Report of Geotechnical Exploration

Bottom Ash Disposal Area 1
Gypsum Disposal Area 2A and
Fly Ash Pond Area 2
Bull Run Fossil Plant
Anderson County, Tennessee

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Prepared for:
Tennessee Valley Authority
Chattanooga, Tennessee

April 12, 2010

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April 12, 2010 rpt_002_172679015

Mr. Scott Turnbow
Tennessee Valley Authority
1101 Market Street, LP-5E-C
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Re: Report of Geotechnical Exploration
Bottom Ash Disposal Area 1
Gypsum Disposal Area 2A and
Fly Ash Pond Area 2
Bull Run Fossil Plant
Anderson County, Tennessee

Dear Mr. Snider:

As requested, Stantec Consulting Services Inc. (Stantec) has completed the geotechnical exploration of the Bottom Ash Storage Area, Gypsum Storage Area and Main Ash Pond at the Bull Run Fossil Plant located in Clinton, Anderson County, Tennessee. The purpose of the exploration was to perform a general evaluation of the stability of the dikes that form the different structures. This report documents the subsurface conditions, results of laboratory testing, findings from historical document reviews, results of our seepage and slope stability analyses, and our conclusions and recommendations. These services were performed under Engineering Service Request ESR 909 in accordance with the terms and provisions established in our System-Wide Services Agreement dated December 22, 2008.

Stantec appreciates the opportunity to provide engineering services for this project. If you have any questions, or if we may be of further assistance, feel free to contact our office.

Sincerely,

STANTEC CONSULTING SERVICES INC.

Hugo R. Aparicio, PE
Principal

/rdr

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Executive Summary

Stantec has completed a geotechnical exploration of the Bottom Ash Disposal Area (Area 1), Gypsum Disposal Area (Area 2A) and Fly Ash Pond (Area 2) at the Bull Run Fossil Plant. The scope of work consisted of reviewing pertinent historical documentation provided by TVA, field observations, a geotechnical exploration, engineering analyses, and providing conclusions and recommendations relative to the general stability conditions of the three Coal Combustion Byproduct (CCB) storage facilities.

The area occupied by the three facilities was initially developed in the 1960s by constructing dikes in the floodplain adjacent to Clinch River (Melton Hill Reservoir) and its tributary Bull Run Creek. The original facility was divided into two areas, Area 1 and Area 2, separated by a drainage channel. The tributary stream was relocated to increase the size of Area 2. At first both areas served as sluiced ash disposal facilities. The dike was initially built to a crest elevation of 800 feet, making it an approximately 15-foot high barrier. In the mid 1970s, the dikes were raised to their current elevation (810 feet) and a divider dike was added within Area 2 to create a stilling pond in the southwest corner. Starting in 1980, Area 1 was used for different dry and wet ash disposal activities, and since 2004 it has received all bottom ash not sold offsite. In 1981, an interior dike was constructed within Area 2 to form Area 2A. Area 2A received sluiced ash until about 1989; thereafter, it received dry bottom ash from Area 1 until 2004, when it became inactive.

The Gypsum Disposal Area was constructed within Area 2A starting in 2006. This facility went online in late 2008. The principal features constructed prior to going online were a dike to raise the west, south and east sides of Area 2A up to elevation 835'; grading the bottom so it would drain toward the south; and installing perimeter and finger under-drains to control seepage. According to design drawings, the dike was built of compacted bottom ash on top of different ash deposits, including sluiced and dredged fly ash. Additional measures were implemented to construct the south dike, as this area of the dike was underlain by sluiced ash deposits and located next to the fly ash pond (Area 2). Furthermore, according to design drawings and 2009 hydrographic survey information, the bottom of the pond is shallow and flat next to the east side of the south dike, but slopes downward toward the center of the ash pond next to the west side of the south dike.

In early 2007, seeps developed along the south slope of Area 2A causing sloughing near the toe of the slope. As a result, several changes were implemented to under-drain features installed initially to control seepage across the south dike. Although the sloughing was repaired by early 2008, it reappeared in October 2009. The changes reportedly consisted of installing an extensive bottom drainage system within the pool area. Water collected by this system is to be discharged into a header pipe installed near and parallel to the interior toe of the south dike. In turn, water collected by the header pipe is supposed to discharge into the existing spillway pipes of Area 2A.

Design and as-built drawings show the section of the initial dike that formed Areas 1 and 2 (up to elevation 800 feet) to be uniform. Conversely, the expansion of the dike to elevation 810 feet varied in cross section as well as foundation conditions according to location. The exterior slope of the initial dike remains under water below elevation 795 feet, the normal pool elevation of Melton Hill Reservoir.

The geotechnical exploration consisted of advancing 93 borings across the disposal areas. The subsurface investigation included Standard Penetration Testing (SPT) in most of the borings, and Cone Penetration Tests (CPT) and undisturbed soil sampling in selected borings. A total of 42 piezometers and 5 slope inclinometers were installed in some of the borings.

Seepage analyses were performed on selected Areas 2 and 2A dike cross-sections to estimate seepage gradients for the evaluation of piping potential and pore water pressures within the dike and foundation soils used in slope stability analyses. The analyses were performed for steady-state seepage through saturated and unsaturated soils. The applied boundary conditions represented the normal and observed maximum storage pool elevations in the Fly Ash Pond (806.5 feet) and Gypsum Disposal Area (825 feet), respectively. The lowest factors of safety against piping, computed for the surficial 3 to 5 feet of soil in these areas, ranged from 2.4 for one Area 2 dike section to 1.8 for a cross section of Area 2A. Based on USACE design criteria for dams (EM 110-2-1901), the target minimum factor of safety against piping is 3.0.

The stability of the dikes was evaluated using two-dimensional limit equilibrium methods of analysis, assuming static, long-term and fully drained conditions within the existing dikes and foundation soils. Stability analyses were performed for several existing cross sections using soil properties selected based on in-situ, as well as laboratory testing results, phreatic levels obtained from piezometer readings, and pore water pressures within the dike and foundation materials as estimated by the seepage analyses. Stability analyses of future expansions of the Gypsum Disposal Area were not performed as expansion plans for this area may vary depending on the final closure design.

The slope stability calculations produced factors of safety against sliding below 1.5 (which is the minimum acceptable value that current USACE criteria requires for long-term loading conditions on similar dikes) for the south dike of the Gypsum Disposal Area and the perimeter dikes constructed initially to form Area 2. The low factors of safety for the south slope of Area 2A are caused by the low shear strength of the foundation material (sluiced ash), relatively high phreatic levels near the dike toe, and the sloping ash pond pool bottom next to the west side of the slope. The low factors of safety for Area 2 perimeter dikes are a result of high phreatic levels caused by the ash pond pool level, lack of under-drain features to control seepage across the dike, exterior slope steepness of the dikes, and shear strength of the dike material.

The factor of safety against sliding for the south dike of Area 2A can be raised to the minimum acceptable value by buttressing the toe area using crushed stone and armoring the slope. The buttressing will require placing crushed stone on fly ash deposited on the bottom of the ash pond. In view of its soft and wet conditions, the surface of the fly ash needs to be stabilized prior to building the buttress. Applicable stabilization measures include placing a layer of geo-grid over the ash and then placing thin layers of sand or fine crushed stone at a prescribed rate of construction. Sand is required in areas where the factor of safety against piping needs to be improved. A work plan to construct this buttress is being prepared parallel with this report.

The factor of safety against sliding and piping for the perimeter dike of Areas 2 and 2A can be raised to acceptable levels by different methods or a combination thereof. One measure that can be implemented immediately is to lower the normal pool elevation of the ash pond permanently. Lowering this normal pool elevation approximately 6 feet would reduce the

seepage across the perimeter dike along the south and west sides of the ash pond/stilling basin, which in turn would raise the factor of safety against deep seated slope failure to above 1.5, the minimum acceptable value. Constructing a buttress along the exterior slope of the lower perimeter dike would also raise the factors of safety above minimum acceptable levels, including those of the perimeter dike system along the west side of the gypsum disposal area.

TVA can also consider constructing a slurry wall within the upper dike to lower the phreatic surface across the perimeter dikes (from the southeast corner of the ash pond to the northwest corner of the gypsum stack) and obtain higher factors of safety. However, unless the pool level is also lowered near elevation 795 feet, this measure alone would not raise the factors of safety of the ash pond dikes to adequate levels. In the case of the perimeter dike system west of the gypsum disposal area, flattening the slope of the upper perimeter dike would need to be implemented in addition to the slurry wall in order to raise the factor of safety to 1.5.

This report presents the results of stability analyses performed along five cross sections of the perimeter dike after the different methods discussed above, by themselves or combined, are included in the analyses. Lowering the normal pool elevation of the fly ash pond permanently to reduce seepage across the dike appears to be the most effective method to raise the factors of safety of the fly ash pond/stilling basin dike system. Buttressing of the exterior lower perimeter dike slope or combining the use of a slurry wall with flattening of the upper perimeter dike slope appear to be the most practical measures to raise the factor of safety of the perimeter dike system located west of the gypsum stack. A work plan to attain acceptable factors of safety against sliding and piping for the perimeter dike of Areas 2 and 2A should be prepared based on more detailed analyses and additional geotechnical information.

Existing ditches controlling exterior surface drainage of Areas 1, 2 and 2A lack adequate positive grading. Likewise, there are slopes along the north side of Area 2A and west side of Area 1, above elevation 810 feet, which are steeper than 2:1 and pose a concern in terms of maintenance activities. Work plans have already been prepared to grade back these steep slope areas and address deficient surface runoff conditions along the west and south sides of Area 1 and all sides of Area 2A. Implementation of these work plans is scheduled to start April 2010. Surface runoff improvements along the exterior slope of Area 2 should be included as part of a work plan to raise the factors of safety against sliding and piping.

Report of Geotechnical Exploration

Bottom Ash Disposal Area 1
Gypsum Disposal Area 2A and
Fly Ash Pond Area 2
Bull Run Fossil Plant
Anderson County, Tennessee

1. Introduction

1.1. General

Subsequent to the failure of the dredge cell at the Kingston Fossil Plant in December of 2008, the Tennessee Valley Authority (TVA) contracted with Stantec Consulting Services Inc. (Stantec) to perform stability evaluations for the coal combustion byproduct (CCB) storage facilities at each of its coal fired power plants. These facilities consist of ash ponds, scrubber sludge (gypsum) ponds, wet ash dredge cells, dry ash stacks, and gypsum stacks. A number of the facilities have completed their design life and are abandoned; however, a majority of the facilities are currently receiving by-products.

Initial efforts consisted of site visits with TVA personnel and review of historical documents to provide recommendations for immediate risk reduction measures and to identify sites/facilities that require further evaluation. The final reports for these efforts, labeled as Phase I of the stability evaluations, were submitted in June of 2009. In general, these reports recommend conducting geotechnical explorations for CCB disposal facilities and performing engineering analyses of existing configurations for comparison against current dam safety criteria.

1.2. Plant Location and Layout of CCB Disposal Facilities

The Bull Run Fossil Plant (BRF) is located in Anderson County and is situated along the banks of Clinch River (Melton Hill Reservoir) and Bull Run Creek in Clinton, Tennessee. Nearby cities include Oak Ridge, which is located approximately six miles to the west, and Knoxville, which is located approximately 12 miles to the southeast. Figure 1 provides an approximate location of the plant and its vicinity.

The construction of the Bull Run Fossil Plant began in 1962 and was completed in 1966. Initial development of the CCB disposal areas covered in this report was part of the original plant construction. The plant has one coal-fired generating unit, consumes approximately 7,300 tons of coal per day, and generates about six billion kilowatt-hours of electricity each year.

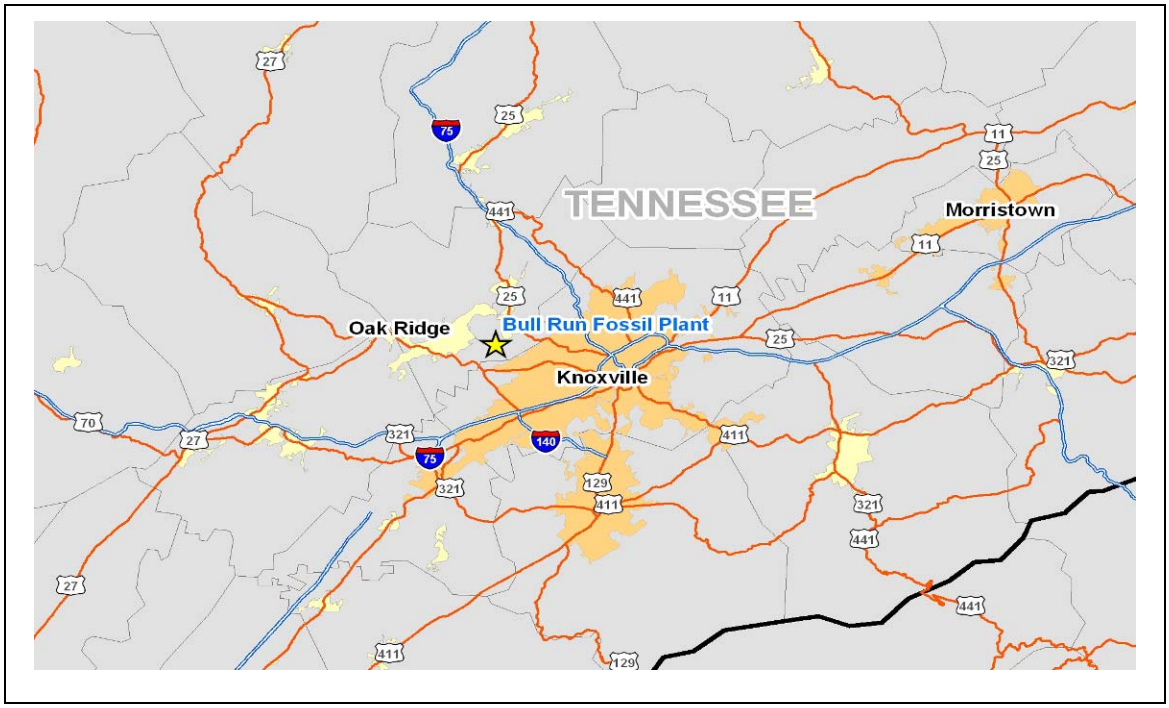
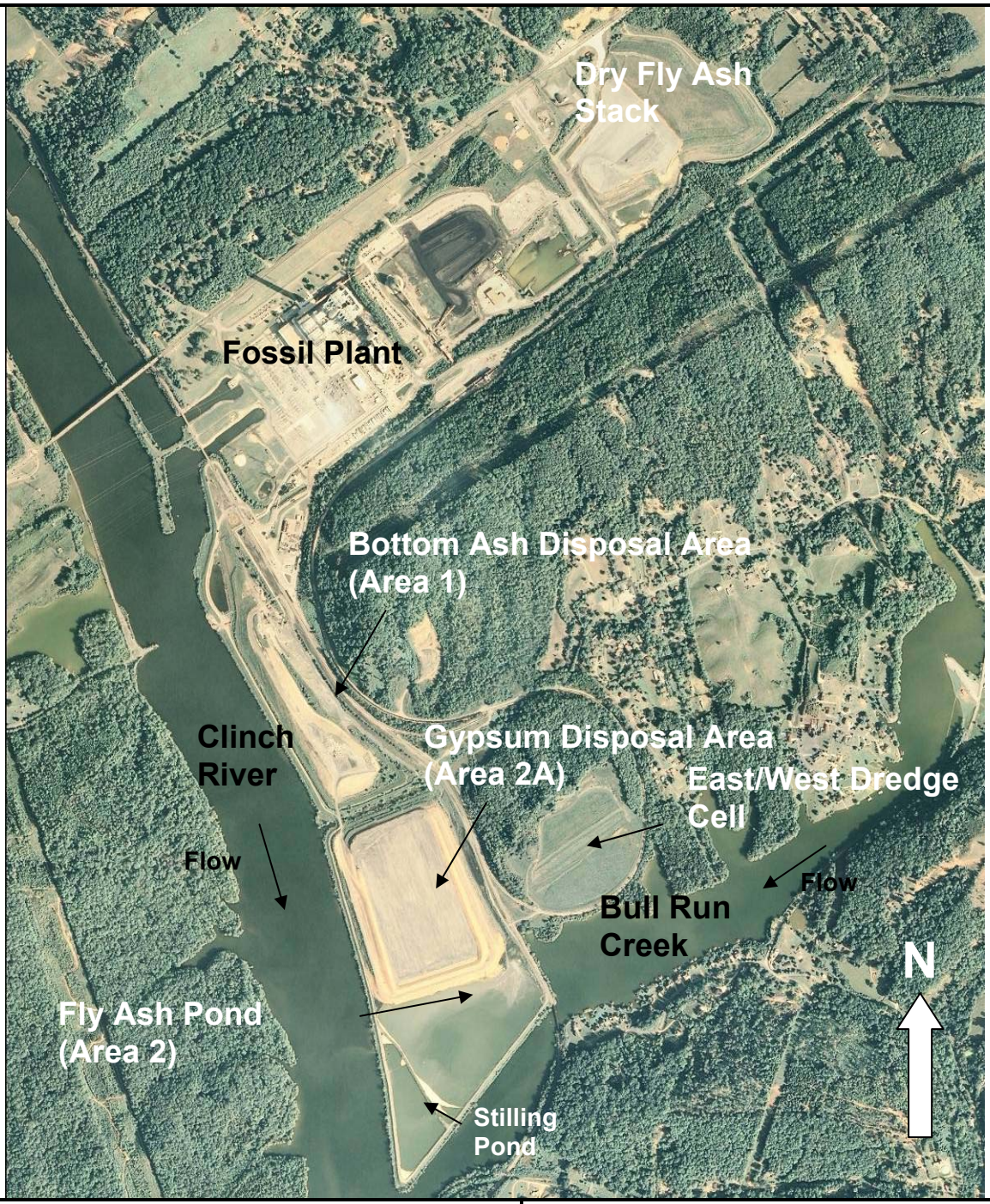


Figure 1. Site Vicinity Map

The Bull Run Fossil Plant currently utilizes four CCB storage facilities. The location of these facilities, along with other pertinent features, is provided in Figure 2. This report focuses on three of the CCB facilities; the Bottom Ash Disposal Area (also known as Area 1), Gypsum Disposal Area (also known as Area 2A) and the Fly Ash Pond (also known as Area 2). The Fly Ash Pond includes a Stilling Pond. The fourth CCB storage facility is a Dry Ash Disposal Area located on the northeast side of the plant. This fourth area is not part of this exploration. At one time the CCB disposal facilities also included an area known as the East/West Dredge Cell located east of Area 2. This dredge cell was closed and has remained inactive since 1995.



Bull Run Fossil Plant
Bottom Ash Disposal Area 1
Gypsum Disposal Area 2A and
Fly Ash Pond Area 2
Anderson County, Tennessee

Stantec

Figure 2. Aerial View of Coal Combustion By-Product Storage Facilities at BRF

1.3. Scope of Work

This report addresses the geotechnical exploration performed to support Stantec's engineering evaluation of three of the CCB disposal facilities at the Bull Run Fossil Plant. The scope of work performed included the following tasks:

- Review of available documentation to support the development of a work plan for the geotechnical exploration and engineering evaluations.
- Survey services to develop dike cross-sections – performed by TVA surveyors.
- Development and planning of the geotechnical exploration.
- Execution of a drilling program to develop the subsurface lithology and provide samples for subsequent laboratory testing.
- Installation of piezometers for monitoring water levels in the dikes and foundation soils, and slope inclinometers for monitoring subsurface movement along the south slope of the Gypsum Disposal Area.
- Execution of a laboratory testing program to develop strength and permeability data to support engineering analyses.
- Instrumentation monitoring program to observe the fluctuations of water levels in the installed piezometers and movements in the slope inclinometers over a period of six months.
- Perform seepage and stability analyses on the existing dike geometry. As previously discussed, the initial development of the CCB disposal areas covered in this report occurred in the late 1960's and these areas have been in use since that time. As such, the slope stability and seepage analyses model static, long-term, steady-state seepage conditions. Seismic stability evaluations were beyond the scope of work for this effort.
- Prepare a geotechnical report documenting the scope of work, outlining the results of the exploration, discussing the engineering analyses, and providing applicable recommendations relative to the existing slope conditions observed at the site.

Parallel with the preparation of this report, Stantec has also developed a workplan to address the stability of the south slope of the Gypsum Storage Area (Area 2A). The workplan includes measures that once implemented, will result in an acceptable factor of safety against sliding. The engineering analyses associated with this workplan are discussed in this report.

2. General Site Description and Geologic Setting

2.1. Site Location and Description

The Bull Run Fossil Plant is located in the eastern half of Tennessee just northwest of the city of Knoxville. The plant is situated next to the east bank of Clinch River, with the three CCB disposal areas located mostly on the floodplain of the river and its tributary, Bull Run Creek. The local topography is relatively level, with the constructed dikes originally rising about 0 to 40 feet above the surrounding terrain. Based on available drawings dating to the time of the construction of the CCB disposal areas (see Reference No. 1 in Table 1), the natural ground elevation within the CCB disposal areas varied from approximately 770 to 820 feet above Mean Sea Level (MSL) prior to excavating native (borrow) materials for construction of the dikes.

The original construction of the perimeter dikes included the relocation of Bull Run Creek, which meandered across Areas 2 and 2A, and constructing a channel that separated these areas from Area 1. Bull Run Creek was relocated by constructing a straight channel traversing parallel to the south dike of Area 2. The channel separating Area 1 from Areas 2 and 2A was apparently constructed to convey surface drainage from the areas east of the storage facilities to Clinch River.

2.2. Geologic Setting

The Bull Run Fossil Plant is located within the Valley and Ridge Province of the Appalachian Highlands. The three CCB disposal facilities lie within a peninsula bordered by the Clinch River to the west and Bull Run Creek to the south. Accordingly, the majority of the site is underlain by alluvial deposits consisting of silts and clays with varying amounts of sand. The remaining portion of the plant is underlain by residual soils resulting from in-place weathering of the parent Ordovician and Cambrian aged limestone and calcareous shale bedrock formations.

The topography and geology within the vicinity of the plant are typical of the Valley and Ridge Physiographic Province, characterized by parallel ridges trending northeast to southwest and underlain by more erosion resistant siltstones, sandstones, and dolomites, and valleys underlain by the less erosion resistant shales and limestones. The area has been subjected to several tectonic events that have caused folding, fracturing and faulting of the bedrock throughout the region. A succession of thrust faults within the area has resulted in several bedrock units being present beneath the plant footprint.

The plant straddles Bull Run Ridge, which is underlain by the Rome Formation consisting of arenaceous shale and sandstone beds. The valley to the south of Bull Run Ridge is underlain by interbedded argillaceous shales and siltstones of the Conassauga Group, while the valley to the north of the ridge is underlain by several sub-units of the Chickamauga Formation consisting of limestone, shaley limestone, calcareous shale, and calcareous siltstones. The Chickamauga formation dips about 40º to the southeast, is moderately to highly jointed and faulted, and is moderately solutioned along the joints and bedding planes. These solution features produce near vertical “slots” filled with soft clay which can extend to significant depths.

While geologic information for the CCB disposal area sites is only available in typically broad descriptions, a foundation investigation (see Reference 4 in Table 1) performed within the Bull Run plant area as part of the original project provides a more in depth description of the geology and its potential impacts on the construction of the different plant unit foundations. These potential impacts, such as exposure of clay-filled cavities or open cavities, were related to relatively deep bedrock excavation required to construct the plant building foundations. Since similar excavation into the bedrock was not required for the construction of the CCB disposal areas, similar impact of the geology would not necessarily apply to the performance of the CCB structures. Furthermore, available historical project information does not mention the presence of karst activity within the CCB disposal areas.

3. Review of Available Information

3.1. General

As part of the Phase 1 site assessments, Stantec engineers and geologists reviewed documents provided by TVA with the objective of developing an understanding of the development and history of the plant and CCB storage facilities. The documents reviewed include design drawings, design and construction memoranda, aerial photographs, survey/topographical data, and annual inspection reports. Other documents reviewed consisted of correspondence (letters, emails and faxes) and photos. A complete list of the documents provided by TVA for review is presented with the Phase 1 Facility Assessment Report. Table 1 presents a list of the documents considered more relevant to the geotechnical study of the subject CCB storage facilities. A copy of the documents listed in Table 1 is presented in Appendix A.

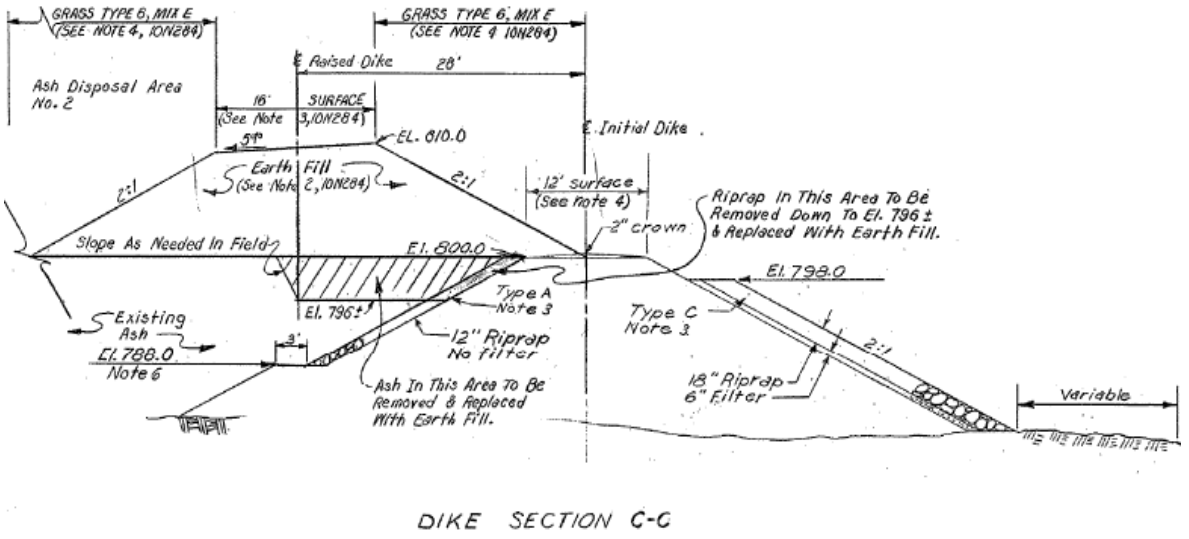
3.2. Development of CCB Disposal Areas

Reference 1 is a design drawing titled "*Ash Disposal Areas and Dikes",* originally dated April 1962 and revised for the fourteenth time in February, 1977. This drawing was prepared by TVA and identifies several historic changes to the original layout of the ash storage facilities, including addition of rip-rap protection in 1966, raising the dike in 1975, constructing a divider dike in 1975, and relocating the dike in 1977. The drawing is believed to have been used mainly for constructing the starter dike for Areas 1 and 2. A summary of the quantities for construction of the initial dike are included on this drawing along with notes indicating that the initial dike for Areas 1 and 2 was constructed up to an elevation of 800 feet. This drawing also appears to illustrate the original ground contours prior to any development of the ash disposal facility.

Reference 2 is a drawing titled "*Ash Disposal Areas Supplemental Details Sheet 3*," originally dated April, 1962 and last revised in May, 1975. This design drawing includes typical cross sections of the dike impoundments for Areas 1 and 2 associated with Drawing 10N213 (Reference 1). This drawing was revised in 1975 to include raising the dike and limits of ash removal. The section shown below in Figure 3 illustrates the south dike of Area 2 having a crest elevation of 800 feet and external slopes at 2H:1V (Horizontal:Vertical). The raised dike is also show on this section with a maximum crest elevation of 810 feet and sloped embankments at 2H:1V.

Table 1. List of Documents Reviewed for Geotechnical Exploration

Reference No.	Document Name	Type of Document	Dated	Agency	TVA Reference No.
1	Ash Disposal Areas and Dikes	Design/As-Built Drawing	April 1962 (Revised 1977)	TVA	10N213
2	Ash Disposal Areas Supplemental Details Sheet 3	Design/As-Built Drawing	April 1962 (Revised 1975)	TVA	10N214
3	Ash Disposal Areas Supplemental Details Sheet 4	Design/As-Built Drawing	April 1975 (Revised 1975)	TVA	10N284
4	Foundation Investigation for the Bull Run Steam Plant	Report	January 1962	TVA	NA
5	Gypsum & Ash Disposal	Design Drawings	June 2008	TVA	10W297 1 through 40
6	Gypsum & Ash Disposal	Design Drawings	December 2008	TVA	10W298 1 through 42
7	FPG- Design Change Notice	Notes and Design Drawings	February 2008	TVA	BRF-08-1052-001 and Drawings. 10W297-5A, 10W297-27A and 10W297-32A
8	Report of Geotechnical Exploration	Report	July 2004	MACTEC	NA
9	BRF Plant FGD Disposal Area Dike Seepage and Stability	MS Power Point Slides	April 2007	Geosyntec	NA
10	BRF Plant Gypsum Stack and Ash Disposal Dike Field Observations and Recommended Actions	Letter	February 2009	Stantec	NA
11	Ash Ponds 1 & 2A Soil Investigation	Report	March 1985	TVA	NA
12	Report of a Geotechnical Exploration	Report	March 1989	Tri-State Testing & Drilling	NA



DIKE SECTION C-C

Figure 3. Ash Disposal Area 2 – Dike Construction (Drawing 10N213)

Reference 3 is a drawing titled "Ash Disposal Areas Supplemental Details Sheet 4," originally dated April, 1975 and last revised in July, 1975. This design drawing includes typical cross sections of the dike impoundments for Area 2 also associated with Drawing 10N213 (Reference 1). This drawing was revised in 1975 to include an added divider dike and the addition of a stilling pool in the southwestern corner of Area 2. A typical section of the divider dike is shown to have a crest elevation of 810 feet and 2H:1V external slopes down to elevation 798 feet and 6H:1V slopes thereafter. The drawing notes that the divider dike was to be constructed of compacted bottom ash. According to available design or as-built information, no under-drain features were installed to control seepage across the dikes generated by the ash/stilling pond.

3.2.1. Area 1 - Bottom Ash Disposal Area

Area 1 was initially utilized to store hydraulically placed (wet sluiced) fly ash when the plant went online in 1966. This area originally had a spillway in the southwest corner which discharged into the Clinch River. Starting in 1980, a major portion of Area 1 was diked to receive dredged material from Area 2 (fly ash). When the East/West Dredge Cell went online in 1981, Area 1 was used as a fly ash settlement pond and discharged into an ash channel. The northeast corner of Area 1 received sluiced bottom ash and a channel traversing along its east side conveyed the bottom ash to Area 2 (current operations). In 1985, the settlement pond in Area 1 ceased receiving sluiced ash and was filled with bottom ash. Bottom ash was stacked according to a 1986 stacking plan until 1988. From 1988 to 2004, bottom ash was temporarily stacked in this area prior to going to Area 2A for disposal. From 2004 to present, all bottom ash not sold is stacked in Area 1.

Historical information reviewed as part of the Phase 1 assessment Stantec performed in 2009 indicates that slippage and settlement was observed along the south dike of Area 1 in 1981. Also, several slides were noted on the upper dike in 1998, but the records do not indicate where in Area 1 this occurred or the extent of the slides.

The lower and upper dikes that form Area 2 also extend along the west and south sides of Area 1. The west dikes along Area 1 have flatter slopes and, in fact, the top of the lower dike in the north portion of Area 1 slopes down toward the river instead of forming a flat intermediate bench. The ash stacked on top of the sluiced ash rises above the upper dike up to near elevation 850 feet. There are areas along the west and east sides of the raised stack where the slope of the bottom ash deposits approach 1.5H:1V.

3.2.2. Area 2 - Fly Ash Pond

The Fly Ash Pond Area 2 was one of the original facilities constructed when the plant went online in 1966-1967. No ash was sluiced to the pond until 1971, when the sluice channel was constructed that linked Area 1 to the current Fly Ash Pond Area 2. The original spillway was located in the south end of the pond and discharged into Bull Run Creek. In 1976, an internal dike was constructed to form the stilling pond in the west portion of Area 2. Since then, water enters the stilling pond through a rock weir near the south end of the internal dike and effluent from the stilling pond discharges into the Clinch River through three concrete riser spillway structures. The spillway in the south portion of the pond was abandoned.

In 1981, a portion of Area 2 was diked off to form Area 2A, the eventual location of the Gypsum Disposal Area. In 1981, Area 2A was used as a secondary fly ash settlement pond. Currently, Area 2 receives sluiced fly ash (and some bottom ash) from the ash channel which originates on the east side of Area 1. The pond also receives discharges from the Gypsum Disposal Area 2A, Coal Yard Runoff Pond and Chemical Treatment Pond.

According to historical records, seepage was observed along the west dike from 1976 to 1979. Also, a wet and soft area was noted on the toe of the south dike in 1995. This area was probably located along the top of the lower dike, which is also the toe of the upper dike, since the toe of the lower dike is submerged under waters of Bull Run Creek. Wet areas were also observed during the Phase 1 field reconnaissance, as described in Reference 10, along the top of the lower dike. A slump of the Bull Run Creek bank, or exterior south slope of the lower dike, was also observed during the Phase 1 assessment. This slumped area was repaired in the spring of 2009 using crushed stone rip rap.

3.2.3. Area 2A- Gypsum Disposal Area

In 1981, a divider dike was constructed within Area 2 to form Area 2A. Fly ash was sluiced into Area 2A until 1989, after which, bottom ash from Area 1 was dry stacked there until 2004. Construction began in 2006 to create the Gypsum Disposal Area which went online in late 2008. Approximately 240,000 dry tons of scrubber gypsum are supposed to be produced each year and transported to Area 2A through wet sluicing. Approximately 50,000 tons of byproduct are supposed to be sold to off-site sources.

The lower and upper dikes that form Area 2 also extend along the west and north sides of Area 2A. In general, the south and east sides of Area 2A above elevation 810 feet were constructed using uniform 3:1 slopes up to elevation 835 feet, with a 20-foot wide intermediate bench at elevation 825 feet. The east slope toes out along the sluice ditch channel that extends from the northeast corner of Area 1 to the northeast corner of Area 2. The south slope of Area 2A toes out into the Fly Ash Pond. The west and north side slopes above elevation 810 feet are not uniform, varying in steepness from 1.5V:1H to 3H:1V, but include an intermediate bench that varies in width near elevation 825 feet and elevation 818 feet (north slope only).

3.2.4. As-Built Drawings

The title blocks for References 1, 2, and 3 drawings contain the description "Record Drawings as Constructed." The date of signing for all three referenced drawings is January, 1979. All documented revisions have prior dates.

3.2.5. Geotechnical Studies

The historical documentation provided by TVA for review does not include geotechnical exploration information that would have preceded the initial development of the CCB disposal areas. As mentioned before, Reference 4 documents a foundation investigation performed only at the site of the plant building structures. References 11 (1985) and 12 (1989) are reports of limited subsurface explorations of Areas 1 and 2A. The 1985 exploration included borings drilled along the west and south sides of Area 2A and the west side of Area 1. According to Reference 11, the raised portion of the perimeter dike was constructed either on top of bottom ash deposits or on top of fly ash deposits. Also, based on the reference, it was not uncommon to stack ash inside the pool of Area 2A up to elevation 825 feet.

3.3. Design, Construction and Sloughing of Area 2A South Slope

The south dike of the gypsum disposal area was constructed over sluiced ash deposits that extend into the Fly Ash Pond (Area 2) well beyond the toe of the dike. In view of the foundations conditions, the design of the south dike included certain features to reduce the potential for settlement or failure due to pore pressure buildup within the soft sluice ash foundation deposits, and to control seepage across the dike. A review of available information relative to the design, construction modifications and performance of the south embankment is presented in the following paragraphs.

3.3.1. Design of South Dike Toe Area

The design of this area called for bottom ash columns to be constructed within the sluiced ash deposits underneath most of the south dike, as shown in Drawing 10W298-40 (included in Reference 6) which shows the column layout, details and grid pattern. According to TVA, the columns were actually constructed with manufactured sand instead of bottom ash. The columns were to extend from elevation 810 feet down to native soil (approximate elevation 784 feet). The purpose for the columns was to reduce pore pressure buildup within the sluiced ash deposits during construction of south dike. In addition, a 5-foot thick blanket of bottom ash was constructed between elevations 810 feet and 805 feet, around the columns, to further promote pore pressure dissipation near the top of the columns (see Drawing 10W297-27 in Reference 5). The top of the 5-foot thick blanket of bottom ash was to be lined with geotextile fabric, which was to extend from the bottom (interior) of the disposal area toward the south toe of the exterior slope, and end about 5 feet from the face of the slope.

In addition, the toe area design included a perimeter under-drain (6 inch perforated pipe wrapped in crushed stone and filter fabric traversing parallel to the slope contours) at elevation 810 feet. The perimeter under-drain was to include lateral outlet pipes (6 inch non-perforated pipe) at 100 feet intervals, as indicated on Detail D27 of Drawing 10W297-27 reproduced below.

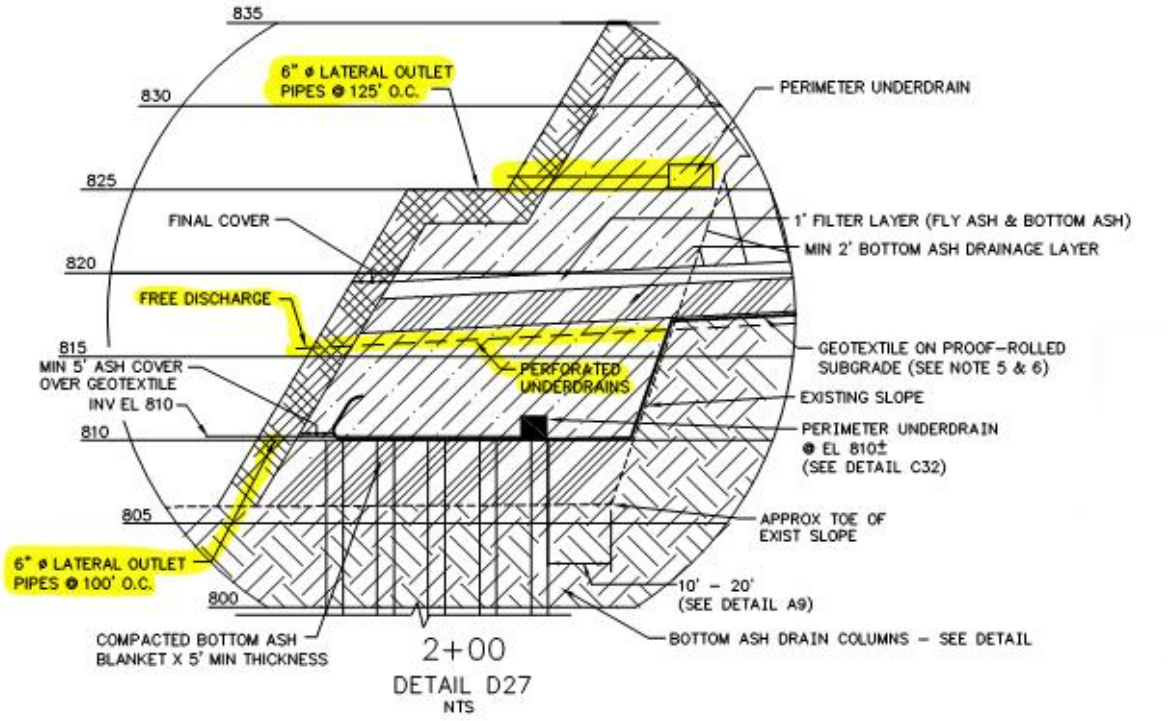


Figure 4. Detail D27 South Slope Toe Area Design (Drawing 10W297-27)

Detail D27 and Section B27 of Drawing 10W297-27 also show a series of 4 inch perforated under-drain pipes traversing across the entire bottom of the disposal area in a north-south direction, with the pipes installed at 50-foot intervals and discharging near elevation 815 feet. The design also called for another perimeter under-drain at elevation 825 feet with 6-inch lateral outlet pipes installed at 125-foot intervals. Drawing 10W297-26 also shows perimeter drains at elevation 815 feet running parallel to the east and west sides of Area 2A, with lateral outlet pipes installed at 250 feet spacing intervals.

Stantec's October 2009 reconnaissance of the exterior dike slopes revealed the presence of two sets of lateral pipes exiting the south slope and one set exiting each the west and east slopes of the dike. On the south dike, one set consists of six 6-inch diameter lateral pipes daylighting slightly below elevation 825 feet at approximately 125-foot intervals. The second set daylights near the toe of the slope, slightly above or below the normal ash pond pool elevation. A total of ten 4-inch diameter or 6-inch diameter lateral pipes were found day lighting near elevation 806 feet at 50-foot to 100-foot intervals.

3.3.2. Sloughing along Toe Area and 2007 Repair Measures

As the construction of the initial gypsum disposal area dike was being completed in 2007, seepage through the lower portion of the dike caused sloughs along the exterior toe of the south dike. In addition, erosion around the 30 inch CMP outlet of the spillway pipes was observed, presumably caused by leakage through openings encountered in pipe joints.

The 2007 sloughing was repaired along with some modifications to the seepage control features as discussed in the next paragraphs. However, new sloughing developed along the toe of the south embankment on October 6, 2009. Information from slope inclinometers installed as part of this exploration show the bottom of the sloughing to be near elevation 803 feet.

According to a TVA Design Change Notice dated February 22, 2008 (Reference 7), the seepage problems were corrected by implementing several corrective measures along the toe of both the exterior and interior south dike slopes and the south side of the gypsum stack bottom. The 30 inch CMP spillway pipes were reportedly slip-lined using a 24 inch HDPE (butt-fusion weld), which included grouting the annular space between the two pipes. The erosion (voids) observed around the outlet of the spillway pipes was to be filled by the grouting.

According to notes dated February 15 and 27, March 15, and April 4, 2007 in Reference 7, under-drainage through the 4-inch perforated HDPE pipe system (Section B27 of Drawing 10W297-27) was cutoff. These under-drain pipes were connected to a 12-inch header pipe installed north (upstream) of the interior toe of the embankment slope. This header pipe included a penetration into each of the 24-inch spillway pipes, such that the water collected by the header pipe would drain into the spillway pipes (Page 2A of Reference 7). The header pipe also included two 12-inch HDPE stand pipes immediately south of each stop log structure (weir). The stand pipes can be seen today protruding out of the pool, near the weir structures.

The under-drain perforated pipes (finger drains) through the dike were to be plugged, retaining the outer 20 feet (+/-) as a toe drain but blocking drainage from within the embankment. Detail D27 on Drawing 10W298-27 calls for field plugging these under-drain pipes using bentonite pellets.

Notes on Sheet 4 of 6 contained within Reference 7 calls for a clay plug/shoulder to be constructed along the interior toe of the embankment, immediately south of the 12-inch header pipe. The dimensions of this plug were presumably modified as per recommendations from Geosyntec and are presented on the last page of Reference 7. Reference 7 also includes two drawings (10W298-5A and 10W298-27A) prepared by Geosyntec with recommendations to change the bottom drainage system by installing drainage collection pipes wrapped in gravel and geotextile filter fabric. Figure 5 presents photos of the modified bottom drainage system. These photos were obtained from TVA's FY2009 Annual Report of Waste Disposal Areas at the Bull Run Fossil Plant.

Figure 5. Area 2A – Gypsum Disposal Area – Bottom Drainage Systems

Sheet 4 of 6 of Reference 7 and Drawing 10W298-27 (dated February 1, 2008) also show the proposed construction of crushed stone pocket drains on 50-foot centers along the exterior toe of the embankment. These pockets were to be constructed by excavating approximately 14 feet into the slope at elevation 805 feet, with the top of the excavation located near elevation 812 feet. The pockets were to be lined with non-woven filter fabric and formed using #7 crushed stone.

Thirteen pocket drains installed at 50-foot centers were found near the toe of the south slope during the October 2009 observations. Each pocket is 2 to 3 feet wide and appears to have been constructed using #7 or finer crushed stone. It is assumed that the toe areas between pocket drains were repaired using ash and clay.

TVA provided two sets of documents that describe Geosyntec's review and assessment of the sloughing conditions. One set of documents consists of a Power Point presentation dated April 4, 2007 (Reference 9). The second document consists of three drawings (10W297-32A, 10W297-5A and 10W297-27A) that are also part of Reference 7.

3.4. 2009 Field Observations and Repair Work

Observations made during Phase 1 of the disposal facility assessment identified several areas or features of concern along both the exterior and interior slopes of the dikes. These observations are described in the Phase 1 report submitted to TVA in June 2009. Some of the most relevant concerns were discussed in a Stantec letter dated February 25, 2009 (Reference 10) to TVA.

Outstanding concerns, aside from global stability of some of the dike slopes, are poor surface drainage conditions along exterior intermediate benches of Area 2A above elevation 810 feet, and the exterior bench of the perimeter dike (top of lower dike) along the south and west sides of Area 2 and west side of Area 2A. The source of wet conditions on top of the lower dike along the south and west sides of Area 2 is likely due to seepage of impounded water through the dike. Other concerns consist of steep slopes (1.5:1) above elevation 810 feet in Areas 1 and 2A which require periodic maintenance, especially after significant precipitation events. In 2009, sloughing and erosion were observed along the intermediate bench at elevation 818 feet, on the north slope of Area 2A. These disturbed areas were repaired temporarily, waiting for permanent measures to be implemented based on the results of the geotechnical exploration reported herein. More recently, in 2010, tension cracks have developed next to the crest of the same bench (elevation 818 feet).

Several of the concerns identified during the Phase 1 assessment have been corrected and Stantec has prepared and issued work plans to address drainage and grading for Areas 1 and 2A. This report provides recommendations for further work to provide adequate factors of safety for slope stability as part of the final closure of Areas 2 and 2A.

4. Subsurface Exploration

4.1. General

Fieldwork for the geotechnical exploration was performed by Stantec personnel from June 3 through August 14, 2009. The subsurface exploration consisted of advancing a total of 93 borings (including offset borings from original sample borings) at select locations across the

project site. Boring locations were chosen by Stantec and were staked and surveyed by TVA. The subsurface exploration included performing 2,374 standard penetration (SP) tests in selected borings; the installation of 42 piezometers advanced using 3¼ inch (ID) hollow stem augers; the installation of 5 slope inclinometers advanced using 4¼ inch (ID) hollow stem augers, and 8 cone penetration test (CPT) borings. The locations of the borings and their corresponding elevations are shown on the boring layout drawing provided in Appendix B. The locations of the installed slope monitoring instruments (piezometers and slope inclinometers) and their corresponding elevations are shown on the instrumentation layout drawing provided in Appendix B.

An automatic hammer was utilized to perform SP testing in the borings advanced as part of this exploration. A standard penetration test consists of dropping a 140-pound hammer to drive a split-barrel sampler 18 inches. The consistency or relative density of the soil material is estimated by the number of blows it takes to drive the split spoon the last 12 inches. In accordance with ASTM D1586, this method was used to obtain soil samples, estimate the consistency or relative density of subsurface materials and estimate the vertical limits of the subsurface soil horizons. In addition, undisturbed samples (Shelby Tubes) were also obtained from selected depth intervals within clay fill, sluiced ash and fine grained alluvial materials. Upon completion of the drilling and sampling procedures, the boreholes were either backfilled with bentonite-grout, or well backfill materials (cement, sand and/or bentonite) depending on the type of instrumentation the borehole received.

A geotechnical engineer or geologist was present on-site throughout the exploration in order to supervise drilling operations and to visually classify and collect the subsurface samples. Particular attention was given to the subsurface material's color, texture, moisture content and consistency or relative density. Following the field exploration, the recovered samples were transported to laboratory facilities for testing.

4.2. Summary of Borings

Typed boring logs are presented in Appendix C. Results of laboratory testing on selected samples are included in Appendix F. The boring and instrumentation layouts are presented in Appendix B. A summary of the boring information is presented in Table 2, where all measurements are expressed in feet.

Table 2. Summary of Borings

Boring No.	Surface Elevation (ft)	Northing (ft)	Easting (ft)	Depth to Bottom of Hole (ft)	Elevation of Bottom of Hole (ft)
STN-1	832.4	595,024.10	2,544,375.85	82.0	750.4
STN-2	819.4	595,022.62	2,544,232.15	55.5	763.9
STN-3	810.2	595,020.59	2,544,104.02	40.8	769.4
STN-5	841.0	594,652.96	2,544,484.24	75.0	766.0
STN-6	818.2	594,610.05	2,544,394.75	50.8	767.4
STN-7	809.5	594,577.54	2,544,332.94	54.3	755.2
STN-8	821.0	594,312.72	2,544,896.21	52.0	769.0
STN-9	837.5	594,232.56	2,544,740.10	73.5	764.0
STN-10	817.9	594,173.80	2,544,636.59	50.5	767.4
STN-11	808.6	594,140.80	2,544,576.48	40.3	768.3
STN-13	831.3	593,923.78	2,545,228.66	69.0	762.3
STN-14	848.7	593,802.44	2,545,004.48	85.5	763.2
STN-15	818.1	593,734.18	2,544,875.42	51.3	766.8
STN-16	808.0	593,705.67	2,544,823.03	42.7	765.3
STN-18	821.7	593,524.13	2,545,835.46	52.5	769.2
STN-19	810.2	593,480.64	2,545,884.32	45.0	765.2
STN-20	819.6	593,389.26	2,545,507.73	53.0	766.6
STN-21	808.0	593,286.66	2,545,087.68	44.8	763.2
STN-22	799.0	593,138.35	2,545,015.84	34.5	764.5
STN-23	835.0	593,275.52	2,546,061.35	82.0	753.0
STN-24	809.9	593,211.79	2,545,589.93	45.0	764.9
STN-25	826.2	593,158.33	2,545,607.45	60.0	766.2
STN-26	817.3	592,971.96	2,546,347.19	54.0	763.3
STN-27	831.3	592,960.52	2,546,295.43	66.0	765.3
STN-28	816.8	592,587.48	2,546,501.20	52.5	764.3
STN-29	816.8	592,243.83	2,546,673.33	39.5	777.3
STN-30	826.2	592,227.12	2,546,605.60	60.2	766.0
STN-31	823.8	592,969.83	2,545,291.84	60.0	763.8
STN-32	808.2	593,010.17	2,545,153.51	45.5	762.7
STN-33	836.1	592,559.31	2,545,426.43	70.4	765.7
STN-34	825.6	592,527.95	2,545,300.77	65.0	760.6
STN-35	808.9	592,523.92	2,545,221.40	44.7	764.2
STN-36	800.5	592,517.47	2,545,204.09	36.0	764.5
STN-38	808.6	592,160.74	2,545,322.53	44.3	764.3
STN-39	835.7	591,840.77	2,545,638.39	73.2	762.5
STN-40	825.8	591,821.33	2,545,513.41	62.7	763.1
STN-41	809.7	591,800.67	2,545,427.16	44.9	764.8
STN-43	825.0	591,427.25	2,545,657.42	61.4	763.6
STN-44	835.7	591,537.09	2,545,975.54	66.1	769.6
STN-45	824.8	591,478.25	2,545,990.45	58.2	766.6
STN-46	808.2	591,420.20	2,546,001.83	42.0	766.2
STN-47	835.7	591,691.40	2,546,454.06	69.9	765.8
STN-48	825.8	591,636.19	2,546,471.30	60.4	765.4
STN-49	808.5	591,576.97	2,546,494.42	49.5	759.0

Table 2. Summary of Borings

Boring No.	Surface Elevation (ft)	Northing (ft)	Easting (ft)	Depth to Bottom of Hole (ft)	Elevation of Bottom of Hole (ft)
STN-50	825.1	591,841.40	2,546,757.19	60.2	764.9
STN-51	809.8	591,336.60	2,545,543.56	50.0	759.8
STN-52	809.8	591,060.68	2,545,599.52	45.0	764.8
STN-53	801.3	591,057.48	2,545,580.54	39.0	762.3
STN-54	810.1	590,638.72	2,545,959.39	44.5	765.6
STN-55	810.1	590,589.87	2,545,693.73	46.4	763.7
STN-56	800.2	590,580.44	2,545,673.06	37.5	762.7
STN-58	810.3	590,091.97	2,545,756.90	47.3	763.0
STN-59	800.0	590,089.21	2,545,731.11	38.0	762.0
STN-60	810.2	589,601.84	2,545,827.99	48.0	762.2
STN-61	799.9	589,536.98	2,545,830.43	53.2	746.7
STN-62	809.4	590,000.07	2,546,208.94	46.7	762.7
STN-63	801.2	589,989.70	2,546,223.76	41.5	759.7
STN-65	809.1	590,472.00	2,546,579.19	42.9	766.2
STN-66	799.8	590,462.23	2,546,593.73	35.0	764.8
STN-67	809.5	590,946.92	2,546,949.33	30.5	779.0
STN-68	800.8	590,938.03	2,546,963.83	36.5	764.3
STN-70	809.4	591,380.61	2,547,267.77	49.0	760.4
STN-71	809.1	591,954.22	2,546,956.25	54.5	754.6
STN-87	825.3	591,549.15	2,546,217.62	63.7	761.6
STN-88	808.6	591,493.79	2,546,234.83	49.3	759.3
STN-89	836.1	593,192.06	2,545,830.78	40.0	796.1
STN-90	838.4	593,043.65	2,545,471.40	37.0	801.4
STN-10A	817.9	594173.802	2544636.594	35.0	782.9
STN-25P	826.1	593154.555	2545599.904	54.0	772.1
STN-29P	816.8	592243.83	2546673.332	44.0	772.8
STN-34A	825.5	592522.402	2545302.171	28.0	797.5
STN-34P	825.9	592529.459	2545337.087	58.0	767.9
STN-35A	809.1	592527.793	2545220.582	18.0	791.1
STN-41A	809.6	591803.053	2545424.87	18.0	791.6
STN-46P	808.4	591422.849	2546003.927	43.0	765.4
STN-48P	826.1	591636.189	2546471.303	45.0	781.1
STN-49A	808.5	591577.765	2546496.61	12.0	796.5
STN-49P	808.5	591577.472	2546496.416	28.0	780.5
STN-51A	809.8	591329.16	2545545.058	17.0	792.8
STN-51P	809.8	591336.601	2545543.557	38.0	771.8
STN-55A	810.3	590581.123	2545694.583	18.0	792.3
STN-56P	799.3	590578.052	2545666.216	30.0	769.3
STN-62A	809.6	590004.498	2546211.203	22.0	787.6
STN-65A	809.1	590474.376	2546581.373	19.0	790.1
STN-88A	808.5	591494.074	2546236.742	12.0	796.5

4.3. Undisturbed Sampling

A total of one-hundred sixteen (116) undisturbed Shelby tube samples were obtained containing the fill (clayey soil to construct the dikes), ash and alluvial soils from select borings advanced across the project site. The undisturbed samples were retrieved using 2 7/8-inch inside diameter, 30-inch long thin walled tubes and a piston sampler. The undisturbed soil sampling was performed in general accordance with the procedures outlined in ASTM D1587, "Standard Practice for Thin-Walled Tube Sampling of Soils for Geotechnical Purposes."

All Shelby tube samples were sealed with caps in the field and transported to either Stantec's laboratory in Lexington, Kentucky or Geocomp Corporation/Geotesting Express in Alpharetta, Georgia for testing. Testing of the recovered samples included unit weight, unconsolidated-undrained triaxial tests, consolidated-undrained triaxial tests, unconfined compression tests, direct simple shear tests, index testing, and falling head permeability tests. Laboratory results are presented in Appendix F.

4.4. Cone Penetration Testing

Eight (8) CPT borings were advanced at locations situated adjacent to previously drilled sample borings STN-10, 25, 34, 46, 48, 49, 59 and 88 within the perimeter and ash dikes of Areas 1, 2, and 2A (see boring plan presented in Appendix B). The previous sample logs were used to estimate/calibrate the depths for each soil horizon as the CPT testing was being performed. The CPT testing was performed in accordance with ASTM Standard D 5778, "Standard Test Method for Performing Electronic Cone and Piezocone Penetration Testing of Soils." Cone penetration testing is used to determine soil properties and to delineate soil stratigraphy by measuring tip resistance, sleeve friction, and dynamic pore pressure. Soil parameters determined by a CPT include pore pressure, effective angle of internal friction, and un-drained shear strength. CPT test results were used to compare to laboratory shear strength test results and field sampling results. The results of the CPT testing can be found in Appendix H.

5. Field Instrumentation and Monitoring

5.1. General

As part of the geotechnical exploration, Stantec devised and implemented a slope monitoring program. The program started by installing instrumentation in select boreholes drilled for the geotechnical exploration. After taking initial or baseline instrumentation measurements, the monitoring of the dike slope conditions continued by obtaining periodic readings. The monitoring will continue until actions are implemented to provide adequate, long term stability of the structures, and beyond that time at TVA's discretion. Much of the information obtained from the instrumentation readings was used in the engineering analysis presented in this report. The following paragraphs provide additional details regarding the instrumentation and monitoring program.

5.2. Instrumentation

A total of forty-two (42) borings were instrumented with 5 foot long, slotted screen piezometers (PZ) to monitor pore pressures at the specific depths and locations shown on the piezometer installation details presented in Appendix D and on the instrumentation layout in Appendix B. In general, each piezometer screen was surrounded by a sand filter pack of varying thickness, followed by the application of a minimum two-foot thick bentonite seal, and then the annulus outside the riser pipe was grouted to the surface with a bentonite/portland cement mix. Piezometer instrumentation logs can be found in Appendix D and piezometer readings can be found in Appendix E. Table 3 summarizes the piezometers installed at the Bull Run Fossil Plant disposal areas during Stantec's exploration.

Table 3. Piezometer Data

Location	PZ No.	Surface Elevation (ft MSL)	PZ Tip Elevation (ft MSL)	Range of Water Elevations (7/24/09 to 4/2/10) (ft MSL)	
				Min.	Max.
STN-3	PZ-3	810.2	770.1	799.1	804.3
STN-5	PZ-5	841.0	806.7	807.7	810.7
STN-6	PZ-6	818.2	768.2	795.8	797.1
STN-10A	PZ-10A	817.9	785.7	806.5	807.6
STN-14	PZ-14	848.7	800.7	807.4	809.0
STN-15	PZ-15	818.1	768.1	771.8	798.9
STN-18	PZ-18	821.7	796.8	806.2	807.4
STN-19	PZ-19	810.2	791.2	805.1	806.1
STN-27	PZ-27	831.3	803.1	808.5	809.6
STN-30	PZ-30	826.2	801.1	807.9	811.1
STN-33	PZ-33	836.1	814.5	814.9	815.4
STN-34	PZ-34	825.6	764.2	795.5	796.7
STN-34A	PZ-34A	825.5	801.1	808.1	809.1
STN-35	PZ-35	808.9	771.7	792.0	796.0
STN-35A	PZ-35A	809.1	794.0	804.8	806.3
STN-36	PZ-36	800.5	766.5	794.2	795.3
STN-39	PZ-39	835.7	815.6	816.2	818.0
STN-40	PZ-40	825.8	795.2	808.7	810.3
STN-41	PZ-41	809.7	767.6	794.0	796.0
STN-41A	PZ-41A	809.6	791.5	808.0	809.5
STN-44	PZ-44	835.7	805.2	810.1	815.8
STN-45	PZ-45	824.8	793.7	807.7	811.4
STN-46	PZ-46	808.2	799.0	805.4	810.8
STN-47	PZ-47	835.7	808.6	807.9	813.4
STN-48	PZ-48	826.1	801.6	808.4	811.6
STN-49A	PZ-49A	808.5	799.7	808.1	810.1
STN-51	PZ-51	809.8	761.7	794.3	805.5
STN-51A	PZ-51A	809.8	792.7	793.9	806.0
STN-55	PZ-55	810.1	768.9	795.8	796.6
STN-55A	PZ-55A	810.3	792.3	805.2	805.7
STN-56	PZ-56	800.2	764.2	795.7	796.7
STN-62	PZ-62	809.4	768.4	799.7	800.3

Table 3. Piezometer Data

Location	PZ No.	Surface Elevation (ft MSL)	PZ Tip Elevation (ft MSL)	Range of Water Elevations (7/24/09 to 4/2/10) (ft MSL)	
				Min.	Max.
STN-62A	PZ-62A	809.6	787.5	804.8	805.8
STN-63	PZ-63	801.2	762.4	798.1	799.0
STN-65	PZ-65	809.1	771.5	803.6	804.6
STN-65A	PZ-65A	809.1	789.6	805.1	806.3
STN-66	PZ-66	799.8	767.3	793.4	794.6
STN-67	PZ-67	809.5	798.5	803.8	804.7
STN-68	PZ-68	800.8	765.7	793.6	794.9
STN-88	PZ-88	808.5	797.9	806.6	808.6
STN-89	PZ-89	836.1	798.0	809.5	810.5
STN-90	PZ-90	838.4	804.3	810.5	811.6

A total of five (5) borings (STN-29P, STN-46P, STN-49, STN-87 and STN-88) were instrumented with 2.75 inch OD slope inclinometer (SI) casing to monitor potential lateral movement within the subsurface. These instruments were located in areas having a prior history of slope movement, or within areas believed to have a potential for slope movement. Slope inclinometer readings were obtained a minimum of one week after their installation to establish a baseline reading. Depending on their location and evidence of slope movement, subsequent readings were conducted on a weekly to monthly basis since their installation. Specifically, movement was detected near the ground surface at the location of slope inclinometer SI-49. This report includes the results as of the last recorded slope inclinometer reading on April 4, 2010. Future readings will be conducted and the results will be issued under separate cover. A summary table of installed slope inclinometers is provided in Table 4 below. Details of the slope inclinometer installation are presented in Appendix D and the latest slope inclinometer readings presented as displacement curves are shown in Appendix E.

Table 4. Summary of Slope Inclinometers Installed

Boring No.	Instrument ID	Top of Concrete Pad Elevation (ft)	Top of Casing Elevation (ft)	Bottom of Casing Depth (ft)	Bottom of Casing Elevation (ft)
STN-29P	SI-29	817.1	819.9	47.1	772.8
STN-46P	SI-46	808.4	811.2	46.0	765.2
STN-49	SI-49	808.5	811.3	52.6	758.7
STN-87	SI-87	825.3	828.0	66.4	761.6
STN-88	SI-88	808.6	811.0	51.7	759.3

5.3. Monitoring of Dike Slope Conditions

Stantec began a monitoring program upon installation of instruments listed above. The purpose of the monitoring program was to obtain periodic water level readings from piezometers and slope movement data from slope inclinometers. Piezometer readings were taken using a water level indicator and slope inclinometer readings were obtained using a portable traversing inclinometer probe designed for this purpose. The first slope inclinometer survey established the initial profile of the casing and subsequent surveys measured changes in the profile of the casing.

Stantec's schedule for monitoring readings taken to date is presented in Table 5. Results of the monitoring program are presented in Appendix E in the following order:

- Attachment 1 – PZ Readings, and
- Attachment 2 – SI Readings

Table 5. Monitoring Program Schedule

Reading Number	Date of PZ Reading	Date of SI Reading
1	July 24, 2009	August 18, 2009
2	July 31, 2009	September 10, 2009
3	August 7, 2009	October 6, 2009
4	August 14, 2009	October 14, 2009
5	September 10, 2009	October 19, 2009
6	October 6, 2009	October 28, 2009
7	October 14, 2009	November 3, 2009
8	October 19, 2009	November 13, 2009
9	October 28, 2009	November 20, 2009
10	November 3, 2009	November 24, 2009
11	November 13, 2009	December 3, 2009
12	November 20, 2009	December 18, 2009
13	November 24, 2009	December 22, 2009
14	December 3, 2009	December 28, 2009
15	December 10, 2009	January 8, 2010
16	December 18, 2009	January 14, 2010
17	December 22, 2009	January 22, 2010
18	December 28, 2009	January 27, 2010
19	January 8, 2010	February 19, 2010
20	January 14, 2010	March 11, 2010
21	January 22, 2010	March 30, 2010
22	January 27, 2010	April 2, 2010
23	February 19, 2010	
24	March 30, 2010	
25	April 2, 2010	

5.4. Slug Testing

In addition to obtaining water level readings at frequent intervals, Stantec also performed slug testing at all piezometer locations. The slug tests were performed in general accordance with ASTM D 4044 titled, "Standard Test Method for (Field Procedure) for Instantaneous Change in Head (Slug) Tests for Determining Hydraulic Properties of Aquifers." A pressure transducer with a data recorder manufactured by In-Situ, Inc. was used to collect water level information from wells with a riser pipe of sufficient diameter to accommodate the instrument.

All wells were tested by taking an initial measurement of the static water level followed by the insertion of the pressure transducer into the well. Approximately, a half gallon of water was then poured into the well to cause a nearly instantaneous change in the water level. The water levels were then recorded at regular intervals until reaching near static levels. The results were recorded electronically and downloaded into a data collector. Raw data was checked in the field for any discrepancies prior to demobilizing from the site.

The field data, once collected and returned to the office, was entered into the AQTESOLV software program to estimate the hydraulic conductivity of the in-situ soils. The software utilized the Bouwer-Rice solution for a slug test in an unconfined aquifer to estimate the hydraulic conductivity of the material surrounding the piezometer tip. The hydraulic conductivity was estimated for the soil strata that the piezometer screen is set in. Results from the slug testing data are presented in Appendix E.

6. Surveying

6.1. General

Topographic mapping of the Bull Run Fossil Plant (developed from aerial photographs), contour mapping of the Clinch River adjacent to the south and western perimeter of the disposal areas (developed from a hydrographic survey) and field topographic data from selected locations were provided by TVA upon Stantec's request. A summary of survey data obtained is presented in the following paragraphs.

6.2. Aerial Survey

TVA provided topographic mapping of the overall Bull Run Fossil Plant based on aerial photography performed in April, 2009. The limits of the topographic mapping as well as control points referenced to the plant coordinate system were established by TVA with input from Stantec. The results of aerial survey can be seen on the basemap presented in the boring layout drawing in Appendix B.

6.3. Topographic Survey

Stantec requested a field topographic survey be performed by TVA in September, 2009 of specific cross-sections and slopes across the disposal areas. The objective of this work was to supplement the aerial mapping with a more accurate survey of the following features:

(i) Slopes
(ii) Embankments

(iii) Bench Dimensions
(iv) Drainage ditches,
(v) Pipe inverts, and
(vi) Obscured aerial mapping areas

The results of TVA's topographic survey were applied to the cross section profiles used for stability analysis. Selected cross sections are presented in Appendix B.

6.4. Hydrographic Survey

At the request of Stantec, TVA also performed a hydrographic survey of the Clinch River adjacent to the south and west sides of Areas 1, 2, and 2A in September 2009 to supplement land and aerial survey data. A hydrographic survey completed in February, 2006 of Disposal Area 2 and the Stilling Pond was also provided as supplemental data. The combined survey information was used to aid in cross-section geometry development for engineering analysis.

7. Laboratory Testing

7.1. General

The soil samples obtained during the geotechnical exploration were subjected to laboratory tests by Stantec in Lexington, Kentucky and by GeoComp Corporation/Geotesting Express Inc. in Alpharetta, Georgia. The laboratory tests were performed in accordance with ASTM standard testing procedures.

In general, the laboratory analyses consisted of natural moisture content determinations, sieve and hydrometer analyses, Atterberg Limits; specific gravity determinations, consolidated-undrained triaxial compression, direct simple shear, and permeability testing. The results of the strength, permeability, and index testing were used to assist in estimating appropriate soil parameters for the engineering analyses. The results of the index testing were also used to help classify and define the different soil horizons encountered at the Disposal Areas and develop geometric cross-sections used in the engineering analysis. Detailed results of the laboratory testing are presented in Appendix F.

7.2. Laboratory Tests Performed

Stantec performed laboratory testing on the materials encountered during the drilling program to assist in estimating appropriate soil parameters used in the engineering analysis. Geotesting Express Inc. was subcontracted by Stantec to assist in performing laboratory testing on specific undisturbed soil samples. A summary of laboratory tests performed is presented in Table 6.

Table 6. Laboratory Tests Performed

Group *	Test	Standard
1	Natural Moisture Content	ASTM D 2216
2	Classification	ASTM D 2487
	Particle Size Analysis	ASTM D 422
	Atterberg Limits	ASTM D 4318
	Specific Gravity	ASTM D 854
3	Density	ASTM D 2937
4	Falling Head Permeability	ASTM D 5084
5	Consolidated Undrained Triaxial (CU)	ASTM D 4767
6	Unconfined Undrained Triaxial (UU)	ASTM D 2850
7	Unconfined Compression Test (UC)	ASTM D 2166
8	Direct Simple Shear (DSS)	ASTM D 6528

* Results Presented in this order in Appendix F.

7.3. Natural Moisture Content

Natural moisture content tests were performed on all split-spoon samples, and undisturbed Shelby tube samples. For ash samples, an oven drying temperature of 60ºC was used and for all other soils encountered, an oven temperature of 110ºC was used to determine the natural moisture content. The results of the moisture content determinations are presented in Attachment 1 of Appendix F and are summarized in Table 7 below.

7.4. Classification Testing

Soil classification testing consisting of Atterberg Limits, and particle-size analyses were performed on select undisturbed Shelby tube samples and composite SPT samples. These tests were used specifically for classifying the different soil strata. The results can be found in Attachment 2 of Appendix F. A summary of the natural moisture content and classification testing is presented in Table 7 below.

Table 7. Summary of Natural Moisture Content and Classification Testing

Horizon	Predominant USCS Classification	Moisture Content Range	Liquid Limit	Plasticity Index	% Passing #200 Sieve
Lower Dike	CL (CH)	15% to 28%	37 to 51	15 to 28	84 to 98
Upper Dike	CL (SC, ML)	19% to 42%	32 to 46	11 to 19	36 to 73
Sluiced Ash	ML	20% to 95%	NP	NP	86 to 97
Alluvium	CL, CH	24% to 56%	26 to 47	8 to 27	56 to 99
	ML, SC, SM	25% to 41%	NP to 41	NP to 15	26 to 83

7.4.1. Specific Gravity

Specific gravity tests at 20 degrees Celsius were performed in accordance with ASTM 854A on select undisturbed Shelby tube samples of clay and ash materials. The results of these tests were used during falling head permeability and consolidated-undrained triaxial tests.

7.4.2. Particle Size Analysis

Particle size distribution tests were performed on select undisturbed and SPT composite samples from representative soils encountered at the project site. The tests were performed in accordance with ASTM D 422, "Particle Size Analysis of Soils," using sieve analysis for the soil fraction greater than 0.074 mm (No. 200 sieve size) and hydrometer analysis for the fraction smaller than 0.074 mm. The tests were performed on the predominant soil types to supplement the visual classifications made by the engineer/geologist in the field. The individual grain size distribution curves generated from these tests are presented as Attachment 2 of Appendix F.

7.5. Density

The undisturbed Shelby tube samples obtained from the subsurface exploration were extruded and trimmed into six-inch specimens in the laboratory. The trimmings from each specimen were used to determine the natural moisture content. The respective dry density for each sample was then calculated from the total density, the moisture content measurement, and sample dimensions.

7.6. Shear Strength

Stantec performed consolidated-undrained (CU) triaxial tests with pore pressure measurements (ASTM D 4767) on selected six-inch clay and ash specimens extruded from the Shelby tubes to establish effective-stress shear-strength parameters. Nine (9) CU test sets were performed on clay samples and four sets were performed on sluiced ash samples. The results of the CU testing were considered in selecting effective stress shear-strength parameters for the slope stability analyses. Failures stresses expressed in terms of p'-q values were plotted for each material. A summary of the CU triaxial testing data is provided in Table 8 below. The individual consolidated-undrained testing results are presented as Attachment 5 in Appendix F. The individual p'-q plots are presented in Appendix G.

Table 8. Summary of Consolidated – Undrained Triaxial Testing

Location	Boring No.	Sample Interval (feet)	USCS Textural Classification	CU Triaxial Strength	
				c' (psf)	ϕ' (degrees)
Area 1	STN-10	30.5-31.0	CL	440	32.0
		33.8-34.3			
		37.1-37.6			
	STN-11	20.6-21.1		80	33.5
		25.5-26.0			
		33.6-34.1			
Area 2A	STN-34P	50.0-50.5		540	27.5
		52.6-53.1			
		54.0-54.5			
	STN-88	24.6-25.1		500	26.4

Table 8. Summary of Consolidated – Undrained Triaxial Testing

Location	Boring No.	Sample Interval (feet)	USCS Textural Classification	CU Triaxial Strength	
				c' (psf)	ϕ' (degrees)
Area 1	STN-10	26.5-27.0	ML (Sluiced Fly Ash)	100	36.0
	STN-20	24.0-24.5			
		29.0-29.5			
Area 2A	STN-34P	30.2-30.8		323	35.3
		31.4-32.0			
		40.8-41.4			
		36.2-36.8		478	31.7
		37.4-38.0			
		39.4-40.0			
	STN-46P	11.5-12.0		120	35.2
	STN-88	13.4-14.0			
Area 2A	STN-49P	24.2-24.8	ML (Sluiced Fly Ash)	120	35.2
Area 2	STN-62	4.5-5.0	FILL: CL	800	25.6
	STN-62	9.5-10.0			
	STN-68	9.0-9.5			
	STN-51	4.5-5.0		620	28.6
	STN-51	5.1-5.6			
	STN-51	9.5-10			
	STN-51	20.0-20.5		300	31.8
	STN-68	24.7-25.2			
	STN-67	4.5-5.0		400	31.0
	STN-67	5.1-5.6			
	STN-67	9.5-10.0			
	STN-59	12.6-13.1		300	29.0
	STN-59	19.1-19.6	CH	300	29.0
	STN-59	19.7-20.2			
	STN-62	39.6-40.1	CL	300	31.8

Unconsolidated undrained triaxial tests were performed on undisturbed soil specimens, in accordance with ASTM D 2850. The individual unconsolidated-undrained testing results are presented as Attachment 6 in Appendix F and summarized in Table 9 below.

Table 9. Summary of Unconsolidated–Undrained Triaxial Testing

Location	Boring No.	Sample Interval (feet)	USCS Textural Classification	Max Shear Stress/ Cohesion (psf)	Corrected Deviater Stress (psf)	Axial Strain (%)
Area 2	STN-56P	20.6-21.1	CL	561	1,126	14.6
		22.6-23.1		734	1,463	11.7
		28.6-29.1		288	567	14.2

Seven (7) unconfined compression tests were performed on undisturbed clay samples obtained from Areas 2 and 2A borings, in accordance with ASTM D2166. The individual unconfined compression testing results are presented as Attachment 7 in Appendix F and summarized in Table 10 below.

Table 10. Summary of Unconfined Compression Strength Testing

Location	Boring No.	Sample Interval (feet)	USCS Textural Classification	Unconfined Compressive Strength (psf)	Maximum Shear Strength/ Cohesion (psf)
Area 2A	STN-34P	50.0-52.0	CL	5,160	2,580
		56.0-58.0		800	400
	STN-88	26.0-28.0		480	240
Area 2	STN-51P	32.0-34.0		1,680	840
		36.0-38.0		920	460
	STN-67	19.0-21.0		4840	2420
		24.0-26.0		5280	2640

Direct Simple Shear (DSS) tests were performed in accordance with ASTM D 6528 on undisturbed six-inch sluiced ash specimens obtained from borings located on the south side of Area 2A. The results of the DSS tests were plotted in terms of p-q values and used to aid in selection of effective-stress shear strength parameters. Results from the tests are presented as Attachment 8 in Appendix F and summarized in Table 11 below. The p-q plots are presented in Appendix G.

Table 11. Summary of Direct Simple Shear Testing

Location	Boring No.	Sample Interval (ft)	USCS Textural Classification	Max. Shear Strength (psf)	Eff. Internal Friction Angle (degrees)
Area 2A	STN-46	8.1-8.9	ML (Sluiced Fly Ash)	531.4	25.0
		11.0-11.5		288	33.7
	STN-48P	27.0-27.8		786.2	21.6
		34.3-35.0		986.4	27.8
		40.4-41.0		711.4	26.3
	STN-49P	4.3-5.0		228.9	39.9
		25.4-26.0		861.1	35.8

7.7. Permeability

Falling head permeability tests were performed on select undisturbed clay and ash samples from each disposal area. The tests were performed in triaxial cells in general accordance with ASTM D 5084, “Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials using Flexible Wall Permeameter. The summary of the permeability tests conducted is presented below in Table 12 and complete test results are provided in Attachment 4 of Appendix F.

Table 12. Permeability Test Results

Location	Boring No.	Sample Interval (ft)	USCS Textural Class.	In-Situ Moisture Content (%)	Initial Dry unit Weight, (pcf)	Specific Gravity	Average Hydraulic Conductivity k (cm/s)
Area 1	STN-10	26.5-28.5	ML (Fly Ash)	23.6	102.8	2.63	3.27E-07
		32.5-34.5	CL (Alluv.)	21.5	106.1	2.71	8.66E-08
		45.2-45.7	SM (Alluv.)	20.7	106.6	2.68	7.46E-06
Area 2A	STN-34P	40.2-40.6	ML (Fly Ash)	42.8	72.6	Est.	1.4E-07
	STN-46P	7.0-7.3	ML (Fly Ash)	57.9	63.9	Est.	2.2 E-07
	STN-48P	28.0-28.3	CH (Alluv.)	38.5	77.3	Est.	5.6E-08
Area 2	STN-51	10.1-10.6	CL (Alluv.)	20.0	104.1	2.71	2.63E-06
	STN-59	4.5-6.5	CL (Fill)	24.5	98.1	2.69	2.38E-08
	STN-62	39.0-41.0	CL (Alluv.)	26.0	98.4	2.71	1.49E-07
	STN-68	25.0-27.0	CL (Alluv.)	25.1	98.9	2.68	8.81E-08

8. Results of Field Exploration & Laboratory Testing

8.1. General

Based on the results of the drilling, laboratory testing, historical documentation, and drawings, the on-site materials were divided into soil layers used during development of cross-section geometry for engineering analysis. Please refer to the geologic sections in Appendix B and boring logs in Appendix C which depict the approximate soil breaks/horizons and soil descriptions for each section. The soil layers identified on the cross sections are described per disposal area in the paragraphs below.

8.2. Area 1 – Bottom Ash Disposal Area

Borings STN-1 through STN-21 were advanced within Area 1 along the upper dike bordering the western and southern perimeters of the facility, and within the limits of the coal ash impoundment area. Borings were not advanced within the lower dike along the western portion of Area 1, however, based on boring logs in Reference 11 of Table 1, it is believed that its subsurface composition is relatively consistent with the subsurface conditions found during our exploration of this dike at similar elevations along the western perimeter of Areas 2 and 2A.

The upper dike is generally comprised of a surficial layer consisting of six inches of topsoil along the outer embankments and six to eight inches of gravel across the roadway situated atop of the dike. Beneath the surficial layer is earth fill material consisting of light brown to red-brown, clayey sand (SC) and clayey gravel (GW) with a relative density ranging from very loose to medium dense. Other soils encountered within the Upper Dike consist of light brown, medium stiff to stiff, variably sandy, lean clay (CL). The fill material extends to elevations ranging from 797 to 800 feet MSL, or 7.5 to 11.5 feet below the top of the existing grade elevation. Beneath the upper dike are variably thick intervals of moist to saturated, sluiced ash materials (bottom and fly ash) with loose to medium relative densities underlain by alluvial materials. The ash intervals extend to elevations of 792.6 feet MSL in boring STN-11 to 787.0 feet MSL in boring STN-16.

A placed bottom ash/fly ash mixture occupies most of the interior portions and upper dike embankments above elevation 810 feet MSL of Area 1. However, the subsurface profile occasionally consists of a six inch thick topsoil layer or a two to three feet thick capping layer of tan to light brown, lean clay (CL) followed by a light to dark gray, bottom/fly ash mixture ranging in thickness from 10 feet to 23 feet. The consistency of the ash mixture is generally medium to very dense in relative density and damp to moist in natural moisture content. Underlying the placed ash material are alternating intervals of sluiced fly ash and sluiced bottom ash with varying thicknesses ranging from four feet in boring STN-1 to 36 feet in boring STN-13. According to N-values obtained from SP testing, the sluiced materials have a very loose to loose relative density and were generally observed to be saturated.

Native soils consisting of alluvial clays overlying alluvial sands make up the foundation materials within Area 1. The clay soils consist of light brown to red-brown, often sandy, lean clays (CL) and clayey silts (ML) with consistencies ranging from very soft to very stiff. Generally, the clay soils are underlain by light brown to brown, sometimes clayey, medium to coarse grained sands with relative densities ranging from very loose to dense.

8.3. Area 2- Fly Ash Pond

Borings STN-51 through STN-71 were advanced within the lower and upper perimeter dikes along the south and western side of the Fly Ash Pond - Area 2. The lower dike was the initial structure constructed of earth fill material for purposes of enclosing the coal ash impoundment areas and extends from the southeastern corner of the Fly Ash Pond to the northwest corner of the Bottom Ash Disposal Area 1. The crest of the lower dike sets at about elevation 800 feet (MSL) and its depth throughout the perimeter varies according to the pre-construction elevation of the ground surface upon which it was constructed. Generally, thicker intervals of earth fill exist within the southern portions of the Area 2 facility correlating well with historical topographic maps showing the original ground surface generally sloping downward to the south across the facility. Portions of the lower dike were constructed over the original channel of Bull Run Creek. According to historical documents, the channel was redirected and filled in prior to the dike construction resulting in thicker horizons of fill material in locations where the creek had originally coursed.

Along the outer embankment of the lower dike are roughly six inches of topsoil for vegetative cover. Underlying this surficial layer is earth fill consisting of light brown to dark brown, sometimes sandy, lean clay (CL) extending to elevations ranging from 792 feet MSL in boring STN-53, to 771 feet MSL in boring STN-68. According to N-values from SP testing, soil consistencies range from stiff to very stiff and indicate a history of some form of compaction during the placement of the earth fill material.

The upper dike's surficial layer consists of six inches of topsoil along its outer embankments and six to eight inches of gravel across a roadway situated atop of the dike. Beneath the surficial layers are earth fill materials consisting of light brown to red-brown, variably sandy, lean clay (CL) with medium to very stiff consistencies. The depths of the fill material range from approximately 10 feet in boring STN-65 to about 28 feet in boring STN-60. As mentioned, larger quantities of fill material were placed in low lying areas to match a consistent elevation across the dike structures. Underlying the earth fill is two to three feet of clayey gravel or compacted bottom ash. This interval is believed to have been placed at the time of construction in order to provide a stable platform (subgrade) for the overlying upper dike. Alluvial clays overlying alluvial sands with characteristics very similar to those described for Area 1 underlie the upper dike subgrade. Sluiced ash was not encountered in any of the borings advanced at Area 2 during our exploration due to the location of the borings along the middle to outside edge of the upper dike crest, and no borings were advanced in the Ash Pond limits. However, it is believed that sluiced ash is impounded by the perimeter dikes of Area 2 at varying depths and extending from the bottom of the ash pond to the alluvial materials.

8.4. Area 2A- Gypsum Disposal Area

Borings STN-23 through STN-50 and borings STN-87 through STN-90 were advanced within Area 2A. The lower and upper dikes described earlier constitute the lower perimeter of this facility on the western and northern sides and the subsurface conditions observed are consistent with those found at Areas 1 and 2.

Ash dikes composed of primarily compacted bottom ash material, with co-mingled fly ash, were constructed in two tiers up to elevations 825 feet and 835 feet, respectively, and form the perimeter of Area 2A. The lower tier ash dike structure was constructed partially on top of the upper dike along the western and northern sides of Area 2A above elevation 810 feet and over sluiced ash material along the south and eastern sides of the facility.

A one to one and a half foot thick capping layer consisting of red-brown, lean and fat clay (CL and CH) make up the surficial layer of the ash dike subsurface profile. Compacted bottom ash with lesser quantities of fly ash underlie the capping layer and extend to approximate elevations ranging from 800 feet to 808 feet (MSL). In general, this material is gray to dark gray and dense to very dense with occasional pockets of loose relative densities. As mentioned, the ash dike system overlies sluiced ash materials. According to N-values derived from SP testing, the sluiced ash materials exhibit a very loose to loose relative density. The thickness of the sluiced ash deposits range from 14 feet to 26 feet and overlie the previously described alluvial clays and sands. Some alluvial silts were also noted in several borings at the interface between the sluiced ash and alluvial clays, and had soft to medium stiff consistencies according to the SPT blow counts.

8.5. Bedrock Conditions

Elevations to the top of bedrock were estimated from attaining 'N'-values of 50+ from standard penetration tests and confirmed by further auguring until refusal was met. In most cases, refusal was achieved on a layer of weathered, shale bedrock. Upon reaching auger refusal, rock coring was performed within borings STN-1, STN-7, STN-23, STN-61 and STN-71 for visual examinations of the bedrock composition.

The underlying bedrock consists of interbedded layers of the Cambrian aged, Conassauga Group limestone and Rome shale formations. The bedrock samples obtained indicate that the underlying shale is gray to reddish-brown, soft to moderately hard, thin to very thinly bedded and very fine grained. Limestone samples are gray to dark gray, moderately hard to hard and thinly bedded with closely spaced fractures. Weathered zones exist within the upper one to ten feet of bedrock at each of the cored locations. Overall, within the upper ten feet of the bedrock unit, rock recovery ranged from 49% in boring STN-23 to 87% in boring STN-7. The percent RQD is the sum of rock core lengths of four inches or greater from a particular run. With the exception of boring STN-1, most of the samples obtained have a RQD of 0% to 22%, which indicates a very poor rock quality. Generally, the bedrock becomes slightly more competent at depths below five feet. The measured recovery and calculated RQD data for each cored location is shown on the appended logs and is summarized in Table 13 below.

Table 13. Rock Core Summary

Boring No.	Approximate Coring Elevations (ft MSL)	Run (ft)	Recovery (ft)	RQD (%)
STN-1	760.0-755.0	5.0	3.5	32
	755.0-750.4	5.0	5.0	64
STN-7	765.2-762.5	2.7	2.7	0
	762.5-757.5	5.0	5.0	22
	757.5-755.2	2.3	1.0	0
STN-23	765.8-763.0	2.8	0.5	0
	763.0-759.0	4.0	2.0	0
	759.0-758.0	1.0	0.6	0
	758.0-753.0	5.0	3.2	0
STN-61	759.5-756.7	2.8	0.5	0
	756.7-751.6	5.1	2.5	8
	751.6-746.7	4.9	4.8	20
STN-71	764.8-762.1	2.7	2.3	19
	762.1-754.6	7.5	5.0	0

8.6. Subsurface Water

Forty two (42) borings advanced at the subject CCB storage facilities were instrumented with slotted screen piezometers to measure subsurface water conditions over time. The presumed water level reading was initially recorded during the inspection of SP samples obtained during drilling. These depths to water are shown on the boring logs presented in Appendix C. Since their installation, water level readings in the piezometers have been

obtained several times as summarized in Table 3. The subsurface water conditions were generally higher in piezometers located at the Gypsum Disposal Area and Fly Ash Pond, where the pool level of the ponds influence the phreatic surface. The piezometer readings also varied over time due to the variable nature of the sluice volume and plant operations.

9. Engineering Analyses

9.1. General

Geotechnical engineering analyses included evaluations of strength and permeability parameters, seepage analyses, and slope stability analyses. Prior to performing the analyses, Stantec developed the dike geometry at each of the twenty (20) cross-sections at the Bottom Ash Disposal Area (Area 1), Gypsum Disposal Area (Area 2A) and Fly Ash Pond (Area 2) using survey data provided by TVA, design drawings, site observations, and the results of the drilling and lab testing programs discussed herein. Once the geometries of the sections were determined, each section was reviewed and evaluated for potential slope failure and several cross-sections were deemed critical and in need of further analysis. The criteria for selecting the critical sections were based on the steepness of slopes, the geometry of the sections, the piezometric surface, and the subsurface conditions. Based on Stantec's evaluations, eight (8) critical cross sections (Sections F, I, K, L, N, O, R, and S) were selected for seepage and slope stability analyses and one cross-section (Section D) was selected for slope stability analysis only (due to no active pool present at the structure to conduct seepage analysis). Permeability and strength parameters were derived based on the results of the drilling and lab testing programs, supplemental in-situ testing, historical information from past explorations, and Stantec's past experience with similar soils and CCB materials. The selection process for material properties modeled in the analyses is discussed in detail in Sections 9.2.2 and 9.3.2 of this report. The cross-sections provided in Appendix B depict the dike geometry, subsurface horizons, and material parameters modeled in the engineering analyses. Results of the analyses and evaluations are summarized in the following paragraphs. The results of the seepage and slope stability analyses are included in Appendix I and the plan locations of each cross section are identified on the geotechnical drawings included in Appendix B.

It should be noted that construction records indicating the methods used to construct the dikes, as-built dike configurations, etc. were not available for review. As a result, generalizations in soil parameters and dike geometry were needed to construct the seepage and stability models.

9.2. Seepage Analysis

9.2.1. SEEP/W Model

An analysis of steady state seepage through the dike was needed to estimate the magnitude of seepage gradients (for the evaluation of potential piping) and pore water pressures within the soils (for the evaluation of slope stability). The numerical seepage model for Bull Run Fossil Plant CCB Disposal Areas was developed using SEEP/W 2007 (Version 7.14), a finite element code tailored for modeling groundwater seepage problems in soil and rock. SEEP/W is distributed by GEO-SLOPE International, Ltd, of Calgary, Alberta, Canada.

SEEP/W uses soil properties, geometry, and boundary conditions provided by the user to compute the total hydraulic head at nodal points within the modeled cross section. Among other features, SEEP/W includes a graphical user interface, semi-automated mesh generation routines, iterative algorithms for solving unconfined flow problems, specialized boundary conditions (seepage faces, etc.), capabilities for steady-state or transient analyses, and features for visualizing model predictions. The program also includes material models that allow tracking both saturated and unsaturated flow, including the transition in seepage characteristics for soils that become saturated or unsaturated during the model simulation.

Eight cross sections through the Gypsum Disposal Area and Fly Ash Pond were modeled using SEEP/W, then subsequently evaluated for slope stability (Section 9.3). For the numerical analysis, each cross section was subdivided into a mesh of elements, consisting of first-order quadrilateral and triangular finite elements. For seepage problems, where the primary unknown (hydraulic head) is a scalar quantity, first-order elements provide for efficient, effective modeling. Given appropriate hydraulic conductivity properties and applied boundary conditions, the finite element method (as implemented in the SEEP/W program) was then used to simulate steady seepage across the mesh. The total hydraulic head was computed at each nodal location, from which pore water pressures and seepage gradients were determined.

9.2.2. Seepage Properties

For each cross section analyzed, a representative subsurface profile was configured based on boring logs, available record drawings, and the known project history. Stantec derived material properties for the seepage analyses based on available laboratory test data, field slug test data, and published reference sources. If no data was available, the material properties were estimated based on typical values for similar soils. For the ash materials encountered at the disposal areas, Stantec assumed one set of values for all sluiced ash (hydraulically placed fly and bottom ash) and ash dikes (compacted bottom and fly ash) due to the co-mingled composition and varying percentages of ash found in each boring. The material properties modeled in the seepage analyses are summarized in Table 14.

Table 14. Material Properties for SEEP/W Analysis

Soil Horizon	Saturated Hydraulic Conductivity k_v (cm/s)	Anisotropy Ratio k_h / k_v	Specific Gravity G_s	Void Ratio e	Volumetric Water Content	
					Saturated (%)	Residual (%)
Sluiced Fly Ash	5.1E-4	50	2.31	0.85	46	4
Ash Dike	2.0E-6	25	2.31	0.85	46	4
Lean Clay Dike (Fill)	7.0E-6	10	2.70	0.70	41	2
Sandy Lean Clay Dike (Fill)	8.5E-6	10	2.70	0.625	38	2
Lean Clay Alluvium	1.4E-5	20	2.70	0.70	41	2
Sandy Lean Clay Alluvium	8.5E-6	20	2.70	0.625	38	2
Fat Clay Alluvium	1.1E-6	20	2.73	0.70	41	2

Table 14. Material Properties for SEEP/W Analysis

Soil Horizon	Saturated Hydraulic Conductivity k_v (cm/s)	Anisotropy Ratio k_h / k_v	Specific Gravity G_s	Void Ratio e	Volumetric Water Content	
					Saturated (%)	Residual (%)
Silt	2.1E-3	20	2.68	0.65	39	2
Silty Sand to Sandy Silt	6.9E-2	20	2.68	0.65	39	2
Clayey Sand	5.0E-5	50	2.68	0.65	39	2
Gravelly Sand to Sand	1.6E-4	50	2.68	0.65	39	1

Note: SEEP/W requires input parameters k_h and ratio of k_v/k_h

Engineering judgment is very important in selecting appropriate hydraulic properties for earth materials. Unlike other soil properties, hydraulic conductivity can vary over several orders of magnitude for various soil horizons, often with substantial anisotropy (seepage in horizontal versus vertical directions). Laboratory test samples often do not represent important variations within a large soil deposit. For the BRF analysis, an iterative process of parametric calibration was used to arrive at final estimates of the seepage properties. Results from trial simulations were compared to field data (measured piezometric levels and the depth of groundwater in the borings). The material properties shown in Table 14 represent a solution matrix that closely matches the field data on all cross-sections. The results of the seepage analysis are discussed in Section 9.2.4.

Saturated vertical hydraulic conductivity values (k_v) were selected using available field data and laboratory test data, TVA memoranda, and published data. Typical values were selected for materials where laboratory test data was not available.

The ratio of horizontal hydraulic conductivity (k_h) to vertical hydraulic conductivity (k_v) was estimated based on Stantec's understanding of the placement or deposition of the material. An isotropic material would have $k_h/k_v = 1$, while deposits of horizontally layered soils, such as alluvial deposits, might have values as high as $k_h/k_v = 100$. Relatively high ratios were assumed for the sluiced fly ash ($k_h/k_v = 50$) and gravelly sands ($k_h/k_v = 50$), reflective of periodic deposition of materials with different gradations. Such deposits typically exhibit much greater permeability in the horizontal direction than in the vertical direction. More modest values ($k_h/k_v = 10$) were assumed for the dike fill materials, which were reportedly compacted in horizontal lifts.

The SEEP/W finite element program is structured to consider seepage through both saturated and unsaturated soils. To represent the change in hydraulic conductivity due to de-saturation of each soil, SEEP/W implements a model based on two functions – a hydraulic conductivity function and a volumetric water content function. Three parameters are needed to define this behavior: the saturated hydraulic conductivity, saturated water content, and residual water content (water content of air dried soil). Of these three parameters, only the residual water contents were estimated for each soil. The estimated residual water content values in Table 14 are based on Rawls et al. (1982) and Stantec's experience with similar materials at other TVA sites.

9.2.3. Boundary Conditions

The seepage analyses were performed assuming steady-state seepage with static water levels upstream and downstream of the dike. The upstream boundary condition values used in these analyses were based on the normal storage pool elevations for the Gypsum Disposal Area and Fly Ash Pond, where applicable by cross-section. The normal pool elevations were obtained from TVA Bull Run Fossil Plant personnel and historical information.

On the downstream side, the normal water elevation for sections K and L was assumed to be the normal storage pool elevation for the Fly Ash Pond. For sections F, I, N, O, R and S, the normal pool elevation for the Clinch River was assumed to be 795 feet MSL based on historical drawings and pool elevation data for 2009 provided by TVA personnel.

Cross-sections K and L, located on the south side of the Gypsum Disposal Area were modeled with a total head node to simulate the underdrain and header pipe system installed during the construction of the Area 2A dike. The node was placed at the horizontal coordinate of the header pipe taken from design drawings and survey information and was assumed to be at elevation 817 feet MSL, which corresponds to the bottom of the header pipe elevation as shown on the design drawings in Reference 7 of Table 1.

The Potential Seepage Face boundary condition applied on the downstream slope and toe assumes no seepage (flux = 0) through these areas of the dike. At the end of the first iteration, SEEP/W checked the nodes along the Potential Seepage Face for positive pressure, which is indicative of water ponding which is not possible along the slope face. Physically, it means water wants to leave through these nodes but the boundary condition prohibits the model from doing so. In subsequent iterations, SEEP/W assigned total head pressure at these nodes equal to the elevation head pressure. The boundary conditions modeled for steady-state seepage analysis are summarized in Table 15.

Table 15. Boundary Conditions

Stability Section	Upper Boundary Condition	Upper Boundary Condition Elevation (feet)	Lower Boundary Condition	Lower Boundary Condition Elevation (feet)
Section I	Gypsum Disposal Area	825.0	Clinch River	795.0
Section K	Gypsum Disposal Area	825.0	Fly Ash Pond	806.5
Section L	Gypsum Disposal Area	825.0	Fly Ash Pond	806.5
Section N	Fly Ash Stilling Pond	806.5	Clinch River	795.0
Section O	Fly Ash Stilling Pond	806.5	Clinch River	795.0
Section R	Fly Ash Pond	806.5	Clinch River	795.0
Section S	Fly Ash Pond	806.5	Clinch River	795.0
Section F	Gypsum Disposal Area/Piezometer Readings	811.0	Clinch River Channel	795.0

The boundary conditions used in the SEEP/W analysis for the ponds described above were modeled as total head equal to the given pool elevation. For sections where the pool limits were just beyond the cross section or the groundline was above recorded pond elevation, a total head vertical boundary line equal to the pond elevation was input into the model. For

this scenario, the hydraulic head at each node was constant with depth and equal to the pool elevation on that side of the embankment. At other locations along the ground surface where potential seepage might occur, a total flux condition was modeled and potential seepage reviewed. The horizontal boundary at the base of the model (located within the bedrock) was modeled as a seepage barrier, with no vertical flow across the boundary nodes.

9.2.4. Seepage Analysis Results

Steady-state seepage analyses were conducted on four cross-sections through the Gypsum Disposal Area dikes and four sections through the Fly Ash Pond perimeter dikes. The material properties and boundary conditions were varied in our analysis until a reasonable match was obtained between the model results and field data. After several iterations, the final soil parameters were within expected ranges, based on soil type and laboratory data, and calibrated to give model predictions consistent with field measurements.

Plots from the SEEP/W analyses of the seven cross-sections are presented in Appendix I. These plots show the finite element mesh, material horizons, and boundary conditions used in each analysis. The results are shown in contour plots of total head, pore water pressure, and seepage gradients. For the slope stability analyses (Section 9.3), the pore water pressures along the considered slip surfaces were determined by interpolation between the nodal pore pressures predicted with the SEEP/W model. The seepage gradients were assessed for maximum exit gradients and the potential for soil piping (Section 9.2.4.3).

The phreatic surface (groundwater table or line of zero pore water pressure) is shown on the plots in Appendix I. In SEEP/W analysis, the location of the phreatic surface is found by interpolation between positive pore water pressures in the upper areas of saturated soil and negative pore pressures or suction in the unsaturated soil zone above. In the SEEP/W formulation, seepage flows are tracked in both the saturated and unsaturated zones. Hence, the top flow line in the SEEP/W results will be above the phreatic line. In more traditional seepage analyses, where unsaturated flows are ignored, the top flow line and the phreatic surface coincide. Hence, while the more complete unsaturated flow formulation in SEEP/W gives a reasonable prediction about the location and shape of the phreatic surface, the results are often different than would be obtained with a solution that considers only saturated flow. Furthermore, the pore water pressures in the stability analysis are determined from the full finite element solution, and not just from the depth below the phreatic surface.

9.2.4.1. Comparison with Field Data

After the initial seepage parameters were estimated, results from the SEEP/W model were compared to the readings in piezometers installed in the sections analyzed. Data from eighteen piezometers at six modeled cross-sections (all critical sections with installed piezometers) were used in this evaluation (three cross-sections at the Gypsum Disposal Area dikes and three on the Fly Ash Pond dikes). Nodes were depicted in our seepage models that corresponded to the elevations of the piezometer tips installed in the field. The total head predicted at the node was compared to the corresponding piezometer reading.

As previously discussed, piezometer data has been collected for the past seven months. Figure 6 shows a comparison between the maximum and minimum piezometer readings over the past seven months and the SEEP/W predicted total head at these piezometer locations.

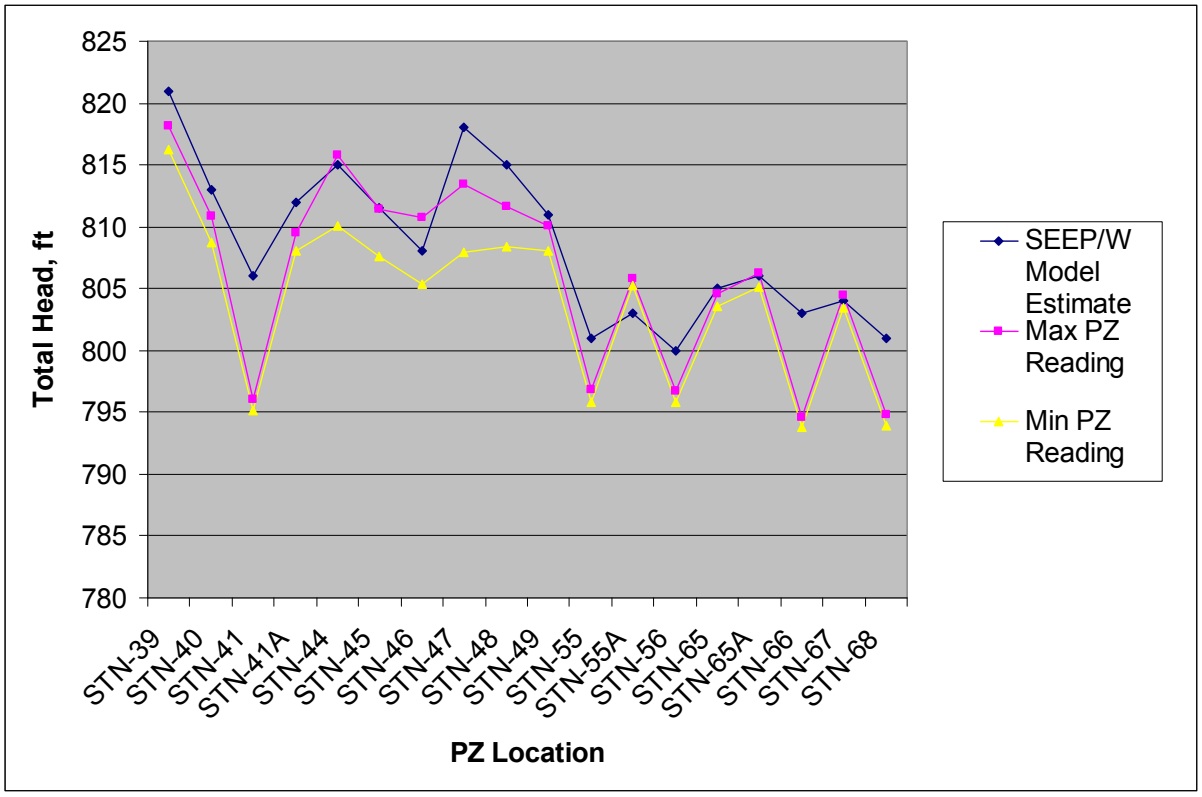


Figure 6. Comparison between the field piezometer readings and total head predicted by the SEEP/W model

The difference between highest field measurements of total head and the model predictions varies from -2.8 feet at STN-46 and STN-55A to 10.0 feet at STN-41. The degree of deviation between the model prediction and the actual piezometer reading is likely due to seasonal fluctuations of the groundwater table and river levels, precipitation, material properties, sluice discharge volume, and accuracy of the field data. As previously mentioned, our model assumed a steady-state condition upstream and downstream using the previously discussed boundary conditions and material properties.

9.2.4.2. Critical Exit Gradients

Seepage forces, resulting from hydrodynamic drag on the soil particles, can destabilize earth structures. Excessive hydraulic gradients near the ground surface can lead to the initiation of soil erosion and piping, which has caused numerous dam failures in the past. Hydraulic gradients, computed at points where seepage exits onto the ground surface, can be evaluated to understand the potential severity of this problem. The factor of safety with respect to soil piping (FS_{piping}) is defined as:

$$FS_{piping} = \frac{i_{crit}}{i}$$ **Eqn. 1**

Where:

i = the vertical gradient of a flow vector at a particular node
i_{crit} = is the critical gradient, a material property of the soils at the node

The critical gradient (i_{crit}) is related to the submerged unit weight of the soil and can be computed as:

$$i_{crit} = \frac{\gamma_{sub}}{\gamma_w} = \frac{G_s - 1}{1 + e}$$ **Eqn. 2**

Where:

γ_{sub} = the submerged unit weight of the soil, γ_w is the unit weight of water,
G_s = the specific gravity of the soil particles
e = the void ratio.

For nearly all soils, the critical gradient is between about 0.6 and 1.4, with a typical value near 1.0.

Where FS_{piping} = 1, the effective stress is zero and the near-surface soils are subject to piping or heaving. Note that Equation 1 is valid only for vertical seepage that exits to the ground surface. If the phreatic surface is buried, then the FS_{piping} will be greater than 1.0 even when $i=i_{crit}$.

9.2.4.3. Seepage Gradients

Contour plots of the hydraulic gradients computed from the SEEP/W solutions are shown for each modeled cross-section in Appendix I. Large gradients and significant seepage can be seen at various locations within the cross-sections, but the concern is for areas where these gradients can initiate erosion or piping of material. In general, areas of potential concern are where water seeps laterally out onto a sloping ground surface, or where vertical, upward seepage occurs at the ground surface. Away from the ground surface, the potential movement of material due to seepage forces is arrested by the adjacent soil. Hence, the evaluation of seepage gradients within the dike is focused on areas near the ground surface on the downstream side of the dike.

In order to locate areas of maximum seepage pressure, contour plots of vertical gradient (i) were generated using a SEEP/W utility function. When turned on, this function can plot contours of maximum vertical gradient within a cross-section. Areas with higher vertical gradient will be shown in gradually darker colors (green to red) in SEEP/W generated models. Results of these models with vertical gradients are attached in Appendix I. All the cross-sections exhibited maximum vertical gradients at the downstream toe of the dike or within alluvial material below the phreatic surface of the downstream pool. Within a region of maximum vertical gradient, the node with the highest vertical gradient, (usually a surface node at the toe of the slope), was determined using another SEEP/W utility function. The critical gradient (i_{crit}) at that particular node was determined from the material properties using

Equation 2. The factor of safety against piping is then calculated using Equation 1. The factors of safety against piping were computed based on the exit gradients from the SEEP/W Model and critical gradients determined from the soil properties, which are summarized below in Table 16.

Table 16. Summary of Computed Exit Gradients and Factors of Safety against Piping

Cross-Section	Vertical Gradient (i) at Critical Exit Point	Location of Critical Exit Point	Material	Critical Gradient (i_{crit})	FS_{piping}	Pool Elevation
I-I'	0.556	Downstream Slope Toe	Lean Clay Fill	1.000	1.8	Normal Pool
K-K'	0.379	Downstream Slope Toe	Sluiced Ash	0.708	1.9	Normal Pool
L-L'	0.277	Downstream Slope Toe	Sluiced Ash	0.708	2.6	Normal Pool
N-N'	0.226	Downstream Slope Toe	Sandy Lean Clay Fill	1.046	4.6	Normal Pool
O-O'	0.219	Downstream Slope Toe	Fat Clay Alluvium	1.018	4.7	Normal Pool
R-R'	0.312	Downstream Slope Toe	Lean Clay Fill	1.000	3.2	Normal Pool
S-S'	0.424	Downstream Slope Toe	Lean Clay Fill	1.000	2.4	Normal Pool

The United States Army Corps of Engineers (USACE) design criteria in EM 1110-2-1901 indicates factors of safety against piping should be at least 3.0. As per our understanding, TVA guidelines match this criterion. The lowest computed factor of safety was found at cross-section I-I' on the downstream slope toe of the dike. However, cross-sections I-I', K-K', L-L' and S-S' show factors of safety below 3.0, hence, they do not meet the design criteria for piping.

9.3. Slope Stability Analyses

The stability of the Bottom Ash Disposal Area (Area 1), Gypsum Disposal Area (Area 2A) and Fly Ash Pond (Area 2) dikes were evaluated using limit equilibrium methods as implemented in the SLOPE/W module. With SLOPE/W, the distribution of pore water pressures within the earth mass can be mapped directly from a SEEP/W solution. In this study, steady-state pore pressures were obtained from the SEEP/W model described in Section 5.2. For Section D-D' in the Bottom Ash Disposal Area, the phreatic surface was estimated from maximum piezometer readings obtained in the field during the previous seven months. Engineering parameters, including unit weight and shear strength properties of the subsurface materials modeled in the stability analyses are discussed in Section 9.2 of this report.

9.3.1. Limit Equilibrium Methods in SLOPE/W

Limit equilibrium methods for evaluating slope stability consider the static equilibrium of a soil mass above a potential failure surface. For conventional, two-dimensional methods of analysis, the slide mass above an assumed failure surface is split into vertical slices and stresses are evaluated along the sides and base of each slice. The factor of safety against a slope failure (FS_{slope}) is defined as:

$$FS_{slope} = \frac{\textit{shear strength of soil}}{\textit{shear stress required for equilibrium}} \qquad \textbf{Eqn. 3}$$

where the strengths and stresses are computed along a defined failure surface, on the base of the vertical slices. The shearing resistance at locations along the potential slip surface are computed, with appropriate strength parameters (cohesion and friction angle), as a function of the total or effective normal stress.

Spencer's solution procedure (1967), which satisfies both moment and force equilibrium for each slice, was used in this study. Spencer's procedure computes FS_{slope} for an assumed failure surface; a search must be made to find the critical slip surface corresponding to the lowest FS_{slope}. Both circular and noncircular potential failure surfaces can be evaluated. The optimization scheme available within SLOPE/W was used to consider noncircular, curved slip surfaces. The results of the slope stability analyses discussed in Section 9.3.3 and depicted on the slope with plots in Appendix I represent factors of safety computed from the optimized, circular slip surface routine.

9.3.2. Strength Parameter Selection

The perimeter lower dikes along the south and west sides of the Bull Run disposal areas were constructed in the mid-1960's and the upper dikes were constructed in the mid-1970's and have exhibited their current cross-sectional geometry (slopes and crest elevation) for approximately 30 years. The ash perimeter dike above elevation 810 feet impounding the Gypsum Disposal Area was constructed in 2006 and has maintained its current cross-sectional geometry for about 3 years. Hence, excess pore pressures generated in the underlying soil during construction have had sufficient time to dissipate and steady state seepage conditions have developed within the dike. Additionally, our analyses focused only on static conditions (no earthquake or other dynamic loads). For these conditions, only soil unit weights and drained strength parameters (c' and Φ') are needed. If stabilizing berms, flattened slopes, or other geometric modifications are constructed, then undrained, total stress stability analyses will need to be performed.

Drained shear strength (S_d) of the soil can be determined from effective stress strength parameters using the following equations:

$$S_d = c' + \sigma' \tan \phi' \qquad \textbf{Eqn. 4}$$

$$\sigma' = \sigma - u \qquad \textbf{Eqn. 5}$$

Where:

- c' = the effective cohesion
- ϕ' = the effective angle of internal friction
- σ' = the effective stress
- σ = the total stress and
- u = the pore water pressure

The soil parameters used for the clay dikes, ash dikes, sluiced ash and alluvial materials were derived using both current and historical laboratory test data (consolidated-undrained triaxial tests, direct simple shear tests, standard penetration testing data, and classification testing data) and Stantec's experience with these materials in similar applications.

Uncemented or Granular Soil

Uncemented soils exhibit no strength at σ'=0, corresponding to c' = 0. In the case of unsaturated fine grained sands, suction results in apparent cohesion, but this component of strength is lost upon saturation. Over a large pressure range, most granular soils have a curved strength envelope. Fitting a straight line through segments of a curved failure envelope can result in c' > 0, but the values are applicable only over the specified range of effective stress.

Several uncemented (granular) soils were encountered during our exploration that were unable to be sampled using undisturbed methods. This prevented conducting triaxial testing to derive shear strength parameters. Compacted bottom ash/fly ash mixture soil horizons were the predominant horizons encountered in the dike above elevation 810' at the Gypsum Disposal Area and Bottom Ash Disposal Area, while sand, silt, silty sand, clayey sand and gravel horizons were encountered at varying thicknesses within the foundation alluvium across the entire project site. These soils typically exhibited medium dense to very dense relative density (N-values ranging from 10 to 50+ blows per foot) with damp to moist moisture contents. The strength and unit weight parameters for these soil horizons were determined from published correlations between SP test blow counts (N_{60}), relative densities, and effective friction angles Φ'. However, as discussed in Section 6.1 of this report, the SP testing was performed utilizing an automatic hammer and were corrected prior to applying them in correlations with other soil index properties. The correction for hammer efficiency is a direct ratio of relative efficiencies as follows:

$$N_{60} = N_{80}\left(\frac{80}{60}\right) \qquad \textbf{Eqn. 6}$$

Stantec also corrected standardized N_{60} values resulting from SP testing within these materials for the effect of overburden pressure prior to using the data in conjunction with correlations for non-cohesive soil parameters. The N_{60} values were normalized to vertical

effective overburden stresses of 2,000 pounds per-square foot. This calculation requires an effective unit weight for each soil horizon multiplied by the depth of the soil horizon. The relationship between the correction factor, C_N, and the effective overburden stress, σ', was based on a relationship proposed by Liao and Whitman as referenced in Seed and Harder [1990]:

$$C_N = \frac{1}{\sqrt{\sigma'}} \qquad \textbf{Eqn. 7}$$

Where:

C_N = correction factor for overburden stress
σ' = vertical effective overburden stress (tsf)

Consequently, the standardized corrected N-value, $(N')_{60}$ is equal to:

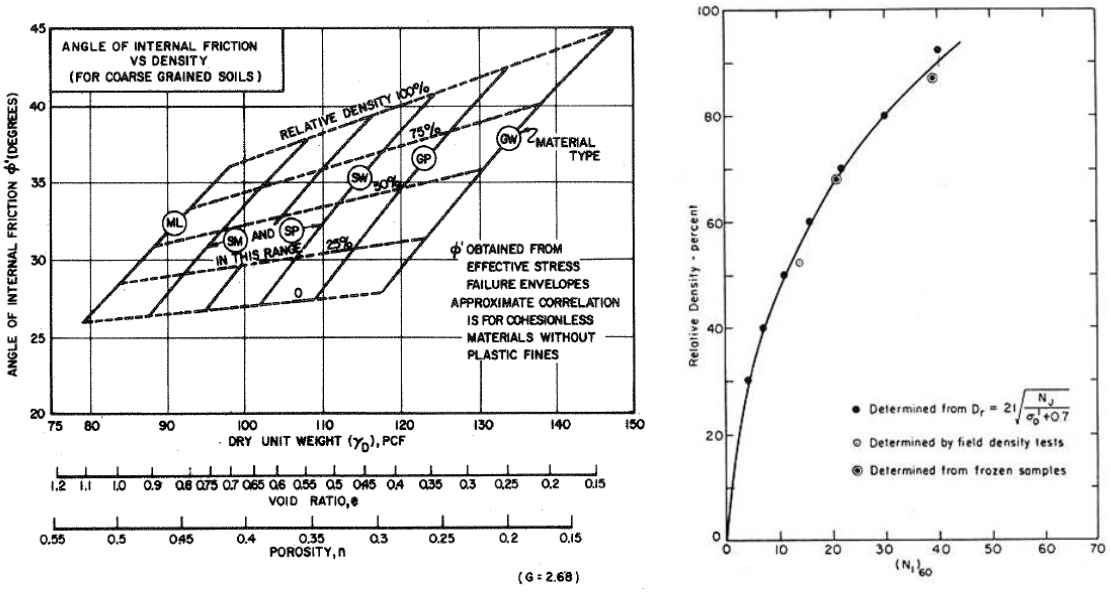
$$(N')_{60} = C_N N_{60} \qquad \textbf{Eqn. 8}$$

Where:

C_N = correction factor for overburden stress
$(N')_{60}$ = standardized N-value

The N-values noted on the graphical boring logs in Appendix B and typed boring logs in Appendix C are calculated based on the actual blowcounts obtained in the field. They do not reflect corrections for hammer efficiency or overburden stress.

The N_{60} values were utilized to obtain relative densities based on relationships developed by Tokimatsu and Seed (1988) as shown in Figure 7 below. NAVFAC (1982) presents a relationship using relative density and specific soil types to correlate angle of internal friction, unit weight, and void ratio as shown in Figure 7 below. Soil classifications for the correlations are based on laboratory testing results and visual classifications performed by the on-site geotechnical engineer or geologist during the drilling process. Once the relationships for the angle of internal friction, unit weight, and void ratio were established, the in-situ unit weight was calculated based upon the natural moisture content.



From NAVFAC (1982) From Tokimatsu and Seed (1988)

Figure 7. Charts used to Correlate N_{60} to ϕ'

Typical N_{60} values for the granular soils described above varied across each section. As such, the unit weight and drained friction angle of each soil horizon was estimated based upon blow counts (N-values) from all cross-sections and using the 2/3rd rule. The rule implies that approximately two-thirds of the data points fall above and one-third fall below the chosen parameter.

Clay Materials

For normally consolidated, saturated clays, the Mohr-Coulomb failure envelope exhibits c' = 0. At effective stresses below the pre-consolidation pressure, overconsolidated clays have a curved failure envelope that can be represented with a straight line having c' > 0. However, overconsolidated clays in the field are often fissured and the in situ c' is significantly smaller than values determined from testing of small samples in the laboratory. To avoid progressive failures in overconsolidated, stiff fissured clays, remolded soil samples are recommended for testing; this generally results in "fully softened" strengths with c' = 0. Thus, in the absence of particle cementation/bonding, long term (drained) shearing resistance related to c' > 0 is considered unreliable. In routine geotechnical design practice, values of c' = 0 are usually assumed for both normally and overconsolidated saturated clays, and for uncemented granular soils. Detailed testing and characterization of a particular soil, coupled with careful application of the fitted strength envelopes, are necessary where values of c' are used in a stability evaluation. For these analyses, c' = 0 was used for all soils.

When surficial soils have c' = 0, shallow sliding parallel to the ground surface will be the critical failure mechanism (lowest factor of safety) found in a slope stability analysis. However, apparent cohesion in unsaturated soils and/or weak cementation is often sufficient to prevent shallow sliding. This mode of failure, which might require periodic maintenance, is considered to be less critical in a stability analysis. For deep seated failures, the assumption of c' = 0 is routinely used for all soils.

An effective friction angle for the lean clay dike (fill), sandy lean clay dike (fill), lean clay alluvium, sandy lean clay alluvium and fat clay alluvium horizons were selected based on (1) results of nine consolidated-undrained triaxial (CU) tests, (2) results of the SP testing and (3) the plasticity index of each soil. A relationship between the plasticity index and peak friction angles for normally consolidated clays is shown in Figure 8 (from Duncan and Wright, 2005). The unit weight for the clay soil horizons were selected based on density testing of undisturbed samples. The results of the testing can be found in Appendix F of this report.

Table 5.7 Typical Values of Peak Friction Angle (ϕ') for Normally Consolidated Clays[a]

Plasticity index	ϕ' (deg)
10	33 ± 5
20	31 ± 5
30	29 ± 5
40	27 ± 5
60	24 ± 5
80	22 ± 5

Source: Data from Bjerrum and Simons (1960).
[a]$c' = 0$ for these materials.

Figure 8. Typical Values of Peak Friction Angle Φ') for Normally Consolidated Clays

Sluiced Fly Ash

Stantec performed four consolidated undrained triaxial tests and seven (7) direct simple shear tests on undisturbed samples of sluiced fly ash with co-mingled sluiced bottom ash. For the purposed of the stability analysis, the sluiced ash (fly and bottom ash) were modeled as one layer with a single set of shear strength parameters. To select the representative strengths for sluiced ash, the methodology outlined in the US Army Corps of Engineers Engineer Manual EM 1110-2-1902 was used as a guide. Failure stresses measured in the laboratory tests were expressed in terms of "p'-q" values, $[p' = 0.5(\sigma_1' + \sigma_3'), q = 0.5(\sigma_1' - \sigma_3')]$, then an envelope was conservatively fit through the data. Separate plots were created using the data generated from the consolidated undrained triaxial tests and the direct simple shear tests. The selected strength parameters represent a failure envelope where about two-thirds of the test data falls above the envelope. Strength parameter selection charts using "p'-q" plots are included in Appendix G.

In addition, Information obtained at other TVA facilities was reviewed in selecting strength parameters for the sluiced fly ash deposits. For example, as a part of the root cause analyses of the Kingston failure, AECOM performed 25 tri-axial compression tests with various consolidation techniques on hydraulically placed ash, and Law Engineering, Inc. completed six triaxial tests in 1995, as a part of a testing program on sluiced ash materials in

Dredge Cells I and III of the Kingston ash disposal area. When plotting these test results on a scatter plot (see Appendix G), the resultant Φ' for the hydraulically placed ash is on the order of 25 degrees.

A friction angle (Φ') of 25 degrees was selected for the sluiced ash encountered at the Bull Run disposal facilities based on the DSS plot and comparison with Kingston Fossil Plant data. The saturated and moist unit weights selected for sluiced ash are 105 and 100 pounds per cubic foot, respectively.

The soil parameters for the clay, ash and granular horizons modeled in the slope stability analyses are summarized in Table 17 and shown on the stability analysis results in Appendix I.

Table 17. Selected Strength parameters for Stability Analysis

Soil Horizon	Saturated Unit Weight (pcf)	Effective Stress Strength Parameters	
		C' (psf)	ϕ' (degrees)
Lean Clay Dike (Fill)	126	0	33
Sandy Clay Dike (Fill)	126	0	33
Sluiced Fly Ash	105	0	25
Compacted Ash Dike	105	0	33
Lean Clay Alluvium	123	0	31
Sandy Lean Clay Alluvium	127	0	33
Fat Clay Alluvium	121	0	30
Clayey Sand Alluvium	112	0	33
Silt Alluvium	109	0	28
Sandy Silt to Silty Sand Alluvium	107	0	29
Sand Alluvium	120	0	33
Gravel Alluvium	135	0	40

9.3.3. Slope Stability Results

Using the strength parameters listed in Table 17, in conjunction with the results of the seepage analyses, the existing dike slopes were analyzed at the nine referenced cross-sections of the disposal areas. The slope stability analyses were performed using SLOPE/W 2007 to evaluate the downstream faces of the dike as applicable. The failure surfaces were generated using the "Grid and Radius" method where a wide variation of trial slip surfaces were generated with a defined grid of possible circle centers and a defined range of radii or "Entry and Exit" method where failure circles were analyzed by defining ranges for potential failure circle entry and exit points and a defined range of radii.

Where the surface slope is composed of cohesionless (c' = 0) materials, an infinite slope failure (shallow sliding parallel to the surface) will be critical. While solutions were obtained for this case for two sections, as reported below, there is less concern for this potential failure mechanism. Suction pressures in unsaturated surface soils will often create enough apparent cohesion to prevent this type of failure. If shallow sliding does occur, the resulting deformations are unlikely to threaten the integrity of the dike and can be repaired. To force

the search routine to evaluate deeper failure mechanisms, the surfaces were generated using the “Grid and Radius” method where a wide variation of trail slip surfaces were generated with a defined grid of possible circle centers and a defined range of radii.

The slope/w plots in Appendix I depict the modeled shear-strength parameters, predicted failure surfaces, and associated factors of safety. The results of the analyses are included in Appendix I and summarized in Table 18 below.

Table 18. Summary of Computed Factors of Safety for Slope Stability

Cross-Section	Exterior Slope Global Failure	Exterior Slope Non-Global Failure	Pool Elevation
D – D’	2.1	1.4	Normal Pool
F – F’	N/A	1.4	Normal Pool
I – I’	1.2	1.0 (dike) 1.1 (embankment)	Normal Pool
K – K’	1.2	N/A	Normal Pool
L – L’	1.1	N/A	Normal Pool
N – N’	1.4	1.1	Normal Pool
O – O’	1.4	1.1	Normal Pool
R – R’	1.3	1.0	Normal Pool
S – S’	1.2	1.1	Normal Pool

The term global failure used in the table above refers to deep seated movements that would threaten partial or total loss of the Area 2 or 2A pool. The slip plane in this case was assumed to be as close as 15 to 20 feet from the ground surface and result in a breach of the dike system by causing most of the upper dike and the entire lower dike to fail.

The term non-global failure refers to relatively shallow slides that, while not detrimental to the overall stability of the dike, could progress into failures that could threaten the pool if not repaired. The deepest segment of this slip surface is as close as 10 feet below the ground surface and this slip plane would correspond to the failure of either the upper or lower dike exterior slopes, or both, but not the entire dike system. It is assumed maintenance or repair actions can be implemented before this failure results in a breach of the dike system.

The Tennessee Department of Environment and Conservation (TDEC) "Rules and Regulations Applied to the Safe Dams Act of 1973" provides guidance and standards with regards to existing dams. The standards do not specifically address target factors of safety for slope stability, but instead merely indicate that the dam shall be "stable". Based on discussions with TVA and to be in accordance with current prevailing practices, a minimum factor of safety of 1.5 was established for long term conditions using the guidelines presented in USACE Manual EM 1110-2-1902 “Slope Stability”.

The results of our stability analyses show that the CCB storage facility slopes do not meet the established criteria for a long term factor of safety of 1.5 for a deep seated failure at cross-sections I-I’, K-K’, L-L’, N-N’, O-O’, R-R’ and S-S’. The lowest factors of safety were calculated at the downstream side of the perimeter clay lower dike surrounding the south and west sides of Disposal Areas 2 and 2A and along the ash dike on the south side of Area 2A. It should also be noted that the slope at several of these locations does not meet the

established factor of safety standard against piping as discussed in the Section 9.2.4.3. Remedial measures will be required to improve the factors of safety for both piping and stability.

9.4. Results of Engineering Analysis after Conceptual Repairs

Where the analyses of existing conditions did not result in acceptable factors of safety for piping and/or stability, the cross-sections were further analyzed assuming certain corrective measures would be implemented. In the case of the perimeter clay dikes on the south and west side of Areas 2 and 2A (cross-sections I-I', N-N', O-O', R-R' and S-S'), the proposed corrective measures analyzed included lowering the pool in the Fly Ash Pond to elevation 801.5 feet (a decrease of approximately 5 feet), and to elevation 795 feet (a decrease of approximately 11.5 feet), or the construction of a crushed stone (rip-rap) buttress along the downstream slope extending into the Clinch River. Additionally, cross-sections I-I' and S-S' were analyzed with a proposed 30' deep slurry wall installed at the crest of the upper perimeter dike, and also the combination of the proposed slurry wall in addition to lowering the pool in the Fly Ash Pond to elevation 801.5' (section S-S' only).

The proposed corrective measures selected for the south dike of the Gypsum Disposal Area are consistent with the workplan that Stantec has prepared to address this slope. The corrective measures include the construction of a crushed stone (rip-rap) buttress at the toe of the slope in combination with armoring of the slope above the buttress and constructing a reverse filter to address low factor of safety against piping on the toe of the slope. This proposed repair condition was analyzed with the current pool elevation in the Gypsum Disposal Area of 825 feet MSL.

Several corrective measures were considered to attempt improving the stability of the perimeter dike system along the west side of the Gypsum Disposal Area. Lowering the Gypsum Disposal Area pool elevation to lower the phreatic surface across the perimeter dikes is not considered a viable option since at this time the plan is for the plant to continue sluicing gypsum into the stack for the next 3 to 5 years and the bottom of the stack (gypsum surface) is already near elevation 825 feet. If TVA elects to construct cells within the existing pool area and these cells are properly lined to isolate the sluicing operation and possibly reduce seepage across the dikes, then this option can be reconsidered.

Another corrective measure considered was the construction of a sub-drain along the exterior toe of the Gypsum Area west embankment. However, this is not a practical option due to the following factors: (1) The phreatic surface elevation between the upper Gypsum Area embankment (818 feet) and the upper perimeter dike (809 feet) has only a slight gradient; (2) the phreatic surface along the toe of the west embankment is at or above the existing ground surface (808 feet); (3) the existing ground surface along the toe of the gypsum stack west embankment is practically flat (elevation 808 feet); and (4) as per permit, the toe drain would have to drain into the Fly Ash Pond, where the normal pool elevation is 806.5 feet. Based on the length and flat ground surface along the toe of the west embankment of Area 2A, the construction of a toe drain with adequate gradient would not be practical or effective in lowering the phreatic surface across the perimeter dike system.

To simulate future operations for the next 3 to 5 years at Area 2A, stability analysis was run on the proposed corrective measures described above for cross-section I-I', L-L' and K-K' assuming the pool is raised to elevation 830'. In regards to section I-I', both the proposed measures of constructing a rip-rap buttress on the exterior slope of the lower dike or

constructing a 30-foot deep slurry wall along the centerline of the upper perimeter dike yield factors of safety against sliding of 1.4 for global failures. In order to achieve a factor of safety of 1.5 against global failure, a combination of corrective measures had to be modeled. Using the assumed corrective measures of constructing a 30-foot slurry wall described above and regrading the exterior slope of the upper perimeter dike to a 3H:1V slope, which involves shifting the perimeter access road approximately 9 feet, a factor of safety of 1.6 is achieved against global failure. For the south side of the Gypsum Disposal Area, the work plan Stantec has prepared for construction of a rock buttress meets the minimum factor or safety against sliding of 1.5 for both sections with the Area 2A pool raised to elevation 830'.

Cross-section F-F' on the north slope of the Gypsum Disposal Area and section D-D' on the west slope of the Bottom Ash Disposal Area exhibited deficient factors of safety against maintenance type slope failures. These two cross-sections were analyzed assuming regrading of the deficient steep slopes until a passing factor of safety was achieved. Cross-section I-I' also exhibited a deficient factor of safety against a non-global failure on the ash embankment portion of the slope above elevation 810 feet. Proposed remedial efforst analyzed to achieve a passing factor of safety included a 3H:1V configuration utilizing clay fill and a reverse filter to control seepage. Stantec is currently preparing a work plan to flatten these slopes as part of the construction contract to improve drainage around the perimeter of the subject CCB storage facilities.

Seepage and slope stability analysis of the different proposed conditions for the sections mentioned above were analyzed using the same parameters and search methods discussed in previous sections of this report. Further discussion relative to implementation of corrective measures is presented in Section 10.4 'Slope Stability Improvement Measures'. The results of the additional seepage and stability analyses are included in Appendix I and summarized in Tables 19-26 below.

Table 19. Summary of Computed Exit Gradients and Factors of Safety against Piping with Fly Ash Disposal Area Pool Lowered to Elevation 801.5'

Cross-Section	Vertical Gradient (i_v) at Critical Exit Point	Location of Critical Exit Point	Material	Critical Gradient (i_{crit})	FS_{piping}	Pool Elevation
N-N'	0.137	Downstream Slope Toe	Sandy Lean Clay Fill	1.046	7.6	Lowered Pool
O-O'	0.123	Downstream Slope Toe	Fat Clay Alluvium	1.018	8.3	Lowered Pool
R-R'	0.189	Downstream Slope Toe	Lean Clay Fill	1.0	5.3	Lowered Pool
S-S'	0.253	Downstream Slope Toe	Lean Clay Fill	1.0	4.0	Lowered Pool

Table 20. Summary of Computed Exit Gradients and Factors of Safety against Piping with Proposed Buttress Constructed on Downstream Slope

Cross-Section	Vertical Gradient (i_v) at Critical Exit Point	Location of Critical Exit Point	Material	Critical Gradient (i_{crit})	FS_{piping}	Pool Elevation
I-I'	0.172	Downstream Slope Toe	Lean Clay Fill	1.0	5.8	Normal Pool
N-N'	0.206	Downstream Slope Toe	Sandy Lean Clay Fill	1.046	5.1	Normal Pool
O-O'	0.219	Downstream Slope Toe	Fat Clay Alluvium	1.018	4.7	Normal Pool
R-R'	0.056	Downstream Slope Toe	Lean Clay Fill	1.0	17.9	Normal Pool
S-S'	0.082	Downstream Slope Toe	Lean Clay Alluvium	1.0	12.2	Normal Pool

Table 21. Summary of Computed Exit Gradients and Factors of Safety against Piping with Proposed Slurry Wall and Combination of Remedial Measures

Cross-Section	Vertical Gradient (i_v) at Critical Exit Point	Location of Critical Exit Point	Material	Critical Gradient (i_{crit})	FS_{piping}	Pool Elevation
S-S' (Slurry Wall)	0.214	Downstream Slope Toe	Lean Clay Alluvium	1.0	4.7	Normal Pool
S-S' (Slurry Wall and Lowered Pool)	0.120	Downstream Slope Toe	Lean Clay Alluvium	1.0	8.3	Lowered Pool
I-I' (Slurry Wall)	0.377	Downstream Slope Toe	Lean Clay Fill	1.0	2.7	Normal Pool
I-I' (Slurry Wall, 3H:1V Dike Re-grade, Raised Pool)	0.373	Downstream Slope Toe	Lean Clay Fill	1.0	2.7	Raised Pool

Table 22. Summary of Computed Global Factors of Safety for Slope Stability Assuming Proposed Repairs

Cross-Section	Ash Pond Pool Lowered to 801.5'	Crushed Stone Buttress	30' Deep Slurry Wall	30' Deep Slurry Wall, 3H:1V Dike Regrade, Raised Pool to 830'	30' Deep Slurry Wall and Pool Lowered to 801.5'
I – I'	N/A	1.5	1.5	1.6	N/A
N – N'	1.6	1.7	N/A	N/A	N/A
O – O'	1.6	1.8	N/A	N/A	N/A
R – R'	1.5	1.7	N/A	N/A	N/A
S – S'	1.4	1.7	1.4	N/A	1.5

Table 23. Summary of Computed Exit Gradients and Factors of Safety against Piping with Proposed Buttress Constructed on South Side of Gypsum Stack

Cross-Section	Vertical Gradient (i_v) at Critical Exit Point	Location of Critical Exit Point	Material	Critical Gradient (i_{crit})	FS_{piping}	Pool Elevation
K-K'	0.518	Downstream Slope Toe	Ash Dike	0.708	1.4*	Normal Pool
L-L'	0.040	Downstream Slope Toe	Sluiced Ash	0.708	17.7	Normal Pool

* The work plan prepared by Stantec for the buttress and armoring of the south slope of the Gypsum Disposal Area includes a reverse filter in the area of low factor of safety against piping to control seepage. This filter cannot be modeled in SeepW to raise the Factor of Safety against piping, but construction of the filter will raise the F.S. for piping above the minimum target of 3.0.

Table 24. Summary of Computed Exit Gradients and Factors of Safety against Piping with Proposed Buttress Constructed on South Side of Gypsum Stack and Gypsum Disposal Area Pool Raised to Elevation 830'

Cross-Section	Vertical Gradient (i_v) at Critical Exit Point	Location of Critical Exit Point	Material	Critical Gradient (i_{crit})	FS_{piping}	Pool Elevation
K-K'	0.719	Downstream Slope Toe	Ash Dike	0.708	1.0*	Raised Pool
L-L'	0.050	Downstream Slope Toe	Sluiced Ash	0.708	14.2	Raised Pool

* The work plan prepared by Stantec for the buttress and armoring of the south slope of the Gypsum Disposal Area includes a reverse filter in the area of low factor of safety against piping to control seepage. This filter cannot be modeled in SeepW to raise the Factor of Safety against piping, but construction of the filter will raise the F.S. for piping above the minimum target of 3.0.

Table 25. Summary of Computed Global Factors of Safety for Slope Stability with Proposed Buttress Constructed on South Side of Gypsum Stack

Cross-Section	Gypsum Disposal Area Pool 825'	Gypsum Disposal Area Pool 830'
K – K'	1.7	1.5
L – L'	2.3	2.2

Table 26. Summary of Computed Maintenance Factors of Safety for Slope Stability with Proposed Slopes Reconfiguration

Cross-Section	Slopes Regrade to 2.5:1	Slopes Regrade to 3:1
D – D'	1.9	N/A
F – F'	N/A	2.3
I – I'	N/A	1.6 (Fill)

Table 27. Summary of Computed Global Factors of Safety for Slope Stability for Varying Ash Pond Pool Levels

Cross-Section	Ash Pond Pool at Elev. 806.5'	Ash Pond Pool Lowered to Elev. 801.5'	Ash Pond Pool Lowered to Elev. 795'
N – N'	1.4	1.6	1.9
O – O'	1.4	1.6	1.9
R – R'	1.3	1.5	1.8
S – S'	1.2	1.4	1.7

10. Conclusions and Recommendations

10.1. Area 1 – Bottom Ash Disposal Area

10.1.1. Historical Information

Area 1 was initially utilized to store sluiced fly ash when the BRF plant went online in 1966. In 1980, Area 1 was modified to receive dredged material from Area 2 (fly ash), and in 1981 it was used as a fly ash settlement pond which discharged into an ash channel. The northeast corner of Area 1 received sluiced bottom ash and a channel traversing along its east side conveyed the bottom ash to Area 2 (current operations). In 1985, the settlement pond in Area 1 ceased receiving sluiced ash and was filled with bottom ash. From 1988 to 2004, bottom ash was temporarily stacked in this area prior to going to Area 2A for disposal. From 2004 to present all bottom ash not sold is stacked in Area 1.

According to historical information, slippage and settlement was observed along the south dike in 1981. Also, several slides were noted on the upper dike in 1998, although the records do not indicate on which side of Area 1 this occurred.

10.1.2. Subsurface Conditions and Stability Analyses

The lower and upper dikes extend along the west side of Area 1 are similar to the Area 2 and 2A perimeter dikes. However, the Area 1 dikes have flatter slopes and, in fact, the top of the lower dike in the north portion of Area 1 slopes down toward the river instead of forming a flat intermediate bench as is the case in Areas 2 and 2A. The subsurface conditions within the dikes and foundation deposits next to Area 1 are similar to those encountered in Area 2 dikes. The dikes were constructed using clayey soil and the foundation conditions are as discussed previously in Section 8.2.

The subsurface conditions within the original pool area consist of cyclic sequences of bottom ash, fly ash and bottom ash mixed with fly ash layers, underlain by alluvial clays and sands. Depending on boring location, the presumed top of sluiced ash originally deposited in this area was found at elevations ranging approximately from 788 feet in Boring STN-15 to 810 feet in Borings STN-9 and STN-14.

The stability of the perimeter dikes built along the Clinch River bank was evaluated using two-dimensional limit equilibrium methods of analysis, assuming static, long-term and fully drained conditions within the existing dikes and foundation soils. The slope stability calculations for existing conditions along Section D-D' of the perimeter dike produced a factor of safety of 2.1 against sliding, which is above the minimum acceptable value.

Above elevation 810 feet, the lower portion of the west slope of Area 1 has a 1.5H:1V slope up to elevation 818 feet. Although the factor of safety for global stability above elevation 810 feet is above 1.5, the factor of safety for a shallow (or local) failure is 1.4 due to the steep slope. This factor of safety for shallow failure should also apply to other sites within Area 1 where bottom ash stacks have similar steep slopes.

10.2. Area 2 - Fly Ash Pond

10.2.1. Historical Information

The Fly Ash Pond was originally developed as wet ash disposal area located on the floodplain of the Clinch River along with Area 1. The principal initial feature of the disposal area was a 15-foot (±) high earthen dike constructed along the east flank of Clinch River and what is now the north flank of Bull Run Creek. The top of dike elevation was 800 feet and the interior and exterior dike slopes were 2H:1V. The dike was later expanded vertically toward the pool to a maximum crest elevation of 810 feet also using 2H:1V slopes. Available design or as-built information shows that no under-drain features were installed to control seepage across the dikes. At the present, the normal pool elevation of the pond is 806.5 feet.

According to historical information, the upper dike was constructed partially on top of the lower dike and partially on bottom, fly ash or earthen fill material placed after undercutting ash deposits. Also, it was not uncommon to stack ash inside the pool up to elevation 825 feet. Seepage or wet and soft areas have been observed on the west and south dikes at

various times from 1976 to 2009. A slump of the Bull Run Creek bank, or exterior slope of the lower south dike, was also observed near the southeast corner of the pond during the Phase 1 assessment.

10.2.2. Subsurface Conditions and Slope Stability Analyses

Boring and survey information obtained during this exploration generally confirms the information provided by the historic documents relative to the materials used to construct the dikes and geometry of the dikes. The dikes were constructed with clayey soil and using 2H:1V slopes. The lower dike was constructed mostly on top of alluvial clay deposits underlain by alluvial sands and gravel. The foundation deposits directly under the upper dike vary in terms of material types and consistency. These deposits consist of clayey soil (top of lower dike), bottom ash, fly ash, or a combination thereof. The lateral extent of the different foundation conditions is unknown. The consistency of the clayey dike material and foundation deposits varies from soft to very stiff. The ash deposits and alluvial sand range from very loose to very dense in terms of relative density.

Data obtained from instrumentation installed within the dikes and foundation deposits show high phreatic levels. These conditions are a result of the high Fly Ash Pond normal pool elevation (806.5 feet) with respect to the top of the upper dike (810 feet) and the lack of seepage control measures (under-drain features) within the dikes. It is also possible the uncontrolled seepage across the upper dike is the source of wet conditions observed along the top (elevation 800 feet) of the lower dike.

The stability of the dikes was evaluated using two-dimensional limit equilibrium methods of analysis, assuming static, long-term and fully drained conditions within the existing dikes and foundation materials. The slope stability calculations for existing conditions along four typical cross sections of the dikes produced factors of safety against sliding ranging from about 1.2 to 1.4, which are below the minimum acceptable value that current USACE criteria requires for long-term loading conditions. The low factors of safety for the perimeter dikes are a result of high phreatic levels described in the previous paragraph, lack of under-drain features to control seepage across the dike, steepness of exterior slopes, and shear strength of the dike material.

10.2.3. Seepage Analyses

Seepage analyses were performed on selected cross sections of Area 2 to estimate seepage gradients for the evaluation of piping potential, and pore water pressures within dike and foundation soils used in slope stability analyses. The analyses were performed for steady-state seepage through saturated and unsaturated soils. The lowest factors of safety against piping, computed for the surficial 3 to 5 feet of soil in these areas, ranged from 2.4 to 4.7. According to USACE design criteria for dams (EM 110-2-1901), the target minimum factor of safety against piping is 3.0.

10.3. Area 2A - Gypsum Disposal Area

10.3.1. Historical Information

Area 2A was created in 1981 after a divider dike was constructed to divide Area 2. Prior to its creation and until 1989, Area 2A received mostly sluiced ash. Bottom ash from Area 1 was dry stacked in Area 2A from 1989 until 2004. Construction of the Gypsum Disposal

Area began in 2006 and the facility went online in late 2008. The more recent Area 2A dikes were constructed mostly over sluiced ash deposits, although certain areas of these deposits appear to have filled over with dry ash before the dikes were constructed.

The south dike of the gypsum disposal area was constructed over sluiced ash deposits that extend into the Fly Ash Pond (Area 2) well beyond the toe of the dike. The design of the Gypsum Disposal Area included the construction of sand columns within the sluiced ash foundation deposits to reduce the potential for slope instability of the south dike during construction due to excessive pore pressure buildup. The design also specified the construction of under-drain features to control seepage across the dike. The seepage control measures consisted of perimeter drains discharging into finger drains which in turn discharged seepage water along the exterior slope of the east, west and south dikes.

As construction was being completed in 2007, seepage through the lower portion of the south dike caused sloughs along the exterior toe. As a result, some of the seepage control features were modified, new features were added and the sloughing was repaired. However, new sloughing developed along practically the same areas of the south dike on October 6, 2009.

Observations made during 2009 identified several areas or features of concern along both the exterior and interior slopes of the dikes. Some of the concerns identified in 2009 have been already corrected, or work plans have already been issued to correct them. Other concerns are subject of this exploration. Outstanding concerns aside from global stability of some of the dike slopes are poor surface drainage conditions on the exterior intermediate benches of the Gypsum Disposal Area and the top of the lower dike along the west side of Area 2A.

10.3.2. Subsurface Conditions and Stability Analyses

The dikes of the Gypsum Disposal Area were constructed using bottom ash mixed with fly ash over sluiced ash deposits. The sluiced ash deposits are underlain by alluvial clays, silts and sands. The dike material appears to be well compacted based on SPT information obtained in several borings. Conversely, N-values obtained from standard penetration tests performed within the sluiced ash range from 0 to 5 blow per foot, indicating a very loose to loose relative density. The consistency of the alluvial deposits is generally very soft to medium stiff.

The subsurface conditions of the dikes located along the west side of the Gypsum Disposal Area are similar to those encountered under the dikes that form the west and south sides of Area 2. These conditions are described in Section 8.4 of this report.

The slope stability calculations produced factors of safety against sliding below 1.5 -- the minimum acceptable value that current USACE criteria requires for long-term loading conditions -- for the south dike of the Gypsum Disposal Area and the perimeter dikes (top elevation 810 feet) constructed along the Clinch River bank and the drainage channel that separates Area 1 and 2A. The low factors of safety for the south slope of Area 2A are caused by the low shear strength of the foundation material (sluiced ash), relatively high phreatic levels near the dike toe and sloping ash pond bottom next to the west side of the south slope. The low factor of safety calculated for the perimeter dikes of Area 2A is a result of steep slope conditions and high phreatic levels due to lack of seepage control measures within the dikes.

Above elevation 810 feet, the lower portion of the north and west slope of Area 2A has a 1.5H:1V slope up to elevation 818 feet. Although the factor of safety for global stability above elevation 810 feet is above 1.5, the factor of safety for a shallow (or local) failure is 1.4 for the north side and 1.1 for the west side. Obviously, if the dike below elevation 810 feet fails, the slope above 810 feet may also fail.

10.3.3. Seepage Analyses

Seepage analyses were performed on two south dike cross sections of Area 2A to estimate seepage gradients for the evaluation of piping potential, and pore water pressures within dike and foundation soils used in slope stability analyses. The analyses were performed for steady-state seepage through saturated and unsaturated soils. The factors of safety against piping computed for the surficial 3 to 5 feet of soil near the toe of the south dike were 2.6 for Section L-L' and 1.9 for Section K-K', which are lower than the target minimum factor of safety against piping of 3.0.

A similar analyses was performed for Section I-I' of the perimeter dike located next to Clinch River. The factor of safety against piping computed for the surficial 3 to 5 feet of soil near the toe of the lower dike was 1.8 for Section I-I'.

10.4. Slope Stability Improvement Measures

10.4.1. Area 2 – Fly Ash Pond

After reviewing different corrective measures, Stantec considered one corrective action and two construction measures that could improve the stability of the Area 2 dikes. The factors of safety against sliding were then calculated for the typical dike cross sections after the corrective measures are applied independently.

If the normal pool elevation of the Fly Ash Pond is permanently lowered five feet (to 801.5 feet), as a corrective action to lower the phreatic level across the dikes, the improved calculated factors of safety range from 1.4 to 1.6. Also, lowering the normal pool elevation by five feet would result in an acceptable factor of safety against piping. Based on information provided by TVA, the required free water volume of the ash pond is maintained provided the pool is not lowered below 801 feet. Therefore, since ash would continue to be sluiced into the pond, lowering the pool permanently will probably require dredging ash out of the pond in the near future. In addition, the pool would need to be lowered at a prescribed rate to prevent rapid drawdown failures of the dike interior slopes and the south dike of the Gypsum Disposal Area.

Constructing a rock buttress on the exterior slope of the lower dike would raise the factors of safety against sliding above 1.5. A buttress crest elevation of 800 feet and a slope ranging from 3H:1V to 4H:1V extending approximately 90 to 110 feet into the Clinch River and Bull Run Creek as measured from the outside crest of the lower dike would be required. If at the same time a reverse filter is placed near the exterior toe of the lower dike, the recommended minimum factor of safety against piping would also de attained. Most of the buttress would be constructed within US waters, which would require submitting and attaining an encroachment permit from federal and state regulatory agencies.

Another construction measure TVA may consider would be to construct a cement-bentonite slurry or cutoff wall through the crest of the upper dike. The purpose of the slurry wall would be to control seepage across the two dikes by constructing a two-foot (±) thick barrier that extends approximately 30 feet into the ground. Constructing a slurry wall would initially lengthen the path of the pool water seeping across the dikes and lower the phreatic surface outside the upper dike to approximate elevation 798 feet, or about 3 feet above the normal pool elevation of Melton Hill Reservoir. The engineering analysis of the case analyzed at cross-section S-S' shows that the resultant factor of safety against sliding would increase to 1.4, however, if the slurry wall was constructed in conjunction with permanently lowering the Ash Pond pool to elevation 801.5 feet, then the resultant factor of safety against sliding would increase to 1.5, the minimum target factor of safety. The factor of safety against piping would also be raised to 4.7 and 8.3, respectively, for the two conditions described above. The cost of a slurry wall is dependent on the depth, length, and width of wall, site geological and hydrological characteristics, available workroom, selected backfill material and other ancillary costs such as site restoration and disposal. The typical cost of a cement-bentonite slurry wall ranges from $3.00 to $6.00 per square foot. Economies of scale should apply in this case.

10.4.2. Area 2A – Gypsum Disposal Area

At TVA's request, Stantec has prepared a work plan to improve the stability of the south dike of the Gypsum Disposal Area. The work plan consists of constructing a rock buttress in the fly ash pond next to the toe of the south dike and armoring the south slope from elevation 808 feet up to 825 feet.

The preparatory work to construct the buttress includes removing the sloughed material (vegetative and clay cover). The combination of the constructed buttress and a reverse filter constructed immediately below the toe of the dike and the slope armoring will attain an acceptable factor of safety against piping of the ash material. The work plan also calls for placing a geogrid layer over the sluiced ash surface below the reverse filter to reduce buttress rock fragment penetration into the wet ash.

According to engineering analyses, after constructing the buttress and reverse filter as shown on the work plan, the factor of safety against sliding for long term loading conditions would rise to 1.7 in Section K-K' and to 2.3 in Section L-L', assuming the pool elevation within the Gypsum Disposal Area is at elevation 825 feet. The resulting factor of safety against piping would be above 17 for Section L-L', and below 3.0 for Section K-K' before the graded filter is installed to control piping. If the pool is raised to elevation 830 feet, the calculated factor of safety against sliding is 1.5 in Section K-K' and 2.2 in Section L-L', and the factor of safety against piping would be above 14 for Section L-L', and below 3.0 for Section K-K' before the graded filter is installed to control piping. As mentioned above, the work plan prepared by Stantec for the buttress and armoring of the south slope of the Gypsum Disposal Area includes a reverse filter in the area of low factor of safety against piping to control seepage. This filter cannot be modeled in SeepW due to its thickness and program limitations, but construction of the filter will raise the F.S. for piping above the minimum target of 3.0.

The purpose of the armoring is to prevent sloughing of the south slope due to uncontrolled seepage emerging from the south dike. The armoring will consist of removing the clay cover and undercutting the underlying ash approximately two feet and backfilling the excavation with reverse filter materials and crushed stone.

High phreatic levels were also observed in areas of the dike that extend north of the Fly Ash Pond, along the west side of Area 2A. The exterior slope of the lower dike in this area is also 2H:1V. Therefore, the construction measures described above for the perimeter dikes of Area 2 would need to be extended to near the northwest corner of Area 2A.

It is recommended that the north dike be graded back above elevation 810 feet using 3H:1V slopes and an intermediate bench near elevation 825 feet. The resultant factor of safety against shallow failure for the graded slope is 2.3. The intermediate bench should be graded such that surface runoff is directed toward the east. These measures would eliminate sloughing and erosion problems experienced in this area during 2009. It is also recommended that the west embankment above elevation 810 feet be graded to 3H:1V slope using clay fill and a reverse filter. The resultant factor of safety against non-global failure for the final grade after fill is 1.6. This repair work is to be added to a current work plan scheduled to be implemented in the spring of 2010.

10.4.3. Area 1 – Bottom Ash Disposal Area

Those areas within this CCB disposal facility where existing slopes are 2H:1V or steeper should be graded back to flatter slopes to improve the factor of safety against shallow or local failure; provide safer conditions for maintenance operations and prevent sloughing and surface erosion. Flattening of the steep slopes observed along the west side of Area 1, above elevation 810 feet will be added to a current work plan scheduled to be implemented in the spring of 2010.

10.5. Long Term Stability of Perimeter Dike Slopes and South Dike Area 2A

As discussed earlier, the calculated factors of safety against sliding and piping for portions of the perimeter dikes are below the recommended minimum values. The less than acceptable factors of safety appear to be a result of a combination of the following factors: (1) high phreatic levels, (2) lack of under-drain features to control seepage across the dike, (3) exterior dike slope steepness and (4) shear strength of the dike material. Based on the cross-sections selected for stability analysis, the low factors of safety apply to dike areas extending from the southeast corner of Area 2 to the northeast corner of Area 2A. It appears that low phreatic conditions and flatter exterior dike slopes existing along the west side of Area 1 result in factors of safety at or above recommended minimum values.

This report discusses briefly certain options TVA may consider to improve the stability of perimeter dike areas not meeting the recommended criteria for maintaining long term stability against slope failure and soil piping. In order to determine more specifically the dike areas exhibiting less than acceptable factors of safety and to select corrective measures, it is anticipated that additional geotechnical exploration and engineering analyses may need to be performed. Most of the additional work will probably consist of installing additional piezometers to better define the lateral extent of the high phreatic conditions. The additional borings may also provide further information relative to the subsurface conditions directly below the upper perimeter dike.

The stability and seepage analyses of the Gypsum Stack Disposal Area south dike were performed based on our understanding of historical information describing the seepage control measures (under-drain system) installed within the pool and the assumption that the under-drain system is and will be functional during the service life of the facility. It is critically

important that all instrumentation be read periodically and pool elevations recorded at the same time. A geotechnical engineer should review this information and perform additional engineering analyses of the different dikes as necessary.

11. Closure

The root cause analysis of the December 22, 2008 dredge cell pond failure at TVA's Kingston Fossil Plant identified four main destabilizing factors contributing to the breach of the containment dike and subsequent failure. Stantec's scope of work included a review of the historic documentation, results of the drilling and laboratory testing program, and current dike configurations with respect to these contributing factors to asses the potential for these conditions to exist at the BRF CCB disposal facilities. The review focuses on the conditions encountered within Areas 1, 2 and 2A.

- Weak Silt/Ash Foundation – It is our understanding the BRF plant has historically discharged ash into Areas 1, 2 and 2A via discharge points in the northeast corner of each area. Consequently, there is the potential that weak silt/ash deposits may have formed under the different areas. Sluiced ash over soft weak alluvial material was noted in some of the borings; however, the SPT samples did not encounter a transition zone between the two materials that would be considered as a particularly adverse condition. The sluiced ash deposits are a factor contributing to the lower factors of safety against sliding calculated from the stability analysis of the Gypsum Disposal Area south dike. However, the contact between the sluiced ash and the weak alluvial materials is too deep (too far below the bottom of the dikes) to be considered as a likely contributing factor, unless the height of the Area 2A dike is increased significantly.

- Hydraulically Placed, Loose, Wet Ash – Hydraulically placed, wet ash was encountered below the upper perimeter dike of Areas 1, 2 and 2A and under the Gypsum Disposal Area dikes. Its presence is a contributing factor affecting the stability of the Gypsum Disposal Area south dike but not so for the perimeter dikes. This report includes recommendations that will result in obtaining acceptable factor of safety against sliding for the south dike.

- Increased Loads Due to Embankment/Fill Height – This factor is not applicable for the BRF CCB disposal facilities unless TVA decides to raise the height of the Gypsum Disposal Area dikes.

- Embankment Geometry Setback – This factor is applicable because there is a setback between the perimeter dike of the Fly Ash Pond and the south dike of Area 2A. The potential impact of this factor on the stability of the Area 2A south dike is being addressed by a work plan being prepared concurrently with this report. When implemented, the work plan will result in acceptable factors of safety against sliding and piping provided the Area 2A dikes are not raised.

The scope of Stantec's services did not include an environmental assessment or investigation for the presence or absence of wetlands and hazardous or toxic materials in the soil, surface water, groundwater or air, on below or around the project sites. Any statements in this report or on the boring logs regarding odors noted or unusual or suspicious items or conditions observed are strictly for the information of the client.

These conclusions and recommendations are based on data and subsurface conditions from the borings advanced during this investigation using that degree of care and skill ordinarily exercised under similar circumstances by competent members of the engineering profession. The boring logs and related information presented in this report depict approximate subsurface conditions only at the specific boring locations noted and at the time of drilling. Conditions at other locations may differ from those occurring at the boring locations. Also, the passage of time may result in a change in the subsurface conditions at the boring locations.

The scope of this evaluation was limited to consider only the potential risks to the facilities due to excessive seepage and slope instability under long-term, steady-state seepage loading conditions. The stability of the facilities during a potential earthquake was not analyzed. This assessment did not consider potential failure modes related to spillway capacity and overtopping or seepage along penetrations through the embankment (including the buried spillway pipes).

12. References

The following is a list of documents referenced in this report and/or used to evaluate the stability of the structures at Bull Run Fossil Plant:

Soil Strength and Slope Stability, pp 49, Duncan, J. Michael, Wright, Stephen G., 2005.

Slope Stability, Department of the Army, US Army Corps of Engineers, Engineering Manual EM 1110-2-1902, October 31, 2003.

Geotechnical Investigations, Department of the Army, US Army Corps of Engineers, Engineering Manual EM 1110-1-1804, January 1, 2001.

Seepage Analysis and Control for Dams CH 1, Department of the Army, US Army Corps of Engineers, Engineering Manual EM 1110-1-1901, April 30, 1993.

Evaluation of settlements in sands due to earthquake shaking, Journal of Geotechnical Engineering, ASCE, Vol. 113, No. 8, August, pp. 861-878. Tokimatsu, K., and Seed, H. B. (1987).

Soil Mechanic Design Manual 7.1, Department of the Navy – Navy Facilities Engineering Command, May 1982.

A Method of Analysis of Embankments assuming Parallel Interslice Forces, Geotechnique, Vol 17 (1), pp. 11-26, Spencer, E. (1967).

Rawls, W. J., Brakensiek, D. L., and Saxton, K. E., Estimation of Soil Water Properties, Transactions of the American Society of Agricultural Engineers, Vol. 25, No. 5, pp. 1316 – 1320 & 1328, 1982.

Liao, S.C. and Whitman, R.V. Overburden Correction Factors for SPT in Sand, JGED, ASCE, Vol. 112, No. 3, pp. 373-377, 1985 as referenced in Seed and Harder, "SPT Based Analysis of Cyclic Pore Pressure Generation and Undrained Residual Strength", Volume 2 Memorial Symposium Proceedings, pp. 361-362, May 1990.

Root Cause Analysis of TVA Kingston Dredge Cell Pond Failure from December 22, 2008, AECOM, June 12, 2009.

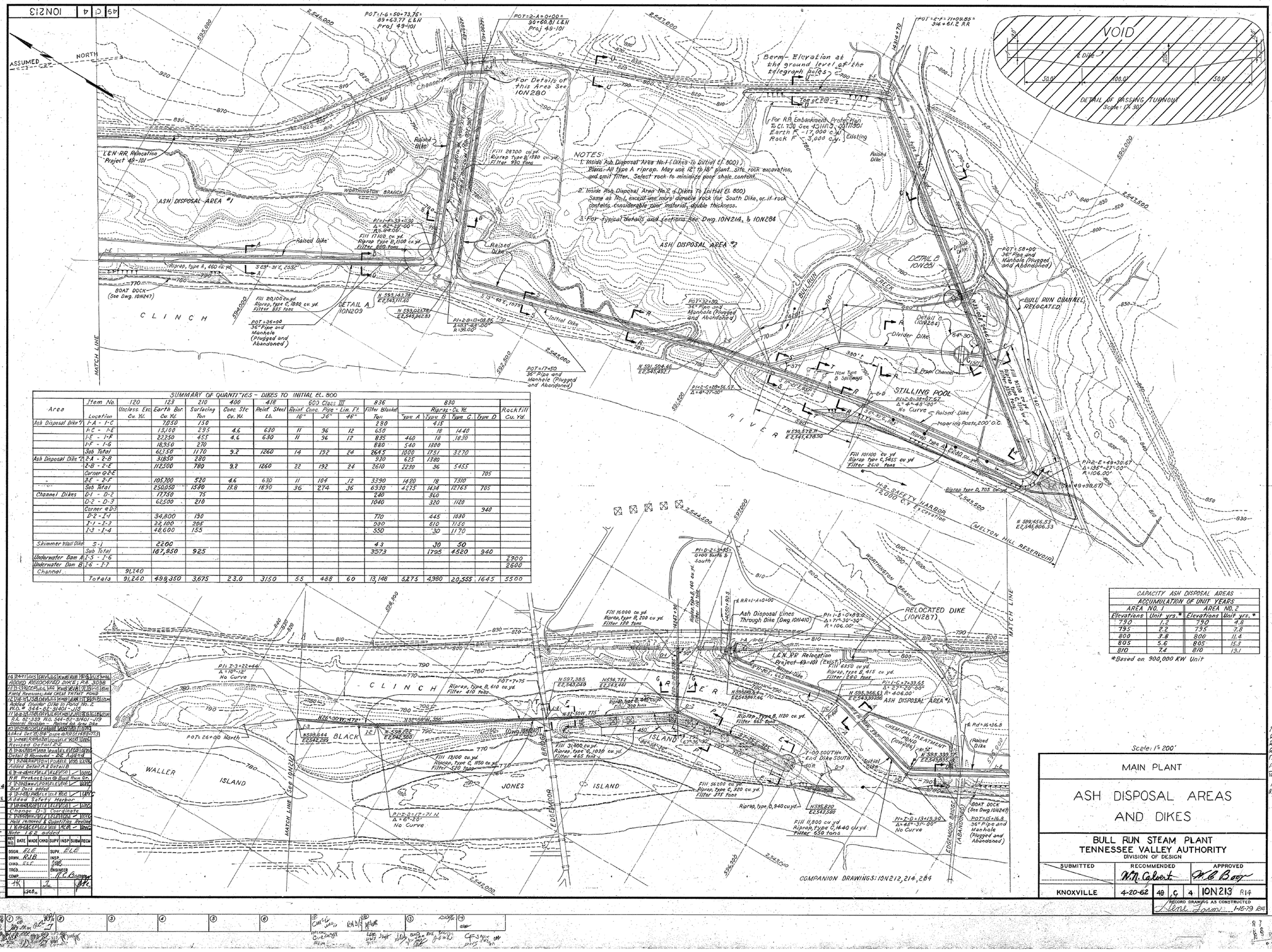
Appendix A

Historical Documents

- Reference No. 1
- Reference No. 2
- Reference No. 3
- Reference No. 4
- Reference No. 5
- Reference No. 6
- Reference No. 7
- Reference No. 8
- Reference No. 9
- Reference No. 10
- Reference No. 11
- Reference No. 12

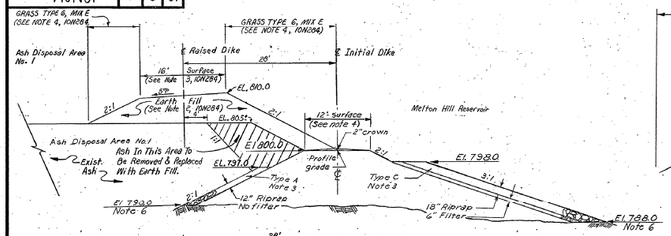
Reference No. 1

10N213 | D | 4 | 49

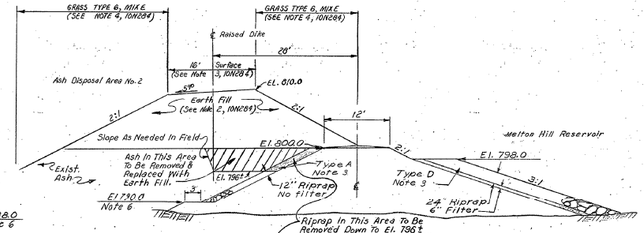

NORTH
ASSUMED
MATCH LINE
CLINCH
RIVER
WALLER ISLAND
BLACK ISLAND
JONES ISLAND
ASH DISPOSAL AREA #1
ASH DISPOSAL AREA #2
WORTHINGTON BRANCH
BULL RUN CREEK
BULL RUN CHANNEL RELOCATED
L&N RR Relocation Project 49-101
Initial Dike
Raised Dike
Divider Dike
Saddle Dike
Ash Disposal Lines Through Dike (Dwg. 10N410)
RELOCATED DIKE (10N287)
STILLING POOL
Riprap Spillway
Riprap Channel
Riprap Lined Channel
Riprap Lined Ditch
Fence
Roadway
Existing
Proposed
Boat Dock (See Dwg. 10N247)
Boat Dock (See Dwg. 10N247)
CHEMICAL TREATMENT POND (Dwg. 10N286)
EDGEMOOR BRIDGE (ABANDONED)
EDGEMOOR BRIDGE
For Details of this Area See 10N280
For RR Embankment Protection To Cl. 136 See 10N175 Earth E - 17,000 c.y. Rock F - 3,000 c.y.
Berm - Elevation at the ground level of the telegraph poles
Toe of Fill
DETAIL A 10N209
DETAIL B 10N284
Detail C (10N284)
Detail D (10N284)
VOID
DETAIL OF PASSING TURNOUT
Scale: 1" = 30'
NOTES:
1. Inside Ash Disposal Area No.1 (Dikes To Initial El. 800) Plans - All Type A riprap. May use 12" to 18" plant site rock excavation, and omit filter. Select rock to minimize poor shale content.
2. Inside Ash Disposal Area No.2 (Dikes To Initial El. 800) Same as No.1, except use more durable rock for South Dike, or if rock contains considerable poor material, double thickness.
3. For Typical Details and Sections See Dwg. 10N214, & 10N284
Fill 28700 cu yd
Riprap Type B 1380 cu yd
Filter 950 Tons
Fill 17100 cu yd
Riprap Type B 1300 cu yd
Filter 880 Tons
Fill 20,100 cu yd
Riprap, Type B 1536 cu yd
Filter 895 Tons
Riprap, Type A, 460 cu. yd.
Fill 16000 cu yd
Riprap, type B, 1200 cu yd.
Filter 720 Tons
Riprap, Type B, 610 cu yd.
Filter 610 Tons
Fill 13100 cu yd
Riprap, type C, 1150 cu yd
Filter 820 Tons
Fill 3400 cu yd
Riprap, type C, 1030 cu yd
Filter 465 Tons
Fill 56200 cu yd
Riprap, type C, 920 cu yd
Filter 915 Tons
Riprap, type D, 940 cu yd
Fill 11800 cu yd
Riprap, type C, 1440 cu yd
Filter 650 Tons
Fill 6450 cu yd
Riprap, type B, 415 cu yd.
Filter 280 Tons
Riprap Type B, 1180 cu yd.
Filter 665 Tons
Fill 10100 cu yd
Riprap Type C, 1455 cu yd
Filter 2610 Tons
Riprap Type D, 705 cu yd
Riprap Type B, 760 cu yd
Filter 1050 Tons
Riprap Type B, 1080 cu yd
Filter 1000 Tons
Riprap Type B, 1200 cu yd
Filter 1100 Tons
Riprap Type B, 1200 cu yd
Filter 1100 Tons
Riprap Type B, 1200 cu yd
Filter 1100

Reference No. 2

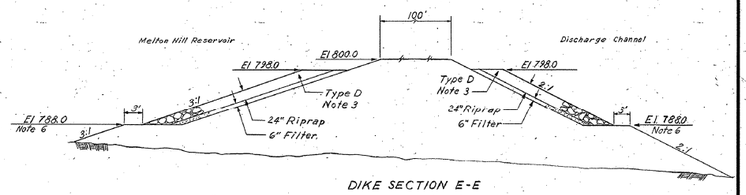
49 C 4 10N214



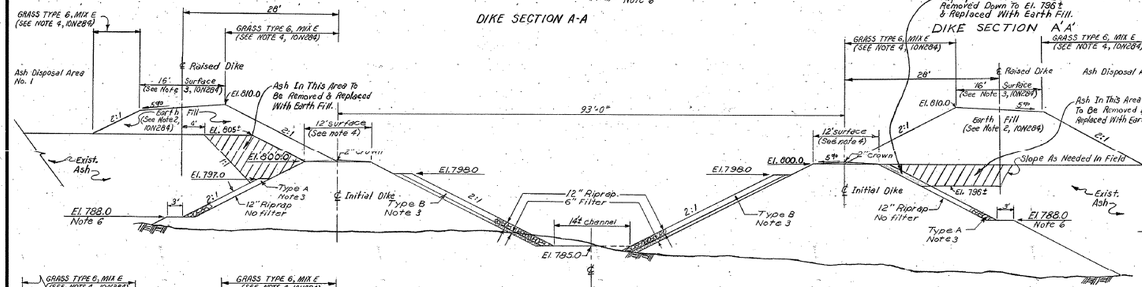
DIKE SECTION A-A



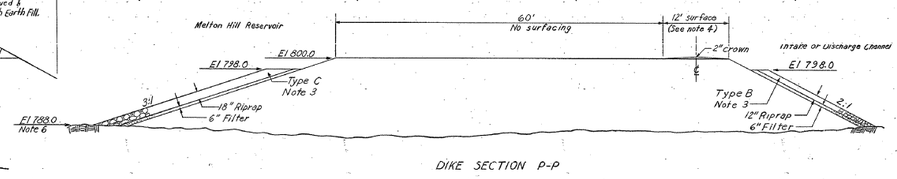
DIKE SECTION A'-A'



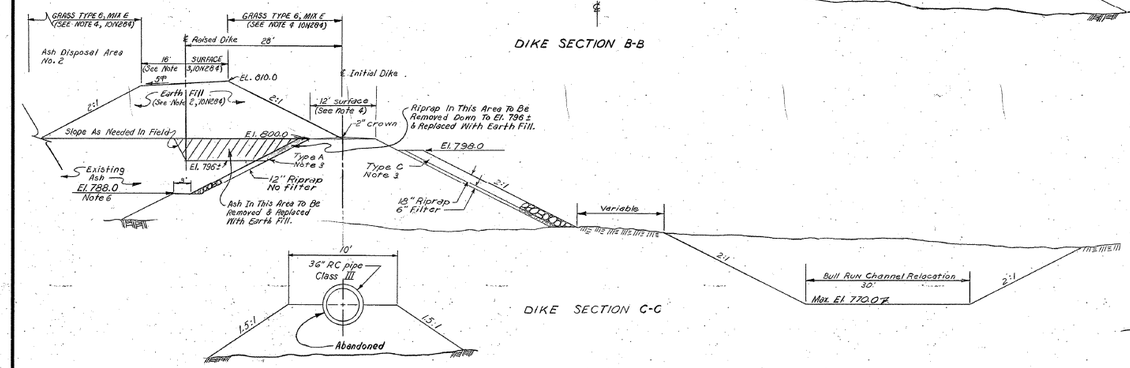
DIKE SECTION E-E



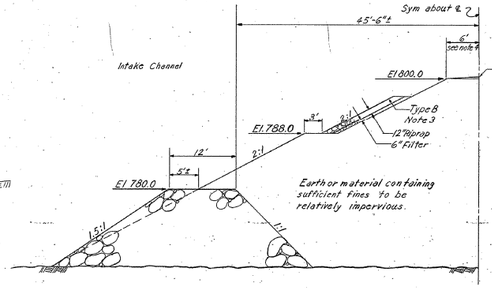
DIKE SECTION B-B



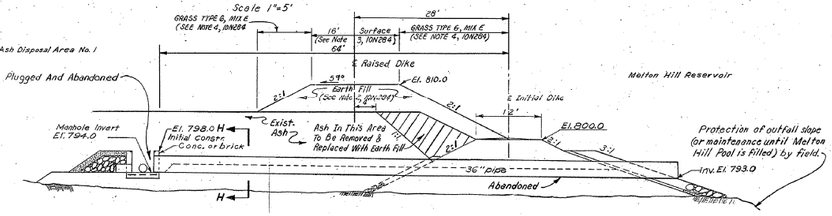
DIKE SECTION P-P



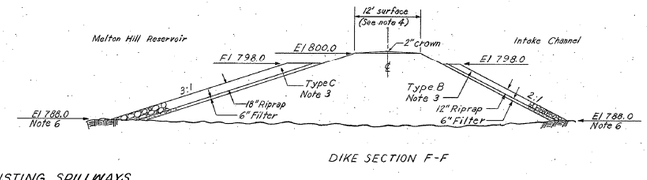
DIKE SECTION C-C



DIKE SECTION G-G

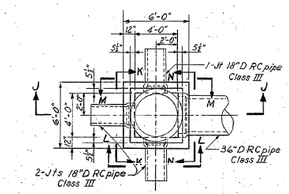


SECTION D-D
ABANDONED SPILLWAY

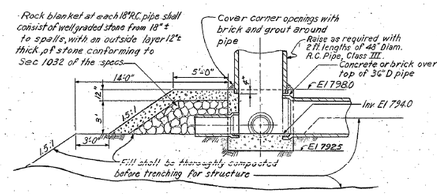


DIKE SECTION F-F

EXISTING SPILLWAYS PLUGGED AND ABANDONED

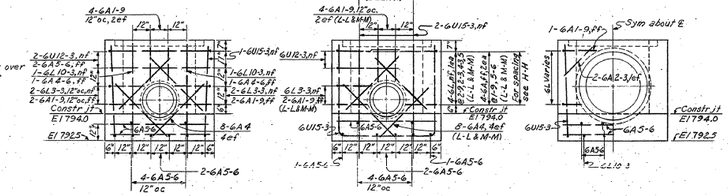


MANHOLE PLAN VIEW
Scale 1"=5'



For New Spillway Details See 10N282, 10N283.

MANHOLE DETAIL
SECTION J-J
Scale 1"=5'



COMPANION DRAWINGS: 10N212, 213, 284

NOTE A:
ALL NOTES FOR RAISED DIKES ARE ON DRAWING 10N284.

NOTES:
① SPECIFICATIONS: All work on the construction of these dikes shall be in accordance with Specifications No. M HC-811.
② EMBANKMENTS shall be constructed in layers and reasonably well compacted with hauling equipment.
③ RIPRAP AND FILTER: Riprap shall consist of sound, durable limestone, section 630. If feasible to use Powerhouse Excavation for all or part of riprap, Division of Design will furnish alternate specifications. Filter shall be crushed stone conforming to section 836.
ⓐ Type A Riprap shall be 12 inches thick and at least 50% of the stones shall weigh 25 lb or more. Riprap laid without filter.
ⓑ Type B riprap shall be 12 inches thick and at least 50% of the stones shall weigh 50 lb or more. Filter blanket shall be 6 inches thick.
ⓒ Type C riprap shall be 18 inches thick and at least 50% of the stones shall weigh 100 lb or more. Filter blanket shall be 6 inches thick.
ⓓ Type D riprap shall be 24 inches thick and at least 50% of the stones shall weigh 150 lb or more. Filter blanket shall be 6 inches thick.
④ CRUSHED STONE SURFACING, 4 inches thick, shall be applied for the full width of the dike in accordance with section 210.
⑤ For riprap along L & N Railroad Relocation see Project 49-101.
⑥ Where indicated earth berm and earth slope may be constructed below elevation shown to eliminate need for riprap below Melton Hill Pool drawdown.
On inside dike slopes riprap not required when toe of slope is 793 or higher.
Insofar as practicable all borrow shall be obtained from inside disposal areas. Where borrow is adjacent to dikes, provide a 10 ft. berm between toe of dike slope and top of borrow slope. Consult with design if borrow is planned on outside of dikes on island under highway bridge.

REFERENCE DRAWING
10DM214 ---------- BILL OF MATERIAL
Scale: 1"=10'
Except as noted

PRINTS RECD-R.E.
BR of PROJ

DWG	SIZE	F	H
ME			
EE			
CE			
AD			
CD	5		
ED			
MD			
BF			
SW			
BL			
PA	1		

REV NO.	DATE	MADE	CHKD	SUPV.	INSP.	SUBM.	RECM.
4	5-8-79	JSB	DAV	WAC	WJR	CAG	CAG
		P.A. 80-339; W.O. 544-80-31401-179 Changed Ash Removed Limits in Area No. 2					
3	10-10-68	JSB	DAV	WAC	WJR	CAG	CAG
		P.A. 62-329; W.O. 544-80-31401-179 Raised Ash Area Dikes & Abandoned Exist. Spillway					
2	10-24-62	WHA	FLE	ELE	EAH		DWG
		48"D.C. Pipe Note revised					
1	9-26-62	CEP	FLE	ELE	ARC	H	LLW
		Loaded companion dwg					

DESGN. F.L.E. SUPV. E.L.E.
DRWN W.T.P. INSP.
CHKD. F.L.E.
TRCD. ENGINEER
COMP. W.C. Cagle
4-79 Je
1180

MAIN PLANT

ASH DISPOSAL AREAS SUPPLEMENTAL DETAILS SHEET 3

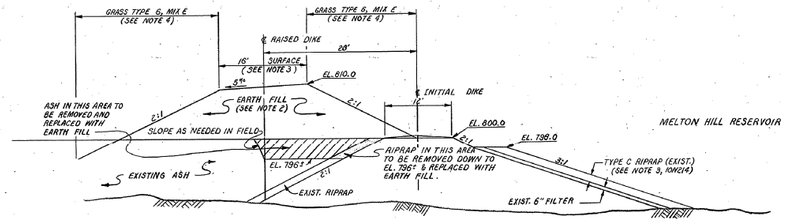
BULL RUN STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF DESIGN

SUBMITTED	RECOMMENDED	APPROVED
	W.M. Calvert	W.E. Bonn
KNOXVILLE	4-20-62	49 C 4 10N214 R4

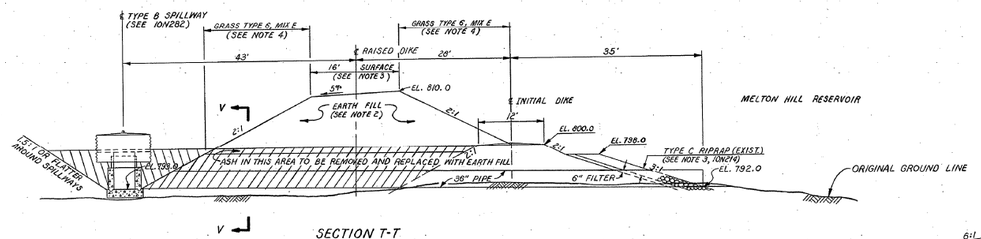
RECORD DRAWING AS CONSTRUCTED
Lena Lanier 1-15-79 R4

BRF-10N214-SHT -REV 4 MAIN PLANT ASH DISPOSAL AREAS SUPPLEMENTAL DETAILS SHEET 3 (36% of Scale); BRF - Ash Pond 2; Projects; 2/9/2009 11:52 AM

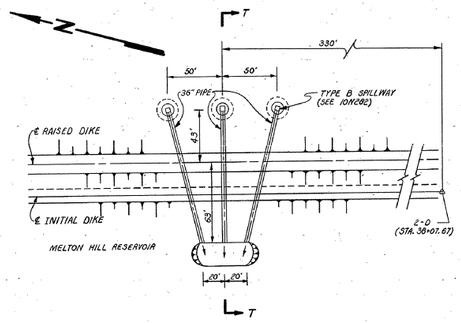
Reference No. 3



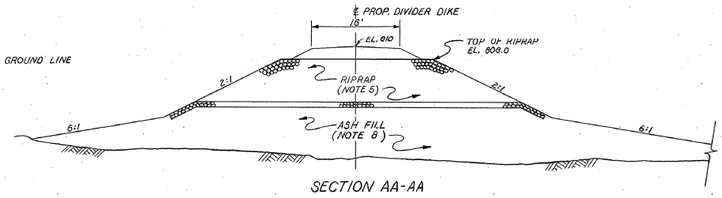
DIKE SECTION R-R



SECTION T-T
NEW SPILLWAY

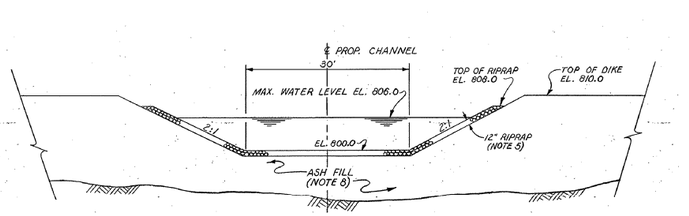


NEW SPILLWAY PLAN
SCALE: 1" = 50'

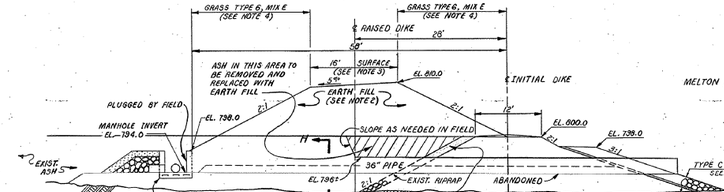


SECTION AA-AA

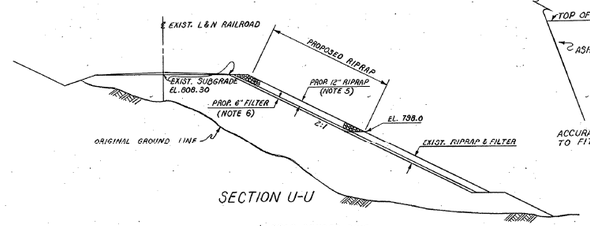
NOTES:
1. SOILS INVESTIGATIONS BY THE TVA MATERIALS LABORATORY ARE REPORTED IN THE MEMORANDUM, GENE FARMER TO ROY H. DUNHAM, DATED DEC. 12, 1974.
2. EARTH FILL FOR RAISED DIKES SHALL BE PLACED IN ACCORDANCE WITH ALL APPLICABLE SECTIONS OF GENERAL CONSTRUCTION SPECIFICATION G-9 FOR ROLLED EARTH FILL FOR DAMS AND POWER PLANTS. EARTH FILL SHALL BE OBTAINED FROM DESIGNATED BORROW AREAS. THE EARTH FILL MOISTURE CONTENT SHALL NOT EXCEED 3% ABOVE OPTIMUM MOISTURE CONTENT AND SHALL BE PLACED AND COMPACTED TO BE AT LEAST 95% OF MAXIMUM DRY DENSITY AS DETERMINED BY THE TVA MATERIALS LABORATORY. AT LEAST ONE MOISTURE-DENSITY ASSURANCE TEST SHALL BE MADE ON EACH 5000 CU. YD. OF FILL PLACED.
3. SURFACING FOR RAISED DIKES SHALL BE 4 INCHES OF CRUSHED STONE, PER SECTION 210, FOR FULL WIDTH OF DIKE.
4. ALL NEW AND DISTURBED DIKE SLOPES SHALL BE SEEDED WITH TYPE 6, MIXTURE E. BORROW AREA SHALL BE SEEDED WITH TYPE 6, MIXTURE A. ALL GRASSED AREAS TO BE FERTILIZED AND MULCHED IN ACCORDANCE WITH SECTIONS 180 & 182 RESPECTIVELY.
5. RIPRAP ALONG THE L & N RAILROAD AND CHANNEL THROUGH DIVIDER DIKE SHALL BE 12 INCHES THICK, WITH A MINIMUM OF 50% BY WEIGHT, CONSISTING OF STONES AT LEAST 80 POUNDS EACH. RIPRAP SHALL CONFORM TO SECTION 830.
6. FILTER BLANKET, 6 INCHES THICK, SHALL CONFORM TO SECTION 836.
7. IN THE EVENT CONSIDERABLE WATER IS ENCOUNTERED IN THE EXCAVATION OF ASH IN DISPOSAL AREA NO. 2, IT IS REQUESTED THAT DED BE CONTACTED BEFORE EARTH FILL IS PLACED.
8. THE DIVIDER DIKE SHALL BE CONSTRUCTED OF COMPACTED BOTTOM ASH. PLACEMENT OF THE UNDERWATER ASH FILL SHALL BE BY END DUMPING ALONG THE LENGTH OF THE DIKE. THE TOP SURFACE OF THE UNDERWATER DIKE JUST ABOVE THE WATER SHALL BE THOROUGHLY COMPACTED AND SCARIFIED BEFORE PLACING THE OVERLAYING ASH FILL. BOTTOM ASH FOR THAT PORTION OF THE DIVIDER DIKE ABOVE WATER SHALL BE PLACED IN NOT MORE THAN 9-INCH LAYERS, AND WELL COMPACTED WITH RUBBER TIRED HAULING EQUIPMENT.



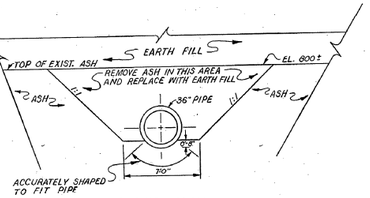
SECTION BB-BB



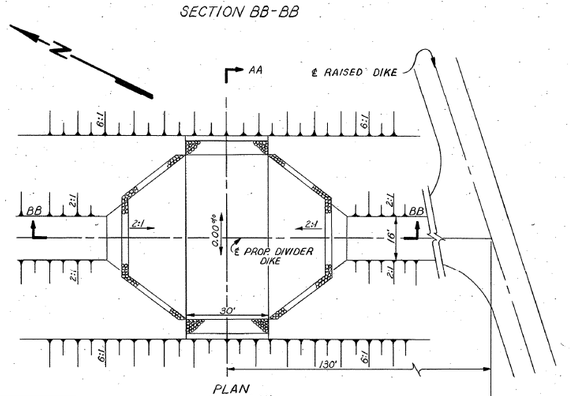
SECTION S-S
ABANDONED SPILLWAY



SECTION U-U



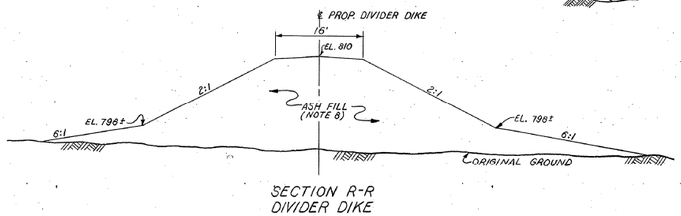
SECTION V-V
SCALE: 1"=5'



PLAN
SCALE: 1"=20'

AA

DETAIL C



SECTION R-R
DIVIDER DIKE

SUMMARY OF QUANTITIES - RAISED DIKE			
ITEM	DESCRIPTION	QUANTITY	UNIT
	REMOVAL OF ASH & RIPRAP	49,700	C.Y.
123	EARTH BORROW	149,900	C.Y.
210	SURFACING (4" CRUSHED STONE)	4,730	TONS
830	RIPRAP	2,140	C.Y.
836	FILTER	1,680	TONS
180 & 182	SEEDING	50,200	S.Y.
	ASH FILL (FOR DIVIDER DIKE)	50,000	C.Y.

FIRST ISSUE FOR P.A. 82-339 AND W.O. 544-82-31401-J19

COMPANION DRAWINGS, 10N213, 10N214

SCALE 1" = 10' EXCEPT AS NOTED

INSPECTED AND APPROVED FOR ISSUE
B.B.M. Montgomery

REV. NO.	ECN NO.	DATE	DSGN	DRWN	CHKD	SUPV	ENGR	INSP	QUBM	PECM	APPR
2		7-18-75	DAV	JSB	DAV	JLG	KWB	RJB	JSB	VGH	
	ADDED DIVIDER DIKE IN POND NO. 3 AND NOTE 8, REVISED NOTE 5 & SECTION T-T. W.O. 544-82-31401-J15										BSM
1		5-12-75	DAV	JSB	DAV	JLG	KWB	RJB	JSB	VGH	
	CHANGED ASH REMOVAL LIMITS IN AREA NO. 2, ADDED NOTE 7. P.A. 82-339; W.O. 544-82-31401-J19										BSM

DSGN — O.A. VALENTINE — INSP
DRWN — S.S. BERRY
CHKD — O.A. VALENTINE — ENGINEER — K.W. Burnett
SUPV — J.L. GLOVER

MAIN PLANT

ASH DISPOSAL AREAS SUPPLEMENTAL DETAILS SHEET 4

BULL RUN STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

SUBMITTED	RECOMMENDED	APPROVED
Robert J. Beauman	F.D. Thomas	G.L. Buchanan

KNOXVILLE | 4-10-75 | 49 | C | 10N284 R2

RECORD DRAWING AS CONSTRUCTED
Llene Sparks 1-15-79-R2

PRINTS REQ'D-R.E. BR or PROJ

	DWG F	DWG H
ME		
EE		
CE		
AD		
CD		3
ED		
MD		
BF		
SW		
BL		
PA		1

Reference No. 4

FOUNDATION INVESTIGATIONS FOR THE BULL RUN STEAM PLANT

J. M. Kellberg

SUMMARY

Preliminary geologic investigations at the Bull Run Steam Plant site were carried on from February through September 1961. During this period 153 core drill holes and 104 auger holes were drilled in the site area. Analysis of the results of the drilling along with other concurrent geologic studies indicates that the condition of the siltstones, shaly limestones, and pure limestones of the Chickamauga formation underlying the site area pose certain problems that will affect both the design of the plant and construction procedures.

The rock strata trend northeast, parallel with Raccoon Valley, and dip at an average inclination of 30° to the southeast--plant south. Secondary faulting and shearing associated with the presence of a major thrust fault along the northwest flank of Bull Run Ridge some 2000 feet southeast of the plant not only have complicated the geologic structure in the plant area, but, in breaking and shattering the limestones, have provided access for circulating groundwater with the consequent development of numerous cavities. The majority of these cavities are clay-filled, but open cavities up to 10.6 feet were encountered. Differences of as much as 70 feet in the elevation of the top of rock and of over 120 feet in the elevation of the bottom serious weathering were recorded in exploratory holes. In some instances holes within 10 feet of rock outcrops were drilled as deep as 30 feet before encountering rock.

The irregular configuration of the bedrock surface will make preliminary grading more expensive than normal. The extensive use of pans will be limited and most of the excavation will have to be done by using trucks and shovels. The numerous cavities which, in many cases, extend well below the desired foundation grade will require specialized design and construction procedures for adequate treatment. The brittle nature of the limestone underlying the Unit 1 area will accentuate overbreakage on blasting unless care is taken. The dip of the rock strata toward the excavation in cuts along or parallel to the north wall will make it difficult to maintain a stable rock face in these areas. The presence of open cavities in the foundation area raises the possibility that water may enter deep excavations from Melton Hill Lake during construction and also impose uplift under the major structures after completion.

INTRODUCTION

The Bull Run Steam Plant site is located in Anderson County, Tennessee, on the left bank of the Clinch River at mile 48.0. The main plant will be located 2000 feet back from the river channel on the shore of Melton Hill Lake. It is approximately 5-1/2 airline miles east of Oak Ridge, Tennessee, and 13 airline miles west of Knoxville, Tennessee.

Prior to the selection of the Bull Run site by the Division of Design, three other sites in the general area had been explored. The Edgemoor site (Clinch River mile 47.0) and the Kirkstall site (Clinch River mile 50.5) were explored during the fall and winter of 1958-59.[1] The Medford site (Clinch River mile 73.0) was explored in the spring of 1960.[2] From February 1961 through September 1961, 153 core drill holes totaling 11,131.6 linear feet, and 104 auger holes totaling 1119.2 linear feet were drilled at the Bull Run site. Through September 1961 all holes were drilled on an extension of the drilling grid laid out for the Edgemoor site, one mile downstream. This grid consisted of lettered ranges trending N 26° 12' W, roughly parallel to the Clinch River, and numbered sections at right angles to the ranges. (Exhibit 1.)

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1. "Preliminary Geologic Investigations - Knoxville Area Steam Plant - Edgemoor and Kirkstall Sites," John M. Kellberg, March 1959.
2. "Preliminary Foundation Investigations for the Medford Steam Plant," John M. Kellberg and Hunter C. Harrell, January 1961.

GENERAL GEOLOGY

Physiography

The Bull Run site is located in the Valley and Ridge province of the Appalachian Highlands. This province extends from New York to Alabama and varies in width from 20 to 75 miles. It is bounded on the east by the steep slopes of the Blue Ridge front and on the west by the abrupt escarpment of the Cumberland Plateau.

Physiographically, this subregion is characterized by long, narrow ridges and somewhat broader intervening valleys with a northeast-southwest trend. The ridges are roughly parallel with fairly level tops. They are held up by the resistant sandstones and less soluble limestones and dolomites, while the valleys have been excavated in the easily weathered shales and the more soluble limestones.

In the vicinity of the Bull Run site the Clinch River flows in a channel 300-400 feet wide about 25 feet below the level of the top of the flood plain deposits on either bank. The river channel is around elevation 775, while the top of the flood plain deposits lies between elevations 795 and 800. Drilling shows that the top of bedrock under the flood plain is at about the same elevation as in the present river channel, indicating that the Clinch River has migrated back and forth across a valley approximately 2000 feet wide during its present cycle of erosion.

The site proper occupies Raccoon Valley, a northeastward trending valley, eroded in predominantly shaly limestones, with a gently rolling terrain varying in elevation from 800 to 860. To the northwest this valley is flanked by Chestnut Ridge with elevations along the crest of over 1200

and to the southeast it is flanked by Bull Run Ridge with crest elevations of over 1100. The floor of Raccoon Valley is generally some 300 to 400 feet below the tops of the flanking ridges.

Regional Geology

The Appalachian Valley is a region of highly deformed but unmetamorphosed sedimentary rocks of Paleozoic age. Limestones, dolomites, and calcareous shales predominate, but argillaceous shales, siltstones, and some sandstones are present. These rocks range in age from early Cambrian to Pennsylvanian, but the Cambrian and Ordovician rocks are the most abundant.

The various formations crop out in relatively narrow, linear belts of northeast-southwest trend, each formation being repeated several times at the surface from the southeast to the northwest across the valley. This outcrop pattern is the result of folding and faulting of the originally nearly horizontal strata, followed by truncation of the resulting structures by erosion. Apparently the rocks were folded and faulted by forces acting from the southeast. Individual folds were compressed tightly, overturned to the northwest, and finally broken by thrust faults along the axial planes of the folds. The structure of the valley, therefore, is characterized by a series of overlapping linear fault blocks which dip to the southeast.

DETAILED GEOLOGY

Stratigraphy

Various lithologies of the Chickamauga formation of Ordovician age make up the bedrock at the site. Overlying bedrock are thicknesses of residual and alluvial material varying from nothing to over 40 feet and averaging 12.5 feet. A brief description of the unconsolidated deposits and of the various members of the Chickamauga formation follows.

Overburden--The unconsolidated materials overlying bedrock can be divided into two categories: (1) alluvial clays, silts, sands, and gravels, deposited by the Clinch River and its tributaries, and (2) residual clay and weathered rock, derived from the decomposition of the Chickamauga limestone. Alluvial materials blanket the main flood plain of the Clinch River west of the L&N Railroad and extend northeastward up the small tributary valleys to approximately elevation 800. The remainder of the area is covered by residual deposits. The majority of the alluvial material is composed of yellow silty, sandy clay containing lenses of gravel scattered throughout. The amount of sand and gravel increases with depth, especially west of the L&N Railroad, until there is usually a blanket of sand and gravel immediately overlying bedrock. Occasionally lenses of dark blue, organic clay are encountered, marking old slough fillings on an earlier flood plain.

Over the majority of the area the overburden consists of yellow, residual clay derived from the weathering of the underlying limestone. Pinnacles and detached boulders of partially weathered limestone are common throughout the overburden. In the northern portion of the site, where the underlying bedrock is maroon to gray calcareous siltstone, the

overburden is red to tan silty clay which grades downward through weathered siltstone into sound, unweathered siltstone.

Chickamauga Formation--All of the bedrock which will be involved in any of the construction activities at the site belongs to the Chickamauga formation of Middle Ordovician age. The Chickamauga formation is a heterogenous assemblage of limestones, shaly limestones, calcareous shales, and calcareous siltstones. The stratigraphic thickness of this formation in the Bull Run area is around 1800 feet; however, this does not represent the total thickness inasmuch as the formation is truncated at the top by a major thrust fault. Inasmuch as the dip of the rocks averages 30° to the southeast, erosion has exposed the older beds at the surface in the northwest portion of the site, while successively younger and higher beds are exposed at the surface to the southeast. Many attempts have been made to subdivide this mass of rock into smaller, subordinate formations with the unfortunate result that over 250 different formational names have been proposed. For purposes of clarity and convenience in this report the Chickamauga is broken down into four recognizable subdivisions called Units A, B, C, and D. A brief description of each of these units follows.

Unit A

The lowest unit of the Chickamauga formation is a series of interbedded ash-gray and maroon, fissile, calcareous siltstones some 250 feet thick which contain at least one prominent zone of siliceous limestone 30 feet thick approximately 65 feet below the top and numerous small limestone lenses and nodules scattered throughout. In contrast to the other units the siltstones break down fairly rapidly upon weathering or exposure. Drill cores after being exposed for a few weeks disintegrate into thin chips or irregular fragments and finally after several months

exposure much of the material has disintegrated into mud. Unit A makes up the bedrock surface under the northwestern (plant north) portion of the site. The base lies near the crest of the hill northwest of the state highway, while the trace of the top of the unit angles across the construction area from Station 25 + 25 on Range S to Station 28 + 00 on Range AA + 50 (exhibit 1).

Unit B

Overlying Unit A are 180 feet of limestone of varying textures and lithologies, but this group of strata is sufficiently distinct from the underlying siltstones of Unit A and overlying argillaceous limestones of Unit C to be easily recognizaole either in cores or on outcrop. The following tabulation describes the individual members of this unit from top to bottom:

Thickness	Description
23'	Medium gray, medium crystalline limestone with shaly partings.
10'	Light gray, coarse crystalline limestone.
25'	Medium gray, medium crystalline limestone with shaly partings.
10'	Light gray, coarse crystalline limestone.
11'	Medium gray, medium crystalline limestone with shaly partings.
15'	Dark gray, nodular, argillaceous limestone.
8'	Medium gray, medium crystalline limestone with shaly partings.
3'	Light gray, coarse crystalline limestone.
10'	Medium gray, medium crystalline limestone with shaly partings.
50'	Dark gray, nodular, argillaceous limestone.
10'	Medium gray, medium crystalline limestone with shaly partings.
5'	Dark gray, nodular, argillaceous limestone.

The Unit 1 powerhouse will be founded on these rocks. Inasmuch as Unit B contains a greater amount of purer limestone as compared with overlying and underlying units, there has been more solution with the resultant development of cavities. Most of these are clay-filled, although quite a few open cavities were encountered in exploratory drilling.

Unit C

Overlying the relatively pure limestones of Unit B is 250 feet of dark gray, nodular, banded, argillaceous limestone designated as Unit C. Because of their relatively high argillaceous, or clay, content these strata do not weather as rapidly as do the purer limestones of Unit B, with the result that the surface of the area underlain by Unit C is characterized by numerous rock outcrops. The outcrops normally occur as low ridges of limestone trending northeast-southwest, separated from overlying and underlying ridges to the southeast and northwest by intervening pockets of clay residuum containing numerous partially weathered limestone fragments. This unit will be encountered only along the south side of the Unit 1 powerhouse excavation, but will underlie all of Unit 2.

Unit D

Immediately above Unit C is 20 feet of calcareous, fossiliferous shale marking the base of Unit D. The total thickness of this unit exposed in the Bull Run area is approximately 1100 feet, but this is, in all probability, not the total thickness inasmuch as the top of the formation is truncated by a major thrust fault near the crest of Bull Run Ridge. With the exception of the basal shale member, this unit is composed of alternating sequences of gray, green, pink, and red impure, silty limestones that at times contain shale bands up to one foot in thickness. In

general these strata underlie the site area southeast (plant south) of the old county road and extend up the northwest flank of Bull Run Ridge to within 100 feet of the crest. Future units 3 and 4 will be founded on these rocks, as will the coal handling facilities along the flank of Bull Run Ridge. Relatively few holes were drilled in this unit during the preliminary site investigations and it may well be that this unit can be further subdivided when more details about it are known.

Structure

Three major features of geologic structure have a direct bearing on the foundation conditions that will be encountered at the site. These are (1) the attitude of the bedding, (2) faults and shears, and (3) joints. Each of these will be discussed briefly.

Attitude of the Bedding--Strike measurements made on over 100 rock outcrops in the plant area gave an average reading of N 55° E, which is consistent with the trend of the crests of Flint Ridge to the northwest and Bull Run Ridge to the southeast; however, individual measurements varied from N 35° E to N 70° E. The average dip of the strata determined both from outcrops and cores is 30° to the southeast, although dips as low as 10° and as high as 90° were noted in cores. The major variations in the alignment of the strike and the degree of dip occur in the vicinity of faults and shears where minor folding and brecciation associated with these displacements are the cause of the abnormal readings. The strata trend nearly parallel to the Unit 1 (E-W) base line and dip toward plant south, which means that excavation for the north wall of the powerhouse will be a dip slope and may require either pinning of rock strata adjacent to a vertical cut or cuts being laid back to the dip of the rock. Vertical

cuts should be able to be maintained on the other three sides of the excavation (S, W, E) without undue difficulty.

Faults and Shears--Cores from practically every hole drilled at the site showed some evidence of shearing or faulting. In many instances the movements could be classified as minor shears wherein the displacement was practically negligible and represented minor adjustments along bedding planes during folding and larger scale faulting. In other instances correlation of cores between adjacent holes indicated displacement of as much as 65 to 70 feet. The faulting in the plant area is directly related to the presence of a major thrust fault, the Copper Creek fault, which crops out along the northwest flank of Bull Run Ridge some 2000 feet southeast of the plant site. The Copper Creek fault can be traced for some 400 miles from northwest Georgia to Central Virginia and along it in the Bull Run area the Lower Cambrian Rome formation has been thrust northwestward an undetermined distance over the Chickamauga formation. The Chickamauga formation, being composed primarily of relatively incompetent shaly limestones, has been complexly sliced and sheared. This deformation is most intense nearest the fault and becomes progressively less to the northwest, however the plant is not sufficiently far away to be free from the effects of the secondary shearing and faulting that accompanied the movement along the major fault. From striations observed in the drill cores it appears that much of the fault movement was somewhat rotational in nature with the major component in a westerly to southwesterly direction instead of to the northwest, as would normally be expected. Exposure of the bedrock during excavation will undoubtedly show more faults and shears than are indicated on the geologic sections (exhibits 2, 3, 4, 5, 6). In most instances the dip of the faults is

steeper than the dip of the bedding--up to 70°--but many are comformable with the bedding, dipping about 30° to the southeast. All of these faults are ancient structures and further movement along them is highly improbable. The major difficulty that they will cause is in the fact that in breaking and shattering the limestone they have provided access for circulating ground water with the consequent development of cavities.

Joints--All of the rocks at the site are cut by numerous joints which to a large degree will control the breakage of the rock during blasting. Inasmuch as solution has progressed along many of these steeply dipping joints, it is not possible to determine their trend from surface exposures for they are masked by residuum, but from indications afforded by the drill cores it appears that there are three sets. The most prominent set strikes approximately N 55° E parallel to the bedding and dips steeply, 70° to 90° to the northwest. The other two sets strike approximately north and west and are nearly vertical.

Foundation Conditions

The preliminary exploratory drilling has shown that foundation conditions change rapidly throughout the site area. This is a result of the combination of two factors: (1) the original physical and chemical character of the various rock types, and (2) the structural deformation the rock has been subjected to in the geologic past. Numerous solution cavities have developed in the purer limestone zones along bedding, fault, and joint planes while the less competent siltstones have been crumpled and contorted by folding and faulting. An indication of the irregularity of the conditions is shown by the maximum and minimum elevations of the top of rock and the bottom of serious weathering. The maximum elevation

of top of rock encountered in any of the drill holes was 844.7 in hole DD - (-28 + 00), while the minimum was 774.1 in hole S - (-24 + 00). The highest elevation for the bottom of serious weathering was 837.9 in hole DD - (-28 + 00) and the lowest was 716.5 in hole V + 50 - (-25 + 00)--a variation of over 120 feet. The following paragraphs summarize briefly the general foundation conditions to be expected in the powerhouse, stack, service bay, intake and discharge areas, but development of specific details will have to await the completion of the more intensive drilling program currently underway.

Powerhouse--With the new design of this plant there will be two general base slab elevations--elevation 770 under the turbine area (the western portion of the powerhouse) and elevation 808 under the boiler area (the eastern portion of the powerhouse). The turbine area is roughly delineated by exploratory holes on the Y, Y + 50, Z, and Z + 50 ranges between stations -27 + 00 and -24 + 00. The boiler area is roughly delineated by the AA, AA + 50, and BB ranges between stations -27 + 00 and -24 + 00 (exhibit 1). Analysis of the 27 holes in the turbine area indicates an average elevation for top of rock as 807, while the average elevation of the bottom of serious weathering is 787--some 20 feet lower. However, in specific instances, the elevation of the top of rock is as low as 791.4 and the bottom of serious weathering as low as 764.4. In the boiler area the analysis of 19 holes shows the average elevation of the top of rock to be 817 and the average elevation of the bottom of serious weathering to be 798--again roughly 20 feet lower. The minimum elevations of top of rock and bottom of serious weathering are 800.0 and 768.9 respectively. The zones of deepest weathering occur in the purer limestone zones near the top of Unit B, where cavities have developed

along near-vertical joints and moderately dipping faults and bedding planes. Most of these cavities are clay-filled; however, open cavities or caves, up to 9.1 feet in hole Z - (-24 + 50), have been encountered. Apparently the most seriously weathered zone lies between ranges Z and AA + 50 and between stations 24 + 00 and 25 + 00.

Stack--Only one hole, DD - (-26 + 00), was drilled in the stack area during the initial exploratory program. This hole indicated sound rock at elevation 802, however, considering the height of the proposed stack, it would be advisable to drill additional holes in this area before a final foundation grade is set.

Service Bay and Office Wing--These structures lying to the north of the main powerhouse will be founded primarily on the siltstones and interbedded limestones of Unit A. This area lies between Ranges Y and DD and Stations -27 + 50 and -28 + 00. The 14 holes drilled within these limits indicated an average elevation of top of rock of 814 and an average elevation of the bottom of serious weathering of 793. Though the siltstones are less competent than the overlying limestones of Unit B, they should be adequate to support the relatively light loading of the service bay and office wing of the plant. In contrast to the limestones, there is no sharp demarcation between residuum and siltstone. The siltstone breaks down gradually on weathering into red to tan silty clay in which the original bedding structures of the siltstone may still be seen, while in the areas underlain by limestone the rock is either relatively unweathered or else entirely replaced by residual clay. The few cavities that were encountered in this unit were found where small limestone lenses in the siltstone had been dissolved.

Intake and Discharge Areas--Initial drilling for a proposed intake tunnel was carried out along section -25 + 50 between Ranges S and Y. These 13 holes indicated that the average elevation of the top of rock was 800 and the average elevation of the bottom of serious weathering was 773. This information indicated that tunneling at the desired grade would not be feasible, so it was decided to use cut and cover for the intake conduit. The generally poor condition of bedrock in this area is attributable to the presence of fault with approximately 65-foot displacement, which thrusts the lower part of Unit B over the siliceous limestone member of Unit A. The fracturing and contortion associated with this faulting provided numerous paths of access for circulating ground water with the resultant development of numerous cavities. At the site for the intake structure 11 holes indicated an average elevation for the top of rock of 782 and for the bottom of serious weathering of 762. Holes drilled for the discharge structure and discharge tunnels indicated sound rock well above the desired grade for the discharge structure, but a zone of deep weathering along the proposed tunnel alignment. As shown on exhibit 5, a section of the initial tunnel alignment some 175 feet long between holes W + 30 - (-23 + 00) and X + 50 - (-23 + 00) is seriously weathered to or below elevation 750. On the basis of this information it was decided to raise the discharge and make it a cut and cover conduit rather than a tunnel. However, the intake system for Units 2, 3, and 4 will have to be tunnels that will pass under the Unit 1 discharge conduit. These may, depending on their alignment, encounter the above mentioned zone of deep weathering.

Construction Problems

Various construction problems directly attributable to the character and condition of the overburden and rock at the Bull Run site are foreseen. The following paragraphs summarize the major problems.

General Excavation--The irregular configuration of the bedrock surface and the presence of numerous detached, partially weathered limestone boulders in the residual overburden will tend to make general excavation costs higher than normal. Over most of the area it will not be possible to use pans effectively to remove the overburden. There are numerous rock ledges that crop out at the surface and these ledges are separated by troughs filled with residual clay as much as 30 feet in depth. Much of the excavation probably will have to be done by shovels and trucks, with some blasting to break up large boulders and bedrock ledges so that they may be handled efficiently. This condition will obtain not only in the powerhouse area but in the coal storage and handling areas as well.

Foundation Excavation--Once excavation has reached essentially solid bedrock there will still be some problems. Many of the filled and open cavities extend below desired foundation grade and special treatment will be required to assure an adequate foundation for the heavy structures. It is currently proposed to solve this problem by the use of large-diameter holes drilled well into sound rock at required column and footing locations. These holes will be filled with steel and concrete to form, in effect, cast-in-place piles. Secondly, some of the limestone beds that will be encountered in the foundation excavation, especially those of Unit B, are relatively brittle and when blasted tend to shatter to a

greater extent than is normally experienced. It is recommended that the "pre-split" method of blasting be used to minimize this tendency as much as possible. Thirdly, as the north (plant) wall of the powerhouse and service bay is nearly parallel to the strike of the rock and the dip is toward the excavation, it will be difficult to obtain a stable vertical rock face along this side of the excavation. As the bedding planes, which dip approximately 30° toward the cut, are undercut by excavation, the rock will tend to slough off along them, resulting in excessive overbreak. This problem will be especially bothersome in any deep cuts along the north wall of the service bay, for in this area the bedrock is the relatively weak and fissile siltstone. Evidence of what well may occur is visible in cuts along the north side of the nearby state highway.

Blasting--Inasmuch as the plant site lies in a valley between two relatively high ridges, it is probable that residents on the ridge to the north will claim damages due to blast shock. Air waves from large blasts probably will be reflected from Bull Run Ridge to the south and increase the apparent effect to residents living on and just behind Flint Ridge to the north. It is recommended that the first few large blasts be monitored with a seismograph so that accurate data will be available to refute any potential blast damage claims.

Ground Water--The presence of both filled and open cavities in the plant area at elevations well below the proposed pool level of Melton Hill Reservoir--795--indicates the possibility that when the lake is impounded and the water table elevation is thereby raised, water may enter deep excavations from the reservoir. While this is not considered too great a probability, it is a distinct possibility. The following tabulation lists the known open cavities in the construction area:

Hole	Elevation From	Elevation To	Size
W + 30 - (-23 + 00)	757.5	746.9	10.6'
X - (-24 + 00)	763.6	757.3	6.3'
Z - (-24 + 50)	773.5	764.4	9.1'
Z + 50 - (-25 + 00)	777.8	777.1	0.7'
AA - (-24 + 50)	808.9	807.8	1.1'
AA + 50 - (-24 + 50)	773.0	768.9	4.1'
BB - (-25 + 00)	793.5	791.0	2.5'

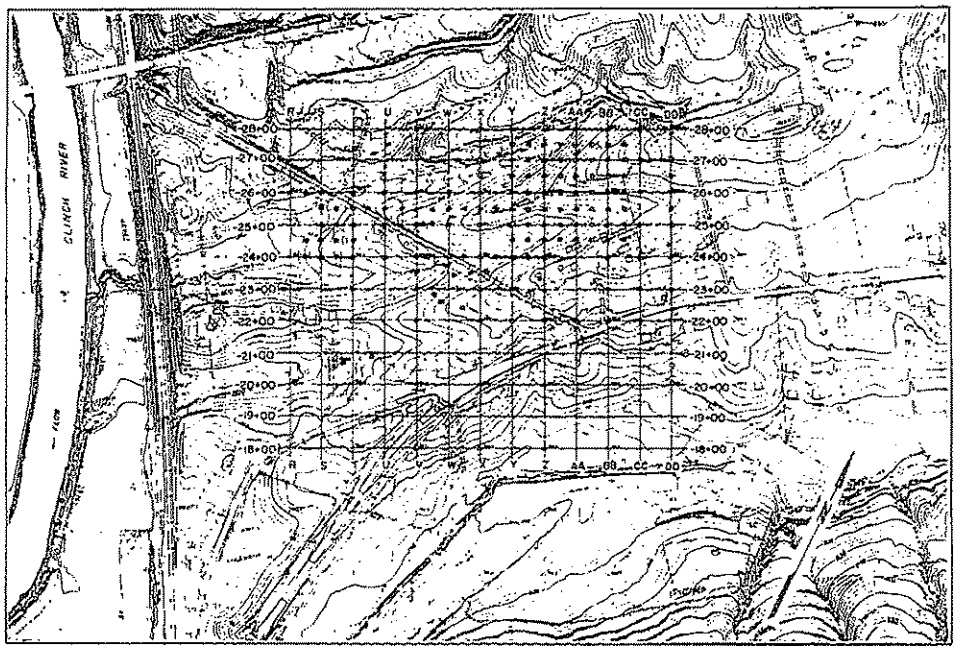
Other than the inconvenience that this potential flooding might cause during the construction period, there remains the question of uplift and possible flooding of basement areas below pool level after construction is completed. Provisions should be made to make all contraction joints in the base slab waterproof.

Construction Materials

No specific investigations were made to determine a source of suitable aggregate for the project. There is, however, one operating quarry on the west side of Clinch River in Union Valley operated by Rogers Brothers that could supply suitable aggregate. This quarry is approximately 4 miles by road from the plant. Lambert Brothers has purchased a quarry site along Bull Run Creek which is approximately 2 miles by road from the plant. The Lambert site is in the same rock--Maynardville limestone--as the Rogers quarry and also could furnish suitable aggregate.

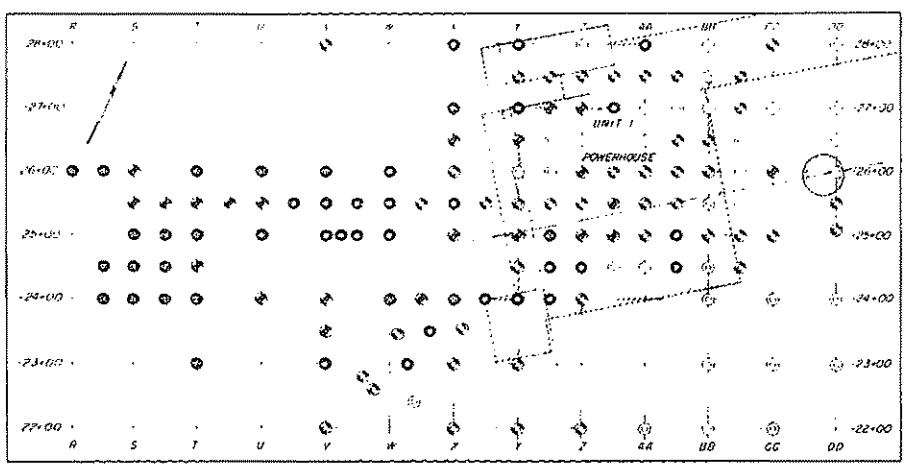
If there are not too many limestone boulders in the residual overburden from the plant site, the residual clay probably would be suitable for fill; however, this problem is one that will have to be resolved by the Materials Testing Section of the Construction Plant Branch.

EXHIBITS



LOCATION OF DIAMOND DRILL HOLES

0 200 400 Feet
SCALE



SUMMARY OF ROCK CONDITIONS

0 100 200 Feet
SCALE

SUMMARY OF DRILLING

Hole	Elevation Surf	TR	BSW	BH
R-(-26+00)	800.8	782.8	736.8	727.8
R+50-(-26+00)	793.1	775.1	737.9	743.1
R+50-(-26+50)	796.7	775.6	735.0	728.6
R+50-(-27+00)	802.6	781.6	727.8	740.8
S-(-24+00)	798.6	774.1	774.1	765.6
S-(-24+50)	796.8	783.8	730.6	685.8
S-(-25+00)	793.6	760.0	773.6	747.2
S-(-25+50)	796.2	785.2	758.2	749.9
S-(-26+00)	803.4	781.4	781.4	750.9
S+50-(-24+00)	800.5	782.2	757.7	756.4
S+50-(-24+50)	804.4	780.9	751.6	694.8
S+50-(-25+00)	798.7	780.7	773.4	743.3
S+50-(-25+50)	797.9	787.9	787.9	749.9
S+70-(-26+20)	804.9	799.9	792.0	749.6
T-(-23+00)	806.3	774.4	765.6	748.9
T-(-24+00)	800.6	777.5	768.4	747.6
T-(-24+50)	804.8	783.4	780.1	729.7
T-(-25+00)	803.3	787.9	765.9	727.6
T-(-25+50)	799.8	798.3	781.3	744.8
T-(-26+00)	799.0	787.8	742.0	750.9
T+50-(-25+50)	802.2	793.2	785.6	750.0
T+50-(-26+00)	807.5	796.5	796.5	746.5
U-(-24+00)	806.1	787.5	781.4	748.7
U-(-24+50)	808.3	801.9	785.3	758.1
U-(-25+00)	804.7	789.9	773.8	747.8
U-(-26+00)	802.6	784.7	760.8	729.8
U+50-(-25+50)	807.5	800.5	794.1	743.8
V-(-23+00)	809.6	801.1	781.6	749.9
V-(-24+00)	813.8	804.8	782.3	749.7
V-(-24+50)	815.3	812.6	783.1	748.7
V-(-25+00)	807.4	800.5	790.1	747.4
V-(-25+50)	803.9	791.9	783.9	749.7
V-(-26+00)	807.9	797.1	781.7	748.6
V-(-26+50)	813.1	800.8	760.0	750.3
V-(-27+00)	808.1	804.7	753.9	741.3
V-(-27+50)	814.0	799.1	753.9	749.6
V-(-28+00)	810.0	802.2	752.8	724.8
W-(-25+00)	815.0	806.4	792.7	744.2
W+50-(-25+00)	814.5	801.3	781.3	780.8
W+50-(-25+50)	812.1	801.5	740.4	738.5
X-(-24+00)	810.8	788.6	751.1	738.7
X-(-25+00)	816.9	807.3	760.4	678.4
X-(-25+50)	813.0	812.4	746.0	715.0
X-(-26+00)	808.2	803.2	763.5	749.3
W-12-(-23+45)	809.5	804.5	778.4	750.0
W+30-(-23+00)	816.9	804.4	738.5	731.7
W+50-(-22+40)	823.3	813.2	805.4	749.0

Hole	Elevation Surf	TR	BSW	BH
W+50-(-24+00)	810.9	791.6	781.9	749.7
W+50-(-25+50)	810.2	808.3	789.3	749.7
W+65-(-23+30)	813.0	800.8	754.5	746.0
X-(-18+00)	790.0	785.7	774.1	749.5
X-(-24+00)	812.0	796.2	796.2	730.0
X-(-24+50)	820.6	809.4	776.8	749.1
X-(-25+00)	821.3	819.1	799.5	749.0
X-(-26+00)	811.6	777.5	751.1	745.6
X-(-27+00)	821.8	791.8	728.8	745.8
X-(-25+50)	821.3	815.2	746.8	731.3
X-(-26+00)	815.8	809.8	780.0	723.2
X-(-26+50)	809.2	786.2	786.2	750.2
X-(-27+00)	815.6	786.6	760.9	737.6
X-(-28+00)	827.8	805.1	756.5	745.0
X+15-(-23+55)	816.0	815.0	794.7	750.0
X+50-(-24+00)	813.7	812.2	739.1	745.2
X+50-(-25+40)	823.5	800.0	793.4	749.2
Y-(-22+00)	820.9	808.6	799.1	746.9
Y-(-23+00)	827.2	826.2	799.5	747.2
Y-(-24+00)	817.9	814.9	789.2	749.6
Y-(-24+50)	814.5	805.9	775.5	750.5
Y-(-25+00)	819.6	793.2	751.4	747.9
Y-(-25+50)	824.8	803.8	782.6	749.4
Y-(-26+00)	822.5	816.9	800.8	735.6
Y-(-26+50)	812.3	772.4	772.4	730.3
Y-(-27+00)	812.9	800.9	737.9	739.6
Y+(-27+50)	825.7	808.1	799.2	750.4
Y-(-28+00)	828.8	809.8	780.7	748.8
Z+50-(-24+00)	822.7	814.5	761.5	748.6
Z+50-(-24+50)	816.6	807.6	731.8	749.5
Z+50-(-25+00)	817.3	789.9	776.3	751.4
Z+50-(-25+50)	812.5	806.2	790.8	748.0
Z+50-(-26+00)	825.9	817.9	800.2	749.4
Z+50-(-26+50)	819.0	804.3	804.3	730.7
Z+50-(-27+00)	813.1	793.3	793.3	749.9
Z+50-(-27+50)	817.0	804.0	788.6	750.5
AA-(-18+00)	790.1	781.0	774.0	758.1
AA-(-20+00)	802.5	796.6	796.1	750.0
AA-(-22+00)	810.7	809.2	799.3	748.9
AA-(-24+00)	825.5	821.5	796.9	749.9
AA-(-24+50)	819.0	809.0	778.4	748.8
AA-(-25+00)	817.4	791.4	791.4	744.2
AA-(-25+50)	822.3	806.9	783.4	750.4
AA-(-26+00)	828.5	799.7	799.7	749.7
AA-(-26+50)	829.5	821.8	805.1	749.7
AA-(-27+00)	813.8	798.3	777.1	750.0
AA-(-27+50)	826.1	801.1	787.5	750.1
AA-(-28+00)	810.7	808.7	808.6	745.7
AA50-(-24+40)	822.6	816.9	808.1	751.4
AA50-(-24+00)	818.9	796.7	777.1	747.7
AA50-(-25+20)	823.2	795.1	789.1	749.2
AA50-(-26+00)	831.0	824.8	780.8	731.0
AA50-(-26+40)	833.4	826.8	812.8	735.4
AA50-(-27+00)	834.6	828.4	788.6	748.8
AA50-(-27+50)	816.1	807.1	792.7	751.1

Hole	Elevation Surf	TR	BSW	BH
AA-(-22+00)	818.4	811.4	806.9	747.7
AA-(-24+50)	825.3	822.1	804.1	743.1
AA-(-25+00)	821.8	808.0	793.8	749.2
AA-(-25+50)	824.4	809.4	781.0	748.4
AA+(-26+00)	831.6	808.4	788.1	729.6
AA-(-26+50)	835.0	817.2	817.2	749.3
AA-(-27+00)	832.6	825.1	813.6	731.6
AA-(-27+50)	824.5	815.5	794.6	749.5
AA-(-28+00)	818.5	809.0	780.9	731.9
AA50-(-24+50)	829.2	819.2	786.9	750.0
AA+50-(-25+00)	823.4	800.7	773.3	750.2
AA+50-(-25+50)	824.7	813.7	786.7	749.7
AA+50-(-26+00)	831.6	805.8	791.1	749.8
AA+50-(-26+50)	830.4	823.4	791.7	731.0
AA+50-(-27+00)	837.6	829.6	812.6	750.0
AA+50-(-27+50)	824.5	815.5	799.2	741.7
BB-(-22+00)	816.4	814.4	810.4	749.9
BB-(-23+00)	826.0	816.1	811.4	749.5
BB-(-24+00)	824.4	823.4	823.4	750.9
BB-(-24+50)	832.9	823.4	823.4	749.7
BB-(-25+00)	826.0	824.0	785.0	748.0
BB-(-25+50)	824.7	807.3	807.3	749.7
BB-(-26+00)	830.5	810.5	793.8	749.5
BB-(-26+50)	839.5	824.5	775.6	750.1
BB-(-27+00)	842.8	826.9	820.2	738.5
BB-(-27+50)	837.9	827.9	809.3	751.2
BB-(-28+00)	830.5	815.2	806.5	737.0
BB+50-(-24+50)	834.9	819.5	796.4	748.8
BB+50-(-25+00)	826.5	823.6	796.4	751.6
BB+50-(-25+50)	826.4	808.7	803.3	749.0
BB+50-(-26+00)	830.4	808.9	805.4	749.9
BB+50-(-26+50)	839.5	819.3	805.0	750.0
BB+50-(-27+00)	843.1	832.5	782.4	748.0
BB+50-(-27+50)	844.1	833.8	795.4	751.0
CC-(-20+00)	817.0	802.0	802.9	749.3
CC-(-23+00)	825.8	822.2	806.5	748.8
CC-(-24+00)	835.0	834.0	822.9	750.3
CC-(-24+50)	834.7	827.2	793.1	750.5
CC-(-25+00)	830.6	799.3	799.3	751.6
CC-(-26+00)	840.0	833.2	821.6	751.3
CC-(-27+00)	839.8	795.0	795.0	752.8
DD-(-22+00)	802.9	819.8	809.9	753.5
DD-(-24+00)	826.1	824.1	815.7	749....
DD-(-25+00)	831.1	815.8	793.7	749.1
DD-(-25+50)	832.9	832.1	795.0	749.0
DD-(-26+00)	835.5	827.7	820.6	749.2
DD-(-26+50)	842.6	820.6	820.6	738.6
DD-(-27+00)	851.6	839.1	800.8	749.1
DD-(-28+00)	852.4	844.7	837.9	759.4

LEGEND:

TR - Top of rock
BSW - Bottom of serious weathering
BH - Bottom of hole

- ○ - Top of rock and bottom of serious weathering above el 800
- ◔ - Top of rock above el 800 - bottom of serious weathering between el 800 and el 775
- ◎ - Top of rock above el 800 - bottom of serious weathering below el 775
- ◕ - Top of rock below el 800 - bottom of serious weathering below el 775
- ● - Top of rock below el 800 - bottom of serious weathering below el 775

NOTE:

For geologic sections see drawings
49 GE 1 822 X 1337-1, -2, -3, -4, -5

KEY NO.	DATE	MADE	CHKD	SUPV	APP'D
DRWN	COMPUTED				
TRCD	ENGINEER				
CHKD					

FOUNDATION INVESTIGATIONS

HOLE LOCATION AND DRILLING SUMMARY

BULL RUN STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF WATER CONTROL PLANNING

SUBMITTED	RECOMMENDED	APPROVED
John M. Kelley		Barbara L. Brown

KNOXVILLE	1-29-62	49	GE	1	822 K 1336

EXHIBIT B1

LEGEND:

OVERBURDEN

- Yellow silty clay containing numerous partially weathered limestone boulders and pinnacles

CHICKAMAUGA FORMATION

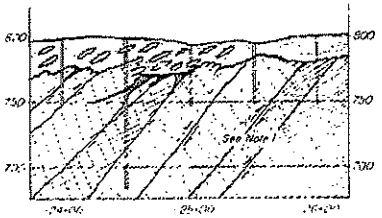
- Unit C - Thin to medium bedded, dark gray, nodular, fossiliferous, argillaceous limestone

- Unit B - Predominantly thin to medium bedded, medium gray, medium crystalline limestone with shaly partings. There are lenses and beds of light gray, coarse crystalline limestone up to 10 feet thick in the upper portion and a 50 foot zone of nodular, argillaceous limestone near the base.

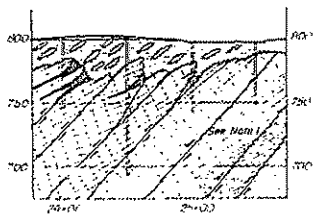
- Unit A - Maroon and gray-green, banded, calcareous siltstone containing scattered thin limestone lenses and nodules. A 20 foot thick zone of medium gray, banded, siliceous limestone occurs 65 feet from top

- Cavities - Filled and open

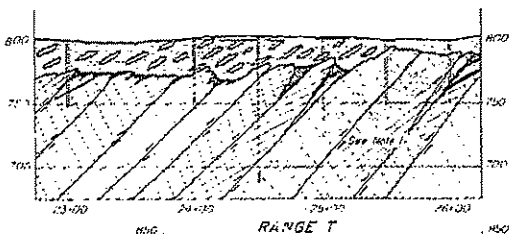
- Faults



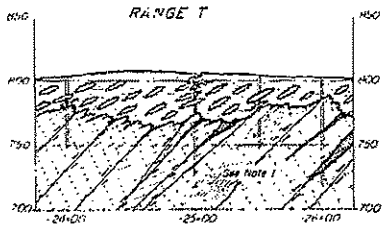
RANGE S



RANGE S+50

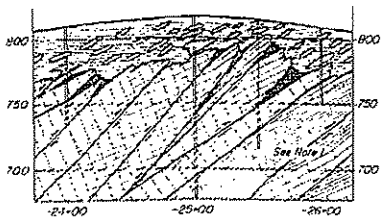


RANGE T

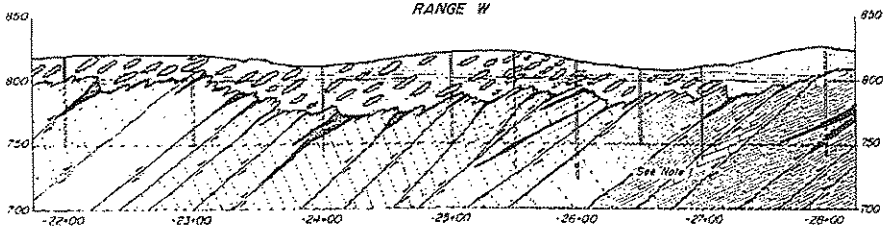


RANGE U

RANGE V

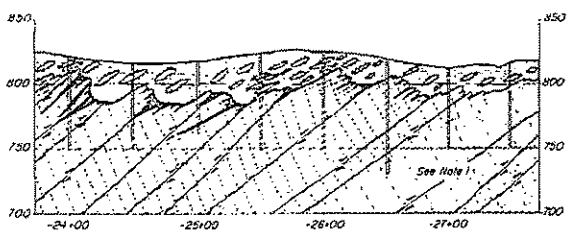


RANGE W



RANGE X

RANGE Y



RANGE Y+50

NOTES:

1. Details of geologic structure in Unit A cannot be determined because of lack of key horizons. It is believed that these strata are more sheared and contorted than the more competent overlying limestones.
2. For location of sections see drawing 49 GE 1 822 K 1336.
3. For additional geologic sections see drawings [illegible].

SCALE: 50 0 50 100 Feet

REV. NO.	DATE	MADE	CHKD	SUPV	ENGR
DRWN.		COMPUTED			
TRCD.		ENGINEER			
CHKD.					

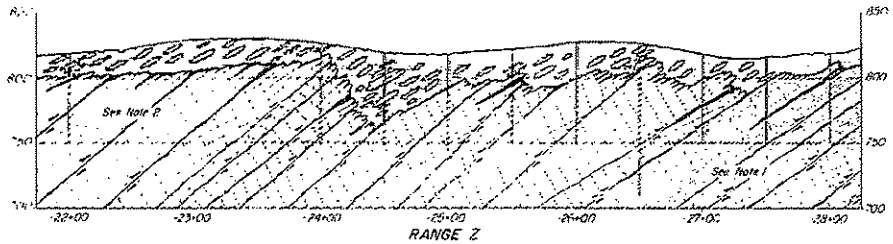
FOUNDATION INVESTIGATIONS

GEOLOGIC SECTIONS

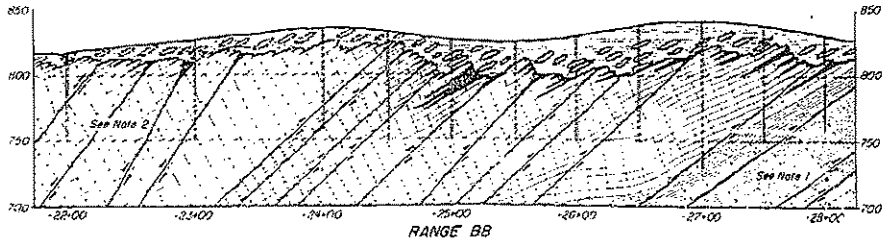
BULL RUN STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF WATER CONTROL PLANNING

SUBMITTED	RECOMMENDED	APPROVED
J. L. W. Gilley		Burlage Morgan

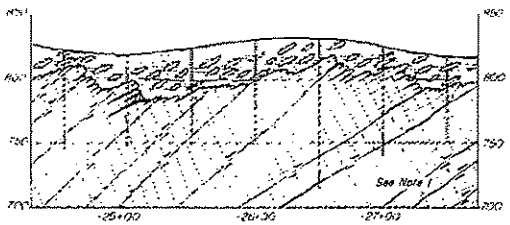
KNOXVILLE	1-29-62	49	GE	1	822 K 1337



RANGE Z



RANGE BB



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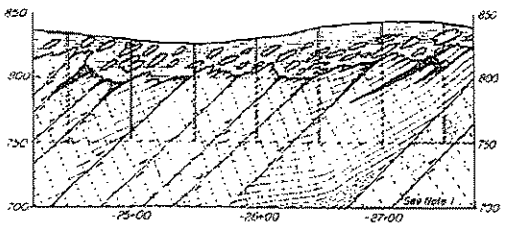

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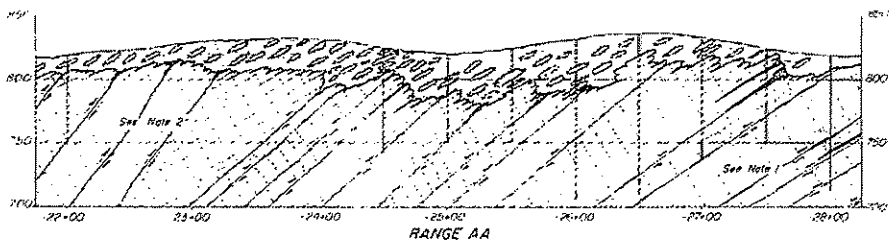
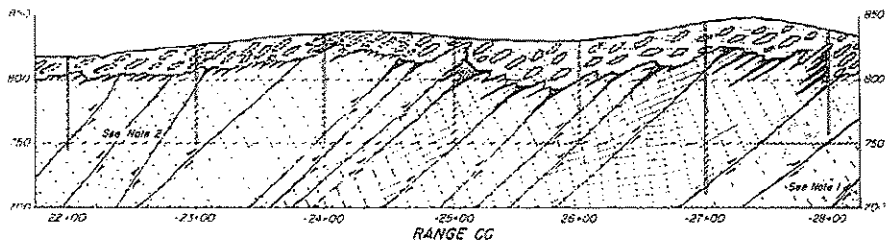
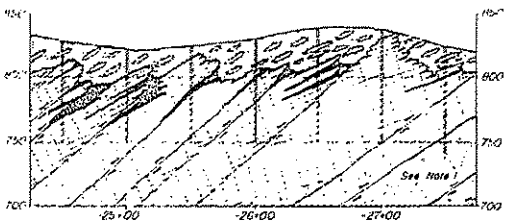


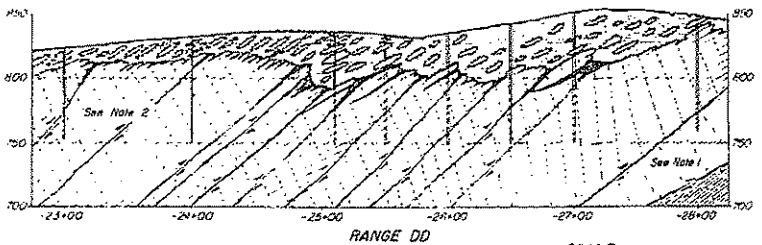
RANGE AA



RANGE CC



RANGE AA+50



RANGE DD

NOTES:

1. Details of geologic structure in Unit A cannot be determined because of lack of key horizons. It is believed that these strata are more sheared and contorted than the more competent overlying limestones.
2. The lack of key horizons in Unit C does not permit details of the geologic structure to be determined. It is assumed that it is sheared and faulted in a similar manner to Unit B.
3. For location of sections see drawing 49 GE 1 822 K 1336.
4. For additional geologic sections see drawings 49 GE 1 822 K 1337-1, -3, -4, -5.
5. For legend see drawings 49 GE 1 822 K 1357-1 or -3.

SCALE:

50 0 50 100 Feet

ALT. NO.	DATE	DRAWN	CHKD	SUPV.	DESIGN
DRAWN		COMPUTED			
TRACED		ENGINEER			
CHKD.					

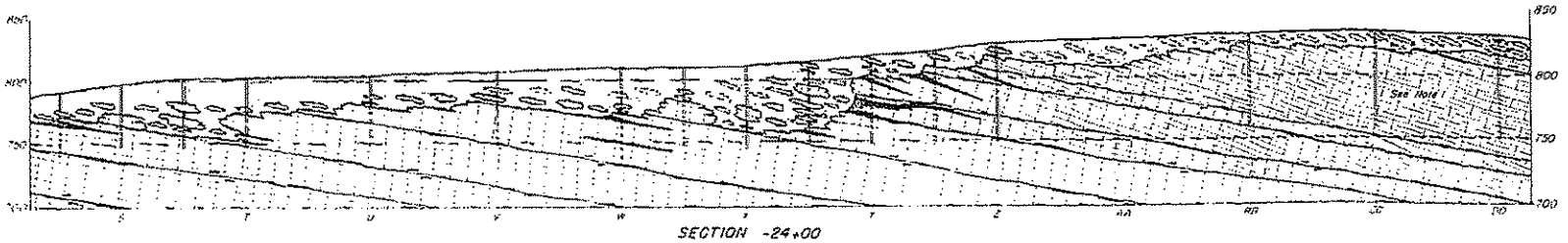
FOUNDATION INVESTIGATIONS

GEOLOGIC SECTIONS

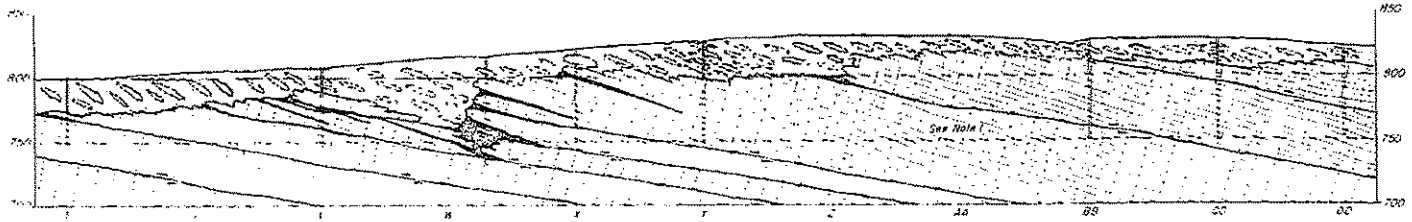
BULL RUN STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF WATER CONTROL PLANNING

SUBMITTED	RECOMMENDED	APPROVED

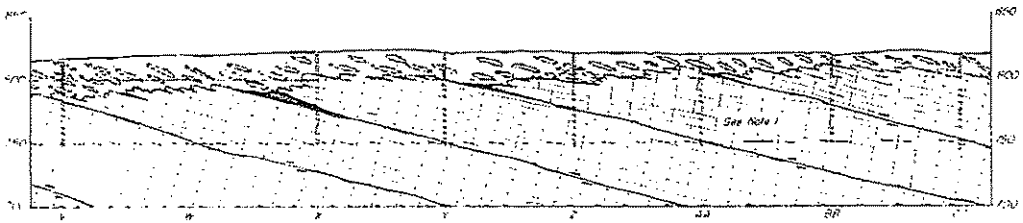
KNOXVILLE	1-29-62	49	GE	1	822 K1337-2



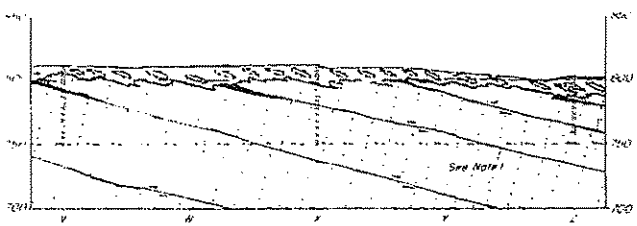
SECTION -24+00



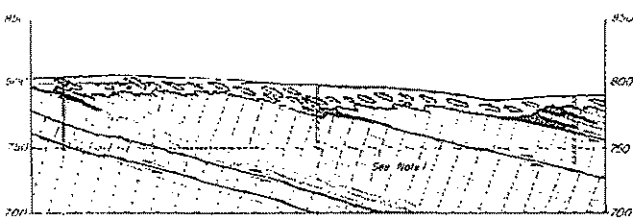
SECTION -23+00



SECTION -22+00



SECTION -20+00



SECTION -18+00

LEGEND

OVERBURDEN

Yellow silty clay containing numerous partially weathered limestone boulders and pinnacles

CHICKAMAUGA FORMATION

- Unit D - Thin bedded, medium gray to pink, banded, silty limestone with a 20 foot calcareous shale zone at base
- Unit C - Thin to medium bedded, dark gray, argillaceous, fossiliferous, argillaceous limestone
- Unit B - Predominantly thin to medium bedded, medium gray, medium crystalline limestone with shaly partings. There are lenses and beds of light gray, coarse crystalline limestone up to 10 feet thick in the upper portion and a 30 foot zone of nodular, argillaceous limestone near the base
- Unit A - Maroon and gray-green, banded, calcareous siltstone containing scattered thin limestone lenses and nodules. A 20 foot thick zone of medium gray, banded, siliceous limestone occurs 65 feet from the top
- Cavities - Filled and open
- Faults

NOTES:

1. The lack of key horizons in Unit C does not permit details of the geologic structure to be determined. From all indications it is sheared and faulted in a similar manner to Unit B
2. For location of sections see drawing 49GE 822K1336
3. For additional geologic sections see drawings 49GE 822K1337-1, -2, -4, -5

SCALE:

50 0 50 100 Feet

REVISED	DATE	BY	CHKD	SUPV	APPD
DRAWN		COMPUTED			
TRACED		ENGINEER			
CHKD					

FOUNDATION INVESTIGATIONS

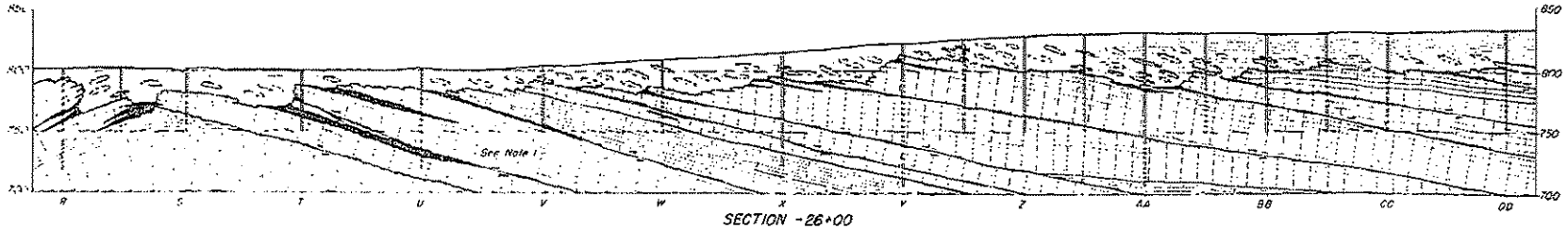
GEOLOGIC SECTIONS

BULL RUN STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF WATER CONTROL PLANNING

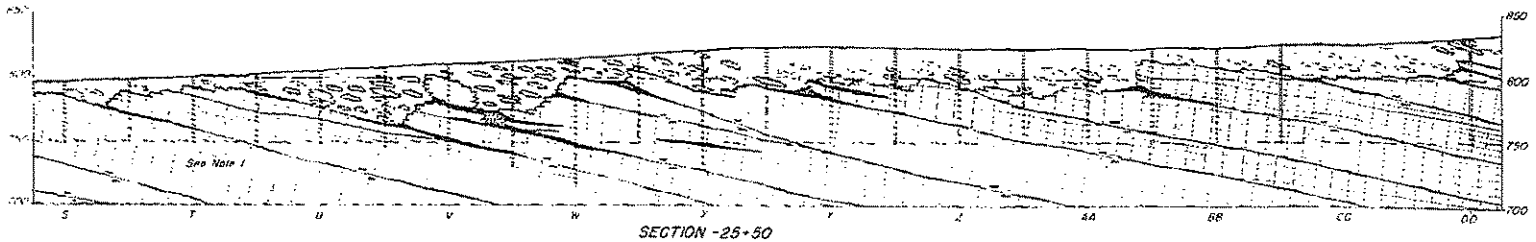
SUBMITTED	RECOMMENDED	APPROVED
John M. Evans Jr.		Barbara Montgomery

KNOXVILLE	1-29-62	49	GE	1	822K1337-3

EXHIBIT 5

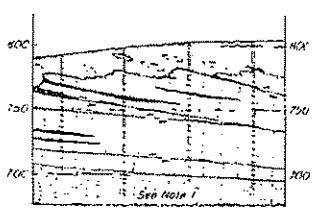


SECTION -26+00



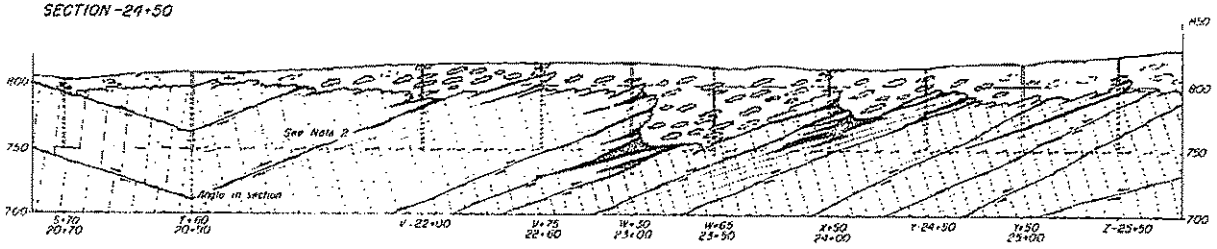
SECTION -25+50

SECTION -25+00



SECTION -24+50

SECTION -24+50



DISCHARGE TUNNEL AREA

NOTES:

1. Details of geologic structure in Unit A cannot be determined because of lack of key horizons. It is believed that these strata are more sheared and contorted than the more competent overlying limestones.
2. The lack of key horizons in Unit C does not permit details of the geologic structure to be determined. From all indications it is sheared and faulted in a similar manner to Unit B.
3. For location of sections see drawing 49GE 1822K1336.
4. For additional geologic sections see drawings 49GE1 822K1337-(-2), 5, -8.
5. For legend see drawings 49 GE 1 822K1337-1 or -3.

SCALE:

50 0 50 100 Feet

DRWN		COMPUTED			
TRACE		ENGINEER			
CHKD					

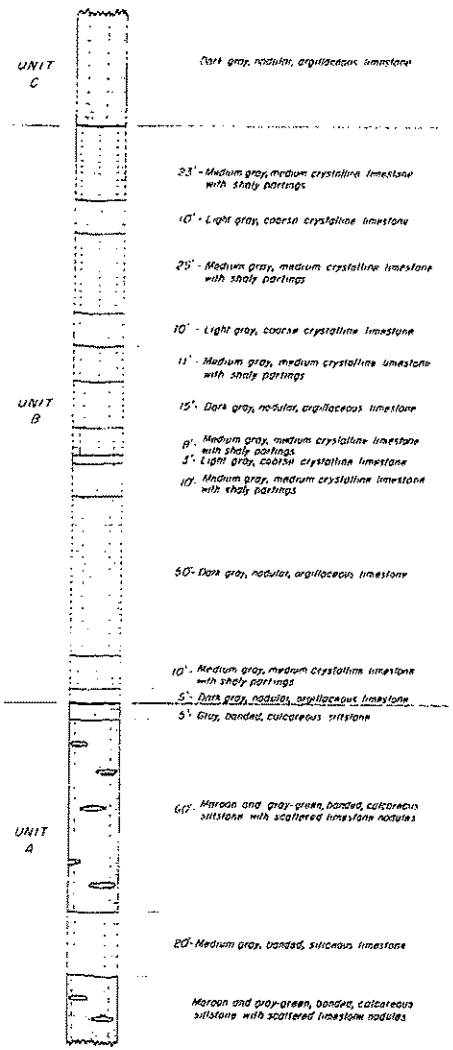
FOUNDATION INVESTIGATIONS

GEOLOGIC SECTIONS

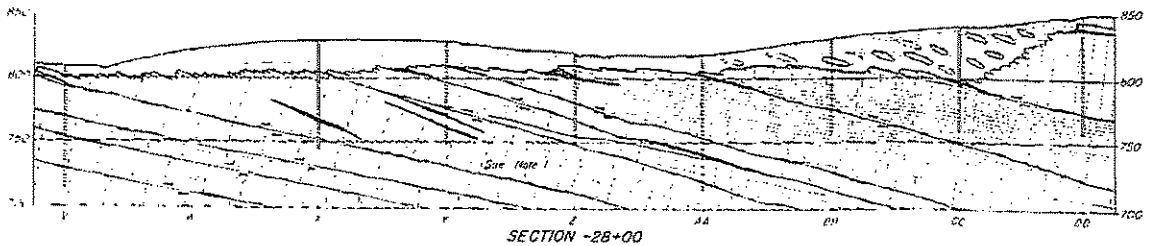
BULL RUN STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF WATER CONTROL PLANNING

SUBMITTED	RECOMMENDED	APPROVED
John W. Keller		Frederic E. Montgomery

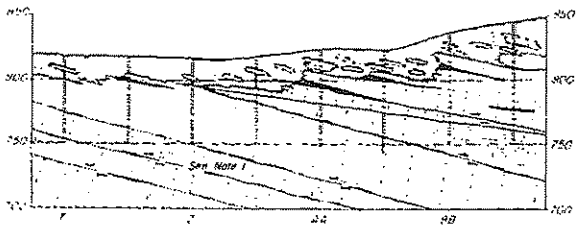
KNOXVILLE	1-29-62	49	GE	1	822K1337-4



STRATIGRAPHIC SECTION



SECTION -28+00



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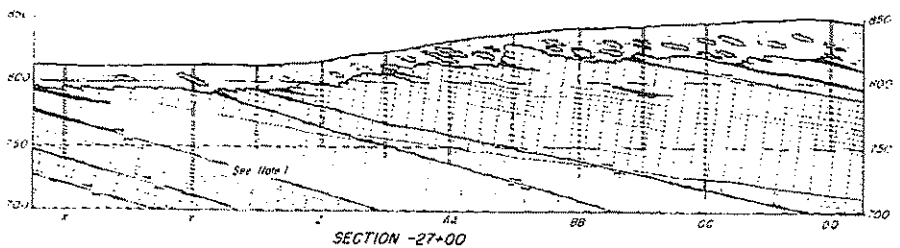

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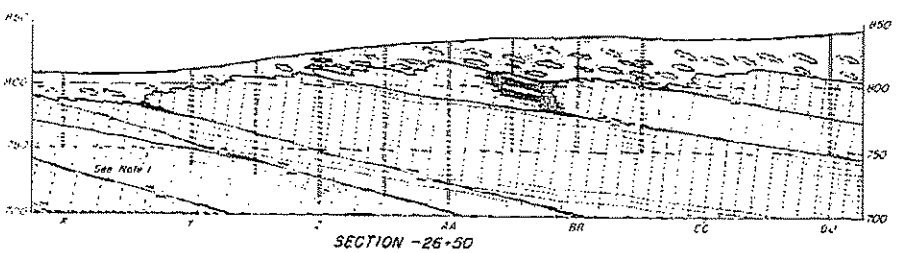


SECTION -26+50

SCALE:

50 0 50 100 Feet

NOTES:

1. Details of geologic structure in Unit A cannot be determined because of lack of key horizons. It is believed that these strata are more sheared and contorted than the more competent overlying limestones.
2. For location of sections see drawing 49GE1-822K1356
3. For additional geologic sections see drawings 49GE1-822K1337-1, -2, -3, -4
4. For legend see drawings 49GE1-822K1337-1 or -3

REV NO.	DATE	BASED	CHKD	SUPV	ASST
DRAWN		COMPUTED			
TRACED		ENGINEER			
CHKD					

FOUNDATION INVESTIGATIONS

GEOLOGIC SECTIONS

BULL RUN STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF WATER CONTROL PLANNING

SUBMITTED	RECOMMENDED	APPROVED
John M. Kellberg		Gordon E. Brumbaugh

KNOXVILLE	1-29-62	49	GE	1	822K1337-5

Reference No. 5

DRAWING INDEX

DRAWING NO.	DRAWING TITLE
10W297-1	GYPSUM & ASH DISPOSAL DRAWING INDEX AND LEGEND
10W297-2	GYPSUM & ASH DISPOSAL SITE LOCATION PLAN
10W297-3	GYPSUM & ASH DISPOSAL PHASING SHEET 1
10W297-4	GYPSUM & ASH DISPOSAL PHASING SHEET 2
10W297-5	GYPSUM & ASH DISPOSAL LAYOUT PLAN INITIAL GRADING
10W297-6	GYPSUM & ASH DISPOSAL LAYOUT PLAN FINAL COVER
10W297-7	GYPSUM & ASH DISPOSAL EXISTING CONDITIONS SHEET 1
10W297-8	GYPSUM & ASH DISPOSAL EXISTING CONDITIONS SHEET 2
10W297-9	GYPSUM & ASH DISPOSAL EXISTING CONDITIONS SHEET 3
10W297-10	GYPSUM & ASH DISPOSAL EXISTING CONDITIONS SHEET 4
10W297-11	GYPSUM & ASH DISPOSAL INITIAL SITE GRADING SHEET 1
10W297-12	GYPSUM & ASH DISPOSAL INITIAL SITE GRADING SHEET 2
10W297-13	GYPSUM & ASH DISPOSAL INITIAL SITE GRADING SHEET 3
10W297-14	GYPSUM & ASH DISPOSAL STAGE 1 SHEET 1
10W297-15	GYPSUM & ASH DISPOSAL STAGE 1 SHEET 2
10W297-16	GYPSUM & ASH DISPOSAL STAGE 1 SHEET 3
10W297-17	GYPSUM & ASH DISPOSAL STAGE 2 SHEET 1
10W297-18	GYPSUM & ASH DISPOSAL STAGE 2 SHEET 2
10W297-19	GYPSUM & ASH DISPOSAL STAGE 2 SHEET 3
10W297-20	GYPSUM & ASH DISPOSAL STAGE 3 SHEET 1
10W297-21	GYPSUM & ASH DISPOSAL STAGE 3 SHEET 2
10W297-22	GYPSUM & ASH DISPOSAL STAGE 3 SHEET 3
10W297-23	GYPSUM & ASH DISPOSAL STAGE 4 SHEET 1
10W297-24	GYPSUM & ASH DISPOSAL STAGE 4 SHEET 2
10W297-25	GYPSUM & ASH DISPOSAL STAGE 4 SHEET 3
10W297-26	GYPSUM & ASH DISPOSAL AREA 2A SECTIONS
10W297-27	GYPSUM & ASH DISPOSAL AREA 2A SECTIONS
10W297-28	GYPSUM & ASH DISPOSAL AREA 1A SECTIONS
10W297-29	GYPSUM & ASH DISPOSAL AREAS 1 & 1A SECTIONS
10W297-30	GYPSUM & ASH DISPOSAL MISCELLANOUS DETAILS SHEET 1
10W297-31	GYPSUM & ASH DISPOSAL METAL SPILLWAY DETAILS SHEET 2
10W297-32	GYPSUM & ASH DISPOSAL TYPICAL CROSS SECTION & DETAILS SHEET 3
10W297-33	EXISTING ASH DISPOSAL DETAILS SHEET 4
10W297-34	GYPSUM & ASH DISPOSAL COVER, CULVERT & ROAD DETAILS FINAL COVER
10W297-35	GYPSUM & ASH DISPOSAL GEOCOMPOSITE FINAL COVER
10W297-36	GYPSUM & ASH DISPOSAL DRAINAGE PLAN, ROADS, & DITCH SCHEDULE FINAL COVER
10W297-37	GYPSUM & ASH DISPOSAL DITCH DETAILS AND NOTES FINAL COVER
10W297-38	GYPSUM & ASH DISPOSAL WASTE DISPOSAL OPTIONS STAGE 1
10W297-39	GYPSUM & ASH DISPOSAL WASTE DISPOSAL OPTIONS STAGE 2
10W297-40	GYPSUM & ASH DISPOSAL DREDGE CELL PLAN

LEGEND

EXISTING		NEW
BM	BENCH MARK	NA
580	GRADE CONTOUR	580
	ASPHALT ROAD	
	GRAVEL ROAD	
	RAILROAD TRACK	NA
	OVERHEAD ELECTRICAL UTILITY POLE	
	OVERHEAD ELECTRICAL UTILITY TOWER	NA
OE	OVERHEAD UTILITY LINES	OE
	ASH SLUICE DITCH	
SD	STORM DRAIN	SD
NA	℄ DITCH	
NA	TERRACE DITCH	
NA	METAL SPILLWAY	
NA	POND DISCHARGE WEIR W/SKIMMER	
NA	SURFACE WATER COMPLIANCE MONITORING POINT	
NA	SILT FENCE	S S
× 430.5	SPOT ELEVATION	430.5
	PIEZOMETER	
	KELLBERG BORING	NA
	SOIL BORING	
	MONITORING WELL	NA
NA	PERMIT BOUNDARY	
NA	UNDERDRAIN	UD-6"
NA	FORCE MAIN	FM
NA	MANHOLE	DMH
NA	PROCESS WATER	PW
	TVA RESERVATION BOUNDARY	NA
NA	EXISTING ASH	
NA	COMPACTED BOTTOM ASH	
NA	GYPSUM	
NA	RANDOM SOIL (COVER)	
NA	SELECT SOIL (COVER)	
NA	CLAY	
NA	RIPRAP OR STONE	
NA	FINAL COVER/ VEGATATIVE LAYER	
NA	BOTTOM ASH DRAINAGE LAYER	
	FINAL COVER ACCESS ROAD	
	WASTE DISPOSAL BOUNDARY	

SOIL BORINGS/CPT'S – NEW

STATION	NORTHING	EASTING
BH-10	594431.2	2544697.9
CPT/MW48	594025.3	2544607.8
BH1/CPT1	592991.6	2545494.2
BH2/CPT2	592306.2	2546019.2
BH3/CPT3	591826.0	2546217.7
CPT4	592267.2	2545710.4
BH5/CPT5	592297.4	2545355.8
BH6/CPT6	591316.1	2545590.1
BH7/CPT7	591568.8	2546300.5
BH8/CPT8	591768.3	2546657.6
BH9/CPT9	590695.2	2546739.6

MONITORING WELLS

STATION	NORTHING	EASTING
1	2546200	594072
47	2544260	594689
48	2544830	593673
49	2545180	592627
50	2545440	591705

SOIL BORINGS – PREVIOUS

STATION	NORTHING	EASTING	GS ELEVATION
SS-1	595028	2544073	809.2
SS-2P	594652	2544230	806.2
SS-3	594308	2544434	808.3
SS-4	593962	2544644	807.7
SS-5	593604	2544812	805.0
SS-6	593270	2545040	807.9
SS-7	592645	2545240	820.9
SS-8	592270	2545365	824.7
SS-9	591885	2545475	824.4
SS-9A	591860	2545400	808.9
SS-9B	591860	2545385	808.9
SS-10	591560	2545715	824.9
SS-11	591700	2546210	826.0
SS-12	591900	2546665	824.6
SS-13	593165	2545690	825.5
SS-14	593350	2545615	809.5

BENCH MARKS

STATION	NORTHING	EASTING	ELEVATION
BRF1	591390	2547284	809.20
BRF2	590118	2546282	809.21
BRF3	589601	2545825	809.86
BRF4	590396	2545734	809.94
BRF5	591084	2545605	809.77
BRDS-1	591823	2546626	826.15
BRDS-10	593590	2546096	810.63
BRDS-2	593247	2545823	825.69
BRDS-3	593418	2545112	825.23
BRDS-4	594337	2544777	835.07
BRDS-5	594949	2544314	837.39
BRDS-6	594029	2544831	833.66
BRDS-7	592589	2545314	824.20

GYPSUM & ASH DISPOSAL
BULL RUN FOSSIL PLANT
IDL #01-0208

REV	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 0		DRS	BSB	WPT	HLP	REP	DL			

INITIAL ISSUE

SCALE: NOT TO SCALE — EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
DRAWING INDEX AND LEGEND

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

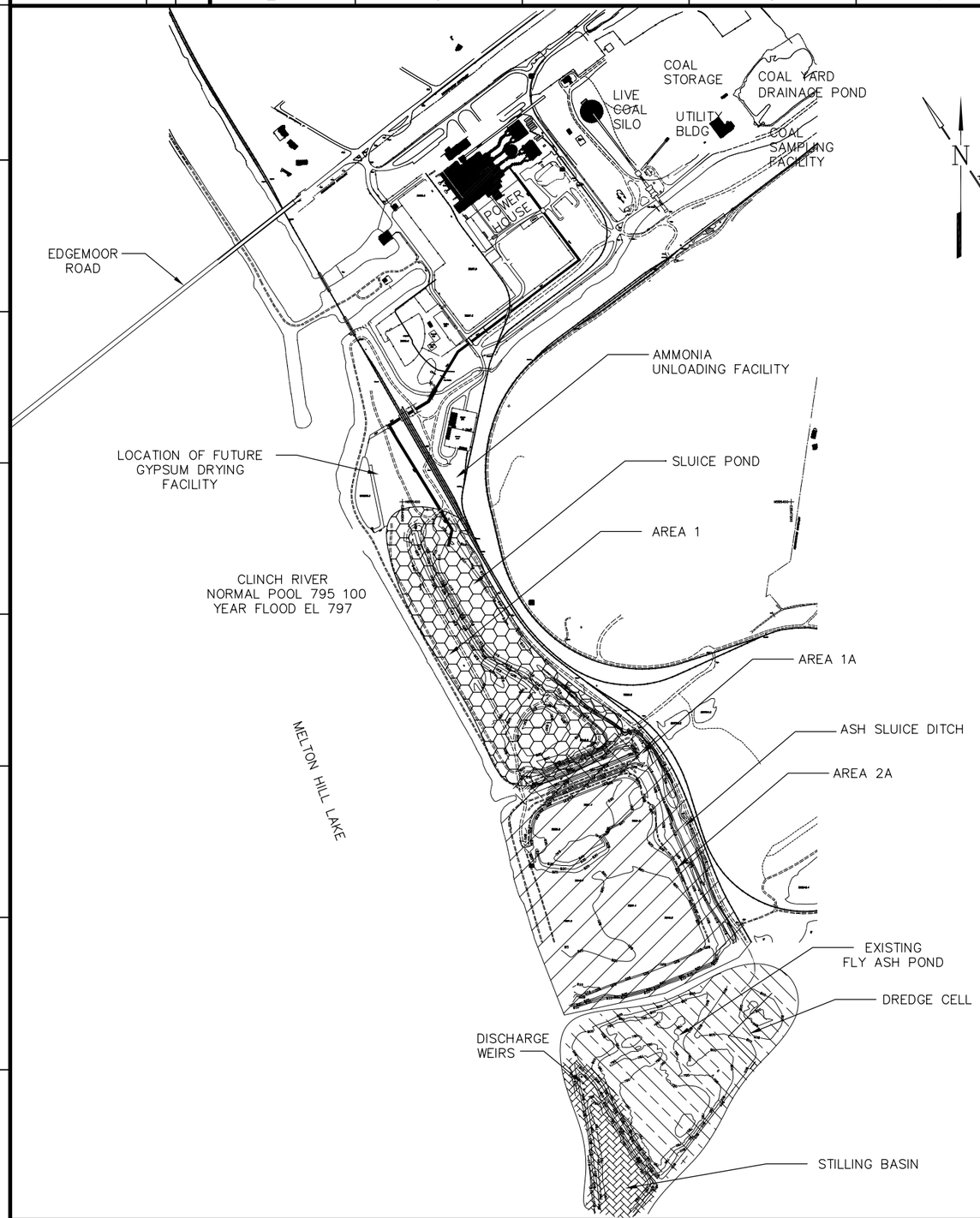
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-1	R 0

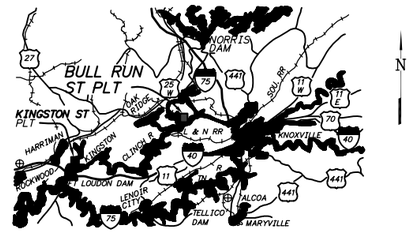
TASK COMPLETED BY: | REV NO.

PLOT FACTOR: W_TVA

C.A.D. DRAWING DO NOT ALTER MANUALLY



SITE PLAN – BULL RUN FOSSIL PLANT



LOCALITY MAP

SCALE 1" = 10 MILE 0 10 20

LEGEND

- AREA 1
- AREA 1A
- AREA 2A
- EXISTING FLY ASH POND
- STILLING BASIN

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 0		DRS	BSB	WPT	HLP	REP	DL			

ISSUED FOR GYPSUM & ASH DISPOSAL

DISCIPLINE INTERFACE

SCALE: NOT TO SCALE EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL SITE LOCATION PLAN

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

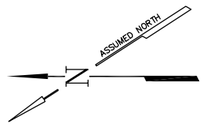
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14 | DATE | 49 | C | 10W297-2 | R 0

TASK COMPLETED BY: | REV NO.

PLOT FACTOR:360
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



PHASING NOTES:

1. FOR DRAWING INDEX AND LEGEND, SEE 10W297-1.
2. DRAWINGS 10W297-3 AND 4 DEPICT PHASING OF EXPANSION CONSTRUCTION. CONSTRUCTION DRAWINGS BEGIN WITH 10W297-5.

FLY ASH POND

BENCH MARK LOCATION, TYP.

DREDGE CELL

MAINTAIN EXISTING ASH SLUICE DITCH

EXISTING R/R CULVERT

MAINTAIN EXISTING DRAINAGE UNTIL NEW CULVERT IS CONSTRUCTED

ASH SLUICE POND

FUTURE LOCATION OF GYPSUM DRYING FACILITY

STILLING BASIN

SURFACE WATER COMPLIANCE MONITORING POINT

EXISTING DISCHARGE WEIRS NPDES OUTLET 001

AREA 2A (GYPSUM OR ASH DISPOSAL)

CLINCH RIVER/ MELTON HILL LAKE

CHANNEL AREA BETWEEN AREAS 1 & 2A TO BE DEVELOPED INTO AREA 1A (BOTTOM ASH FROM SLUICE POND & FLY ASH FROM DREDGE CELL)

FILL AREA 1 WITH BOTTOM ASH FROM SLUICE POND

EXISTING CHEMICAL POND

BRF1 BRF2 BRF3 BRF4 BRF5

BRDS-1 BRDS-2 BRDS-3 BRDS-4 BRDS-5 BRDS-6 BRDS-7 BRDS-8

MW 1 MW 47 MW 48 MW 49 MW 50

R												
R 0		DRS	BSB	WPT	HLP	REP	DL					D
INITIAL ISSUE												DISCIPLINE INTERFACE
REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REVISION	

SCALE: 1" = 200' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL PHASING SHEET 1

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-3	R 0

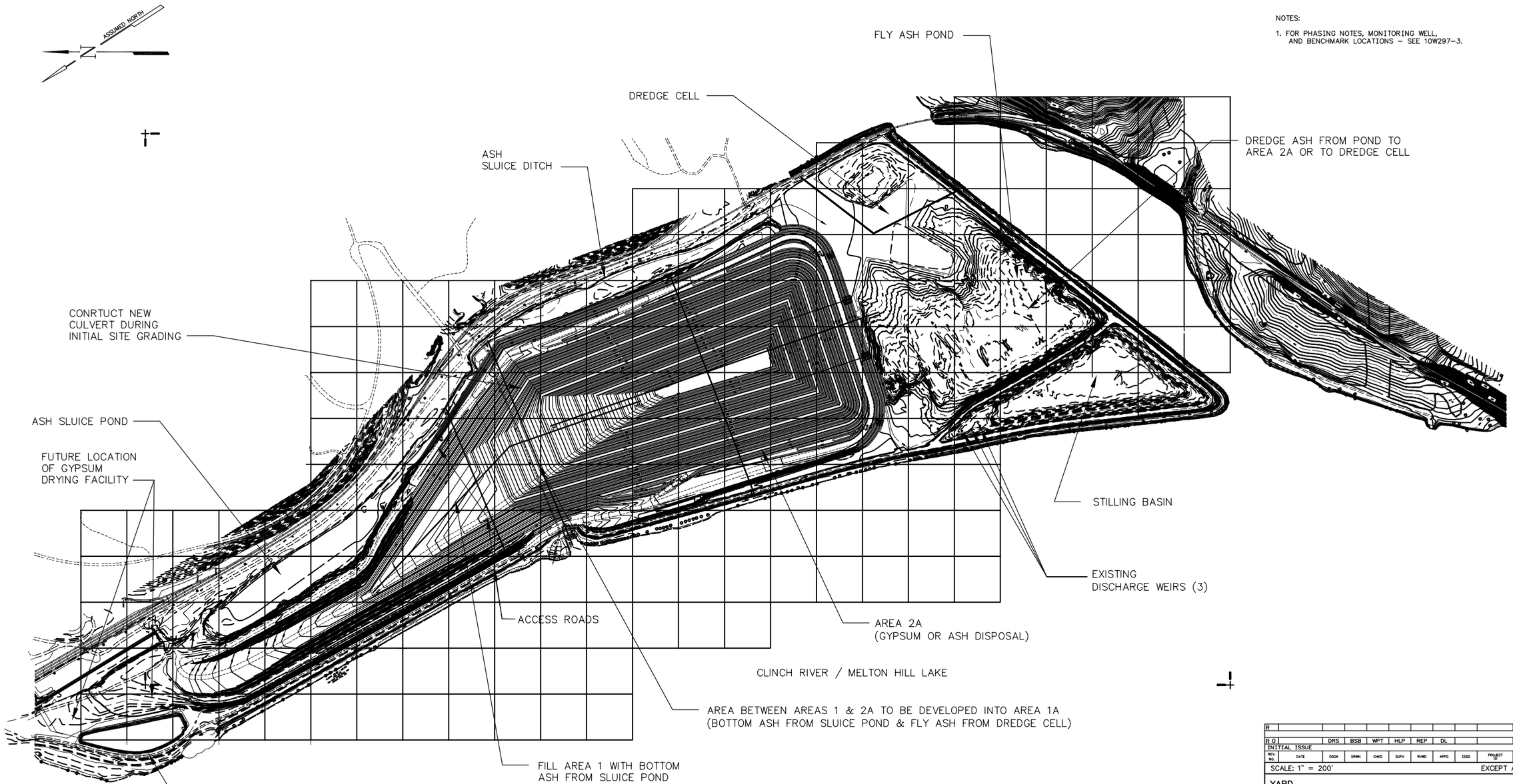
TASK COMPLETED BY: | REV NO.

PLOT FACTOR: W_TVA

C.A.D. DRAWING DO NOT ALTER MANUALLY

NOTES:

1. FOR PHASING NOTES, MONITORING WELL, AND BENCHMARK LOCATIONS – SEE 10W297-3.



R												
R 0		DRS	BSB	WPT	HLP	REP	DL					D
INITIAL ISSUE												
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. ID	

SCALE: 1" = 200' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL PHASING SHEET 2

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

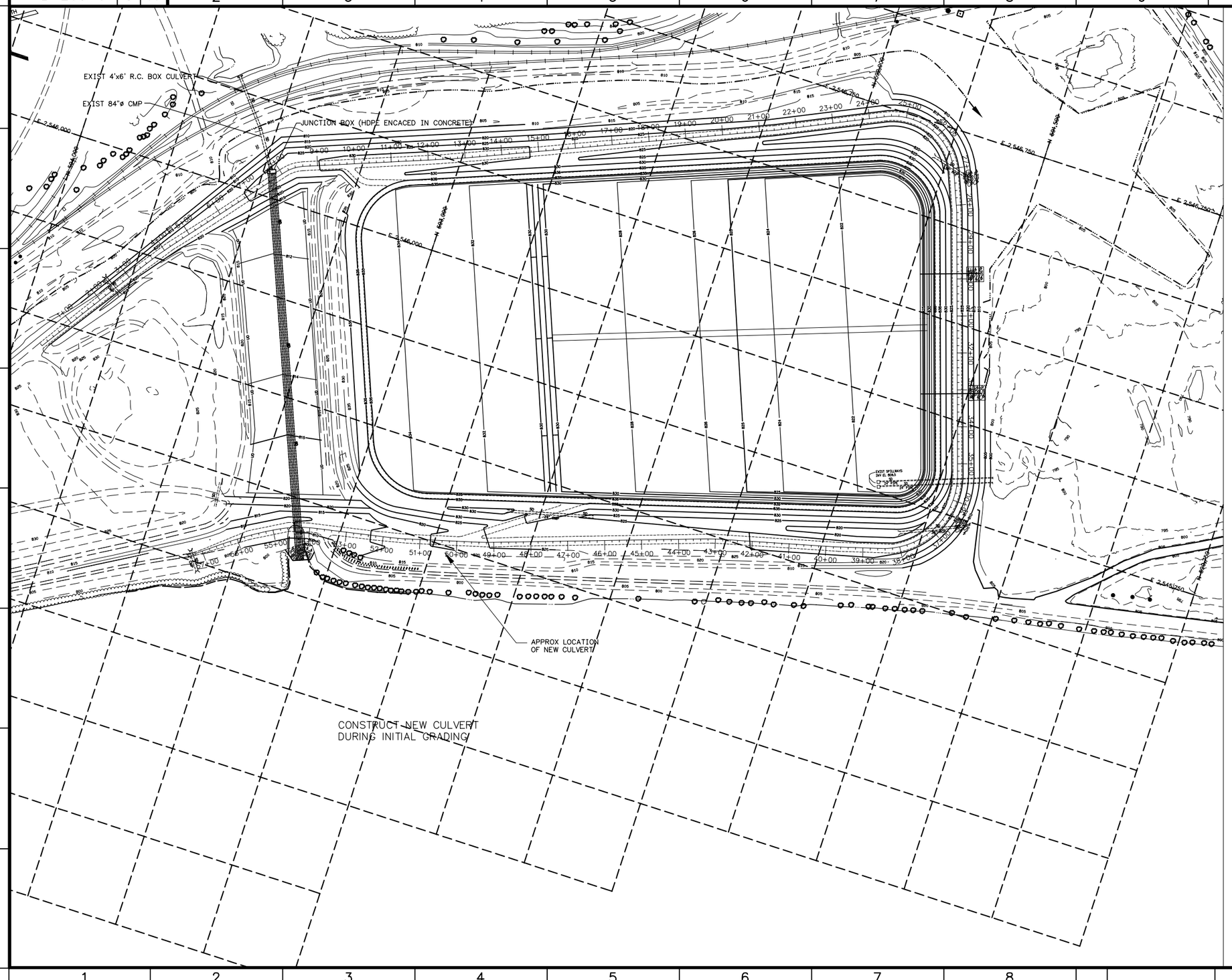
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-4	R 0

TASK COMPLETED BY: | REV NO.

PLOT FACTOR: W_TVA

C.A.D. DRAWING DO NOT ALTER MANUALLY



INITIAL GRADING NOTES:

1. FOR DRAWING INDEX AND LEGEND, SEE 10W297-1.
2. DRAWINGS 10W297-3 AND 4 DEPICT PHASING OF EXPANSION CONSTRUCTION. CONSTRUCTION DRAWINGS BEGIN WITH 10W297-5.

R											
R 0		DRS	BSB	WPT	HLP	REP	DL				D
INITIAL ISSUE											
REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	

DISCIPLINE INTERFACE

SCALE: 1" = 100' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
LAYOUT PLAN
INITIAL GRADING

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

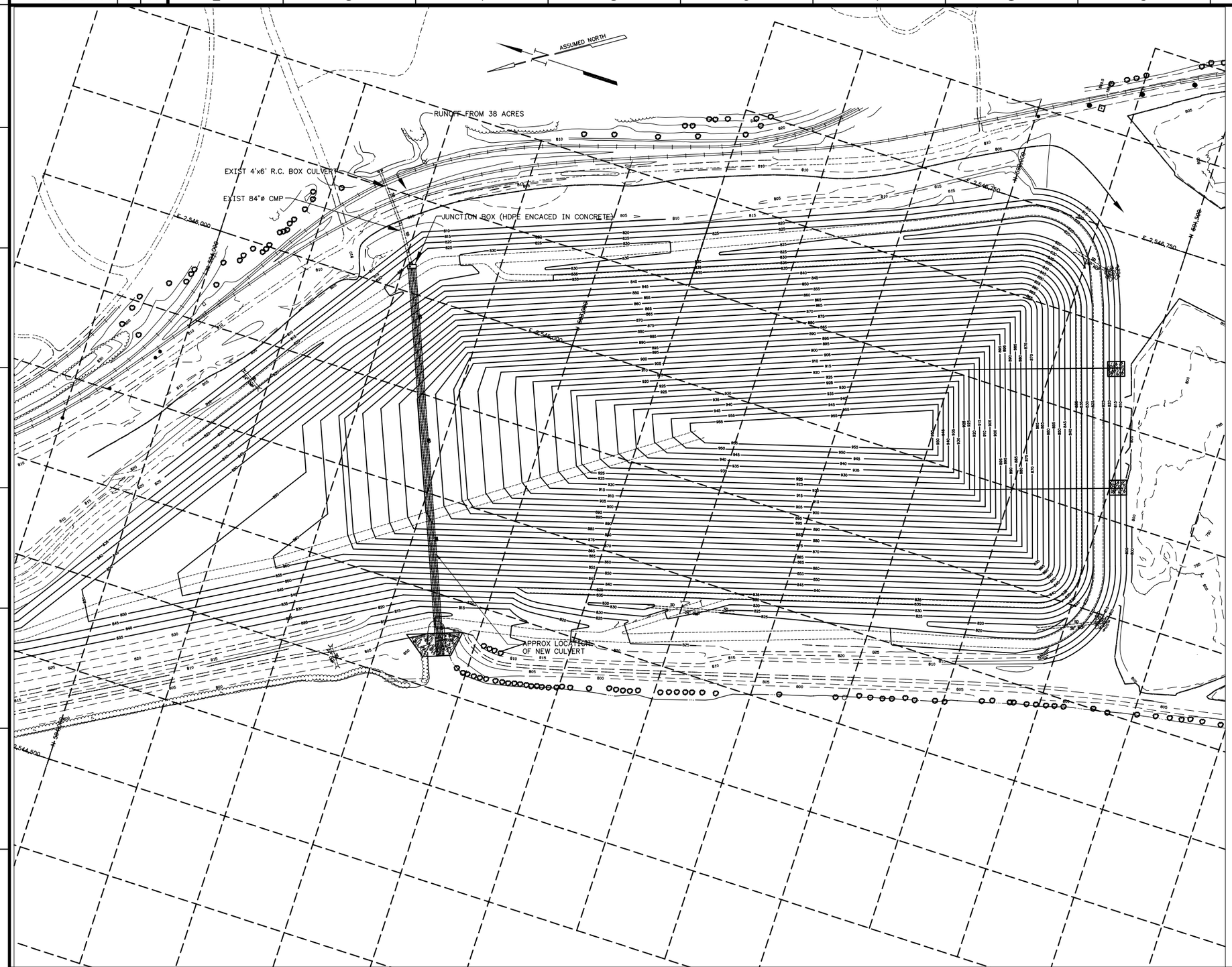
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-5	R 0

TASK COMPLETED BY: | REV NO.

PLOT FACTOR:100
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



NOTES:

1. FOR PHASING NOTES, SEE 10W297-3.

R											
R 0		DRS	BSB	WPT	HLP	REP	DL				D
INITIAL ISSUE											
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	

DISCIPLINE INTERFACE

SCALE: 1" = 200' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
LAYOUT PLAN
FINAL COVER

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

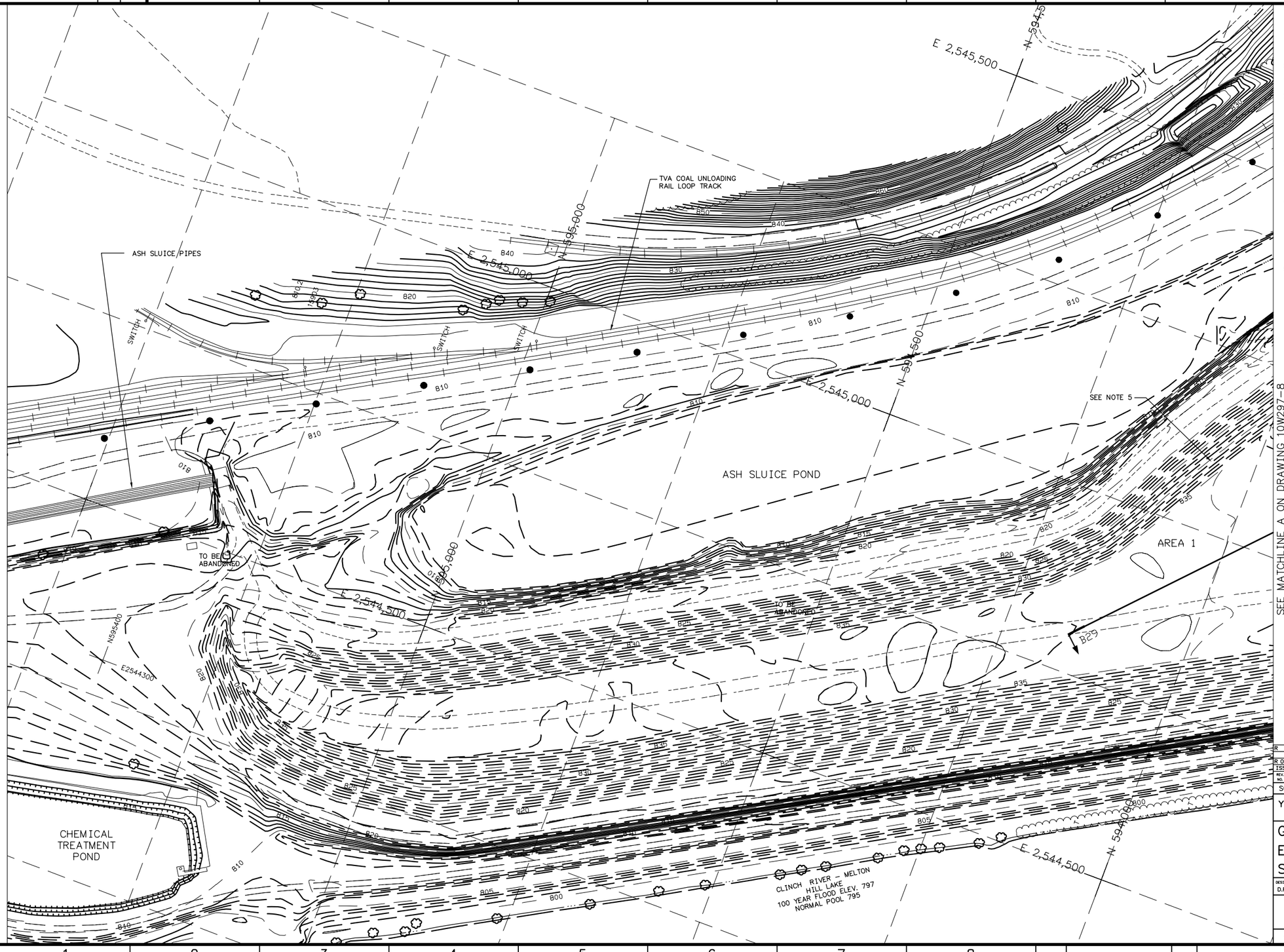
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-6	R 0

TASK COMPLETED BY: | REV NO.

PLOT FACTOR: W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



SURVEY NOTES

1. FOR DRAWING INDEX AND LEGEND, SEE 10W297-1.
2. EXISTING TOPOGRAPHY AND SITE FEATURES OBTAINED FROM A SURVEY PERFORMED BY TVA, DATED OCTOBER 2003. SUPPLEMENTAL SURVEYING FOR AREA 2 PERFORMED MARCH 2004. EXISTING MONITORING WELL LOCATIONS PROVIDED BY TVA. EXISTING ELEVATION CONTOURS ARE SHOWN AT 1-FOOT INTERVALS UNLESS NOTED OTHERWISE. ELEVATION CONTOURS FOR NEW GRADING ARE SHOWN AT 2-FOOT INTERVALS UNLESS NOTED OTHERWISE.
3. SURVEY COORDINATES ARE REFERENCED TO TENNESSEE STATE PLANE COORDINATE SYSTEM, NAD 27, AND NAVD 29. COORDINATES FOR UTILITY STRUCTURES AND PIPING ARE TO CENTERLINE OF STRUCTURE OR PIPE, UNLESS NOTED OTHERWISE.
4. HORIZONTAL AND VERTICAL CONTROL SHALL BE ESTABLISHED BY USING THE EXISTING BENCHMARK LOCATIONS LISTED ON 10W297-1, AND DEPICTED ON THESE DRAWINGS. FOR BENCHMARK DESCRIPTIONS, CONTACT:

   TVA MAPPING
   1101 MARKET ST
   CHATTANOOGA, TN 37402.
5. SOIL BORINGS FROM PAST AND RECENT GEOTECHNICAL EXPLORATION ARE SHOWN ON THESE DRAWINGS FOR REFERENCE. KELLBERG BORINGS WERE PERFORMED IN 1958 AND PREDATE THE CONSTRUCTION OF THE ORIGINAL ASH DISPOSAL FACILITY. KELLBERG BORINGS ARE NOT SHOWN ON CROSS-SECTIONS FOR CLARITY.

SEE MATCHLINE A ON DRAWING 10W297-8

KEY PLAN

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 0		DRS	BSB	WPT	HLP	REP	DL			

ISSUED FOR GYPSUM & ASH DISPOSAL

SCALE: 1"=50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
EXISTING CONDITIONS
SHEET 1

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

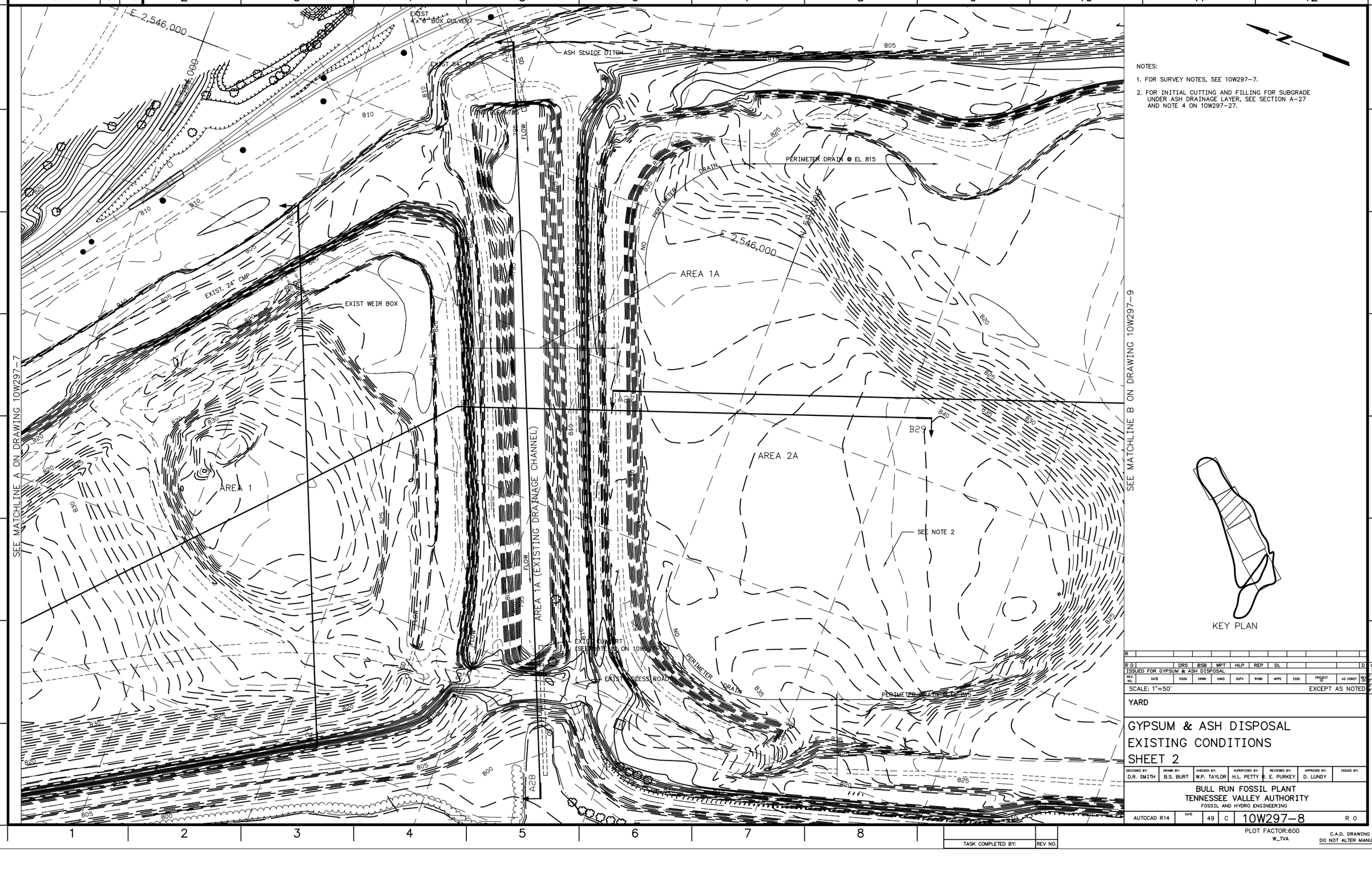
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-7	R 0

TASK COMPLETED BY: | REV NO.

PLOT FACTOR:600
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



NOTES:

1. FOR SURVEY NOTES, SEE 10W297-7.
2. FOR INITIAL CUTTING AND FILLING FOR SUBGRADE UNDER ASH DRAINAGE LAYER, SEE SECTION A-27 AND NOTE 4 ON 10W297-27.

KEY PLAN

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV NO.
R 0		DRS	BSB	WPT	HLP	REP	DL				D

ISSUED FOR GYPSUM & ASH DISPOSAL

DISCIPLINE INTERFACE

SCALE: 1"=50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
EXISTING CONDITIONS
SHEET 2

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R. E. PURKEY	D. LUNDY	

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-8	R 0

PLOT FACTOR:600
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

TASK COMPLETED BY:	REV NO.

ASH SLUICE DITCH
EMPTIES INTO ASH POND

E 2,546,750

N 591,500

N 591,800

E 2,546,750

EXISTING FLY
ASH POND

BH9

PERIMETER DRAIN @ EL 815

300' PERIMETER DRAIN
EL STEPS UP FROM 810 TO 815

PERIMETER DRAIN @ EL 810

SEE NOTE 2

SEE DETAIL A9

SEE NOTE 3

EXISTING PIEZOMETERS
TO BE ABANDON

TO BE
ABANDONED

AREA 2A

CCL BA DRAINAGE COLUMNS
(SEE DETAIL A9 & C27)

APPROX CUT BOUNDARY
TO PREPARE SUBGRADE
FOR BA DRAINAGE
LAYER (EL 817')

EXTEND STORM DRAINS
AS NECESSARY FOR INITIAL
DIKE CONSTRUCTION

PERIMETER DRAIN @ EL 815

300' PERIMETER DRAIN
EL STEPS UP FROM 810 TO 815

2-24"
PIPE
(EXIST.)

SD
SD

EXISTING
SPILLWAY
INV EL
809.5

STILLING BASIN

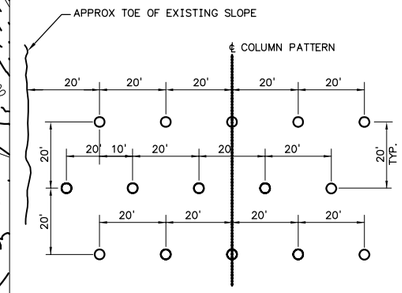
BH6

SEE MATCHLINE B ON DRAWING 10W297-8

SEE MATCHLINE C ON 10W297-10

NOTES:

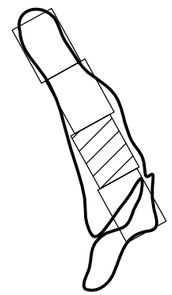
1. FOR SURVEY NOTES, SEE 10W297-7.
2. DRAINAGE COLUMNS TO BE FILLED WITH BOTTOM ASH ARE SHOWN ON THIS DRAWING FOR CLARITY.
3. FOR INITIAL CUTTING AND FILLING FOR SUBGRADE UNDER ASH DRAINAGE LAYER, SEE SECTION A-27 AND NOTE 4 ON 10W297-27.



PLAN VIEW

DETAIL A9

PATTERN FOR BA DRAIN COLUMNS



KEY PLAN

R													
R 0		DRS	BSB	WPT	HLP	REP	DL						D
ISSUED FOR GYPSUM & ASH DISPOSAL													DISCIPLINE INTERFACE
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. NO.		
SCALE: 1"=50'										EXCEPT AS NOTED			

YARD

GYPSUM & ASH DISPOSAL
EXISTING CONDITIONS
SHEET 3

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R. E. PURKEY	D. LUNDY	

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-9	R 0

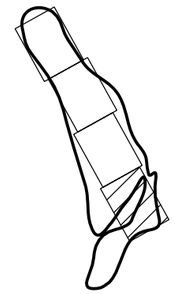
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:600
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

NOTES:

1. FOR SURVEY NOTES, SEE 10W297-7.



KEY PLAN

R											
R 0		DRS	BSB	WPT	HLP	REP	DL				D
ISSUED FOR GYPSUM & ASH DISPOSAL											
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	

DISCIPLINE INTERFACE

SCALE: 1"=50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
EXISTING CONDITIONS
SHEET 4

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

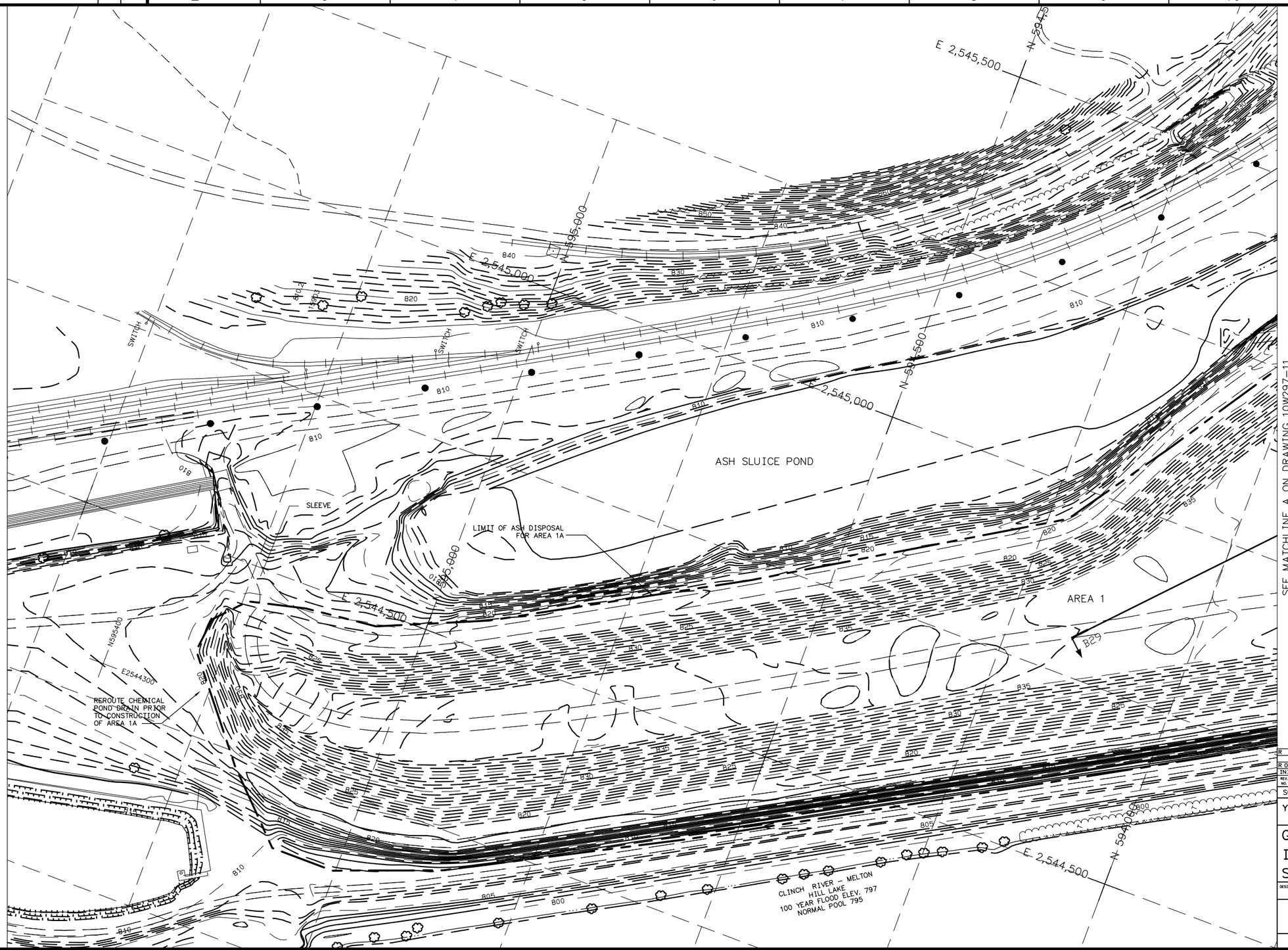
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-10	R 0

TASK COMPLETED BY: | REV NO.

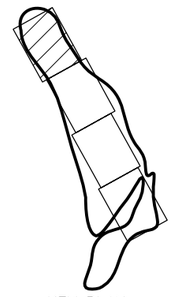
PLOT FACTOR:600
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



GENERAL NOTES

1. THE ASH POND HAS AN EXISTING STILLING BASIN TO PROVIDE SEDIMENTATION CONTROL DURING CONSTRUCTION AND OPERATION. EROSION CONTROL MEASURES (TEMPORARY SILT FENCES, CHECK DAMS) ARE NOT DEPICTED ON THE DRAWINGS BUT SHALL BE UTILIZED, WHEN NECESSARY, BY THE CONSTRUCTOR AND OPERATOR TO CONTROL SEDIMENT DISCHARGE TO THE STILLING BASIN.
2. THE CONSTRUCTOR AND OPERATOR SHALL PROVIDE A MEANS TO CONTROL DUST DURING CONSTRUCTION AND OPERATION. CONTROLS CAN INCLUDE THE USE OF WATER TRUCKS, OR COMMERCIALLY AVAILABLE APPLIED SPRAY-ON MEMBRANE EROSION CONTROL PRODUCTS.
3. SECTION NUMBERS REFER DIRECTLY TO TVA SPECIFICATION T-1, UNLESS NOTED OTHERWISE.
4. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH TVA SPECIFICATION T-1, AND THE FOLLOWING ASH POND EXPANSION DOCUMENTS: OPERATIONS MANUAL; THE CLOSURE/POST CLOSURE PLAN; AND THE QA/QC PLAN.
5. CONSTRUCTOR SHALL VERIFY AMPLE CLEARANCE NEAR OVERHEAD ELECTRICAL LINES FOR CONSTRUCTION EQUIPMENT. CONSTRUCTOR SHALL NOTIFY CONSTRUCTION MANAGER BEFORE ANY WORK STARTS NEAR OVERHEAD ELECTRICAL LINES.
6. THE CONSTRUCTOR IS ADVISED THAT THERE MAY BE UNDERGROUND UTILITIES PRESENT AT THIS SITE WHICH ARE NOT SHOWN ON THESE DRAWINGS. THE CONSTRUCTOR SHALL LOCATE AND VERIFY EXISTING UNDERGROUND UTILITIES THAT MAY NOT BE SHOWN ON THESE DRAWINGS, BUT THAT ARE WITHIN AREAS TO BE DISTURBED. THE CONSTRUCTOR SHALL VERIFY THAT ANY UNDERGROUND ELECTRICAL UTILITIES ARE LOCKED OUT/TAGGED OUT AND ARE NOT ACTIVATED PRIOR TO REMOVAL. THE EXISTING CONCRETE MANHOLE AND UNDERGROUND UTILITIES WITHIN THE AREA TO BE DISTURBED BY CONTRUCTION OF THIS FACILITY SHALL BE REMOVED PRIOR TO EXCAVATION AND GRADING ACTIVITIES.
7. THE CONSTRUCTOR SHALL EXERCISE CARE TO PREVENT DAMAGE TO EXISTING MONITORING WELLS AND/OR EXISTING STRUCTURES.
8. DISPOSAL OF DEMOLISHED ITEMS SUCH AS EXISTING STORM SEWER PIPING OR OTHER MISCELLANEOUS ITEMS SHALL BE AS DIRECTED BY TVA.
9. FOR CONSTRUCTION OF THE AREA 2A BASE AND STARTER DIKE SEE CONSTRUCTION DETAILS ON 10W297-27 AND THE QA/QC PLAN.
10. ELEVATION CONTOURS SHOWN ON THE OUTER SLOPES OF NEW GRADING ARE FINISHED GRADE (INCLUDING FINAL COVER).
11. ELEVATIONS SHOWN INSIDE THE AREA 2A STARTER DIKES ARE TO TOP OF THE FLY ASH BASE AS SHOWN IN TYPICAL CROSS SECTION ON 10W297-27.
12. FOR DRAWING INDEX & LEGEND, SEE 10W297-1.



KEY PLAN

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R										
R 0		DRS	BSB	WPT	HLP	REP	DL			
INITIAL ISSUE										

SCALE: 1" = 50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL INITIAL SITE GRADING SHEET 1

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
DL	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

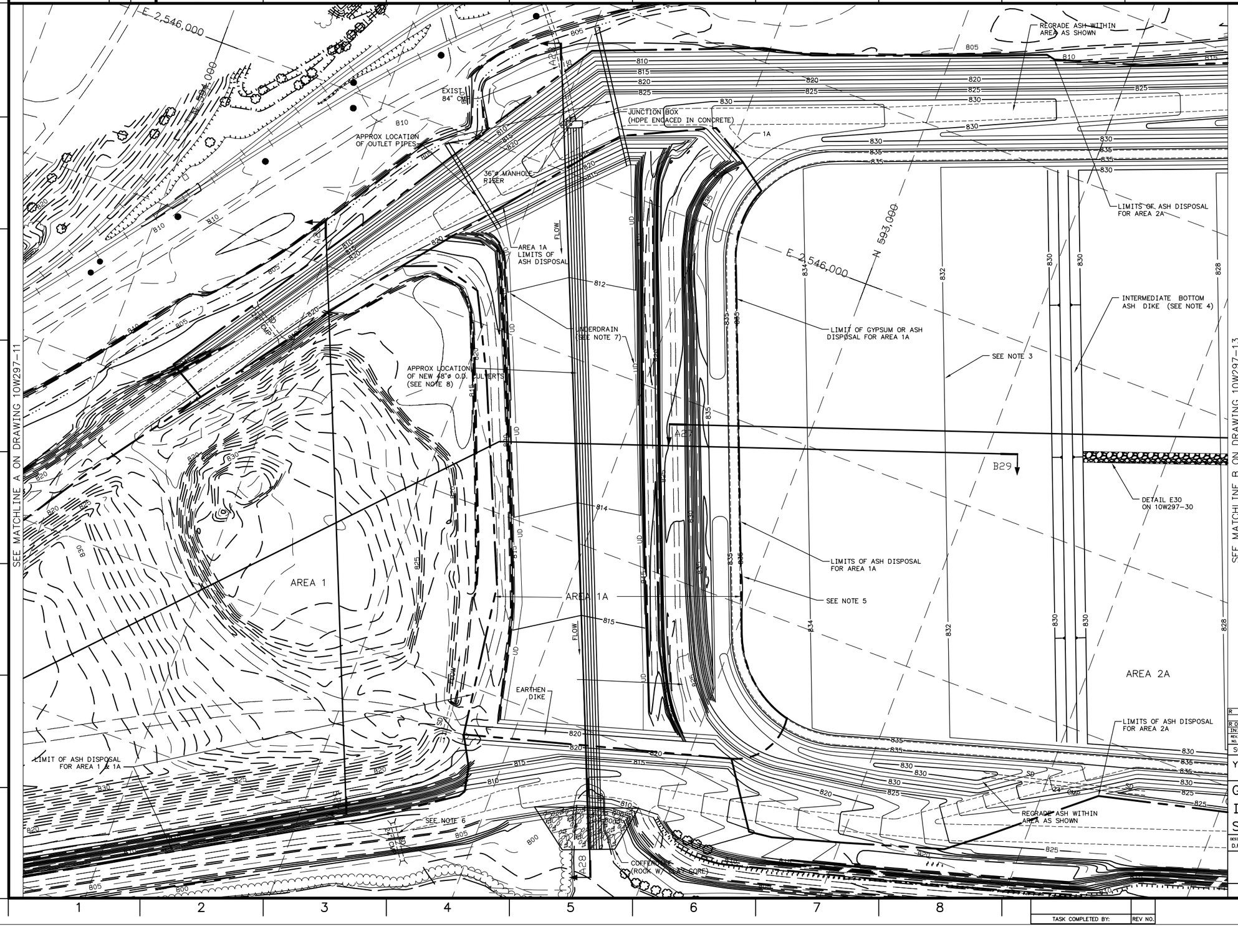
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-11	R 0

TASK COMPLETED BY: | REV NO.

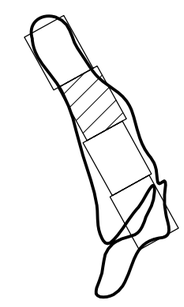
PLOT FACTOR:1:50
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



GRADING NOTES:

1. FOR GENERAL NOTES, SEE 10W297-11.
2. GRADING FOR AREA 2A SHOWN. FOR PHASING OF CONSTRUCTION, SEE 10W297-3 AND 4 AND THE OPERATIONS PLAN.
3. GRADING SHOWN FOR AREA 2A IS TOP OF FLY ASH BASE. FOR POSSIBLE GRADE ADJUSTMENTS, SEE NOTE 4 ON 10W297-27 SEE DETAILS AND CROSS SECTIONS FOR BOTTOM ASH DRAINAGE AND FILTER LAYERS.
4. CONSTRUCT INTERMEDIATE ASH DIKE TO FORM POND FOR INITIAL GYPSUM SLUICING. CONSTRUCT INITIAL WET CAST GYPSUM DIKE USING GYPSUM SLUICED INTO POND AS DESCRIBED IN THE OPERATION PLAN. EXTEND WET CAST GYPSUM DIKE BEYOND THE INITIAL GYPSUM POND TO DEVELOP THE FULL FOOTPRINT OF AREA 2A.
5. APPLY SPRAY-ON MEMBRANE ON ASH SURFACES WITHIN AREA 2A THAT ARE OUTSIDE OF THE INITIAL GYPSUM POND.
6. AREA SHOWN BELOW EL 818 (APPROXIMATELY) SHALL BE STABILIZED WITH VEGETATION PRIOR TO CONSTRUCTION OF DIKES FOR CONSTRUCTION OF AREA 1A. INSTALL STORM DRAIN WHERE SHOWN TO DIVERT STORMWATER TO RESERVOIR.
7. INSTALL UNDERDRAINS AS SHOWN ON SECTION B29 ON 10W297-29 AND DETAIL C32 ON 10W297-32.
8. CULVERT TO BE INSTALLED PRIOR TO THE DEVELOPEMENT OF AREA 1A.



KEY PLAN

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 0		DRS	BSB	WPT	HLP	REP	DL			D
INITIAL ISSUE										

DISCIPLINE INTERFACE

SCALE: 1" = 50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL INITIAL SITE GRADING SHEET 2

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

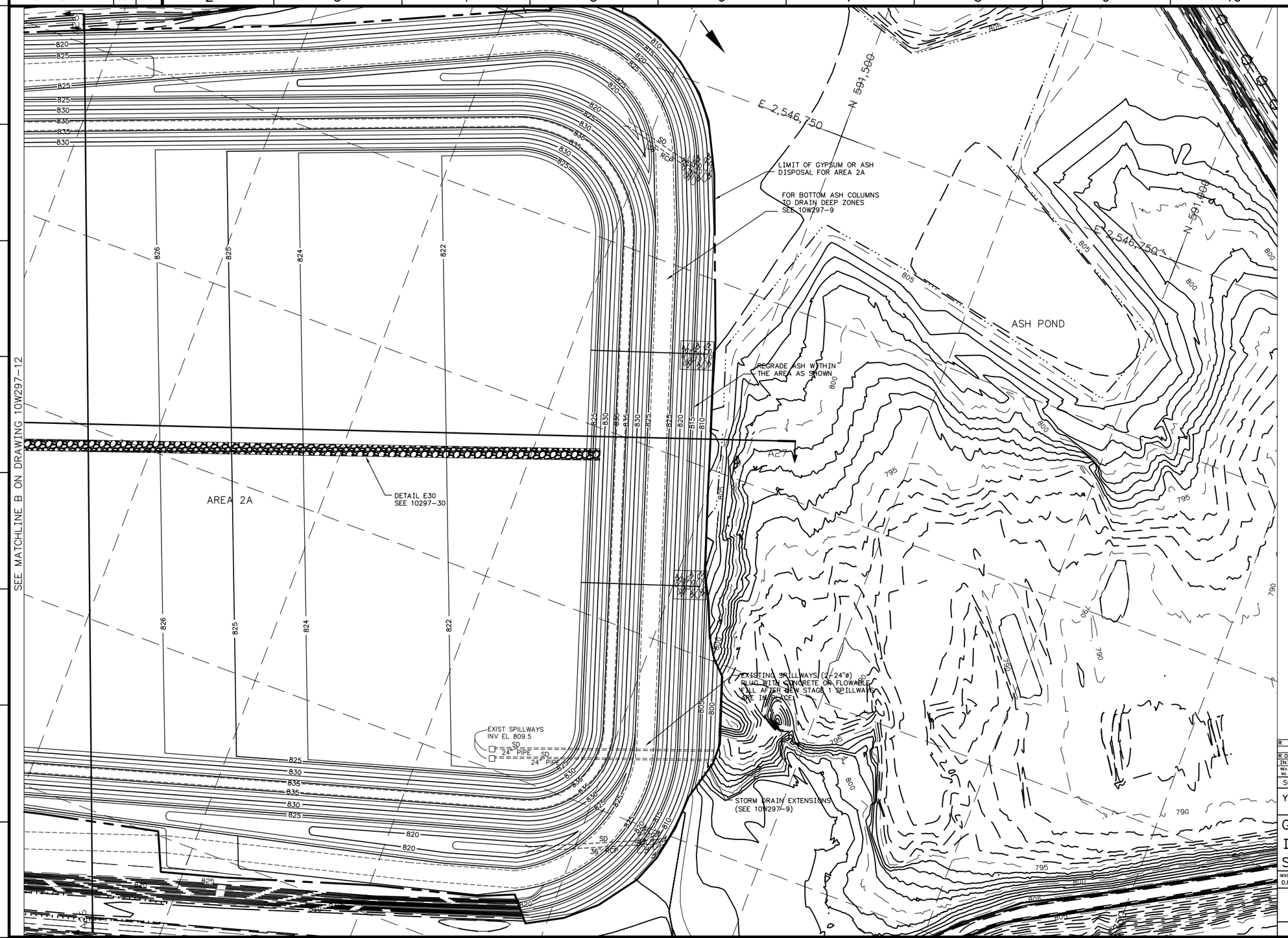
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-12	R 0

TASK COMPLETED BY: | REV NO.

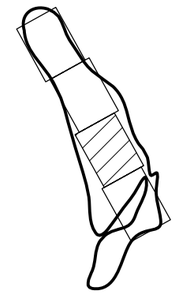
PLOT FACTOR:1:50
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



NOTES:

1. FOR GENERAL NOTES, SEE 10W297-11
2. PERIMETER UNDERDRAINS, LATERAL OUTLET PIPES AND B/A DRAIN COLUMNS OMITTED FOR CLARITY, SEE SECTIONS ON DRAWINGS 10W297-26, 27, 32 & 33 AND 10W297-8 & 9 FOR LOCATIONS.
3. SEE DETAILS OF STAGE 1 SPILLWAY ON 10W297-31. PROVIDE TEMPORARY DITCHES TO SPILLWAY INLETS. FOR LOCATION OF SPILLWAY SEE 10W297-38 & 39.



KEY PLAN

R											
R 0		DRS	BSB	WPT	HLP	REP	DL				D
INITIAL ISSUE											DISCIPLINE INTERFACE
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. NO.

SCALE: 1" = 50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
INITIAL SITE GRADING
SHEET 3

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

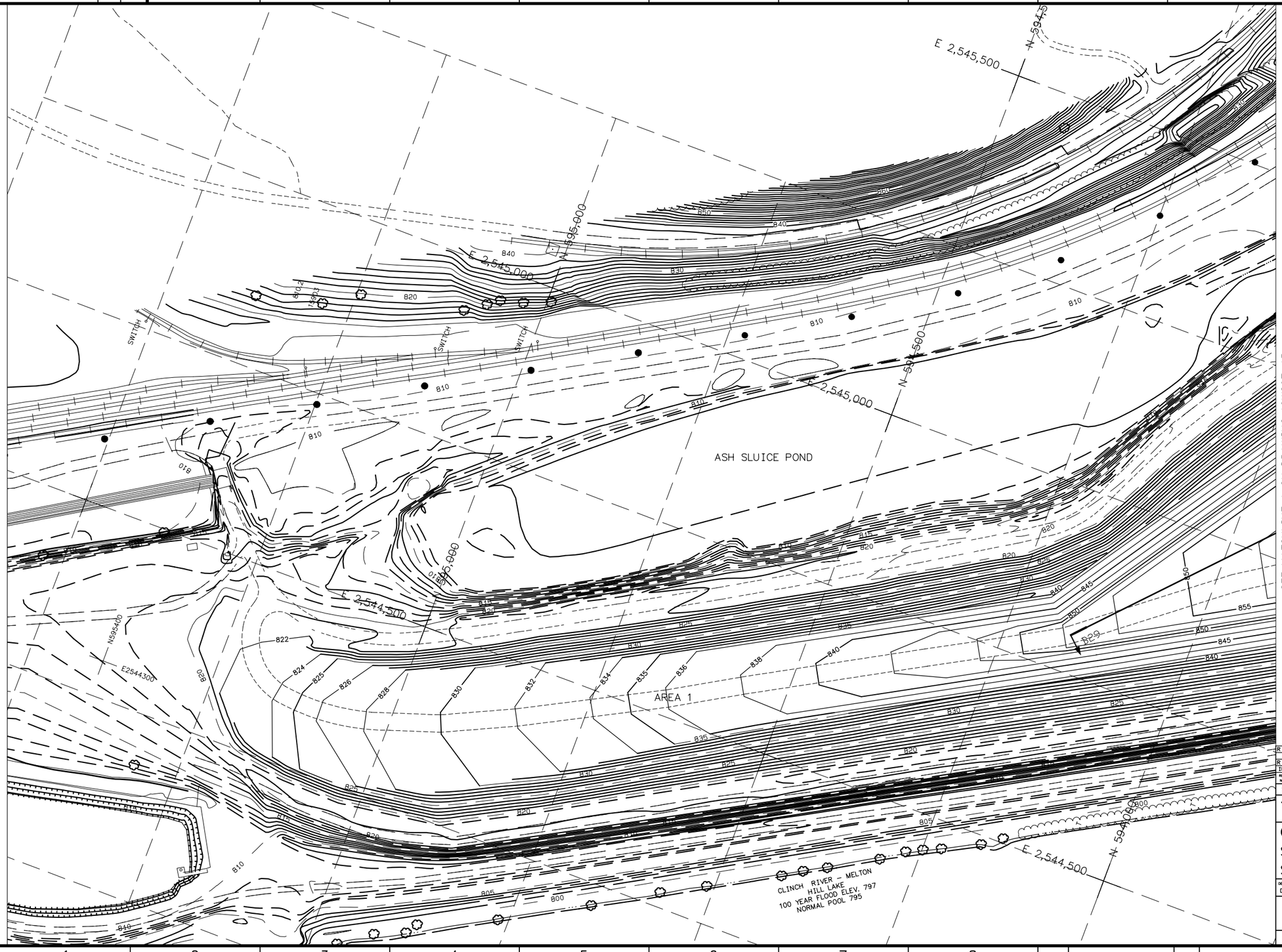
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-13	R 0

TASK COMPLETED BY: | REV NO.

PLOT FACTOR:1:50
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



STAGE 1 NOTES:

1. FOR DRAWING INDEX AND LEGEND, SEE 10W297-1.
2. FOR GENERAL NOTES, SEE 10W297-11.
3. PROVIDE A MINIMUM OF TWO (2) FEET OF FREEBOARD TO THE FINISHED DIKE ELEVATION DURING ASH DREDGING/GYPSUM PLACEMENT ACTIVITIES.
4. LOCATE METAL SPILLWAYS SO THAT THEY COINCIDE WITH PERMANENT LETDOWN CHANNELS.
5. PROPOSED CONTOUR ELEVATIONS SHOWN FOR THE OUTER 3:1 SLOPES ARE FINISHED SURFACE ELEVATIONS (INCLUDING FINAL COVER).
6. FINAL ASH/GYPSUM GRADE SHALL BE AT TWO (2) FEET PLUS OR MINUS BELOW THE ACTUAL GRADE SHOWN.
7. MAXIMUM SLOPE SHALL BE 3:1 (HORIZONTAL TO VERTICAL) FOR AREA 2A AND 4:1 FOR AREA 1
8. FOR CONSTRUCTION OF AND RAISING OF DIKES, SEE DETAIL A32 ON 10W297-32.
9. PERIMETER UNDERDRAINS WITHIN THE OUTER WET-CAST GYPSUM DIKES ARE NOT SHOWN ON THESE DRAWINGS. SEE DETAIL A32 ON 10W297-32.
10. FOR DITCH LAYOUT, SEE 10W297-36.

KEY PLAN

R											
R 0		DRS	BSB	WPT	HLP	REP	DL				D
INITIAL ISSUE											
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	

SCALE: 1" = 50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
STAGE 1
SHEET 1

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

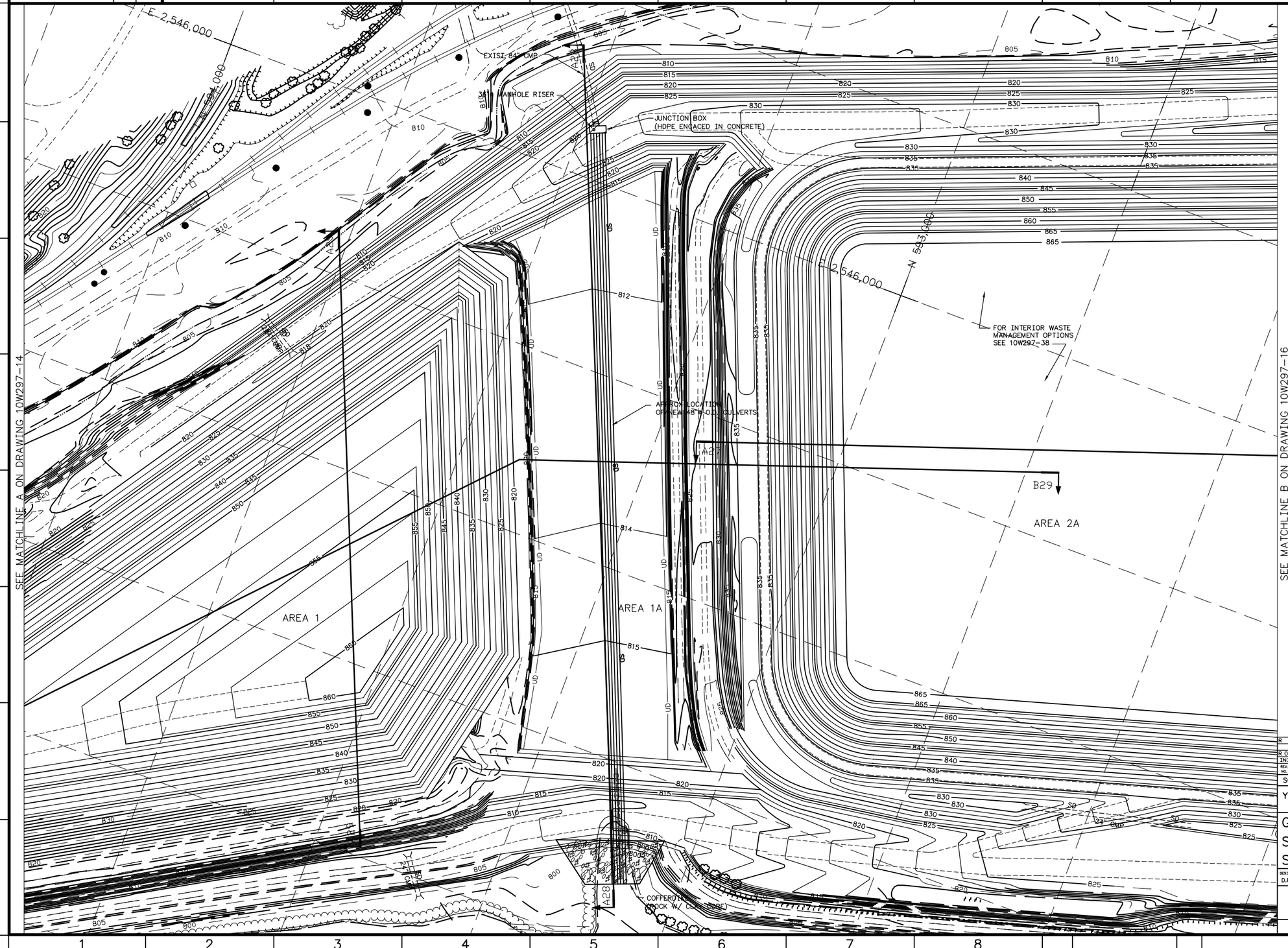
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-14	R 0

TASK COMPLETED BY: | REV NO.

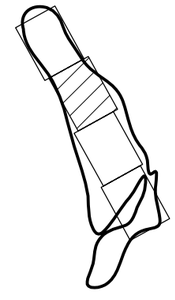
PLOT FACTOR:1:50
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



NOTES:

1. FOR GENERAL NOTES, SEE 10W297-11.
2. FOR STAGE 1 NOTES, SEE 10W297-14.



KEY PLAN

R											
R 0		DRS	BSB	WPT	HLP	REP	DL				D
INITIAL ISSUE											
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. NO.

DISCIPLINE INTERFACE

SCALE: 1" = 50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
STAGE 1
SHEET 2

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

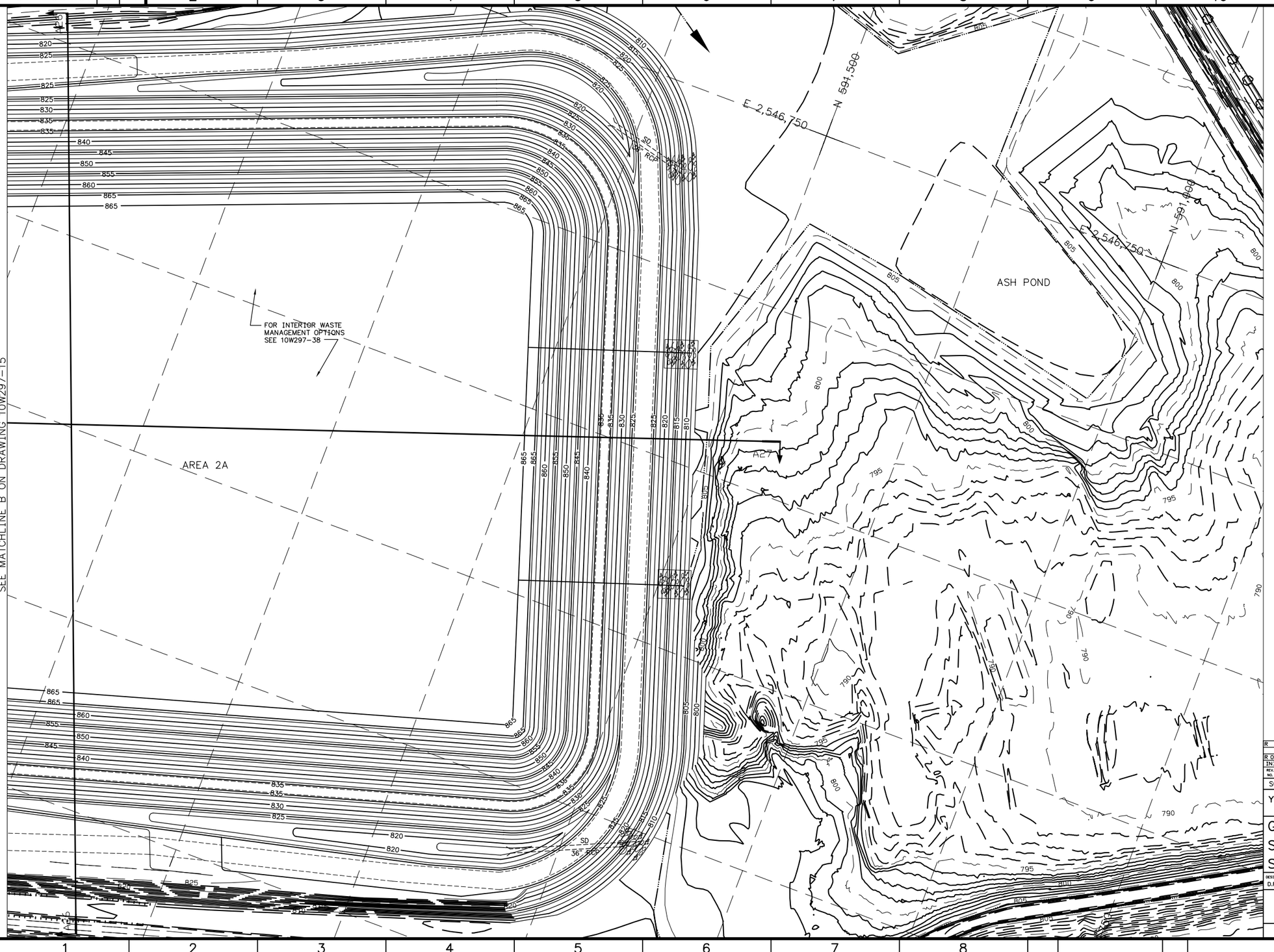
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-15	R 0

PLOT FACTOR:1:50
W_TVA

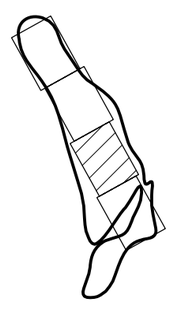
C.A.D. DRAWING
DO NOT ALTER MANUALLY

TASK COMPLETED BY:	REV NO.



NOTES:

1. FOR GENERAL NOTES, SEE 10W297-11.
2. FOR STAGE 1 NOTES, SEE 10W297-14.



KEY PLAN

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 0	INITIAL ISSUE	DRS	BSB	WPT	HLP	REP	DL			

DISCIPLINE INTERFACE

SCALE: 1" = 50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
STAGE 1
SHEET 3

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

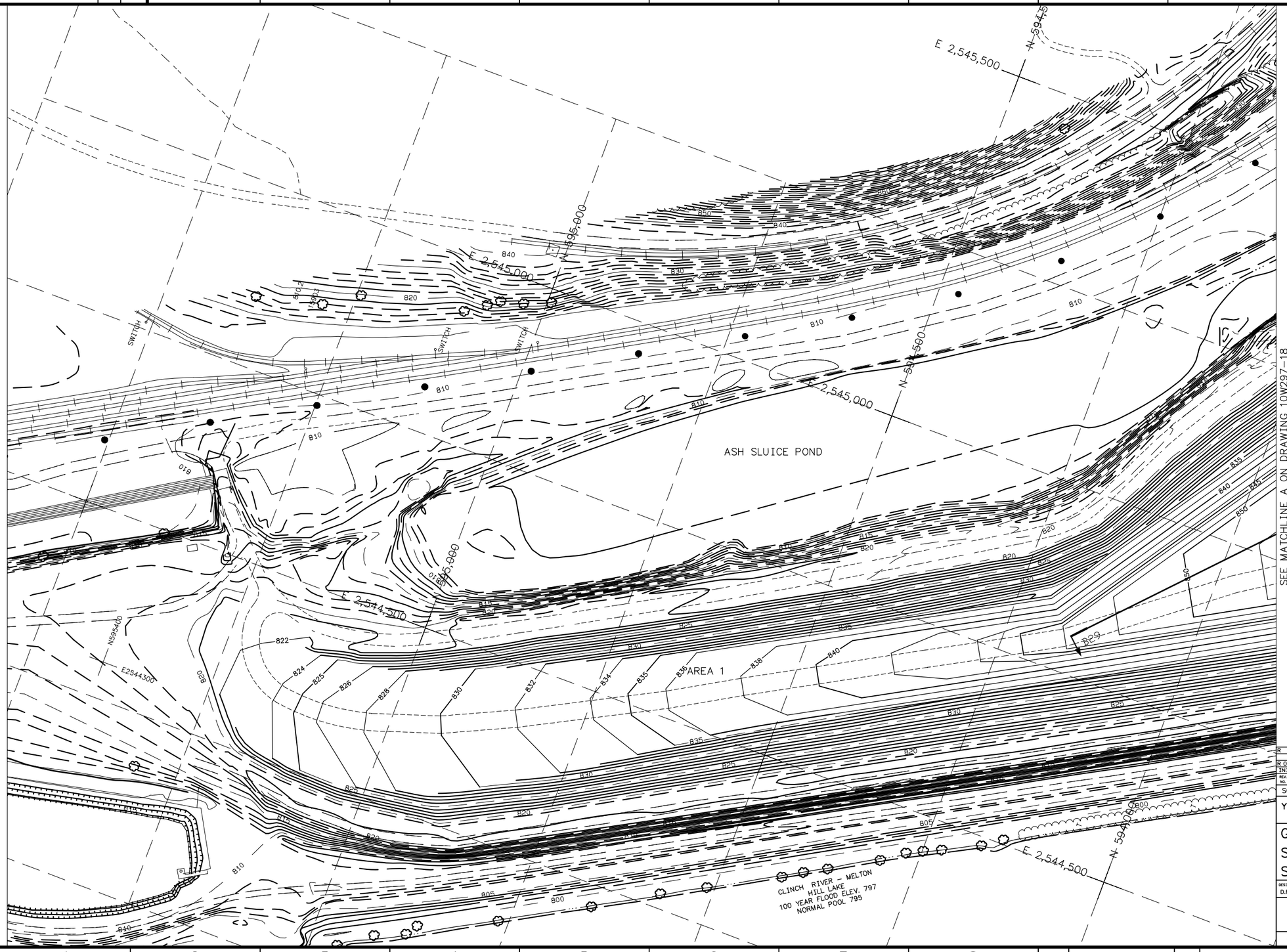
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-16	R 0

TASK COMPLETED BY: | REV NO.

PLOT FACTOR:1:50
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



STAGE 2 NOTES:

1. FOR DRAWING INDEX AND LEGEND, SEE 10W297-1.
2. FOR GENERAL NOTES, SEE 10W297-11.
3. PROVIDE A MINIMUM OF TWO (2) FEET OF FREEBOARD TO THE FINISHED DIKE ELEVATION DURING ASH DREDGING/GYPSUM PLACEMENT ACTIVITIES.
4. LOCATE METAL SPILLWAYS TO TIE INTO EXISTING METAL SPILLWAYS FOR PREVIOUS STAGE AS SHOWN ON 10W297-31.
5. PROPOSED CONTOUR ELEVATIONS SHOWN FOR THE OUTER 3:1 SLOPES ARE FINISHED SURFACE ELEVATIONS (INCLUDING FINAL COVER).
6. FINAL ASH/GYPSUM GRADE SHALL BE AT TWO (2) FEET PLUS OR MINUS BELOW THE ACTUAL GRADE SHOWN.
7. MAXIMUM SLOPE SHALL BE 3:1 (HORIZONTAL TO VERTICAL).
8. FOR CONSTRUCTION OF AND RAISING OF DIKES, SEE DETAIL A32 ON 10W297-32.
9. PERIMETER UNDERDRAINS WITHIN THE OUTER WET-CAST GYPSUM DIKES ARE NOT SHOWN ON THESE DRAWINGS. SEE DETAIL A32 ON 10W297-32.
10. FOR DITCH LAYOUT, SEE 10W297-36.

KEY PLAN

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 0		DRS	BSB	WPT	HLP	REP	DL			
	INITIAL ISSUE									

SCALE: 1" = 50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
STAGE 2
SHEET 1

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

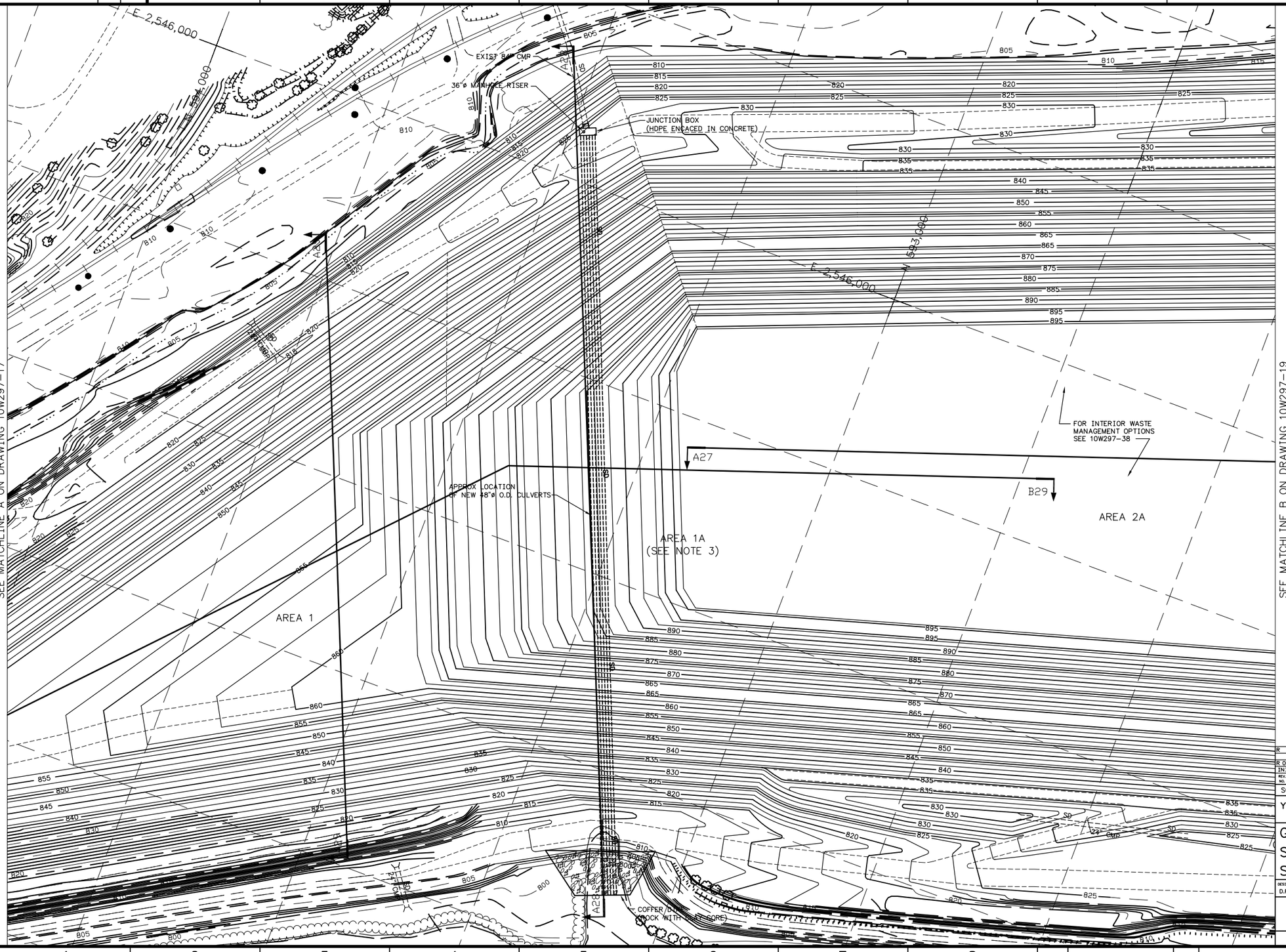
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-17	R 0

TASK COMPLETED BY: | REV NO.

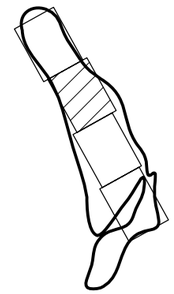
PLOT FACTOR:1:50
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



STAGE 2 NOTES:

1. FOR GENERAL NOTES, SEE 10W297-11.
2. FOR STAGE 2 NOTES, SEE 10W297-17.
3. CONTOURS IN AREA 1A ARE SHOWN ASSUMING AREA 1A FILLING IS DURING STAGE 2. THIS IS OPTIONAL.



KEY PLAN

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. NO.
R 0		DRS	BSB	WPT	HLP	REP	DL				D
INITIAL ISSUE											

SCALE: 1" = 50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
STAGE 2
SHEET 2

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

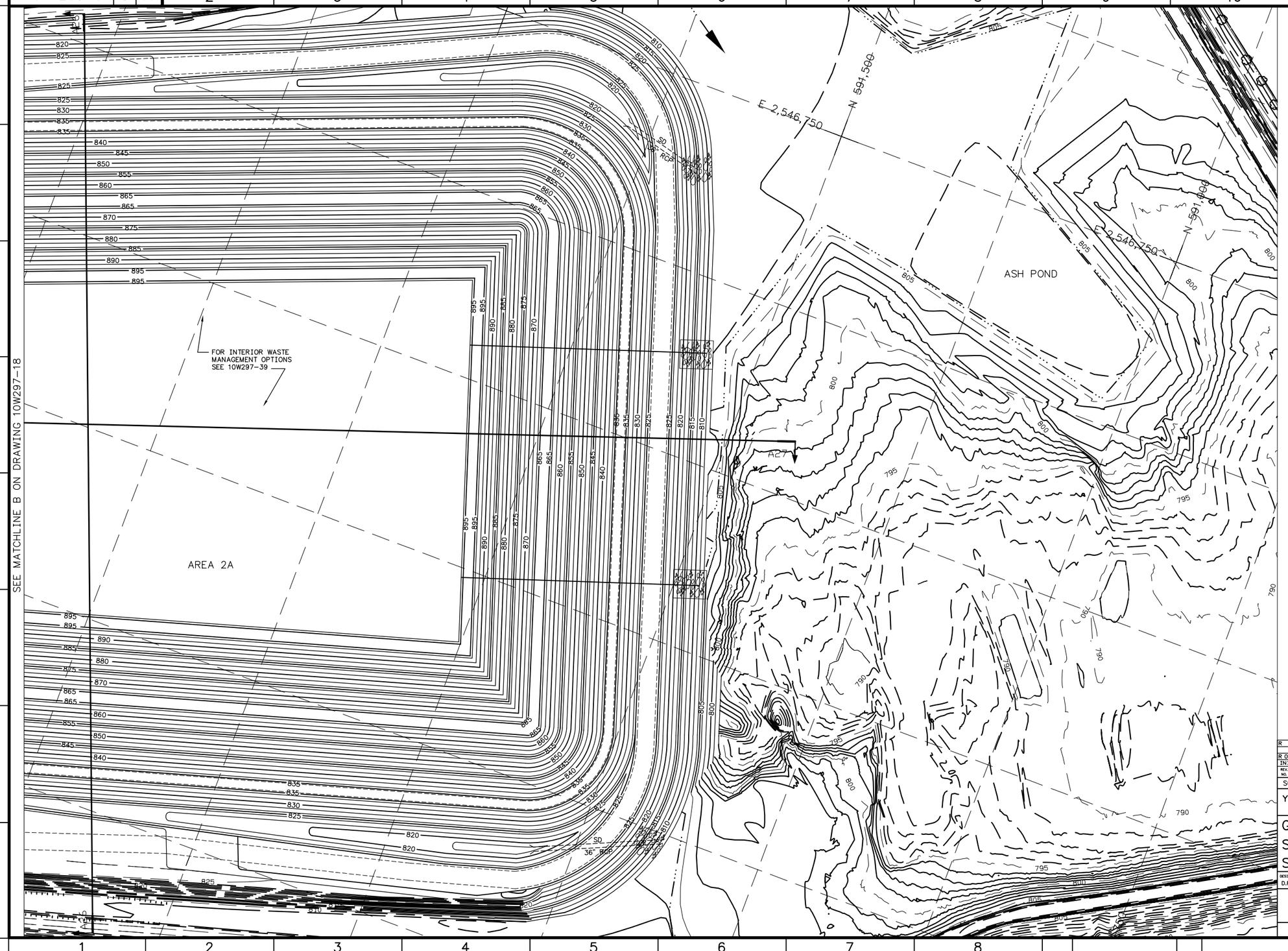
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-18	R 0

TASK COMPLETED BY: | REV NO.

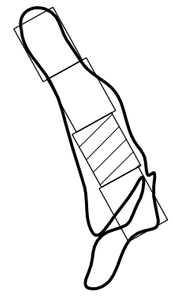
PLOT FACTOR:1:50
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



NOTES:

1. FOR GENERAL NOTES, SEE 10W297-11.
2. FOR STAGE 2 NOTES, SEE 10W297-17.



KEY PLAN

R												
R 0		DRS	BSB	WPT	HLP	REP	DL					D
INITIAL ISSUE												DISCIPLINE INTERFACE
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. NO.	
SCALE: 1" = 50'										EXCEPT AS NOTED		

YARD

GYPSUM & ASH DISPOSAL
STAGE 2
SHEET 3

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

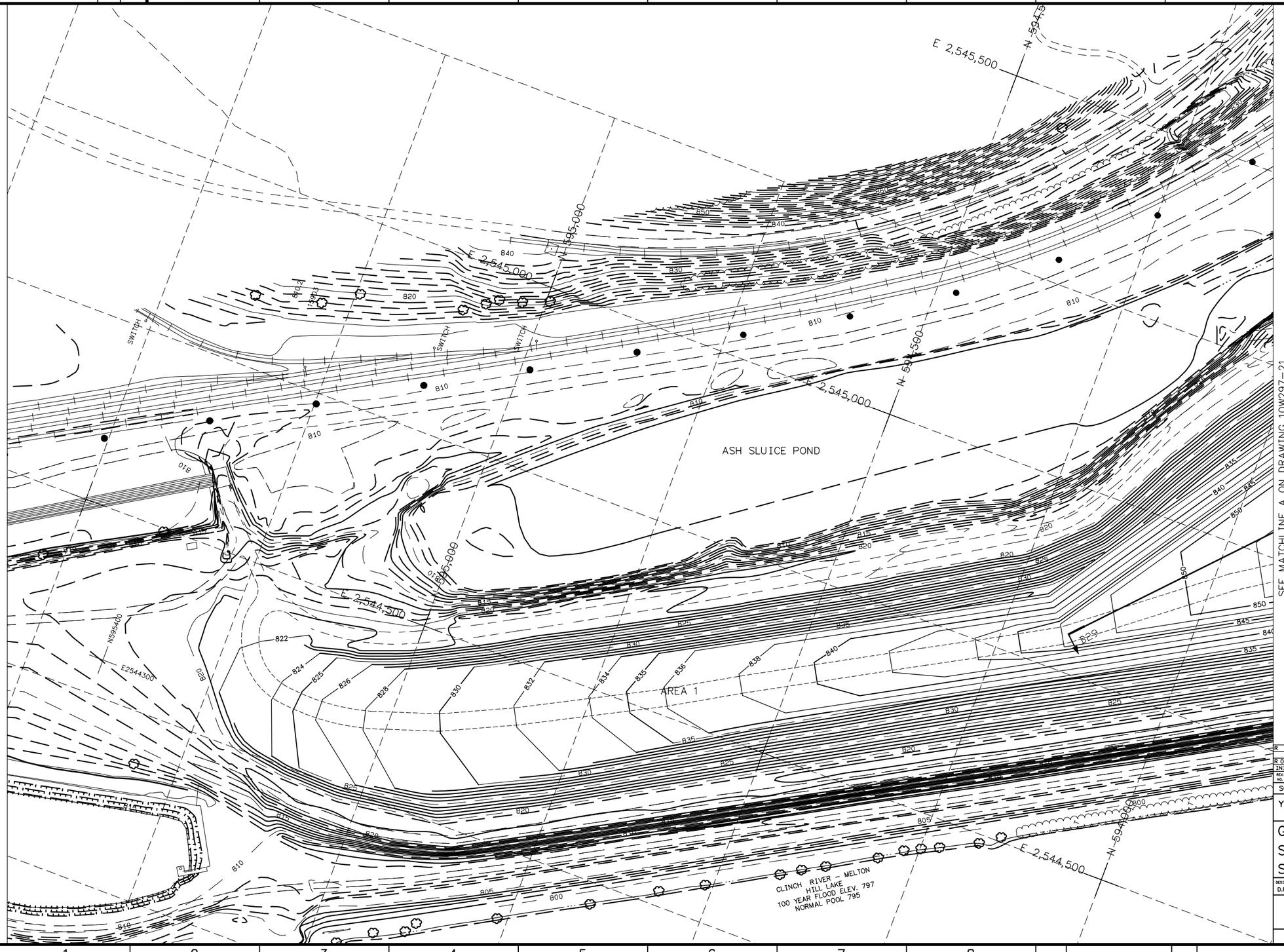
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-19	R 0

TASK COMPLETED BY:	REV NO.

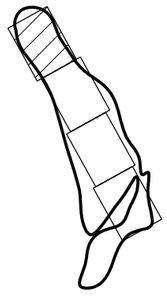
PLOT FACTOR:1:50
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



STAGE 3 NOTES:

1. FOR DRAWING INDEX AND LEGEND, SEE 10W297-1.
2. FOR GENERAL NOTES, SEE 10W297-11.
3. PROVIDE A MINIMUM OF TWO (2) FEET OF FREEBOARD TO THE FINISHED DIKE ELEVATION DURING ASH DREDGING/ GYPSUM PLACEMENT ACTIVITIES.
4. LOCATE METAL SPILLWAYS TO TIE INTO EXISTING METAL SPILLWAYS FOR PREVIOUS STAGE AS SHOWN ON 10W297-31.
5. PROPOSED CONTOUR ELEVATIONS SHOWN FOR THE OUTER 3:1 SLOPES ARE FINISHED SURFACE ELEVATIONS (INCLUDING FINAL COVER).
6. FINAL ASH/GYPSUM GRADE SHALL BE AT TWO (2) FEET PLUS OR MINUS UNDER THE ACTUAL GRADE SHOWN.
7. MAXIMUM SLOPE SHALL BE 3:1 (HORIZONTAL TO VERTICAL) FOR AREA 2A AND 4:1 FOR AREA 1.
8. FOR CONSTRUCTION OF AND RAISING OF WET CAST GYPSUM DIKES, SEE DETAIL A32 ON 10W297-32. FOR CONSTRUCTION OF AND RAISING OF ASH DIKES, SEE DETAIL A33 ON 10W297-33.
9. PERIMETER UNDERDRAINS WITHIN THE OUTER WET-CAST GYPSUM DIKES AND ASH DIKES ARE NOT SHOWN ON THESE DRAWINGS. SEE DETAIL A32 ON 10W297-32.
10. FOR DITCH LAYOUT, SEE 10W297-36.



KEY PLAN

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT IE	AS CONST	TECH. PUBS
R 0		DRS	BSB/JM	WPT	HLP	REP	DL				D
INITIAL ISSUE											DISCIPLINE INTERFACE

SCALE: 1" = 50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
STAGE 3
SHEET 1

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT/J. MILES	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

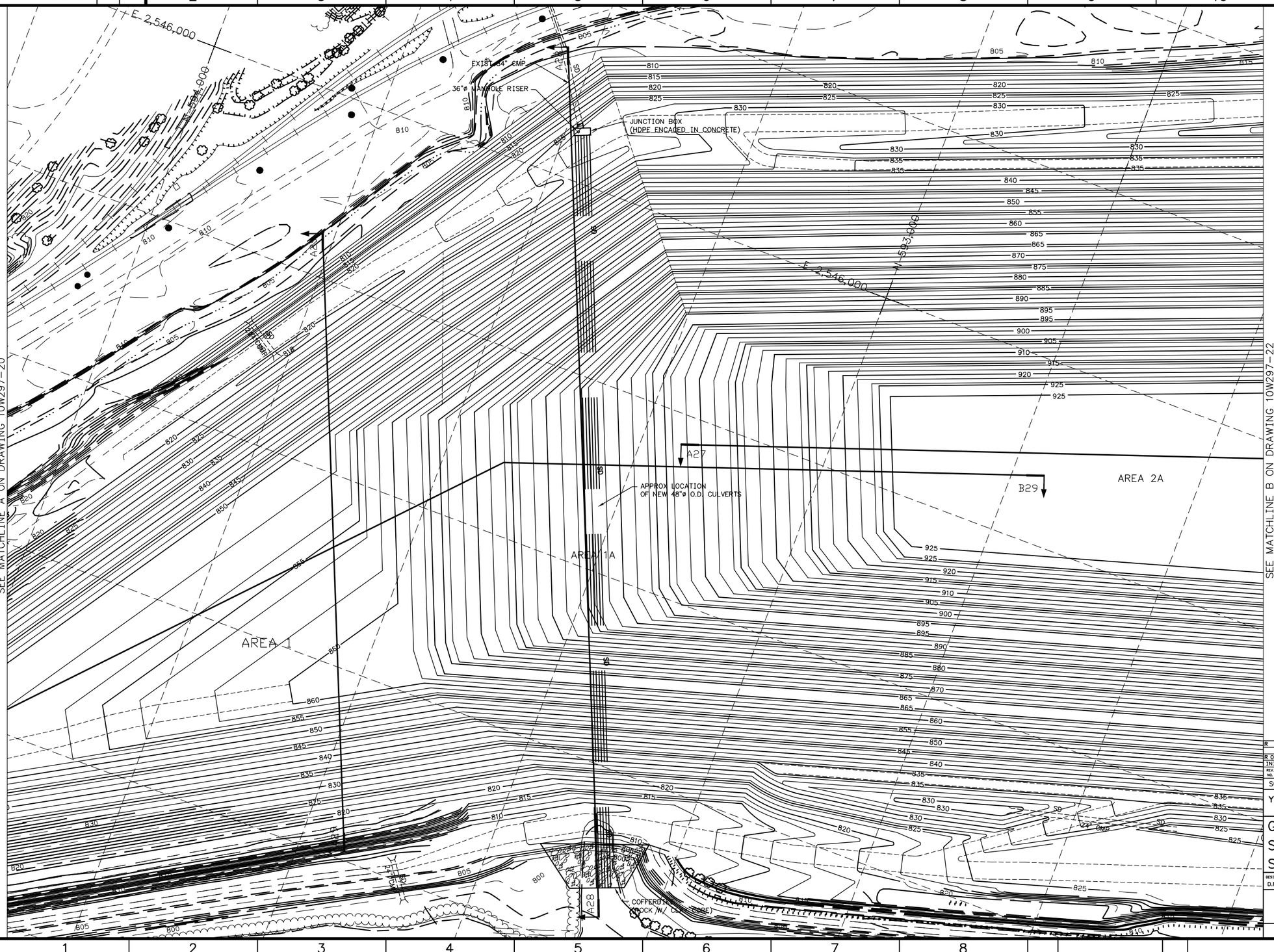
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-20	R 0

TASK COMPLETED BY: | REV NO.

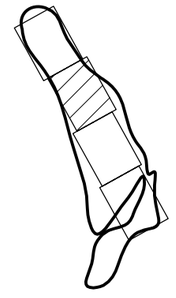
PLOT FACTOR:1:50
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



NOTES:

1. FOR GENERAL NOTES, SEE 10W297-11.
2. FOR STAGE 3 NOTES, SEE 10W297-20.



KEY PLAN

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 0		DRS	BSB	WPT	HLP	REP	DL			
INITIAL ISSUE										

SCALE: 1" = 50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
STAGE 3
SHEET 2

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

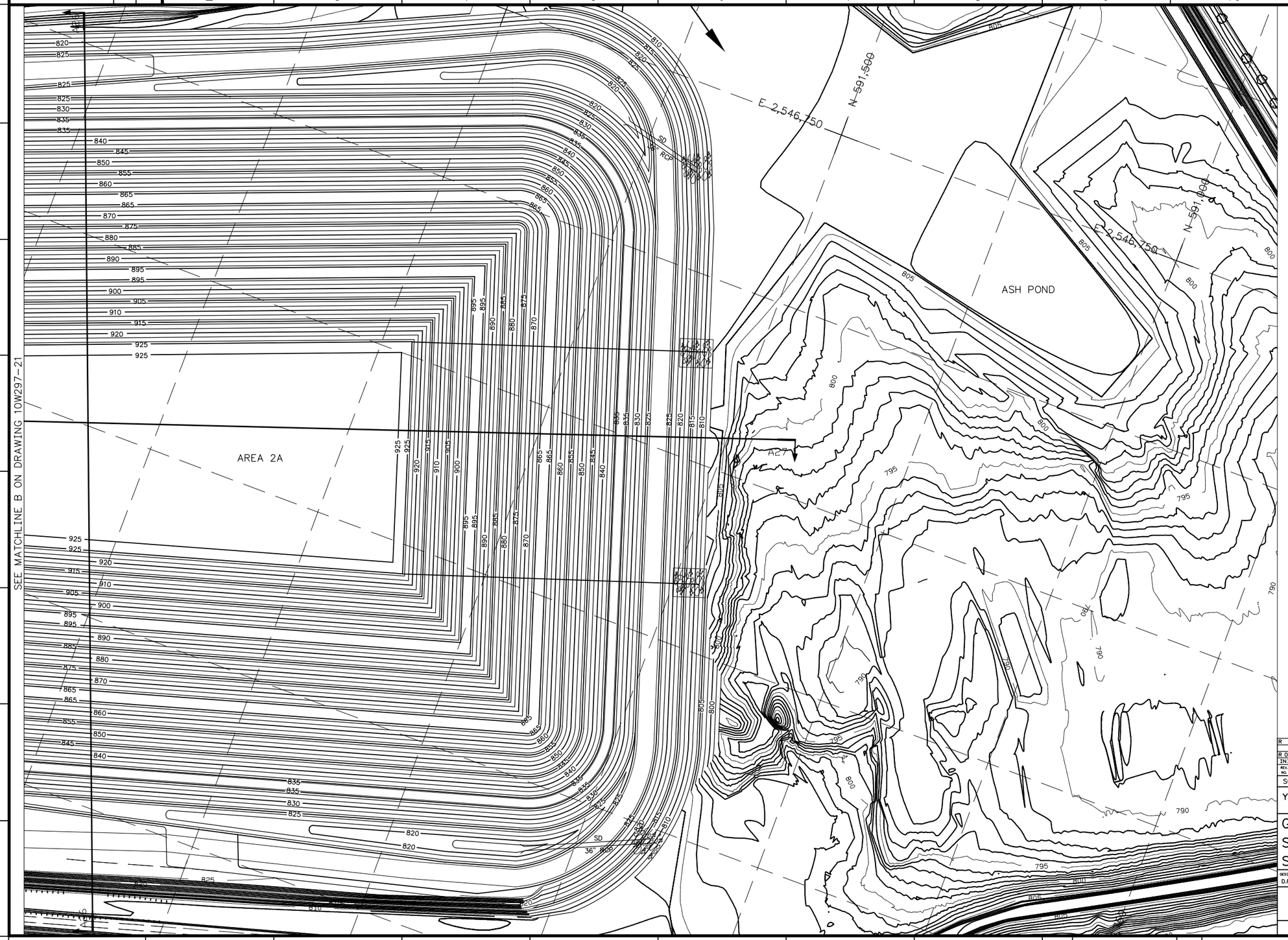
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-21	R 0

TASK COMPLETED BY: | REV NO.

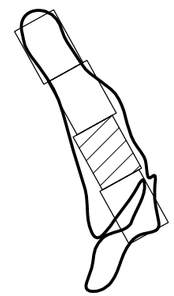
PLOT FACTOR:1:50
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



NOTES:

1. FOR GENERAL NOTES, SEE 10W297-11.
2. FOR STAGE 3 NOTES, SEE 10W297-20



KEY PLAN

R											
R 0		DRS	BSB	WPT	HLP	REP	DL				D
INITIAL ISSUE											
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	TVA 40-22

SCALE: 1" = 50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
STAGE 3
SHEET 3

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

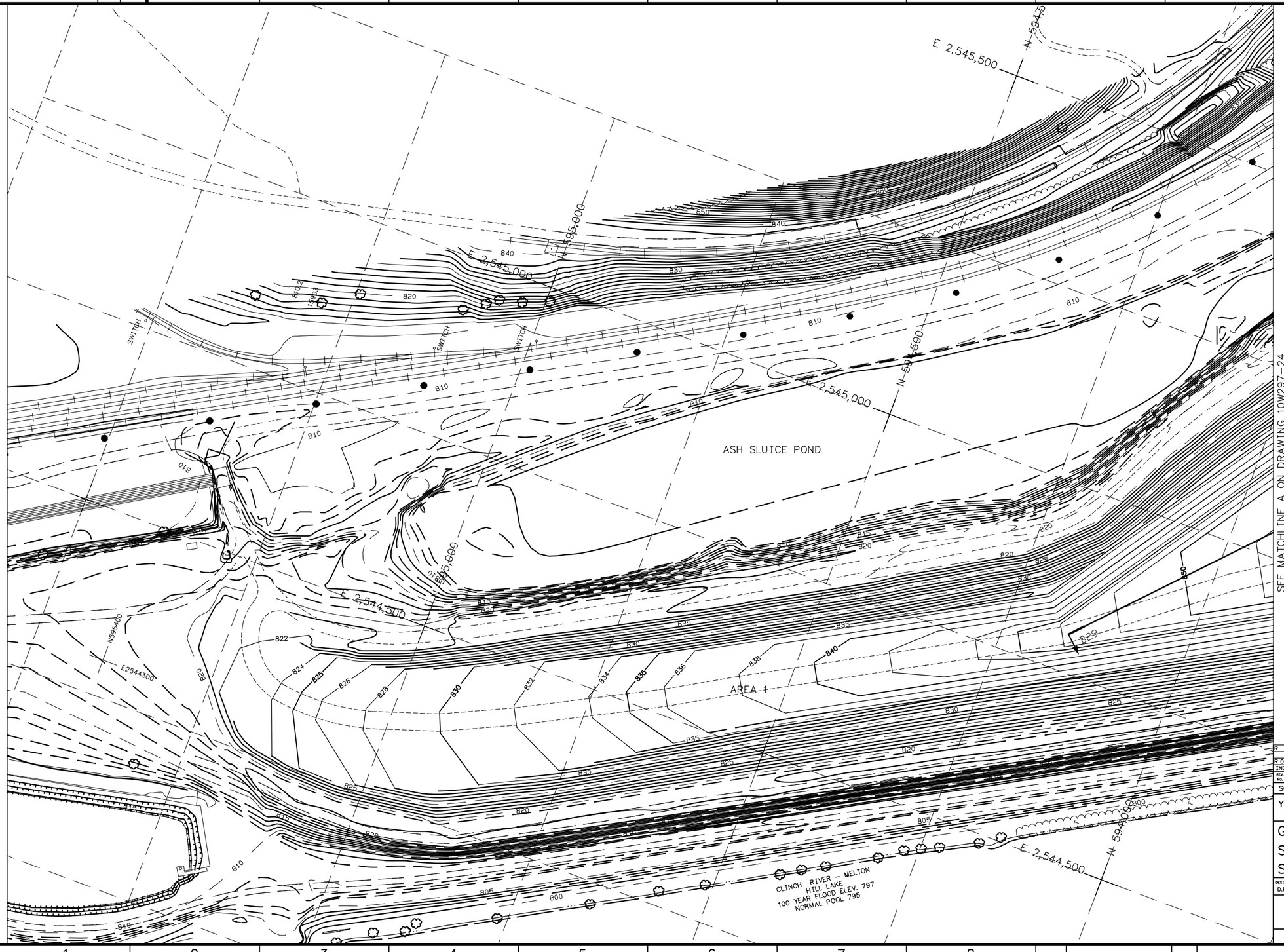
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-22	R 0

PLOT FACTOR:1:50
W_TVA

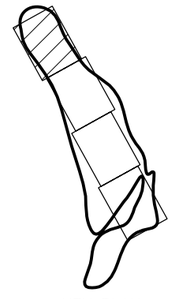
C.A.D. DRAWING
DO NOT ALTER MANUALLY

TASK COMPLETED BY:	REV NO.



STAGE 4 NOTES:

1. FOR DRAWING INDEX AND LEGEND, SEE 10W297-1.
2. FOR GENERAL NOTES, SEE 10W297-11.
3. PROVIDE A MINIMUM OF TWO (2) FEET OF FREEBOARD TO THE FINISHED DIKE ELEVATION DURING ASH DREDGING/GYPSUM PLACEMENT ACTIVITIES.
4. LOCATE METAL SPILLWAYS TO TIE INTO EXISTING METAL SPILLWAYS FOR PREVIOUS STAGE AS SHOWN ON 10W297-31.
5. PROPOSED CONTOUR ELEVATIONS SHOWN FOR THE OUTER 3:1 SLOPES ARE FINISHED SURFACE ELEVATIONS (INCLUDING FINAL COVER).
6. FINAL ASH/GYPSUM GRADE SHALL BE AT TWO (2) FEET PLUS OR MINUS UNDER THE ACTUAL GRADE SHOWN.
7. MAXIMUM SLOPE SHALL BE 3:1 (HORIZONTAL TO VERTICAL).
8. FOR CONSTRUCTION OF AND RAISING OF DIKES, SEE DETAIL A32 ON 10W297-32.
9. PERIMETER UNDERDRAINS WITHIN THE OUTER WET-CAST GYPSUM DIKES ARE NOT SHOWN ON THESE DRAWINGS. SEE DETAIL A32 ON 10W297-32.
10. CONSTRUCTION OF THE FINAL COVER SHALL BE IN ACCORDANCE WITH THE QA/QC PLAN AND SPECIFICATIONS APPENDED TO THE OPERATION PLAN.
11. FOR DITCH LAYOUT, SEE 10W297-36.



KEY PLAN

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT IE	AS CONST	DISCIPLINE INTERFACE
R 0		DRS	BSB	WPT	HLP	REP	DL				D
INITIAL ISSUE											

SCALE: 1" = 50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
STAGE 4
SHEET 1

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

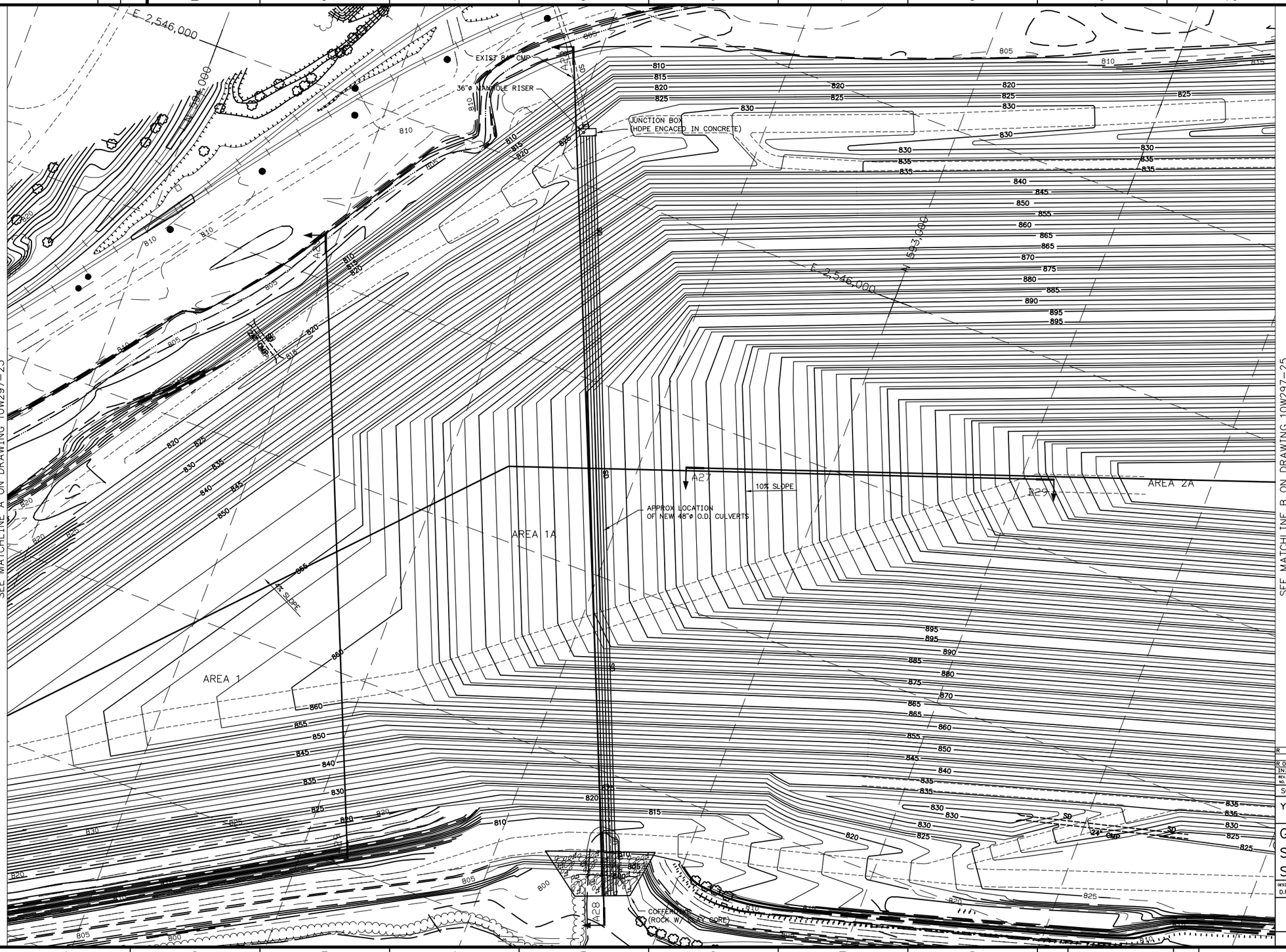
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-23	R 0

TASK COMPLETED BY: | REV NO.

PLOT FACTOR:1:50
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



NOTES:

1. FOR GENERAL NOTES, SEE 10W297-11.
2. FOR STAGE 4 NOTES, SEE 10W297-23.

KEY PLAN

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV NO.
R 0		DRS	BSB	WPT	HLP	REP	DL				D
INITIAL ISSUE											

DISCIPLINE INTERFACE

SCALE: 1" = 50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
STAGE 4
SHEET 2

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

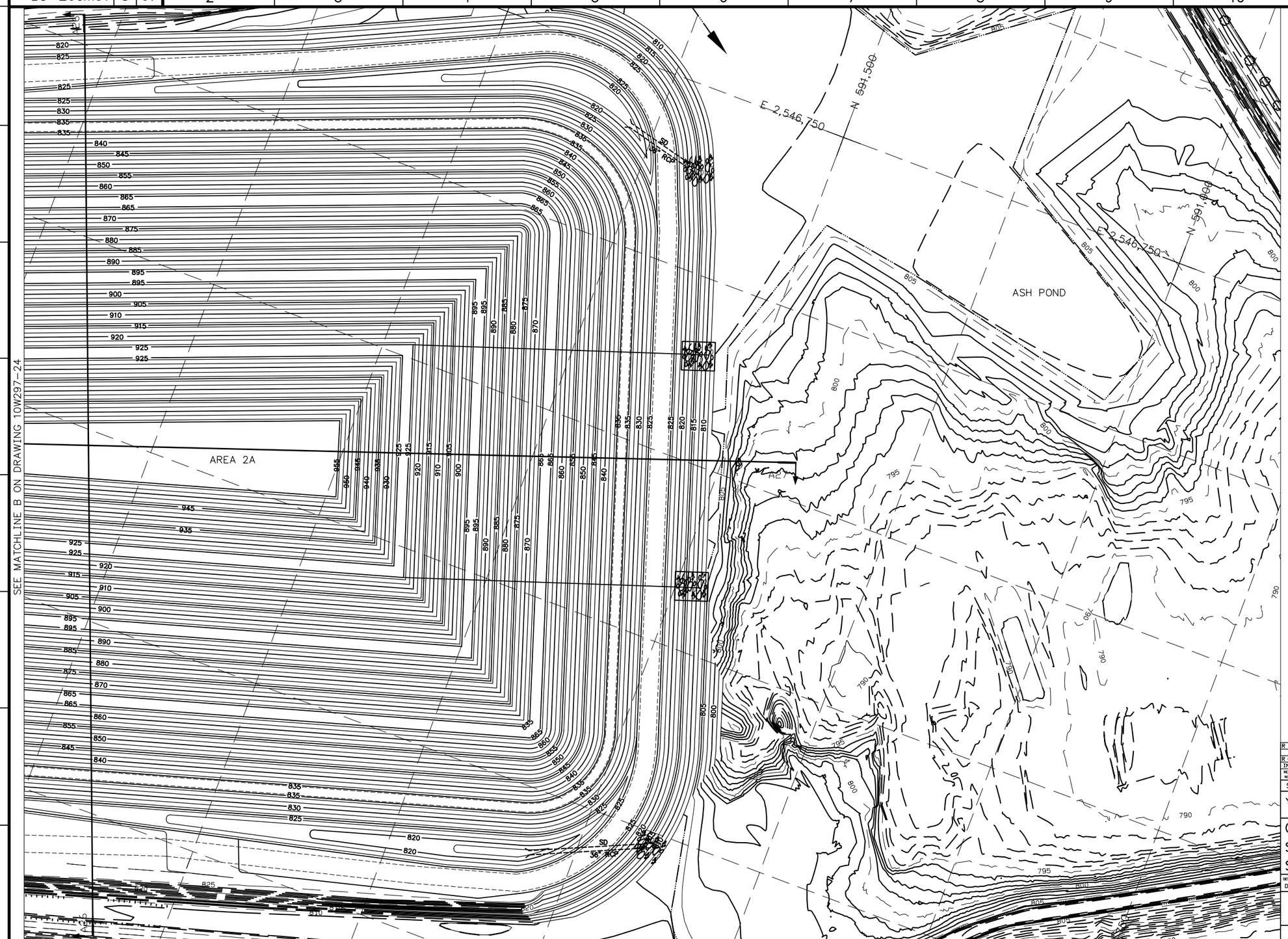
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-24	R 0

PLOT FACTOR:1:50
W_TVA

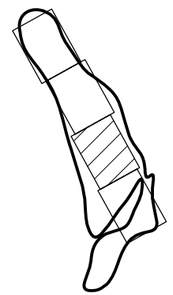
C.A.D. DRAWING
DO NOT ALTER MANUALLY

TASK COMPLETED BY:	REV NO.



NOTES:

1. FOR GENERAL NOTES, SEE 10W297-11.
2. FOR STAGE 4 NOTES, SEE 10W297-23.



KEY PLAN

R												
R 0		DRS	BSB	WPT	HLP	REP	DL					D
INITIAL ISSUE												
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. NO.	DISCIPLINE INTERFACE

SCALE: 1" = 50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
STAGE 4
SHEET 3

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

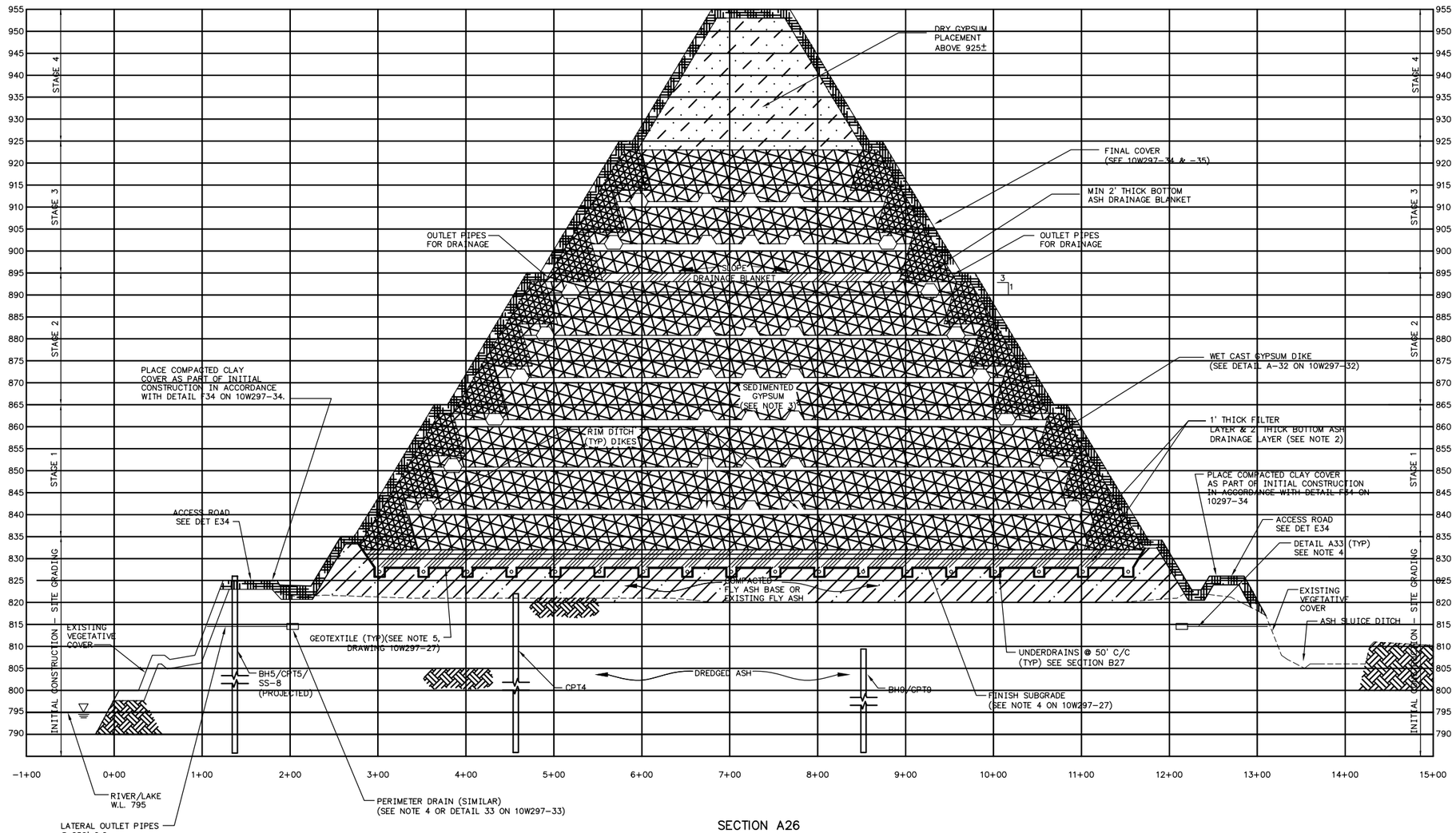
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-25	R 0

TASK COMPLETED BY:	REV NO.

PLOT FACTOR:1:50
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



SECTION A26

NOTES:

1. FOR DRAWINGS LIST AND LEGEND, SEE 10W297-1
2. FOR GENERAL NOTES, SEE 10W297-11.

NOTES FOR SECTION A26:

1. CONSTRUCT INTERIOR WET CAST DIKES IN ACCORDANCE WITH DETAIL A32 ON 10W297-32, EXCEPT THAT PERIMETER UNDERDRAIN IS NOT REQUIRED.
2. BOTTOM ASH DRAINAGE LAYER SHALL BE TOPPED WITH A 1' THICK FILTER LAYER (BOTTOM ASH/FLY ASH MIXTURE). CROWN THE DRAIN IN THE CENTER SO THAT IS DRAINS TO EITHER SIDE AS SHOWN. MAINTAIN ELEVATION HIGHER IN THE CENTER OF FACILITY. DECANT WATER FROM CELL AND PLACE WET ASH & GYPSUM INTO CELL TO OBTAIN PROPER ELEVATION PRIOR TO PLACEMENT OF BOTTOM ASH LAYER. FLY ASH & GYPSUM DISPOSAL AREAS SHOWN IN PLAN, VIEW MAY BE SUBDIVIDED AS NECESSARY TO FACILITATE SEQUENCED DRAINAGE LAYER CONSTRUCTION.
3. TWO PONDS (OPTION 1) SHOWN FOR GYPSUM DISPOSAL. FOR GYPSUM/ASH DISPOSAL, SEE WASTE DISPOSAL OPTIONS ON 10W297-38 & -39.
4. INSTALL PERIMETER UNDERDRAIN AT ELEVATION 815 (APPROXIMATELY), BY EXCAVATING A TRENCH AND INSTALLING DRAINAGE TUBING. FOR SOUTHERNMOST 300' OF EAST AND WEST DIKES, UNDERDRAIN IS SLOPED TO ELEVATION 807 TO MATCH TO SECTION A-27 ON 10W297-27.
5. KELLBERG BORING LOCATIONS NOT SHOWN FOR CLARITY.

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ENGR	AS CONST	REV BY
R 0	ISSUED FOR GYPSUM & ASH DISPOSAL	DRS	BSB	WPT	HLP	REP	DL				

DISCIPLINE INTERFACE

SCALE: HORIZONTAL: 1"=50' VERTICAL: 1"=10' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
AREA 2A
SECTIONS

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

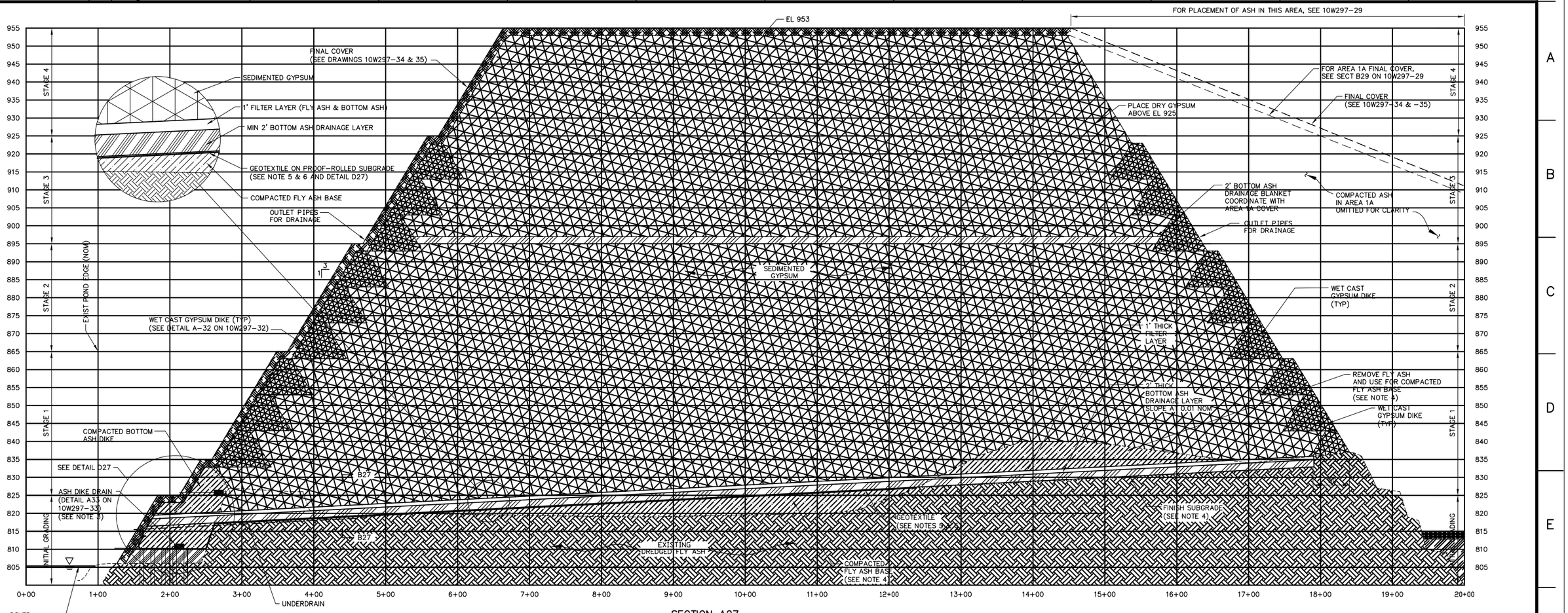
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-26	R 0

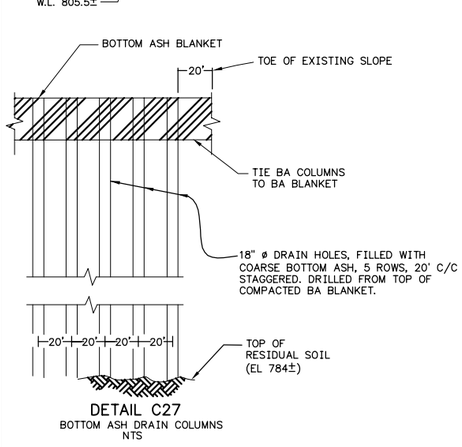
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:1200
W_TVA

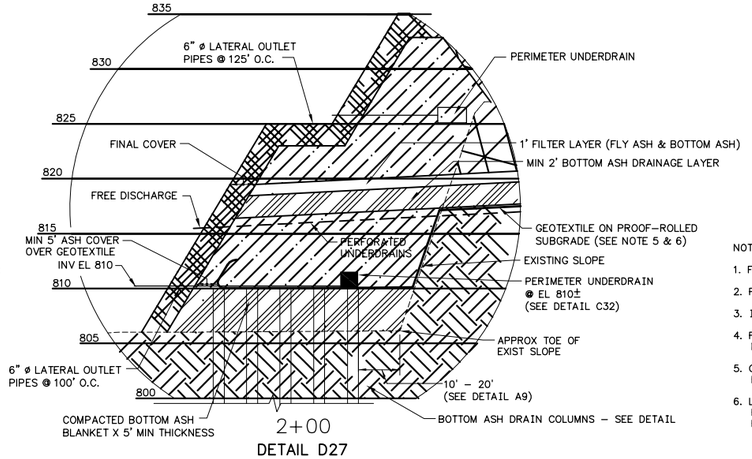
C.A.D. DRAWING
DO NOT ALTER MANUALLY



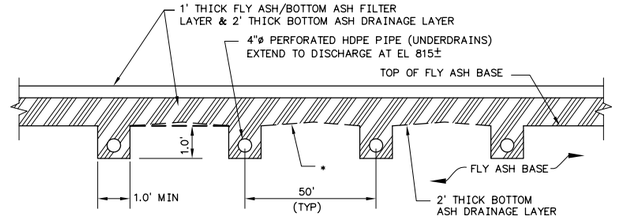
SECTION A27



DETAIL C27
BOTTOM ASH DRAIN COLUMNS
NTS



DETAIL D27
NTS



* MOUNDING (TRANSVERSE) OF 0.5' IS DESIRABLE.
ZERO (0) MOUNDING IS MINIMUM.

SECTION B27
NTS

NOTES FOR SECTION A-27:

1. FOR DRAWING LIST AND LEGEND, SEE 10W297-1.
2. FOR GENERAL NOTES, SEE 10W297-11. 2. 3.
3. INSTALL LATERAL DRAINS IN ACCORDANCE WITH DETAIL C33 AT THE ELEVATIONS SHOWN ON 10W297-26 & 27.
4. FINISH SUBGRADE ELEVATIONS SHOWN MAY BE LOWERED BY UP TO 2' IF INSUFFICIENT ASH IS AVAILABLE TO GRADE AS SHOWN. MAINTAIN N-S SUBGRADE SLOPE BETWEEN .008 & 012.
5. GEOTEXTILE SHALL BE HIGH TENACITY POLESTER, COMTRAC 300.70 BY HUESKER, INC., GEDON HS1715 BY MIRAFI, OR EQUAL. EXTEND 650' FROM SOUTH TOE WITHOUT END JOINT, MACHINE DIRECTION RUNS NORTH-SOUTH. LAP SIDE JOINTS 1.5' MIN.
6. LONG TERM DESIGN STRENGTH (LTDS) IN MACHINE DIRECTION SHALL BE 650 lb/in MINIMUM AFTER REDUCTION FOR ALL APPLICABLE FACTORS OF SAFETY PER AASHTO CRITERIA. FACTORS OF SAFETY SHALL BE DETERMINED BY MATERIAL MANUFACTURERS THROUGH PRODUCT SPECIFIC TESTING AND DATA SHEETS SUBMITTED FOR APPROVAL.

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	DISCIPLINE INTERFACE
R											
R 0		DRS	BSB	WPT	HLP	REP	DL				

ISSUED FOR GYPSUM & ASH DISPOSAL

SCALE: HORIZONTAL: 1"=50' VERTICAL: 1"=10' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
AREA 2A
SECTIONS

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-27	R 0

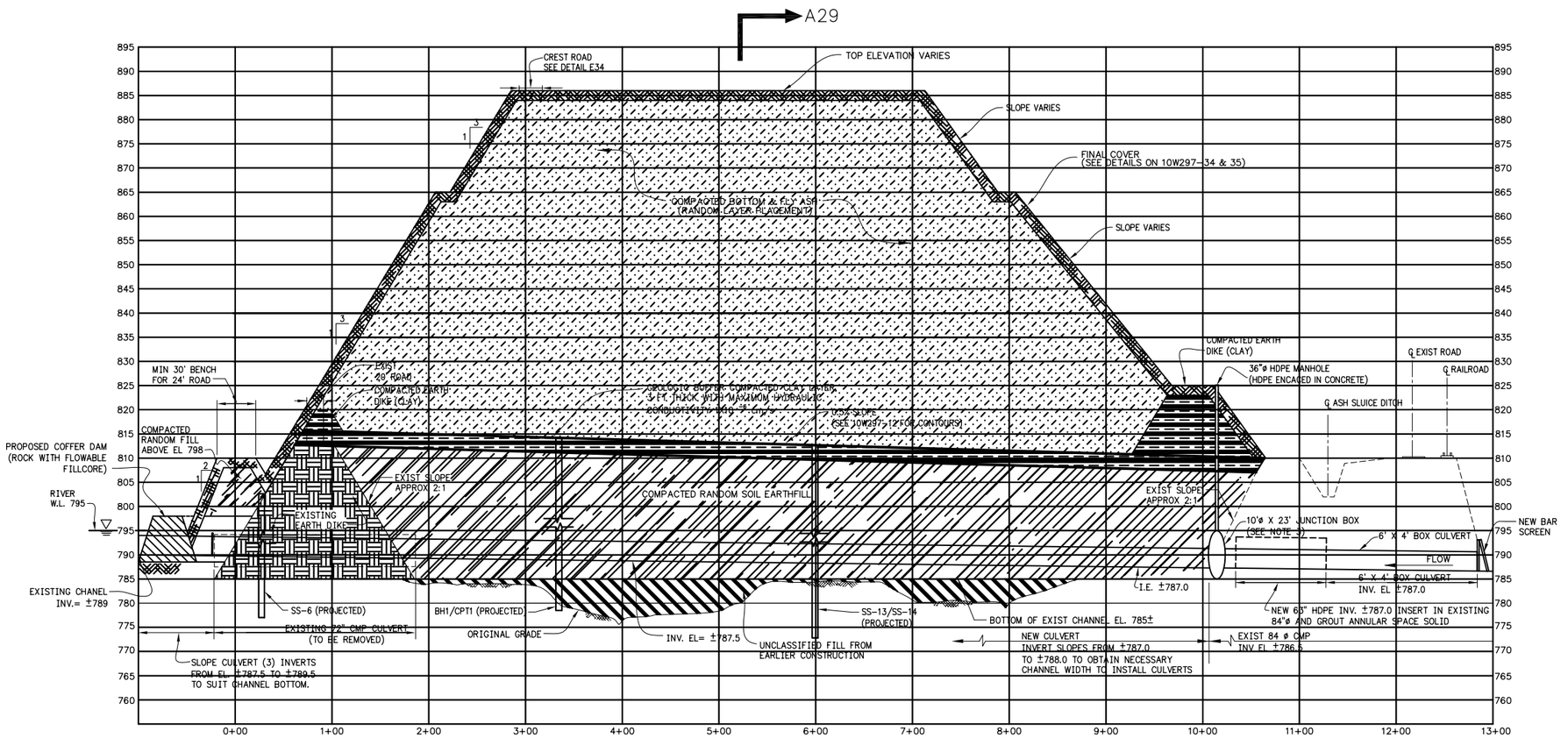
PLOT FACTOR:1200
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

TASK COMPLETED BY:	REV NO.

NOTES:

1. FOR DRAWING LIST AND LEGEND, SEE 10W297-1.
2. FOR GENERAL NOTES, SEE 10W297-11.
3. HDPE JUNCTION BOX AT 10= FT. I.D. SHALL BE REINFORCED INTERNALLY BY THE FABRICATOR TO WITHSTAND EARTH LOADS AND HYDROSTATIC PRESSURE. PARTIAL OR FULLY ENCASEMENT IN CONCRETE WILL BE PROVIDED IF STUDIES INDICATE JUSTIFICATION.



SECTION A28

R													
R 0		DRS	BSB	WPT	HLP	REP	DL						DISCIPLINE INTERFACE
ISSUED FOR GYPSUM & ASH DISPOSAL													
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	FIELD CH		

SCALE: HORIZONTAL: 1"=50' VERTICAL: 1"=10' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
AREA 1A
SECTIONS

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

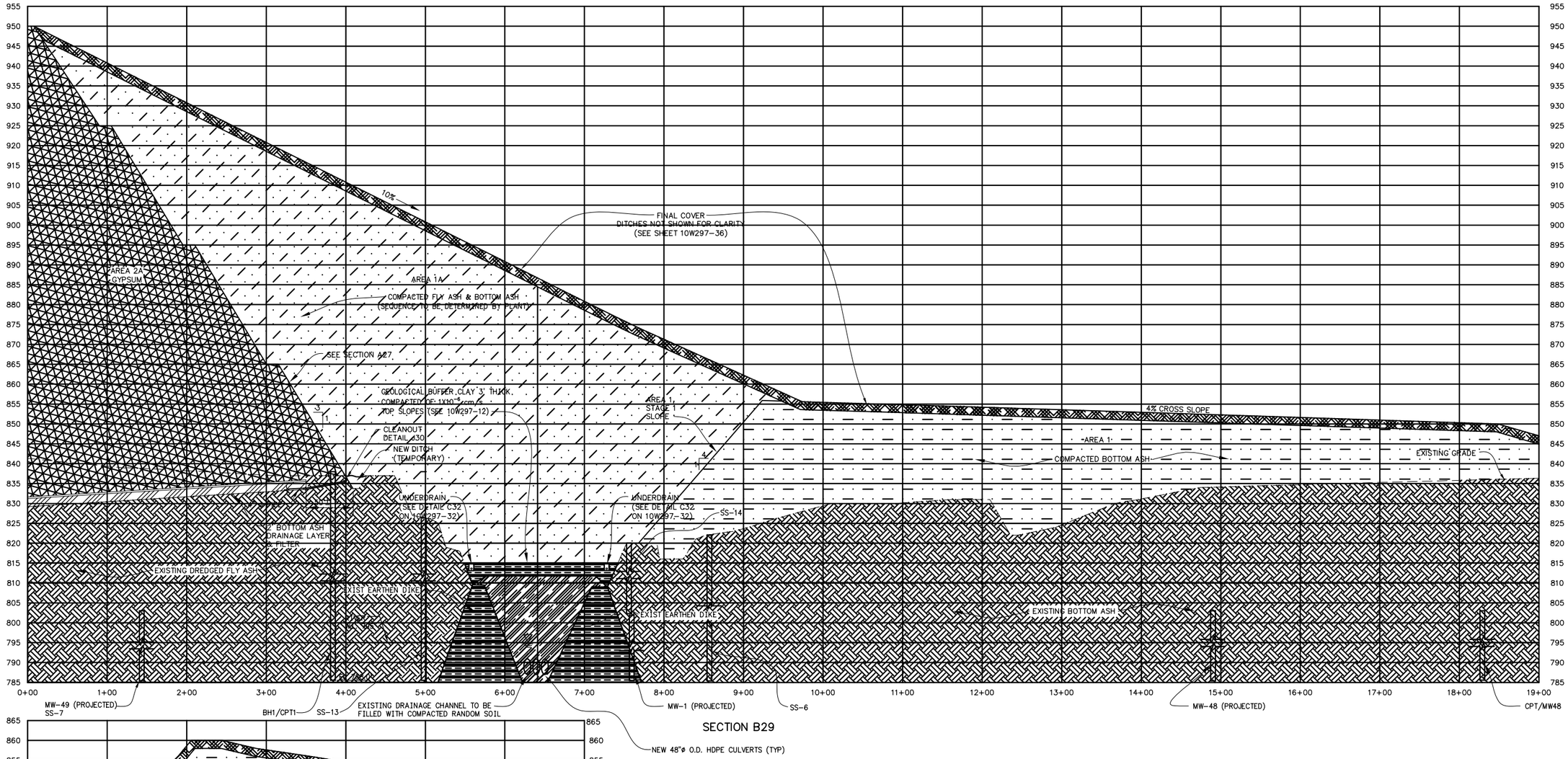
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-28	R 0

TASK COMPLETED BY: | REV NO.

PLOT FACTOR:50
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



NOTES:

1. FOR DRAWINGS LIST AND LEGEND SEE 10W297-1
2. FOR GENERAL NOTES SEE 10W297-11

R												
R 0		DRS	BSB	WPT	HLP	REP	DL					DISCIPLINE INTERFACE
ISSUED FOR GYPSUM & ASH DISPOSAL												
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT SE	AS CONST	REV. NO.	

SCALE: HORIZONTAL: 1"=50' VERTICAL: 1"=10' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
AREAS 1 & 1A
SECTIONS

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

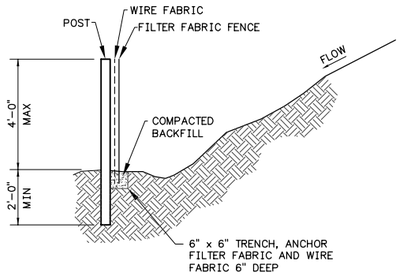
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-29	R 0

TASK COMPLETED BY: | REV NO.

PLOT FACTOR:1200
W_TVA

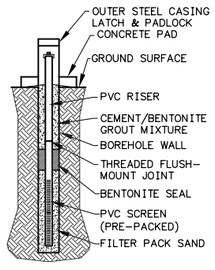
C.A.D. DRAWING
DO NOT ALTER MANUALLY



DETAIL A30
TEMPORARY SILT FENCE

TEMPORARY SILT FENCE NOTES:

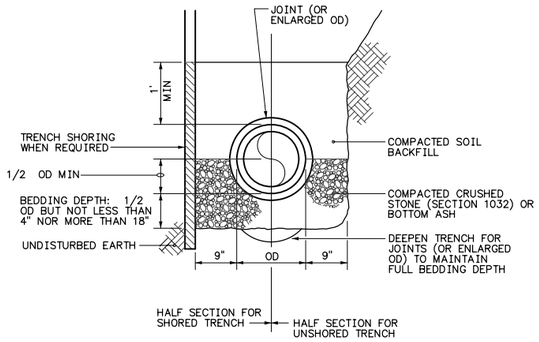
1. FILTER FABRIC FENCE TO BE PLACED PRIOR TO THE START OF ROUGH GRADING.
2. STEEL POSTS SHALL BE METAL "T" POSTS – 6'–0" LONG.
3. WOOD POSTS SHALL BE 2" x 2" NOMINAL OR LARGER (CCA TREATED).
4. POSTS SHALL BE PLACED AT 5' INTERVALS MAX.
5. WIRE FABRIC AND FILTER FABRIC SHALL BE SECURELY BOUND TO POSTS WITH EITHER STAPLES OR WIRE TIES. SUBCONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING
6. CONDITION OF FILTER FABRIC FENCE IN A CONDITION THAT IS SATISFACTORY UNTIL FINAL ACCEPTANCE OF WORK. FILTER FABRIC SHALL BE A CLASS A FABRIC IN ACCORDANCE
7. WITH TVA SPECIFICATION T–1, SECTION 571.



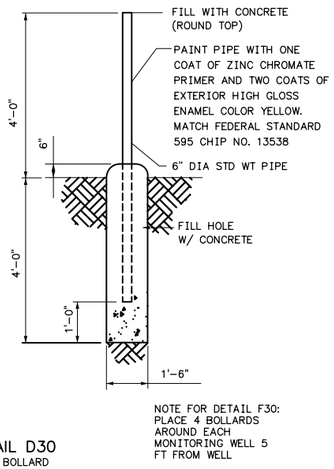
DETAIL B30
TYPICAL PVC MONITORING WELL

TYPICAL PVC MONITORING WELL NOTES:

1. MONITORING WELL INSTALLATION RECORDS ARE CONTAINED IN THE HYDROGEOLOGICAL REPORT APPENDED TO THE OPERATIONS PLAN.
2. INSTALL BOLLARDS AS SHOWN ON DETAIL D30.



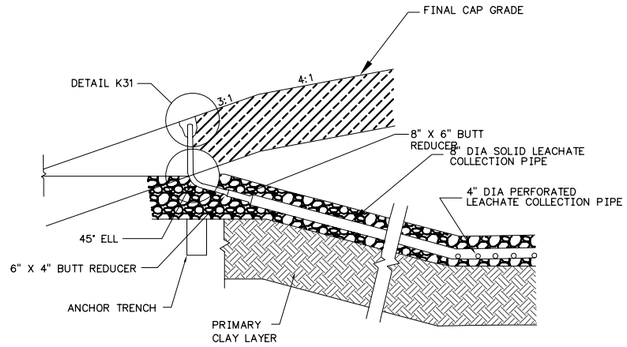
DETAIL C30
CLASS "B" PIPE BEDDING



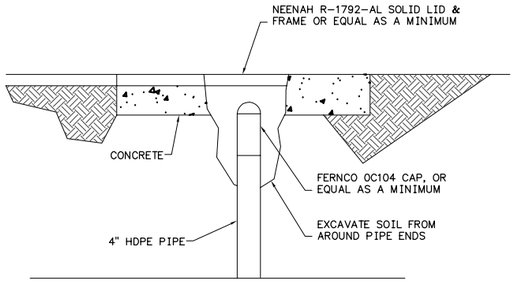
DETAIL D30
PIPE BOLLARD

NOTES:

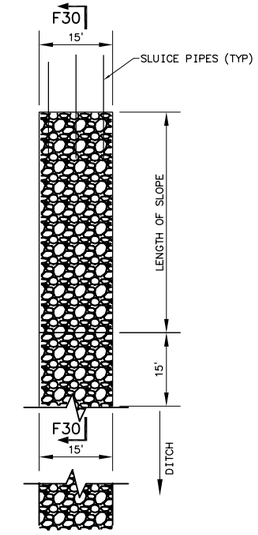
1. FOR DRAWINGS LIST AND LEGEND, SEE 10W297–1
2. FOR GENERAL NOTES, SEE 10W297–11



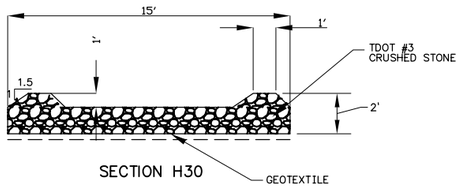
DETAIL J30
COLLECTION PIPE CLEANOUT



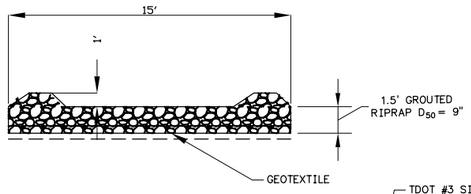
DETAIL K31
CLEANOUT ACCESS COVER



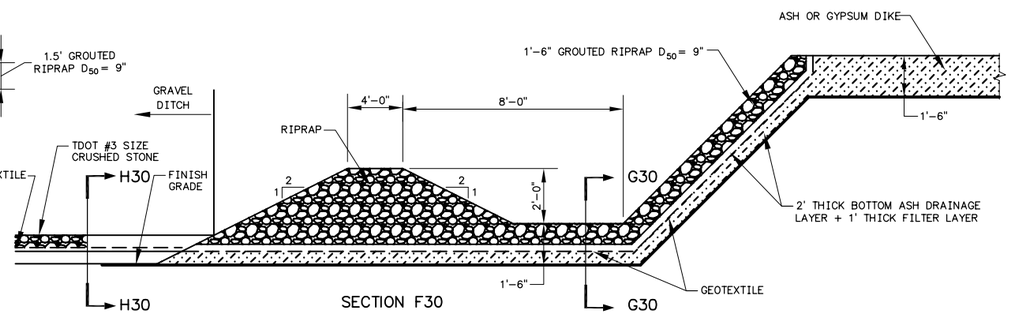
DETAIL E30
EROSION PROTECTION FOR SUBGRADE



SECTION H30



SECTION G30



SECTION F30

R

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV NO.
R 0		DRS	JLM	WPT	HLP	REP	DL				D
ISSUED FOR GYPSUM & ASH DISPOSAL											DISCIPLINE INTERFACE

SCALE: NOT TO SCALE EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL MISCELLANOUS DETAILS SHEET 1

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	J.L. MILES	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

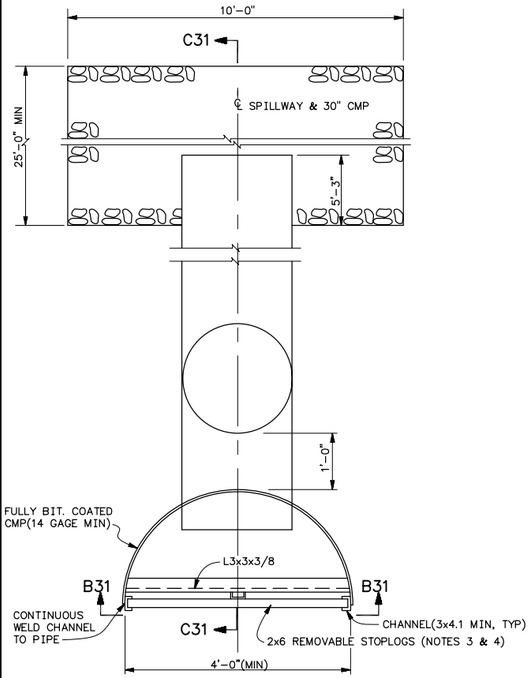
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297–30	R 0

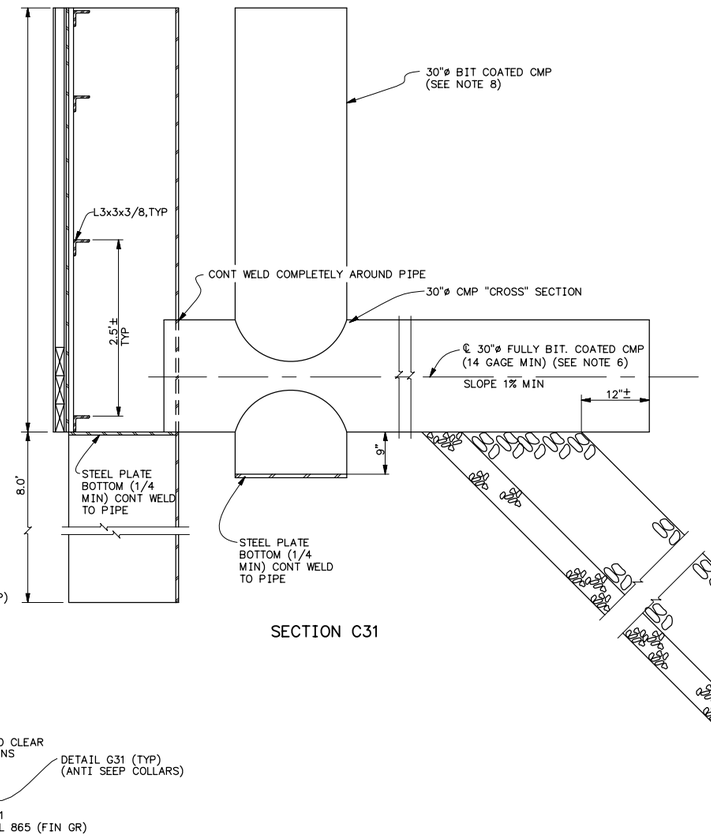
TASK COMPLETED BY: REV NO.

PLOT FACTOR: 48
W_TVA

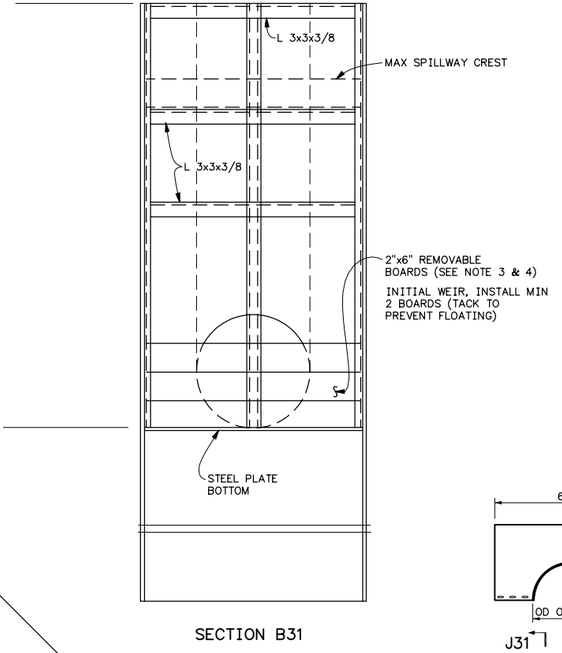
C.A.D. DRAWING DO NOT ALTER MANUALLY



DETAIL A31
PLAN–METAL SPILLWAY



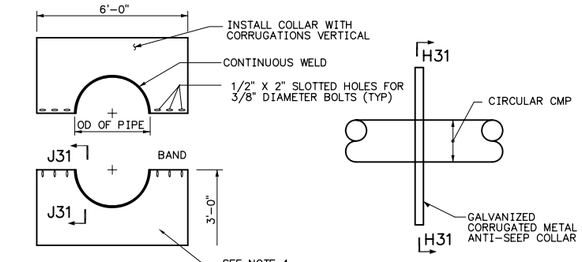
SECTION C31



SECTION B31

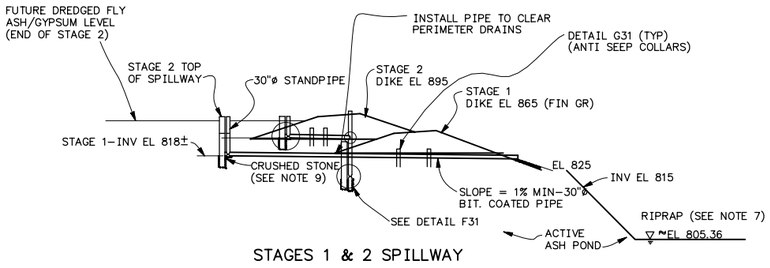
SPILLWAY NOTES:

1. FOR DRAWING LIST AND LEGEND, SEE 10W297–1
2. FOR GENERAL NOTES, SEE 10W297–11
3. ALL TIMBER STOPLOGS SHALL BE SOUTHERN PINE NO. 2 DENSE SELECT TIMBER.
4. ALL WOOD SHALL BE PRESSURE TREATED WITH 0.4–0.6 POUNDS OF PRESERVATIVE PER CUBIC FOOT OF WOOD. THE PRESERVATIVE SHALL BE WOLMAN PRESERVATIVE CCA BY KOPPERS OR EQUAL. SYNTHETIC MATERIALS (I.E. HDPE) MAY BE USED IN LIEU OF TIMBER STOPLOGS. MATERIAL SELECTION SELECTION BY TVA FES.
5. ALL NAILS SHALL BE GALVANIZED.
6. 30 INCH CORRUGATED METAL PIPE SHALL BE FULLY BITUMINOUS COATED AND 14 GAGE (MIN) THICKNESS.
7. RIPRAP SHALL CONSIST OF 50 % OF THE STONES WEIGHING 100 LBS EACH OR GREATER, PER SECTION 575.
8. 30 INCH CROSS SECTION AND STANDPIPE NOT REQUIRED FOR STAGE 4 SPILLWAY.
9. A 6' x 6' HOLE SHALL BE EXCAVATED TO A DEPTH OF 8' FOR PLACEMENT OF THE 48" HALF–PIPE, THE AREA IS TO BE BACKFILLED WITH 1032 CRUSHED STONE AND COMPACTED UNTIL A STABLE BASE IS ACHIEVED.

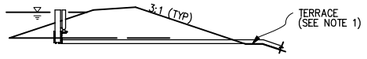


SECTION H31

DETAIL G31
CORRUGATED METAL ANTI–SEEP COLLAR



STAGES 1 & 2 SPILLWAY



DETAIL K31
OPTIONAL METAL SPILLWAY CONFIGURATION

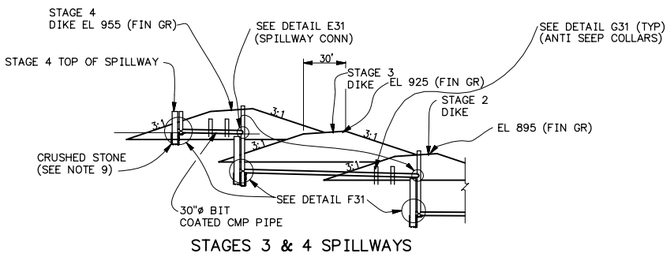
NOTE:

1. DO NOT USE THIS DETAIL WHERE VEHICLE TRAFFIC MUST TRAVEL ON TERRACE.

SECTION J31

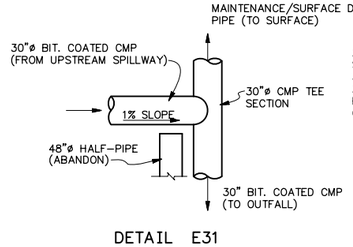
METAL COLLARS NOTES:

1. UNASSEMBLED COLLARS SHALL BE MARKED BY PAINTING OR TAGGING TO IDENTIFY MATCHING PAIRS.
2. THE LAP BETWEEN THE TWO HALF SECTIONS INCLUDING BOLTS AND BETWEEN THE PIPE AND CONNECTING BAND SHALL BE CAULKED WITH ASPHALT MASTIC AT TIME OF INSTALLATION.
3. EACH COLLAR SHALL BE FURNISHED WITH TWO 1/2 " DIA RODS WITH STANDARD TANK LUGS FOR CONNECTING COLLARS TO PIPE.
4. CONTRACTOR MAY CONSTRUCT ANTI–SEEP COLLARS USING 1 FT THICK CONCRETE, 3,000 PSI MIN., TO THE SAME DIMENSIONS SHOWN.

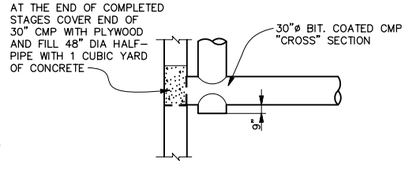


STAGES 3 & 4 SPILLWAYS

DETAIL D31
METAL SPILLWAY STAGED CONSTRUCTION
(SEE OPTIONAL DETAIL K31)



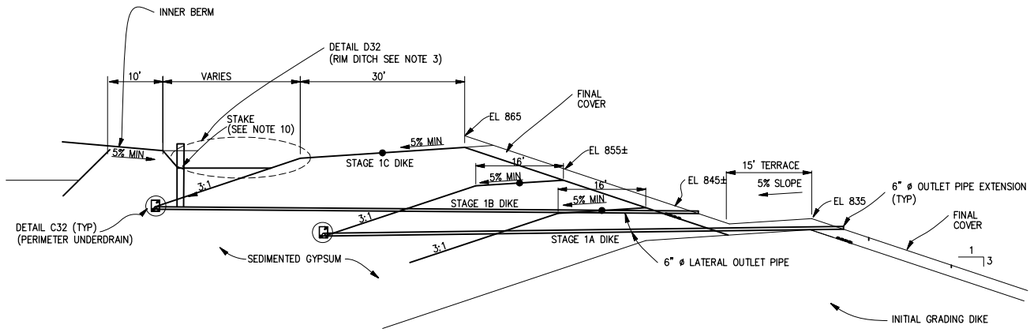
DETAIL E31
SPILLWAY CONNECTION



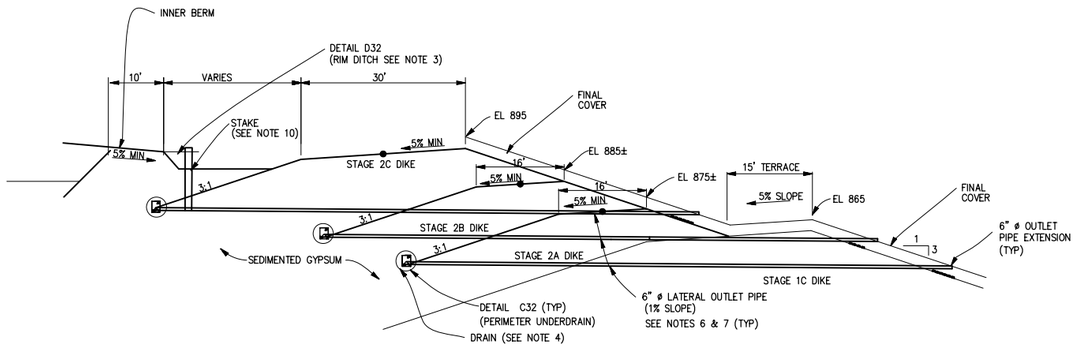
DETAIL F31
BOTTOM OF SPILLWAY

R

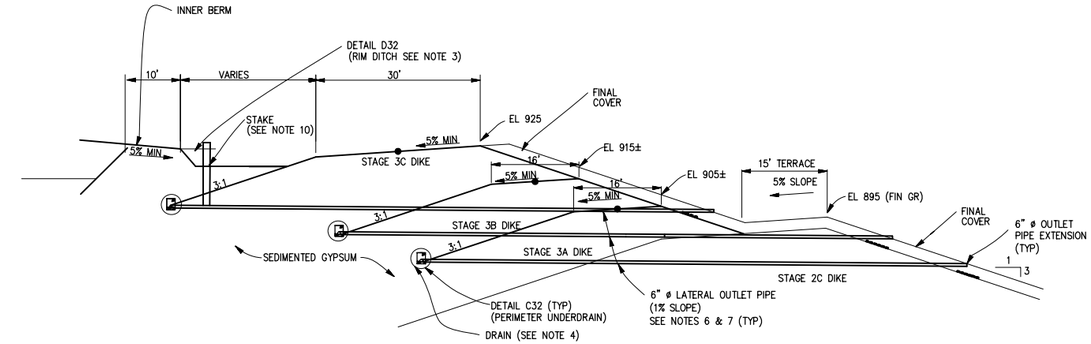
| R | | |



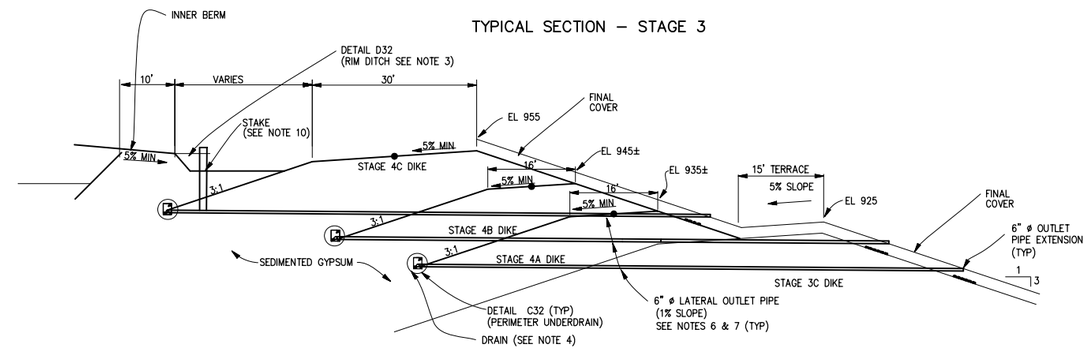
TYPICAL SECTION – STAGE 1



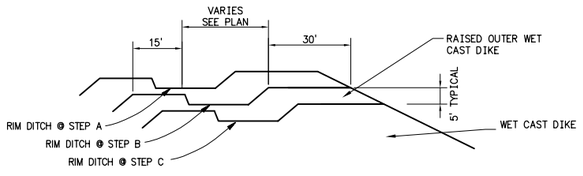
TYPICAL SECTION – STAGE 2



TYPICAL SECTION – STAGE 3

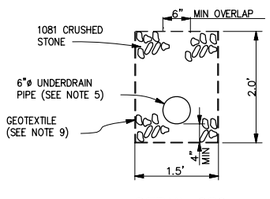


TYPICAL SECTION – STAGE 4



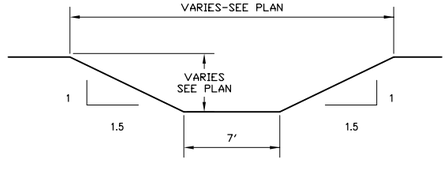
DETAIL B32

DIKE RAISING 5' INCREMENT



DETAIL C32

PERIMETER UNDERDRAIN



DETAIL D32

RIM DITCH

WET CAST GYPSUM DIKE
DETAIL A32

DIKE CONSTRUCTION NOTES:

1. FOR DRAWING LIST AND LEGEND, SEE 10W297-1
2. FOR GENERAL NOTES, SEE 10W297-11
3. CONSTRUCT RIM DITCHES AT EACH INTERMEDIATE A, B, AND C DIKE, E.G., 10' VERTICAL INTERVALS RIM DITCHES FOR A AND B DIKES NOT SHOWN FOR CLARITY.
4. INSTALL DRAINS SO THAT THEY ARE BENEATH INVERT ELEVATION OF RIM DITCH BY A MINIMUM OF 1.0 FOOT CLEAR.
5. UNDERDRAIN PIPE SHALL BE PERFORATED HDPE CORRUGATED TUBING AS MANUFACTURED BY:

   ADVANCED DRAINAGE SYSTEMS,
   INC., COLUMBUS, OHIO
   (614) 457-3051

   OR EQUAL. UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 500.
6. PERIMETER UNDERDRAIN SHALL HAVE MIN 1% SLOPE FROM HIGH PTS TO LOW POINTS. PLACE LATERAL OUTLET PIPES AT LOW POINTS.
7. LATERAL OUTLET PIPE SHALL BE NON-PERFORATED HDPE CORRUGATED TUBING AS MANUFACTURED BY:

   ADVANCED DRAINAGE SYSTEMS, INC.,
   COLUMBUS, OHIO
   (614) 457-3051

   OR EQUAL. DISCHARGE END SHALL BE SUITABLE FOR FUTURE PIPE CONNECTION TO FACILITATE COLLECTION OF DRAINAGE.
8. LATERAL OUTLET PIPES SHALL BE PLACED EVERY 250 FEET ON CENTER MAXIMUM ALONG SOUTH, EAST AND WEST DIKES.
9. GEOTEXTILE SHALL BE A WOVEN MONOFILAMENT WITH AN APPARENT OPENING SIZE (AOS) SELECTED BY TVA FES (US STANDARD SIEVE SIZE) WHEN TESTED IN ACCORDANCE WITH ASTM D 4751. THE GEOTEXTILE SHALL BE GEOTEX 104F AS MANUFACTURED BY SYNTHETIC INDUSTRIES OR APPROVED EQUAL.
10. AFTER INSTALLATION OF PERIMETER DRAIN, INSTALL STAKES AT DRAINAGE OUTLET. PROVIDE A MARK ON THE STAKE INDICATING THE DEPTH TO THE DRAIN PIPE VISIBLE TO EQUIPMENT OPERATOR TO PREVENT DAMAGE TO DRAIN PIPE.

R										
R 0		DRS	BSB	WPT	HLP	REP	DL			
ISSUED FOR GYPSUM & ASH DISPOSAL										
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST

DISCIPLINE INTERFACE

SCALE: NOT TO SCALE EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
TYPICAL CROSS SECTION & DETAILS
SHEET 3

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E.PURKEY	D. LUNDY	

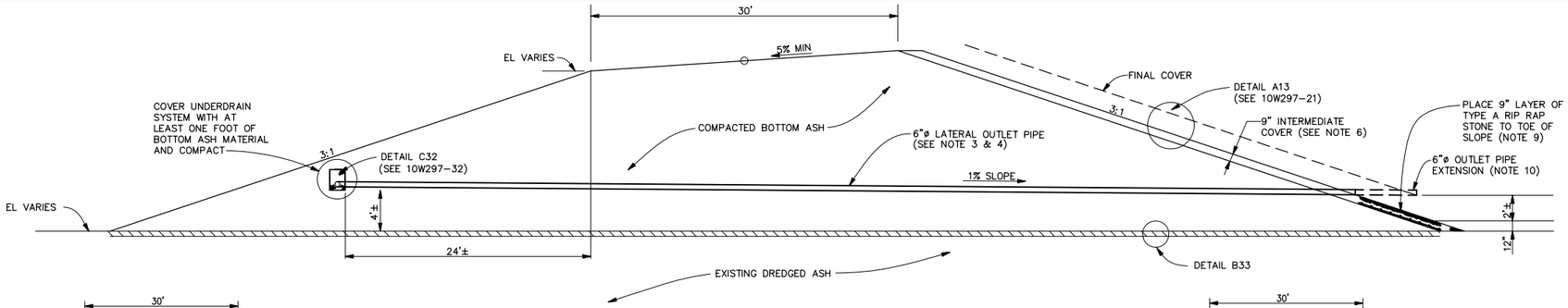
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-32	R 0

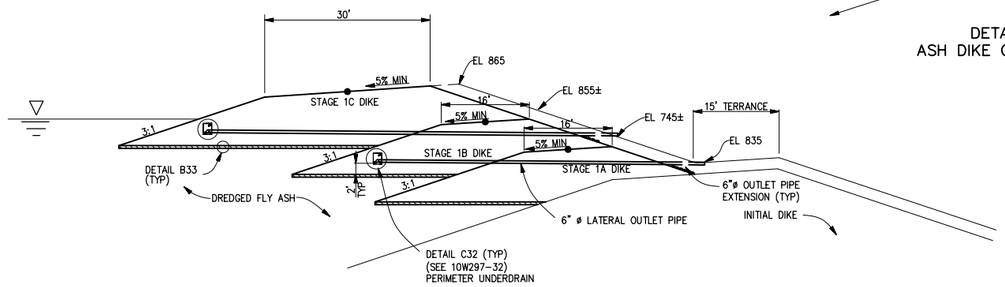
TASK COMPLETED BY: | REV NO.

PLOT FACTOR: W_TVA

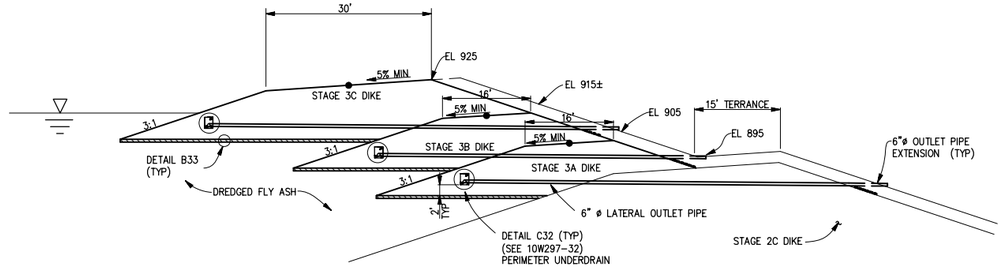
C.A.D. DRAWING
DO NOT ALTER MANUALLY



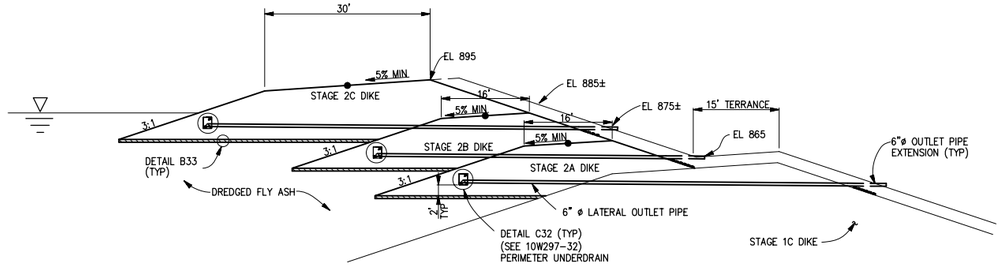
DETAIL C33
ASH DIKE CONSTRUCTION



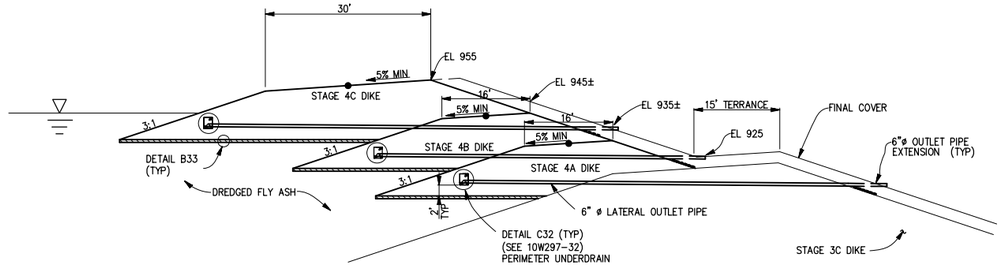
TYPICAL SECTION – STAGE 1



TYPICAL SECTION – STAGE 3

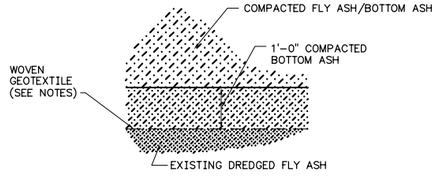


TYPICAL SECTION – STAGE 2



TYPICAL SECTION – STAGE 4

DETAIL A33
BOTTOM ASH DIKES



DETAIL B33
BONDING DETAIL

BONDING DETAIL NOTES:

1. WOVEN GEOTEXTILE SHALL BE CLASS C IN ACCORDANCE WITH SECTION 571.
2. OMIT WOVEN GEOTEXTILE IF A SUITABLY FIRM BASE EXISTS.
3. BOTTOM ASH THICKNESS MAY BE INCREASED OR DECREASED AS REQUIRED TO OBTAIN REQUIRED COMPACTION.

NOTES:

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE T-1 GENERAL CONSTRUCTION SPECIFICATIONS AND THE CLOSURE/POST-CLOSURE PLAN – ASH POND AREA – TVA KINGSTON FOSSIL PLANT, UNLESS OTHERWISE NOTED. SECTION NUMBERS REFER DIRECTLY TO THE T-1 SPECIFICATION.
2. UNDERDRAIN PIPE SHALL BE PERFORATED POLYETHYLENE CORRUGATED TUBING AS MANUFACTURED BY ADVANCED DRAINAGE SYSTEMS, INC., COLUMBUS, OHIO (614) 457-3051 OR EQUAL. UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 500.
3. LATERAL OUTLET PIPE SHALL BE NON-PERFORATED POLYETHYLENE CORRUGATED TUBING AS MANUFACTURED BY ADVANCED DRAINAGE SYSTEMS, INC., COLUMBUS, OHIO (614) 457-3051 OR EQUAL.
4. LATERAL OUTLET PIPES SHALL BE PLACED EVERY 250 FEET ON CENTER MAXIMUM BEGINNING AT STATION 2+00.
5. FILTER FABRIC SHALL BE TREVIRA SPUNBOUND TYPE 1135 NON-WOVEN GEOTEXTILE OR EQUIVALENT AND SHALL BE INSTALLED ACCORDING TO SECTION 571.
6. INTERMEDIATE COVER SHALL BE PLACED INCREMENTALLY AND CONCURRENTLY WITH DIKE CONSTRUCTION AND WILL CONSIST OF 9" OF SOIL SUITABLE FOR THE SUPPORT OF VEGETATION. AFTER PLACEMENT OF COVER, AREA SHALL BE SEEDED WITH SECTION 580 TYPE 6, MIX 9 (SPRING) OR TYPE 8, MIX 3 (FALL).
7. THE AREA FOR THE BASE OF THE DIKE SHALL BE CLEARED OF VEGETATION BY SCRAPING THE SURFACE ACCORDING TO SECTION 101.
8. BASE REINFORCEMENT SHALL CONSIST OF TYPE 300ST WOVEN SLIT FILM GEOTEXTILE AS PRODUCED BY SYNTHETIC INDUSTRIES, INC., ?CHATTANOOGA, TN (800) 621-0444 OR EQUIVALENT PLACED OVER THE DREDGED ASH SURFACE. 12" TO 18" OF BOTTOM ASH IS THEN TO BE BACKFILLED ONTO THE GEOTEXTILE TO PROTECT IT FROM TEARING BY THE GEOTEXTILE SHALL BE INSTALLED ACCORDING TO HAULING EQUIPMENT. MANUFACTURER'S SPECIFICATIONS.
9. TYPE A RIP RAP LAYER SHALL BE 9" THICK. A MINIMUM OF 50%, BY WEIGHT, OF THE STONES SHALL BE 25 LB. EACH AND IN ACCORDANCE WITH SECTION 575.
10. BEFORE FINAL COVER IS COMPLETED, OUTLET PIPES SHALL BE EXTENDED A MINIMUM OF 6' TO INSURE THAT THE END OF THE PIPE PROTRUDES BEYOND THE FINAL GRADE.
11. TYPE B RIP RAP LAYER SHALL BE 18" THICK. A MINIMUM OF 50%, BY WEIGHT, OF THE STONES SHALL BE 100 LB. EACH AND IN ACCORDANCE WITH SECTION 575.
12. AREAS OF FINAL SOIL COVER SHALL BE SEEDED (TYPE 8, MIXTURE 3) AND MULCHED IN ACCORDANCE WITH SECTIONS 580 AND 582. FINAL COVER SHALL NOT BE PLACED UNTIL DREDGING IS COMPLETE AND FACILITY IS AT ULTIMATE ELEVATION.
13. FOR DRAWING INDEX AND LEGEND, SEE 10W297-1.

R												
R 0	ISSUED FOR DREDGE CELL EXPANSION		DRS	BSB	WPT	HLP	REP	DL				DISCIPLINE INTERFACE
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. NO.	

SCALE: NOT TO SCALE — EXCEPT AS NOTED

YARD

EXISTING ASH DISPOSAL DETAILS SHEET 4

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E.PURKEY	D. LUNDY	

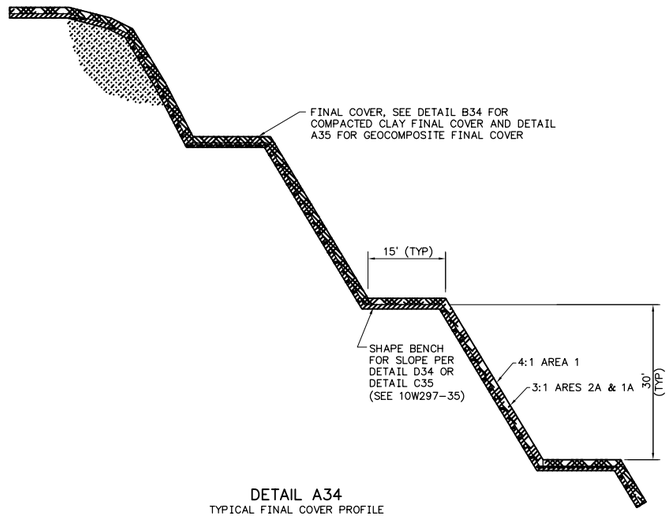
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-33	R 0

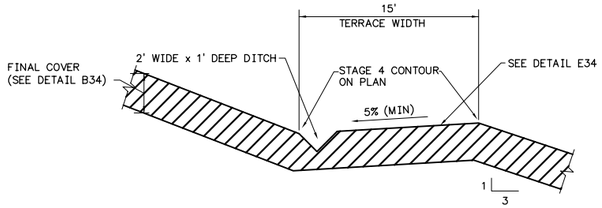
TASK COMPLETED BY: | REV NO.

PLOT FACTOR: W_TVA

C.A.D. DRAWING DO NOT ALTER MANUALLY



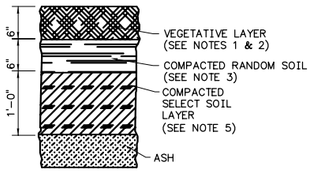
DETAIL A34
TYPICAL FINAL COVER PROFILE



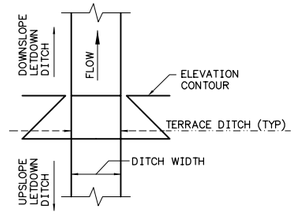
DETAIL D34
TERRACE DITCH (TYP)
COMPACTED CLAY FINAL COVER
AREA 1A & 2A

FINAL COVER CLOSURE NOTES:

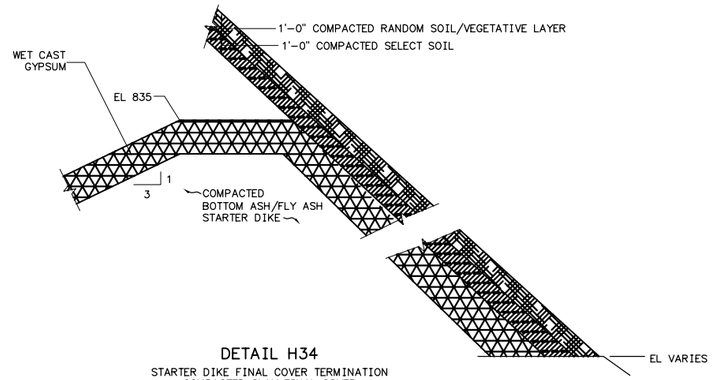
1. FOR DRAWINGS LIST AND LEGEND, SEE 10W297-1
2. FOR GENERAL NOTES, SEE 10W297-11
3. THE UPPERMOST 1 FT. OF THE FINAL COVER SHALL CONSIST OF RANDOM SOIL PLACED IN ACCORDANCE WITH THE QA/QC PLAN FOR THIS FACILITY. THE UPPER 6 IN. SHALL BE PREPARED FOR SEEDING. PRIOR TO SEEDING, A MINIMUM OF 3 SOIL SAMPLES OF VEGETATIVE LAYER SOIL SHALL BE TESTED TO DETERMINE APPROPRIATE AMOUNTS OF LIME, FERTILIZER, ETC. TO BE SPREAD PRIOR TO SEEDING.
4. SEED ALL AREAS (EXCLUDING ROADS & DITCHES) IN ACCORDANCE WITH TVA SPECIFICATION T-1, SECTION 583.
5. CONSTRUCT COMPACTED SELECT SOIL LAYER IN ACCORDANCE WITH THE CONSTRUCTION QA/QC PLAN FOR THIS FACILITY. THE COMPACTED SELECT SOIL LAYER SHALL BE CONSTRUCTED USING SELECT SOIL BACKFILL OBTAINED FROM STOCKPILED MATERIAL USED TO CONSTRUCT THE CLAY LAYER FOR THE LINER. STABILIZED AGGREGATE BASE SHALL BE IN ACCORDANCE WITH SECTION 1061.
6. STABILIZED AGGREGATE BASE SHALL BE IN ACCORDANCE WITH SECTION 1061.
7. GEOTEXTILE FABRIC SHALL BE A NON-WOVEN NEEDLE PUNCHED FABRIC CLASS C IN ACCORDANCE WITH SECTION 571.



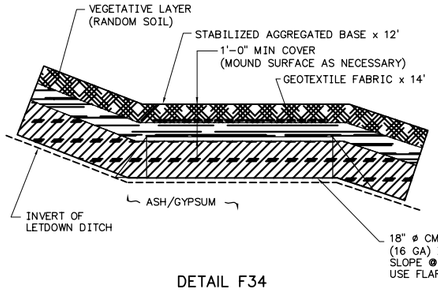
DETAIL B34
COMPACTED CLAY FINAL COVER



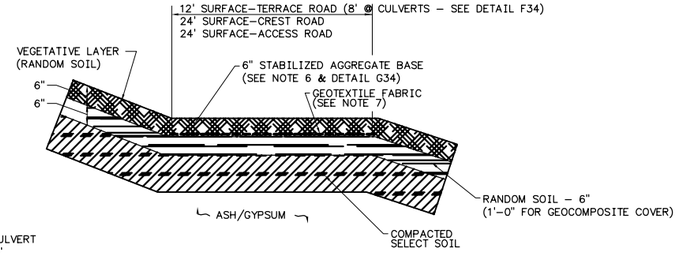
DETAIL C34
PLAN VIEW
TERRACE DITCH INTERSECTION
WITH LETDOWN DITCH



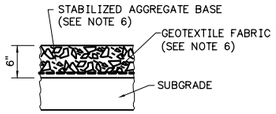
DETAIL H34
STARTER DIKE FINAL COVER TERMINATION
COMPACTED CLAY FINAL COVER



DETAIL F34
DITCH CROSSING TERRACE ROAD
(COMPACTED CLAY FINAL COVER)



DETAIL E34
TERRACE, ACCESS & CREST ROADS



DETAIL G34
ROAD DETAIL (TYP)

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REVISION DESCRIPTION
R											
R 0		DRS	JLM	WPT	HLP	REP	DL				D DISCIPLINE INTERFACE
ISSUED FOR GYPSUM & ASH DISPOSAL											

SCALE: NOT TO SCALE — EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
COVER, CULVERT & ROAD DETAILS
COMPACTED CLAY FINAL COVER

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	J.L. MILES	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

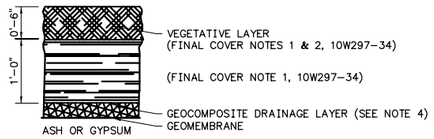
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-34	R 0

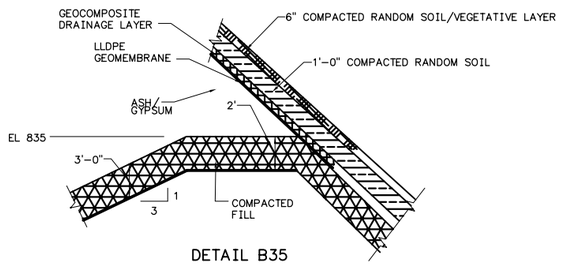
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:96
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



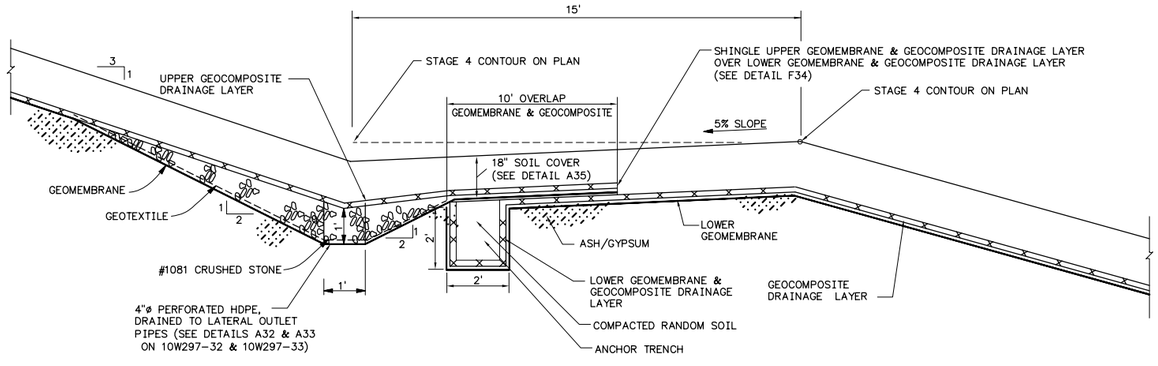
DETAIL A35
TYPICAL GEOCOMPOSITE FINAL COVER DETAIL



DETAIL B35
STARTER DIKE FINAL COVER TERMINATION GEOCOMPOSITE FINAL COVER

NOTES:

1. FOR DRAWINGS LIST AND LEGEND, SEE 10W297-1
2. FOR GENERAL NOTES, SEE 10W297-11
3. FOR FINAL COVER NOTES, SEE 10W297-34
4. THE GEOCOMPOSITE DRAINAGE LAYER BENEATH THE COMPACTED SOIL LAYER SHALL CONSIST OF THE FOLLOWING COMPONENTS PLACED IN ORDER FROM ASH SURFACE UPWARD:
   - A CALENDERED WOVEN GEOTEXTILE WITH AOS DETERMINED BY TVA FES;
   - THE CALENDERED WOVEN GEOTEXTILE SHALL BE HEAT BONDED TO THE GEONET;
   - THE UPPER GEOTEXTILE SHALL BE A NON-WOVEN NEEDLEPUNCHED GEOTEXTILE.
5. FOR DETAILS OF ROADS AND DITCH/CULVERTS CROSSINGS SEE 10W297-34



DETAIL C35
TYPICAL TERRACE DITCH AND GEOCOMPOSITE ANCHOR GEOCOMPOSITE FINAL COVER

R												
R 0		DRS	JLM	WPT	HLP	REP	DL					D
ISSUED FOR GYPSUM & ASH DISPOSAL												DISCIPLINE INTERFACE
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST		

SCALE: NOT TO SCALE — EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
GEOCOMPOSITE
FINAL COVER

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	J.L. MILES	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

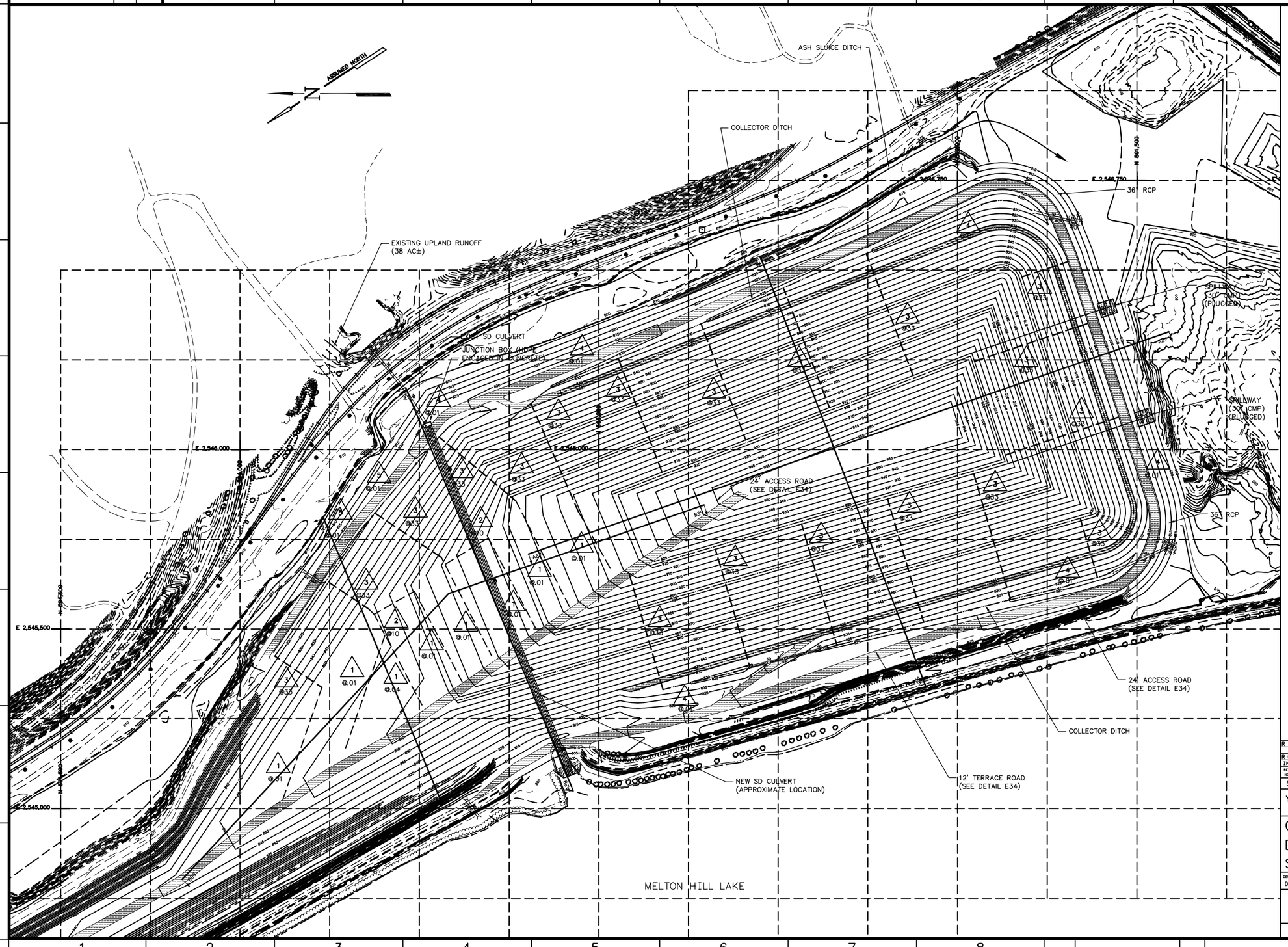
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-35	R 0

TASK COMPLETED BY: | REV NO.

PLOT FACTOR:96
W_TVA

C.A.D. DRAWNG
DO NOT ALTER MANUALLY



NOTES:

1. FOR DITCH NOTES, SEE 10W297-37.
2. SPILLWAY PIPES SHOWN FOR LOCATION REFERENCE

DITCH SCHEDULE

DITCH SCHD	DITCH DEPTH-D	BOTTOM WIDTH-W	LINING
1	–	–	SEE NOTE 4, DET B37
2	2' MIN	2' NOM	SEE NOTE 5, DET A37
3	2' MIN	2' NOM	SEE NOTE 5, DET A37
4	2.5' MIN	10' MIN	SEE NOTE 5, DET A37

LEGEND

- SD — STORM DRAIN PIPE
- COLLECTOR DITCHES
- DITCHES
- TERRACE DITCHES
- ASH SLUICE DITCH
- 1 — DITCH CLASS
- .01 — DITCH SLOPE
- ROAD

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV NO.
R 0		DRS	BSB	WPT	HLP	REP	DL				D
INITIAL ISSUE											

SCALE: 1" = 100' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL DRAINAGE PLAN, ROADS, & DITCH SCHEDULE FINAL COVER

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-36	R 0

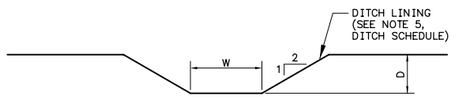
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:100
W_TVA

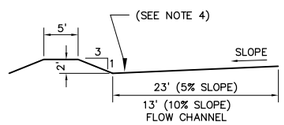
C.A.D. DRAWING
DO NOT ALTER MANUALLY

DITCH NOTES:

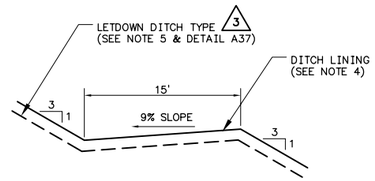
1. FOR DRAWINGS LIST AND LEGEND, SEE 10W297-1
2. FOR GENERAL NOTES, SEE 10W297-11
3. FOR DRAINAGE PLAN & DITCH SCHEDULE, SEE 10W297-36.
4. SEED DITCH IN ACCORDANCE WITH SECTION 581. INSTALL JUTE MATTING (NORTH AMERICAN GREEN S150 OR SYNETHETIC INDUSTRIES LAND LOK-2) ON SEEDED AREAS WITHIN THE TOP WIDTH OF DITCH IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
5. PERMANENT SOIL REINFORCEMENT/LINER SHALL BE PYRAMAT BY SYNTHETIC INDUSTRIES, INC. OR EQUAL INSTALLED AND ANCHORED PER MANUFACTURERS INSTRUCTIONS.



DETAIL A37



DETAIL B37



DETAIL C37
TERRACE DITCH

R											
R 0		DRS	BSB	WPT	HLP	REP	DL				DISCIPLINE INTERFACE
ISSUED FOR GYPSUM & ASH DISPOSAL											
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. NO.

SCALE: NOT TO SCALE — EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
DITCH DETAILS & NOTES
FINAL COVER

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

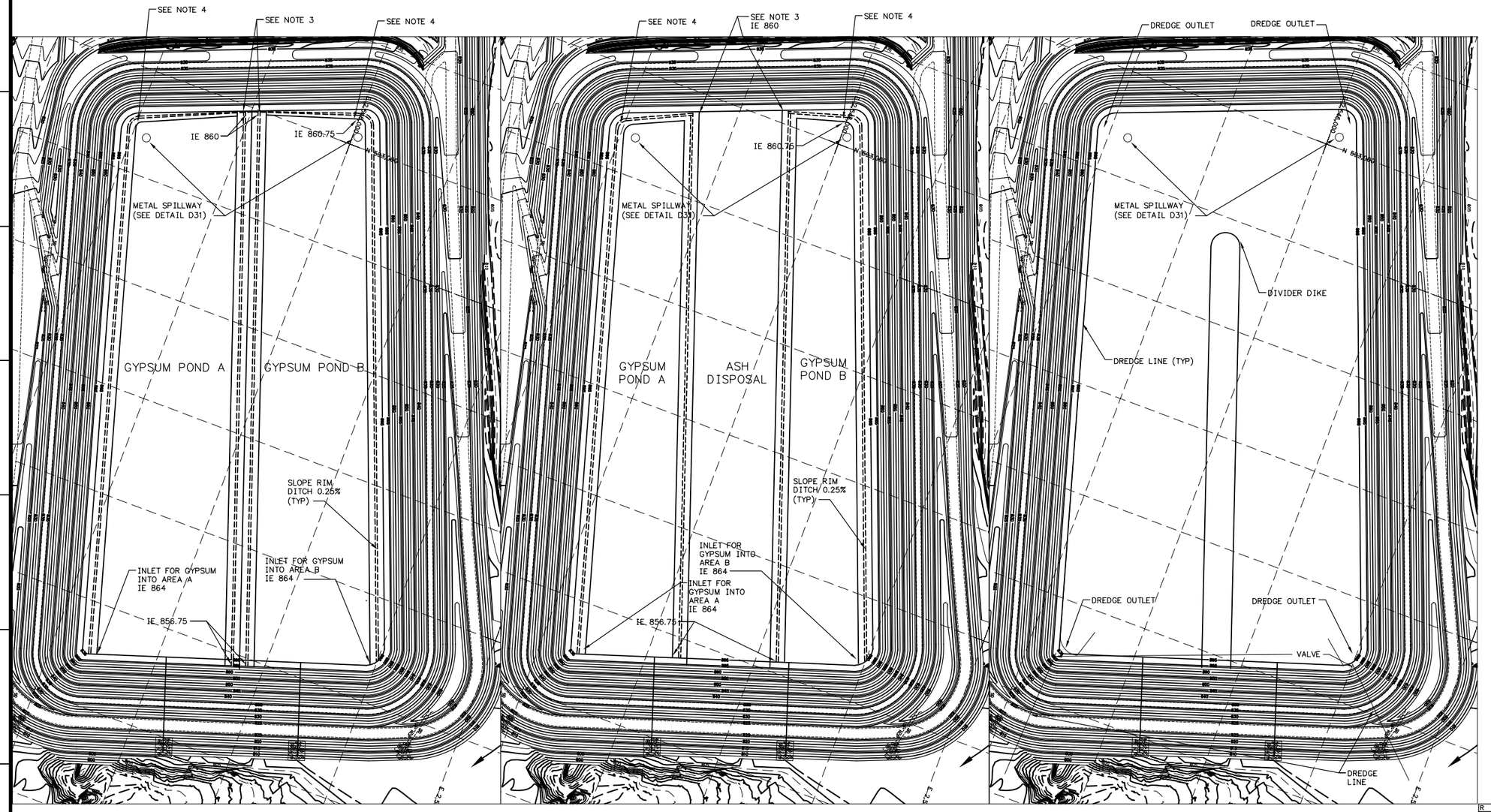
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-37	R 0

TASK COMPLETED BY: | REV NO.

PLOT FACTOR:1
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

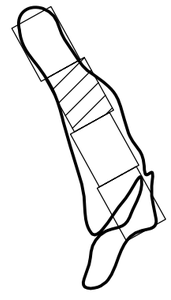


OPTION 1 OPTION 2 OPTION 3

STAGE 1

NOTES:

1. FOR DRAWINGS LIST AND LEGEND, SEE 10W297-1
2. FOR GENERAL NOTES, SEE 10W297-11
3. END OF STAGE 1 SHOWN. FOR BEGINNING OF STAGE 1, CONSTRUCT RIM DITCH FROM INLET AND TERMINATE AT SOUTH END OF POND, TO AVOID INTERFERENCE WITH DRAINAGE LAYER. CONTINUE RIM DITCH TO NORTH END OF POND WHEN PROJECTED INVERT ELEVATION AND RIM DITCH EXCEED ELEVATION 840.
4. WHERE RIM DITCHES HAVE SHARP TURNS, WIDEN DITCHES IN THE TURN TO 10FT.



KEY PLAN

R												
R 0		DRS	BSB	WPT	HLP	REP	DL					D
INITIAL ISSUE												DISCIPLINE INTERFACE
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. NO.	

SCALE: 1" = 100' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL WASTE DISPOSAL OPTIONS STAGE 1

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

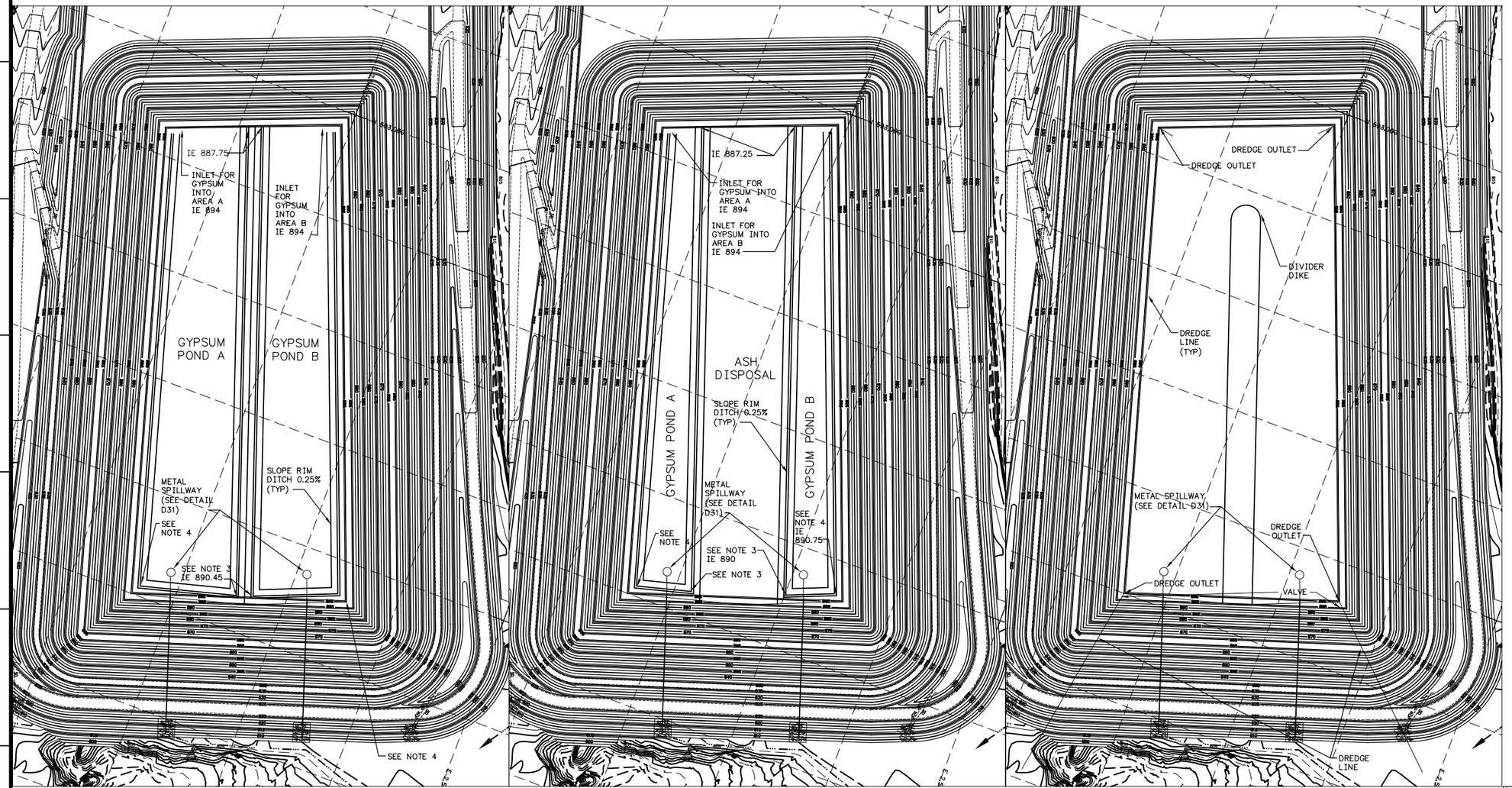
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-38	R 0

TASK COMPLETED BY: REV NO.

PLOT FACTOR:1:50
W_TVA

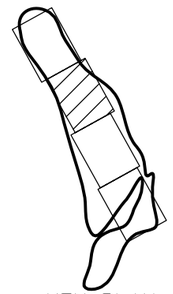
C.A.D. DRAWING
DO NOT ALTER MANUALLY



STAGE 2

NOTES:

1. FOR DRAWINGS LIST AND LEGEND, SEE 10W297-1
2. FOR GENERAL NOTES, SEE 10W297-11
3. END OF STAGE 2 SHOWN.
4. WHERE RIM DITCHES HAVE SHARP TURNS, WIDEN DITCHES IN THE TURN TO 10FT.



KEY PLAN

R													
R 0		DRS	BSB	WPT	HLP	REP	DL						D
INITIAL ISSUE													
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST			

SCALE: 1" = 100' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
WASTE DISPOSAL OPTIONS STAGE 2

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

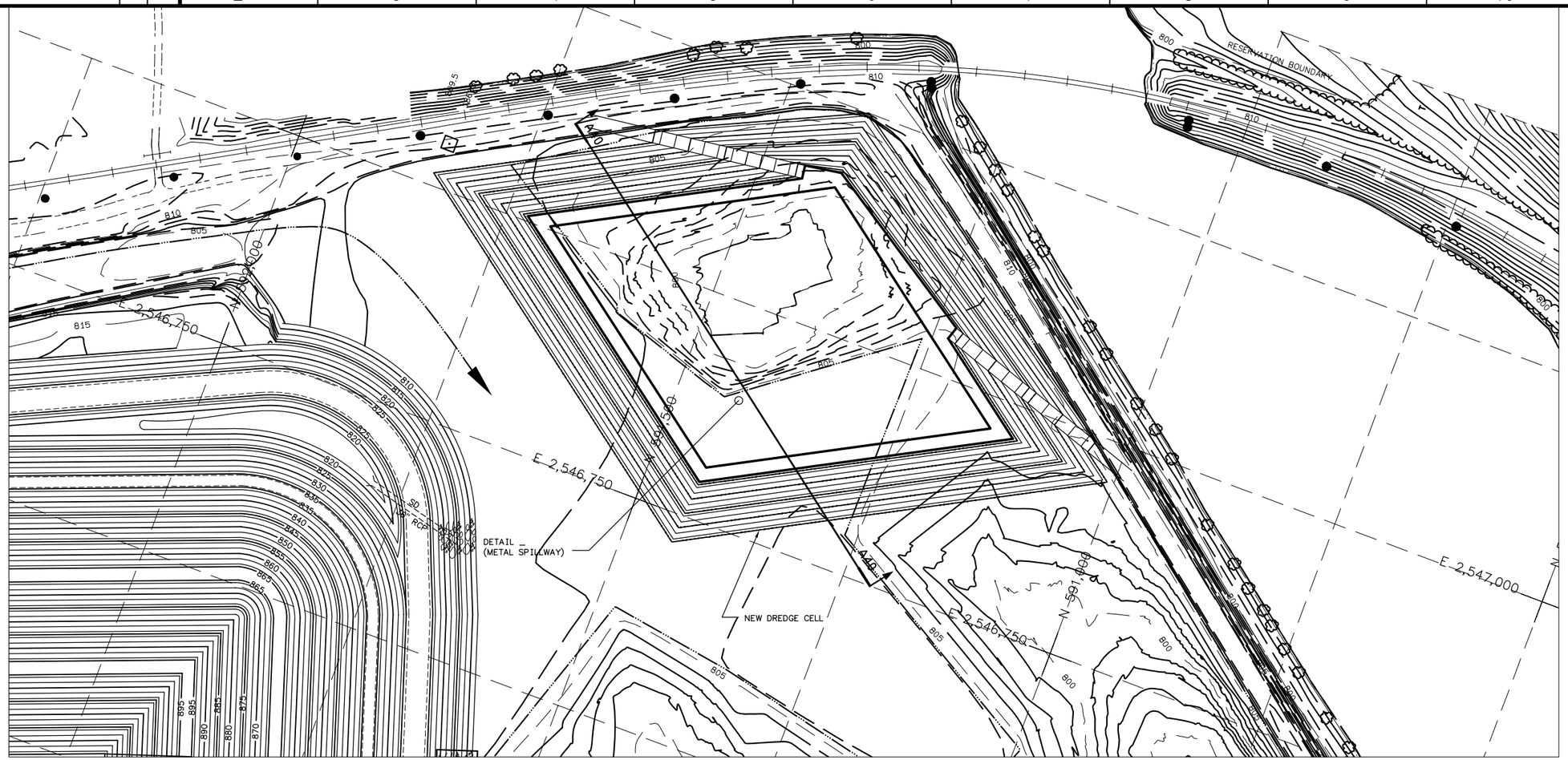
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-39	R 0

TASK COMPLETED BY: | REV NO.

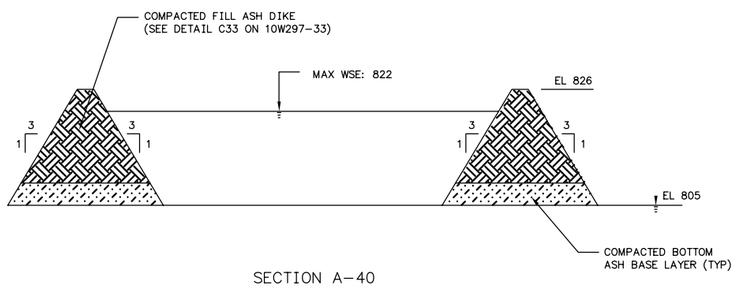
PLOT FACTOR:1:50
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

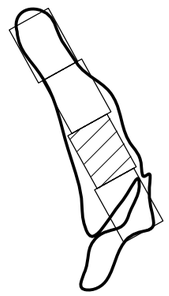


DREGDE CELL NOTES:

1. FOR DRAWING INDEX AND LEGEND, SEE 10W297-1
2. FOR GENERAL NOTES, SEE 10W297-11.
3. FOR GRADING NOTES, SEE 10W297-12.



SECTION A-40



KEY PLAN

R												
R 0	DRS	BSB	WPT	HLP	REP	DL						D
ISSUED FOR GYPSUM & ASH DISPOSAL												

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV NO.

SCALE: 1"=50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
DREDGE CELL
PLAN

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
D.R. SMITH	B.S. BURT	W.P. TAYLOR	H.L. PETTY	R.E. PURKEY	D. LUNDY	

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14	DATE	49	C	10W297-40	R 0

TASK COMPLETED BY:	REV NO.

PLOT FACTOR:600
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

Reference No. 6

DRAWING INDEX

DRAWING NO.	DRAWING TITLE
10W298-1	GYPSUM & ASH DISPOSAL DRAWING INDEX AND LEGEND
10W298-2	GYPSUM & ASH DISPOSAL SITE LOCATION PLAN
10W298-3	GYPSUM & ASH DISPOSAL PHASING SHEET 1
10W298-4	GYPSUM & ASH DISPOSAL PHASING SHEET 2
10W298-5	GYPSUM & ASH DISPOSAL LAYOUT PLAN INITIAL GRADING
10W298-6	GYPSUM & ASH DISPOSAL LAYOUT PLAN FINAL COVER
10W298-7	GYPSUM & ASH DISPOSAL EXISTING CONDITIONS SHEET 1
10W298-8	GYPSUM & ASH DISPOSAL EXISTING CONDITIONS SHEET 2
10W298-9	GYPSUM & ASH DISPOSAL EXISTING CONDITIONS SHEET 3
10W298-10	GYPSUM & ASH DISPOSAL EXISTING CONDITIONS SHEET 4
10W298-11	GYPSUM & ASH DISPOSAL INITIAL SITE GRADING SHEET 1
10W298-12	GYPSUM & ASH DISPOSAL INITIAL SITE GRADING SHEET 2
10W298-13	GYPSUM & ASH DISPOSAL INITIAL SITE GRADING SHEET 3
10W298-14	GYPSUM & ASH DISPOSAL STAGE 1 SHEET 1
10W298-15	GYPSUM & ASH DISPOSAL STAGE 1 SHEET 2
10W298-16	GYPSUM & ASH DISPOSAL STAGE 1 SHEET 3
10W298-17	GYPSUM & ASH DISPOSAL STAGE 2 SHEET 1
10W298-18	GYPSUM & ASH DISPOSAL STAGE 2 SHEET 2
10W298-19	GYPSUM & ASH DISPOSAL STAGE 2 SHEET 3
10W298-20	GYPSUM & ASH DISPOSAL STAGE 3 SHEET 1
10W298-21	GYPSUM & ASH DISPOSAL STAGE 3 SHEET 2
10W298-22	GYPSUM & ASH DISPOSAL STAGE 3 SHEET 3
10W298-23	GYPSUM & ASH DISPOSAL STAGE 4 SHEET 1
10W298-24	GYPSUM & ASH DISPOSAL STAGE 4 SHEET 2
10W298-25	GYPSUM & ASH DISPOSAL STAGE 4 SHEET 3
10W298-26	GYPSUM & ASH DISPOSAL AREA 2A SECTIONS
10W298-27	GYPSUM & ASH DISPOSAL AREA 2A SECTIONS
10W298-28	GYPSUM & ASH DISPOSAL AREA 1A SECTIONS
10W298-29	GYPSUM & ASH DISPOSAL AREAS 1 & 1A SECTIONS
10W298-30	GYPSUM & ASH DISPOSAL MISCELLANOUS DETAILS SHEET 1
10W298-31	GYPSUM & ASH DISPOSAL METAL SPILLWAY DETAILS SHEET 2
10W298-32	GYPSUM & ASH DISPOSAL TYPICAL CROSS SECTION & DETAILS SHEET 3
10W298-33	EXISTING ASH DISPOSAL DETAILS SHEET 4
10W298-34	GYPSUM & ASH DISPOSAL COVER, CULVERT & ROAD DETAILS FINAL COVER
10W298-35	GYPSUM & ASH DISPOSAL GEOCOMPOSITE FINAL COVER
10W298-36	GYPSUM & ASH DISPOSAL DRAINAGE PLAN, ROADS, & DITCH SCHEDULE FINAL COVER
10W298-37	GYPSUM & ASH DISPOSAL DITCH DETAILS AND NOTES FINAL COVER
10W298-38	GYPSUM & ASH DISPOSAL WASTE DISPOSAL OPTIONS STAGE 1
10W298-39	GYPSUM & ASH DISPOSAL WASTE DISPOSAL OPTIONS STAGE 2
10W298-40	GYPSUM & ASH DISPOSAL WICK DRAIN ARRANGEMENT
10W298-41	GYPSUM & ASH DISPOSAL TYPICAL CROSS-SECTIONS AND DETAILS
10W298-42	GYPSUM & ASH DISPOSAL CLEANOUT & STANDPIPE DETAILS

LEGEND

EXISTING		NEW
BM	BENCH MARK	NA
580	GRADE CONTOUR	580
	ASPHALT ROAD	
	GRAVEL ROAD	
	RAILROAD TRACK	NA
	OVERHEAD ELECTRICAL UTILITY POLE	
	OVERHEAD ELECTRICAL UTILITY TOWER	NA
OE	OVERHEAD UTILITY LINES	OE
	ASH SLUICE DITCH	
SD	STORM DRAIN	SD
NA	¢ DITCH	
NA	TERRACE DITCH	
NA	METAL SPILLWAY	
NA	POND DISCHARGE WEIR W/SKIMMER	
NA	SURFACE WATER COMPLIANCE MONITORING POINT	
NA	SILT FENCE	S S
× 430.5	SPOT ELEVATION	430.5
	PIEZOMETER	
	KELLEBERG BORING	NA
	SOIL BORING	
	MONITORING WELL	NA
NA	PERMIT BOUNDARY	
NA	UNDERDRAIN	UD-6"
NA	FORCE MAIN	FM
NA	MANHOLE	DMH
NA	PROCESS WATER	PW
	TVA RESERVATION BOUNDARY	NA
NA	EXISTING ASH	
NA	COMPACTED BOTTOM ASH	
NA	GYPSUM	
NA	RANDOM SOIL (COVER)	
NA	SELECT SOIL (COVER)	
NA	CLAY	
NA	RIPRAP OR STONE	
NA	FINAL COVER/ VEGATATIVE LAYER	
NA	BOTTOM ASH DRAINAGE LAYER	
	FINAL COVER ACCESS ROAD	
	WASTE DISPOSAL BOUNDARY	

SOIL BORINGS/CPT'S - NEW

STATION	NORTHING	EASTING
BH-10	594431.2	2544687.9
CPT/MW48	594025.3	2544687.8
BH1/CPT1	592991.6	2545494.2
BH2/CPT2	592386.2	2546019.2
BH3/CPT3	591826.0	2546217.7
CPT4	592267.2	2545710.4
BH5/CPT5	592297.4	2545355.8
BH6/CPT6	591316.1	2545599.1
BH7/CPT7	591568.8	2546388.5
BH8/CPT8	591768.3	2546657.6
BH9/CPT9	590895.2	2546739.6

MONITORING WELLS

STATION	NORTHING	EASTING
1	2546200	594072
47	2544260	594689
48	2544830	593673
49	2545180	592627
50	2545448	591705

SOIL BORINGS - PREVIOUS

STATION	NORTHING	EASTING	GS ELEVATION
SS-1	595028	2544073	809.2
SS-2P	594652	2544230	806.2
SS-3	594308	2544434	808.3
SS-4	593962	2544644	807.7
SS-5	593604	2544812	805.0
SS-6	593270	2545040	807.9
SS-7	592645	2545240	820.9
SS-8	592270	2545365	824.7
SS-9	591885	2545475	824.4
SS-9A	591860	2545400	808.9
SS-9B	591860	2545385	808.9
SS-10	591560	2545715	824.9
SS-11	591700	2546210	826.0
SS-12	591900	2546665	824.6
SS-13	593165	2545690	825.5
SS-14	593350	2545615	899.5

BENCH MARKS

STATION	NORTHING	EASTING	ELEVATION
BRF1	591390	2547284	809.20
BRF2	590118	2546282	809.21
BRF3	589691	2545825	809.86
BRF4	590396	2545734	809.94
BRF5	591084	2545605	809.77
BRDS-1	591823	2546626	826.15
BRDS-10	593590	2546096	810.63
BRDS-2	593247	2545823	825.69
BRDS-3	593418	2545112	825.23
BRDS-4	594337	2544777	836.07
BRDS-5	594949	2544314	837.39
BRDS-6	594829	2544831	833.66
BRDS-7	592589	2545314	824.20

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

GYPSUM & ASH DISPOSAL
BULL RUN FOSSIL PLANT
IDL #01-0208

R	DATE	DSGN	DRWN	CHKD	SUPV	APVD	APVD	ISSUED	PROJECT ID	AS CONST	REV NO.
R 0	12/12/08	CWH	ACM	DRD	DRD	LJP	JCK		BRF211		0

DCN BRF-08-1052-001: INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE

SCALE: NOT TO SCALE — EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
DRAWING INDEX AND LEGEND

DESIGNED BY: | DRAWN BY: | CHECKED BY: | SUPERVISED BY: | APPROVED BY: | ISSUED BY: | ISSUED BY:

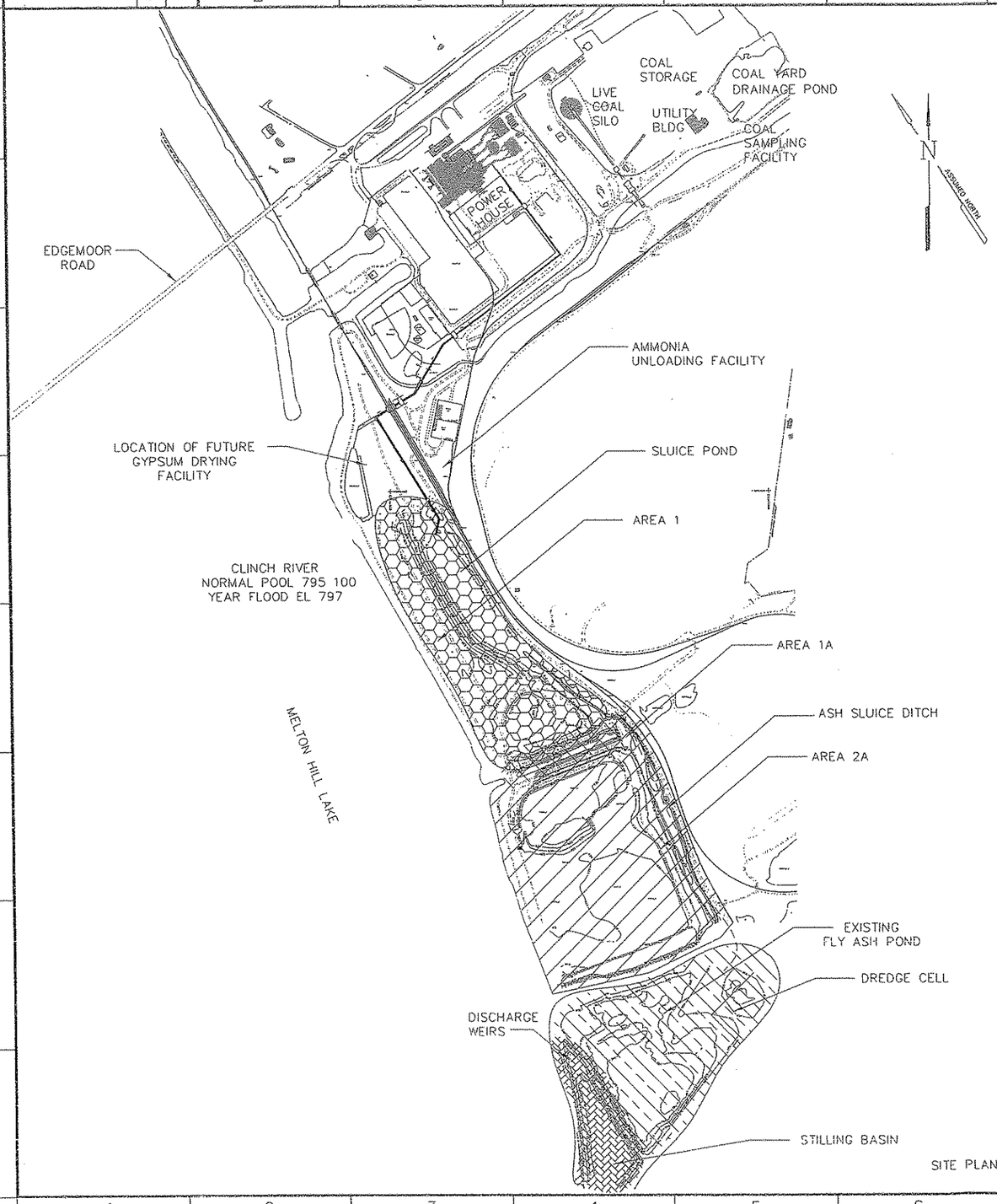
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-1	R 0

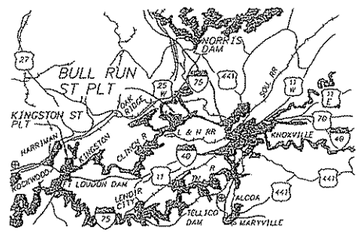
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:1
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



SITE PLAN – BULL RUN FOSSIL PLANT



LOCALITY MAP

SCALE 1" = 10 MILE 0 10 20

LEGEND

- AREA 1
- AREA 1A
- AREA 2A
- EXISTING FLY ASH POND
- STILLING BASIN

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

REV NO	DATE	DSGN	DRWN	CHKD	QUAL	APPD	ITEM	PROJECT NO	AS BUILT
R 0	12/12/08	CWH	ACM	DRD	DRD	LJP	JCK	BRF211	

DCN BRF-08-1052-000; INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

SCALE: NOT TO SCALE EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL SITE LOCATION PLAN

DESIGNED BY: | DRAWN BY: | CHECKED BY: | SUPERVISED BY: | PROJECT MGR: | ISSUED BY:

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K | DATE | 49 | C | 10W298-2 | R 0

PLOT FACTOR:360 W_TVA

C.A.D. DRAWING DO NOT ALTER MANUALLY

TASK COMPLETED BY: | REV NO.

PHASING NOTES:

1. FOR DRAWING INDEX AND LEGEND, SEE 10W298-1.
2. DRAWINGS 10W298-3 AND 4 DEPICT PHASING OF EXPANSION CONSTRUCTION. CONSTRUCTION DRAWINGS BEGIN WITH 10W298-5.

ASSUMED NORTH

FLY ASH POND

BENCH MARK LOCATION, TYP.

DREDGE CELL

MAINTAIN EXISTING ASH SLUICE DITCH

EXISTING R/R CULVERT

MAINTAIN EXISTING DRAINAGE UNTIL NEW CULVERT IS CONSTRUCTED

ASH SLUICE POND

FUTURE LOCATION OF GYPSUM DRYING FACILITY

STILLING BASIN

SURFACE WATER COMPLIANCE MONITORING POINT

EXISTING DISCHARGE WEIRS NPDES OUTLET 001

AREA 2A (GYPSUM OR ASH DISPOSAL)

CLINCH RIVER/ MELTON HILL LAKE

CHANNEL AREA BETWEEN AREAS 1 & 2A TO BE DEVELOPED INTO AREA 1A (BOTTOM ASH FROM SLUICE POND & FLY ASH FROM DREDGE CELL)

FILL AREA 1 WITH BOTTOM ASH FROM SLUICE POND

EXISTING CHEMICAL POND

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

R	DATE	ORIG	CHK	DES	DRN	APP	DESCRIPTION
0	12/12/08	CWH	ACH	GRD	DRD	LJP	KJK	INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

DGN: RSV-00-10W298-0001

SCALE: 1"=200' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL PHASING SHEET 1

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

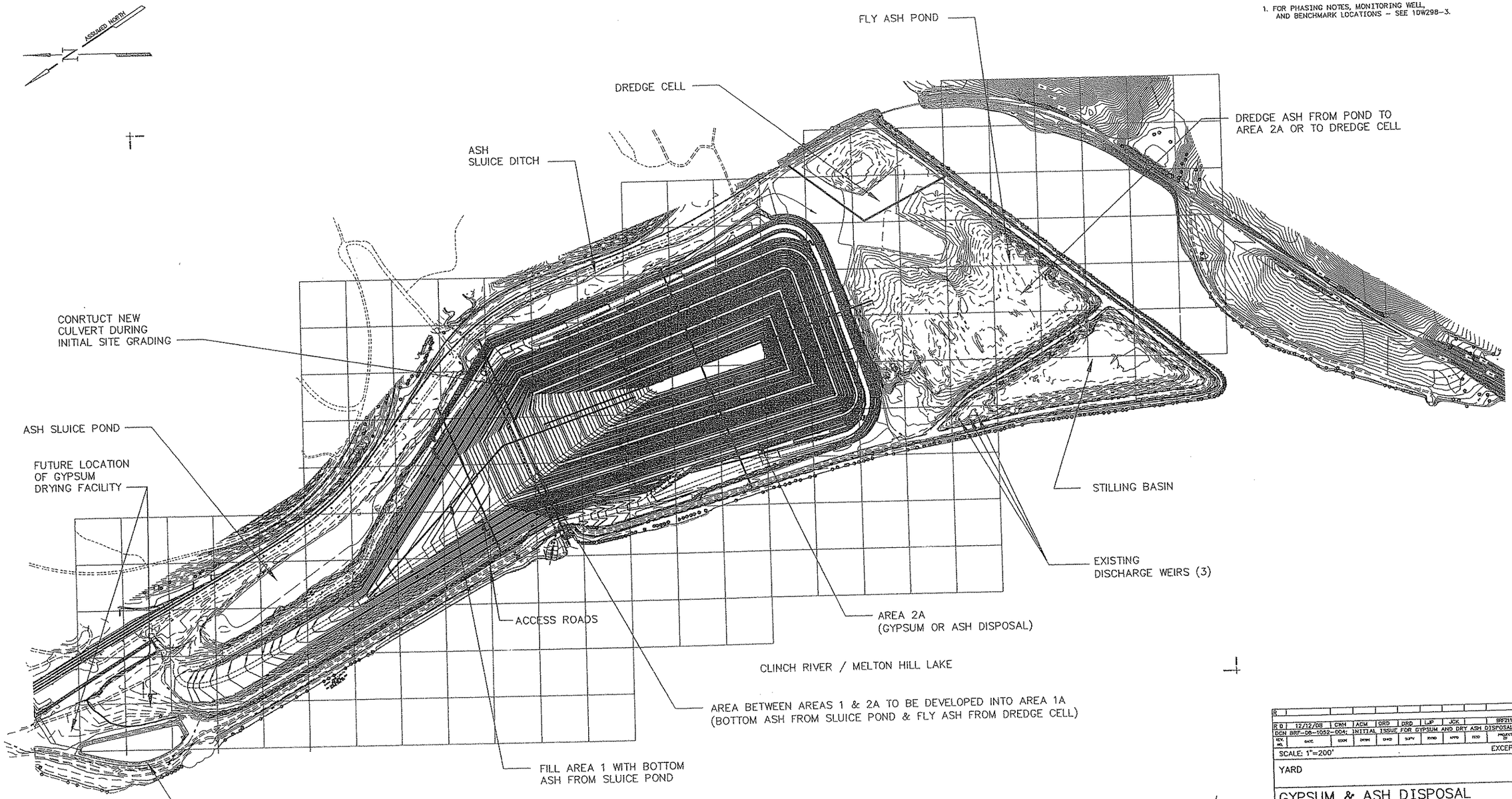
AUTOCAD R2K | DGN | 49 | C | 10W298-3 | R 0

PLOT FACTOR:200 W_TVA

CAD STAND DO NOT ALTER !

NOTES:

1. FOR PHASING NOTES, MONITORING WELL, AND BENCHMARK LOCATIONS – SEE 10W298-3.



FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

REV	DATE	DESCRIPTION
R 0	12/12/08	CWH | ACM | ORD | DRD | LMP | JCK | 109721 — DCN BRF-08-1052-004: INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE

SCALE: 1"=200' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL PHASING SHEET 2

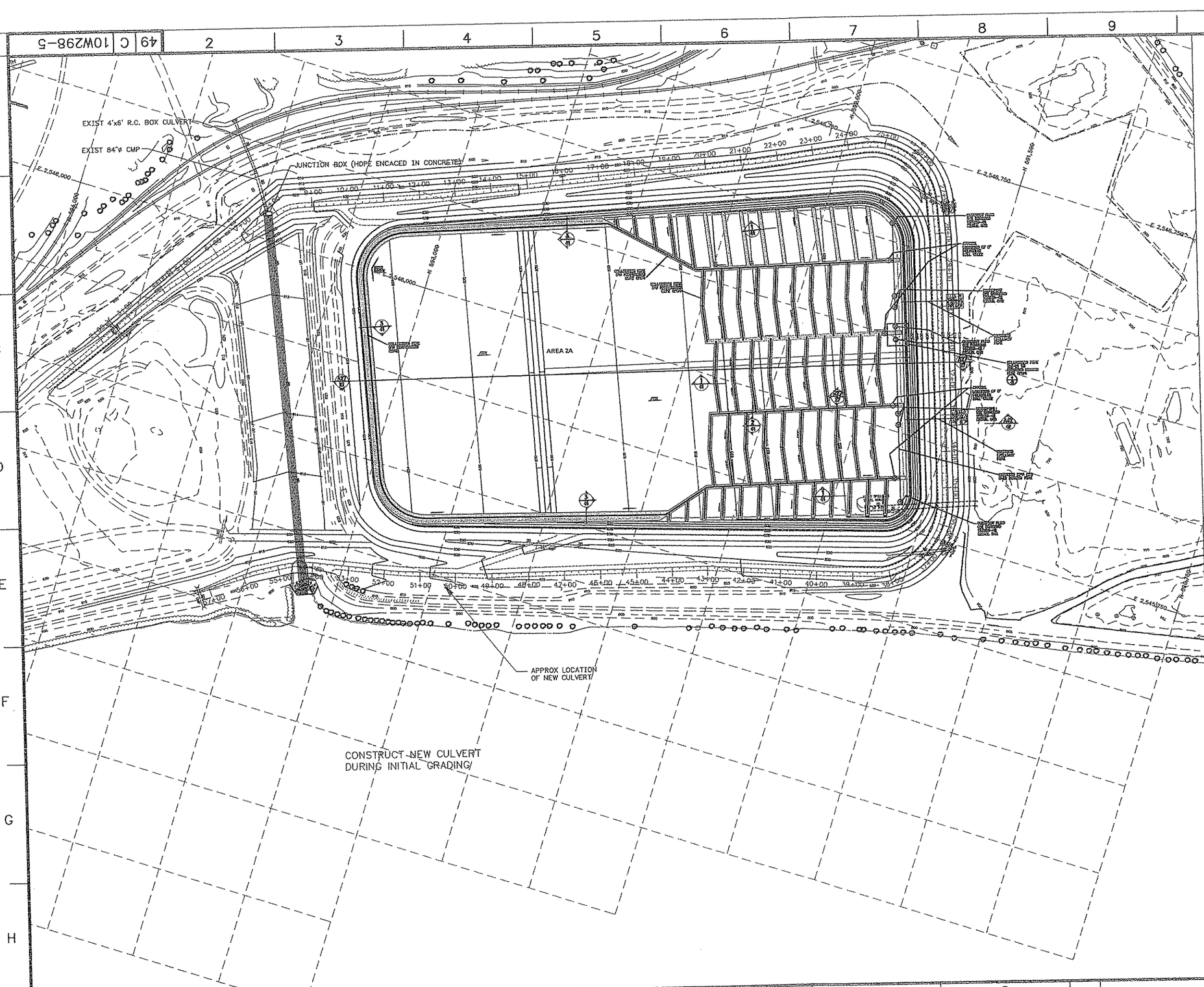
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K | DATE | 49 | C | 10W298-4 | R 0

PLOT FACTOR:200

C.A.D. DRAWN W.,TVA

DO NOT ALTER



LEGEND

- 6"ø COLLECTION PIPE
- 8"ø COLLECTION PIPE
- 12"ø EXISTING HEADER PIPE
- GEOTEXTILE FILTER FABRIC AND GRAVEL DRAINAGE LAYER

DETAIL IDENTIFICATION LEGEND

Detail Number / Sheet on which above Detail is Presented

PLAN VIEW REFERENCE

Detail Number 2 / 11 — DETAIL TITLE OF DETAIL — SCALE: 1" = 1'

Sheet on which above Detail was First Referenced

DETAIL SHEET REFERENCE

Example: Detail Number 2 Presented on Sheet No. 12 was Referenced for the First Time on Sheet No. 11.

Note: Above System also applies to Section Identifications.

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

INITIAL GRADING NOTES:

1. FOR DRAWING INDEX AND LEGEND, SEE 10W298-1.
2. DRAWINGS 10W298-3 AND 4 DEPICT PHASING OF EXPANSION CONSTRUCTION. CONSTRUCTION DRAWINGS BEGIN WITH 10W298-5.

R								
R 0	12/12/08	CWH	ACM	DRD	DRD	LeP	JCK	WR'211
DCN BRF-06-1052-005: INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.								

SCALE: 1"=100' — EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL LAYOUT PLAN INITIAL GRADING

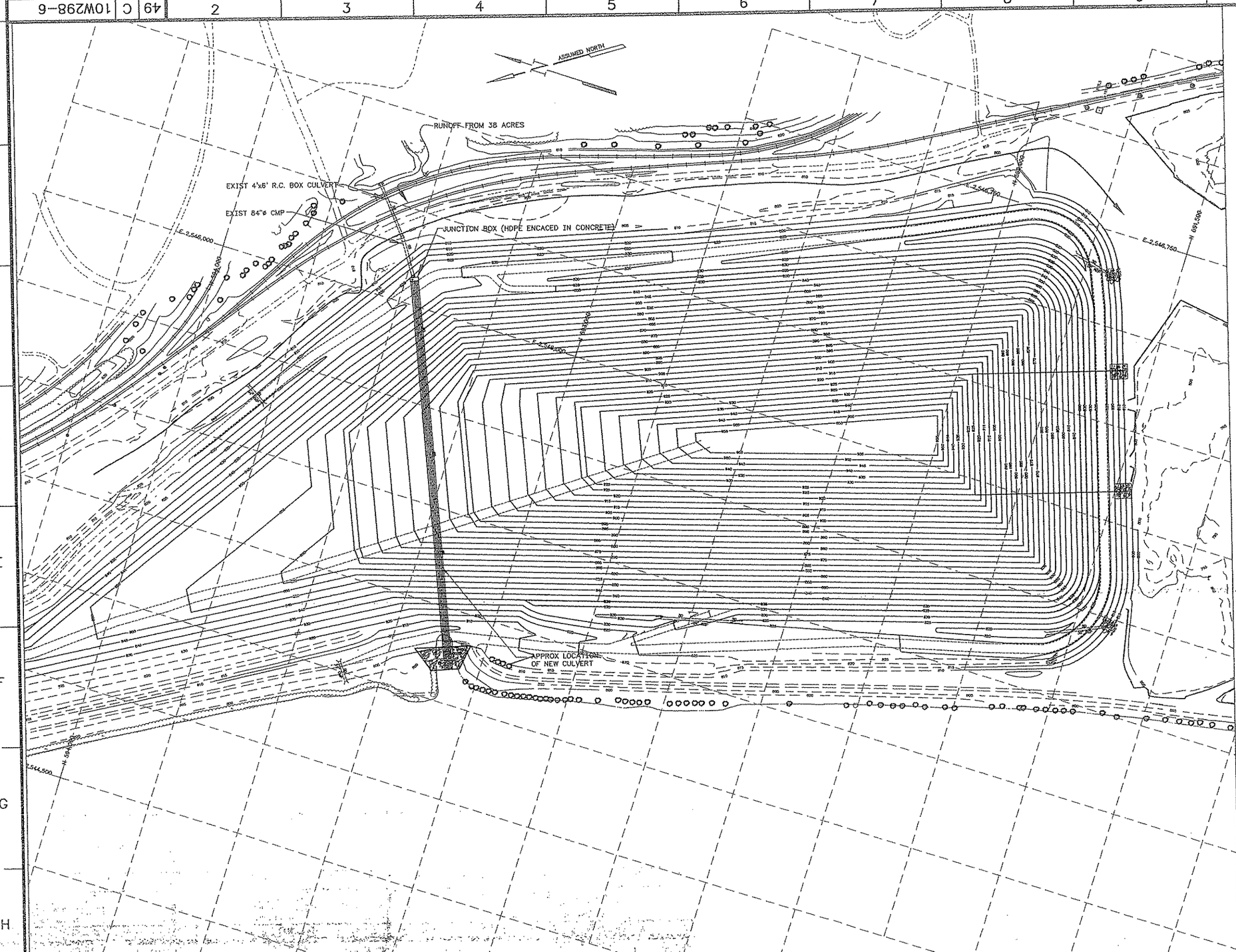
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K | DATE | 49 | C | 10W298-5 | R 0

PLOT FACTOR:100 W_TVA

C.A.D. DRAWIN
DO NOT ALTER MA

TASK COMPLETED BY: | REV NO.



FOR ASSOCIATED PERMIT DRAWINGS SEE "10W297" SERIES

NOTES:

1. FOR PHASING NOTES, SEE 10W298-3.

REV	DATE	DSGN	DRWN	CHKD	SUPV	PVWD	APVD	ISSD	PROJECT ID	AS CONST
R										
0	12/12/08	CWH	ACM	DRD	DRD	LeP	JCK		99211	
DCN BRF-08-1052-006: INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.										

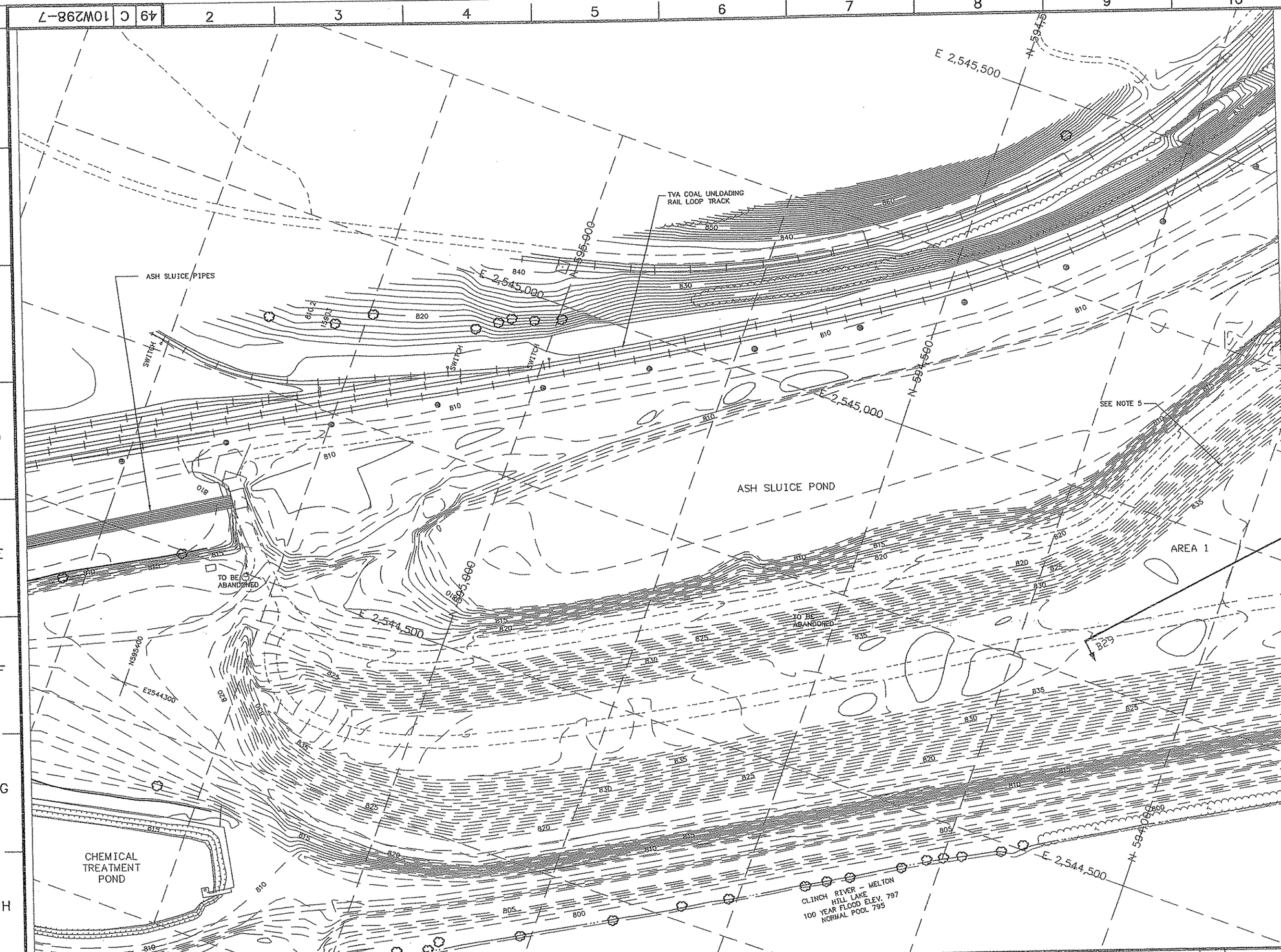
SCALE: 1"=200' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
LAYOUT PLAN
FINAL COVER

DESIGNED BY	DRAWN BY	CHECKED BY	SUPERVISED BY	REVIEWED BY	APPROVED BY	ISSUED BY

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

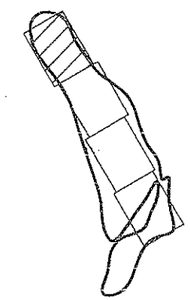


SURVEY NOTES

1. FOR DRAWING INDEX AND LEGEND, SEE 10W298-1.
2. EXISTING TOPOGRAPHY AND SITE FEATURES OBTAINED FROM A SURVEY PERFORMED BY TVA, DATED OCTOBER 2003. SUPPLEMENTAL SURVEYING FOR AREA 2 PERFORMED MARCH 2004. EXISTING MONITORING WELL LOCATIONS PROVIDED BY TVA. EXISTING ELEVATION CONTOURS ARE SHOWN AT 1-FOOT INTERVALS UNLESS NOTED OTHERWISE. ELEVATION CONTOURS FOR NEW GRADING ARE SHOWN AT 2-FOOT INTERVALS UNLESS NOTED OTHERWISE.
3. SURVEY COORDINATES ARE REFERENCED TO TENNESSEE STATE PLANE COORDINATE SYSTEM, NAD 27, AND NGVD 29. COORDINATES FOR UTILITY STRUCTURES AND PIPING ARE TO CENTERLINE OF STRUCTURE OR PIPE, UNLESS NOTED OTHERWISE.
4. HORIZONTAL AND VERTICAL CONTROL SHALL BE ESTABLISHED BY USING THE EXISTING BENCHMARK LOCATIONS LISTED ON 10W298-1, AND DEPICTED ON THESE DRAWINGS. FOR BENCHMARK DESCRIPTIONS, CONTACT:

   TVA MAPPING
   1101 MARKET ST
   CHATTANOOGA, TN 37402.
5. SOIL BORINGS FROM PAST AND RECENT GEOTECHNICAL EXPLORATION ARE SHOWN ON THESE DRAWINGS FOR REFERENCE. KELLBERG BORINGS WERE PERFORMED IN 1958 AND PREDATE THE CONSTRUCTION OF THE ORIGINAL ASH DISPOSAL FACILITY. KELLBERG BORINGS ARE NOT SHOWN ON CROSS-SECTIONS FOR CLARITY.

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES



KEY PLAN

REV NO.	DATE	DESN	DFTG	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT #	AS CONST
R 0	12/12/08	CWH	ACM	DRD	DRD	LJP	JCK		BRF211	
DCN BRF-08-1052-007; INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.										

SCALE: 1"=50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL EXISTING CONDITIONS SHEET 1

DESIGNED BY	DRAWN BY	CHECKED BY	SUPERVISED BY	REVIEWED BY	APPROVED BY	ISSUED BY

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-7	R 0

PLOT FACTOR:1 W_TVA

C.A.D. DRAWI DO NOT ALTER M

E 2,546,000

N 564,000

EXIST 4'x6' BOX CULVERT

EXIST 84" CMP

ASH SLUICE DITCH

INVERT EL 785

FLOW

EXIST. 24" CMP

EXIST WEIR BOX

PERIMETER DRAIN @ EL 815

PERIMETER DRAIN

LOWER LIMIT OF BOTTOM ASH EXCAVATION, EL 815

N 565,000

E 2,546,000

AREA 1A

AREA 1

AREA 2A

A27

B29

SEE NOTE 2

AREA 1A (EXISTING DRAINAGE CHANNEL)

EXIST CULVERT (SEE NOTE 2 ON 10W298-27)

EXIST ACCESS ROAD

PERIMETER DRAIN @ EL 815

A28

SEE MATCHLINE A ON DRAWING 10W298-7

SEE MATCHLINE B ON DRAWING 10W298-9

NOTES:

1. FOR SURVEY NOTES, SEE 10W298-7.
2. FOR INITIAL CUTTING AND FILLING FOR SUBGRADE UNDER ASH DRAINAGE LAYER, SEE SECTION A-27 AND NOTE 4 ON 10W298-27.

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

KEY PLAN

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	MYRD	APVD	ISSD	PROJECT ENGR	AS CONST
R 0	12/12/08	CWH	ADM	DRD	DRD	LJP	JCK		BRF211	

DCN BRF-08-1052-008: INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

SCALE: 1"=50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL EXISTING CONDITIONS SHEET 2

RECEIVED BY:	DRAWN BY:	DESIGNED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-8	R 0

PLOT FACTOR:1
W_TVA

C.A.D. DRAWN
DO NOT ALTER

ASH SLUICE DITCH EMPTIES INTO ASH POND

E 2,546,750

N 591,500

PERIMETER DRAIN @ EL 815

300' PERIMETER DRAIN EL STEPS UP FROM 810 TO 815

LOWER LIMIT OF BOTTOM ASH EXCAVATION, EL 815

PERIMETER DRAIN @ EL 810

SEE NOTE 2

SEE DETAIL A9

EXISTING FLY ASH POND

BH9

SEE NOTE 3

EXISTING PIEZOMETERS TO BE ABANDON

TO BE ABANDONED

AREA 2A

A27

℄ BA DRAINAGE COLUMNS (SEE DETAIL A9 & C27)

APPROX CUT BOUNDARY TO PREPARE SUBGRADE FOR BA DRAINAGE LAYER (EL 817±)

EXTEND STORM DRAINS AS NECESSARY FOR INITIAL DIKE CONSTRUCTION

PERIMETER DRAIN @ EL 815

300' PERIMETER DRAIN EL STEPS UP FROM 810 TO 815

EXISTING SPILLWAYS TO BE UTILIZED FOR DREDGING OPERATIONS

2-24" PIPE (EXIST.)

SD

EXISTING SPILLWAYS INV EL 809.5

STILLING BASIN

BH6

SEE MATCHLINE B ON DRAWING 10W298-8

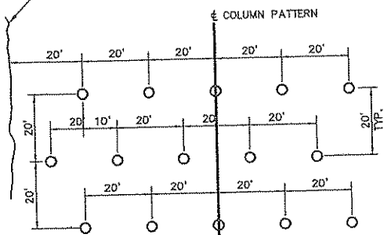
SEE MATCHLINE C ON 10W298-10

NOTES:

1. FOR SURVEY NOTES, SEE 10W298-7.
2. DRAINAGE COLUMNS TO BE FILLED WITH BOTTOM ASH ARE SHOWN ON THIS DRAWING FOR CLARITY.
3. FOR INITIAL CUTTING AND FILLING FOR SUBGRADE UNDER ASH DRAINAGE LAYER, SEE SECTION A-27 AND NOTE 4 ON 10W298-27.

APPROX TOE OF EXISTING SLOPE

℄ COLUMN PATTERN

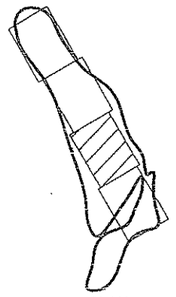


PLAN VIEW

DETAIL A9

PATTERN FOR BA DRAIN COLUMNS
SEE 10W298-40 FOR ADDITIONAL REQUIREMENTS

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES



KEY PLAN

REV	DATE	DSGN	DWN	CHKD	SUPV	APVD	APVD	ISSD	PROJECT ID	AS CONST
R 0	12/12/08	CWH	ACM	DRD	DRD	LJP	JCK		BRF211	

DCN BRF-08-1052-C09: INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

SCALE: 1"=50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
EXISTING CONDITIONS
SHEET 3

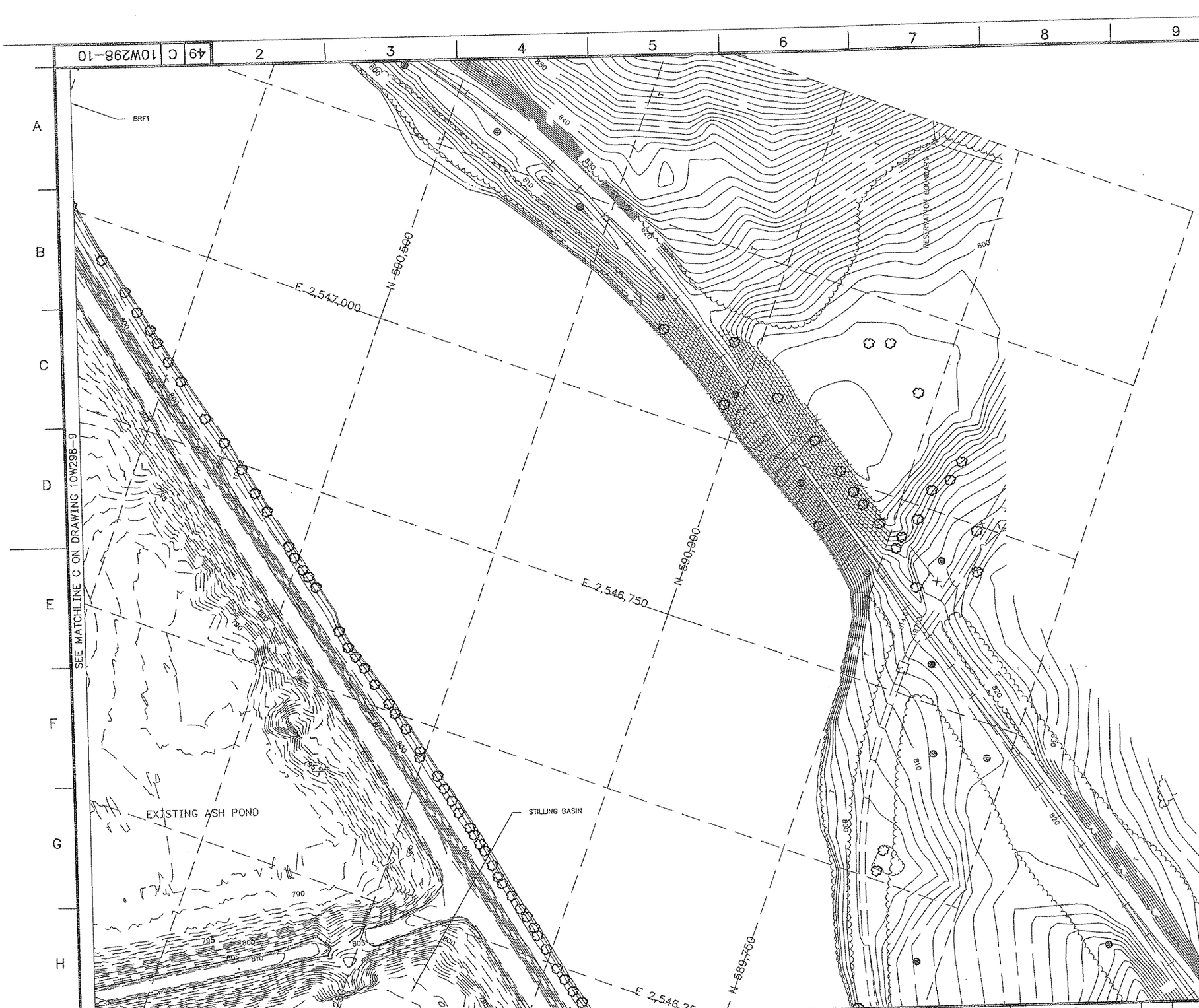
DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-9	R 0

PLOT FACTOR:1
W_TVA

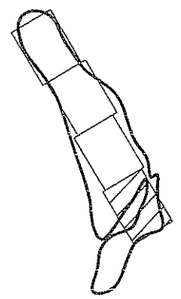
C.A.D. DRAWI
DO NOT ALTER M



NOTES:

1. FOR SURVEY NOTES, SEE 10W298-7.

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES



KEY PLAN

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT EP	AS CONST
R 0	12/12/08	CWH	AGH	DRD	DRD	LJP	JCK		08F211	

DGN BRF-08-1092-D10; INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

SCALE: 1"=50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
EXISTING CONDITIONS
SHEET 4

DESIGNED BY | DRAWN BY | CHECKED BY | SUPERVISED BY | REVIEWED BY | APPROVED BY | ISSUED BY

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K | DATE | 49 | C | 10W298-10 | R 0

PLOT FACTOR:1 W_TVA

C.A.D. DRAWI
DO NOT ALTER M

TASK COMPLETED BY: | REV NO.

FOR ASSOCIATED PERMIT DRAWINGS
SEE 10W297 SERIES

ASH SLUICE POND

AREA 1

LIMIT OF ASH DISPOSAL FOR AREA 1A

SLEEVE

REROUTE CHEMICAL POND DRAIN PRIOR TO CONSTRUCTION OF AREA 1A

CLINCH RIVER - MELTON HILL LAKE
100 YEAR FLOOD ELEV. 797
NORMAL POOL 795

E 2,545,500
N 595,500
E 2,545,000
N 595,000
E 2,544,500
N 594,500
N395400
E2544300

SEE MATCHLINE A ON DRAWING 10W298-11

GENERAL NOTES

1. THE ASH POND HAS AN EXISTING STILLING BASIN TO PROVIDE SEDIMENTATION CONTROL DURING CONSTRUCTION AND OPERATION. EROSION CONTROL MEASURES (TEMPORARY SILT FENCES, CHECK DAMS) ARE NOT DEPICTED ON THE DRAWINGS BUT SHALL BE UTILIZED, WHEN NECESSARY, BY THE CONSTRUCTOR AND OPERATOR TO CONTROL SEDIMENT DISCHARGE TO THE STILLING BASIN.
2. THE CONSTRUCTOR AND OPERATOR SHALL PROVIDE A MEANS TO CONTROL DUST DURING CONSTRUCTION AND OPERATION. CONTROLS CAN INCLUDE THE USE OF WATER TRUCKS, OR COMMERCIALLY AVAILABLE APPLIED SPRAY-ON MEMBRANE EROSION CONTROL PRODUCTS.
3. SECTION NUMBERS REFER DIRECTLY TO TVA SPECIFICATION T-1, UNLESS NOTED OTHERWISE.
4. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH TVA SPECIFICATION T-1, AND THE FOLLOWING ASH POND EXPANSION DOCUMENTS: OPERATIONS MANUAL; THE CLOSURE/POST CLOSURE PLAN; AND THE QA/QC PLAN.
5. CONSTRUCTOR SHALL VERIFY AMPLE CLEARANCE NEAR OVERHEAD ELECTRICAL LINES FOR CONSTRUCTION EQUIPMENT. CONSTRUCTOR SHALL NOTIFY CONSTRUCTION MANAGER BEFORE ANY WORK STARTS NEAR OVERHEAD ELECTRICAL LINES.
6. THE CONSTRUCTOR IS ADVISED THAT THERE MAY BE UNDERGROUND UTILITIES PRESENT AT THIS SITE WHICH ARE NOT SHOWN ON THESE DRAWINGS. THE CONSTRUCTOR SHALL LOCATE AND VERIFY EXISTING UNDERGROUND UTILITIES THAT MAY NOT BE SHOWN ON THESE DRAWINGS, BUT THAT ARE WITHIN AREAS TO BE DISTURBED. THE CONSTRUCTOR SHALL VERIFY THAT ANY UNDERGROUND ELECTRICAL UTILITIES ARE LOCKED OUT/TAGGED OUT AND ARE NOT ACTIVATED PRIOR TO REMOVAL. THE EXISTING CONCRETE MANHOLE AND UNDERGROUND UTILITIES WITHIN THE AREA TO BE DISTURBED BY CONTRUCTION OF THIS FACILITY SHALL BE REMOVED PRIOR TO EXCAVATION AND GRADING ACTIVITIES.
7. THE CONSTRUCTOR SHALL EXERCISE CARE TO PREVENT DAMAGE TO EXISTING MONITORING WELLS AND/OR EXISTING STRUCTURES.
8. DISPOSAL OF DEMOLISHED ITEMS SUCH AS EXISTING STORM SEWER PIPING OR OTHER MISCELLANEOUS ITEMS SHALL BE AS DIRECTED BY TVA.
9. FOR CONSTRUCTION OF THE AREA 2A BASE AND STARTER DIKE SEE CONSTRUCTION DETAILS ON 10W298-27 AND THE QA/QC PLAN.
10. ELEVATION CONTOURS SHOWN ON THE OUTER SLOPES OF NEW GRADING ARE FINISHED GRADE (INCLUDING FINAL COVER).
11. ELEVATIONS SHOWN INSIDE THE AREA 2A STARTER DIKES ARE TO TOP OF THE FLY ASH BASE AS SHOWN IN TYPICAL CROSS SECTION ON 10W298-27.
12. FOR DRAWING INDEX & LEGEND, SEE 10W298-1.

KEY PLAN

REV	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APVD	ISSUED	PROJECT MGR	AS CONST
R 0	12/12/08	CWH	ACM	DRD	DRD	LJP	JCK		BRF211	

DCN BRF-08-1052-011: INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

SCALE: 1"=50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
INITIAL SITE GRADING
SHEET 1

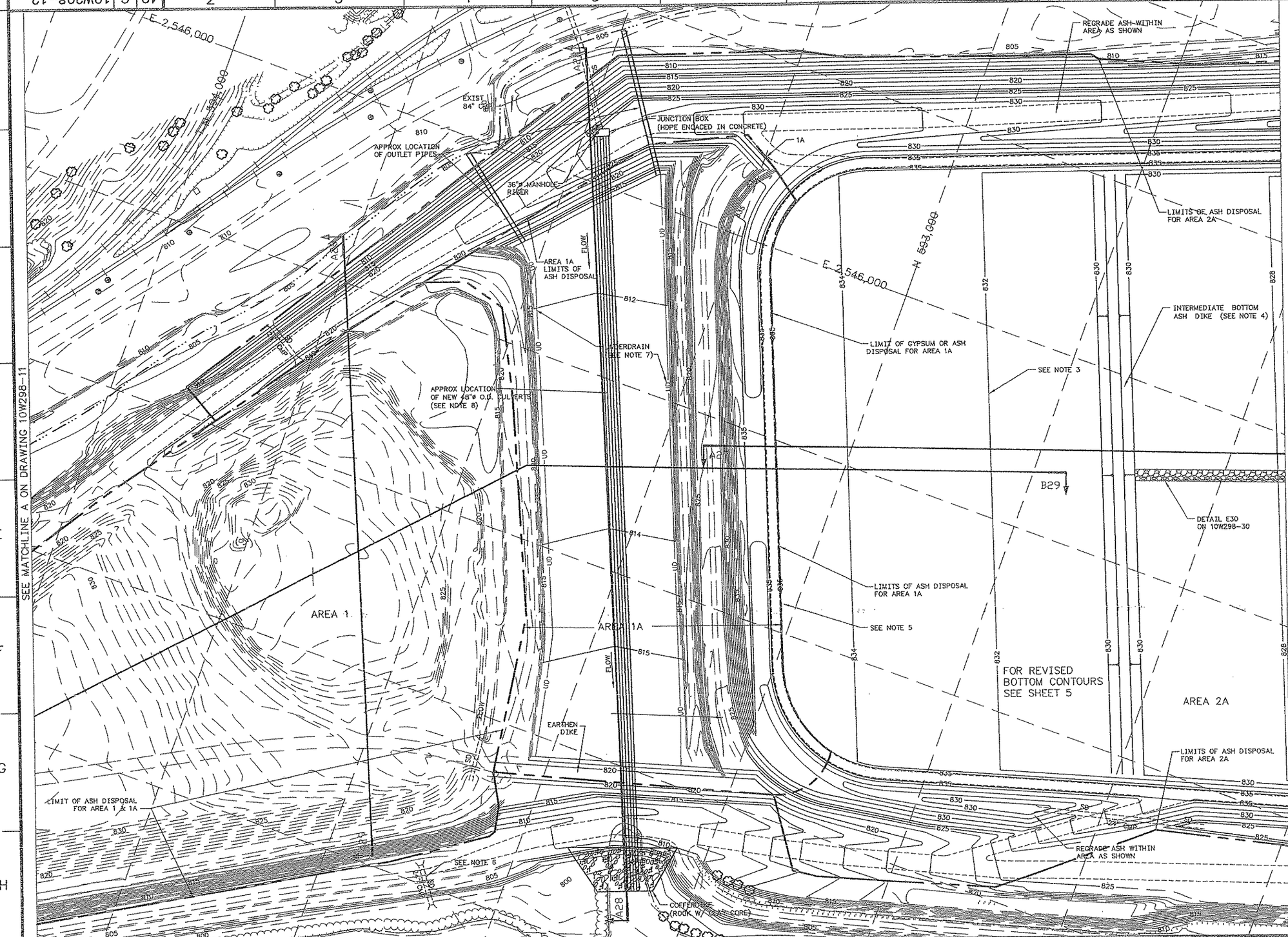
DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-11	R 0

PLOT FACTOR:1
W_TVA

C.A.D. DRAWING
DO NOT ALTER MAN



GRADING NOTES:

1. FOR GENERAL NOTES, SEE 10W298-11.
2. GRADING FOR AREA 2A SHOWN. FOR PHASING OF CONSTRUCTION, SEE 10W298-3 AND 4 AND THE OPERATIONS PLAN.
3. GRADING SHOWN FOR AREA 2A IS TOP OF FLY ASH BASE. FOR POSSIBLE GRADE ADJUSTMENTS, SEE NOTE 4 ON 10W298-27 SEE DETAILS AND CROSS SECTIONS FOR BOTTOM ASH DRAINAGE AND FILTER LAYERS.
4. CONSTRUCT INTERMEDIATE ASH DIKE TO FORM POND FOR INITIAL GYPSUM SLUICING. CONSTRUCT INITIAL WET CAST GYPSUM DIKE USING GYPSUM SLURRIED INTO POND AS DESCRIBED IN THE OPERATION PLAN. EXTEND WET CAST GYPSUM DIKE BEYOND THE INITIAL GYPSUM POND TO DEVELOP THE FULL FOOTPRINT OF AREA 2A.
5. APPLY SPRAY-ON MEMBRANE ON ASH SURFACES WITHIN AREA 2A THAT ARE OUTSIDE OF THE INITIAL GYPSUM POND.
6. AREA SHOWN BELOW EL 818 (APPROXIMATELY) SHALL BE STABILIZED WITH VEGETATION PRIOR TO CONSTRUCTION OF DIKES FOR CONSTRUCTION OF AREA 1A. INSTALL STORM DRAIN WHERE SHOWN TO DIVERT STORMWATER TO RESERVOIR.
7. INSTALL UNDERDRAINS AS SHOWN ON SECTION B29 ON 10W298-29 AND DETAIL C32 ON 10W298-32.
8. CULVERT TO BE INSTALLED PRIOR TO THE DEVELOPEMENT OF AREA 1A.

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

KEY PLAN

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	HYDR	APVD	ISSD	PROJECT ID	AS CONST
R 0	12/12/08	CWH	ACH	DRD	DRD	LJP	JCK		BRF201	
DCN BRF-08-1052-012: INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.										

SCALE: 1"=50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL INITIAL SITE GRADING SHEET 2

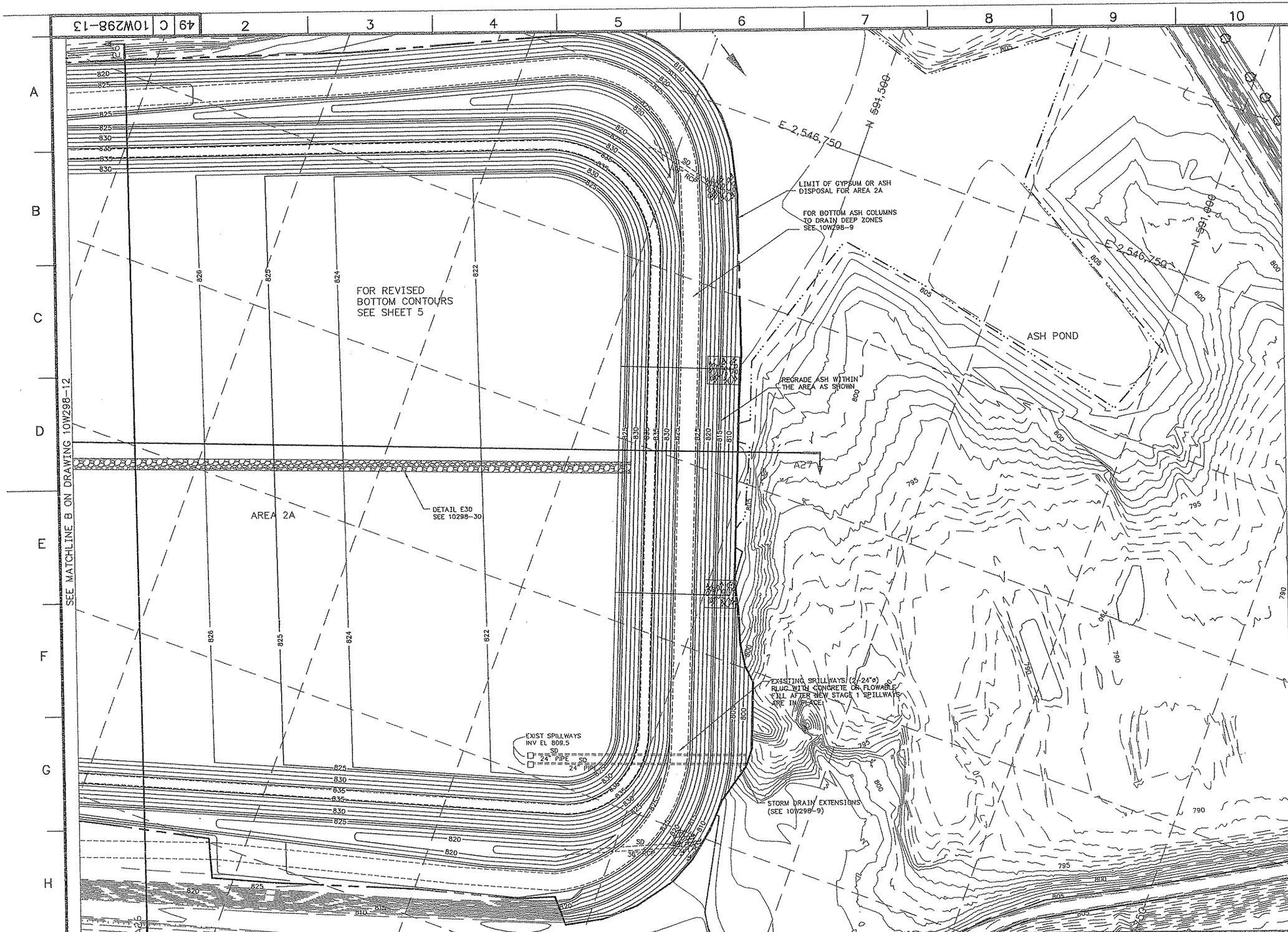
DESIGNED BY	DRAWN BY	CHECKED BY	SUPERVISED BY	REVIEWED BY	APPROVED BY	ISSUED BY

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-12	R 0

PLOT FACTOR:1
W_TVA

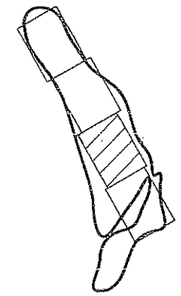
C.A.D. DRAWN
DO NOT ALTER MAN



NOTES:

1. FOR GENERAL NOTES, SEE 10W298-11
2. PERIMETER UNDERDRAINS, LATERAL OUTLET PIPES AND B/A DRAIN COLUMNS OMITTED FOR CLARITY, SEE SECTIONS ON DRAWINGS 10W298-26, 27, 32 & 33 AND 10W298-8 & 9 FOR LOCATIONS.
3. SEE DETAILS OF STAGE 1 SPILLWAY ON 10W298-31. PROVIDE TEMPORARY DITCHES TO SPILLWAY INLETS. FOR LOCATION OF SPILLWAY SEE 10W298-38 & 39.

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES



KEY PLAN

R	DATE	DSGN	DRWN	CHKD	SUPV	APVD	ISSD	PROJECT ID	AS CONST
0	12/12/08	CWH	AGM	DRD	DRD	LJP	JCK	BRF211	

DCN BRF-08-1052-013; INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

SCALE: 1"=50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
INITIAL SITE GRADING
SHEET 3

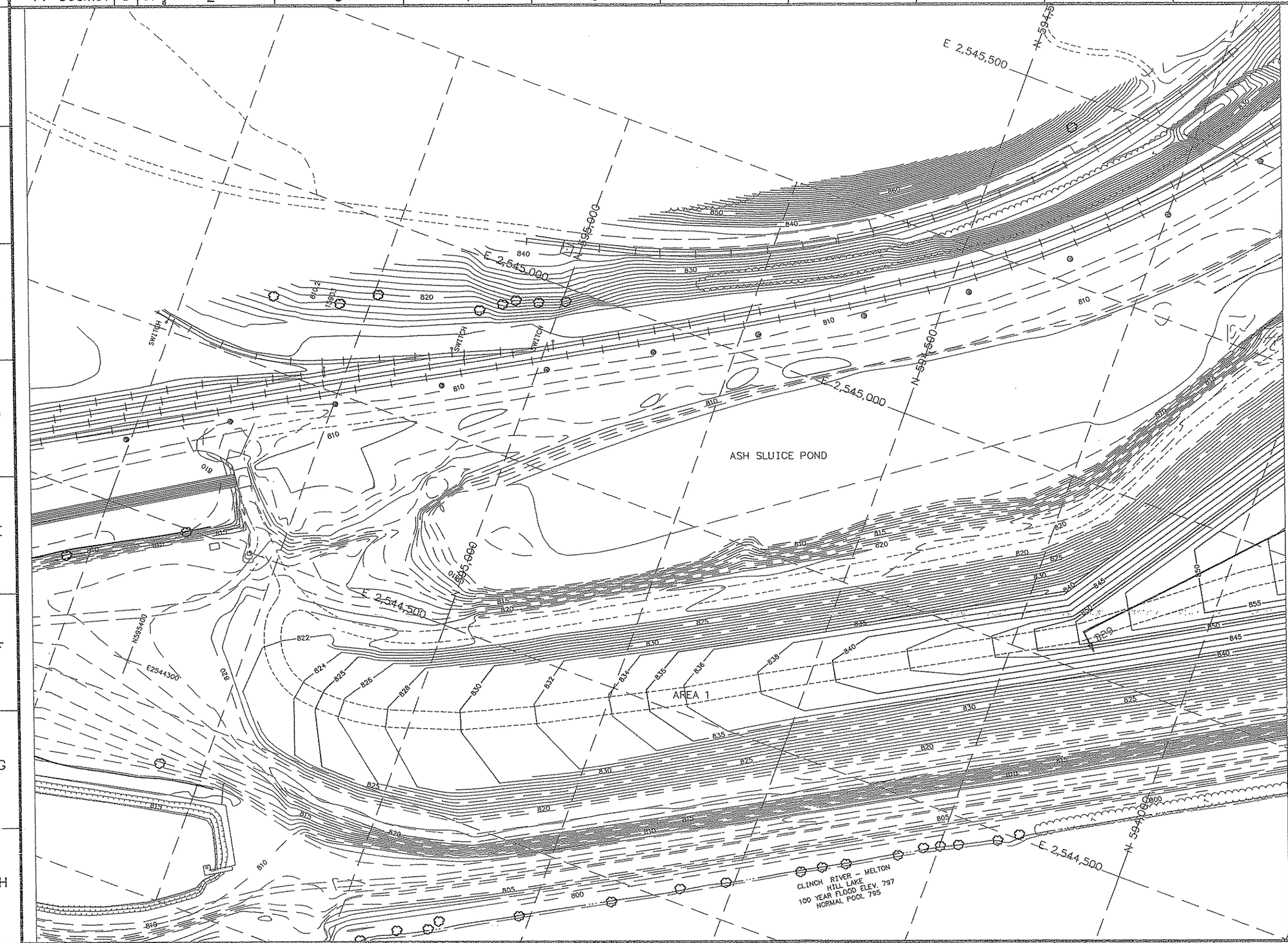
DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-13	R 0

PLOT FACTOR:1
W_TVA

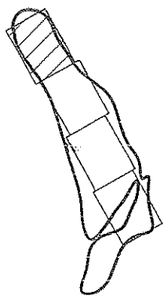
C.A.D. DRAWING
DO NOT ALTER MANU



STAGE 1 NOTES:

1. FOR DRAWING INDEX AND LEGEND, SEE 10W298-1.
2. FOR GENERAL NOTES, SEE 10W298-11.
3. PROVIDE A MINIMUM OF TWO (2) FEET OF FREEBOARD TO THE FINISHED DIKE ELEVATION DURING ASH DREDGING/GYPSUM PLACEMENT ACTIVITIES.
4. LOCATE METAL SPILLWAYS SO THAT THEY COINCIDE WITH PERMANENT LETDOWN CHANNELS.
5. PROPOSED CONTOUR ELEVATIONS SHOWN FOR THE OUTER 3:1 SLOPES ARE FINISHED SURFACE ELEVATIONS (INCLUDING FINAL COVER).
6. FINAL ASH/GYPSUM GRADE SHALL BE AT TWO (2) FEET PLUS OR MINUS BELOW THE ACTUAL GRADE SHOWN.
7. MAXIMUM SLOPE SHALL BE 3:1 (HORIZONTAL TO VERTICAL) FOR AREA 2A AND 4:1 FOR AREA 1
8. FOR CONSTRUCTION OF AND RAISING OF DIKES, SEE DETAIL A32 ON 10W298-32.
9. PERIMETER UNDERDRAINS WITHIN THE OUTER WET-CAST GYPSUM DIKES ARE NOT SHOWN ON THESE DRAWINGS. SEE DETAIL A32 ON 10W298-32.
10. FOR DITCH LAYOUT, SEE 10W298-36.

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES



KEY PLAN

REV	DATE	DSGN	DRWN	CHKD	SUPV	APVD	APVD	ISSD	PROJECT ID	AS CONST
R 0	12/12/08	CMM	AGH	DRD	DRD	LJP	JCK		BRF211	

DCN BRF-08-1052-D14: INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

SCALE: 1"=50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
STAGE 1
SHEET 1

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-14	R 0

PLOT FACTOR:1
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANU.

2 3 4 5 6 7 8 9 10 11 12

A B C D E F G H

E 2,546,000

E 2,544,000

N 583,000

N 582,000

EXIST. 84" CMP

MANHOLE RISER

JUNCTION BOX
(HDPE ENCASED IN CONCRETE)

AREA 1

AREA 1A

AREA 2A

B29

A28

A2

FOR INTERIOR WASTE MANAGEMENT OPTIONS SEE 10W298-38

APPROX. LOCATION OF NEW 48" O.D. CULVERTS

COFFERDIKE
ROCK W/ CLAY CORE

SEE MATCHLINE A ON DRAWING 10W298-14

SEE MATCHLINE B ON DRAWING 10W298-16

NOTES:

1. FOR GENERAL NOTES, SEE 10W298-11.
2. FOR STAGE 1 NOTES, SEE 10W298-14.

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

KEY PLAN

REV	DATE	DESCRIPTION	BY	CHK	APP	ISSUED
0	12/12/08	INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.	CHM	ACM	DRD	LJP

DCN BRF-08-1052-015

BRF211

SCALE: 1"=50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
STAGE 1
SHEET 2

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K | 49 | C | 10W298-15 | R 0

PLOT FACTOR:1
W_TVA

C.A.D. DRAWIN
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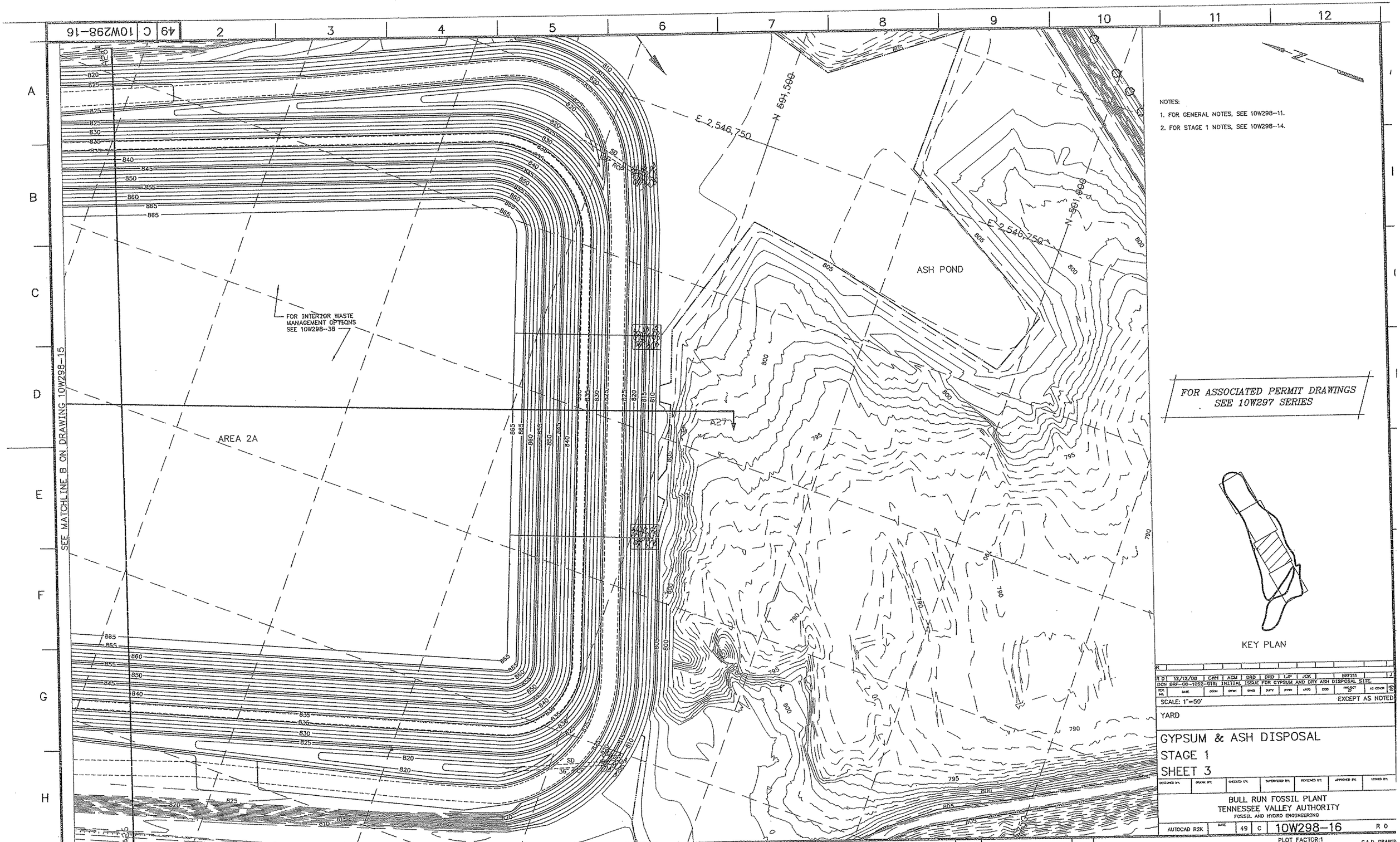


NOTES:

1. FOR GENERAL NOTES, SEE 10W298-11.
2. FOR STAGE 1 NOTES, SEE 10W298-14.

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

KEY PLAN

R	DATE	DSGN	DRWN	CHKD	SUPV	REVWD	APVD	ISSD	PROJECT ID	AS CONST
0	12/12/08	CWH	ACM	DRD	DRD	LJP	JCK		88P311	

DCN BRF-08-1052-018; INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

SCALE: 1"=50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
STAGE 1
SHEET 3

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:

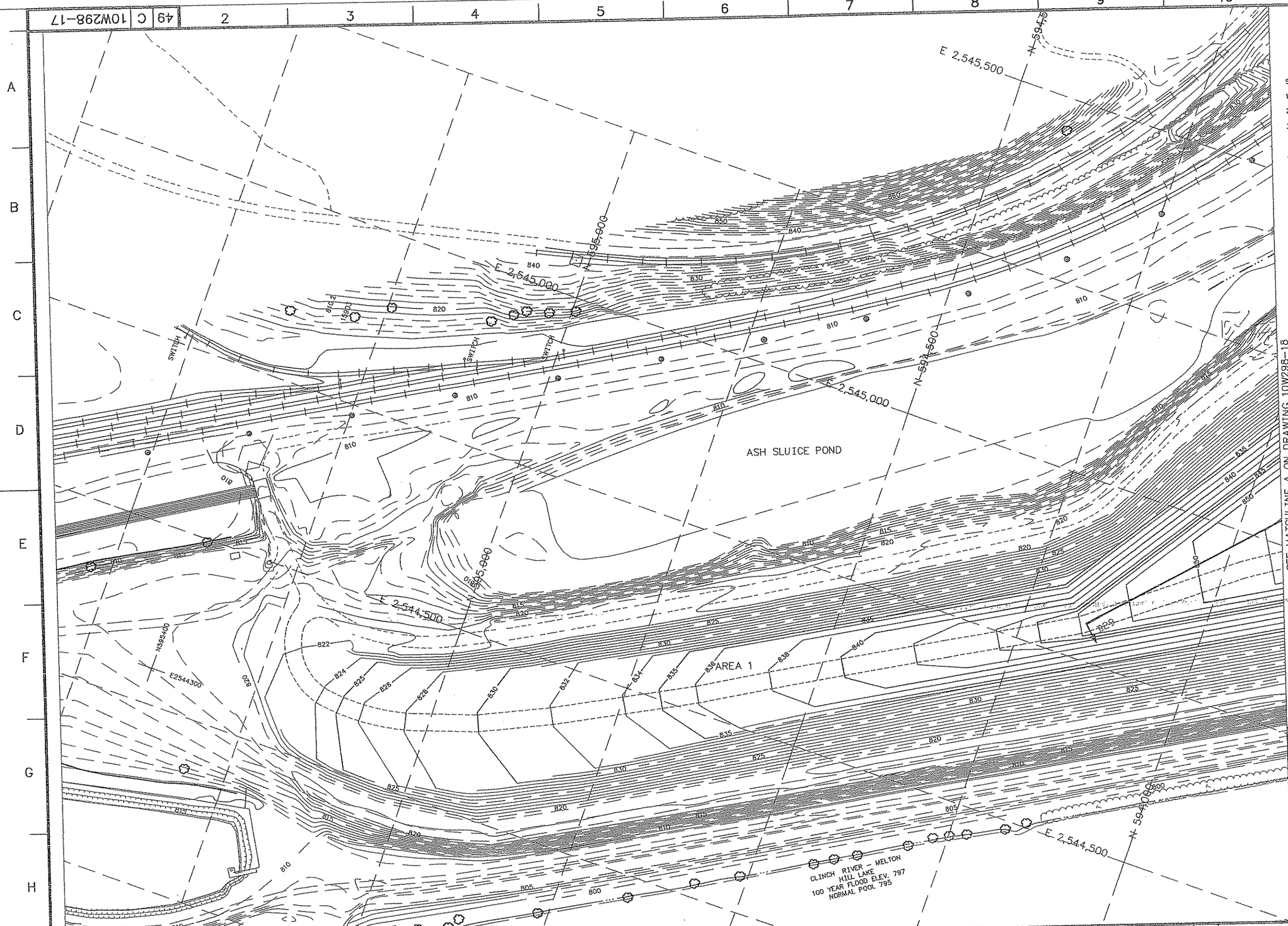
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-16	R 0

PLOT FACTOR:1
W_TVA

C.A.D. DRAWIN
DO NOT ALTER MA

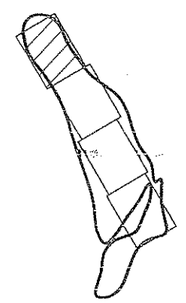
TASK COMPLETED BY:	REV NO.



STAGE 2 NOTES:

1. FOR DRAWING INDEX AND LEGEND, SEE 10W298-1.
2. FOR GENERAL NOTES, SEE 10W298-11.
3. PROVIDE A MINIMUM OF TWO (2) FEET OF FREEBOARD TO THE FINISHED DIKE ELEVATION DURING ASH DREDGING/GYPSUM PLACEMENT ACTIVITIES.
4. LOCATE METAL SPILLWAYS TO TIE INTO EXISTING METAL SPILLWAYS FOR PREVIOUS STAGE AS SHOWN ON 10W298-31.
5. PROPOSED CONTOUR ELEVATIONS SHOWN FOR THE OUTER 3:1 SLOPES ARE FINISHED SURFACE ELEVATIONS (INCLUDING FINAL COVER).
6. FINAL ASH/GYPSUM GRADE SHALL BE AT TWO (2) FEET PLUS OR MINUS BELOW THE ACTUAL GRADE SHOWN.
7. MAXIMUM SLOPE SHALL BE 3:1 (HORIZONTAL TO VERTICAL).
8. FOR CONSTRUCTION OF AND RAISING OF DIKES, SEE DETAIL A32 ON 10W298-32.
9. PERIMETER UNDERDRAINS WITHIN THE OUTER WET-CAST GYPSUM DIKES ARE NOT SHOWN ON THESE DRAWINGS. SEE DETAIL A32 ON 10W298-32.
10. FOR DITCH LAYOUT, SEE 10W298-36.

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES



KEY PLAN

REV	DATE	DESCRIPTION	DRAWN	CHKD	SUPV	HYDRO	APVD	ISSD	PROJECT ENGR	AS CONST
R 0	12/12/08	GWH	ADM	DRD	DRD	LJP	JCK		BRF211	
DCN BRF-08-1052-017: INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.										

SCALE: 1"=50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
STAGE 2
SHEET 1

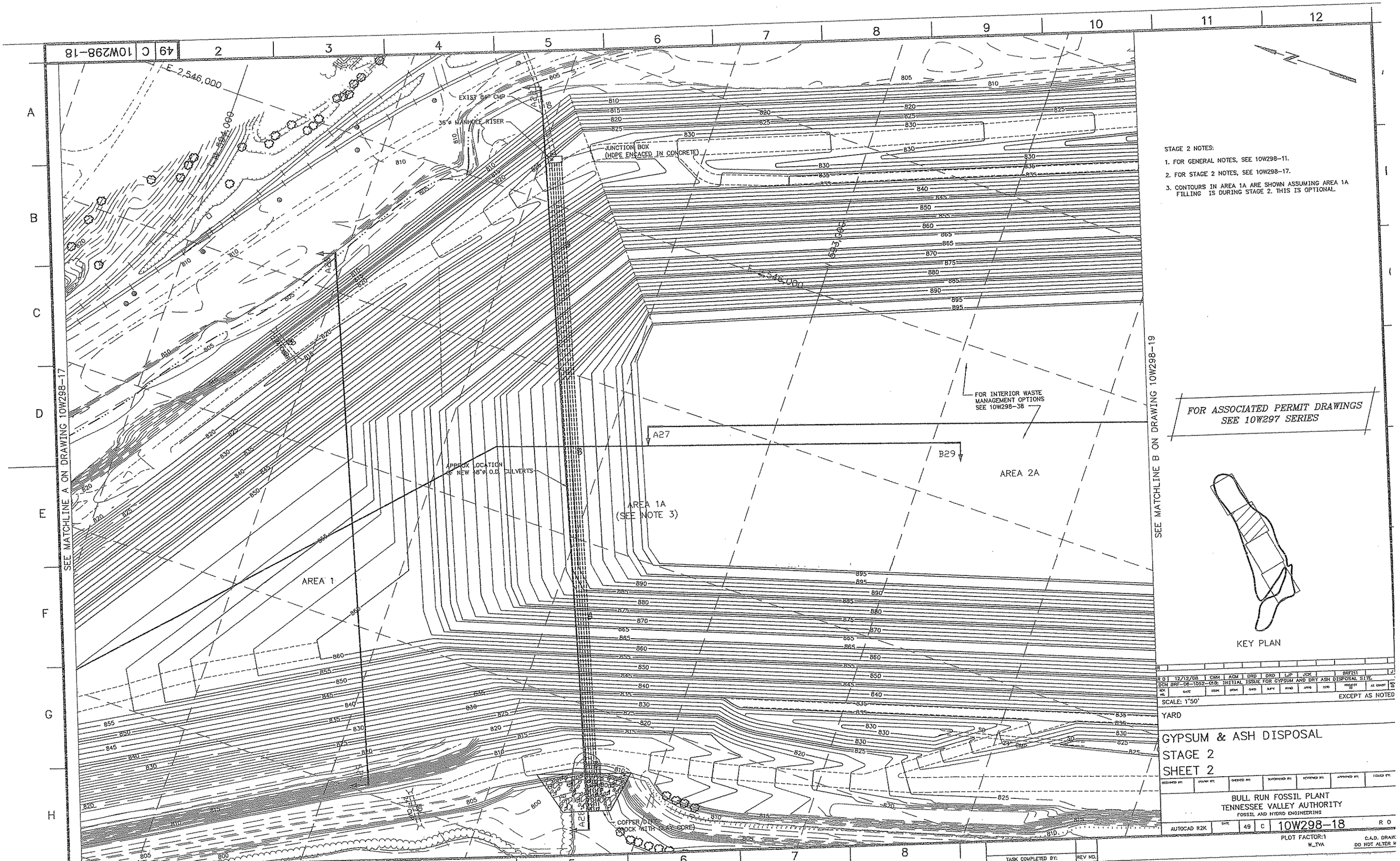
DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-17	R 0

PLOT FACTOR:1 W_TVA

C.A.D. DRAWI DO NOT ALTER MA



STAGE 2 NOTES:

1. FOR GENERAL NOTES, SEE 10W298-11.
2. FOR STAGE 2 NOTES, SEE 10W298-17.
3. CONTOURS IN AREA 1A ARE SHOWN ASSUMING AREA 1A FILLING IS DURING STAGE 2. THIS IS OPTIONAL.

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

KEY PLAN

REV	DATE	DSGN	DRWN	CHKD	SUPV	PJMD	APPD	SEND	PROJECT ID	AS CONST
R 0	12/12/08	CWH	AGM	DRD	DRD	LJP	JCK		BRF211	

DGN: BRF-08-1052-018; INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE

SCALE: 1"=50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
STAGE 2
SHEET 2

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:

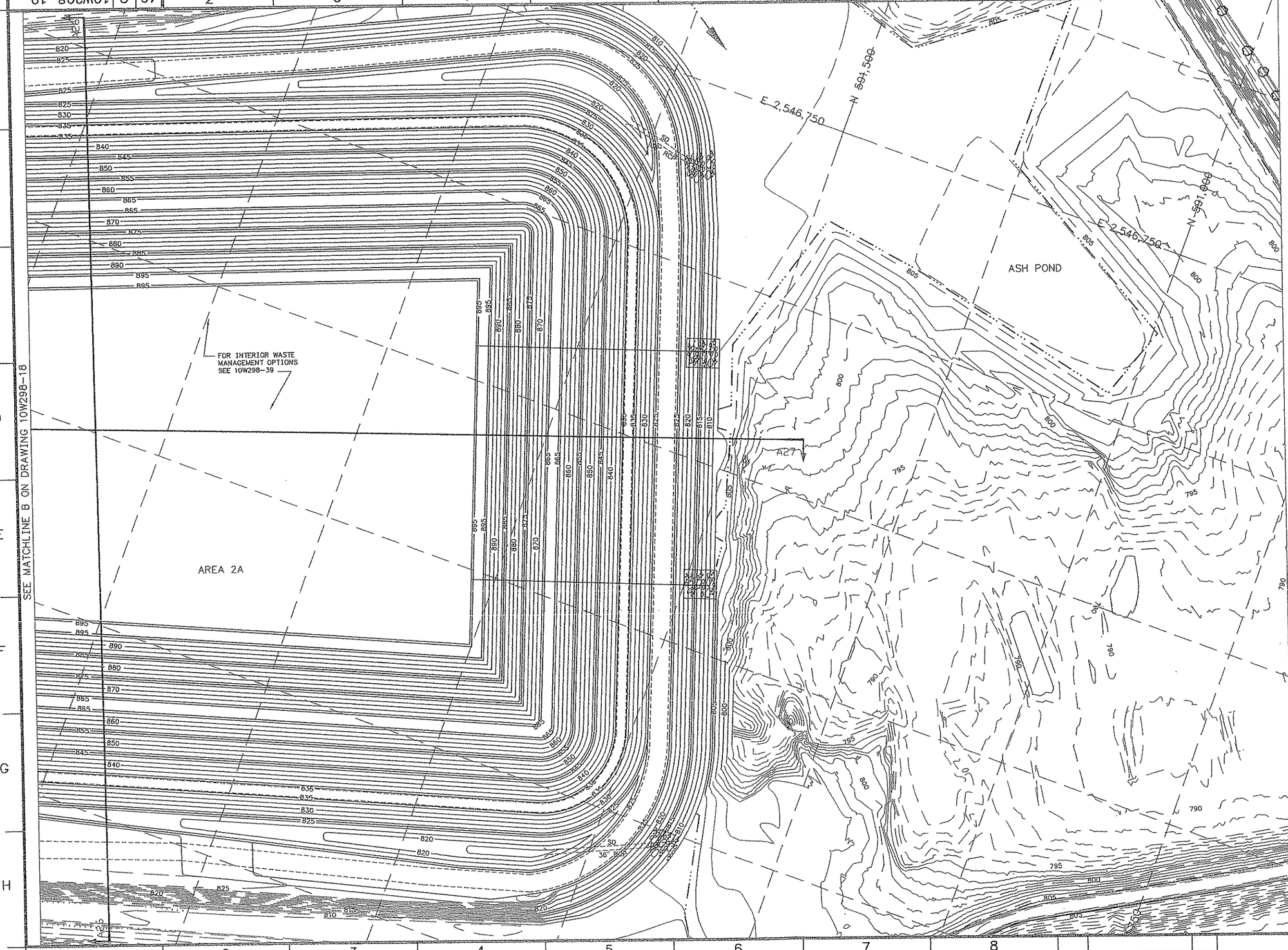
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-18	R D

PLOT FACTOR:1 W_TVA

C.A.D. DRAWI
DO NOT ALTER

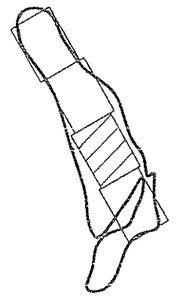
TASK COMPLETED BY:	REV NO.



NOTES:

1. FOR GENERAL NOTES, SEE 10W298-11.
2. FOR STAGE 2 NOTES, SEE 10W298-17.

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES



KEY PLAN

REV. NO.	DATE	DESCR.	CHKD	SURV	MGR	APPD	ISSD	PROJECT ID	AS CONST
R									
0	12/12/08	CWH	AGM	DRD	DRD	LJP	JCK	BRF211	

DCN BRF-06-1052-019; INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

SCALE: 1"=50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
STAGE 2
SHEET 3

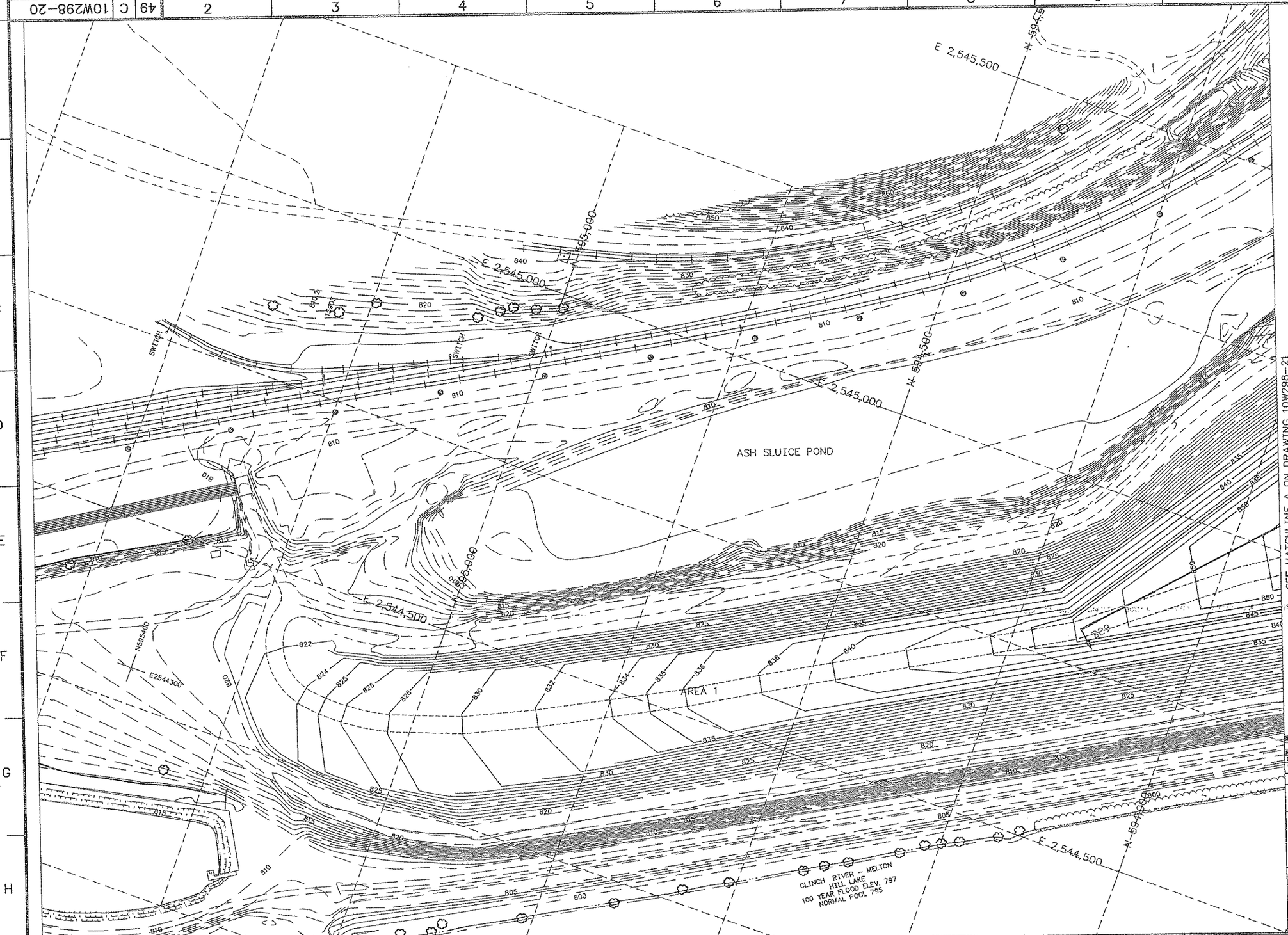
DESIGNED BY	DRAWN BY	CHECKED BY	SUPERVISED BY	REVIEWED BY	APPROVED BY	ISSUED BY

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-19	R 0

PLOT FACTOR:1
W_TVA

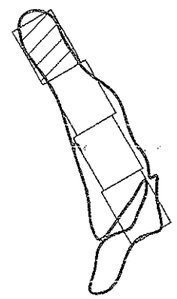
C.A.D. DRAWING
DO NOT ALTER MANU



STAGE 3 NOTES:

1. FOR DRAWING INDEX AND LEGEND, SEE 10W298-1.
2. FOR GENERAL NOTES, SEE 10W298-11.
3. PROVIDE A MINIMUM OF TWO (2) FEET OF FREEBOARD TO THE FINISHED DIKE ELEVATION DURING ASH DREDGING/ GYPSUM PLACEMENT ACTIVITIES.
4. LOCATE METAL SPILLWAYS TO TIE INTO EXISTING METAL SPILLWAYS FOR PREVIOUS STAGE AS SHOWN ON 10W298-31.
5. PROPOSED CONTOUR ELEVATIONS SHOWN FOR THE OUTER 3:1 SLOPES ARE FINISHED SURFACE ELEVATIONS (INCLUDING FINAL COVER).
6. FINAL ASH/GYPSUM GRADE SHALL BE AT TWO (2) FEET PLUS OR MINUS UNDER THE ACTUAL GRADE SHOWN.
7. MAXIMUM SLOPE SHALL BE 3:1 (HORIZONTAL TO VERTICAL) FOR AREA 2A AND 4:1 FOR AREA 1.
8. FOR CONSTRUCTION OF AND RAISING OF WET CAST GYPSUM DIKES, SEE DETAIL A32 ON 10W298-32. FOR CONSTRUCTION OF AND RAISING OF ASH DIKES, SEE DETAIL A33 ON 10W298-33.
9. PERIMETER UNDERDRAINS WITHIN THE OUTER WET-CAST GYPSUM DIKES AND ASH DIKES ARE NOT SHOWN ON THESE DRAWINGS. SEE DETAIL A32 ON 10W298-32.
10. FOR DITCH LAYOUT, SEE 10W298-36.

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES



KEY PLAN

REV NO.	DATE	BY	DWN	CHKD	SUPV	APPD	PROJECT ENGR	AS CONST
R 0	12/12/08	CWH	ACM	DRD	DRD	LJP	JCK	
DCN BRF-08-1052-D20: INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.								

SCALE: 1"=50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
STAGE 3
SHEET 1

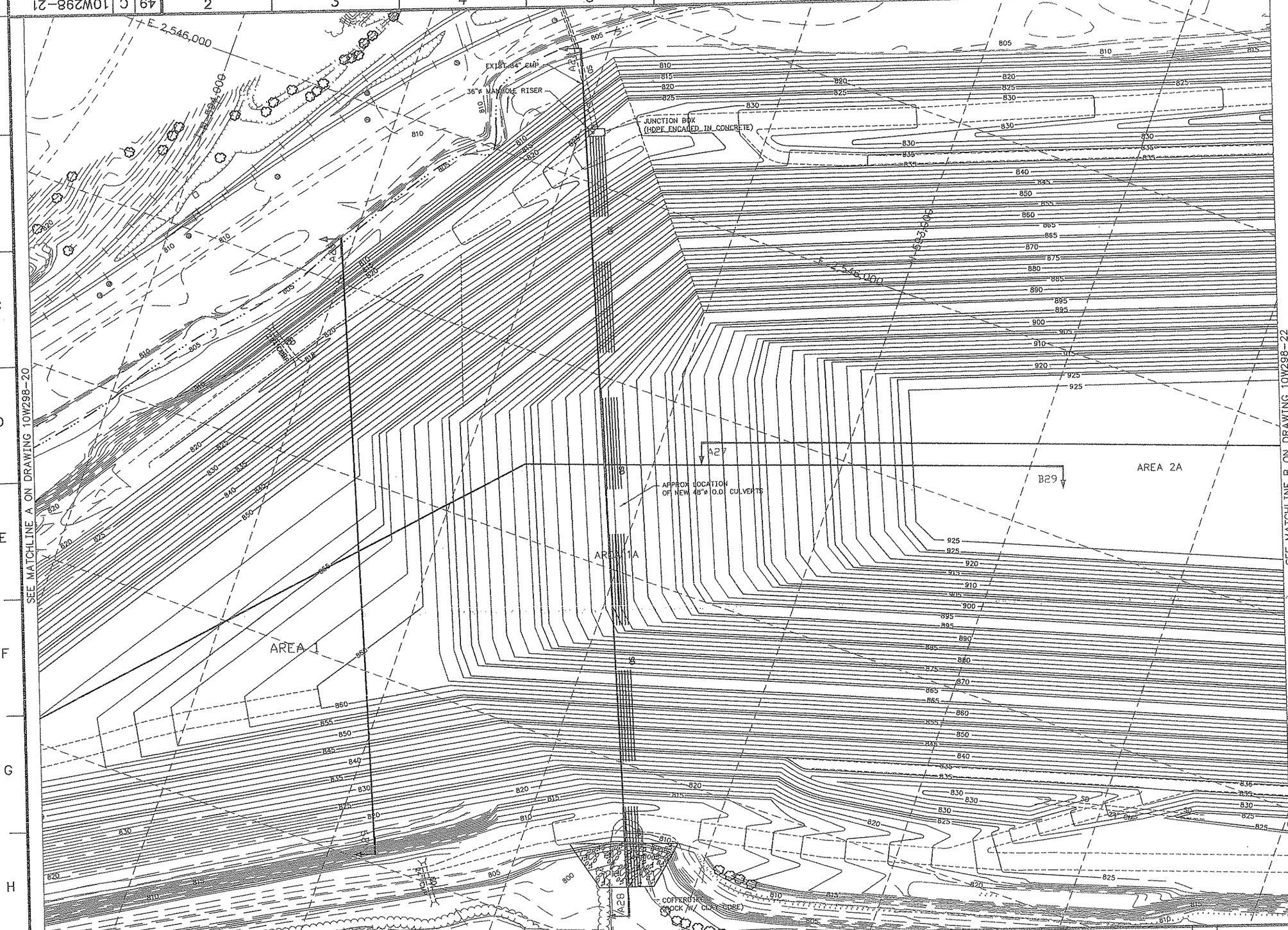
DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-20	R 0

PLOT FACTOR: W_TVA

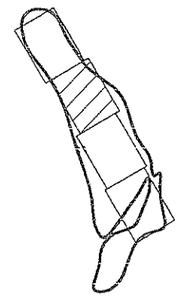
C.A.D. DRAWI
DO NOT ALTER MA



NOTES:

1. FOR GENERAL NOTES, SEE 10W298-11.
2. FOR STAGE 3 NOTES, SEE 10W298-20.

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES



KEY PLAN

REV	DATE	DSGN	DRWN	CHKD	SUPV	APVD	APVD	ISSD	PROJECT ID	AS CONST
R 0	12/12/08	CMH	ACM	DRD	DRD	LJP	JCK		BRF211	

DCN BRF-06-1052-021: INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

SCALE: 1"=50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
STAGE 3
SHEET 2

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-21	R 0

PLOT FACTOR:1 W_TVA

C.A.D. DRAWI
DO NOT ALTER MA

SEE MATCHLINE B ON DRAWING 10W298-21

SEE MATCHLINE A ON DRAWING 10W298-23

N 591,500

E 2,546,750

E 2,545,750

N 590,500

ASH POND

AREA 2A

A27

NOTES:

1. FOR GENERAL NOTES, SEE 10W298-11.
2. FOR STAGE 3 NOTES, SEE 10W298-20

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

KEY PLAN

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	APVD	ISSD	PROJECT ID	AS CONST
R 0	12/12/08	CWH	ACM	GRD	DRD	LJP	JCK		BRF211

DCN BRF-08-1052-022: INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

SCALE: 1"=50' EXCEPT AS NOTE

YARD

GYPSUM & ASH DISPOSAL
STAGE 3
SHEET 3

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:

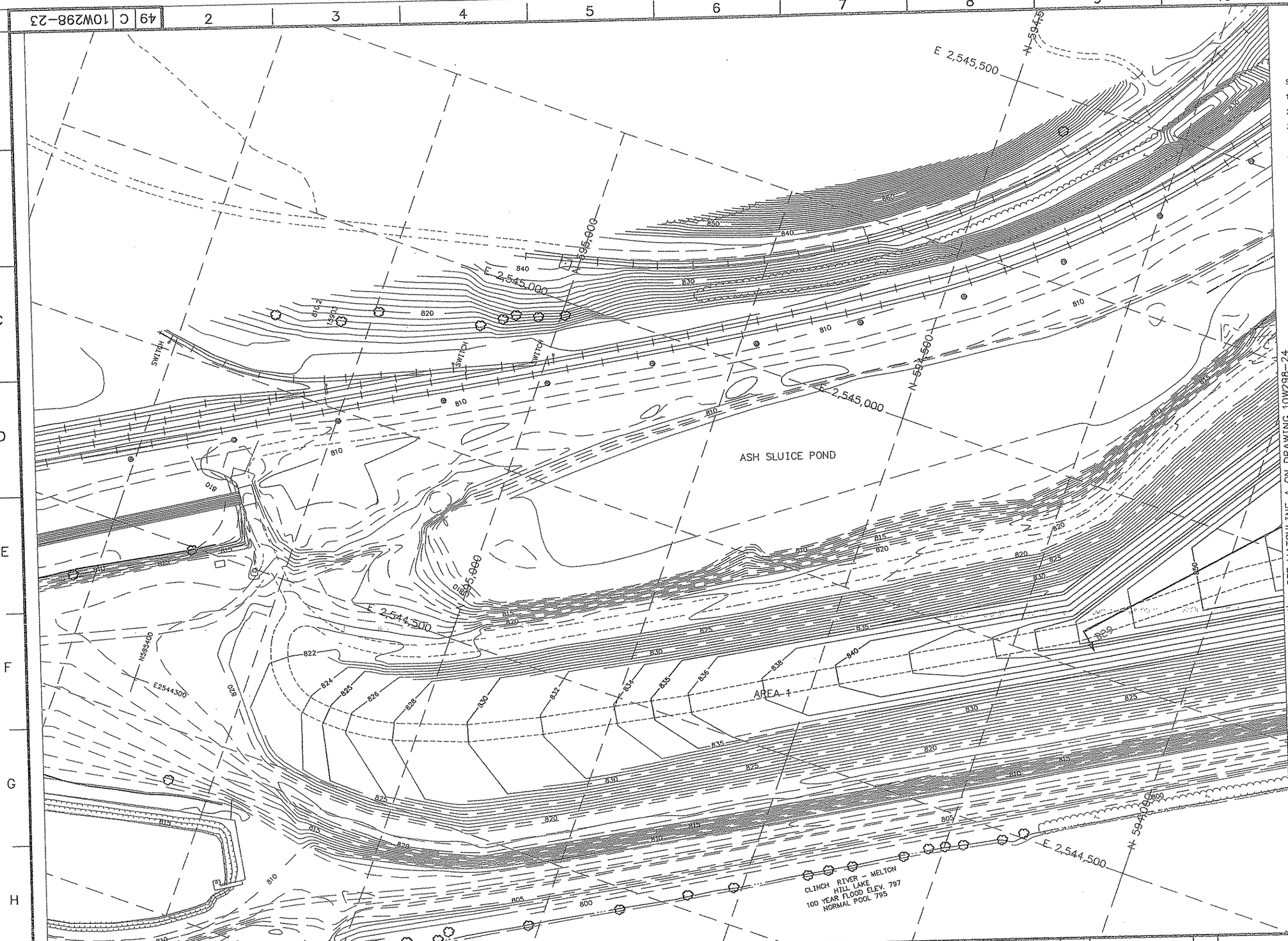
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-22	R 0

PLOT FACTOR:1
W_TVA

C.A.D. DRA
DO NOT ALTER

TASK COMPLETED BY:	REV NO.



STAGE 4 NOTES:

1. FOR DRAWING INDEX AND LEGEND, SEE 10W298-1.
2. FOR GENERAL NOTES, SEE 10W298-11.
3. PROVIDE A MINIMUM OF TWO (2) FEET OF FREEBOARD TO THE FINISHED DIKE ELEVATION DURING ASH DREDGING/GYPSUM PLACEMENT ACTIVITIES.
4. LOCATE METAL SPILLWAYS TO TIE INTO EXISTING METAL SPILLWAYS FOR PREVIOUS STAGE AS SHOWN ON 10W298-31.
5. PROPOSED CONTOUR ELEVATIONS SHOWN FOR THE OUTER 3:1 SLOPES ARE FINISHED SURFACE ELEVATIONS (INCLUDING FINAL COVER).
6. FINAL ASH/GYPSUM GRADE SHALL BE AT TWO (2) FEET PLUS OR MINUS UNDER THE ACTUAL GRADE SHOWN.
7. MAXIMUM SLOPE SHALL BE 3:1 (HORIZONTAL TO VERTICAL).
8. FOR CONSTRUCTION OF AND RAISING OF DIKES, SEE DETAIL A32 ON 10W298-32.
9. PERIMETER UNDERDRAINS WITHIN THE OUTER WET-CAST GYPSUM DIKES ARE NOT SHOWN ON THESE DRAWINGS. SEE DETAIL A32 ON 10W298-32.
10. CONSTRUCTION OF THE FINAL COVER SHALL BE IN ACCORDANCE WITH THE QA/QC PLAN AND SPECIFICATIONS APPENDED TO THE OPERATION PLAN.
11. FOR DITCH LAYOUT, SEE 10W298-36.

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

KEY PLAN

REV	DATE	DESCRIPTION
R 0	12/12/08	GWH AGM DRD DRD LJP JDK BRF211
DGN BRF-08-1052-023; INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.		

SCALE: 1"=50' EXCEPT AS NOTED

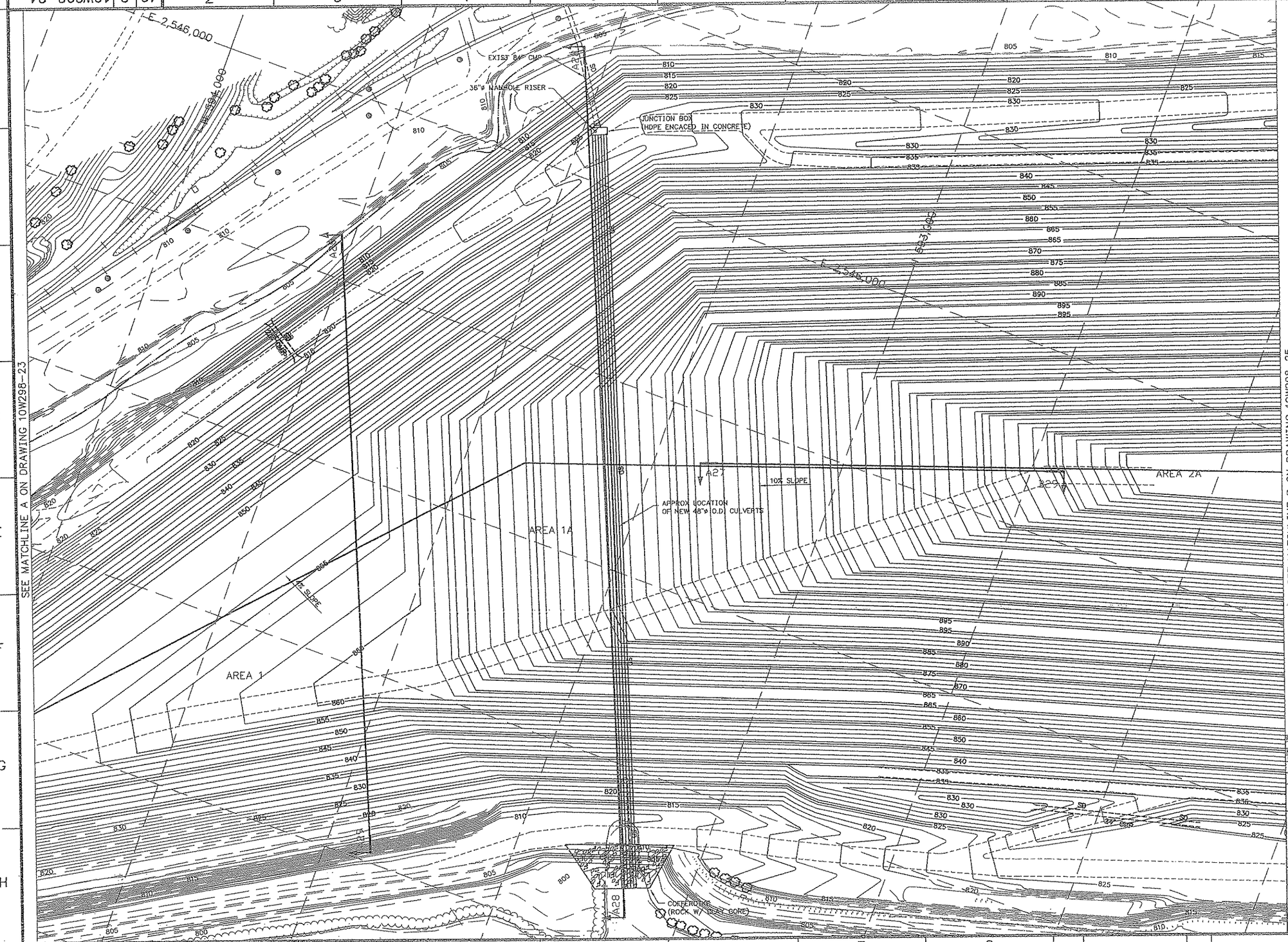
YARD

GYPSUM & ASH DISPOSAL
STAGE 4
SHEET 1

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K | DATE | 49 | C | 10W298-23 | R 0

PLOT FACTOR:1 C.A.D. DRAWI
W_TVA DO NOT ALTER M



NOTES:

1. FOR GENERAL NOTES, SEE 10W298-11.
2. FOR STAGE 4 NOTES, SEE 10W298-23.

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

KEY PLAN

REV	DATE	DSGN	DRWN	CHKD	SUPV	REVWD	APPD	ISSD	PROJECT #	AS BUILT
R 0	12/12/08	CMH	ACM	DRD	DRD	LJP	JCK		BRF233	

DCN BRF-08-1052-02X; INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

SCALE: 1"=50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
STAGE 4
SHEET 2

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:

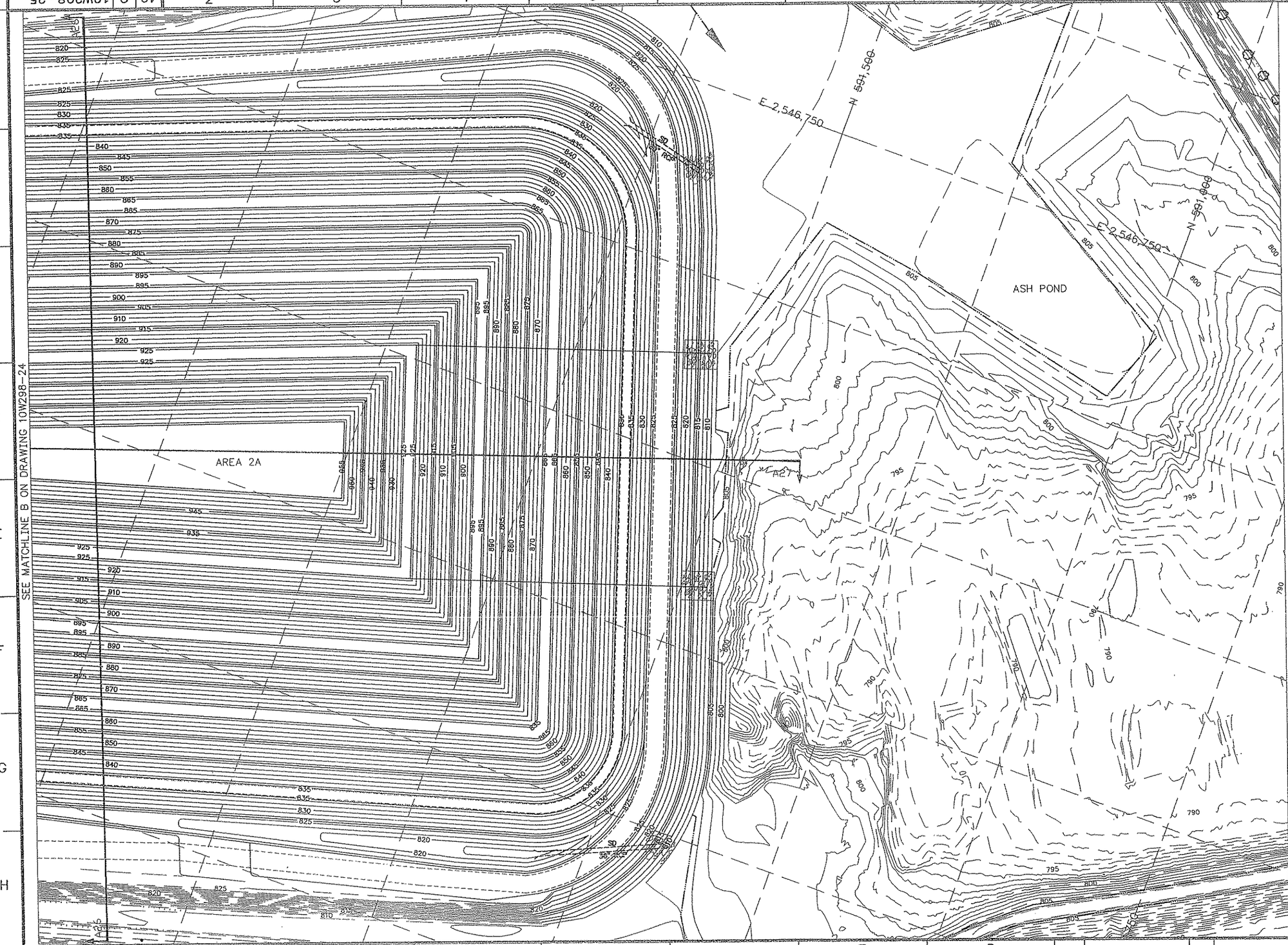
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-24	R 0

PLOT FACTOR:1
W_TVA

C.A.D. DRAWIN
DO NOT ALTER MA

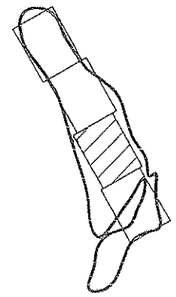
TASK COMPLETED BY:	REV NO.



NOTES:

1. FOR GENERAL NOTES, SEE 10W298-11.
2. FOR STAGE 4 NOTES, SEE 10W298-23.

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES



KEY PLAN

REV. NO.	DATE	DSGN	DWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 0	12/12/06	CWH	AGM	DRD	DRD	LJP	JCK		BRF211	

DCN BRF-06-1052-025: INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

SCALE: 1"=50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
STAGE 4
SHEET 3

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:

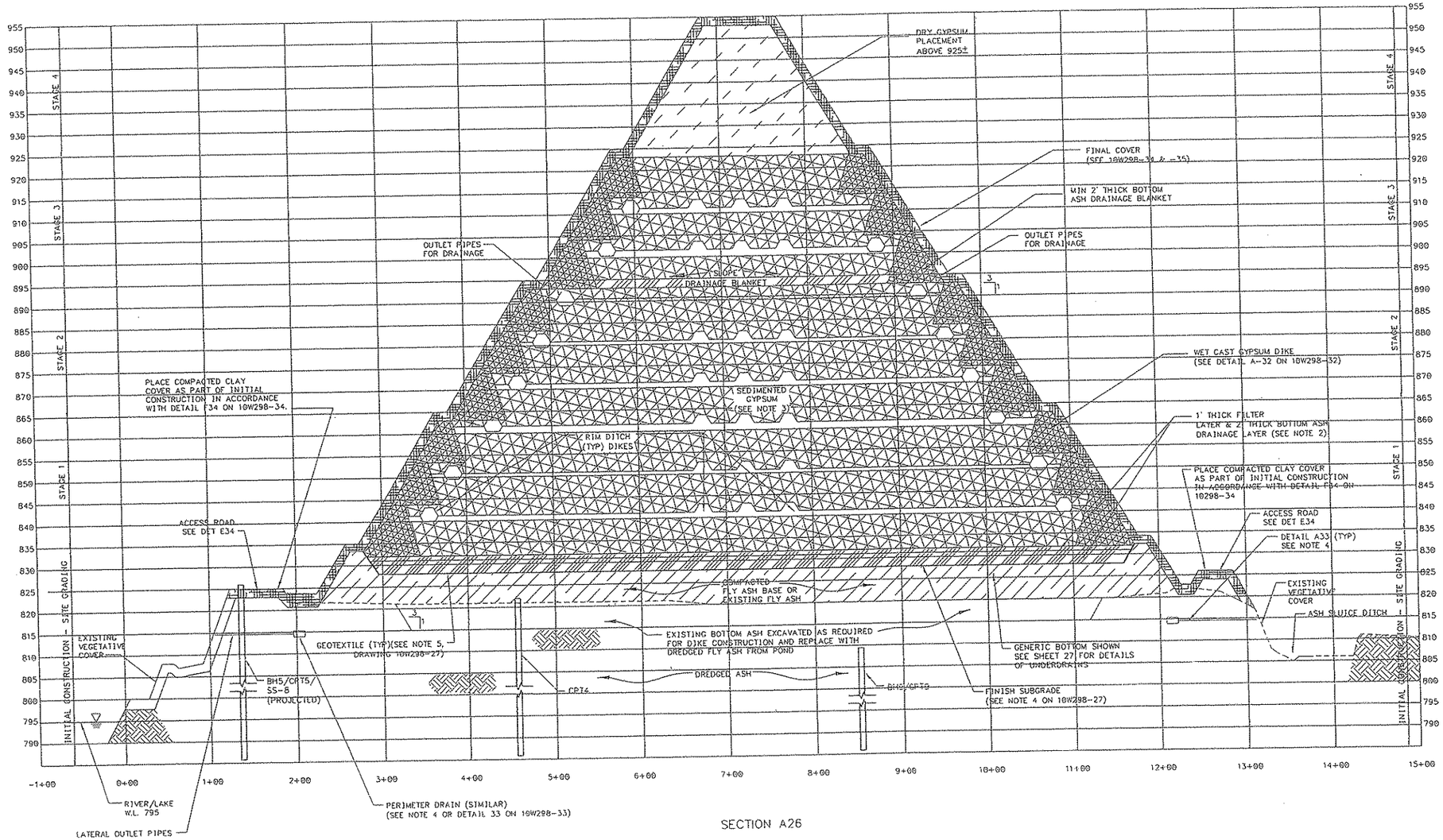
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-25	R 0

PLOT FACTOR:1
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANU.

TASK COMPLETED BY:	REV NO.



SECTION A26

NOTES:

1. FOR DRAWINGS LIST AND LEGEND, SEE 10W298-1
2. FOR GENERAL NOTES, SEE 10W298-11.

NOTES FOR SECTION A26:

1. CONSTRUCT INTERIOR WET CAST DIKES IN ACCORDANCE WITH DETAIL A32 ON 10W298-32, EXCEPT THAT PERIMETER UNDERDRAIN IS NOT REQUIRED.
2. BOTTOM ASH DRAINAGE LAYER SHALL BE TOPPED WITH A 1' THICK FILTER LAYER (BOTTOM ASH/FLY ASH MIXTURE). CROWN THE DRAIN IN THE CENTER SO THAT IS DRAINS TO EITHER SIDE AS SHOWN. MAINTAIN ELEVATION HIGHER IN THE CENTER OF FACILITY. DECANT WATER FROM CELL AND PLACE WET ASH & GYPSUM INTO CELL TO OBTAIN PROPER ELEVATION PRIOR TO PLACEMENT OF BOTTOM ASH LAYER. FLY ASH & GYPSUM DISPOSAL AREAS SHOWN IN PLAN, VIEW MAY BE SUBDIVIDED AS NECESSARY TO FACILITATE SEQUENCED DRAINAGE LAYER CONSTRUCTION.
3. TWO PONDS (OPTION 1) SHOWN FOR GYPSUM DISPOSAL. FOR GYPSUM/ASH DISPOSAL, SEE WASTE DISPOSAL OPTIONS ON 10W298-38 & -39.
4. INSTALL PERIMETER UNDERDRAIN AT ELEVATION 815 (APPROXIMATELY), BY EXCAVATING A TRENCH AND INSTALLING DRAINAGE TUBING. FOR SOUTHERNMOST 300' OF EAST AND WEST DIKES, UNDERDRAIN IS SLOPED TO ELEVATION 807 TO MATCH TO SECTION A-27 ON 10W298-27.
5. KELLBERG BORING LOCATIONS NOT SHOWN FOR CLARITY.

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

REV	DATE	DESCRIPTION	BY
R 0	12/12/08	DCN 8RF-08-1052-826 INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE	CWM ACM DRD DRD LJP JCK

SCALE: HORIZONTAL: 1"=50' VERTICAL: 1"=10' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL AREA 2A SECTIONS

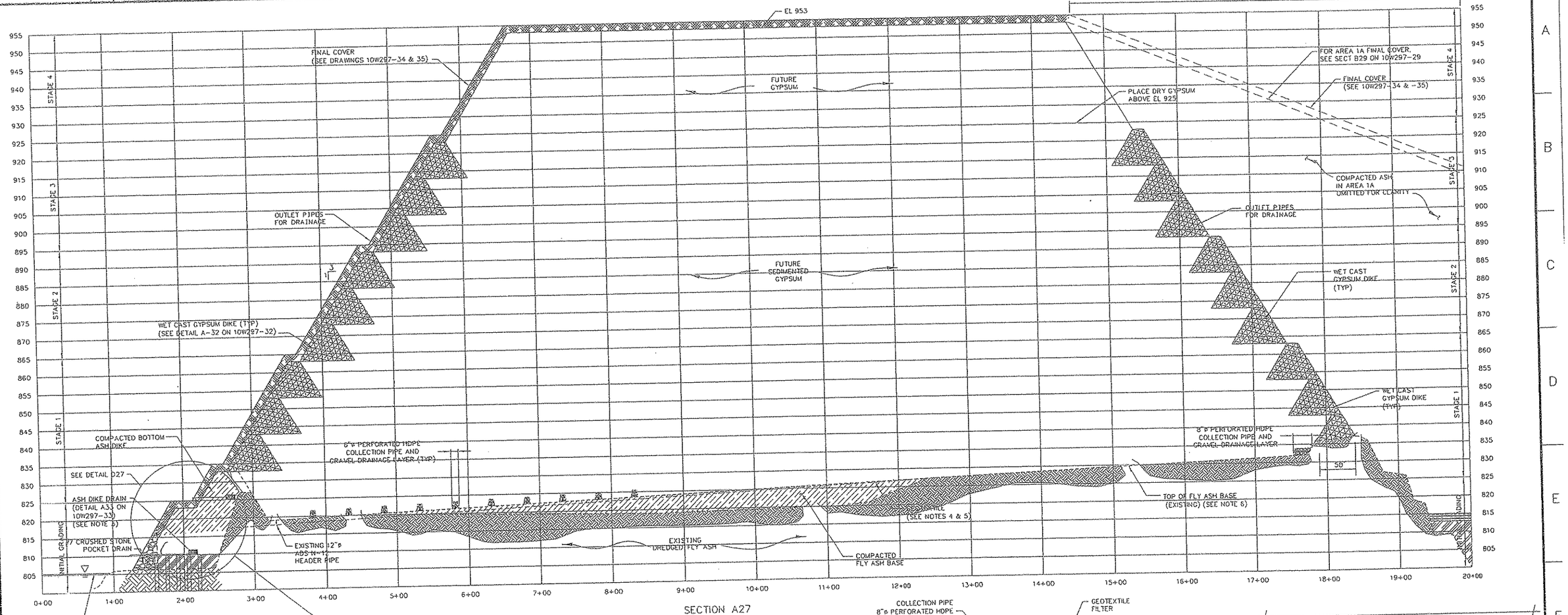
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

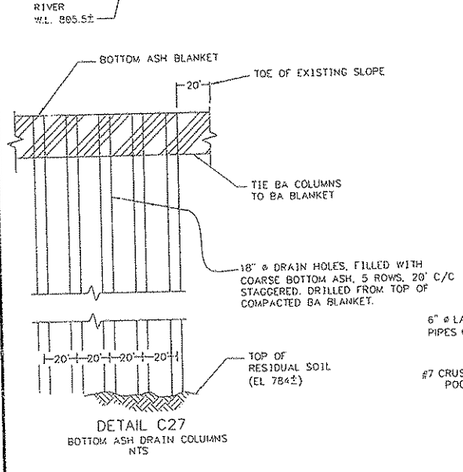
AUTOCAD R2K | 49 | C | 10W298-26 | R 0

PLOT FACTOR:1
W_TVA

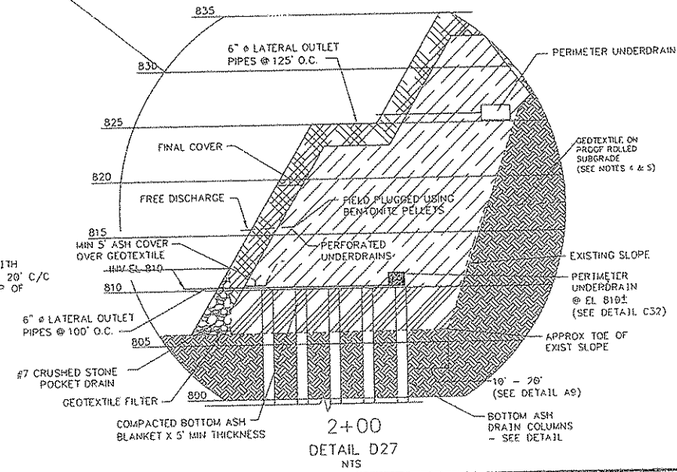
C.A.D. DRAWING
DO NOT ALTER MANUALL

TASK COMPLETED BY: | REV NO.





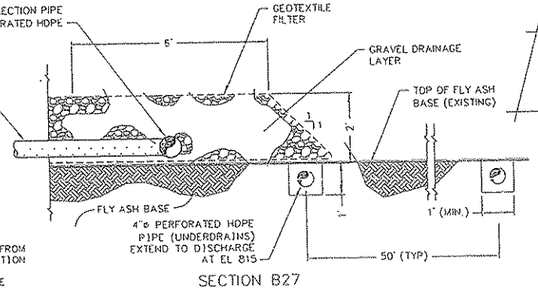
DETAIL C27
BOTTOM ASH DRAIN COLUMNS
NTS



2+00
DETAIL D27
NTS

NOTES FOR SECTION A-27:

1. FOR DRAWING LIST AND LEGEND, SEE 10W297-1.
2. FOR GENERAL NOTES, SEE 10W297-11, 2, 3.
3. INSTALL LATERAL DRAINS IN ACCORDANCE WITH DETAIL C33 AT THE ELEVATIONS SHOWN ON 10W297-26 & 27.
4. GEOTEXTILE REINFORCEMENT SHALL EXTEND 650' FROM SOUTH TOE WITHOUT END JOINT. MACHINE DIRECTION RUNS NORTH-SOUTH. LAP SIDE JOINTS 1.5' MIN. LONG TERM DESIGN STRENGTH (LTDS) IN MACHINE DIRECTION SHALL BE 650 lb/in MINIMUM AFTER REDUCTION FOR ALL APPLICABLE FACTORS OF SAFETY PER AASHTO CRITERIA. FACTORS OF SAFETY SHALL BE DETERMINED BY MATERIAL MANUFACTURERS THROUGH PRODUCT SPECIFIC TESTING AND DATA SHEETS SUBMITTED FOR APPROVAL.
5. GEOTEXTILE REINFORCEMENT MAY BE REMOVED IF ADEQUATE STABILITY IS DEMONSTRATED BY ANALYSIS.
6. TOP OF FLY ASH BASE OF AREA 2A WAS SURVEYED ON 16 JANUARY 2008. SURFACE SHOWN IS BASED ON LIMITED SURVEY DATA AND NEEDS TO BE CONFIRMED BY CONTRACTOR PRIOR TO INSTALLATION OF FINGER DRAIN SYSTEM.



SECTION B27
NTS

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

R	DATE	DSGN	DRWN	CHKD	SUPV	APVD	MPED	ISSD	PROJECT ID	AS BUILT	
R 8	12/17/08	CVM		ACM	DRD	DRD	J.P	JCK	BRF211		J

DCN BRF-06-1057-027: INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

SCALE: HORIZONTAL: 1"=50' VERTICAL: 1"=10' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL AREA 2A SECTIONS

DESIGNED BY: | DRAWN BY: | CHECKED BY: | APPROVED BY: | ISSUED BY:

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K | 49 | C | 10W298-27 | R 8

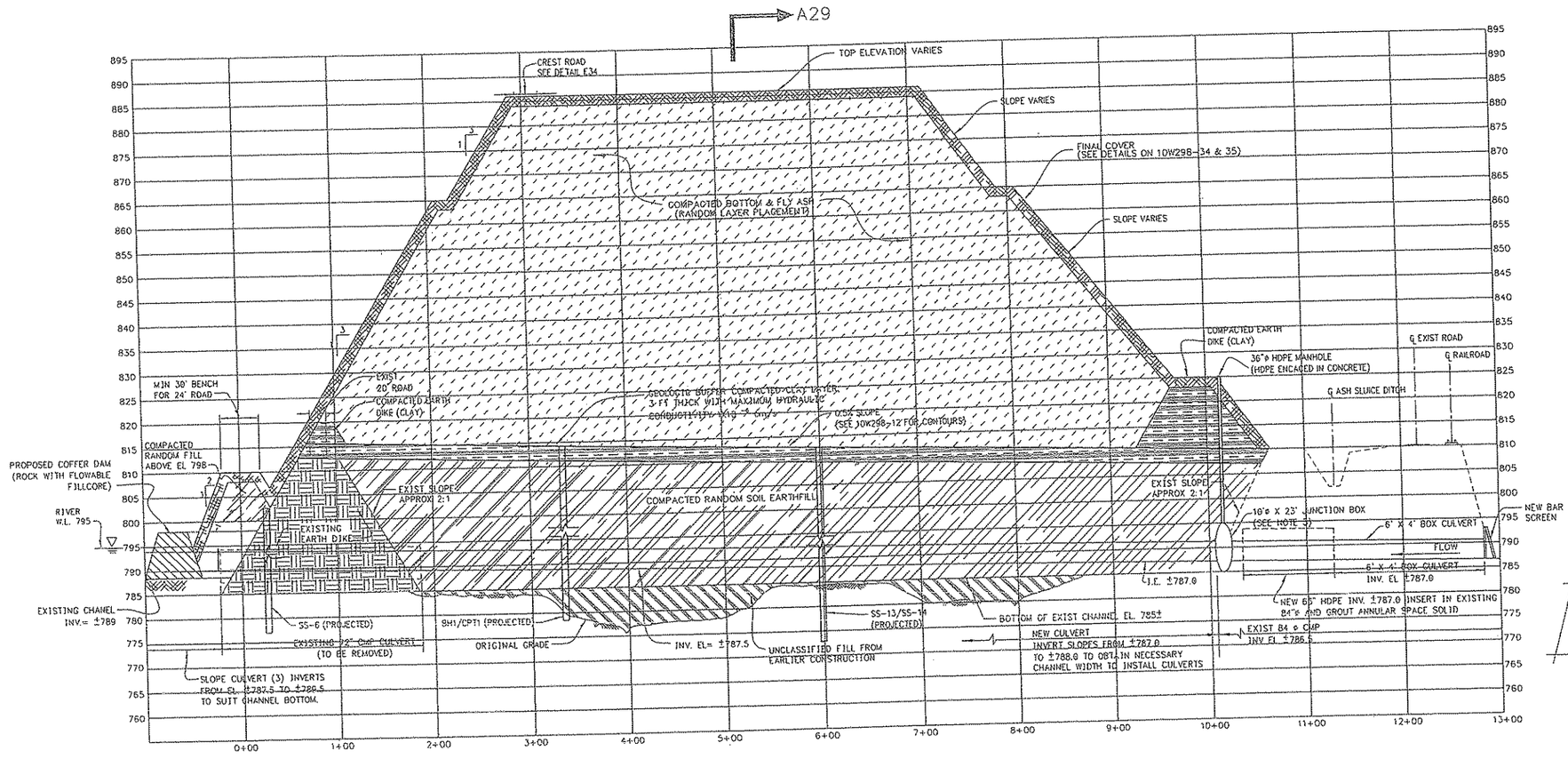
PLOT FACTOR:1 W_TVA

C.A.D. DRAWING DO NOT ALTER MANUAL

TASK COMPLETED BY: | REV NO.

NOTES:

1. FOR DRAWING LIST AND LEGEND, SEE 10W298-1.
2. FOR GENERAL NOTES, SEE 10W298-11.
3. HDPE JUNCTION BOX AT 10= FT. I.D. SHALL BE REINFORCED INTERNALLY BY THE FABRICATOR TO WITHSTAND EARTH LOADS AND HYDROSTATIC PRESSURE. PARTIAL OR FULLY ENCASEMENT IN CONCRETE WILL BE PROVIDED IF STUDIES INDICATE JUSTIFICATION.



SECTION A28

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	APPD	APPD	ISSUED	AS CONST
R 0	12/12/08	CWH	ACM	DRD	DRD	LLP	JCK	BRF211	

DCN BRF-06-1052-028: INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE

SCALE: HORIZONTAL: 1"=50' VERTICAL: 1"=10' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL AREA 1A SECTIONS

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	APPROVED BY:	ISSUED BY:

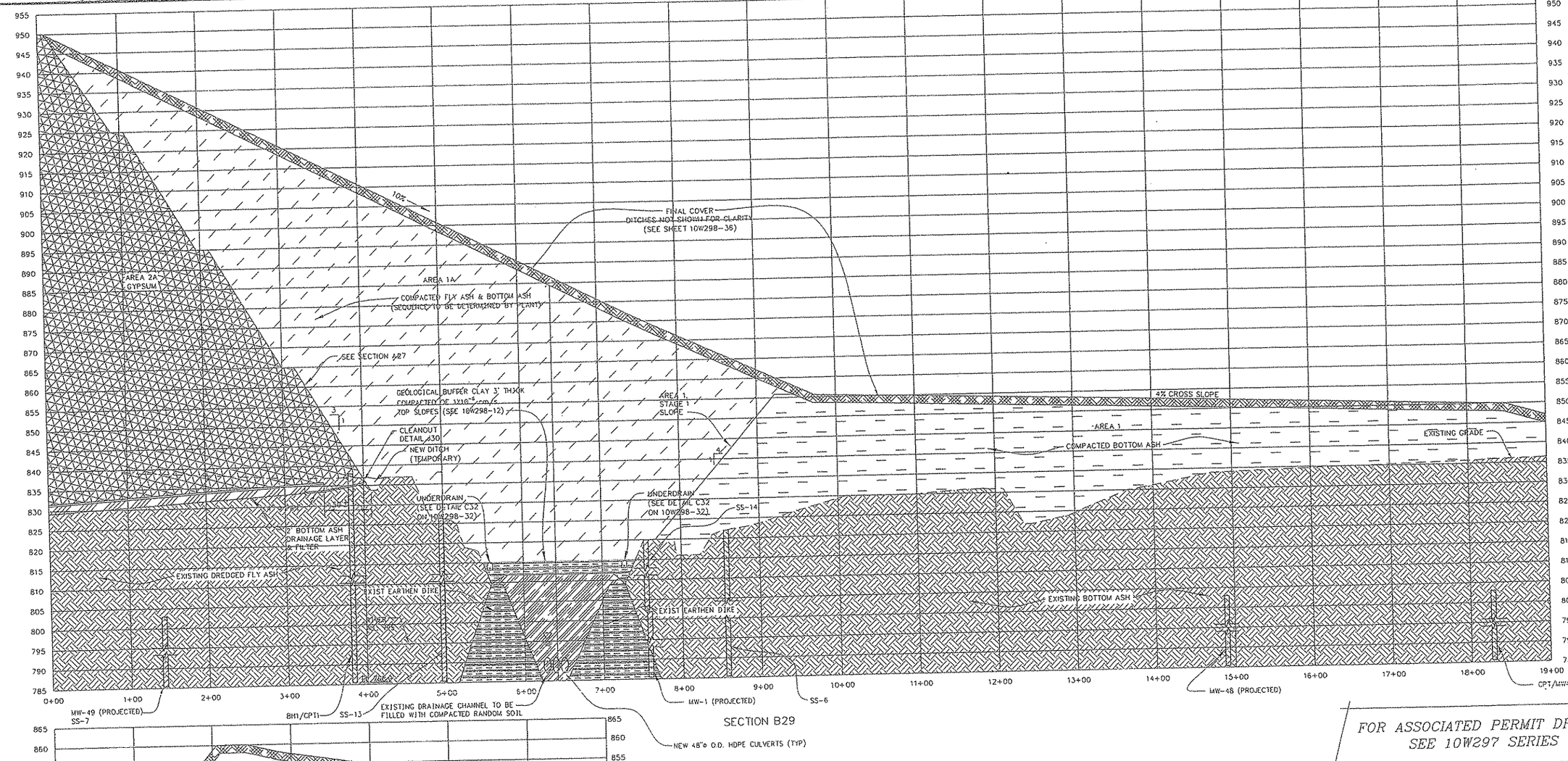
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-28	R 0

PLOT FACTOR:1
W_TVA

C.A.D. DRAWING DO NOT ALTER MANUALLY

TASK COMPLETED BY:	REV NO.



FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

NOTES:

1. FOR DRAWINGS LIST AND LEGEND SEE 10W298-1
2. FOR GENERAL NOTES SEE 10W298-11

R	DATE	DSGN	DRWN	CHKD	SUPV	APVD	ISSD	PROJECT ID	AS CONST
R 8	12/12/08	CWH	ACW	DMD	DRD	LAP	JCK	BRF211	
DCN BRF-08-1052-029 INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE									

SCALE: HORIZONTAL: 1"=50' VERTICAL: 1"=10' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL AREAS 1 & 1A SECTIONS

DESIGNED BY: | DRAWN BY: | CHECKED BY: | SUPERVISED BY: | APPROVED BY: | ISSUED BY:

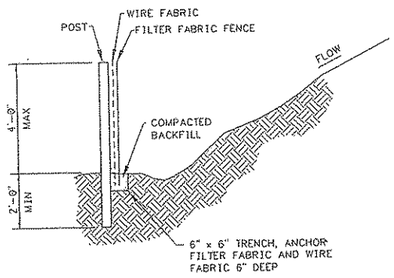
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K | DATE | 49 | C | 10W298-29 | R 0

PLOT FACTOR:1 W_TVA

C.A.D. DRAWING DO NOT ALTER MANUALLY

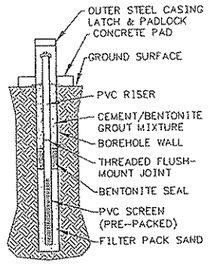
TASK COMPLETED BY: | REV NO.



DETAIL A30
TEMPORARY SILT FENCE

TEMPORARY SILT FENCE NOTES:

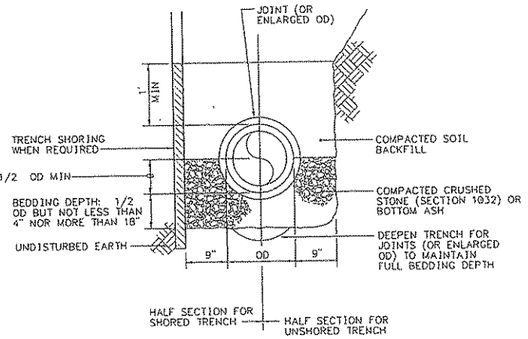
1. FILTER FABRIC FENCE TO BE PLACED PRIOR TO THE START OF ROUGH GRADING.
2. STEEL POSTS SHALL BE METAL "T" POSTS – 6'-0" LONG.
3. WOOD POSTS SHALL BE 2" x 2" NOMINAL OR LARGER (CCA TREATED).
4. POSTS SHALL BE PLACED AT 5' INTERVALS MAX.
5. WIRE FABRIC AND FILTER FABRIC SHALL BE SECURELY BOUND TO POSTS WITH EITHER STAPLES OR WIRE TIES. SUBCONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING
6. CONDITION OF FILTER FABRIC FENCE IN A CONDITION THAT IS SATISFACTORY UNTIL FINAL ACCEPTANCE OF WORK. FILTER FABRIC SHALL BE A CLASS A FABRIC IN ACCORDANCE
7. WITH TVA SPECIFICATION T-1, SECTION 571.



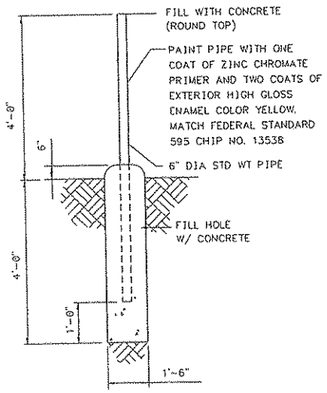
DETAIL B30
TYPICAL PVC MONITORING WELL

TYPICAL PVC MONITORING WELL NOTES:

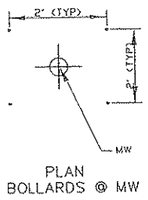
1. MONITORING WELL INSTALLATION RECORDS ARE CONTAINED IN THE HYDROGEOLOGICAL REPORT APPENDED TO THE OPERATIONS PLAN.
2. INSTALL BOLLARDS AS SHOWN ON DETAIL D30.



DETAIL C30
CLASS "B" PIPE BEDDING



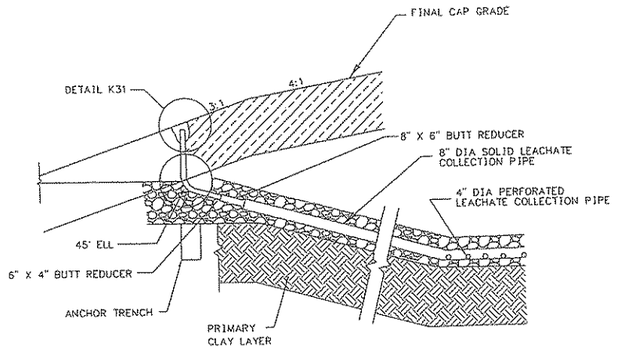
NOTE FOR DETAIL F30:
PLACE 4 BOLLARDS AROUND EACH MONITORING WELL 5 FT FROM WELL



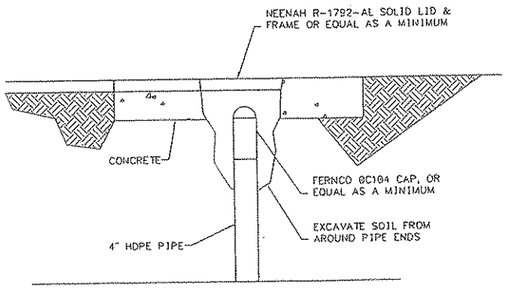
DETAIL D30
PIPE BOLLARD

NOTES:

1. FOR DRAWINGS LIST AND LEGEND, SEE 10W298-1
2. FOR GENERAL NOTES, SEE 10W298-11

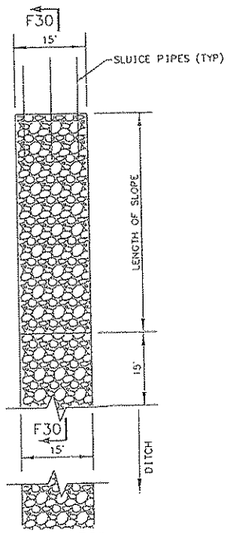


DETAIL J30
COLLECTION PIPE CLEANOUT

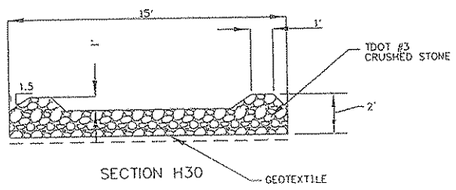


DETAIL K31
CLEANOUT ACCESS COVER

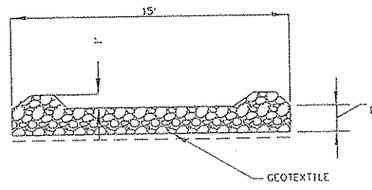
FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES



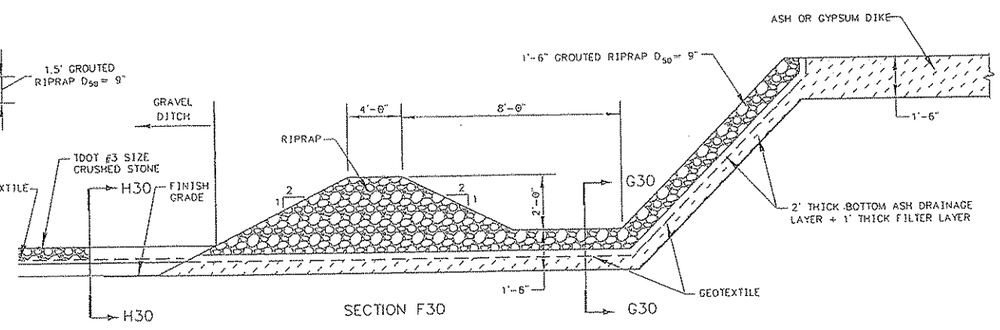
DETAIL E30
EROSION PROTECTION FOR SUBGRADE



SECTION H30



SECTION G30



SECTION F30

R									
R 0	12/12/08	CWH	ACM	DRD	DRD	LMP	JCK	BRF211	J J
DCN BRF-06-1052-030: INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.									
REV NO.	DATE	DSGN	DRAW	CHKD	SUPV	APVD	ECID	PROJECT NO.	AS CONST NO.

SCALE: NOT TO SCALE — EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
MISCELLANOUS DETAILS
SHEET 1

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPV BY:	APVD BY:	ISSUED BY:

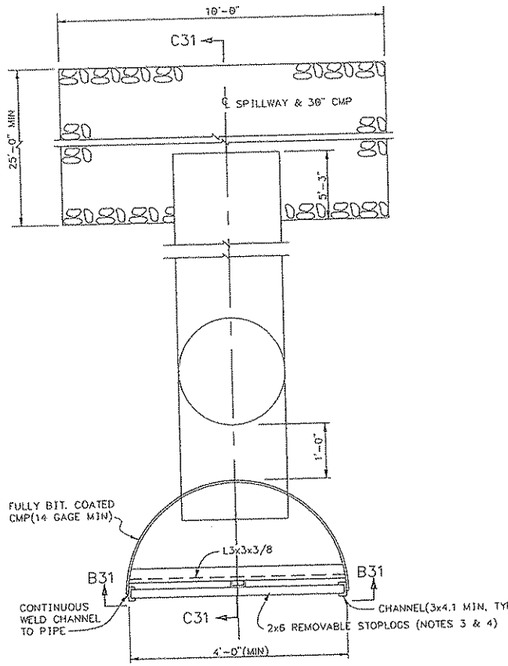
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-30	R 0

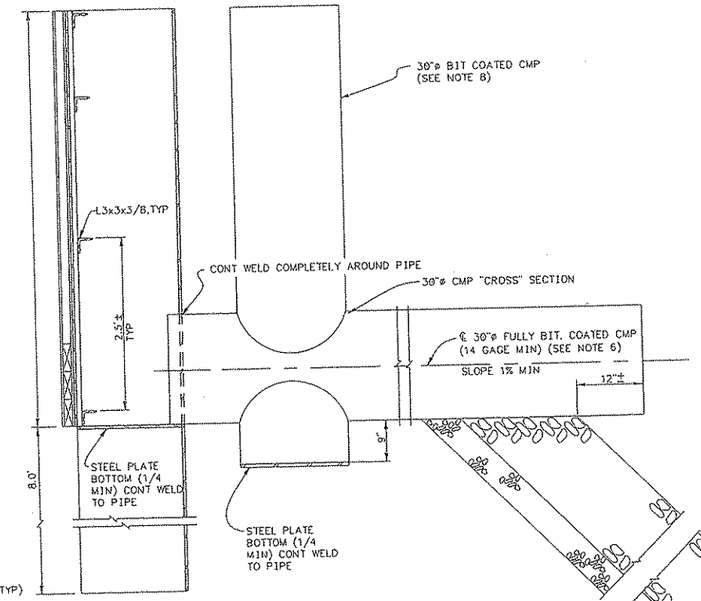
PLOT FACTOR: 48
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

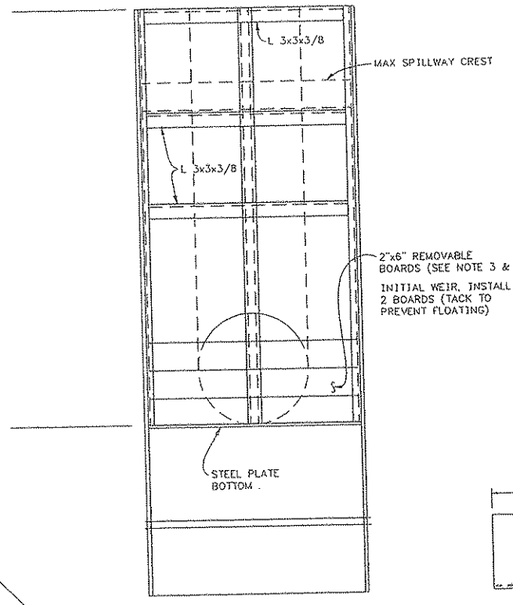
TASK COMPLETED BY:	REV NO.



DETAIL A31
PLAN-METAL SPILLWAY



SECTION C31

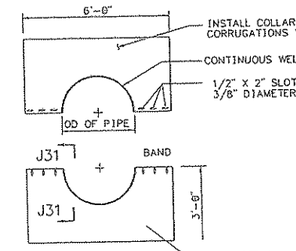


SECTION B31

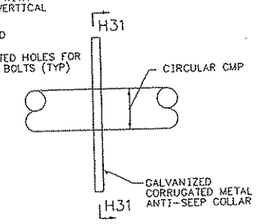
SPILLWAY NOTES:

1. FOR DRAWING LIST AND LEGEND, SEE 10W298-1
2. FOR GENERAL NOTES, SEE 10W298-11
3. ALL TIMBER STOPLOGS SHALL BE SOUTHERN PINE NO. 2 DENSE SELECT TIMBER.
4. ALL WOOD SHALL BE PRESSURE TREATED WITH 0.4-0.6 POUNDS OF PRESERVATIVE PER CUBIC FOOT OF WOOD. THE PRESERVATIVE SHALL BE WOLMAN PRESERVATIVE CCA BY KOPPERS OR EQUAL. SYNTHETIC MATERIALS (I.E. HDPE) MAY BE USED IN LIEU OF TIMBER STOPLOGS. MATERIAL SELECTION SELECTION BY TVA FES.
5. ALL NAILS SHALL BE GALVANIZED.
6. 30 INCH CORRUGATED METAL PIPE SHALL BE FULLY BITUMINOUS COATED AND 14 GAGE (MIN) THICKNESS.
7. RIPRAP SHALL CONSIST OF 50 % OF THE STONES WEIGHING 100 LBS EACH OR GREATER, PER SECTION 575.
8. 30 INCH CROSS SECTION AND STANDPIPE NOT REQUIRED FOR STAGE 4 SPILLWAY.
9. A 6' x 6' HOLE SHALL BE EXCAVATED TO A DEPTH OF 8' FOR PLACEMENT OF THE 48" HALF-PIPE, THE AREA IS TO BE BACKFILLED WITH 1032 CRUSHED STONE AND COMPACTED UNTIL A STABLE BASE IS ACHIEVED.

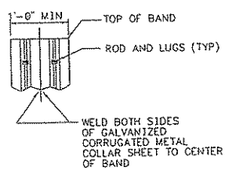
FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES



SECTION H31



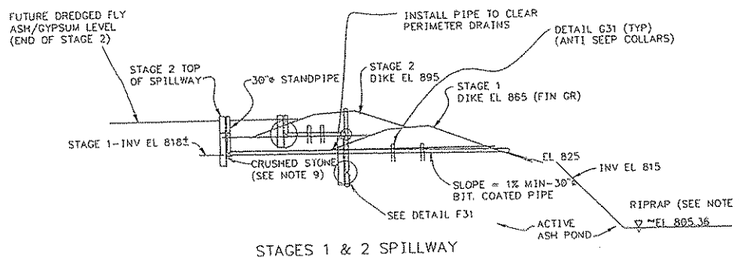
DETAIL G31
CORRUGATED METAL ANTI-SEEP COLLAR



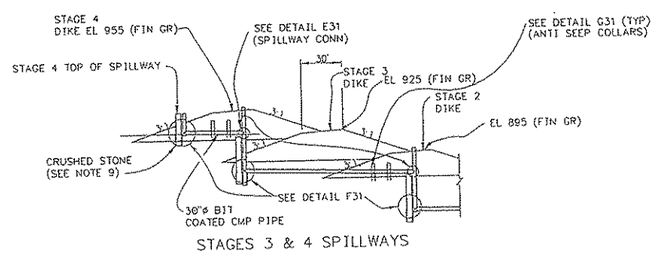
SECTION J31

METAL COLLARS NOTES:

1. UNASSEMBLED COLLARS SHALL BE MARKED BY PAINTING OR TAGGING TO IDENTIFY MATCHING PAIRS.
2. THE LAP BETWEEN THE TWO HALF SECTIONS INCLUDING BOLTS AND BETWEEN THE PIPE AND CONNECTING BAND SHALL BE CAULKED WITH ASPHALT MASTIC AT TIME OF INSTALLATION.
3. EACH COLLAR SHALL BE FURNISHED WITH TWO 1/2 " DIA RODS WITH STANDARD TANK LUGS FOR CONNECTING COLLARS TO PIPE.
4. CONTRACTOR MAY CONSTRUCT ANTI-SEEP COLLARS USING 1 FT THICK CONCRETE, 3,000 PSI MIN., TO THE SAME DIMENSIONS SHOWN.

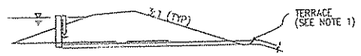


STAGES 1 & 2 SPILLWAY



STAGES 3 & 4 SPILLWAYS

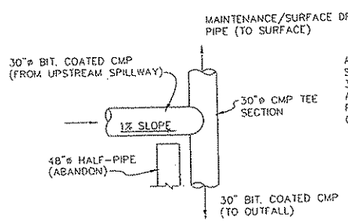
DETAIL D31
METAL SPILLWAY STAGED CONSTRUCTION
(SEE OPTIONAL DETAIL K31)



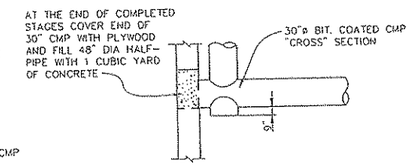
DETAIL K31
OPTIONAL METAL SPILLWAY CONFIGURATION

NOTE:

1. DO NOT USE THIS DETAIL WHERE VEHICLE TRAFFIC MUST TRAVEL ON TERRACE.



DETAIL E31
SPILLWAY CONNECTION



DETAIL F31
BOTTOM OF SPILLWAY

R									
R 0	12/12/08	CWH	ACM	DRD	DRD	LAP	JCK	BRF311	J
DCN BRF-08-1052-053; INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.									
NO.	DATE	DSGN	DRWN	CHKD	SUPV	APVD	ISSD	PROJECT ID	AS CONST

SCALE: NOT TO SCALE — EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
METAL SPILLWAY DETAILS
SHEET 2

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	APPROVED BY:	ISSUED BY:

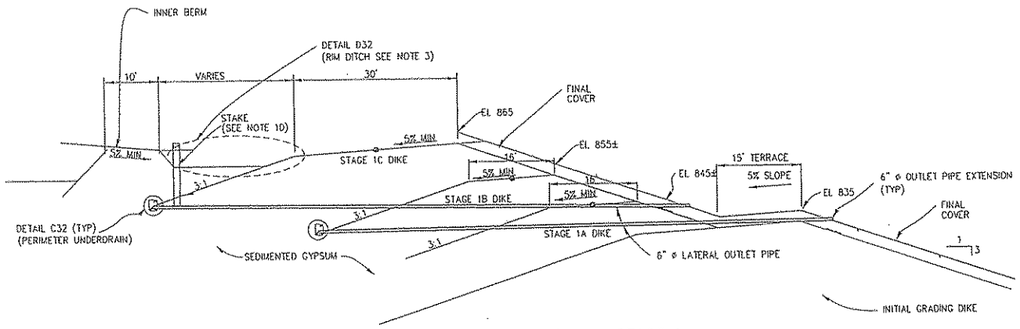
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-31	R 0

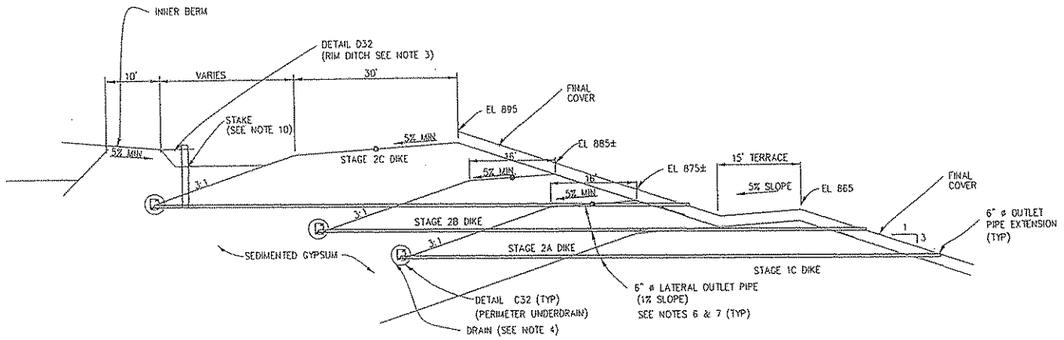
PLOT FACTOR:1
W-SIZE

C.A.D. DRAWING
DO NOT ALTER MANUALLY

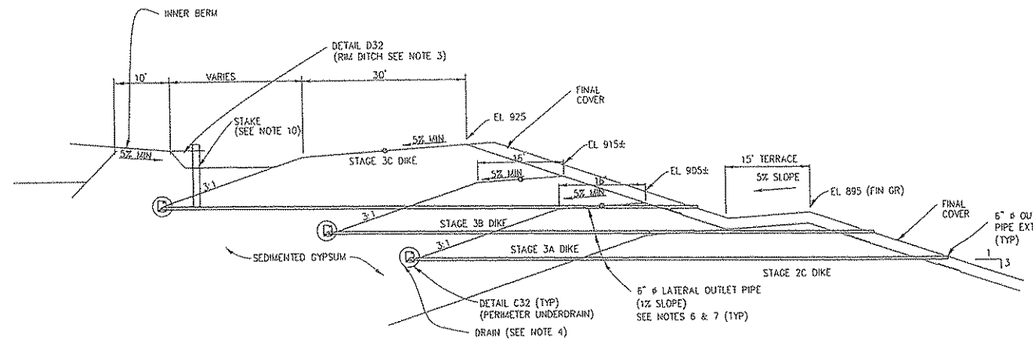
TASK COMPLETED BY:	REV NO.



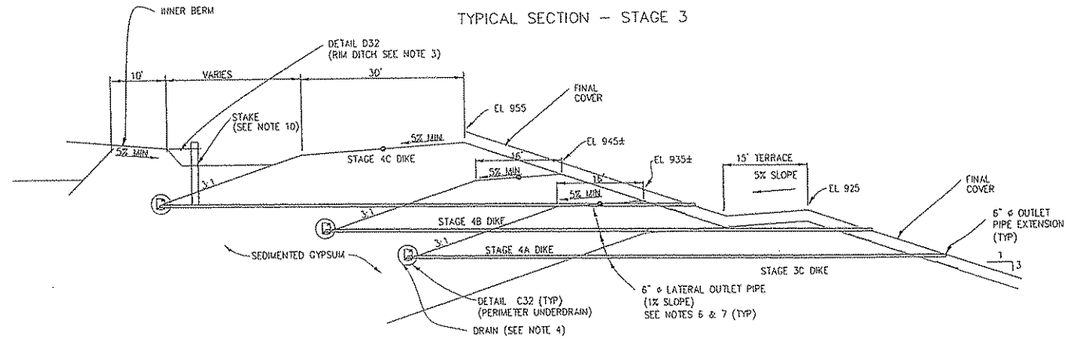
TYPICAL SECTION – STAGE 1



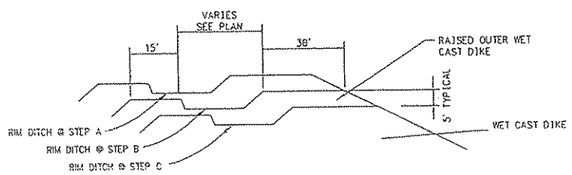
TYPICAL SECTION – STAGE 2



TYPICAL SECTION – STAGE 3

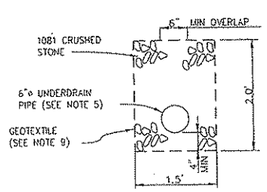


TYPICAL SECTION – STAGE 4



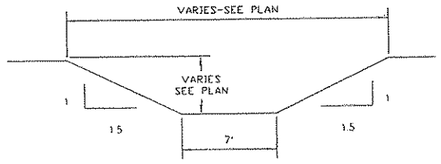
DETAIL B32

DIKE RAISING 5' INCREMENT



DETAIL C32

PERIMETER UNDERDRAIN



DETAIL D32

RIM DITCH

WET CAST GYPSUM DIKE
DETAIL A32

DIKE CONSTRUCTION NOTES:

1. FOR DRAWING LIST AND LEGEND, SEE 10W298-1
2. FOR GENERAL NOTES, SEE 10W298-11
3. CONSTRUCT RIM DITCHES AT EACH INTERMEDIATE A, B, AND C DIKE, E.G., 10' VERTICAL INTERVALS RIM DITCHES FOR A AND B DIKES NOT SHOWN FOR CLARITY.
4. INSTALL DRAINS SO THAT THEY ARE BENEATH INVERT ELEVATION OF RIM DITCH BY A MINIMUM OF 1.0 FOOT CLEAR.
5. UNDERDRAIN PIPE SHALL BE PERFORATED HDPE CORRUGATED TUBING AS MANUFACTURED BY:

   ADVANCED DRAINAGE SYSTEMS,
   INC., COLUMBUS, OHIO
   (614) 457-3051

   OR EQUAL. UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 509.
6. PERIMETER UNDERDRAIN SHALL HAVE MIN 1% SLOPE FROM HIGH PTS TO LOW POINTS. PLACE LATERAL OUTLET PIPES AT LOW POINTS.
7. LATERAL OUTLET PIPE SHALL BE NON-PERFORATED HDPE CORRUGATED TUBING AS MANUFACTURED BY:

   ADVANCED DRAINAGE SYSTEMS, INC.,
   COLUMBUS, OHIO
   (614) 457-3051

   OR EQUAL. DISCHARGE END SHALL BE SUITABLE FOR FUTURE PIPE CONNECTION TO FACILITATE COLLECTION OF DRAINAGE.
8. LATERAL OUTLET PIPES SHALL BE PLACED EVERY 250 FEET ON CENTER MAXIMUM ALONG SOUTH, EAST AND WEST DIKES.
9. GEOTEXTILE SHALL BE A WOVEN MONOFILAMENT WITH AN APPARENT OPENING SIZE (AOS) SELECTED BY TVA FES (US STANDARD SIEVE SIZE) WHEN TESTED IN ACCORDANCE WITH ASTM D 4751. THE GEOTEXTILE SHALL BE GEOTEX 104F AS MANUFACTURED BY SYNTHETIC INDUSTRIES OR APPROVED EQUAL.
10. AFTER INSTALLATION OF PERIMETER DRAIN, INSTALL STAKES AT DRAINAGE OUTLET. PROVIDE A MARK ON THE STAKE INDICATING THE DEPTH TO THE DRAIN PIPE VISIBLE TO EQUIPMENT OPERATOR TO PREVENT DAMAGE TO DRAIN PIPE.

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

R										
R 0	12/12/08	CWM	ACM	DRD	DRD	LJP	JDK		BRF291	J
DCN BRF-06-1052-033; INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.										
REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	APVD	ITEM	PROJECT NO.	AS SHOWN	PLAN NO.

SCALE: NOT TO SCALE — EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
TYPICAL CROSS SECTION & DETAILS
SHEET 3

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	APPROVED BY:	ISSUED BY:

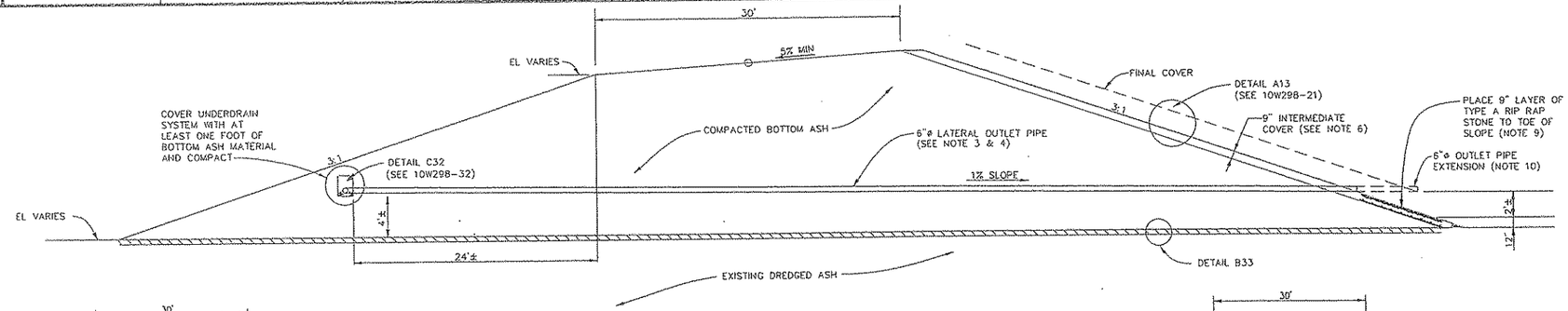
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-32	R 0

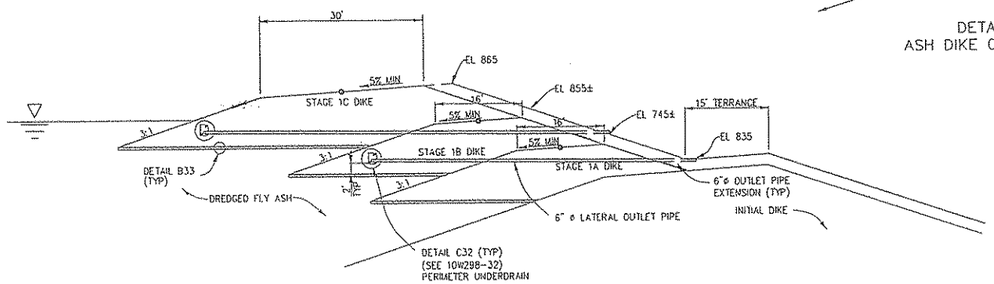
PLOT FACTOR:1
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

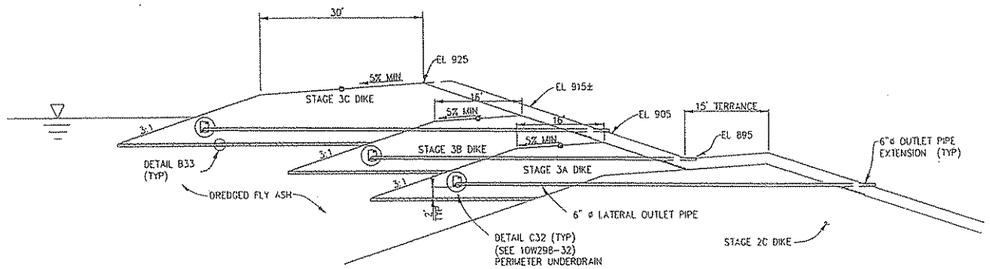
TASK COMPLETED BY:	REV NO.



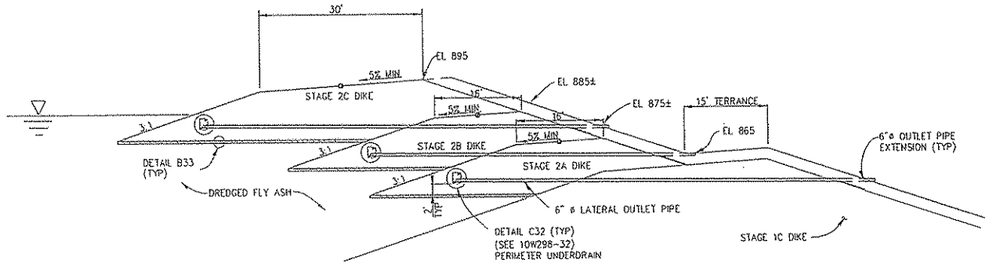
DETAIL C33
ASH DIKE CONSTRUCTION



TYPICAL SECTION – STAGE 1



TYPICAL SECTION – STAGE 3



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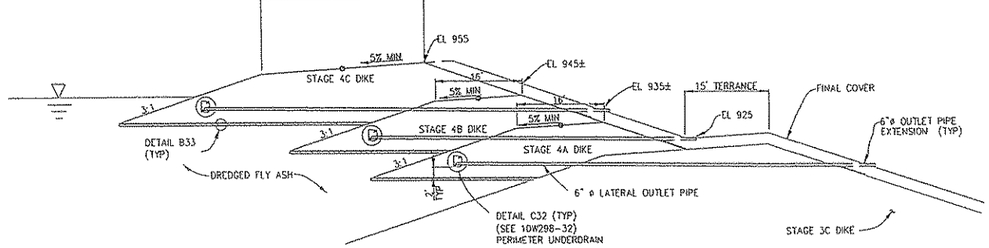
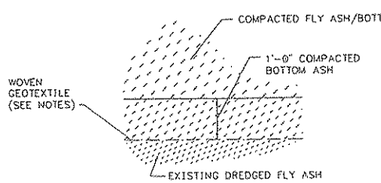


TYPICAL SECTION – STAGE 4

DETAIL A33
BOTTOM ASH DIKES



DETAIL B33
BONDING DETAIL

BONDING DETAIL NOTES:

1. WOVEN GEOTEXTILE SHALL BE CLASS C IN ACCORDANCE WITH SECTION 571.
2. OMIT WOVEN GEOTEXTILE IF A SUITABLY FIRM BASE EXISTS.
3. BOTTOM ASH THICKNESS MAY BE INCREASED OR DECREASED AS REQUIRED TO OBTAIN REQUIRED COMPACTION.

NOTES:

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE T-1 GENERAL CONSTRUCTION SPECIFICATIONS AND THE CLOSURE/POST-CLOSURE PLAN – ASH POND AREA – TVA KINGSTON FOSSIL PLANT, UNLESS OTHERWISE NOTED. SECTION NUMBERS REFER DIRECTLY TO THE T-1 SPECIFICATION.
2. UNDERDRAIN PIPE SHALL BE PERFORATED POLYETHYLENE CORRUGATED TUBING AS MANUFACTURED BY ADVANCED DRAINAGE SYSTEMS, INC., COLUMBUS, OHIO (614) 457-3051 OR EQUAL. UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 590.
3. LATERAL OUTLET PIPE SHALL BE NON-PERFORATED POLYETHYLENE CORRUGATED TUBING AS MANUFACTURED BY ADVANCED DRAINAGE SYSTEMS, INC., COLUMBUS, OHIO (614) 457-3051 OR EQUAL.
4. LATERAL OUTLET PIPES SHALL BE PLACED EVERY 250 FEET ON CENTER MAXIMUM BEGINNING AT STATION 2+00.
5. FILTER FABRIC SHALL BE TREVIRA SPUNBOUND TYPE 1135 NON-WOVEN GEOTEXTILE OR EQUIVALENT AND SHALL BE INSTALLED ACCORDING TO SECTION 571.
6. INTERMEDIATE COVER SHALL BE PLACED INCREMENTALLY AND CONCURRENTLY WITH DIKE CONSTRUCTION AND WILL CONSIST OF 9" OF SOIL SUITABLE FOR THE SUPPORT OF VEGETATION. AFTER PLACEMENT OF COVER, AREA SHALL BE SEEDED WITH SECTION 580 TYPE 6, MIX 9 (SPRING) OR TYPE 8, MIX 3 (FALL).
7. THE AREA FOR THE BASE OF THE DIKE SHALL BE CLEARED OF VEGETATION BY SCRAPING THE SURFACE ACCORDING TO SECTION 101.
8. BASE REINFORCEMENT SHALL CONSIST OF TYPE 300ST WOVEN SLIT FILM GEOTEXTILE AS PRODUCED BY SYNTHETIC INDUSTRIES, INC., CHATTANOOGA, TN (800) 621-9444 OR EQUIVALENT PLACED OVER THE DREDGED ASH SURFACE. 12" TO 18" OF BOTTOM ASH IS THEN TO BE BACKFILLED ONTO THE GEOTEXTILE TO PROTECT IT FROM TEARING BY THE GEOTEXTILE SHALL BE INSTALLED ACCORDING TO HAULING EQUIPMENT. MANUFACTURER'S SPECIFICATIONS.
9. TYPE A RIP RAP LAYER SHALL BE 9" THICK. A MINIMUM OF 50%, BY WEIGHT, OF THE STONES SHALL BE 25 LB. EACH AND IN ACCORDANCE WITH SECTION 575.
10. BEFORE FINAL COVER IS COMPLETED, OUTLET PIPES SHALL BE EXTENDED A MINIMUM OF 6' TO INSURE THAT THE END OF THE PIPE PROTRUDES BEYOND THE FINAL GRADE.
11. TYPE B RIP RAP LAYER SHALL BE 18" THICK. A MINIMUM OF 50%, BY WEIGHT, OF THE STONES SHALL BE 100 LB. EACH AND IN ACCORDANCE WITH SECTION 575.
12. AREAS OF FINAL SOIL COVER SHALL BE SEEDED (TYPE 8, MIXTURE 3) AND MULCHED IN ACCORDANCE WITH SECTIONS 580 AND 582. FINAL COVER SHALL NOT BE PLACED UNTIL DREDGING IS COMPLETE AND FACILITY IS AT ULTIMATE ELEVATION.
13. FOR DRAWING INDEX AND LEGEND, SEE 10W298-1.

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	ENVD	APPD	ISSD	PROJECT ID	AS CONST
R 0	12/12/08	CWH	ACM	DRD	DRD	LLP	JCK		BRF231	

DCN BRF-06-1052-033: INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

SCALE: NOT TO SCALE — EXCEPT AS NOTED

YARD

EXISTING ASH DISPOSAL DETAILS SHEET 4

DESIGNED BY: | DRAWN BY: | CHECKED BY: | SUPERVISED BY: | APPROVED BY: | ISSUED BY:

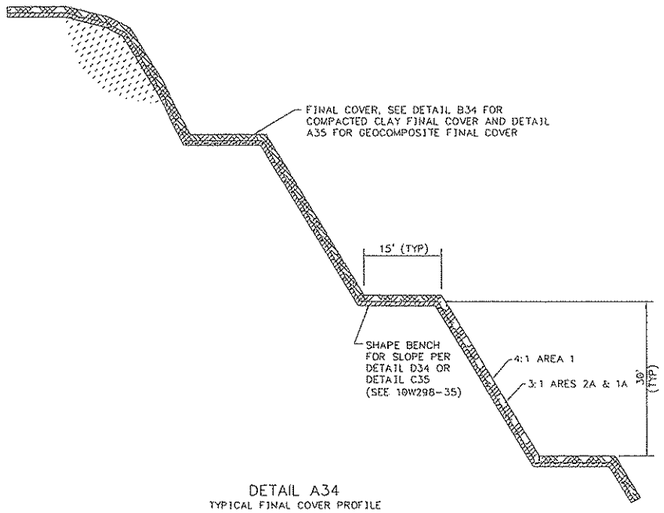
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K | DATE | 49 | C | 10W298-33 | R 0

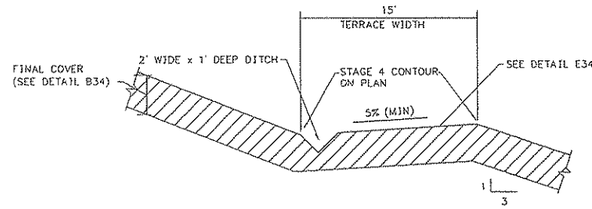
PLOT FACTOR:1
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

TASK COMPLETED BY: | REV NO.



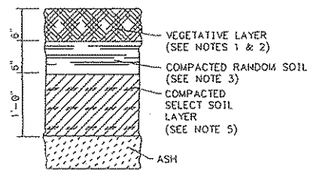
DETAIL A34
TYPICAL FINAL COVER PROFILE



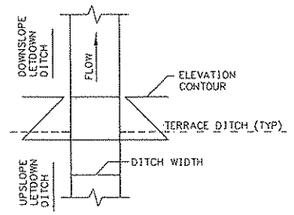
DETAIL D34
TERRACE DITCH (TYP)
COMPACTED CLAY FINAL COVER
AREA 1A & 2A

FINAL COVER CLOSURE NOTES:

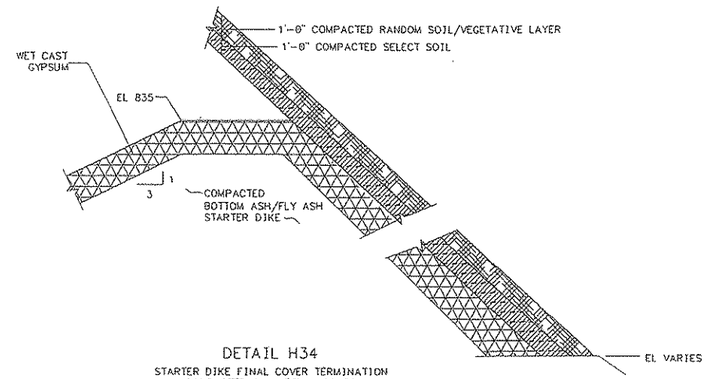
1. FOR DRAWINGS LIST AND LEGEND, SEE 10W298-1
2. FOR GENERAL NOTES, SEE 10W298-11
3. THE UPPERMOST 1 FT. OF THE FINAL COVER SHALL CONSIST OF RANDOM SOIL PLACED IN ACCORDANCE WITH THE QA/QC PLAN FOR THIS FACILITY. THE UPPER 6 IN. SHALL BE PREPARED FOR SEEDING. PRIOR TO SEEDING, A MINIMUM OF 3 SOIL SAMPLES OF VEGETATIVE LAYER SOIL SHALL BE TESTED TO DETERMINE APPROPRIATE AMOUNTS OF LIME, FERTILIZER, ETC. TO BE SPREAD PRIOR TO SEEDING.
4. SEED ALL AREAS (EXCLUDING ROADS & DITCHES) IN ACCORDANCE WITH TVA SPECIFICATION T-1, SECTION 583.
5. CONSTRUCT COMPACTED SELECT SOIL LAYER IN ACCORDANCE WITH THE CONSTRUCTION QA/QC PLAN FOR THIS FACILITY. THE COMPACTED SELECT SOIL LAYER SHALL BE CONSTRUCTED USING SELECT SOIL BACKFILL OBTAINED FROM STOCKPILED MATERIAL USED TO CONSTRUCT THE CLAY LAYER FOR THE LINER. STABILIZED AGGREGATE BASE SHALL BE IN ACCORDANCE WITH SECTION 1061.
6. STABILIZED AGGREGATE BASE SHALL BE IN ACCORDANCE WITH SECTION 1061.
7. GEOTEXTILE FABRIC SHALL BE A NON-WOVEN NEEDLE PUNCHED FABRIC CLASS C IN ACCORDANCE WITH SECTION 571.



DETAIL B34
COMPACTED CLAY FINAL COVER

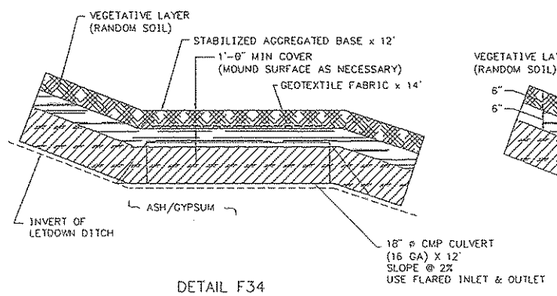


DETAIL C34
PLAN VIEW
TERRACE DITCH INTERSECTION
WITH LETDOWN DITCH

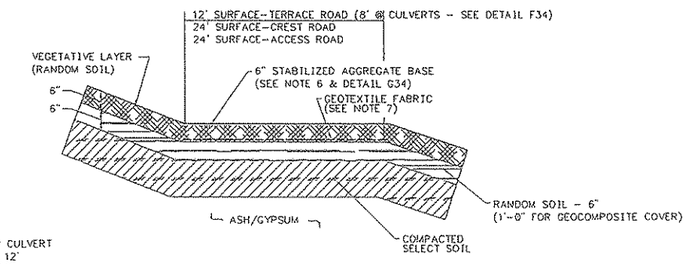


DETAIL H34
STARTER DIKE FINAL COVER TERMINATION
COMPACTED CLAY FINAL COVER

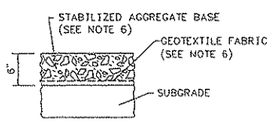
FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES



DETAIL F34
DITCH CROSSING TERRACE ROAD
(COMPACTED CLAY FINAL COVER)



DETAIL E34
TERRACE, ACCESS & CREST ROADS



DETAIL G34
ROAD DETAIL (TYP)

REV NO.	DATE	BY/CH	DRAWN	CHKD	SUPV	APVD	ISSD	PROJECT ID	AS CONST
R 0	12/12/08	CHN	ASH	DRD	DRD	LJP	JCK	09T201	

DCN BRF-08-1052-034; INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

SCALE: NOT TO SCALE — EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL COVER, CULVERT & ROAD DETAILS COMPACTED CLAY FINAL COVER

REVIEWED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	APPROVED BY:	ISSUED BY:

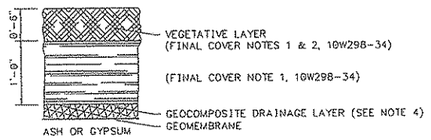
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-34	R 0

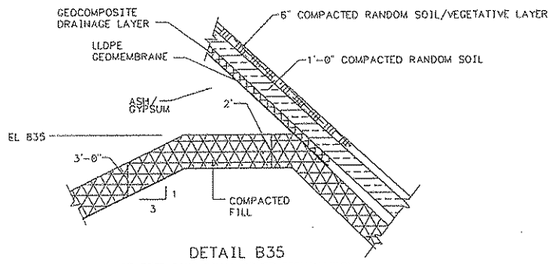
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:96
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



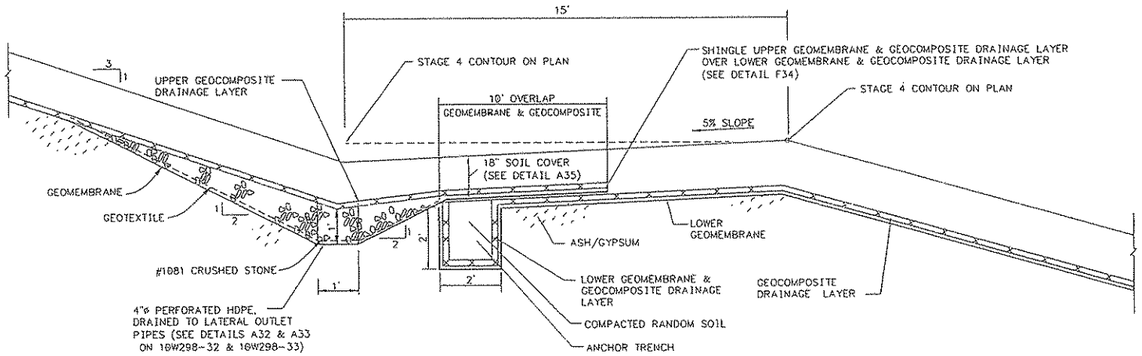
DETAIL A35
TYPICAL GEOCOMPOSITE FINAL COVER DETAIL



DETAIL B35
STARTER DIKE FINAL COVER TERMINATION
GEOCOMPOSITE FINAL COVER

NOTES:

1. FOR DRAWINGS LIST AND LEGEND, SEE 10W298-1
2. FOR GENERAL NOTES, SEE 10W298-11
3. FOR FINAL COVER NOTES, SEE 10W298-34
4. THE GEOCOMPOSITE DRAINAGE LAYER BENEATH THE COMPACTED SOIL LAYER SHALL CONSIST OF THE FOLLOWING COMPONENTS PLACED IN ORDER FROM ASH SURFACE UPWARD:
   - A CALENDERED WOVEN GEOTEXTILE WITH AOS DETERMINED BY TVA FES;
   - THE CALENDERED WOVEN GEOTEXTILE SHALL BE HEAT BONDED TO THE GEONET;
   - THE UPPER GEOTEXTILE SHALL BE A NON-WOVEN NEEDLEPUNCHED GEOTEXTILE.
5. FOR DETAILS OF ROADS AND DITCH/CULVERTS CROSSINGS SEE 10W298-34



DETAIL C35
TYPICAL TERRACE DITCH AND GEOCOMPOSITE ANCHOR
GEOCOMPOSITE FINAL COVER

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

REV NO.	DATE	DSGN	DRWN	CHKD	QUAL	APPD	ISSD	PROJECT ID	AS FOUND	AS BUILT
R 0	12/12/08	CWH	ACM	DRD	DRD	LJP	JCK		BNF211	

DCN BRF-06-1052-035, INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

SCALE: NOT TO SCALE — EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL GEOCOMPOSITE FINAL COVER

ACCEPTED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	ISSUED BY:

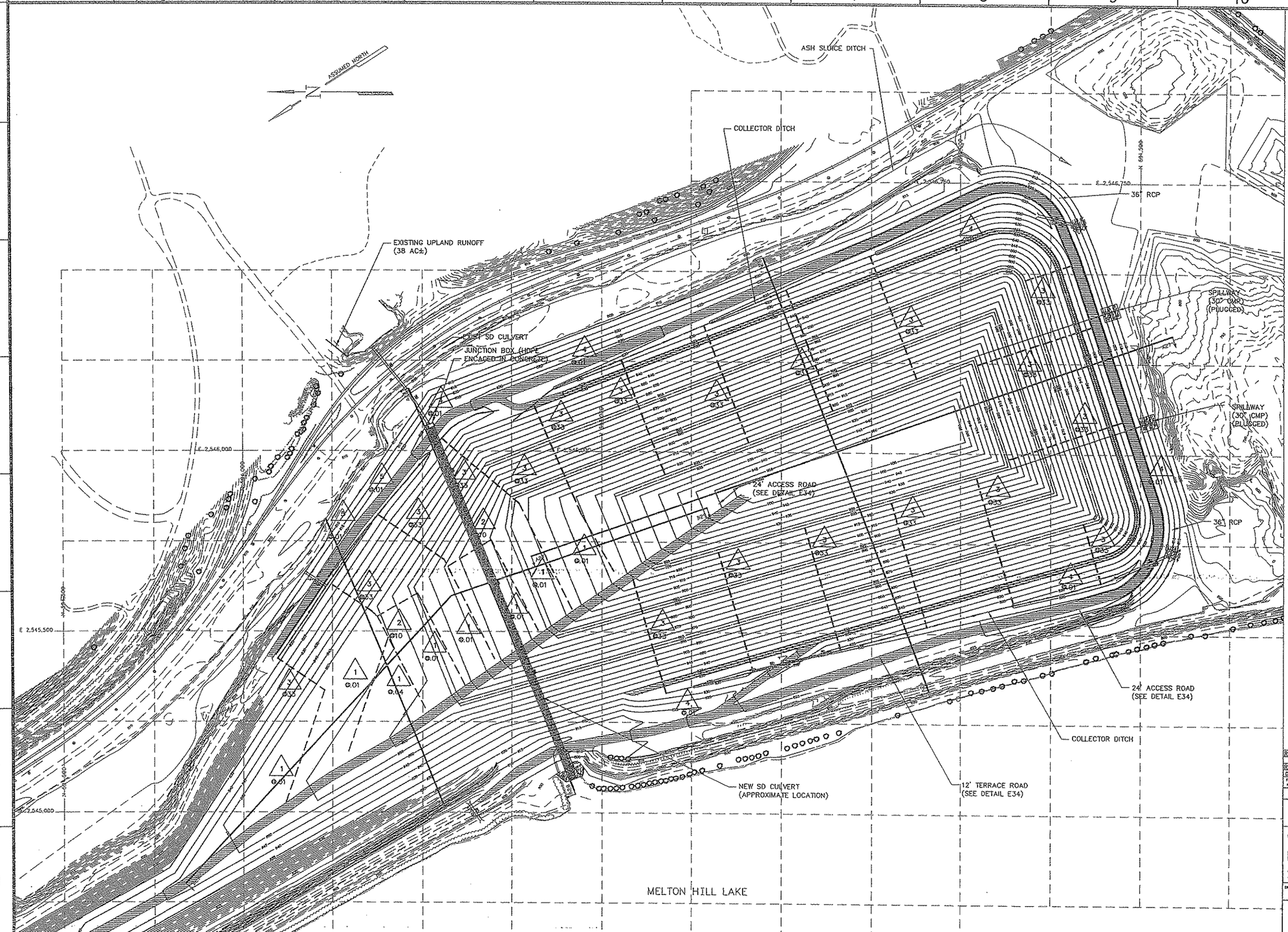
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-35	R 0

PLOT FACTOR: 96
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

TASK COMPLETED BY: | REV NO.



NOTES:

1. FOR DITCH NOTES, SEE 10W298-37.
2. SPILLWAY PIPES SHOWN FOR LOCATION REFERENCE

DITCH SCHEDULE

DITCH SCHD	DITCH DEPTH-D	BOTTOM WIDTH-W	LINING
1	–	–	SEE NOTE 4, DET B37
2	2' MIN	2' NOM	SEE NOTE 5, DET A37
3	2' MIN	2' NOM	SEE NOTE 5, DET A37
4	2.5' MIN	10' MIN	SEE NOTE 5, DET A37

LEGEND

- SD — STORM DRAIN PIPE
- COLLECTOR DITCHES
- DITCHES
- TERRACE DITCHES
- ASH SLUICE DITCH
- 1 — DITCH CLASS
- ⌀.01 — DITCH SLOPE
- ROAD

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APVD	ISSD	PERMIT NO	AS CONST
0	12/12/08	CWH	AGM	DRD	DRD	LJP	JCK		899231	

DCN BRF-08-1052-036; INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

SCALE: 1"=100' EXCEPT AS NOTED

YARD

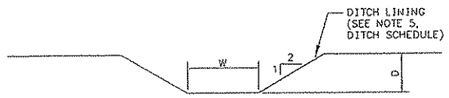
GYPSUM & ASH DISPOSAL DRAINAGE PLAN, ROADS, & DITCH SCHEDULE FINAL COVER

DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY	REVIEWED BY	ACCEPTED BY	ISSUED BY

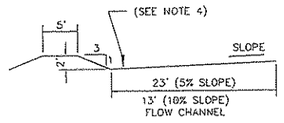
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

DITCH NOTES:

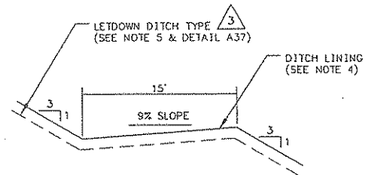
1. FOR DRAWINGS LIST AND LEGEND, SEE 10W298-1
2. FOR GENERAL NOTES, SEE 10W298-11
3. FOR DRAINAGE PLAN & DITCH SCHEDULE, SEE 10W298-36.
4. SEED DITCH IN ACCORDANCE WITH SECTION 581. INSTALL JUTE MATTING (NORTH AMERICAN GREEN S150 OR SYNETHETIC INDUSTRIES LANDLOK-2) ON SEEDED AREAS WITHIN THE TOP WIDTH OF DITCH IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
5. PERMANENT SOIL REINFORCEMENT/LINER SHALL BE PYRAMAT BY SYNTHETIC INDUSTRIES, INC. OR EQUAL INSTALLED AND ANCHORED PER MANUFACTURERS INSTRUCTIONS.



DETAIL A37



DETAIL B37



DETAIL C37
TERRACE DITCH

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 0	12/12/08	EWH	ACM	DRD	DRD	LJP	JCK		BRF231	

DCN BRF-06-1052-037: INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

SCALE: NOT TO SCALE — EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
DITCH DETAILS & NOTES
FINAL COVER

DESIGNED BY | DRAWN BY | CHECKED BY | SUPERVISED BY | APPROVED BY | ISSUED BY

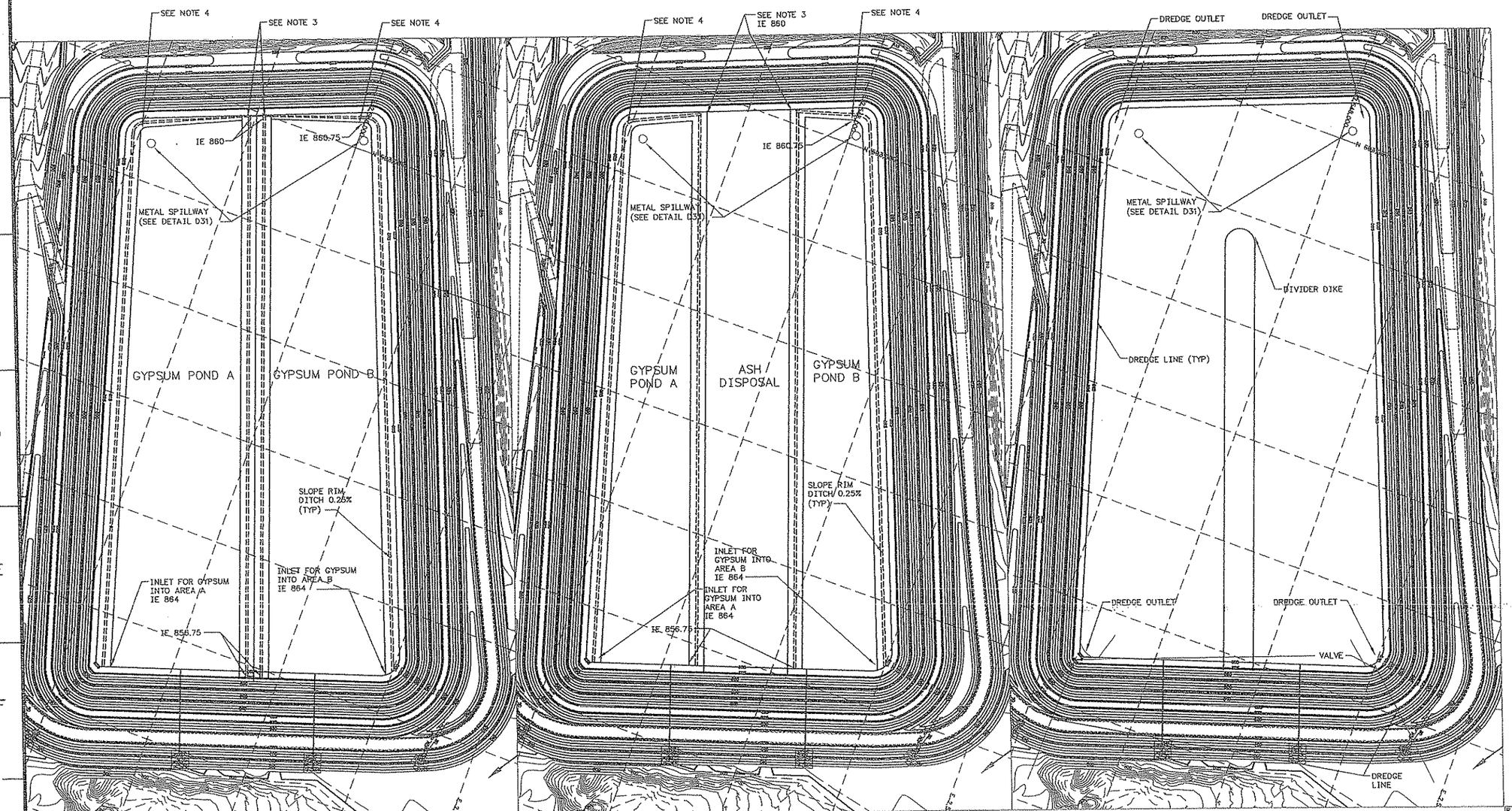
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K | DATE | 49 | C | 10W298-37 | R 0

TASK COMPLETED BY: | REV NO.

PLOT FACTOR: 1
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



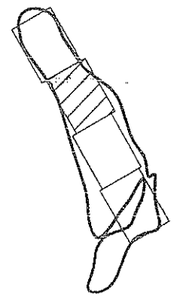
OPTION 1 OPTION 2 OPTION 3

STAGE 1

NOTES:

1. FOR DRAWINGS LIST AND LEGEND, SEE 10W298-1
2. FOR GENERAL NOTES, SEE 10W298-11
3. END OF STAGE 1 SHOWN. FOR BEGINNING OF STAGE 1, CONSTRUCT RIM DITCH FROM INLET AND TERMINATE AT SOUTH END OF POND, TO AVOID INTERFERENCE WITH DRAINAGE LAYER. CONTINUE RIM DITCH TO NORTH END OF POND WHEN PROJECTED INVERT ELEVATION AND RIM DITCH EXCEED ELEVATION 840.
4. WHERE RIM DITCHES HAVE SHARP TURNS, WIDEN DITCHES IN THE TURN TO 10FT.

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES



KEY PLAN

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APVD	CCRD	PROJECT ID	AS CONST
R 0	12/12/08	CWH	ACM	DRD	DRD	LeP	JCK		BRF211	

DCN BRF-08-1052-038: INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

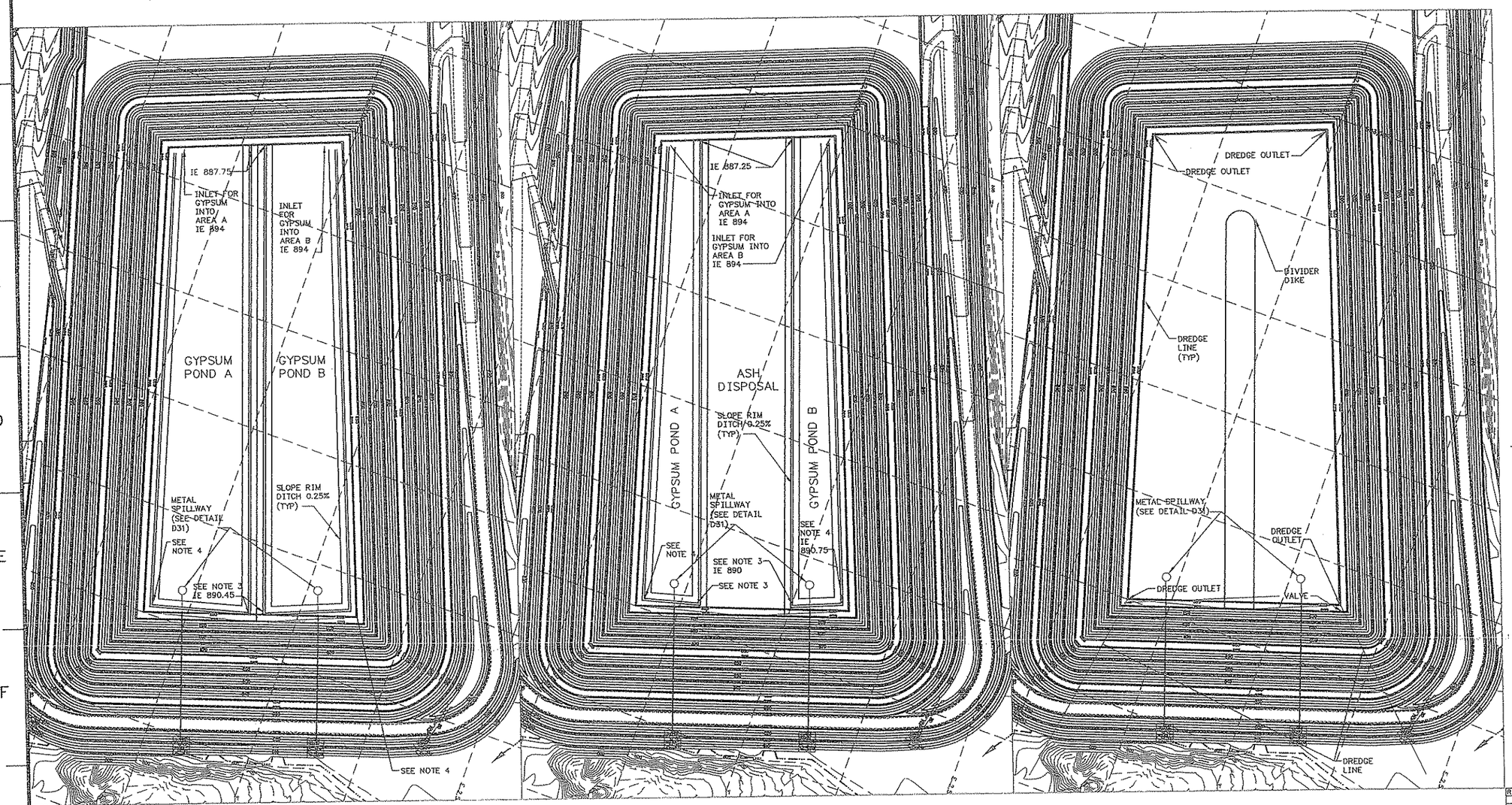
SCALE: 1"=100' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL WASTE DISPOSAL OPTIONS STAGE 1

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING



STAGE 2

NOTES:

1. FOR DRAWINGS LIST AND LEGEND, SEE 10W298-1
2. FOR GENERAL NOTES, SEE 10W298-11
3. END OF STAGE 2 SHOWN.
4. WHERE RIM DITCHES HAVE SHARP TURNS, WIDEN DITCHES IN THE TURN TO 10FT.

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

KEY PLAN

R	DATE	DSGN	DRWN	CHKD	SUPV	REVWD	APPD	ISSD	PROJECT ID	AS CONST
0	12/12/08	CWH	ACM	DRD	DRD	LJP	JCK		BRF211	

DCN BRF-08-1052-039; INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

SCALE: 1"=100' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL WASTE DISPOSAL OPTIONS STAGE 2

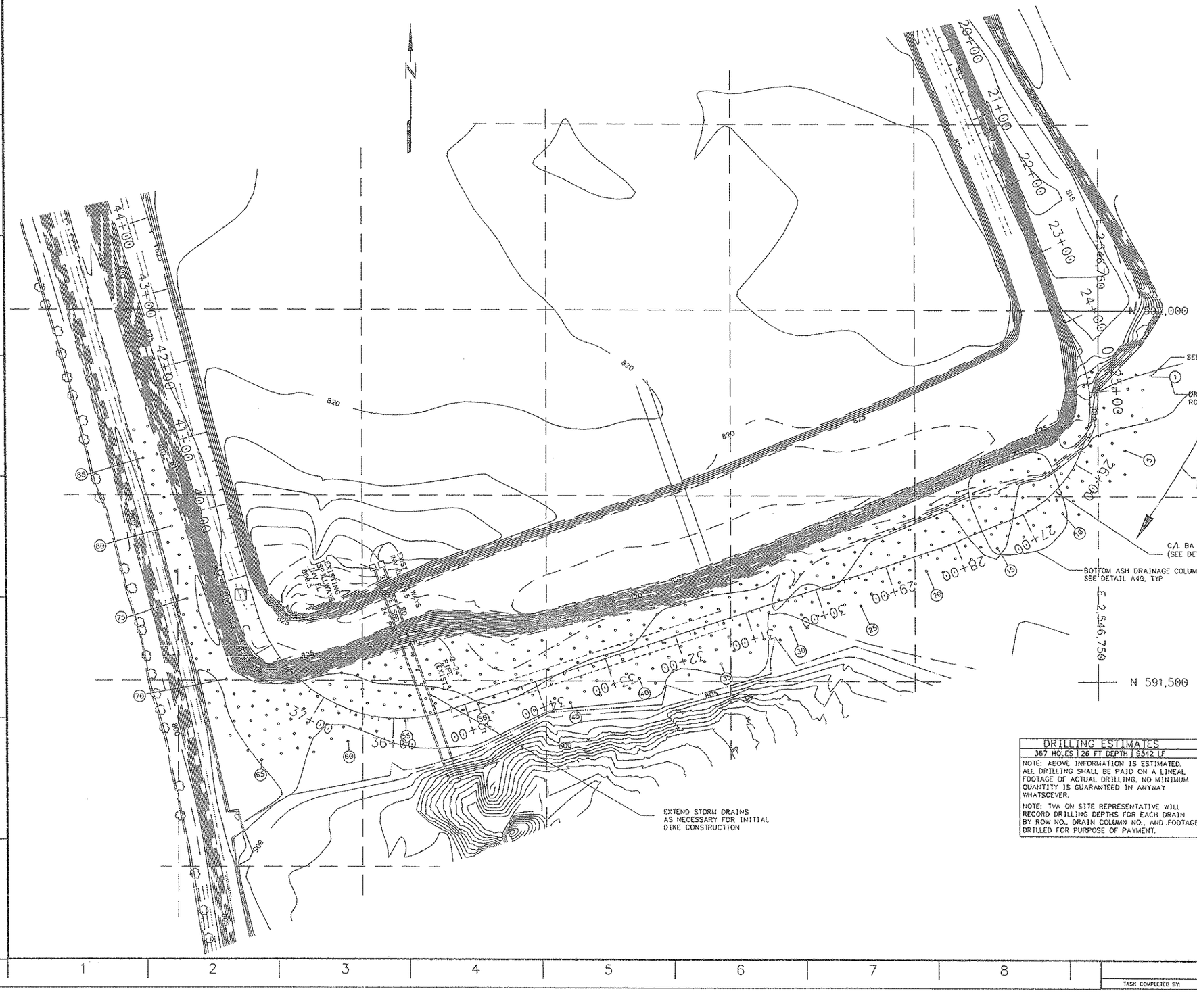
DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:

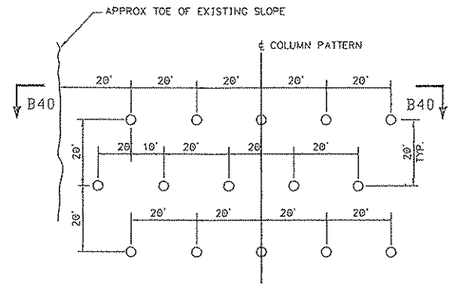
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-39	R 0

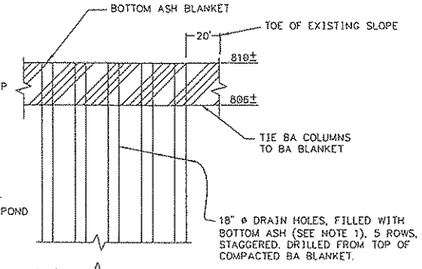
PLOT FACTOR:1
W_TVA

C.A.D. DRAWING DO NOT ALTER MANU





DETAIL A40
PATTERN FOR BA DRAIN COLUMNS



DETAIL B40
BOTTOM ASH DRAIN COLUMNS
NTS

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

NOTE:
1. BOTTOM ASH FOR COLUMN DRAINS SHALL BE AS SPECIFIED BY EDS BASED UPON LABORATORY TESTING OF AVAILABLE BOTTOM ASH AND DRY ASH PRODUCTS.

DRILLING ESTIMATES
367 HOLES | 26 FT DEPTH | 9542 LF

NOTE: ABOVE INFORMATION IS ESTIMATED. ALL DRILLING SHALL BE PAID ON A LINEAL FOOTAGE OF ACTUAL DRILLING. NO MINIMUM QUANTITY IS GUARANTEED IN ANYWAY WHATSOEVER.

NOTE: TVA ON SITE REPRESENTATIVE WILL RECORD DRILLING DEPTHS FOR EACH DRAIN BY ROW NO., DRAIN COLUMN NO., AND .FOOTAGE DRILLED FOR PURPOSE OF PAYMENT.

R									
R 0	12/12/08	CWH	ACM	DRD	DRD	LJP	JCK	BRF211	J
DCN BRF-08-1052-040: INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.									

SCALE: 1"=50' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL WICK DRAIN ARRANGEMENT

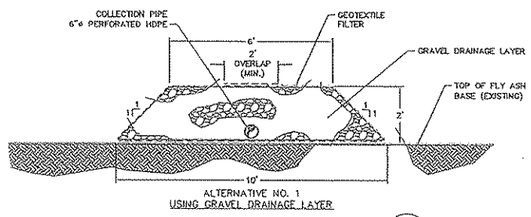
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2K | 49 | C | 10W298-40 | R 0

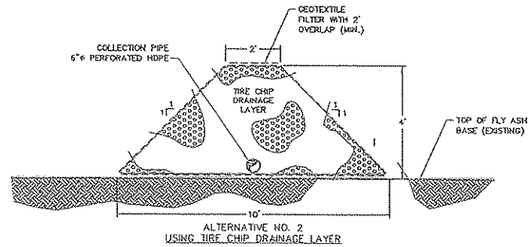
PLOT FACTOR:1
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

TASK COMPLETED BY: | REV NO.

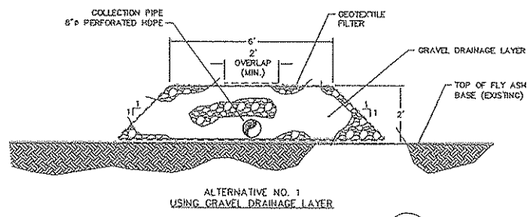


ALTERNATIVE NO. 1
USING GRAVEL DRAINAGE LAYER

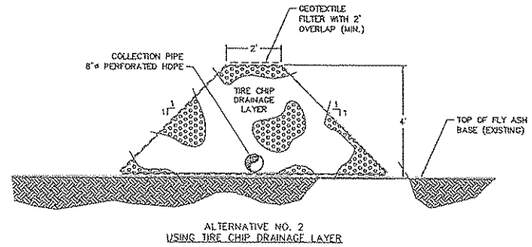


ALTERNATIVE NO. 2
USING TIRE CHIP DRAINAGE LAYER

1/5 DETAIL
BOTTOM DRAINAGE COLLECTION PIPE
SCALE: 1" = 2'

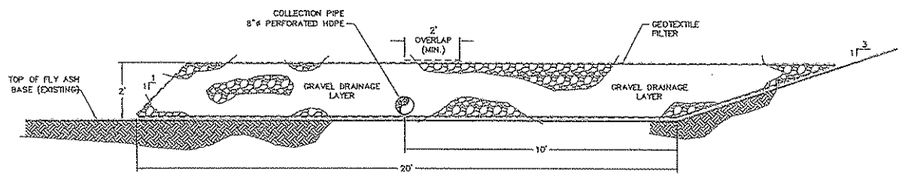


ALTERNATIVE NO. 1
USING GRAVEL DRAINAGE LAYER

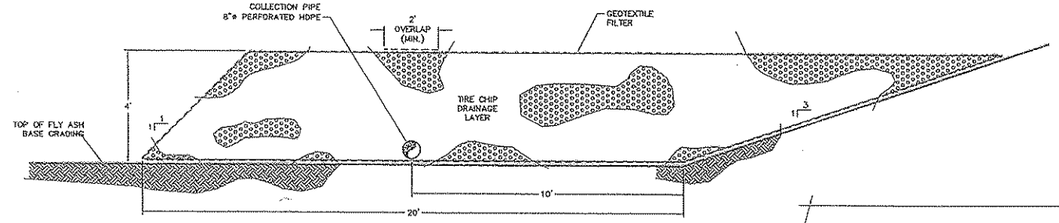


ALTERNATIVE NO. 2
USING TIRE CHIP DRAINAGE LAYER

2/5 DETAIL
BOTTOM DRAINAGE COLLECTION PIPE
SCALE: 1" = 2'



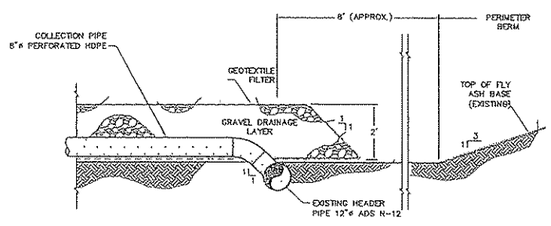
ALTERNATIVE NO. 1
USING GRAVEL DRAINAGE LAYER



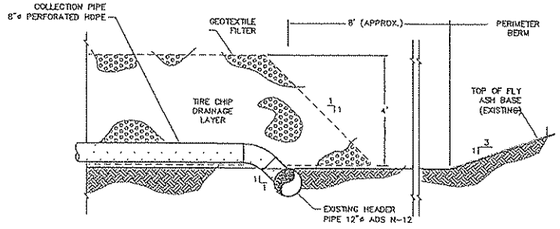
ALTERNATIVE NO. 2
USING TIRE CHIP DRAINAGE LAYER

3/5 DETAIL
BOTTOM DRAINAGE COLLECTION PIPE
SCALE: 1" = 2'

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES



ALTERNATIVE NO. 1
USING GRAVEL DRAINAGE LAYER



ALTERNATIVE NO. 2
USING TIRE CHIP DRAINAGE LAYER

4/5 DETAIL
BOTTOM DRAINAGE COLLECTION PIPE
TIE-IN TO EXISTING HEADER PIPE
SCALE: 1" = 2'

NOTES:

1. GRAVEL DRAINAGE LAYER SHALL CONSIST OF #57 STONE OR APPROVED EQUAL.

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	APVD	APVD	PROJECT ID	AS CONST	
R 0	12/12/08	CWH	ACM	DRD	DRD	JLP	JCK	BRF251		

DCN BRF-08-1052-041; INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

SCALE: AS SHOWN — EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL TYPICAL CROSS-SECTIONS AND DETAILS

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	APPROVED BY:	ISSUED BY:

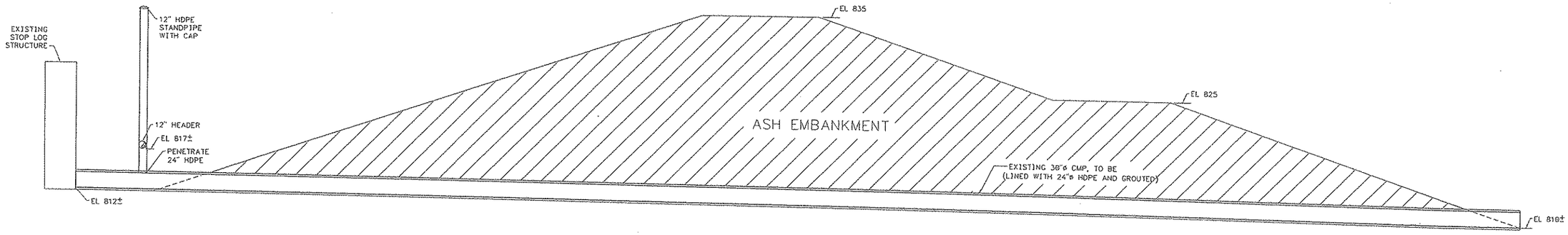
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2K	DATE	49	C	10W298-41	R 0

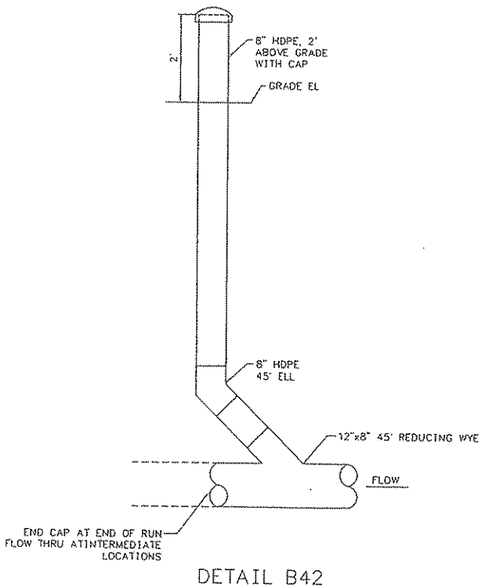
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:24
W_TVA

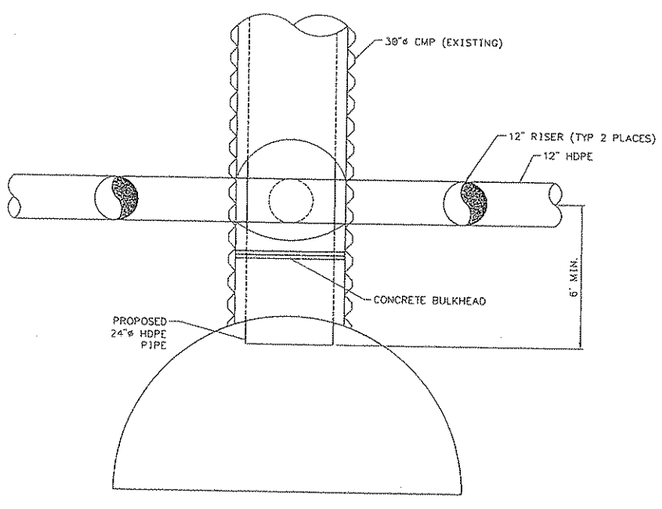
C.A.D. DRAWING
DO NOT ALTER MANUALLY



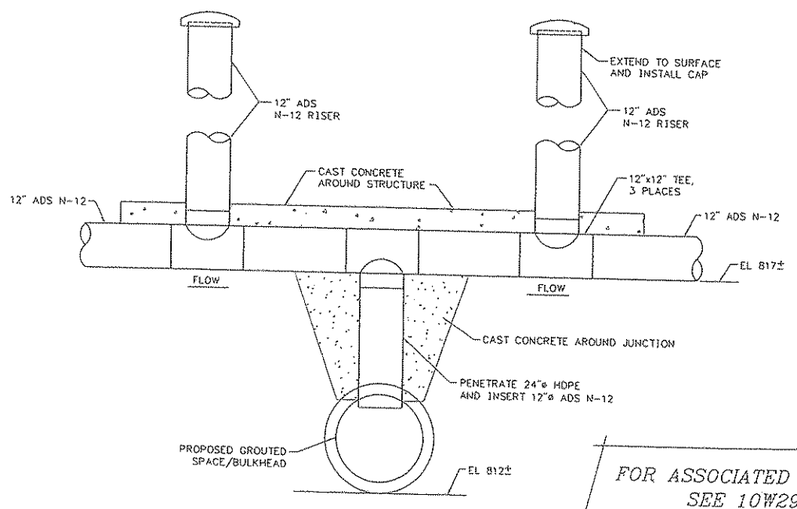
SECTION A42
SCALE: 1"=5'



DETAIL B42
CLEANOUT INSTALLATION
TYPICAL 4 PLACES
SCALE: NTS



PLAN
STANDPIPE INSTALLATION
SCALE: NTS



DETAIL C42
STANDPIPE INSTALLATION
TYPICAL 2 PLACES
SCALE: NTS

FOR ASSOCIATED PERMIT DRAWINGS SEE 10W297 SERIES

REV NO.	DATE	DESIGN	DRAWN	CHKD	SURV	APPD	ISSUED	PROJECT ID	AS COMP	DESCRIPTION
R 0	12/12/08	CWM	ACM	DRD	DRD	LJP	JCK	BRF251		DEN BRF-08-1052-042: INITIAL ISSUE FOR GYPSUM AND DRY ASH DISPOSAL SITE.

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL CLEANOUT & STANDPIPE DETAILS

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	APPROVED BY:	ISSUED BY:

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R2K	DATE	49	C	10W298-42	R 0

TASK COMPLETED BY: | REV NO.

PLOT FACTOR:5
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

Reference No. 7

TVA/FPG	FPG - Form A – Design Change Notice	Page 1 of 2

1. a. DCN Type	b. Class	2. DCN No	BRF-08-1052-001	Rev.	0
☐ Base DCN ☒ PIC for Base/	Routine Design Change ☒ Documentation Only ☐	3.	Plant	Bull Run Fossil	
Parent DCN No.:	Material Equivalency ☐		Unit No.	1	
BRF-06-1052	c. Advance Authorization ☒ Yes ☐ No	4.	System(s)	14, 300	

Part I - Requested Change

5.	Authorizing Documents	BRF211
6.	Requested Change or Problem Statement	Unanticipated construction problems encountered in the field during implementation of DCN BRF-06-1052 necessitate changes to drawings. For detailed description of problem see attached Advance Authorization Tracking Sheets.

7.	Chris Hensley	EDS	751-4413	8.	[signature]	2-22-08
	Initiator's Name (Print)	Organization	Phone		Supervisor/Principal Engr	Date

Part II - Initiation Approval

(Skip blocks 9 and 10 for Advance Authorization Approval)

9.			10.		
	Reviewed Initiator's Department Manager	Date		Approved Engrg/Operations Manager	Date

Part III - Approved Change/Detailed Design

11.	Approved Change Description	Resolve construction problems encountered during implementation of DCN BRF-06-1052 and incorporate the required changes to the drawings. For detailed description of resolutions, see attached Advance Authorization Tracking Sheets.

12.	Advanced Authorization Approval (If applicable, otherwise mark N/A.)	Engrg or Manager	[signature]	Date	2-22-08

13.	Does this change contain any assumptions or constraints that require confirmation before RTO?	☐ Yes	☒ No
14.	Does this change address the full scope of the authorizing document?	☒ Yes	☐ No

15.				16.		
	RE	Phone	Date		Civil	Date
17.	N/A			18.	N/A	
	Electrical/I&C	Date			Mechanical	Date
19.				20.		
	Operations	Date			Maintenance	Date
21.	N/A			22.		
	System Engineer	Date			Implementing Organization	Date
23.				25.	**ISSUE EDMS #**	
	Plant Manager	Date				
24.						
	Engrg or Site Engrg Manager	Date				

Part IV - DCN Closure

26.			27.	**CLOSURE EDMS #**
	Verification that Form F has been completed, all primary DCA's have been incorporated and anticipated drawings have been issued.	Date		
28.				
	Engineering Record Unit	Date		

TVA/FPG	FPG - Form A - Design Change Notice	Page 2 of 2

DCN Revision Log

Revision Number	Effective Date	Pages Affected	Description of Revision
0	02/20/08		See Advance Authorized Tracking Sheets

DCN Continuation Sheet

6. Cont'd Requested Change or Problem Statement	
11. Cont'd Approved Change Description	

Related DCNs Required to Complete this Modification

FPG - Form G – Advance Authorized Tracking Sheet

Parent DCN Number BRF-06-1052

PIC Number BRF-08-1052-001 (Enter one number per sheet)

AA-01 Issue Date	02/20/08	Initiator	Signature	Date
AA-02 Issue Date	02/20/08	Initiator	Signature	2-22-08 Date
AA-03 Issue Date		Initiator	Signature	Date
AA-04 Issue Date		Initiator	Signature	Date
AA-05 Issue Date		Initiator	Signature	Date
AA-06 Issue Date		Initiator	Signature	Date
AA-07 Issue Date		Initiator	Signature	Date
AA-08 Issue Date		Initiator	Signature	Date
AA-09 Issue Date		Initiator	Signature	Date
AA-10 Issue Date		Initiator	Signature	Date
AA-11 Issue Date		Initiator	Signature	Date
AA-12 Issue Date		Initiator	Signature	Date
AA-13 Issue Date		Initiator	Signature	Date
AA-14 Issue Date		Initiator	Signature	Date

***NOTE:* If additional AAs are needed, additional tracking sheets may be added with the AA level numbers above increased accordingly. Any unused AA lines should be lined through with a diagonal line and marked "N/A."**

Last AA issued before requesting final approval _____

Final approval requested			
Date	Initiator	Signature	Date

FPG - Form G – Advance Authorized Tracking Sheet

AA- 01 PIC# BRF-08-1052-001 Page 1 of 1

Block 6 - Requested Change
Correct deficiencies found during construction:

1. Wicking of water thru dike along fabric interface

2. Sloughs at exterior of dike caused by water flowing thru perforated pipes.

Block 11 - Approved Change
See Attached sketches.

1. Construct Clay plug/shoulder along interior toe of dike, forming an impervious lap by breaking the fabric within the clay plug. Also reconstruct exposed fabric at exterior toe of dike as detailed.

2. Redesigned the perforated underdrain system. Pipe thru the dike to be plugged with grout (retaining the outer ~20' as a toe drain but blocking drainage from within the dike area. Redesigned the weir to accept a header pipe arrangement thru which the under drains drain out thru the weir structures.

Supv/Prin Egnr: _____ 2-22-08
Signature Date

RE: _____ 2-22-08
Signature Date

FPG - Form G – Advance Authorized Tracking Sheet

AA- 02 PIC# BRF-08-1052-001 Page 1 of 1

Block 6 - Requested Change
Correct deficiencies found during construction:

1. Insufficient Bottom Ash to construct blanket drain

2. Actual header pipe and clay/shoulder construction from AA-01 constructed different from design and fabric interface must be revised for construction access.

Block 11 - Approved Change
See Attached Sketches.

1. Redesigned blanket drain by replacing with crushed stone finger drains. See attached GeoSyntec sketches.

2. Redesigned the clay plug/shoulder to show fabric lap above the 12" header pipe.

Supv/Prin Egnr: R.L. Reddy 2-22-08
Signature Date

RE: R L Reddy ltr/ via phone 2-22-08
Signature Date

Cost Estimate by Heavy Equipment Division
For
Bull Run Fossil Plant
Gypsum Pond "Seep Repair" Project
Revision ~~#0~~ ~~#1~~ #2
#3 4/4/07

Mr. Randy Petty,

The below estimate will include all supervision, labor, materials and equipment to repair seep in accordance with provided preliminary sketches 1 through 6 dated 2/15/07 from Fossil Engineering.

Basis of Estimate

Scope of work is based upon scope understanding and provided sketches. 4 CLEAN OUTS 4 RISERS 2 PENETRATIONS (6)

Scope of Work

- ~~Add 4 FLAP VALVES~~ (4) (A)
- Weave existing fabric with new fabric in new clay pocket.
- Install new #7 stone drainage pockets at 50' intervals as shown. ~~(ESTIMATE & HOLD)~~ (4) (3)
- Grout up all existing 4" perforated pipes in dike.
- ~~Directional bore (2 ea.) x 200lf each, new 24" dia. Sch. 40 (.375 wall thickness) "field perforated" sleeves through the south dike at 2 locations.~~ (4)
- ~~Insert (2 ea.) 18" HDPE pipes through new sleeves.~~
- ~~Install (2 ea.) pipe plugs to protect existing underdrain system from grouting operations.~~
- ~~Install concrete bulkheads at sleeve / dike pipe entrance.~~
- ~~Pressurized grout (by sub-contractor) between new sleeve and new 18" dia. SDR 17 HDPE pipe to ensure no voids exist between ash dike and new sleeve, as well as between new sleeve and new 18" SDR 17 HDPE pipe.~~
- ~~Install 2 ea. 4' dia. Concrete manhole base & riser sections for connection of all new internal pond piping.~~ (2)
- Construct a header of 12" HDPE N-12 non-perforated pipe at the base of the south dike inner slope.
- Run 4" piping in existing layout to new header with 12" x 12" x 4" water tight tee's at 17 locations within the pond.

Should include grouting of 4" PIPES (A), upper 20' (3)

Project Work Schedule

- All work is proposed on a 40 hour week.
- Construction activities: 4 x 10's (2 – 3 weeks)

(A) RUN PIG OR CAMERA THROUGH EXISTING 30" CMP'S TO VERIFY LINE IS FREE OF OBSTRUCTION.

(A) Scope Based upon relining of Pipes being scoped Separately (Keep separate so ~~like~~ we can track cost separately for Now - Makes sense to complete together)

TVA 11030 (WM-7-75)

CROSS SECTION

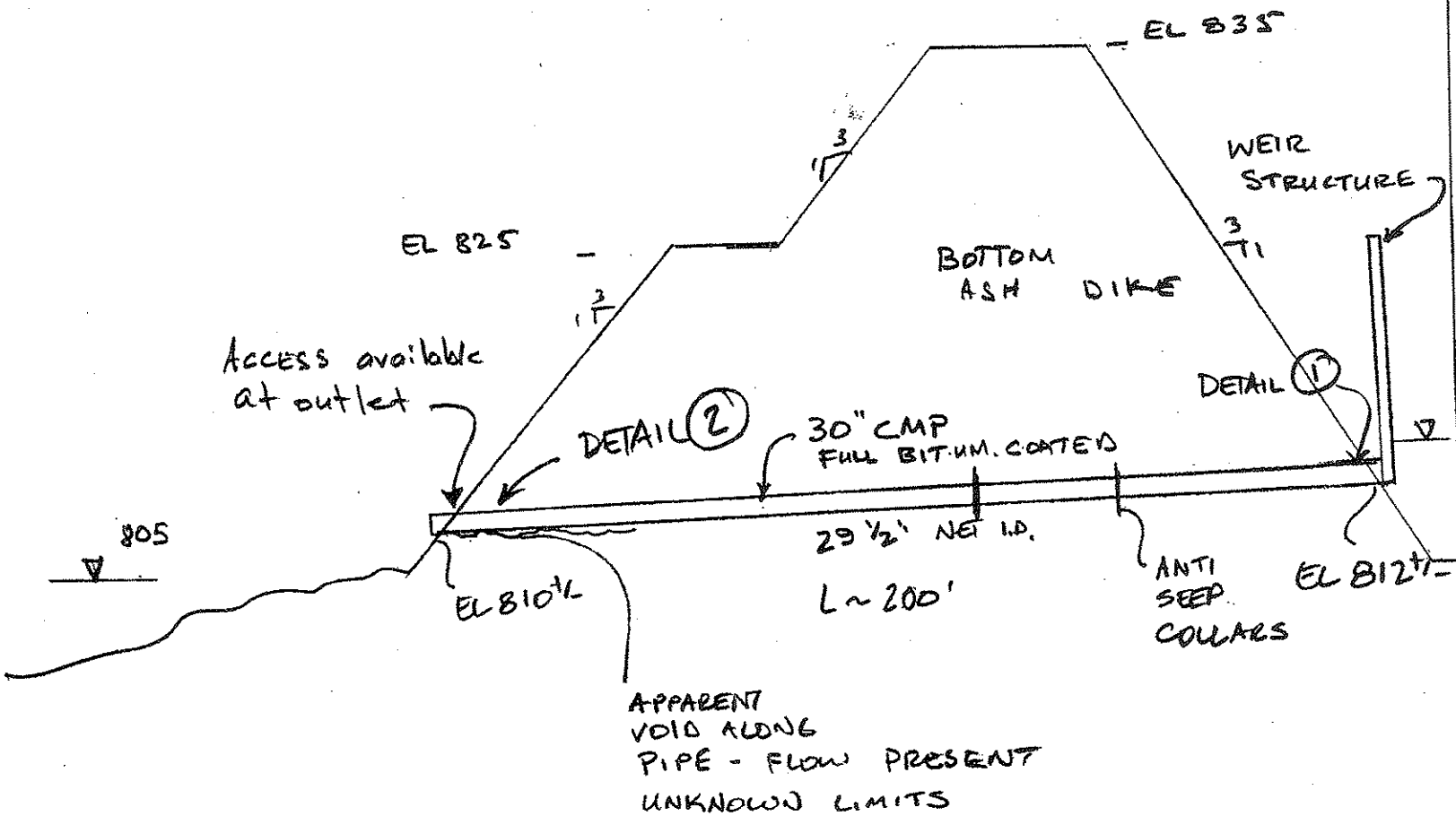
CORRUGATED METAL PIPE APPARENT JOINT FAILURE

BRF-F6D R1 3/15/07

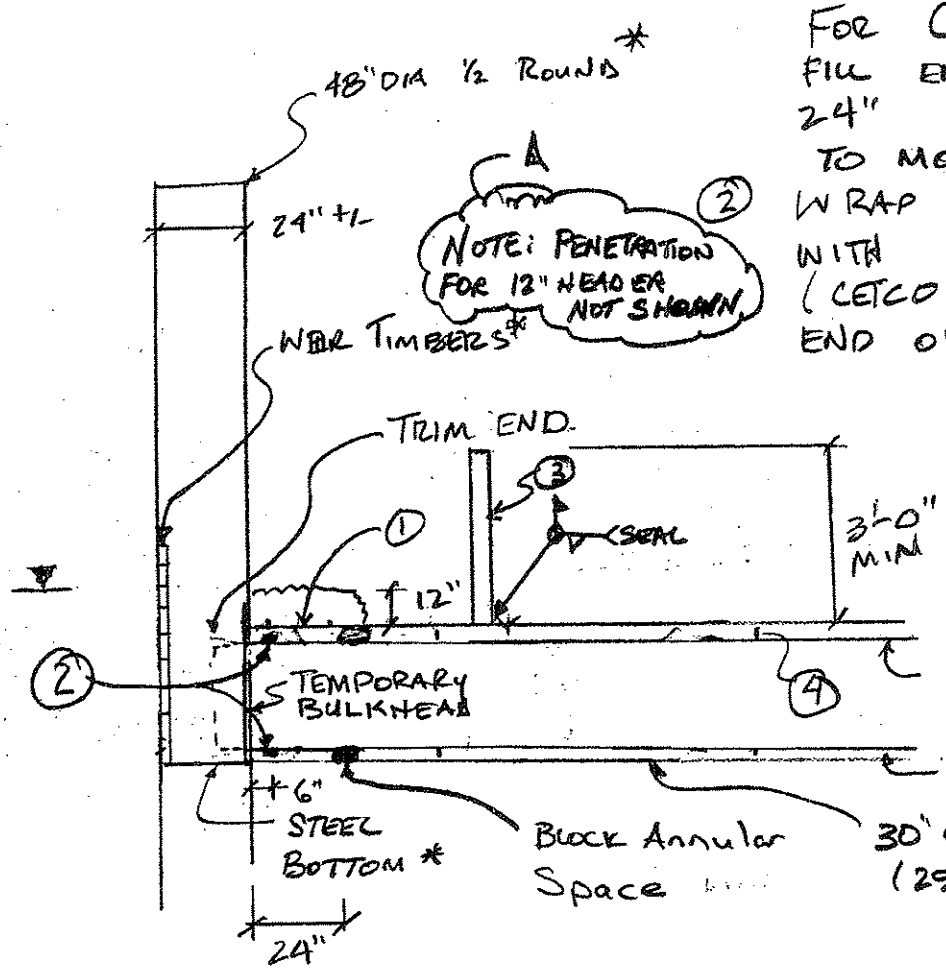
SHEET 1 OF 3

COMPUTED RLP DATE 12-15-2006

CHECKED DATE



TVA 11030 (WM-7-75)



① CUT HOLE IN TOP OF CMP TO PROVIDE ACCESS FOR CONCRETE PLACEMENT - FILL END OF PIPE WITH 24" CONCRETE. ALLOW CONCRETE TO MOUND OVER PIPE 12" MIN

WRAP END OF HDPE PIPE Δ WITH BENTONITE WATER STOP (CETCO WATER STOP-RX), 6" FROM END OF PIPE

③ 3" DIA STL PIPE, FIELD-SEAL WELDED TO 30" CMP (GROUT VENT PIPE)

④ CASING SPACERS, 2 PER JOINT, APS Polyethylene Δ (AS REQD FOR INSTALLATION)

* EXISTING

DETAIL ①

(SHOWN OPP HAND)

PVC LINER Option

BFF 253

Δ R1 5/15/07

SHEET 2 OF 3

COMPUTED RKP DATE 1/8/6

CHECKED _____ DATE _____

TVA 11030 (WM-7-75)

BRF 255

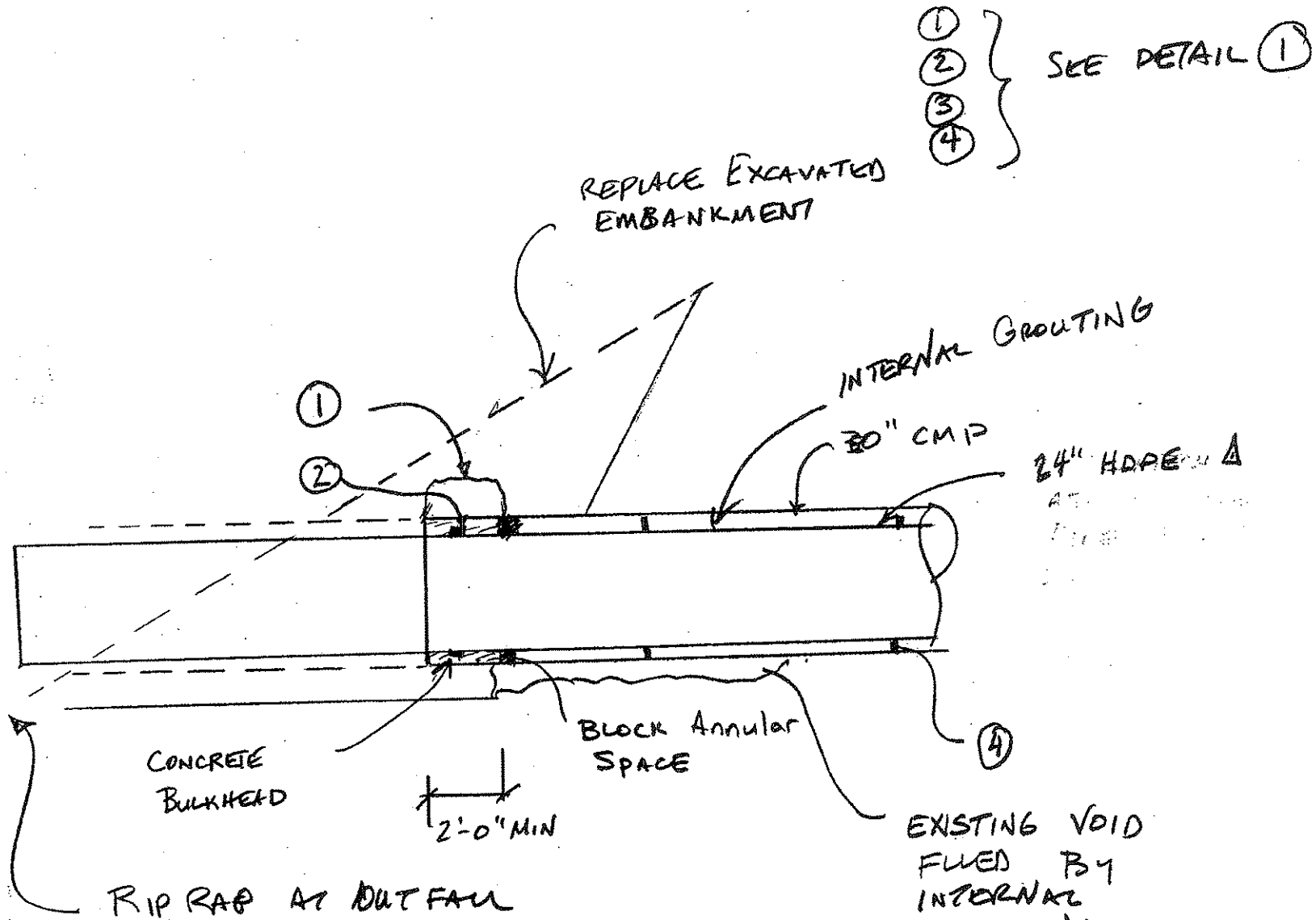
PVC Liner option

SHEET 3 OF 3

Δ R1 3/15/07

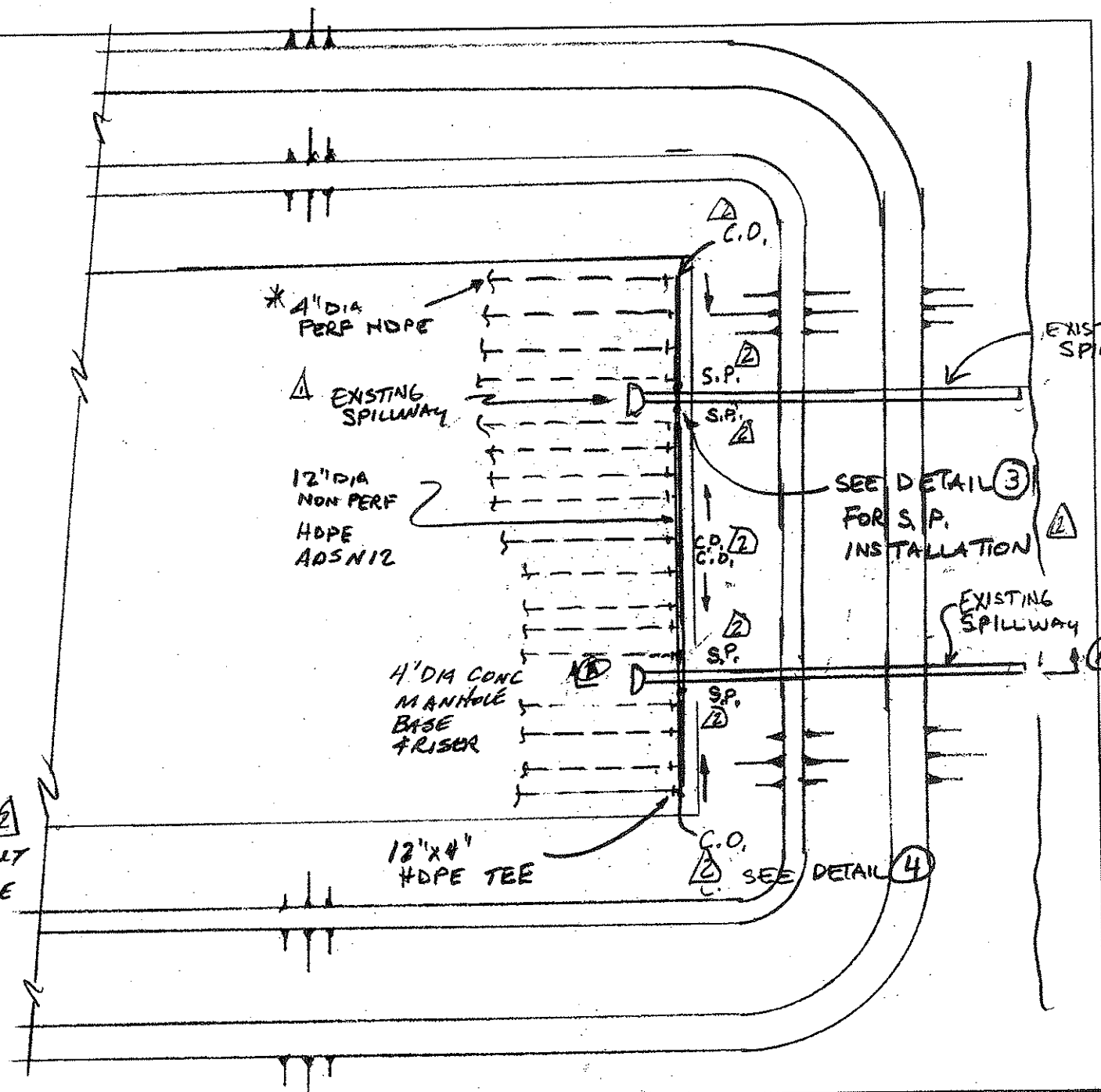
COMPUTED RLP DATE 1/8/07

CHECKED DATE



DETAIL (2)

TVA 11030 (WM-7-75)



PLAN

C.O. = CLEAN OUT
S.P. = STANDPIPE

BRF - FGD

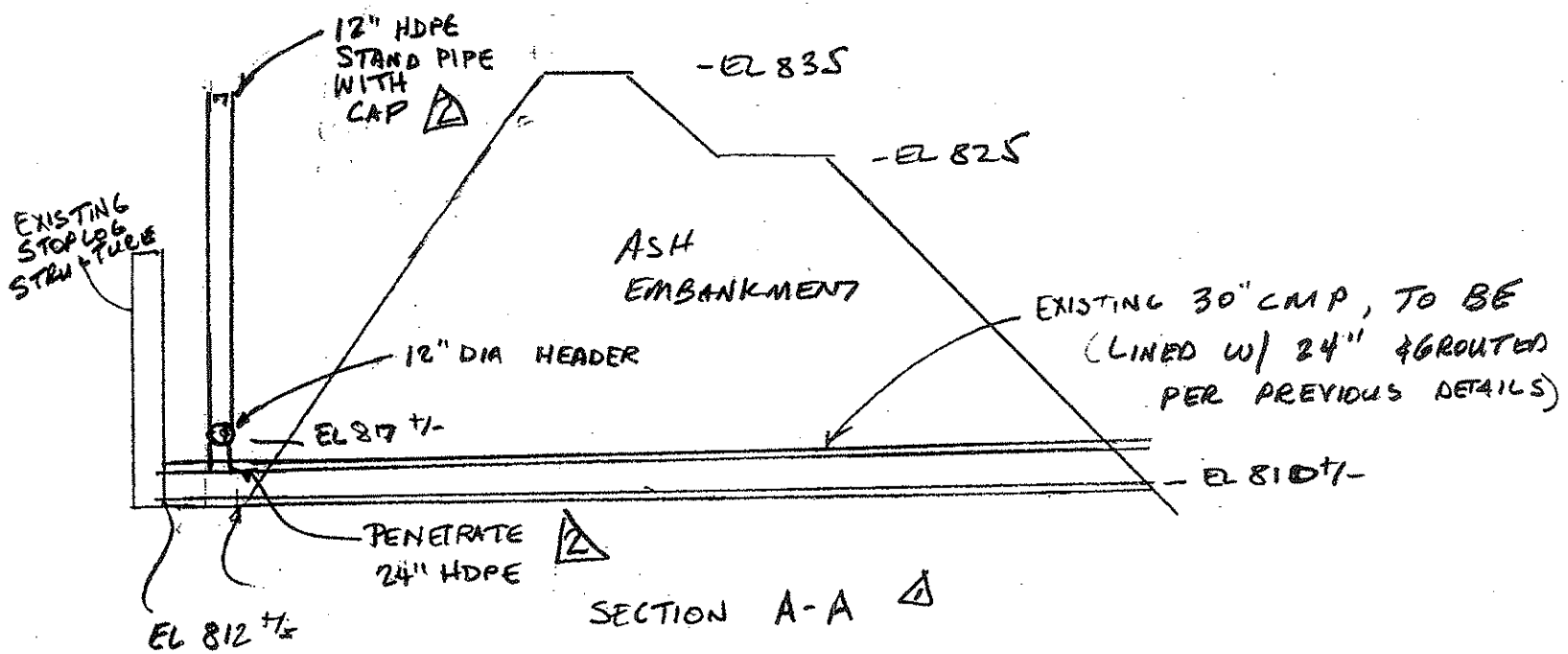
SHEET 1 OF 6

RL 3/15/07
RI 2/27/04

COMPUTED RLP DATE 2-15-07

CHECKED _____ DATE _____

TVA 11030 (WM-7-75)



SHEET 2 OF

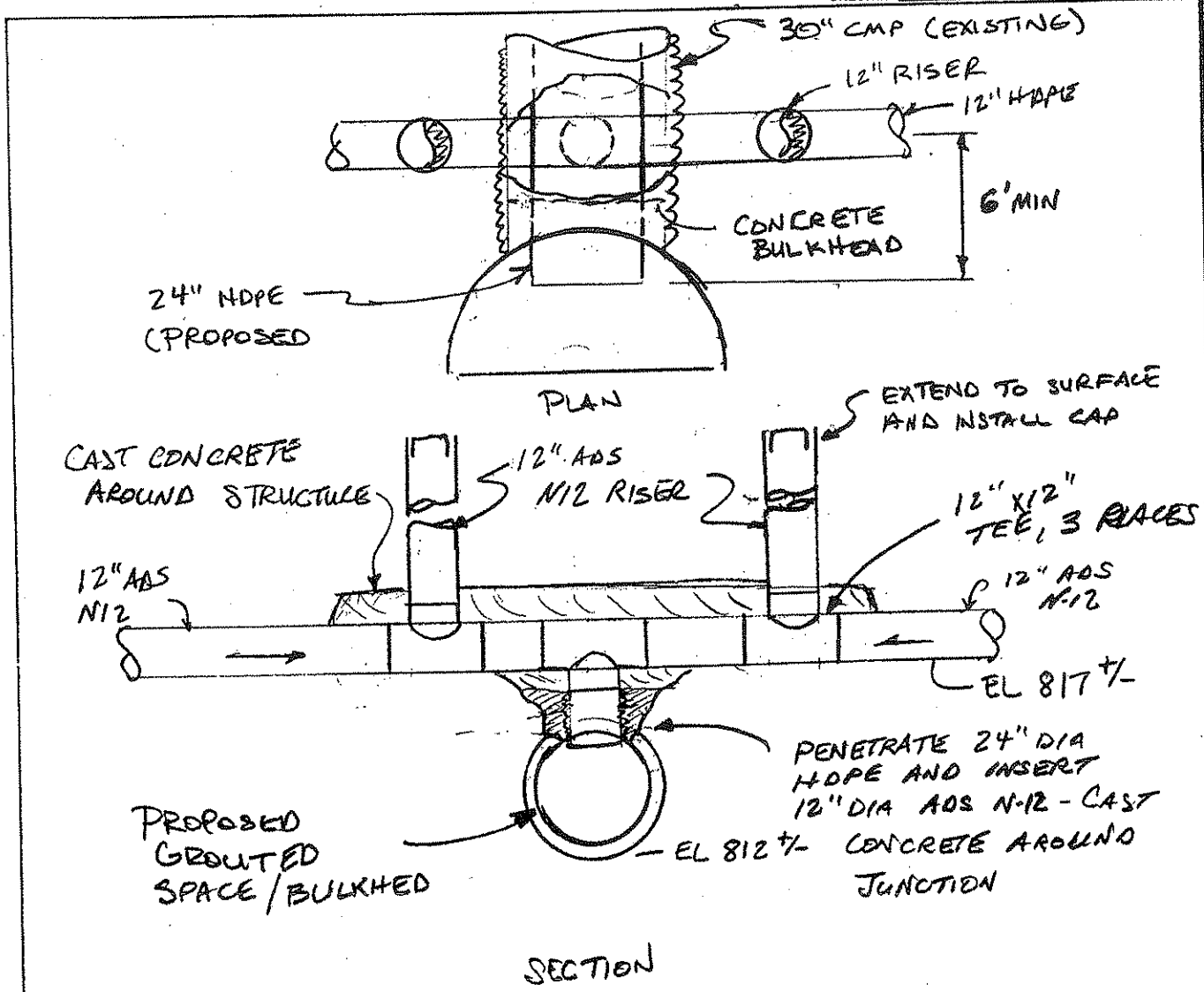
1 R2 3/15/07

COMPUTED LLP DATE 2-27-06

CHECKED _____ DATE _____

COMPUTED PLP DATE 3/15/07

CHECKED ____ DATE ____



DETAIL (3)

S.P. INSTALLATION

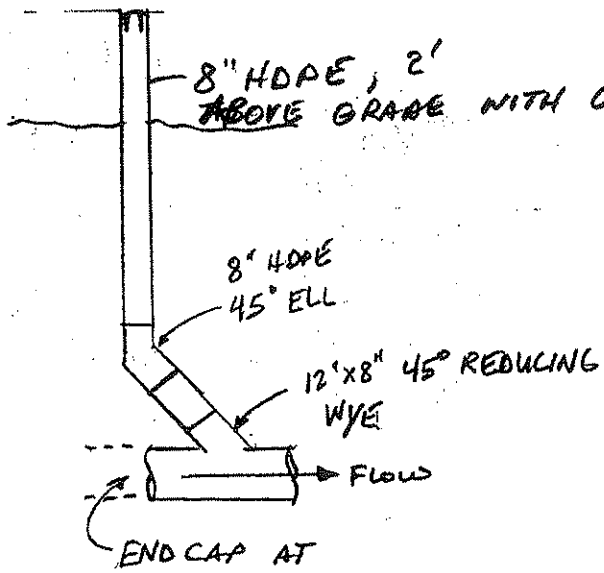
TYP 2 PLACES

N.T.S

TVA 11030 (WM-7-75)

COMPUTED REP DATE 3/15/07

CHECKED _____ DATE _____

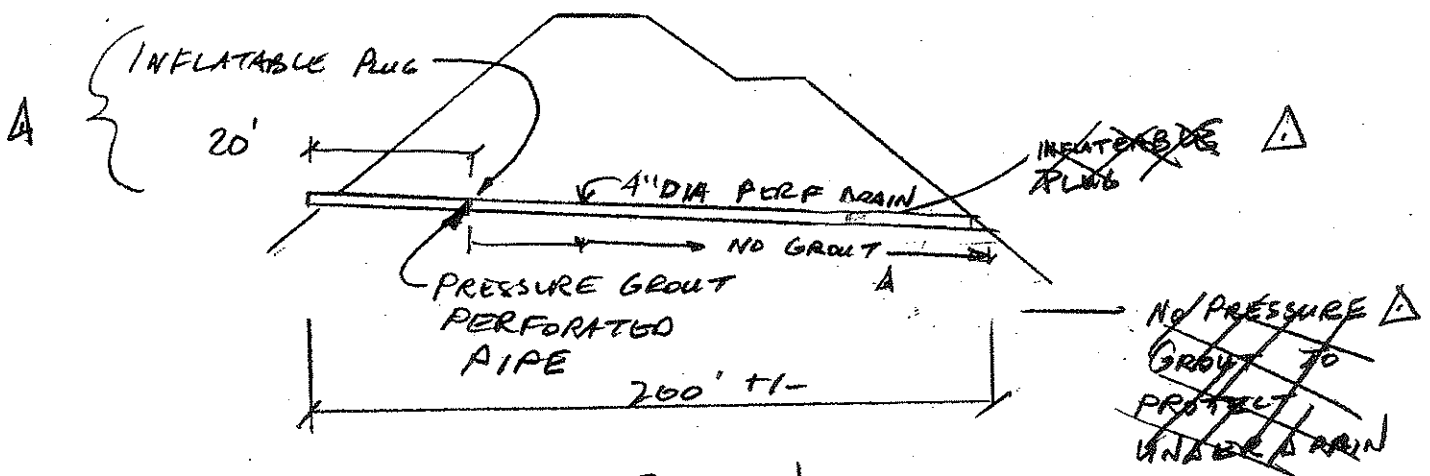


DETAIL (4)

C.O. INSTALLATION

TYPICAL 4 PLACES

TVA 11030 (WM-7-75)



TYPICAL SECTION
PERFORATED
PIPE

BCF FGD

SHEET 3 OF 6

Rev 1 4/5/07

COMPUTED BGD DATE 2-13-07

CHECKED _____ DATE _____

TVA 11030 (WM-7-75)

BRF FED

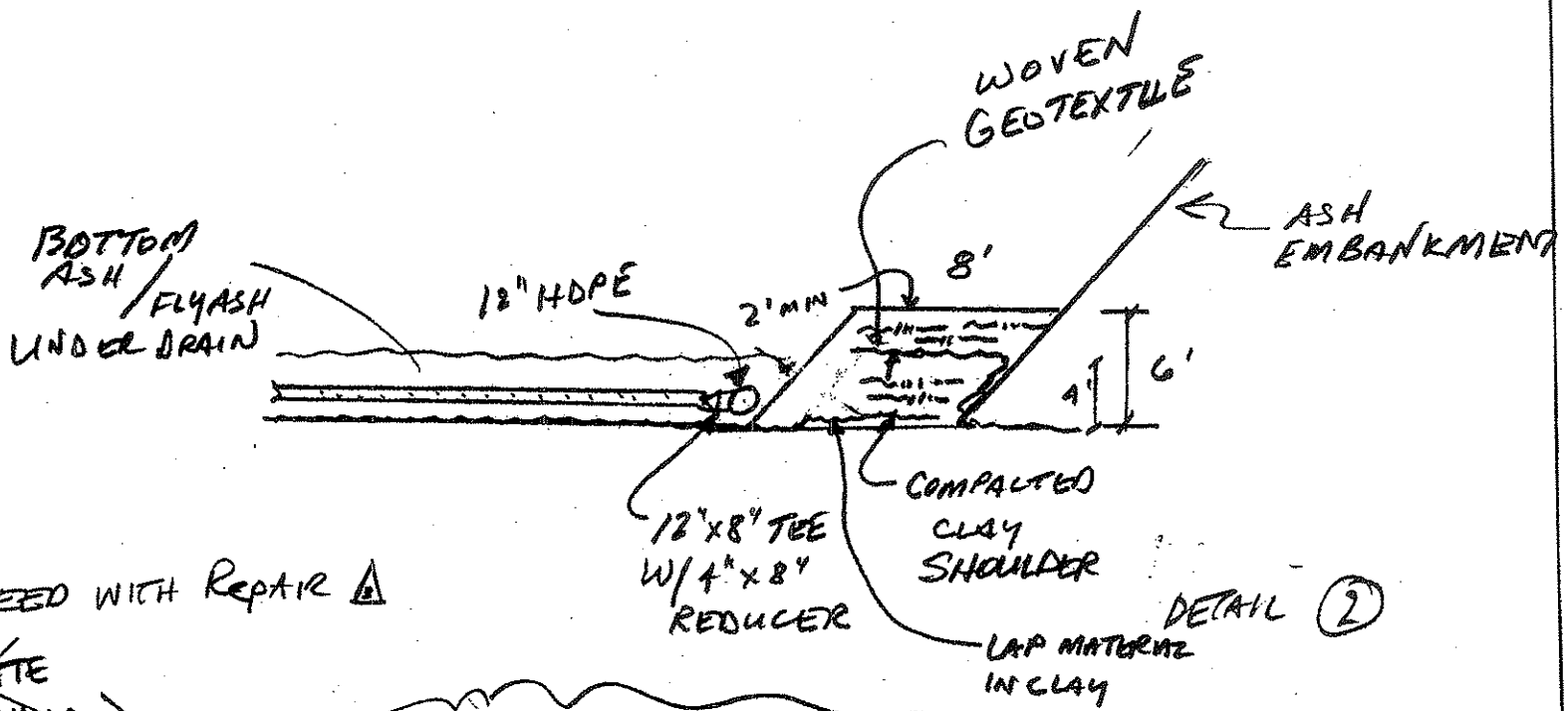
SHEET 4 OF 6

2 R2 3/15/07

A ES 4/4/07

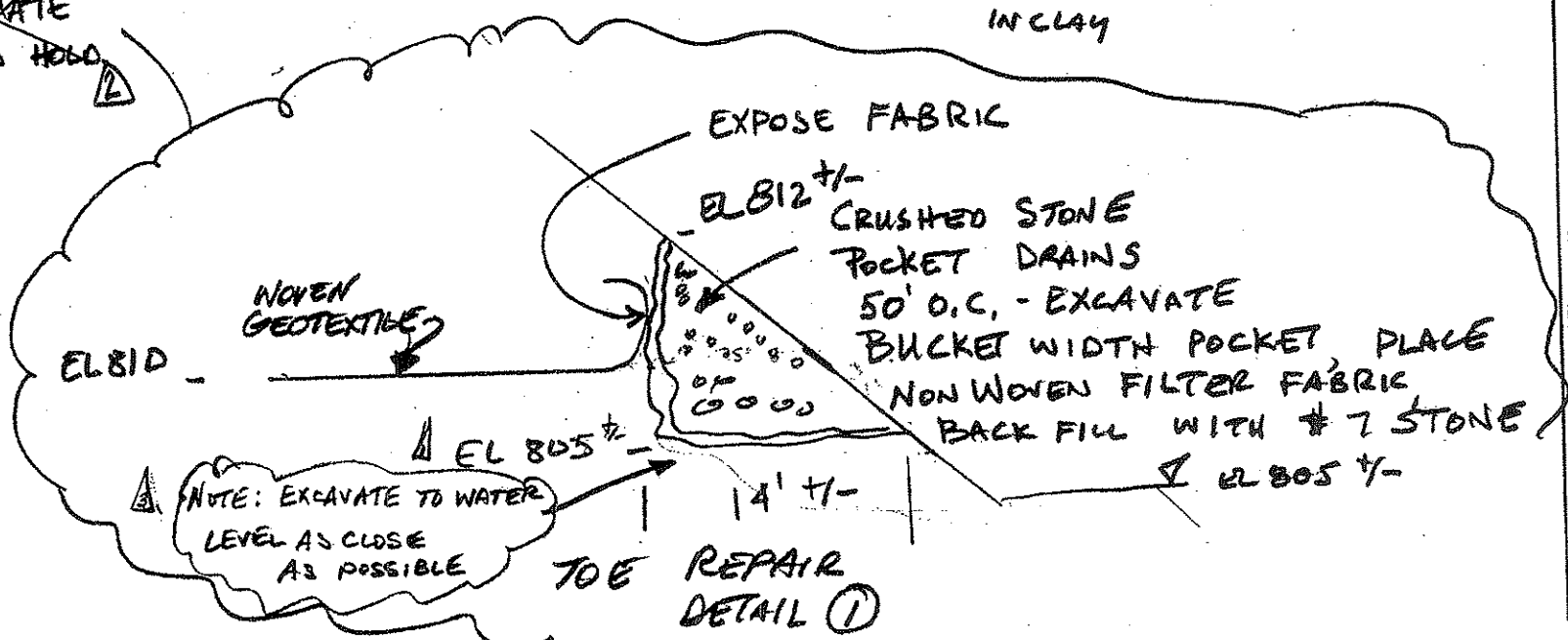
COMPUTED RP DATE 2.15.07

CHECKED DATE



PROCEED WITH REPAIR 2

~~ESTIMATE~~ AND HOLD 2



SHEET 5 OF 6

BRF-FGD

Δ R1 2-27-06

COMPUTED BP DATE 2.15.07

CHECKED _____ DATE _____

GROUTING

4" Δ A PERF ASSUME 5" Δ A CRUM

$\left(\pi 5^2/4(144)\right)$ 200' x 17 464 FT³ GROUT

ANNULAR SPACE $A = \frac{\pi}{4}(28^2 - 18^2)\left(\frac{1}{144}\right)(200)(2)$

$V = 1000\ FT^3$

~ 1500 FT³ GROUT

FROM ACTION GROUT, 1/4/07

MOB	# 1500	= # 1500
Δ GROUT	18.50 /FT³ x 500 FT³	= # 9250 ~~17,750~~
Δ CREW	$1850 /DAY x 2 DAY	= 3700 ~~7400~~
		# ~~36,650~~
		Δ # 14,450

ASSUME 2 Δ DAY PROJECT)

Δ (22,200 Reduction)

TVA 11030 (WM-7-75)

BRP F6D

SHEET 6 OF 6

△R3 4/4/07 △R1 2/27/07

△R2 3/15/07

COMPUTED RLP DATE 2.15.07

CHECKED _____ DATE _____

MATERIAL ESTIMATE

TEES	12"x4" HDPE WATER TIGHT SEALS	17 EA	
END CAPS	12" HDPE W/ WATER TIGHT SEALS	6 EA	2
12" DIA HDPE	NON-PERFORATED, ADS N12, WATER-TIGHT SEALS	980 LF	2
TEES	12"x12"x12" HDPE, WATER TIGHT SEALS	6 EA	2
WYES	12"x12"x8" HDPE WATER TIGHT SEALS	4 EA	
ELLS	45°, 8" HDPE, WATER TIGHT SEALS	4 EA	
8" DIA HDPE	NON PERFORATED ADS N12, WATER TIGHT SEALS	80 LF	

~~2 EA. [illegible] SDR 17 WITH A-LOCK SEAL 1 EA; BITUMINOUS SEAL AND BUTYL RUBBER WRAP EACH JOINT~~

1 ~~18" HDPE SDR 17, BUTT FUSION WELD WITH 24" JACKED PERFORATED STEEL CASING PIPE (2 BORINGS @ 200 LF EA)~~ ~~400 LF~~

1 GROUT ~~40,000~~ 9115,000

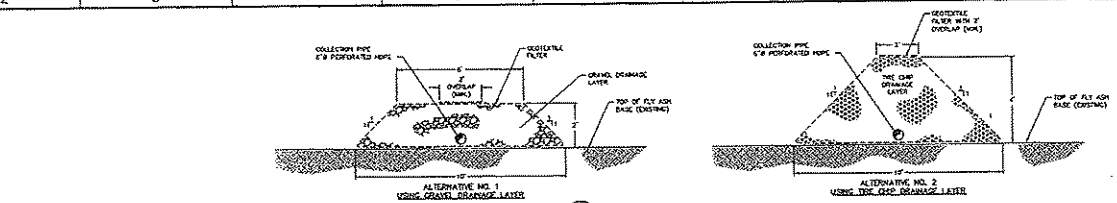
2 STONE #7 WASHED LIMESTONE ~~ESTIMATE~~ 106 TONS

FILTER FABRIC, NON WOVEN 250 yd²

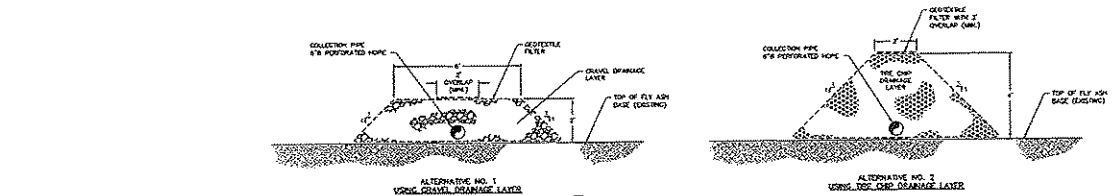
COMPACTED CLAY 1550 yd³ ↳ PROCEED △

2 ~~A FEATHERVE 4 REBO (ASSUME 1500 EACH) $6,000~~

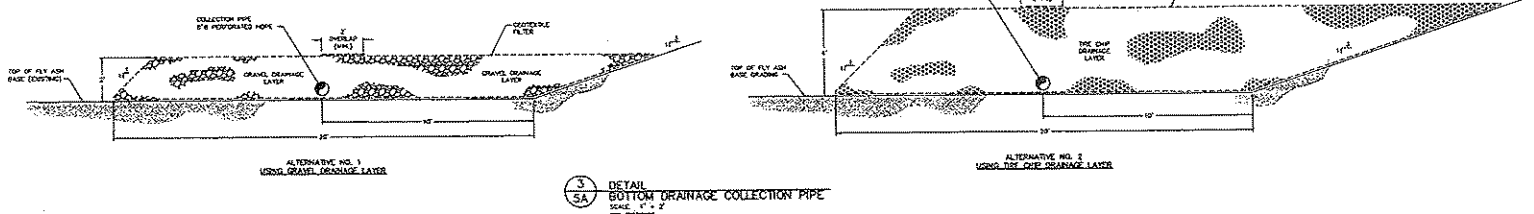
TVA 11030 (WM-7-75)



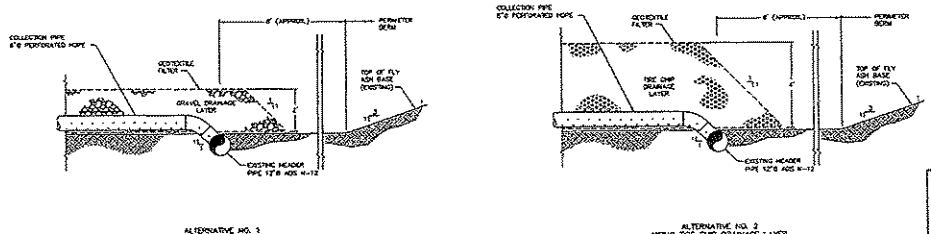
1 / 5A DETAIL
BOTTOM DRAINAGE COLLECTION PIPE
SCALE: 1" = 3'



2 / 5A DETAIL
BOTTOM DRAINAGE COLLECTION PIPE
SCALE: 1" = 3'



3 / 5A DETAIL
BOTTOM DRAINAGE COLLECTION PIPE
SCALE: 1" = 3'



4 / 5A DETAIL
BOTTOM DRAINAGE COLLECTION PIPE
TIE-IN TO EXISTING HEADER PIPE
SCALE: 1" = 3'

THIS DRAWING PROVIDES AN ALTERNATIVE TO DRAWING 10W297-32

NOTES:

1. GRAVEL DRAINAGE LAYER SHALL CONSIST OF #57 STONE OR APPROVED EQUAL.

SCALE: AS SHOWN — EXCEPT AS NOTED

YARD

Geosyntec consultants

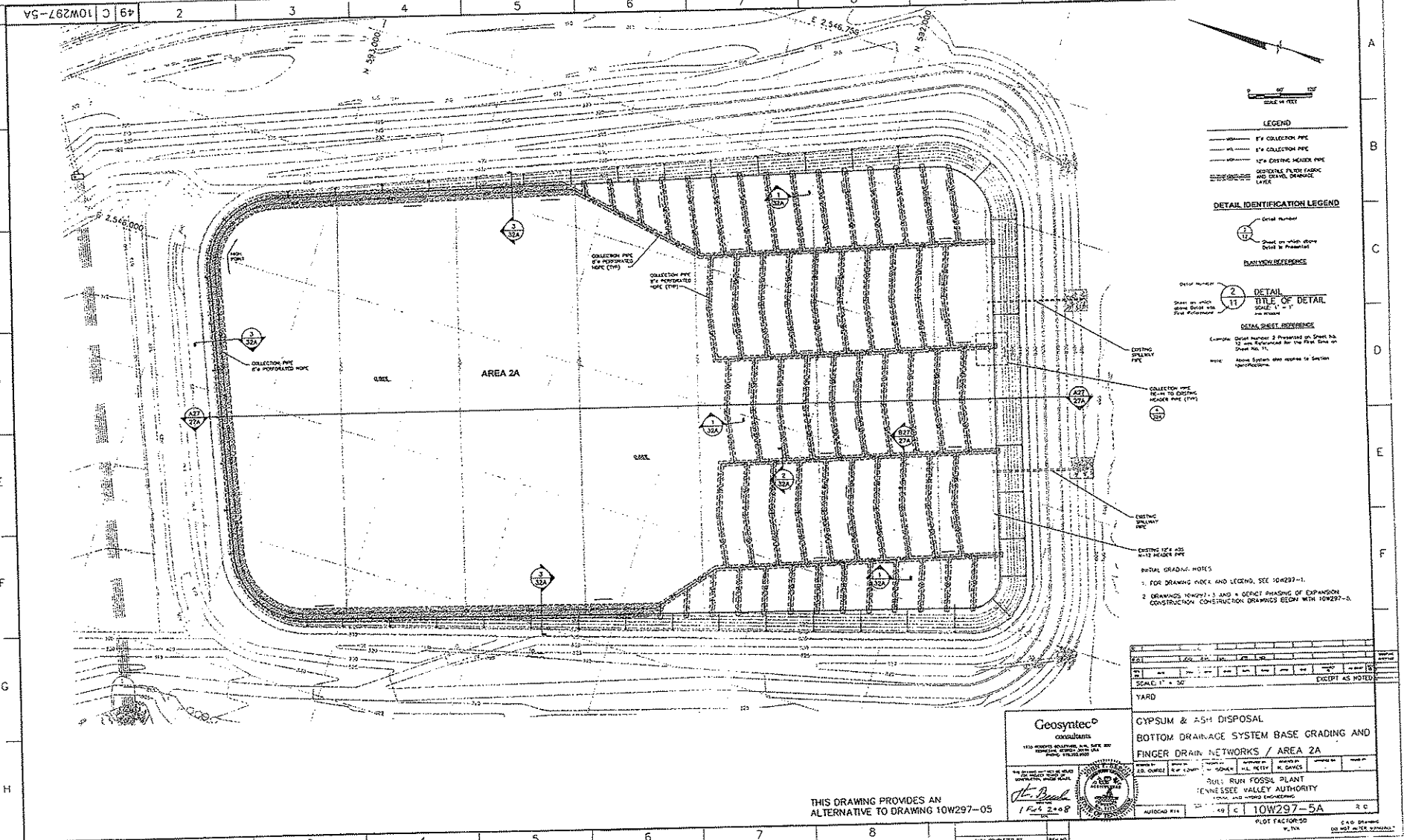
GYPSUM & ASH DISPOSAL
TYPICAL CROSS-SECTIONS
AND DETAILS

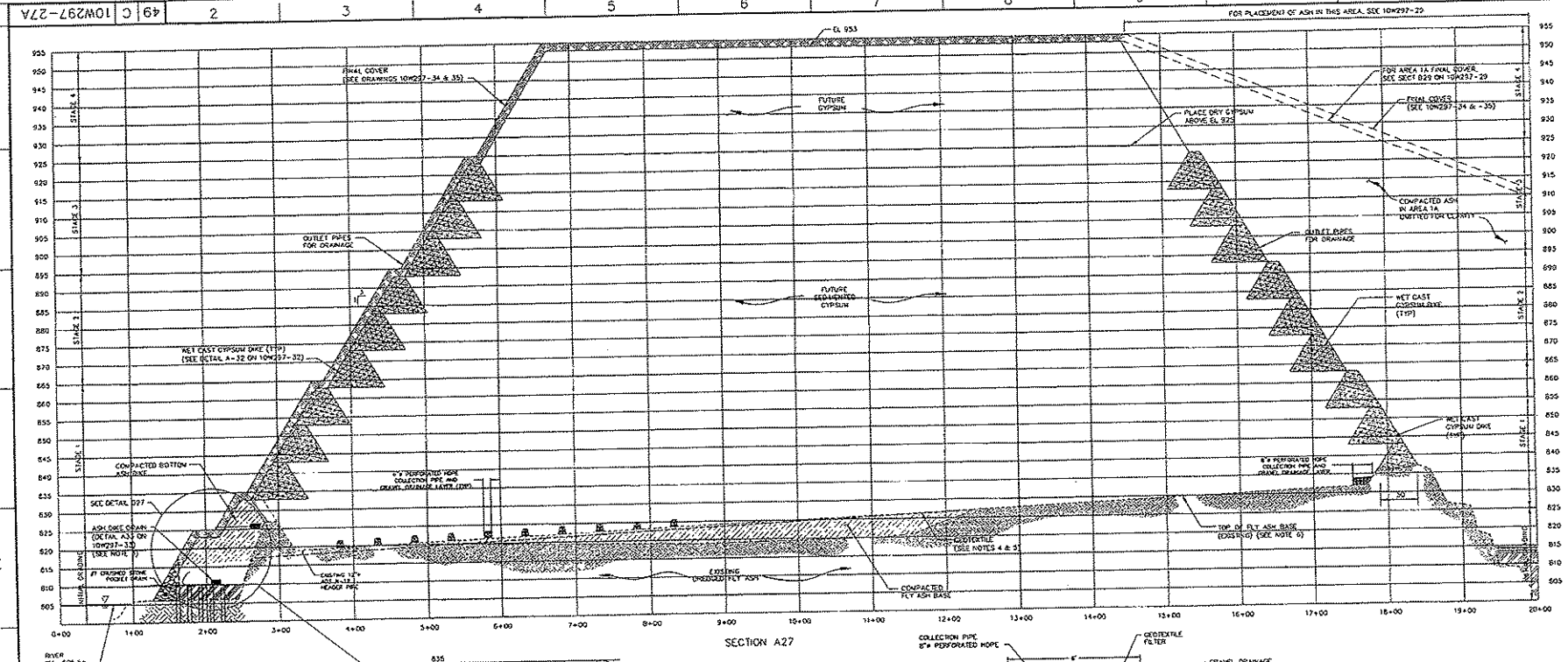
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R14 | 49 | C | 10W297-32A | R 0

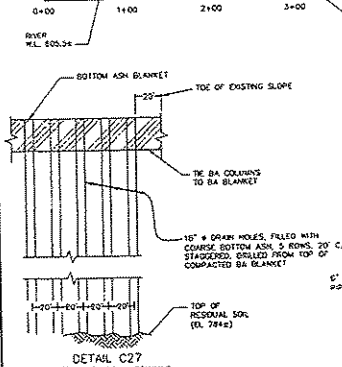
PLOT FACTOR: 1

CAD DRAWING
DO NOT ALTER MANUALLY

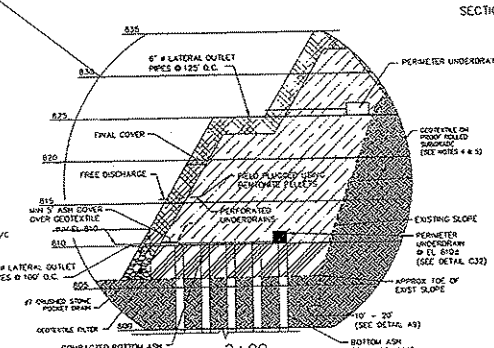

AREA 2A
LEGEND
DETAIL IDENTIFICATION LEGEND
PLAN VIEW REFERENCE
DETAIL SHEET REFERENCE
INITIAL GRADING NOTES
1. FOR DRAWING INDEX AND LEGEND, SEE 10W297-1.
2. DRAWINGS 10W297-3 AND 4 DEPICT PHASING OF EXPANSION CONSTRUCTION CONSTRUCTION DRAWINGS BEGIN WITH 10W297-5.
SCALE: 1" = 50'
EXCEPT AS NOTED
YARD
Geosyntec consultants
GYPSUM & ASH DISPOSAL
BOTTOM DRAINAGE SYSTEM BASE GRADING AND
FINGER DRAIN NETWORKS / AREA 2A
PAUL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
10W297-5A
THIS DRAWING PROVIDES AN
ALTERNATIVE TO DRAWING 10W297-05



SECTION A27



DETAIL C27
BOTTOM ASH DRAIN COLUMNS
NTS

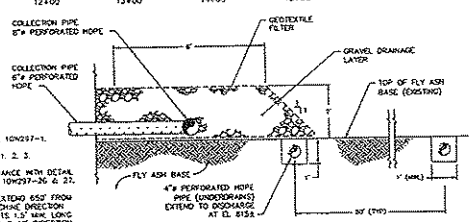


2+00
DETAIL D27
NTS

NOTES FOR SECTION A-27:

1. FOR DRAWING LIST AND LEGEND, SEE 10W297-1.
2. FOR GENERAL NOTES, SEE 10W297-11, 2, 3.
3. INSTALL LATERAL DRAINS IN ACCORDANCE WITH DETAIL C33 AT THE ELEVATIONS SHOWN ON 10W297-26 & 27.
4. GEOTEXTILE REINFORCEMENT SHALL EXTEND 65' FROM SOUTH TOE WITHOUT END JOINT, MACHINE DIRECTION RUNS NORTH-SOUTH, LAP SIDE JOINTS 1.5' MIN, LONG TERM DESIGN STRENGTH (LTDS) IN MACHINE DIRECTION SHALL BE 650 lb/in MINIMUM AFTER REDUCTION FOR ALL APPLICABLE FACTORS OF SAFETY PER AASHTO CRITERIA. FACTORS OF SAFETY SHALL BE DETERMINED BY MATERIAL MANUFACTURERS THROUGH PRODUCT SPECIFIC TESTING AND DATA SHEETS SUBMITTED FOR APPROVAL.
5. GEOTEXTILE REINFORCEMENT MAY BE REMOVED IF ADEQUATE STABILITY IS DEMONSTRATED BY ANALYSIS.
6. TOP OF FLY ASH BASE OF AREA 2A WAS SURVEYED ON 16 JANUARY 2008. SURFACE SHOWN IS BASED ON LIMITED SURVEY DATA AND NEEDS TO BE CONFIRMED BY CONTRACTOR PRIOR TO INSTALLATION OF FINGER DRAIN SYSTEM.

THIS DRAWING PROVIDES AN ALTERNATIVE TO DRAWING 10W297-27



SECTION B27
NTS

Geosyntec consultants

SCALE: HORIZONTAL 1"=50' VERTICAL 1"=10' EXCEPT AS NOTED

YARD

GYPSUM & ASH DISPOSAL
AREA 2A
SECTIONS

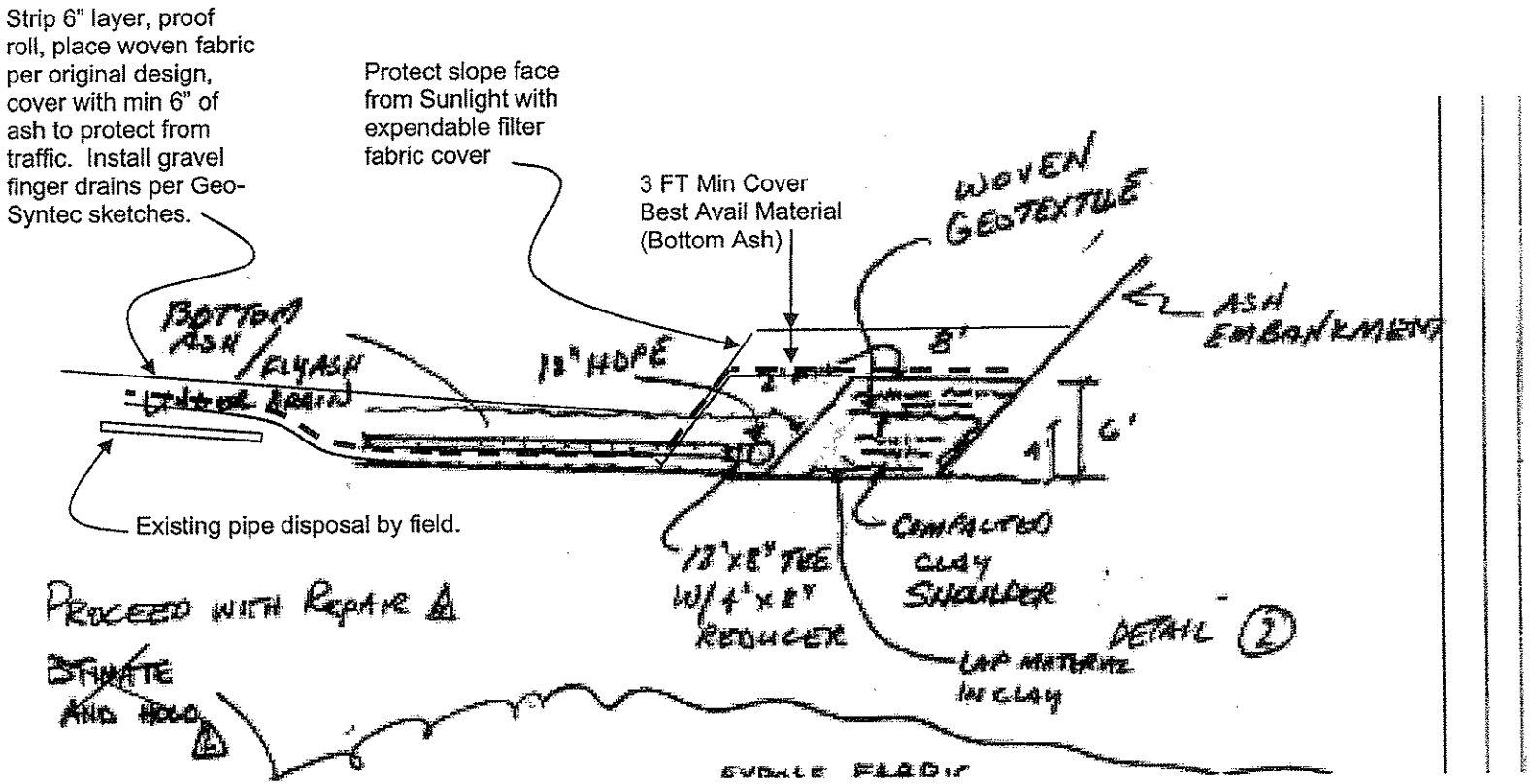
TENNESSEE VALLEY AUTHORITY
CIVIL AND HYDRO ENGINEERING

BULL RUN FOSSIL PLANT

AUTOCAD R14 | 49 | C | 10W297-27A | R 0

PLOT FACTOR:1200

C.A.D. DRAWING DO NOT ALTER MANUALLY



Indicates Woven Filter Fabric

Indicates Existing Ground line (Feb 2008)

Reference No. 8

K

REPORT OF GEOTECHNICAL EXPLORATION

ASH DISPOSAL AREA
BULL RUN FOSSIL PLANT
CLINTON, TENNESSEE

Prepared For:

TENNESSEE VALLEY AUTHORITY

Chattanooga, Tennessee

Prepared By:

MACTEC ENGINEERING AND CONSULTING, INC.

Knoxville, Tennessee

MACTEC Project 3043041022/01

July 13, 2004

MACTEC

MACTEC

July 13, 2004

Mr. Ron Purkey
Tennessee Valley Authority
1101 Market Street, LP-2G
Chattanooga, TN 37402

Subject: **Report of Geotechnical Exploration**
Ash Disposal Area
TVA Bull Run Fossil Plant
Clinton, Tennessee
MACTEC Project 3043041022/01

Dear Mr. Purkey:

We at MACTEC Engineering and Consulting, Inc., (MACTEC) are pleased to submit this Report of Geotechnical Exploration for your project. Our services, as authorized through TAO No. MAC-0696-00054, were provided in general accordance with our proposal number Prop04Knox/162 dated May 3, 2004.

This report reviews the information provided to us, discusses the site and subsurface conditions, and presents our results of field and laboratory testing of the materials at the existing Ash Disposal Area. The Appendices contain a brief description of the Field Exploratory Procedures, a Key Sheet and Test Boring Records, Cone Penetrometer Test Results, the Laboratory Test Procedures, and the Laboratory Test Results.

We anticipate further dialog and interaction with your team and will be happy to provide additional information or interpretation of the data and recommendations presented herein which may be necessary.

We will be pleased to discuss our results with you and would welcome the opportunity to provide the engineering services needed to successfully complete your project.

Sincerely,
MACTEC ENGINEERING AND CONSULTING, INC.

C. Todd Justice, E.I.T
Project Professional

Hussein A. Benkhayal
Senior Professional

Carl D. Tockstein, P.E.
Chief Engineer - Tennessee Operations

CARL DEWAYNE TOCKSTEIN REGISTERED ENGINEER AGRICULTURE COMMERCE No. 20004 STATE OF TENNESSEE

CTJ/HAB/CDT:sjm

MACTEC Engineering and Consulting
1725 Louisville Drive • Knoxville, TN 37921-5904
865-588-8544 • Fax: 865-588-8026

REPORT OF GEOTECHNICAL EXPLORATION

ASH DISPOSAL AREA
BULL RUN FOSSIL PLANT
CLINTON, TENNESSEE

Prepared For:

TENNESSEE VALLEY AUTHORITY

Chattanooga, Tennessee

Prepared By:

MACTEC ENGINEERING AND CONSULTING, INC.

Knoxville, Tennessee

MACTEC Project 3043041022/01

July 13, 2004

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1 Site Location Map

2 Boring Location Plan

EXECUTIVE SUMMARY

MACTEC was selected by the Tennessee Valley Authority (TVA) to perform a geotechnical exploration for the existing Ash Disposal Area at the Bull Run Fossil Plant near Clinton, Tennessee. The objectives of our exploration were to determine the subsurface conditions at the site, to obtain data to evaluate the strength and hydraulic conductivity characteristics of the ash materials and alluvial soils, and also to evaluate the consolidation characteristics of the alluvial soils.

The exploration consisted of drilling a total of thirteen geotechnical test borings, installing one piezometer, and performing 13 Cone Penetrometer Test (CPT) probes at 11 selected locations. The major findings and recommendations of our geotechnical exploration are as follows:

- The test borings typically encountered ash and intervals of fill soils overlying alluvial and residual soils. The ash was typically comprised of silt and sand sized particles with lesser percentages of clay and gravel sized particles. The consistency and relative density of the ash varied from very soft to firm and very loose to dense. The fill soils were typically comprised of silty clay with shale fragments, and silty sand. The fill soils are judged to generally be of stiff consistency and loose relative density. The underlying alluvial soils were typically comprised of clays, silts, and sands with varying percentages of gravel. The alluvial soils are judged to have very soft to very stiff consistencies and very loose to very dense relative densities. The residual materials consisted of shale and silty clay with varying percentages of limestone fragments. The consistency of the residuum varied from very soft to very hard.

- Ground-water was measured in the test borings at the time of drilling. Table 2 summarizes the recorded ground-water data. A piezometer identified as B-2P was installed near boring location B-2 (see Figure 2: Boring Location Plan). A 24-hour water level reading was recorded at location B-2P. Long-term ground-water levels can be obtained at this location.

- Cone Penetrometer Test soundings were performed at locations near the geotechnical test borings and at other selected locations. The test locations are shown on Figure 2: Boring Location Plan. A discussion of the test results is found in Section 7.0. The CPT results are found in Appendix C.

This summary is only an overview and should not be used as a separate document or in place of reading the entire report, including the appendices.

1.0 INTRODUCTION

This report presents the findings of our subsurface exploration and field and laboratory testing recently performed for the existing Ash Disposal Area at TVA's Bull Run Fossil Plant. Our services were authorized by Mr. Ron Purkey of TVA.

2.0 OBJECTIVES OF EXPLORATION

The objectives of our exploration were to characterize the subsurface conditions at the Ash Disposal Area, and to obtain data to aid in the evaluation of the strength and hydraulic conductivity characteristics of the ash materials and alluvial soils and to evaluate the consolidation characteristics of the alluvial soils. An assessment of site environmental conditions, or an assessment for the presence or absence of pollutants in the soil, bedrock, surface water, or ground water of the site was beyond the proposed objectives of our exploration.

3.0 SCOPE OF EXPLORATION

The scope of our exploration was based on our proposal number Prop04Knox/162 dated May 03, 2004, and the geotechnical scope of work outlined in the project's scope of work prepared by TVA and Parsons E & C. It included the following:

3.1 DRILLING AND SAMPLING

The subsurface exploration for this project consisted of drilling and sampling nine geotechnical borings (designated B-1 through B-3, and B-5 through B-10), four offset geotechnical borings (designated B-1A, B-3A, B-8A, and B-10A), and drilling and installing one piezometer, (designated B-2P). The boring locations are shown on Figure 2: Boring Location Plan. TVA and Parsons E & C located the borings in the field, and determined the coordinates and ground surface elevations at the geotechnical boring locations relative to mean sea level (msl) using surveying techniques.

The borings were drilled with an all-terrain vehicle (ATV) mounted Central Mine Equipment (CME) Model 55 drill rig in general accordance with the procedures described in Appendix A. Standard Penetration Tests (SPTs) were performed in the geotechnical borings using a CME automatic hammer. The SPTs were performed using standard 2.00-inch OD split spoons with

1.38-inch ID barrels (i.e., no room for liners in the barrels). SPTs were performed at 3-foot intervals.

Three-inch-diameter relatively undisturbed (Shelby tube) samples were obtained from representative cohesive soils in the geotechnical borings. The Shelby tubes were pushed into the bottoms of the boreholes at the desired sampling depth. The samples were then sealed with wax and capped at both ends to minimize changes in the structure and moisture content of the samples.

A 3.5-inch OD, 3-inch ID split spoon with liner was used to sample the ash at varying depths. The spoon was pushed into the bottoms of the boreholes at the desired sampling depths. The ash samples, enclosed in the liners, were then sealed with wax at both ends and capped to minimize changes in the structure and moisture content of the samples.

3.2 MEASUREMENT OF GROUND-WATER LEVELS

Ground-water levels in the geotechnical borings were generally measured and recorded when first encountered (at the time of drilling). Twenty-four-hour ground-water readings were not recorded in the geotechnical borings due to the introduction of water into the boreholes during drilling, and the necessity of grouting the borings immediately after termination of the borings. The recorded ground-water levels are discussed in Section 9.0 and are summarized in Table 2.

3.3 PLUGGING AND ABANDONMENT OF BOREHOLES

Upon completion of drilling and sampling, the geotechnical boreholes were plugged with a Type I Portland cement-bentonite grout mixture using a tremie pipe method. The borings were backfilled in general accordance with the requirements specified by TVA. During plugging and abandonment precautions were taken to stabilize against cave-ins prior to and during plugging procedures, however, it was observed that at a few of the boring locations portions of the ash profiles collapsed (caved-in) within the borings due to the behavior of the saturated ash. However, it is noted that the alluvial and residual soil profiles encountered underlying the intervals of ash were successfully grouted.

3.4 CONE PENETROMETER TESTING (CPT)

Thirteen CPT soundings were performed to supplement the data obtained from the geotechnical borings. The CPT locations are shown on Figure 2: Boring Location Plan. Eleven soundings were performed near geotechnical test boring locations while two were performed at other selected locations in ash disposal area. The CPT results are found in Appendix C. A discussion of the test results is found in Section 7.0.

CPT soundings were performed using an electric penetrometer with pore pressure measurements. The cone penetrometer equipment was mounted on a track vehicle. Continuous data was recorded with a computerized data acquisition system. Pore pressure measurements were performed to evaluate the rate of pore pressure dissipation within the ash and underlying soils.

3.5 LABORATORY TESTING

This section outlines the geotechnical laboratory testing program. The discussion and summary of the results of the laboratory testing program are found in Section 8.0. The laboratory testing procedures and laboratory test results are included in Appendix D.

- 42 Natural Moisture Content Tests
- 5 Unit Weight with Moisture Content Tests
- 4 Specific Gravity Tests
- 8 Atterberg Limits Tests
- 17 Particle Size Distribution Tests
- 4 Consolidated Undrained Triaxial Compression (CU) Tests
- 4 Falling Head Permeability Tests
- 1 Consolidation Test

4.0 PROJECT INFORMATION AND SITE CONDITIONS

Project information was provided to us by TVA and Parsons E & C in the form of a Subsurface Exploration document and a boring location plan. The existing Ash Disposal Area is bordered by the Clinch River to the west and Bull Run Creek to the south and is located just south of the Bull Run Fossil Plant. The ground surface elevation varies by as much as about 30 feet in the areas of our exploration program. The locations of our exploration included areas 2A and 1 of the disposal facility.

5.0 AREA AND SITE GEOLOGY

The Bull Run Fossil Plant is located in the Appalachian Valley and Ridge Physiographic Province. This province extends as a continuous belt from Central Alabama, through Georgia and Tennessee, northward into Pennsylvania. The formations that underlie this province consist primarily of limestone, dolostone, shale, and sandstone, which have been folded and faulted in the geologic past. These formations range in age from Cambrian to Pennsylvanian and have been subject to at least one extensive period of erosion since their structural deformation. The erosion has produced a series of subparallel, alternating ridges and valleys. The valleys are formed over more soluble bedrock (limestone and interbedded limestone and shale), whereas bedrock more resistant to solution weathering forms ridges (sandstone, shale, and cherty dolostone).

The site and vicinity are blanketed with alluvial (water-transported) soils that have been deposited over time by the nearby Clinch River. The alluvial soils typically consist of heterogeneous mixtures of clay, silt, sand and gravel. The alluvial soils typically grade coarser with depth and may contain rock fragments ranging up to cobble and boulder size. The published geologic map of this area shows that this site is underlain by bedrock of the Chickamauga Group. The bedrock underlying the site can be generally characterized as fine to medium grained limestone with interbedded shale.

6.0 SUBSURFACE CONDITIONS

Subsurface conditions encountered in our borings are described in the following paragraphs. The approximate boring locations are shown on Figure 2: Boring Location Plan. Subsurface conditions encountered at the boring locations are shown on the Boring Records. The Boring Records represent our interpretation of the subsurface conditions based on the field boring logs and visual examination of the field samples by one of our geotechnical engineers. The lines designating the interfaces between various strata on the Boring Records represent the approximate interface locations. Boring depths and types are summarized in Table 1. Descriptions of the materials encountered in the borings are given below:

- Ash – Ash was encountered at each boring location. The ash typically consisted of fine and coarse sized particles as described on the boring logs. Standard Penetration Test (SPT) N-values in the ash ranged from 0 (woh / "weight of hammer") to 48 blows per foot (bpf).

- Fill Soils – Fill was encountered in borings B-2 and B-9. Fill soils are soils that have been transported to their present location by man. These soils typically consisted of silty clay and silty sand with varying percentages of shale fragments. N-values in the fill soils ranged from 10 to 15 blows per foot (bpf).

- Alluvium – Alluvial soils were encountered below the ash in borings B-1 through B-3, and borings B-5 through B-10. Alluvial soils are soils that have been transported to their present location by running water. These soils consisted of clays, silts, and sands with varying percentages of gravel and roots. The N-values in the alluvial soils ranged from 0 (woh / "weight of hammer") to over 50 bpf. The depth to alluvium varied from about 22.0 ft at boring B-9 to about 62.4 ft at boring B-1. Based on the results of the laboratory testing, the alluvial soils were classified as CL and ML in accordance with the USCS.

- Residuum - The residuum was encountered below the alluvial soils and extended to auger refusal or to auger termination depth in borings B-1, B-2, B-5, B-6, B-8, and B-9. Residual soils (residuum) are soils that have developed from the in-place weathering of the underlying parent bedrock. The residuum typically consisted of shale and silty clay with varying percentages of limestone fragments. The N-values in the residuum ranged from 0 to over 50 bpf. The depth to residuum varied from about 44.1 ft at borings B-8 and B-9, to about 68.5 ft at boring B-1.

7.0 CONE PENETROMETER TEST RESULTS

The subsurface profiles developed by the CPT soundings were consistent with those obtained from the geotechnical borings. Typically, the CPT soundings indicated that the tip resistance decreased from the coarser, cohesionless ash into the finer ash. Several pore pressure dissipation tests were performed at the CPT locations which give further indications of material types. Refer to Appendix C for details of the CPT results.

8.0 LABORATORY TESTING AND DISCUSSION OF LAB RESULTS

This section describes the geotechnical laboratory testing program performed for this project. The laboratory testing procedures and laboratory test results are included in Appendix D. The following paragraphs provide a short discussion of the laboratory testing conducted and summarize the results.

8.1 ASH SAMPLES

8.1.1 Index Properties, Specific Gravity, and Unit Weight

Moisture contents of the tested ash ranged from 7.9 (B-2) to 83.8 (B-2) percent. Table 3 summarizes the results of the natural moisture content testing.

The grain size testing confirmed the variability of the grain size distributions of the sampled ash materials. Percent fines (percent silt and clay-size particles) varied from 6.3 to 89.7 percent.

Specific gravities for the ash samples tested varied from 2.20 to 2.26. Moist unit weights in the ash material ranged from 76.9 to 108.7 pounds per cubic foot (pcf), and averaged 94.8 pcf. Dry unit weights in the ash material varied from 60.2 to 85.6 pcf and averaged 71.2 pcf.

8.1.2 Strength

Shear strength testing on ash material included consolidated-undrained triaxial compression with pore pressure measurements (CU w/PP). Tests were performed on relatively undisturbed ash specimens. The strength parameters from the triaxial shear strength testing are summarized in Table 4. The test results are discussed below.

As shown in Table 4, CU w/PP parameters consisted of total stress cohesion intercepts of 1.15 and 2.96 ksf and total stress friction angles of 32.1 and 36.0 degrees. Effective stress cohesion intercepts varied from 0 to 0.89 ksf, and effective stress friction angles varied from 33.2 to 40.7 degrees. The high total stress cohesion values may be indicative of chemical bonding within the ash.

8.1.3 Hydraulic Conductivity

Hydraulic conductivity tests were performed on relatively undisturbed specimens of ash material. The results of the hydraulic conductivity tests are presented in Table 5. Values of hydraulic conductivity for the three specimens were 1.53×10^{-5} cm/sec, 3.24×10^{-5} cm/sec, and 1.29×10^{-3} cm/sec.

8.2 SOIL SAMPLES

8.2.1 Index Properties, Specific Gravity, and Unit Weight

Moisture contents of the tested alluvial soils ranged from 18.8 (B-2) to 23.9 (B-10) percent. Liquid limits of the tested alluvial soils varied from 25 to 44, while the plastic limits varied from 14 to 23. Plasticity indices (PIs) varied from 11 to 21. One sample of the tested alluvial soils was non-viscous and non-plastic. The tested soils, having plasticity indices of less than 30, are considered to have a relatively low potential for volume change with changes in moisture content. The alluvial soils classified as CL and ML in accordance with the Unified Soil Classification System. Table 3 summarizes the results of the natural moisture content and Atterberg limits testing.

The grain size testing confirmed the variability of the grain size distributions of the sampled alluvial soils. Percent fines (percent silt and clay-size particles) varied from 52.0 to 88.6 percent. Specific gravities of the tested alluvial soil samples varied from 2.62 to 2.70. Moist unit weights in the alluvial soils ranged from 125.9 to 129.7 pounds per cubic foot (pcf), and averaged 128.2 pcf. Dry unit weights in the alluvial soils varied from 101.6 to 109.2 pcf and averaged 106.0 pcf.

8.2.2 Strength

Shear strength testing on the alluvial soils included consolidated-undrained triaxial compression with pore pressure measurements (CU w/PP). Tests were performed on relatively undisturbed specimens. The strength parameters from the triaxial shear strength testing are summarized in Table 4. The test results are discussed below.

As shown in Table 4, CU w/PP parameters consisted of a total stress cohesion intercept of 0.25 ksf and a total stress friction angle of 17.1 degrees. The effective stress cohesion intercept was 0.18 ksf, and the effective stress friction angle was 28.8 degrees.

8.2.3 Hydraulic Conductivity

A hydraulic conductivity test was performed on a relatively undisturbed specimen of alluvial soil. The results of the hydraulic conductivity tests are presented in Table 5. The value of the hydraulic conductivity for the alluvial soil specimen was 5.18×10^{-8} cm/sec.

8.2.4 Compressibility

One-dimensional consolidation testing was performed on an undisturbed specimen of alluvial soil. Compression properties of the soil subjected to one-dimensional consolidation testing are summarized in Table 6. The laboratory consolidation data is presented in Appendix D. The preconsolidation pressure listed in Table 6 was estimated graphically by hand using the Casagrande Method and checked by the Log-Log Method.

The coefficients of consolidation were computed for each load increment by the consolidation test software. The compression index for the "laboratory" void ratio versus log pressure curve also was computed by the consolidation test software. The "field" compression index was estimated graphically using the Schmertmann Method.

9.0 GROUND-WATER CONDITIONS

Ground-water level measurements made in the borings during drilling are summarized in Table 2. Ground water was observed in all of the geotechnical borings. Depths below the ground surface to ground-water levels at the time of drilling varied from about 6.0 to 28.5 feet. The ground-water elevations at the time of drilling varied from about 795.4 to 810.0 feet msl.

To provide long-term ground-water data for the site vicinity near boring B-2 a piezometer was installed and identified as B-2P. A twenty-four-hour ground-water measurement was taken at this location after the installation of the piezometer. The initial measurement indicated a depth below the ground surface to the ground-water level of 10.9 ft. This corresponds to a ground-water elevation of 808.2 feet msl.

10.0 BASIS OF RESULTS

The results of our geotechnical exploration provided herein are based on the encountered subsurface conditions, and on the field and laboratory testing performed with respect to the specific project site and locations discussed in this report. Regardless of the thoroughness of a geotechnical exploration, there is always a possibility that conditions between test borings will differ from those at specific test boring locations, and that conditions may not be as anticipated. In addition, the interpretation and analysis of the results of a geotechnical exploration are critical related to proposed design criteria. Therefore, we recommend that experienced geotechnical engineers review any proposed site specific design plans that incorporate the results of our geotechnical

exploration. We recommend that TVA retain MACTEC to provide this service, based upon our familiarity with the subsurface conditions, field and laboratory testing results, and our geotechnical experience.

Our exploration services include storing the collected samples and making them available for inspection for a period of 30 days. The samples are then discarded unless you request otherwise.

TABLES

TABLE 1
BORING SUMMARY

Boring Number	Type	Ground Elevation msl (Feet)	Refusal Depth (Feet)	Refusal Elevation msl (Feet)	Refusal Type	Boring Termination Depth (Feet)	Boring Termination Elevation msl (Feet)
B-1	STB	838.0	70.0	768.0	AR	70.0	768.0
B-1A	STB	838.0*	NA	NA	NA	33.5	804.5
B-2	STB	819.1	47.5	771.6	AR	47.8	771.3
B-2P	P	819.1*	NA	NA	NA	25.0	794.1
B-3	STB	819.8	53.0	766.8	AR	53.0	766.8
B-3A	STB	819.8*	NA	NA	NA	17.0	802.8
B-5	STB	826.0*	64.0	762.0	AR	64.0	762.0
B-6	STB	812.0*	49.5	762.5	AR	49.7	762.3
B-7	STB	808.0*	40.8	767.2	NA	40.8	767.2
B-8	STB	808.3*	44.2	764.1	AR	44.5	763.8
B-8A	STB	809.3*	NA	NA	NA	11.0	798.3
B-9	STB	809.4	44.0	765.4	AR	44.3	765.1
B-10	STB	836.0*	68.5	767.5	AR	68.5	767.5
B-10A	STB	836.0*	NA	NA	NA	32.0	804.0

NA – Not Applicable

STB – Soil Test Boring

AR – Auger Refusal

P– Piezometer

* - Elevations were estimated based on nearby surveyed boring locations, field reconnaissance, and contour lines of existing drawings.

Prepared By CTJ Date 7/12/04 Checked By HAB Date 7/12/04

TABLE 2
GROUND-WATER DATA

Boring Number	Ground Elevation msl (Feet)	Depth to Ground Water at Time of Drilling (Feet)	Ground-Water Elevation, msl at Time of Drilling (Feet)	Depth to Ground Water 24 Hours After Drilling (Feet)	Ground-Water Elevation 24 Hours After Drilling msl (Feet)
B-1	838.0	28.0	810.0	Not Measured	Not Measured
B-1A	838.0	28.0	810.0	Not Measured	Not Measured
B-2	819.1	13.5	805.6	Not Measured	Not Measured
B-2P	819.1	13.5	805.6	10.9*	808.2
B-3	819.8	13.0	806.8	Not Measured	Not Measured
B-3A	819.8	13.0	806.8	Not Measured	Not Measured
B-5	826.0	19.5	806.5	Not Measured	Not Measured
B-6	812.0	11.0	801.0	Not Measured	Not Measured
B-7	808.0	6.0	802.0	Not Measured	Not Measured
B-8	808.3	6.0	802.3	Not Measured	Not Measured
B-8A	809.3	6.0	803.3	Not Measured	Not Measured
B-9	809.4	14.0	795.4	Not Measured	Not Measured
B-10	836.0	28.5	807.5	Not Measured	Not Measured
B-10A	836.0	28.5	807.5	Not Measured	Not Measured

*Measurement was taken 24 hours after piezometer installation.

Prepared By CTJ Date 7/12/04 Checked By HAB Date 7/17/04

TABLE 3
NATURAL MOISTURE CONTENT AND
ATTERBERG LIMITS LABORATORY TEST RESULTS

Boring Number	Sample Number	Sample Type	Sample Description/ Origin	Sample Depth (Feet)	Moisture Content (%)	Atterberg Limits		
						Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)
B-1A	UD-2	UD	ASH	30-32	35.6	NT	NT	NT
B-2	1	SPT	ASH	1-2.5	7.9	NT	NT	NT
B-2	2	SPT	ASH	4-5.5	34.4	NT	NT	NT
B-2	3	SPT	ASH	7-8.5	32.8	NT	NT	NT
B-2	4	SPT	ASH	10-11.5	29.5	NT	NT	NT
B-2	5	SPT	ASH	13-14.5	39.4	NT	NT	NT
B-2	6	SPT	ASH	16-17.5	39.6	NT	NT	NT
B-2	7	SPT	ASH	19-20.5	38.0	NT	NT	NT
B-2	8	SPT	ASH	22-23.5	83.8	NT	NT	NT
B-2	9	SPT	ASH	25-26.5	71.3	NT	NT	NT
B-2	10	SPT	ASH	28-29.5	44.8	NT	NT	NT
B-2	11	SPT	ASH	31-32.5	38.5	NT	NT	NT
B-2	12	SPT	ASH	34-35.5	20.4	NT	NT	NT
B-2	UD-1	UD	ALLUVIUM	35.5-37.5	18.8	27	16	11
B-2	13	SPT	ASH	37.5-39	19.9	NT	NT	NT
B-2	UD-2	UD	ALLUVIUM	39-41	20.3	NV	NP	NP
B-2	14	SPT	ASH	41-42.5	20.3	NT	NT	NT
B-2	15	SPT	ASH	44-45.5	21.1	NT	NT	NT
B-2	16	SPT	ASH	47.5-47.8	10.6	NT	NT	NT
B-2P	UD-5	UD	ASH	14-16	27.0	NT	NT	NT
B-3	UD-3	UD	ALLUVIUM	39-41	NT	44	23	21
B-3	UD-5	UD	ALLUVIUM	45-47	NT	33	19	14
B-3A	UD-1	UD	ASH	5-7	18.2	NT	NT	NT
B-5	1	SPT	ASH	1-2.5	15.1	NT	NT	NT
B-5	2	SPT	ASH	4-5.5	36.9	NT	NT	NT
B-5	3	SPT	ASH	7-8.5	17.7	NT	NT	NT
B-5	4	SPT	ASH	10-11.5	22.7	NT	NT	NT
B-5	5	SPT	ASH	13-14.5	25.6	NT	NT	NT
B-5	6	SPT	ASH	16-17.5	40.5	NT	NT	NT
B-5	7	SPT	ASH	19-20.5	41.9	NT	NT	NT
B-5	8	SPT	ASH	22-23.5	36.9	NT	NT	NT
B-5	9	SPT	ASH	25-26.5	29.7	NT	NT	NT
B-5	10	SPT	ASH	28-29.5	71.6	NT	NT	NT
B-5	11	SPT	ASH	31-32.5	50.3	NT	NT	NT

TABLE 3
NATURAL MOISTURE CONTENT AND ATTERBERG LIMITS LABORATORY TEST RESULTS

Boring Number	Sample Number	Sample Type	Sample Description/ Origin	Sample Depth (Feet)	Moisture Content (%)	Atterberg Limits		
						Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)
B-5	12	SPT	ASH	34-35.5	47.4	NT	NT	NT
B-5	13	SPT	ASH	37-38.5	39.7	NT	NT	NT
B-5	14	SPT	ASH	40-41.5	38.6	NT	NT	NT
B-5	15	SPT	ASH	43-44.5	49.9	NT	NT	NT
B-5	16	SPT	ASH	45.5-47	24.3	NT	NT	NT
B-5	17	SPT	ASH	49-50.5	38.9	NT	NT	NT
B-5	18	SPT	ASH	52-53.5	27.6	NT	NT	NT
B-5	19	SPT	ASH	55-56.5	45.9	NT	NT	NT
B-5	20	SPT	ASH	58-59.5	26.6	NT	NT	NT
B-5	21	SPT	ASH	60.5-62	10.0	NT	NT	NT
B-6	UD-1	UD	ALLUVIUM	33-35	NT	38	20	18
B-8A	UD-2	UD	ASH	5-7	35.5	NT	NT	NT
B-8A	UD-3	UD	ASH	7-9	54.2	NT	NT	NT
B-8A	UD-4	UD	ASH	9-11	35.8	NT	NT	NT
B-10	UD-2	UD	ALLUVIUM	58-60	NT	37	19	18
B-10	UD-3	UD	ALLUVIUM	62-64	23.9*	25	14	11

NT - Not Tested
NV – Non-Viscous
NP - Non-Plastic
SPT - Standard Penetration Test
* - Average of three triaxial specimens

Prepared By CTJ Date 7/12/04 Checked By HAB Date 7/12/04

TABLE 4
ASH AND SOIL TRIAXIAL SHEAR STRENGTH TEST DATA
CONSOLIDATED-UNDRAINED WITH PORE PRESSURE MEASUREMENTS FOR ASH AND SOIL SAMPLES

Boring Number	Sample Depth (Feet)	Sample Type[1, 2]	Description	Standard Penetration Test N-Value (Blows Per Foot)[3]	Average Initial Moisture Content (%)	Average Initial Dry Density (pcf)	Strength Parameters			
							Total		Effective	
							Cohesion, C (ksf)	Friction Angle, ϕ (Degrees)	Cohesion, C′ (ksf)	Friction Angle, ϕ' (Degrees)
B-1A	32-33.5	1	Gray Ash	Not obtained	50.7	65.9	2.96	32.1	0.89	33.2
B-10	62-64	1	Gray lean clay with sand	2	23.9	101.6	0.25	17.1	0.18	28.8
B-10A	10-11.5	1	Gray Ash	Not obtained	22.2	62.9	1.15	36	0	40.7

(1) UD = Undisturbed Sample

(2) Remolded

(3) Performed after undisturbed sample retrieval

Prepared By CTA Date 7/12/04 Checked By HAB Date 7/12/04

TABLE 5
LABORATORY HYDRAULIC CONDUCTIVITY TEST DATA FOR ASH AND SOIL SAMPLES

Boring Number	Sample Depth (Feet)	Sample Type	Description	Initial Moisture Content (%)	Initial Dry Density (pcf)	Average or Mean Hydraulic Conductivity (cm/sec)
B-2	35.5-37.5	1	Tan sandy silty clay	18.8	109.2	5.18×10^{-8}
B-2P	2 – 4	1	Gray Ash	17.9	71.6	1.29×10^{-3}
B-2P	14-16	1	Gray Ash	27.0	85.6	1.53×10^{-5}
B-2P	18-20	1	Gray Ash	38.8	72.3	3.24×10^{-5}

(1) Undisturbed

Prepared By CTJ Date 7/12/04 Checked By HAB Date 7/12/04

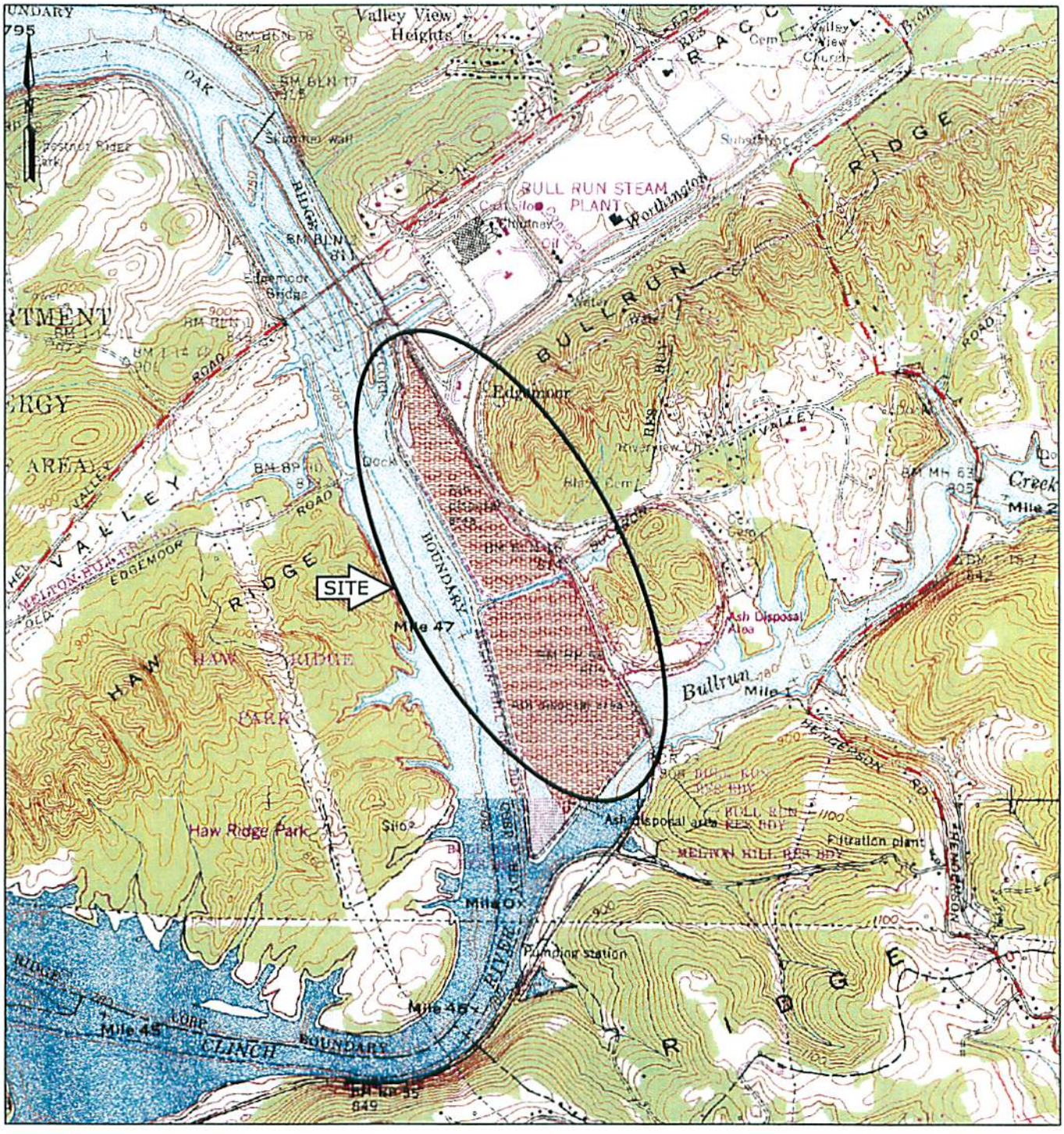
TABLE 6
CONSOLIDATION TEST DATA FOR SOIL SAMPLES

Boring Number	Sample Depth (Feet)	Sample Type	Origin	Initial Moisture Content (%)	Initial Dry Density (pcf)	e Initial Void Ratio	"Laboratory" Cc Compression Index	"Field" Cc Compression Index	Pc Preconsolidation Pressure (ksf)
B-2	39-41	UD	Alluvium	20.3	107.2	0.5418	0.10	0.12	5.6

UD - Undisturbed Sample (ASTM D 1587)

Prepared By CTJ Date 7/12/04 Checked By HAB Date 7/12/04

FIGURES



SOURCE: USGS TOPOGRAPHIC MAP OF THE CLINTON, TN QUADRANGLE

MACTEC

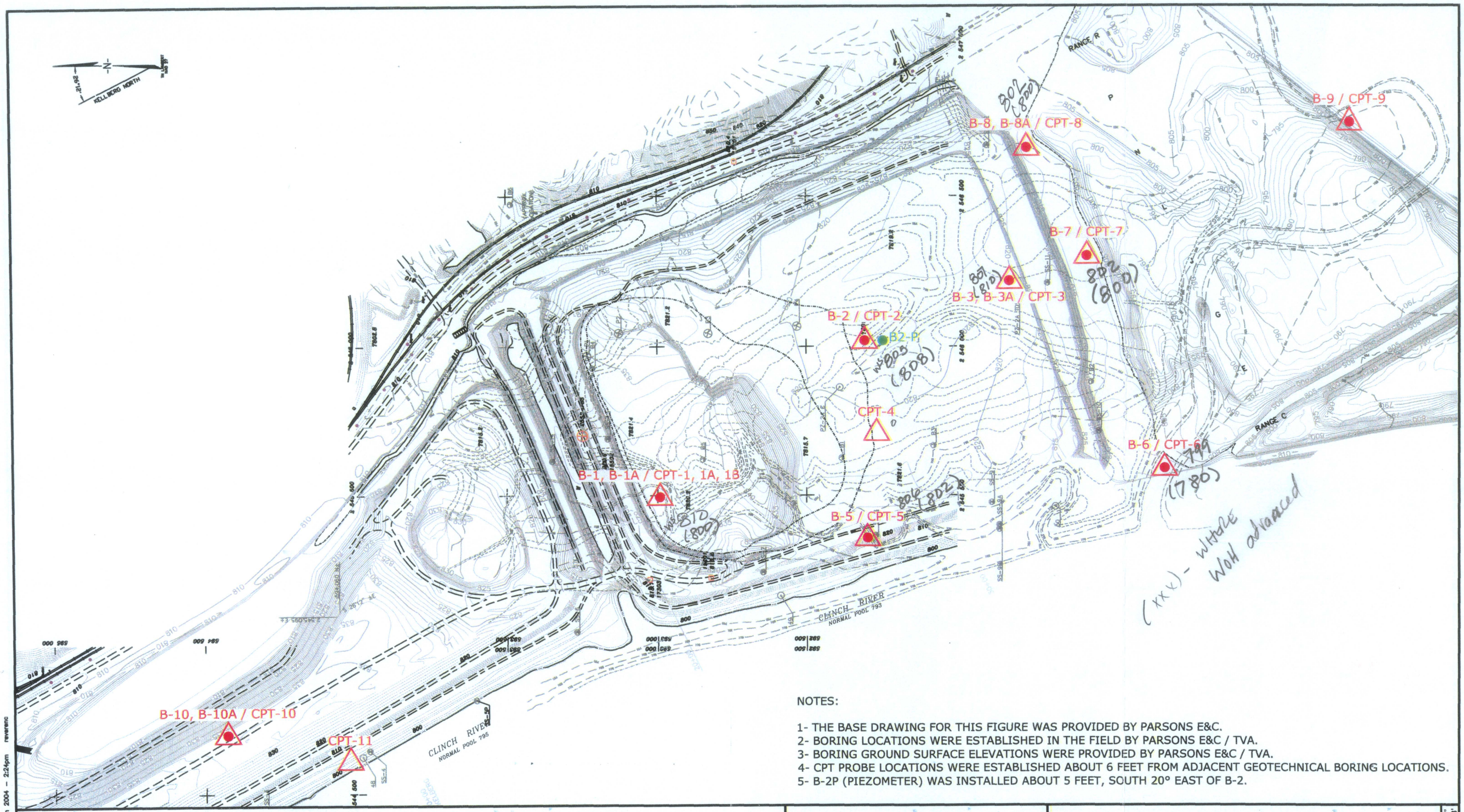
MACTEC Engineering and Consulting, Inc.
1725 Louisville Drive
Knoxville, Tennessee 37921-5904
865-588-8544 • Fax: 865-588-8026

FIGURE 1: SITE LOCATION MAP
TVA BULL RUN ASH DISPOSAL AREA
CLINTON, TENNESSEE

DRAFTING BY:	PREPARED BY: CTJ	CHECKED BY: HAB
JOB NUMBER: 3043041022/0001	DATE: MAY 27, 2004	SCALE: 0 2000'

COORDINATES: N 36° 0.387' W 84° 9.113'

3043041022_FIG1.mxd Thu, 27 May 2004 - 17:29:11 mwarren



NOTES:

1- THE BASE DRAWING FOR THIS FIGURE WAS PROVIDED BY PARSONS E&C.
2- BORING LOCATIONS WERE ESTABLISHED IN THE FIELD BY PARSONS E&C / TVA.
3- BORING GROUND SURFACE ELEVATIONS WERE PROVIDED BY PARSONS E&C / TVA.
4- CPT PROBE LOCATIONS WERE ESTABLISHED ABOUT 6 FEET FROM ADJACENT GEOTECHNICAL BORING LOCATIONS.
5- B-2P (PIEZOMETER) WAS INSTALLED ABOUT 5 FEET, SOUTH 20° EAST OF B-2.

LEGEND

B-2/CPT-2 — GEOTECHNICAL SOIL TEST BORING AND CONE PENETROMETER TEST (CPT) PROBE LOCATION AND IDENTIFICATION

CPT-4 — CONE PENETROMETER TEST (CPT) PROBE LOCATION AND IDENTIFICATION

B2-P — PIEZOMETER LOCATION AND IDENTIFICATION

MACTEC
MACTEC Engineering and Consulting, Inc.
1725 Louisville Drive
Knoxville, Tennessee 37921-5904
865-588-8544 • Fax: 865-588-8026

FIGURE 2: BORING LOCATION PLAN
TVA BULL RUN DISPOSAL ASH AREA
CLINTON, TENNESSEE

DRAFTING BY:	PREPARED BY: CTT	CHECKED BY: HAB
JOB NUMBER: 3043041022/0001	DATE: JUNE 16, 2004	SCALE: 0 300'

COORDINATES: N 36° 0.387' W 84° 9.113'

3043041022_01_FIG2.dwg Wed, 16 Jun 2004 - 2:24pm reverenc

APPENDIX A

FIELD EXPLORATORY PROCEDURES

FIELD EXPLORATORY PROCEDURES

Soil Test Boring (Hollow Stem)

All boring and sampling operations were conducted in general accordance with ASTM D 1586. The borings were advanced by mechanically turning continuous steel hollow-stem auger flights into the ground. At regular intervals, soil samples were obtained with a standard 1.4-inch I.D., 2-inch O.D., split-tube sampler. The sampler was first seated 6 inches to penetrate any loose cuttings and then driven an additional foot with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final foot of penetration was recorded and is designated the "standard penetration test (SPT) resistance." Proper evaluation of the penetration resistance provides an index to the soil's strength, density, and ability to support foundations.

Representative portions of the soil samples obtained from the split-tube sampler were sealed in glass jars and transported to our laboratory for testing and further examination. Test Boring Records are attached, graphically showing the soil descriptions and penetration resistances.

Plugging and Abandonment of Boreholes

Upon completion of drilling and sampling, the geotechnical boreholes were plugged with a Type I Portland cement-bentonite grout mixture using a tremie pipe method. The borings were plugged in general accordance with the requirements specified by TVA. The borings were plugged immediately after drilling and sampling of the boreholes.

Bulk Samples

Bulk samples of several ash types obtained at various elevations were collected for testing.

Undisturbed Sampling

The relatively undisturbed soil samples were obtained by pushing a section of 3-inch O.D., 16-gauge steel tubing into the soil at the desired sampling level. The sampling procedure is described by ASTM D-1587. The tube, together with the encased soils, was carefully removed from the ground, made airtight, and transported to our laboratory.

To obtain relatively undisturbed samples of ash a 3-1/2-inch OD, 3-inch ID split spoon with liner was used. The spoon was pushed into the bottoms of the boreholes at the desired sampling depths. The ash samples, enclosed in the liners, were then sealed with a wax / motor oil mixture at both ends and then capped to minimize changes in the structure and moisture content of the samples.

APPENDIX B

KEY TO SYMBOLS AND DESCRIPTIONS

SOIL TEST BORING RECORDS

GROUP SYMBOLS	TYPICAL NAMES	GROUP SYMBOLS	TYPICAL NAMES
	TOPSOIL		**CONCRETE**
	ASPHALT		**DOLOMITE**
	COAL		**LIMESTONE**
	FILL		**SHALE**
	SUBSOIL		**LIMESTONE/SHALE** - Limestone with shale interbeds
	ALLUVIUM		**SANDSTONE**
	ASH		**SILTSTONE**
	RESIDUUM - Soft to firm		**AUGER BORING**
	RESIDUUM - Stiff to very hard		**UNDISTURBED SAMPLE ATTEMPT**

	Undisturbed Sample 1.5-2.0 = Recovered (ft) / Pushed (ft)		
	Split Spoon Sample		Auger Cuttings
	Rock Core 60-100 = RQD / Recovery		Dilatometer
	No Sample		Crandall Sampler
	Rotary Drill		Pressure Meter
▽	Water Table at time of drilling	○	No Recovery
		▼	Water Table after 24 hours

Correlation of Penetration Resistance with Relative Density and Consistency

SAND & GRAVEL		SILT & CLAY	
No. of Blows	Relative Density	No. of Blows	Consistency
0 - 4	Very Loose	0 - 2	Very Soft
5 - 10	Loose	3 - 4	Soft
11 - 20	Firm	5 - 8	Firm
21 - 30	Very Firm	9 - 15	Stiff
31 - 50	Dense	16 - 30	Very Stiff
Over 50	Very Dense	31 - 50	Hard
		Over 50	Very Hard

BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.

SILT OR CLAY	SAND			GRAVEL		Cobbles	Boulders
	Fine	Medium	Coarse	Fine	Coarse		

No.200 No.40 No.10 No.4 3/4" 3" 12"

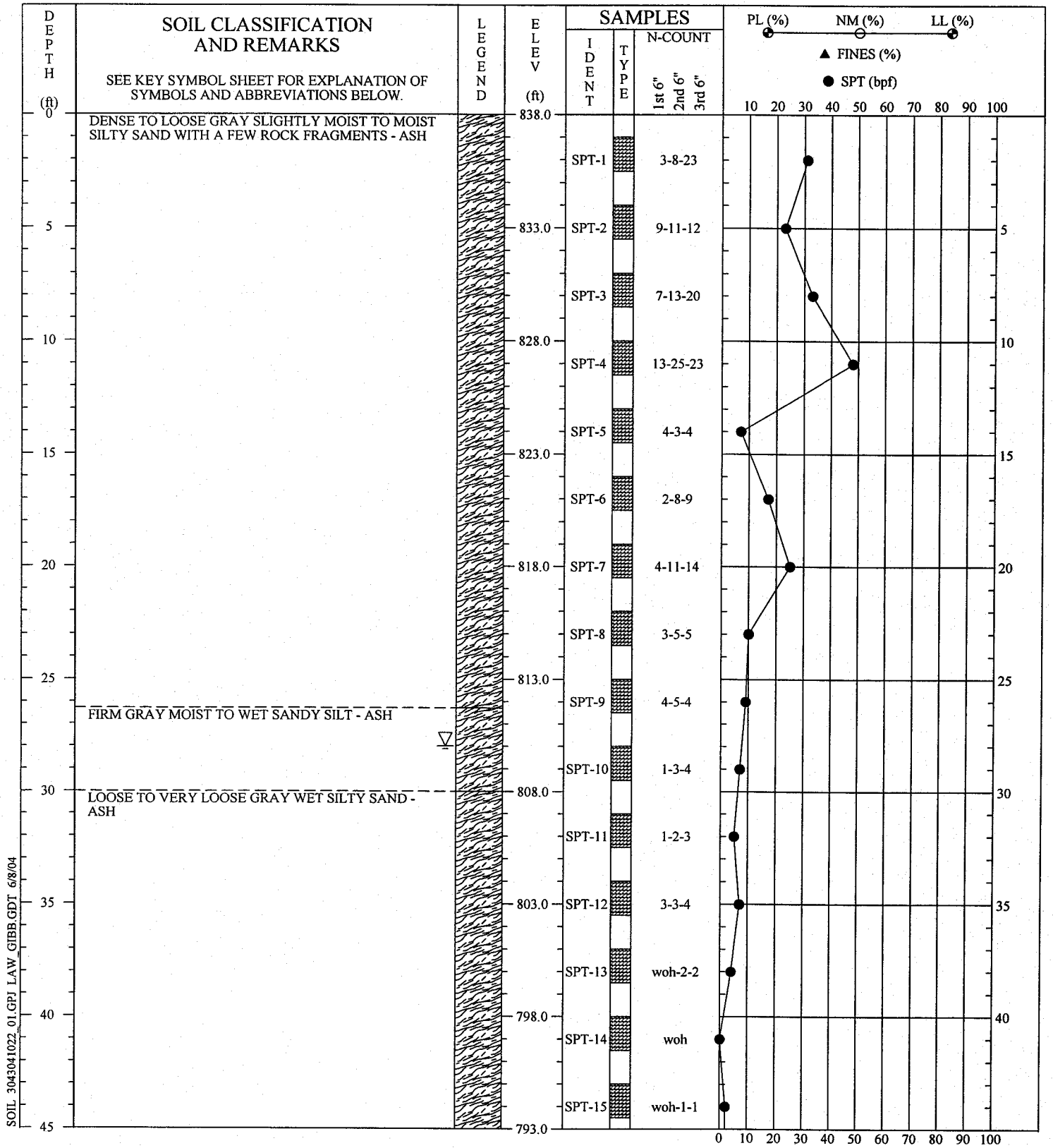
U.S. STANDARD SIEVE SIZE

Reference: The Unified Soil Classification System, Corps of Engineers, U.S. Army Technical Memorandum No. 3-357, Vol. 1, March, 1953 (Revised April, 1960)

KEY TO SYMBOLS AND DESCRIPTIONS

MACTEC

MACTEC Engineering and Consulting of Georgia, Inc.
1725 Louisville Drive
Knoxville, Tennessee 37921-5904
865-588-8544 • Fax: 865-588-8026



SOIL 3043041022_01.GPJ LAW_GIBB.GDT 6/8/04

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER.

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BEWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Driller :	Akins
Prepared By:	Justice
Checked By:	HB

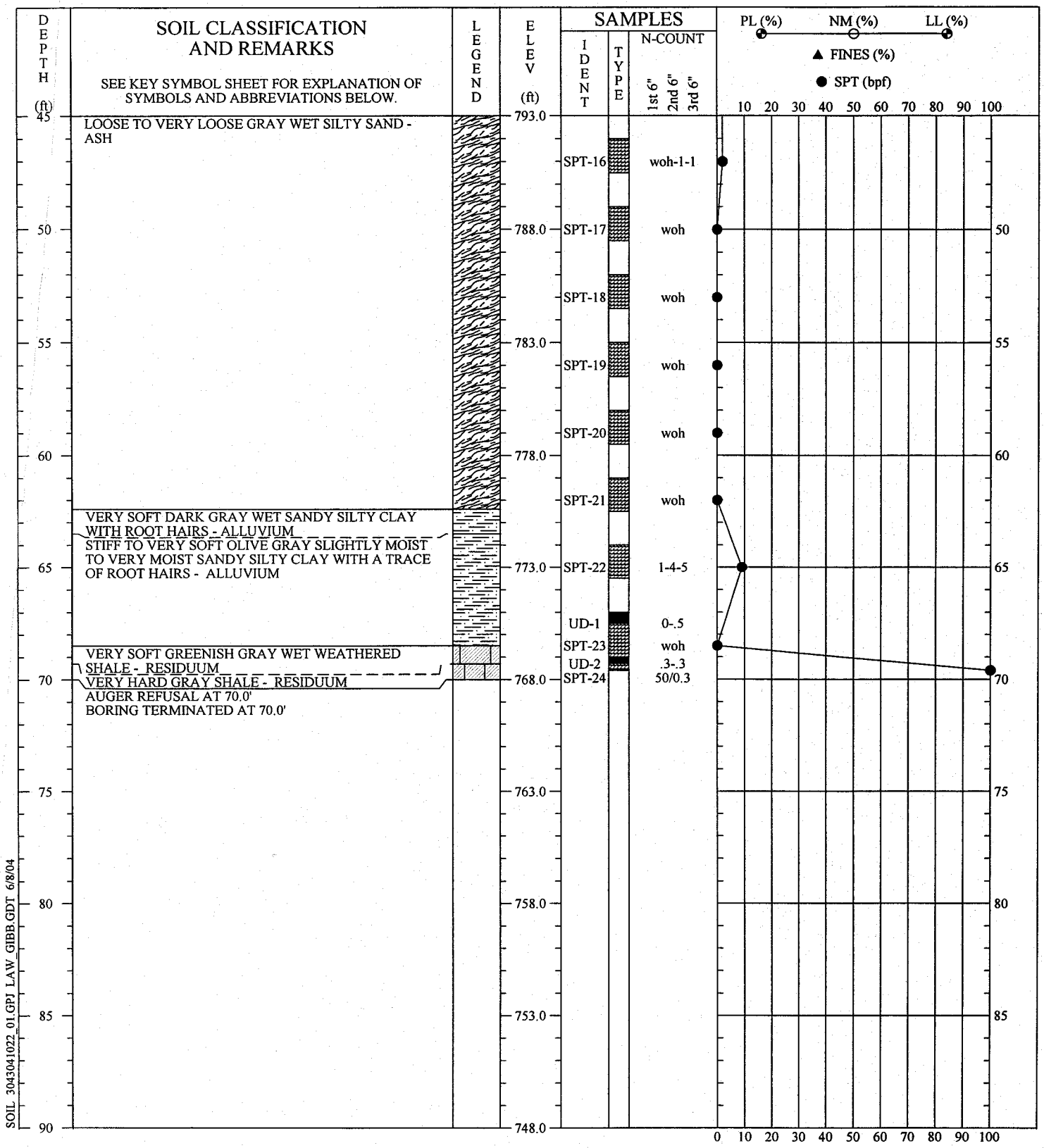
SOIL TEST BORING RECORD

PROJECT: TVA Bull Run Ash

DRILLED: May 13, 2004 **BORING NO.:** B-1

PROJ. NO.: 3043041022/0001 **PAGE 1 OF 2**

MACTEC



SOIL 3043041022_01.GPJ LAW_GIBB.GDT 6/8/04

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Driller : Akins
Prepared By:Justice
Checked By: HB

SOIL TEST BORING RECORD

PROJECT: TVA Bull Run Ash

DRILLED: May 13, 2004 **BORING NO.:** B-1

PROJ. NO.: 3043041022/0001 **PAGE 2 OF 2**

MACTEC

DEPTH (ft)	SOIL CLASSIFICATION AND REMARKS	LEGEND	ELEV (ft)	SAMPLES IDENT	SAMPLES TYPE	SAMPLES N-COUNT 1st 6" 2nd 6" 3rd 6"	PL (%) NM (%) LL (%) ▲ FINES (%) ● SPT (bpf) 10 20 30 40 50 60 70 80 90 100
0	AUGER BORING NOTE: BORING B-1A WAS OFFSET 5 FEET NORTH 20° WEST OF B-1.		838.0				
5			833.0				
10			828.0				
15			823.0	UD-1		.8-1.0	
20			818.0				
25			813.0				
30			808.0	UD-2		1.5-2.0	
				UD-3		1.5-1.5	
35	BORING TERMINATED AT 33.5'		803.0				
40			798.0				
45			793.0				

SOIL 3043041022_01.GPJ LAW_GIBB.GDT 6/10/04

REMARKS:

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Driller : Akins
Prepared By:Justice
Checked By: HB

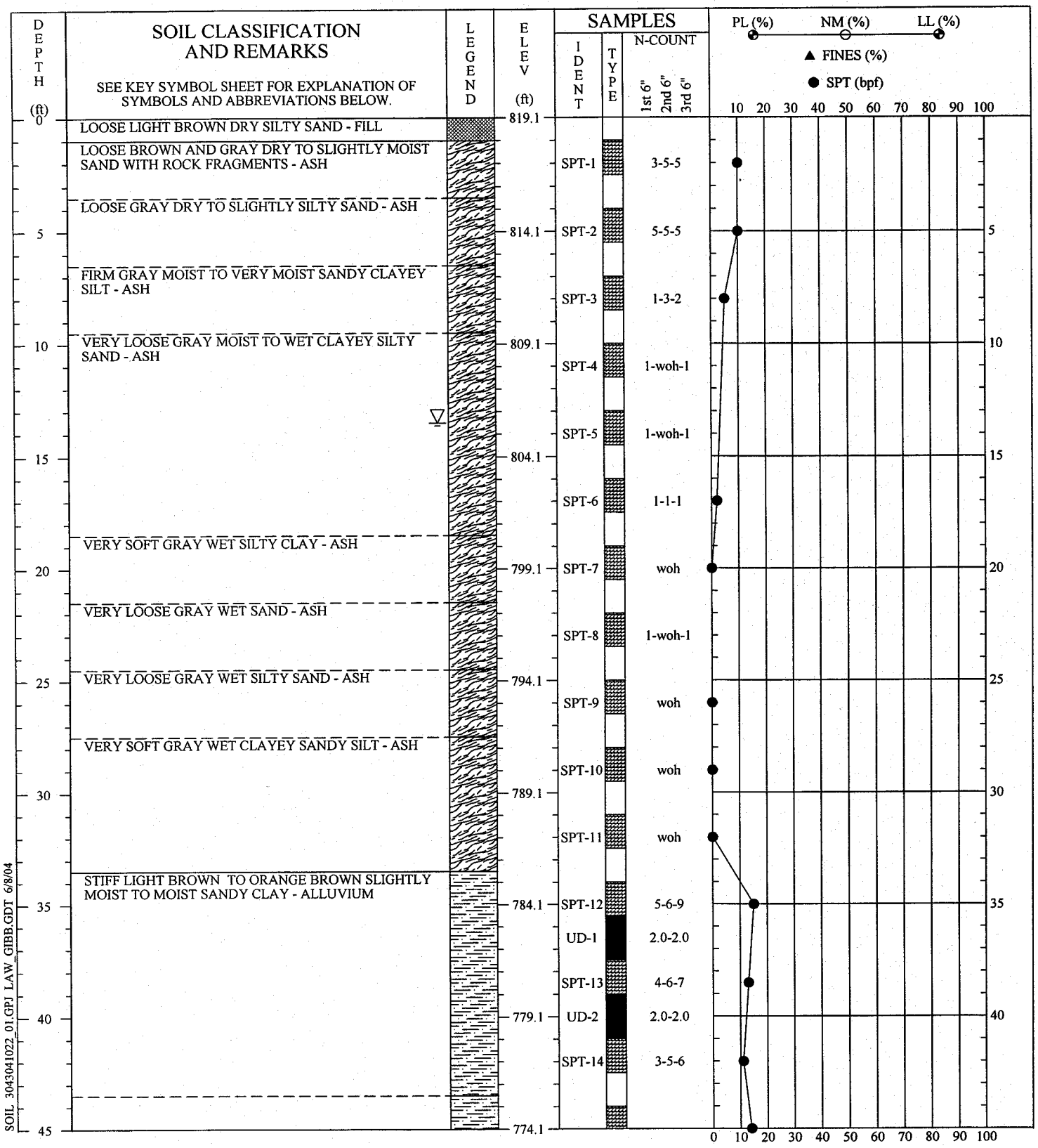
SOIL TEST BORING RECORD

PROJECT: TVA Bull Run Ash

DRILLED: May 14, 2004 **BORING NO.:** B-1A

PROJ. NO.: 3043041022/0001 **PAGE 1 OF 1**

MACTEC



SOIL 3043041022_01.GPJ LAW_GIBB.GDT 6/8/04

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER.

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Driller : Akins	
Prepared By:Justice	
Checked By: HB	

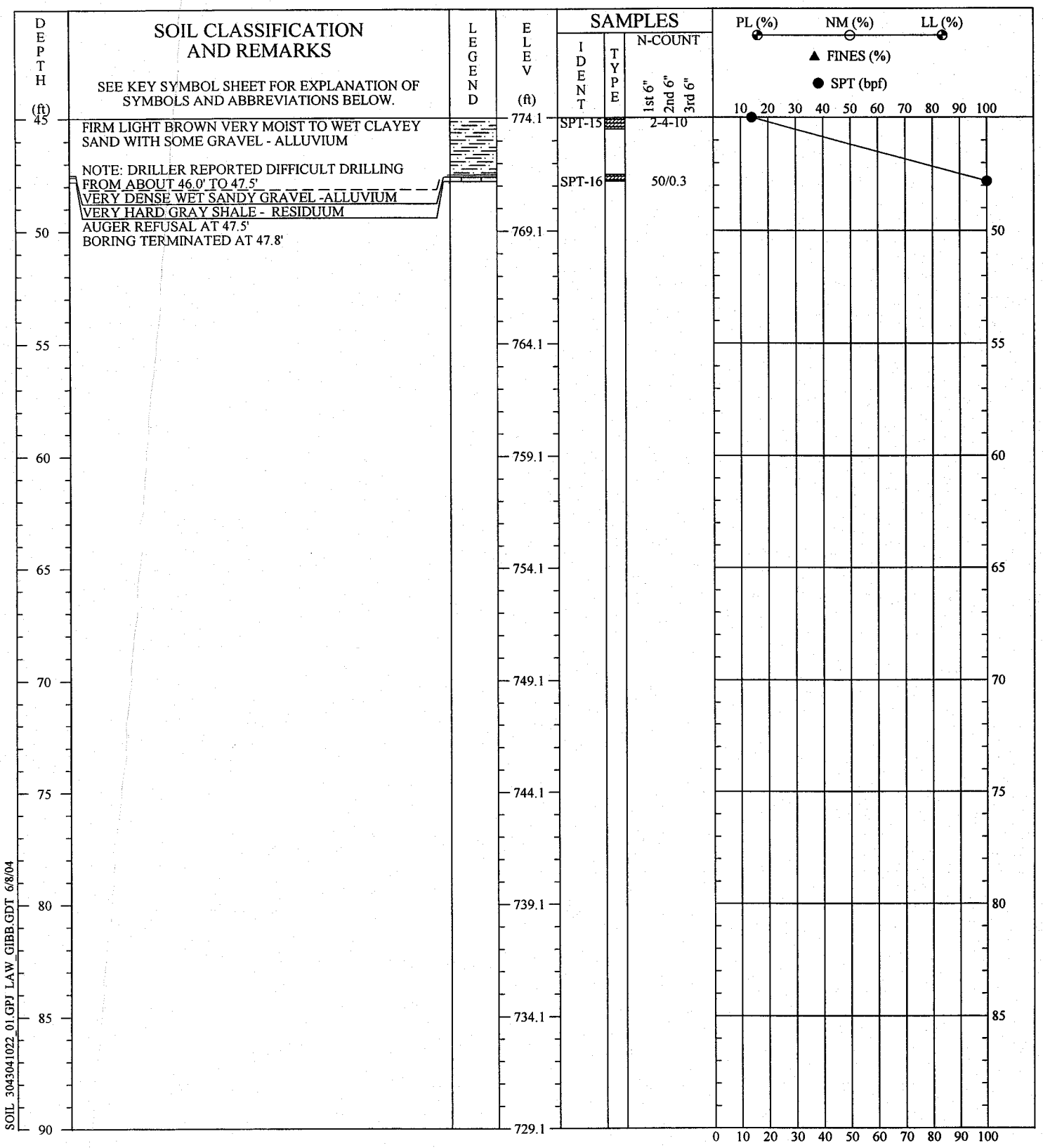
SOIL TEST BORING RECORD

PROJECT: TVA Bull Run Ash

DRILLED: May 14, 2004 **BORING NO.:** B-2

PROJ. NO.: 3043041022/0001 **PAGE** 1 **OF** 2

MACTEC



SOIL 3043041022_01.GPJ LAW_GIBB.GDT 6/8/04

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER.

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Driller : Akins	
Prepared By:Justice	
Checked By: HB	

SOIL TEST BORING RECORD

PROJECT: TVA Bull Run Ash

DRILLED: May 14, 2004 **BORING NO.:** B-2

PROJ. NO.: 3043041022/0001 **PAGE 2 OF 2**

MACTEC

SOIL CLASSIFICATION AND REMARKS

SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.

AUGER BORING

NOTE: B-2P (PIEZOMETER) PIPE WAS INSTALLED ABOUT 5', SOUTH 20° EAST OF B-2.

2" PIEZOMETER PIPE INSTALLED FROM ABOUT 3 FEET ABOVE GROUND SURFACE TO A DEPTH OF ABOUT 25 FEET.

BORING TERMINATED AT 25.0'

DEPTH (ft)	ELEV (ft)	IDENT	TYPE	N-COUNT 1st 6" 2nd 6" 3rd 6"
0	819.1			
		UD-1		1.5-2.0
5	814.1			
		UD-2		0-2.0
10	809.1	UD-3		0-2.0
		UD-4		0-2.0
15	804.1	UD-5		1.0-2.0
		UD-6		.8-2.0
20	799.1			
25	794.1			
30	789.1			
35	784.1			
40	779.1			
45	774.1			

SAMPLES

PL (%) NM (%) LL (%)

▲ FINES (%)

● SPT (bpf)

10 20 30 40 50 60 70 80 90 100

0 10 20 30 40 50 60 70 80 90 100

SOIL 3043041022_01.GPJ LAW_GIBB.GDT 6/8/04

REMARKS:

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Driller : Akins

Prepared By:Justice

Checked By: HB

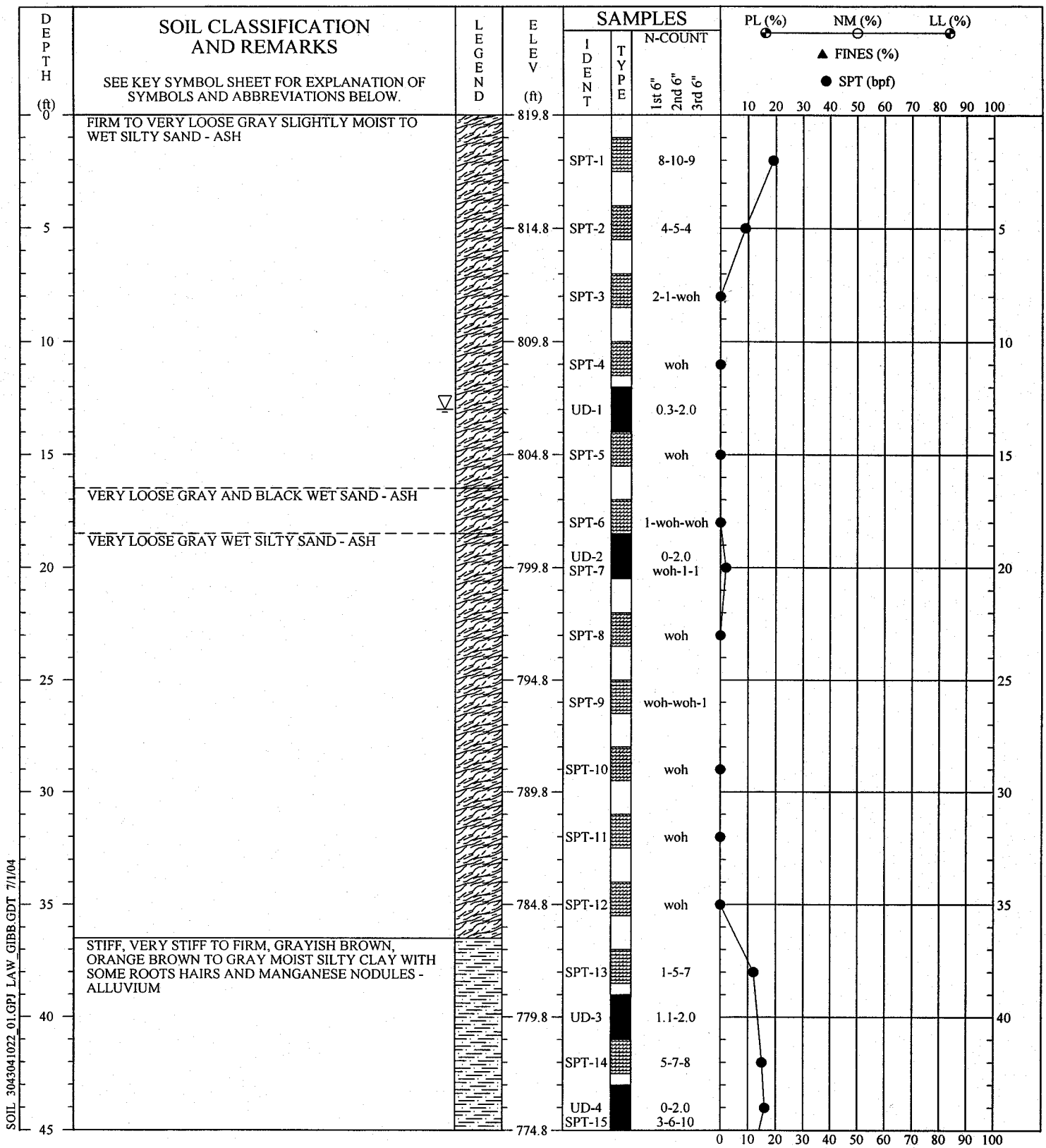
SOIL TEST BORING RECORD

PROJECT: TVA Bull Run Ash

DRILLED: May 17, 2004 **BORING NO.:** B-2P

PROJ. NO.: 3043041022/0001 **PAGE 1 OF 1**

MACTEC



REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER.

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Driller :	Akins
Prepared By:	Justice
Checked By:	HB

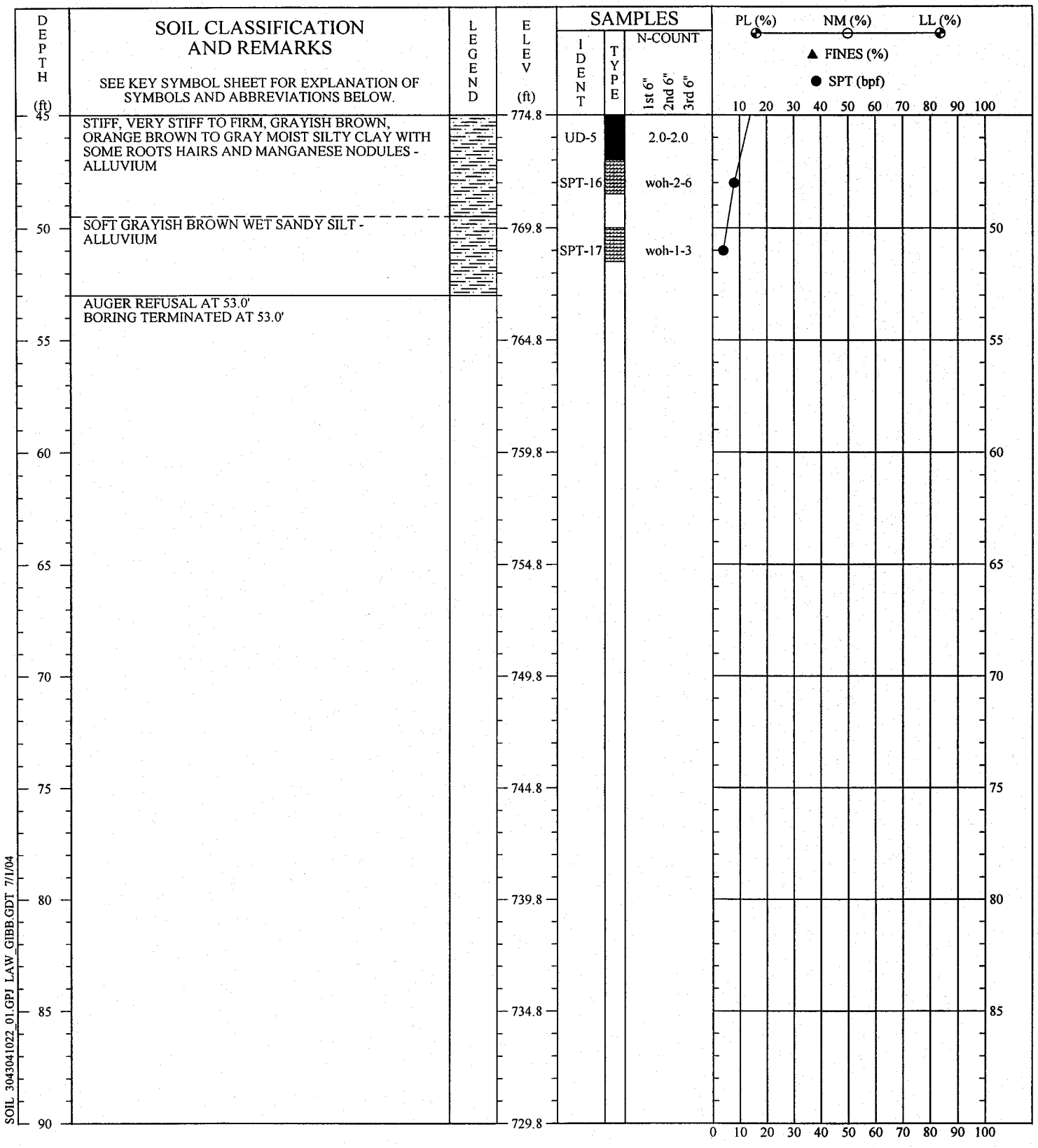
SOIL TEST BORING RECORD

PROJECT: TVA Bull Run Ash

DRILLED: May 12, 2004 **BORING NO.:** B-3

PROJ. NO.: 3043041022/0001 **PAGE 1 OF 2**

MACTEC



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Driller : Akins
Prepared By:Justice
Checked By: HB

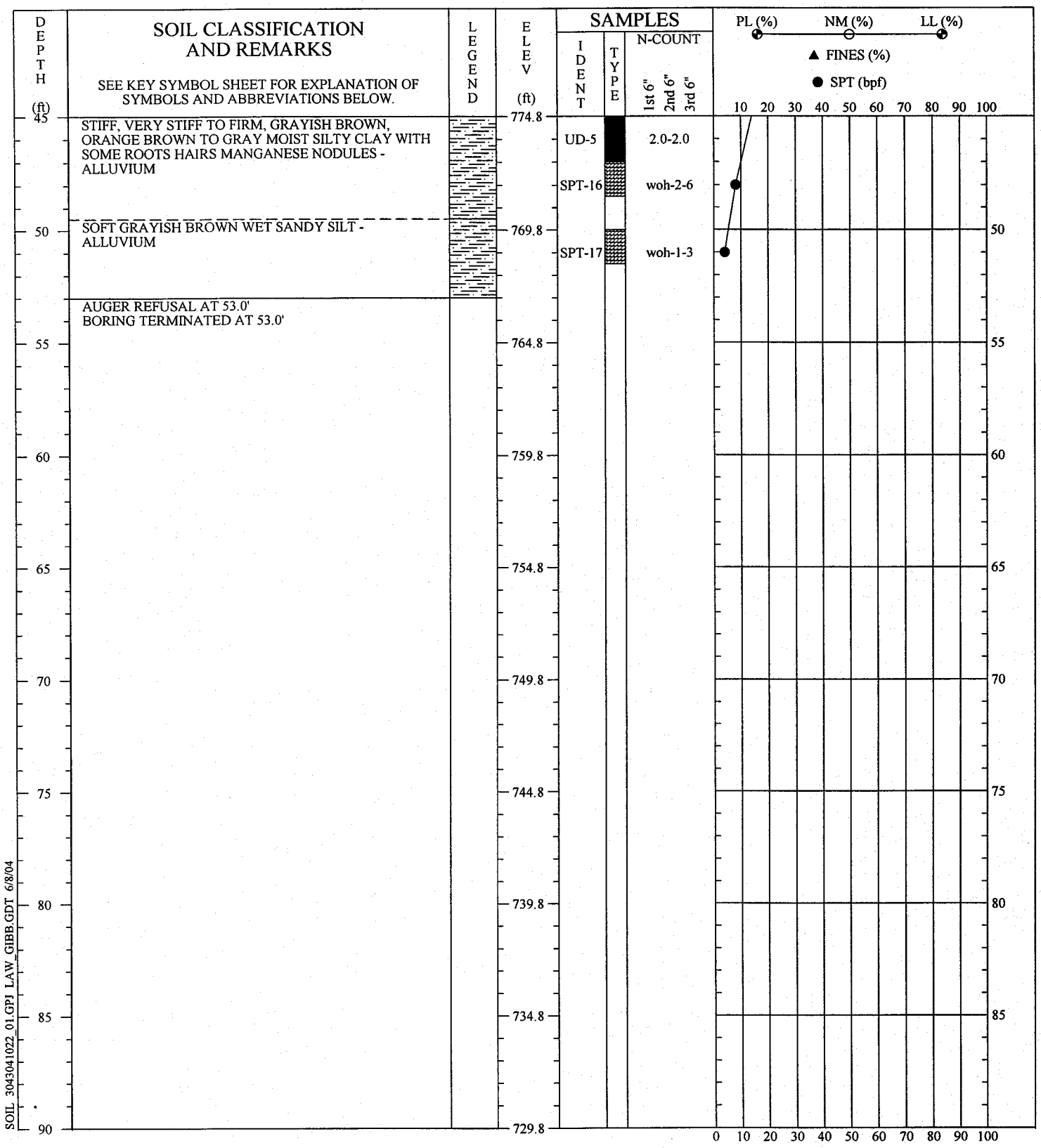
SOIL TEST BORING RECORD

PROJECT: TVA Bull Run Ash

DRILLED: May 12, 2004 **BORING NO.:** B-3

PROJ. NO.: 3043041022/0001 **PAGE 2 OF 2**

MACTEC



SOIL_3043041022_01.GPJ LAW_GIBB.GDT 6/8/04

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER.

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Driller :	Akins
Prepared By:	Justice
Checked By:	HB

SOIL TEST BORING RECORD

PROJECT: TVA Bull Run Ash

DRILLED: May 12, 2004 **BORING NO.:** B-3

PROJ. NO.: 3043041022/0001 **PAGE 2 OF 2**

MACTEC

DEPTH (ft)	SOIL CLASSIFICATION AND REMARKS	LEGEND	ELEV (ft)	SAMPLES IDENT	SAMPLES TYPE	SAMPLES N-COUNT 1st 6" 2nd 6" 3rd 6"	PL (%) NM (%) LL (%) ▲ FINES (%) ● SPT (bpf) 10 20 30 40 50 60 70 80 90 100
0	AUGER BORING NOTE: BORING B-3A WAS OFFSET ABOUT 5 FEET NORTH 20° WEST OF B-3		819.8				
5			814.8	UD-1		1.3-2.0	
10			809.8				
15			804.8	UD-2		2.0-2.0	
20	BORING TERMINATED AT 17.0'		799.8				
25			794.8				
30			789.8				
35			784.8				
40			779.8				
45			774.8				0 10 20 30 40 50 60 70 80 90 100

SOIL 3043041022_01.GPJ LAW_GIBB.GDT 6/10/04

REMARKS:

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Driller : Akins	
Prepared By: Justice	
Checked By: HB	

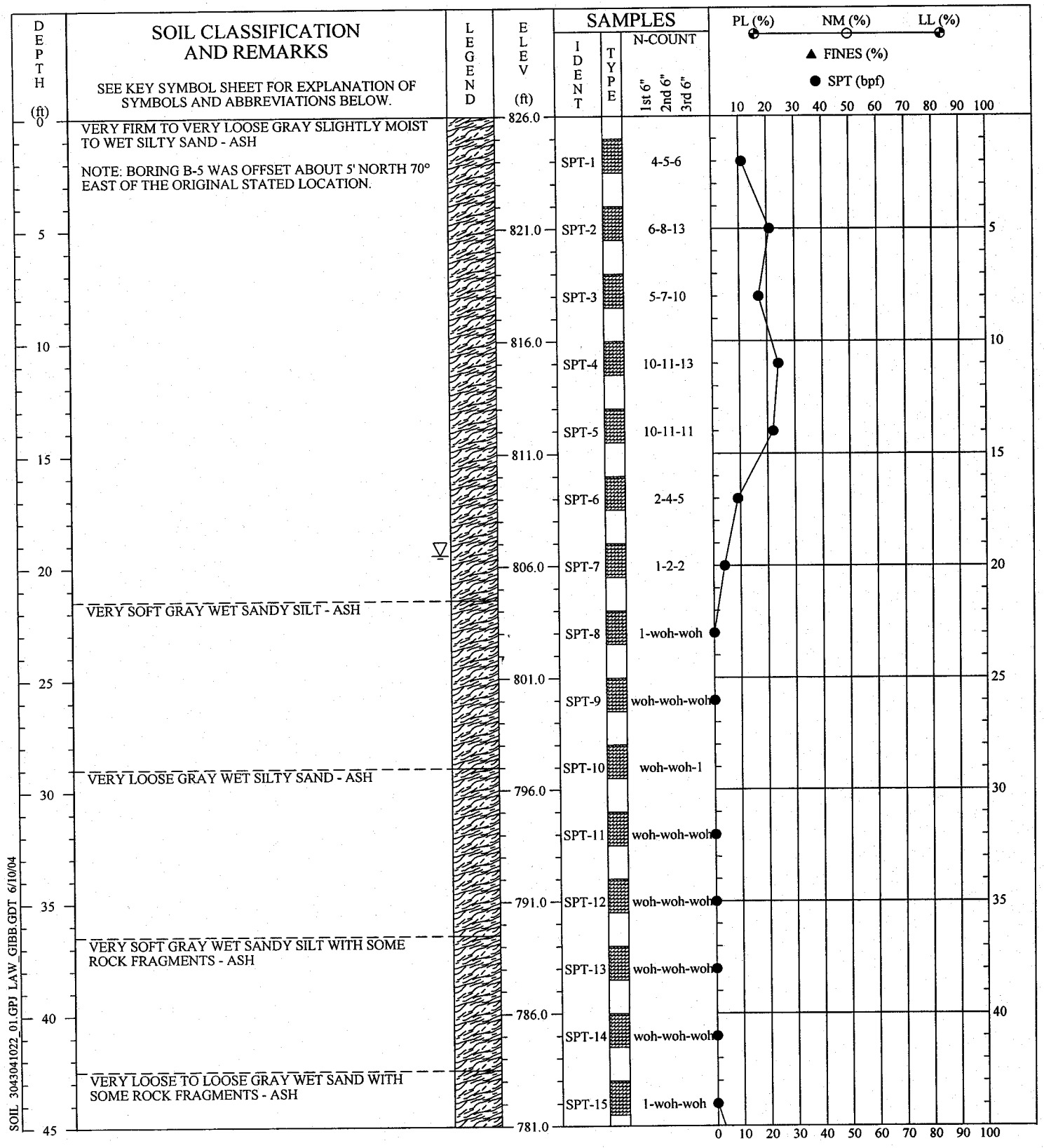
SOIL TEST BORING RECORD

PROJECT: TVA Bull Run Ash

DRILLED: May 12, 2004 **BORING NO.:** B-3A

PROJ. NO.: 3043041022/0001 **PAGE** 1 **OF** 1

MACTEC



SOIL 3043041022_01.GPJ LAW_GIBB.GDT 6/10/04

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Driller : Akins
Prepared By:Justice
Checked By: HB

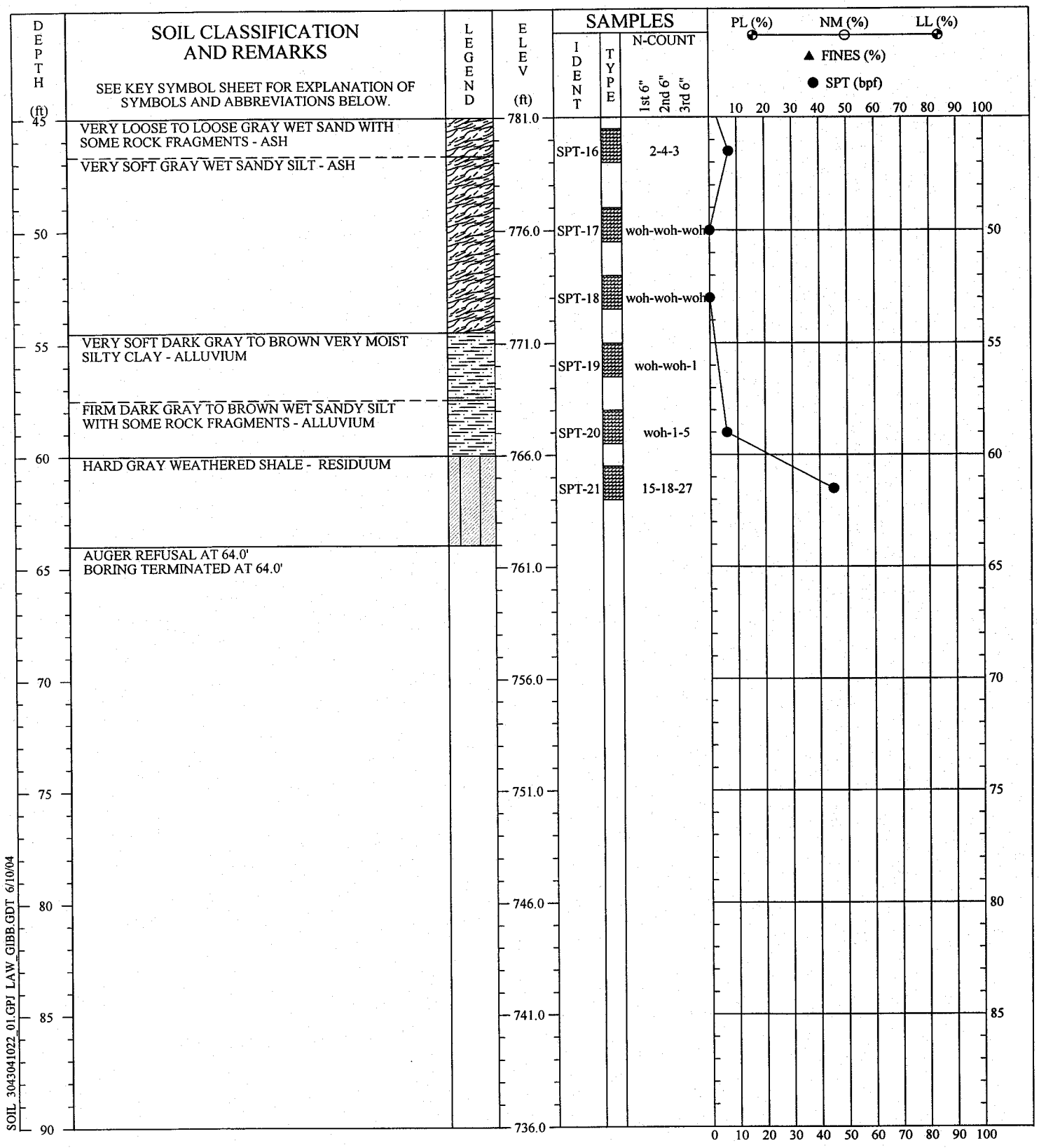
SOIL TEST BORING RECORD

PROJECT: TVA Bull Run Ash

DRILLED: May 11, 2004 **BORING NO.:** B-5

PROJ. NO.: 3043041022/0001 **PAGE 1 OF 2**

MACTEC



SOIL 3043041022_01.GPJ LAW_GIBB.GDT 6/10/04

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER.

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Driller : Akins	
Prepared By:Justice	
Checked By: HB	

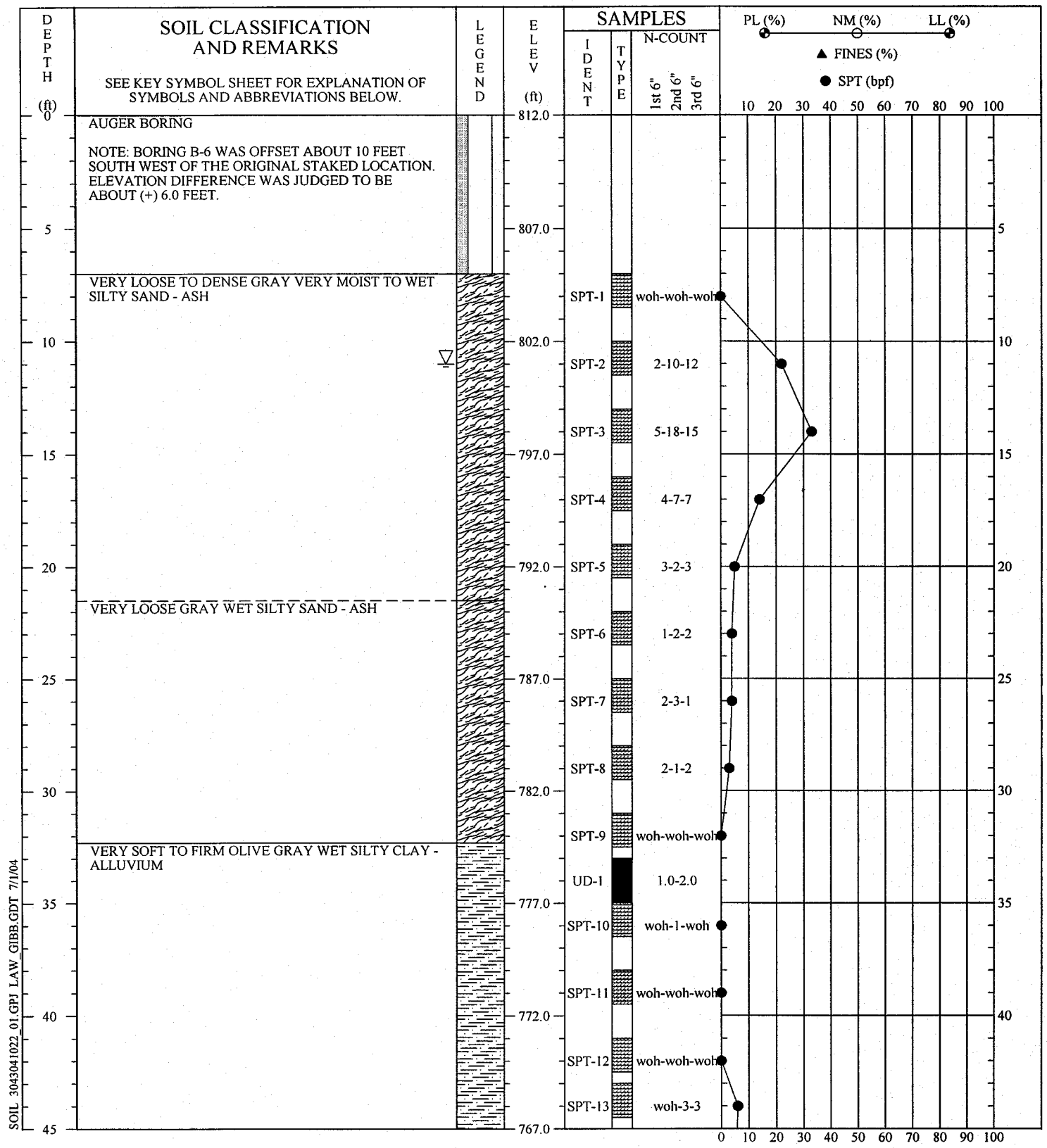
SOIL TEST BORING RECORD

PROJECT: TVA Bull Run Ash

DRILLED: May 11, 2004 **BORING NO.:** B-5

PROJ. NO.: 3043041022/0001 **PAGE 2 OF 2**

MACTEC



SOIL 3043041022_01.GPJ LAW_GIBB.GDT 7/1/04

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER.

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Driller :	Akins
Prepared By:	Justice
Checked By:	HB

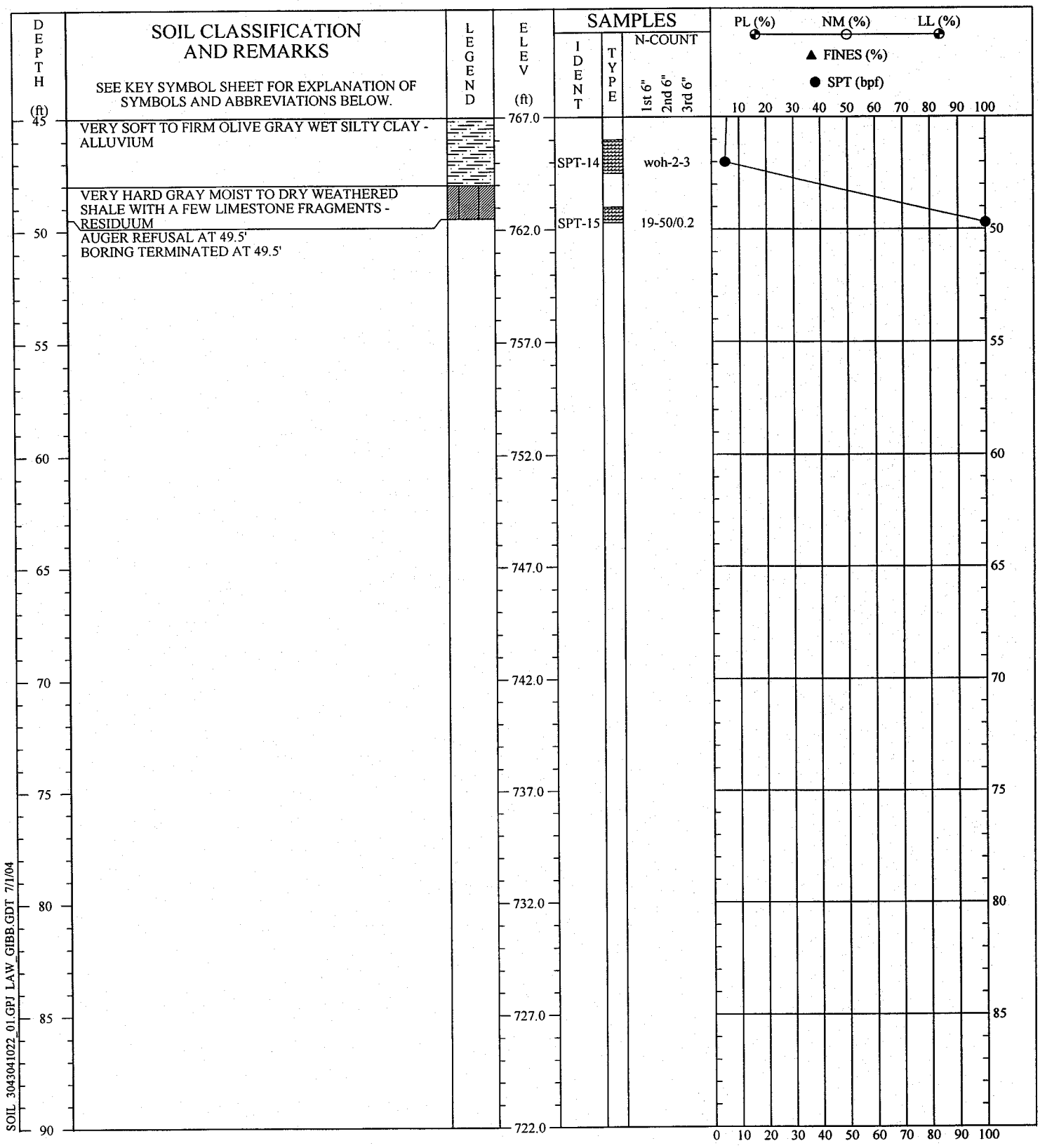
SOIL TEST BORING RECORD

PROJECT: TVA Bull Run Ash

DRILLED: May 20, 2004 **BORING NO.:** B-6

PROJ. NO.: 3043041022/0001 **PAGE 1 OF 2**

MACTEC



SOIL_3043041022_01.GPJ LAW_GIBB.GDT 7/1/04

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER.

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Driller : Akins
Prepared By:Justice
Checked By: HB

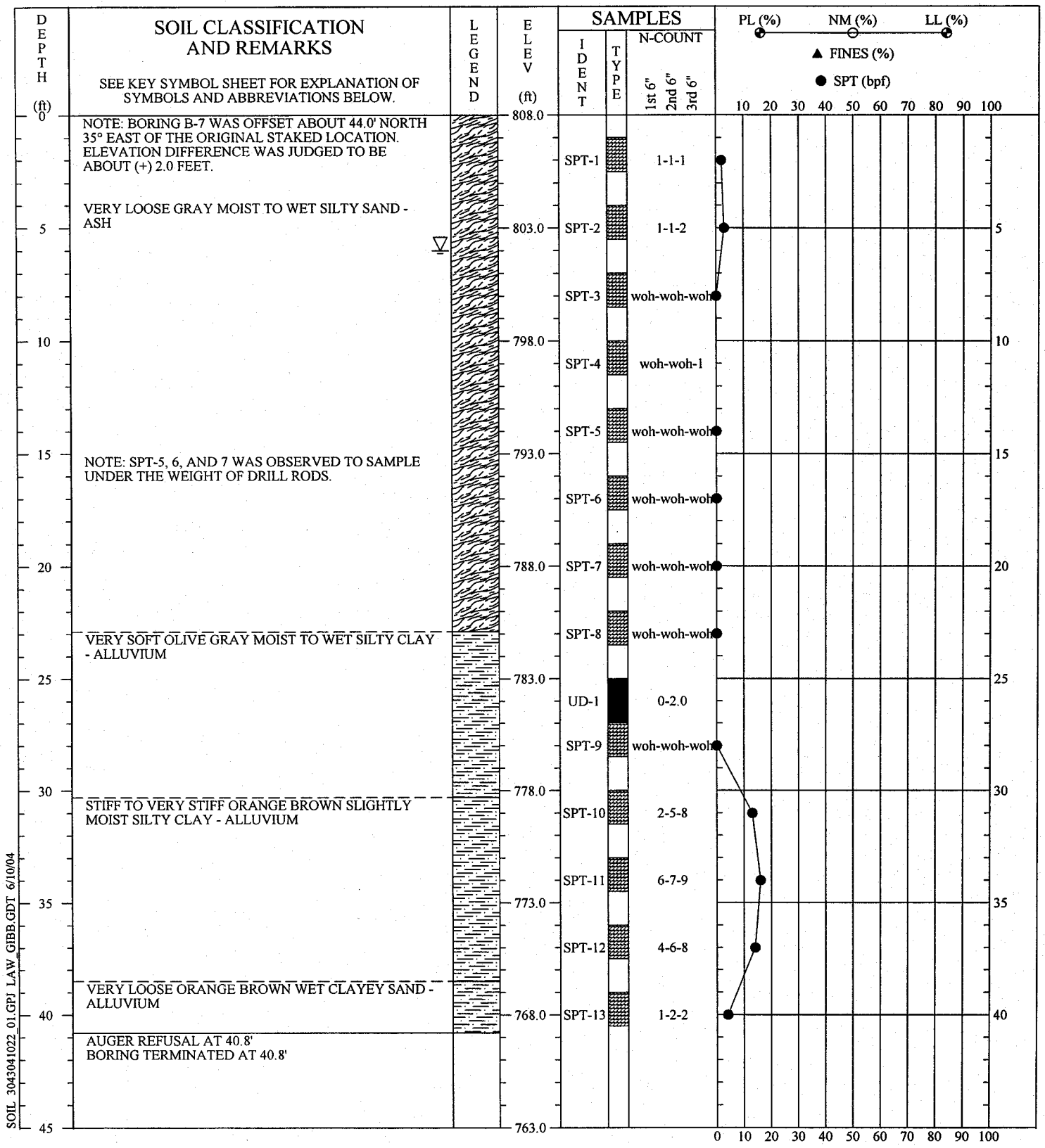
SOIL TEST BORING RECORD

PROJECT: TVA Bull Run Ash

DRILLED: May 20, 2004 **BORING NO.:** B-6

PROJ. NO.: 3043041022/0001 **PAGE 2 OF 2**

MACTEC



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Driller : Akins	
Prepared By:Justice	
Checked By: HB	

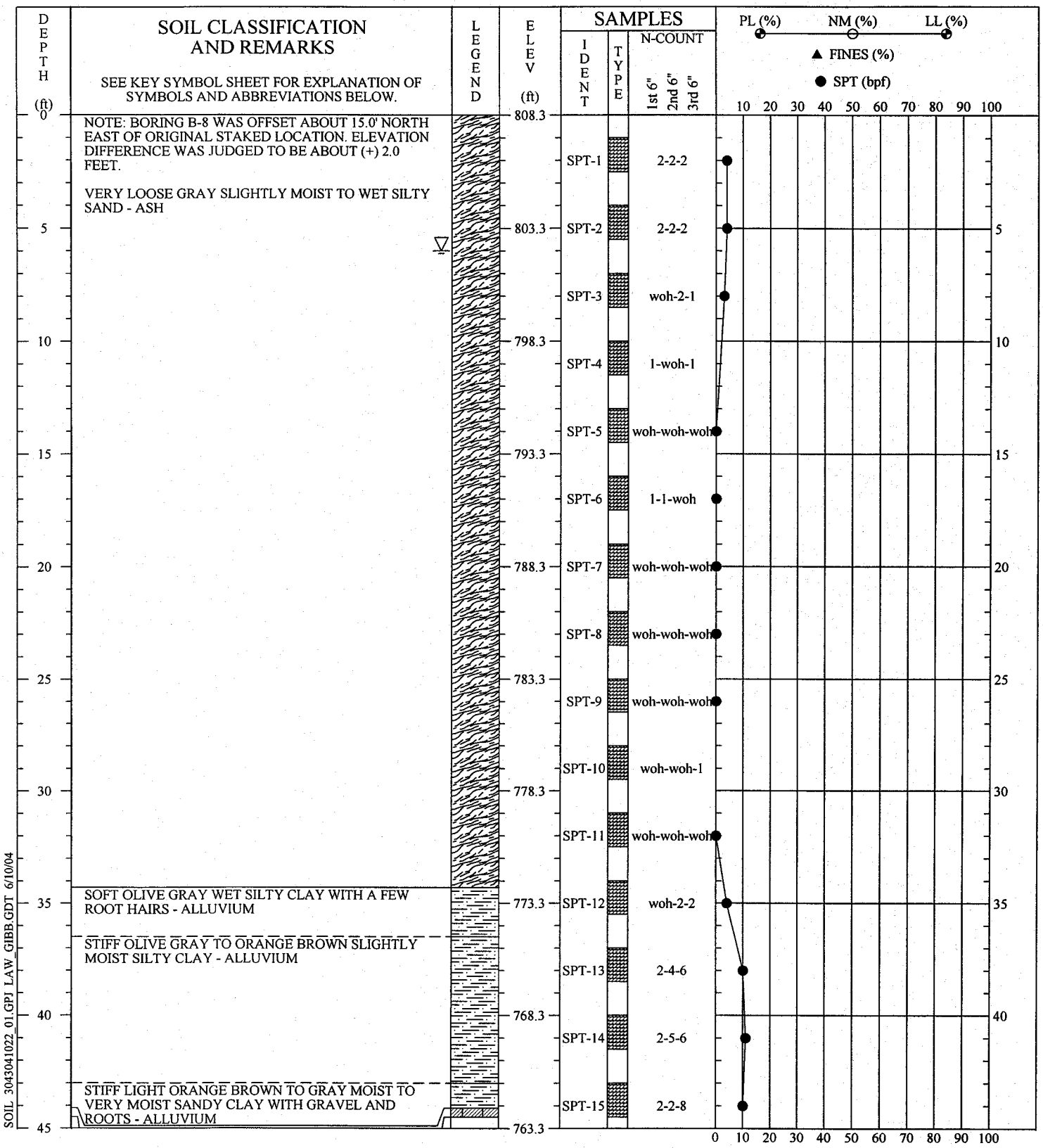
SOIL TEST BORING RECORD

PROJECT: TVA Bull Run Ash

DRILLED: May 19, 2004 **BORING NO.:** B-7

PROJ. NO.: 3043041022/0001 **PAGE** 1 **OF** 1

MACTEC



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Driller :	Akins
Prepared By:	Justice
Checked By:	HB

SOIL TEST BORING RECORD

PROJECT: TVA Bull Run Ash

DRILLED: May 19, 2004 **BORING NO.:** B-8

PROJ. NO.: 3043041022/0001 **PAGE 1 OF 2**

MACTEC

DEPTH (ft)	SOIL CLASSIFICATION AND REMARKS	LEGEND	ELEV (ft)	SAMPLES IDENT	SAMPLES TYPE	SAMPLES N-COUNT 1st 6" 2nd 6" 3rd 6"
45	STIFF GRAY VERY MOIST TO WET SILTY CLAY WITH LIMESTONE FRAGMENTS - RESIDUUM		763.3			
	AUGER REFUSAL AT 44.2'					
	BORING TERMINATED AT 44.5'					
50			758.3			
55			753.3			
60			748.3			
65			743.3			
70			738.3			
75			733.3			
80			728.3			
85			723.3			
90			718.3			

SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.

PL (%) NM (%) LL (%)

▲ FINES (%)

● SPT (bpf)

10 20 30 40 50 60 70 80 90 100

0 10 20 30 40 50 60 70 80 90 100

SOIL 3043041022_01.GPJ LAW_GIBB.GDT 6/10/04

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER.

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Driller :	Akins
Prepared By:	Justice
Checked By:	

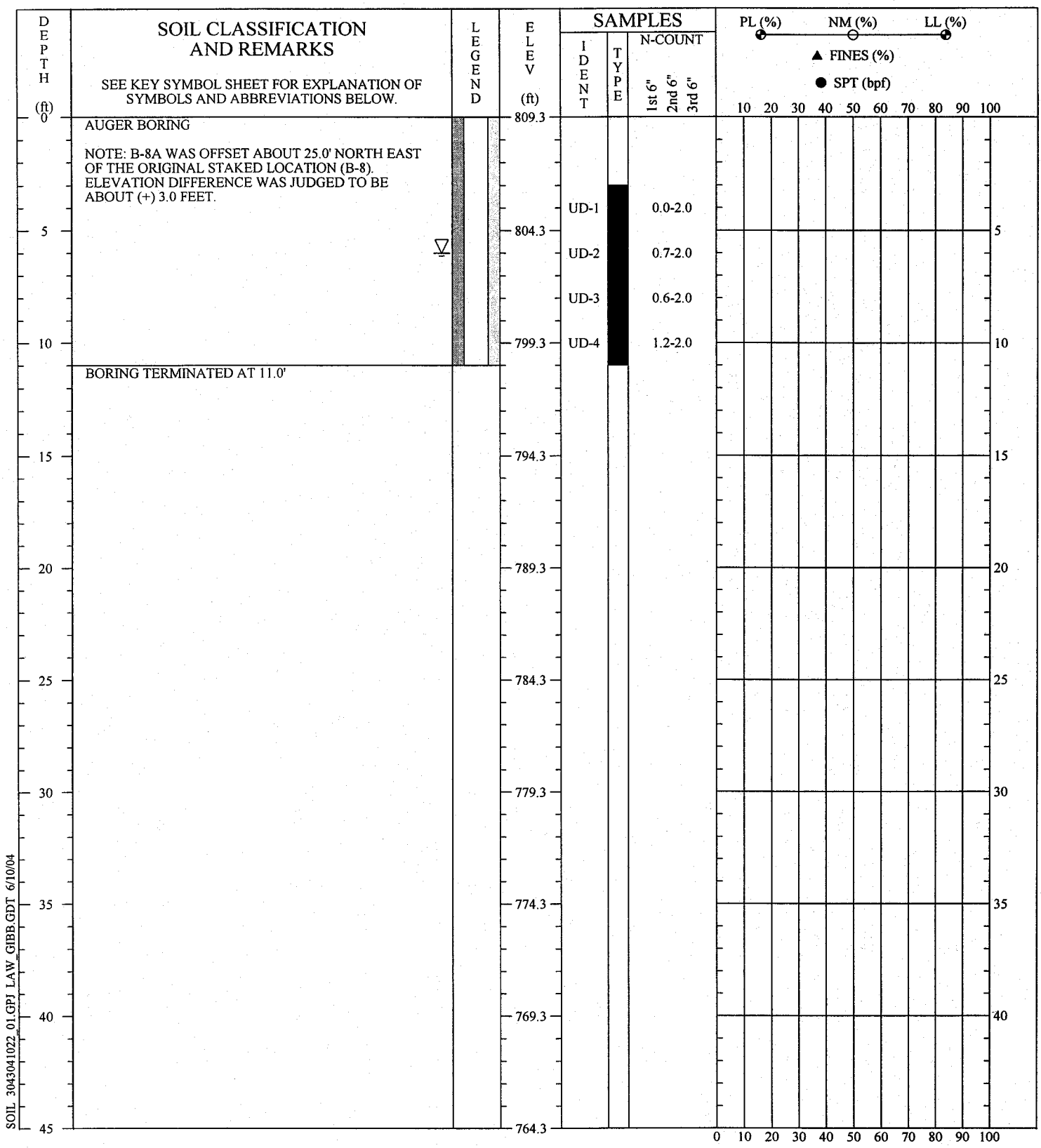
SOIL TEST BORING RECORD

PROJECT: TVA Bull Run Ash

DRILLED: May 19, 2004 **BORING NO.:** B-8

PROJ. NO.: 3043041022/0001 **PAGE 2 OF 2**

MACTEC



SOIL 3043041022_01.GPJ LAW_GIBB.GDT 6/10/04

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Driller : Akins	
Prepared By:Justice	
Checked By: HB	

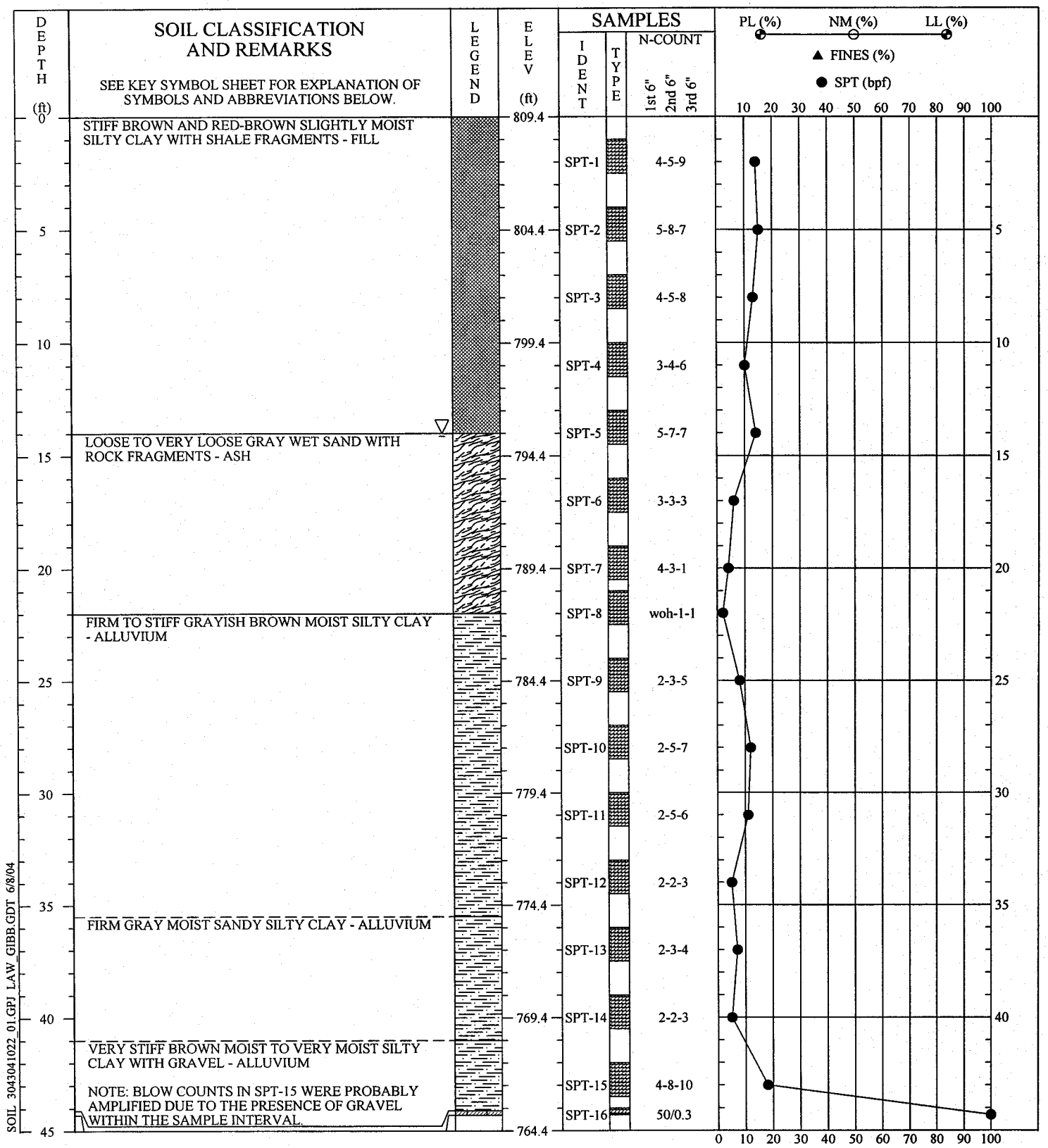
SOIL TEST BORING RECORD

PROJECT: TVA Bull Run Ash

DRILLED: May 21, 2004 **BORING NO.:** B-8A

PROJ. NO.: 3043041022/0001 **PAGE 1 OF 1**

MACTEC



SOIL 3043041022_01.GPJ LAW_GIBB.GDT 6/8/04

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Driller : Akins
Prepared By:Justice
Checked By: HB

SOIL TEST BORING RECORD

PROJECT: TVA Bull Run Ash

DRILLED: May 10, 2004 **BORING NO.:** B-9

PROJ. NO.: 3043041022/0001 **PAGE** 1 **OF** 2

MACTEC

DEPTH (ft)	SOIL CLASSIFICATION AND REMARKS	LEGEND	ELEV (ft)	SAMPLES IDENT	SAMPLES TYPE	SAMPLES N-COUNT 1st 6" 2nd 6" 3rd 6"	PL (%) NM (%) LL (%) ▲ FINES (%) ● SPT (bpf)
45	VERY HARD GREENISH GRAY WEATHERED SHALE - RESIDUUM		764.4				
	AUGER REFUSAL AT 44.0'						
	BORING TERMINATED AT 44.3'						
50			759.4				
55			754.4				
60			749.4				
65			744.4				
70			739.4				
75			734.4				
80			729.4				
85			724.4				
90			719.4				

SEE KEY SYMBOL SHEET FOR EXPLANATION OF SYMBOLS AND ABBREVIATIONS BELOW.

10 20 30 40 50 60 70 80 90 100

0 10 20 30 40 50 60 70 80 90 100

SOIL 3043041022_01.GPJ LAW_GIBB.GDT 6/8/04

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER.

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Driller : Akins
Prepared By:Justice
Checked By: HB

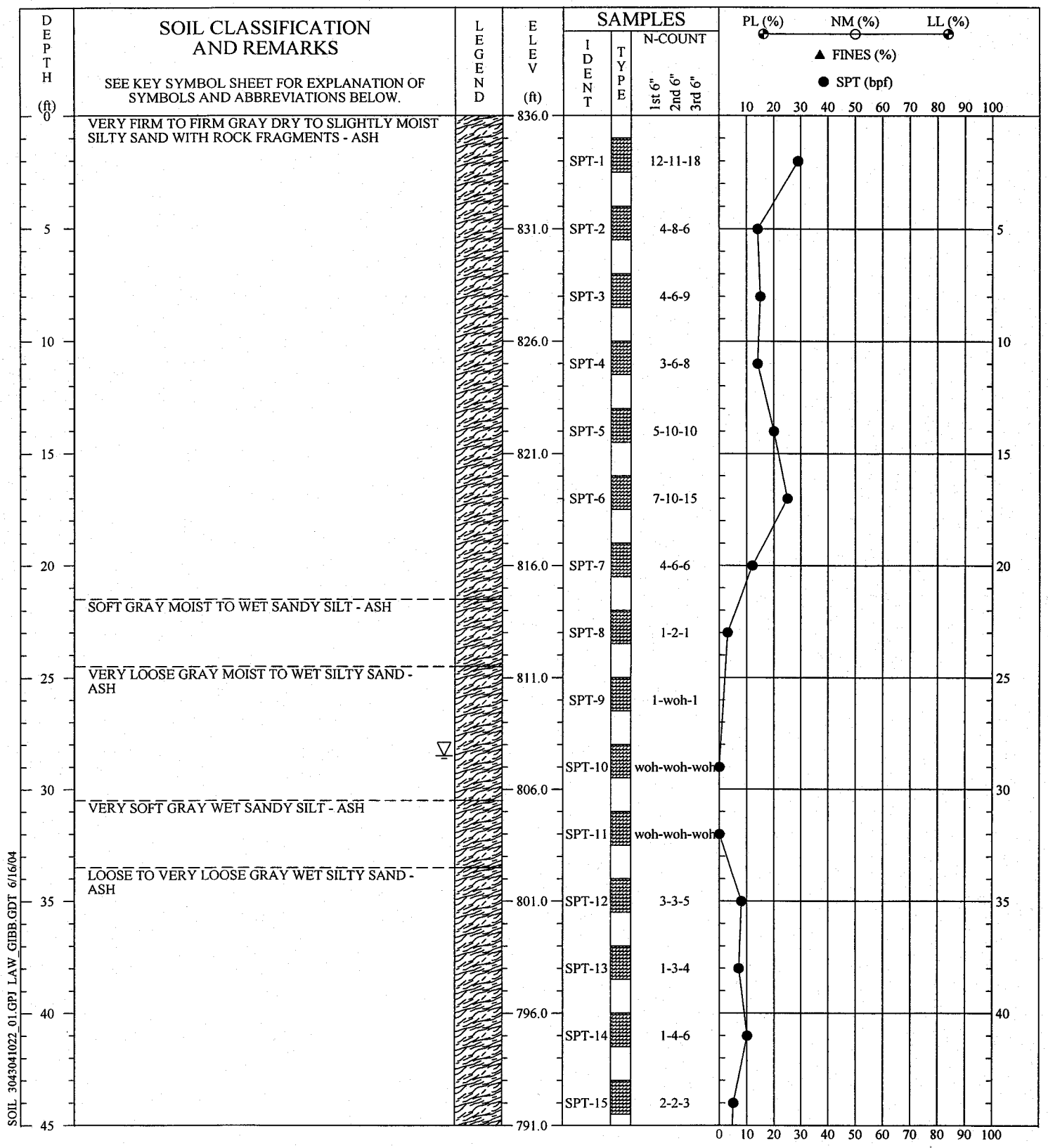
SOIL TEST BORING RECORD

PROJECT: TVA Bull Run Ash

DRILLED: May 10, 2004 **BORING NO.:** B-9

PROJ. NO.: 3043041022/0001 **PAGE 2 OF 2**

MACTEC



SOIL 3043041022_01.GPJ LAW_GIBB.GDT 6/16/04

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER.

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BEWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Driller : Akins	
Prepared By:Justice	
Checked By: HB	

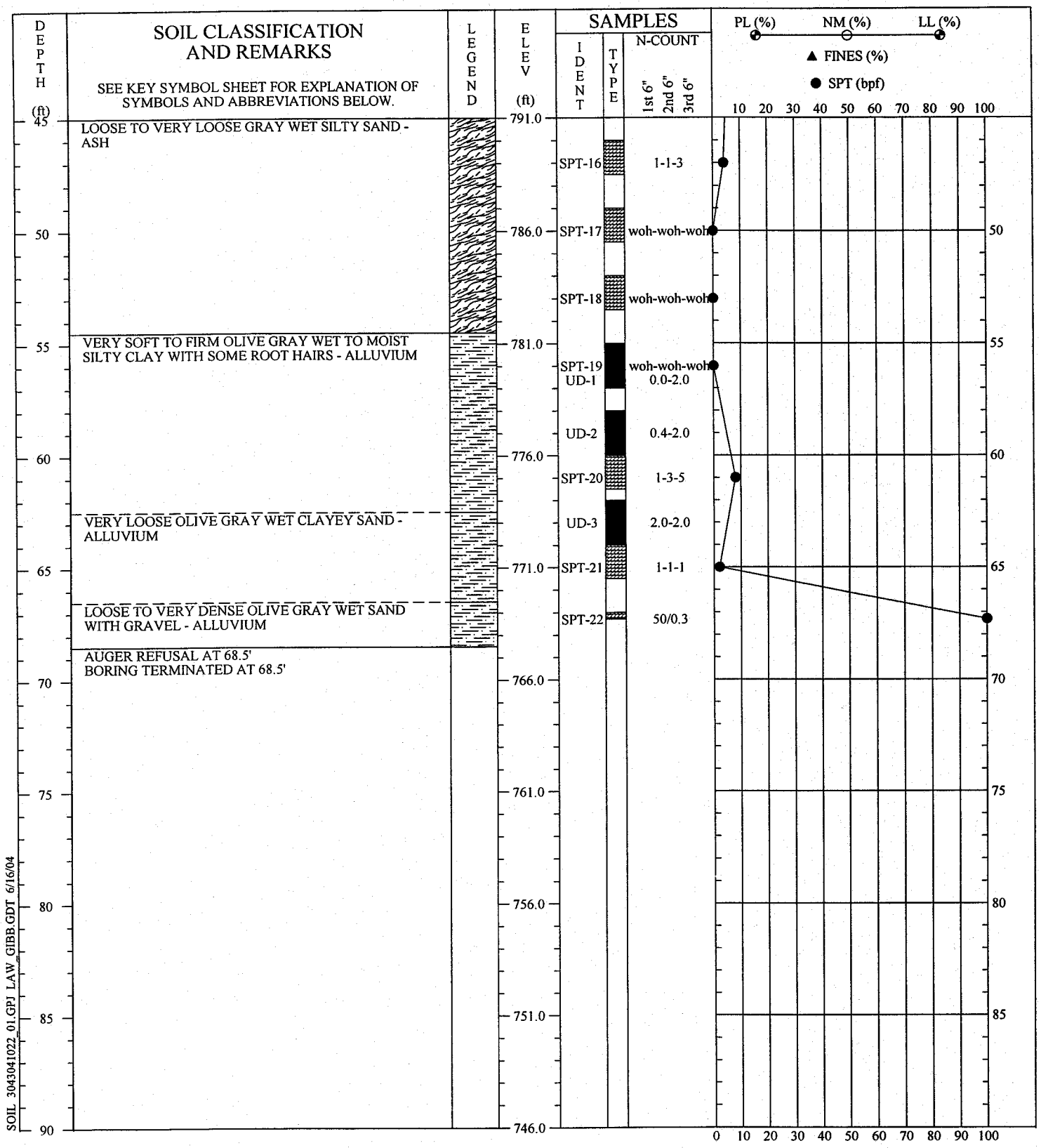
SOIL TEST BORING RECORD

PROJECT: TVA Bull Run Ash

DRILLED: May 17, 2004 **BORING NO.:** B-10

PROJ. NO.: 3043041022/0001 **PAGE 1 OF 2**

MACTEC



SOIL 3043041022_01.GPJ LAW_GIBB.GDT 6/16/04

REMARKS: STANDARD PENETRATION RESISTANCE TESTING PERFORMED USING AN AUTOMATIC HAMMER.

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BEWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Driller : Akins
Prepared By:Justice
Checked By: HB

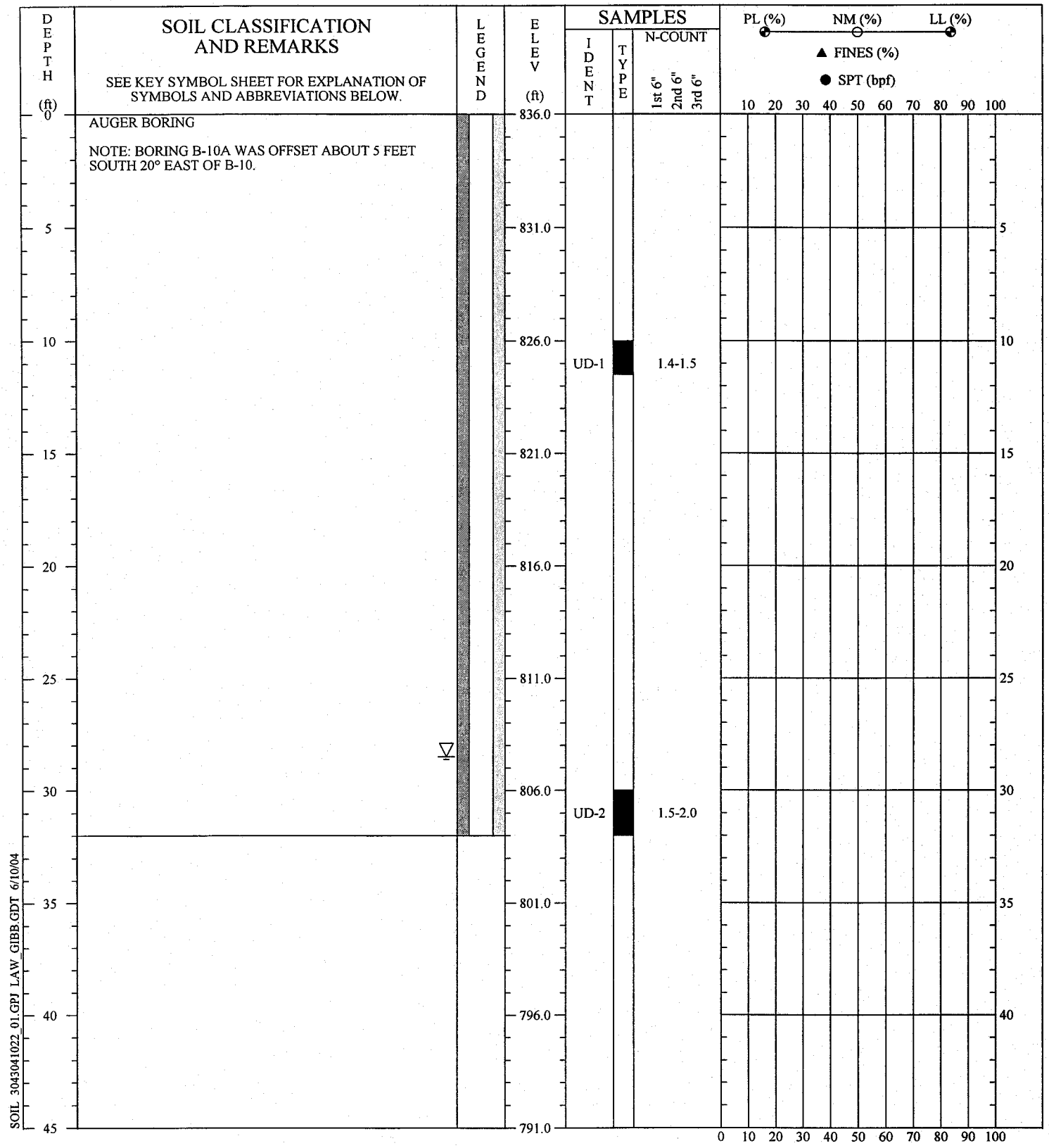
SOIL TEST BORING RECORD

PROJECT: TVA Bull Run Ash

DRILLED: May 17, 2004 **BORING NO.:** B-10

PROJ. NO.: 3043041022/0001 **PAGE 2 OF 2**

MACTEC



SOIL 3043041022_01.GPJ LAW_GIBB.GDT 6/10/04

REMARKS:

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BEWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

Driller :	Akins
Prepared By:	Justice
Checked By:	HB

SOIL TEST BORING RECORD

PROJECT: TVA Bull Run Ash

DRILLED: May 18, 2004 **BORING NO.:** B-10A

PROJ. NO.: 3043041022/0001 **PAGE** 1 **OF** 1

MACTEC

APPENDIX C

CONE PENETROMETER TEST RESULTS

GREGG DRILLING AND TESTING, INC.
GREGG IN SITU, INC.
ENVIRONMENTAL AND GEOTECHNICAL INVESTIGATION SERVICES

May 24, 2004

MACTEC Engineering and Consulting, Inc.
Attn: Hussein Bankayal
1725 Louisville Drive
Knoxville, Tennessee 37909

Subject: CPT Geotechnical Site Investigation
TVA Bull Run Ash Disposal Facility
Clinton, Tennessee
GREGG Project Number: 04-073SC

Dear Hussein:

The following report presents the results of GREGG IN SITU's Cone Penetration Test investigation for the above referenced site. The following testing services were performed:

1	Cone Penetration Tests	(CPTU)	☒
2	Pore Pressure Dissipation Tests	(PPD)	☒
3	Seismic Cone Penetration Tests	(SCPTU)	☐
4	Resistivity Cone Penetration Tests	(RCPTU)	☐
5	UVIF Cone Penetration Tests	(UVIFCPTU)	☐
6	Groundwater Sampling	(GWS)	☐
7	Soil Sampling	(SS)	☐
8	Vapor Sampling	(VS)	☐
9	Vane Shear Testing	(VST)	☐
10	SPT Energy Calibration	(SPTE)	☐

A list of reference papers providing additional background on the specific tests conducted is provided in the bibliography following the text of the report. If you would like a copy of any of these publications or should you have any questions or comments regarding the contents of this report, please do not hesitate to contact our office at (843) 832-4918.

Sincerely,
GREGG IN SITU, Inc.

Timothy J. Cleary
Operations Manager

Cone Penetration Testing Procedure (CPT)

Gregg In Situ, Inc. carries out all Cone Penetration Tests (CPT) using an integrated electronic cone system, *Figure CPT*. The soundings were conducted using a 20 ton capacity cone with a tip area of 15 cm^2 and a friction sleeve area of 225 cm^2. The cone is designed with an equal end area friction sleeve and a tip end area ratio of 0.85.

The cone takes measurements of cone bearing (q_c), sleeve friction (f_s) and dynamic pore water pressure (u_2) at 5-cm intervals during penetration to provide a nearly continuous hydrogeologic log. CPT data reduction and interpretation is performed in real time facilitating on-site decision making. The above mentioned parameters are simultaneously printed and stored on disk for further analysis and reference. All CPT soundings are performed in accordance with ASTM standards (D 5778-95).

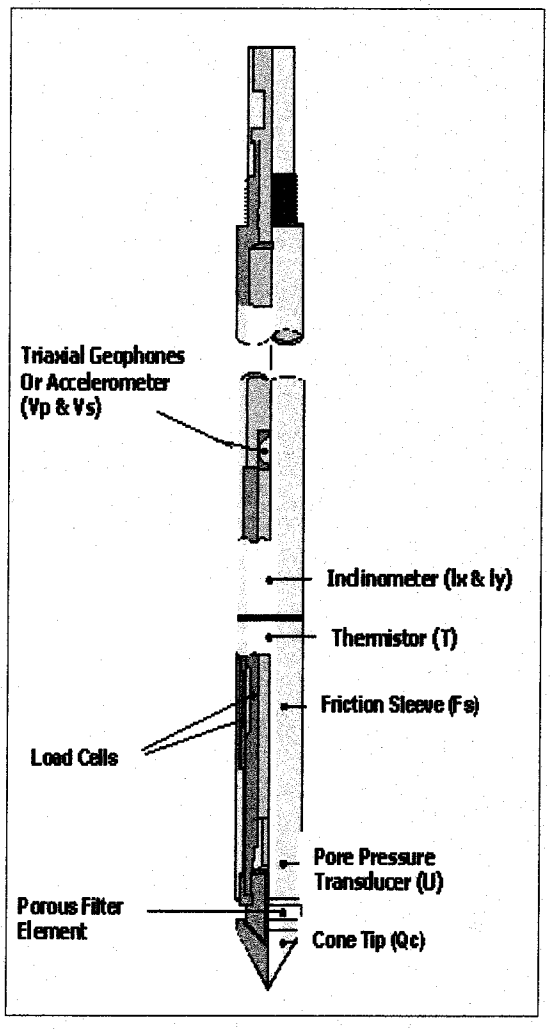


Figure CPT

The cone also contains a porous filter element located directly behind the cone tip, *Figure CPT*. It consists of porous plastic and is 5.0mm thick. The filter element is used to obtain Pore Pressure Dissipation Tests (PPDT's) at 5 second intervals during appropriate pauses in penetration. It should be noted that prior to penetration, the element is fully saturated with silicon oil under vacuum pressure to ensure accurate and fast dissipation.

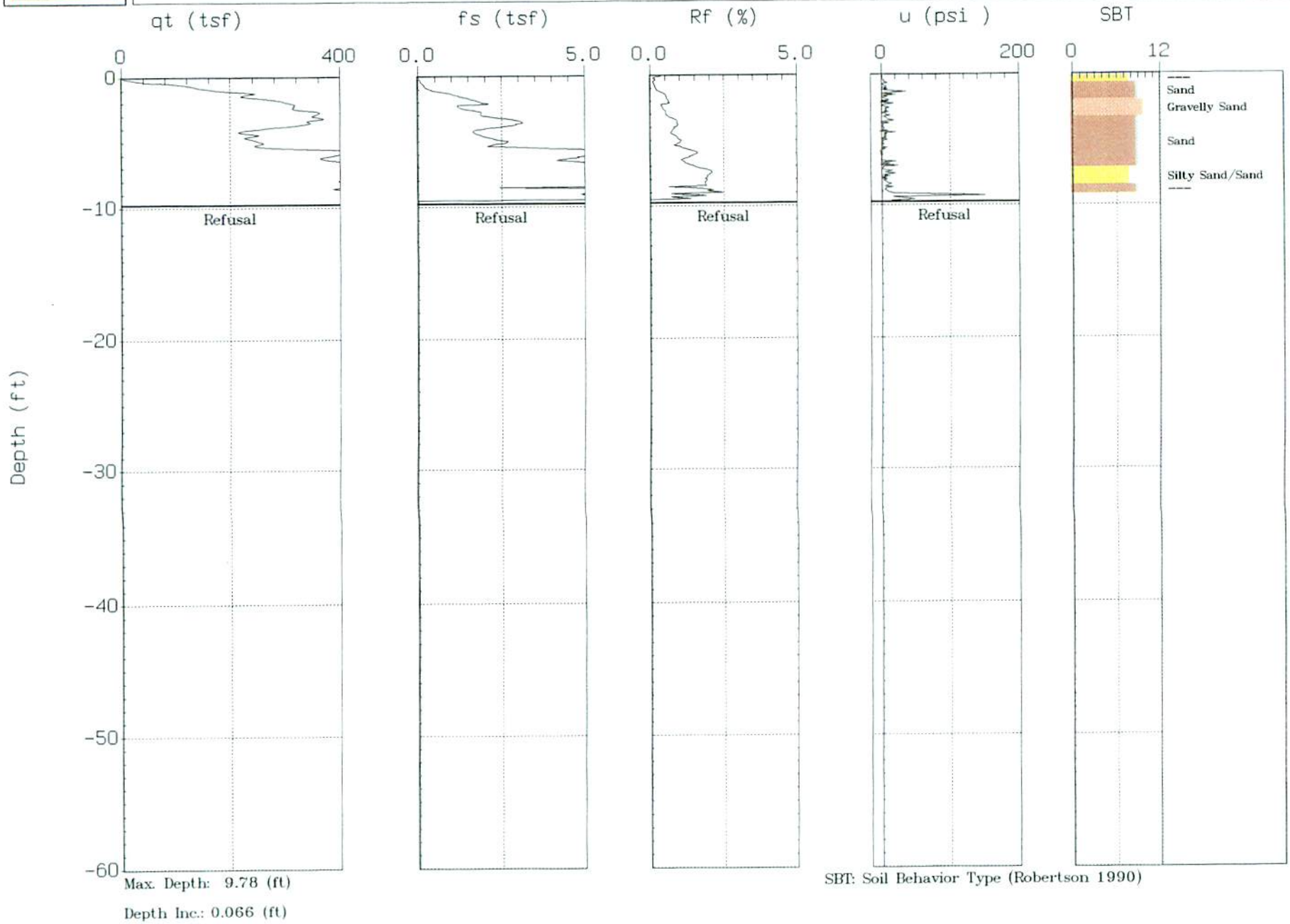
When the soundings are complete, the test holes are grouted using a Gregg In Situ support rig. The grouting procedure consists of pushing a hollow CPT rod with a "knock out" plug to the termination depth of the test hole. Grout is then pumped under pressure as the tremie pipe is pulled from the hole. Disruption or further contamination to the site is therefore minimized.

GREGG

MACTEC

Sounding: CPT-01
Location: TVA Bull Run

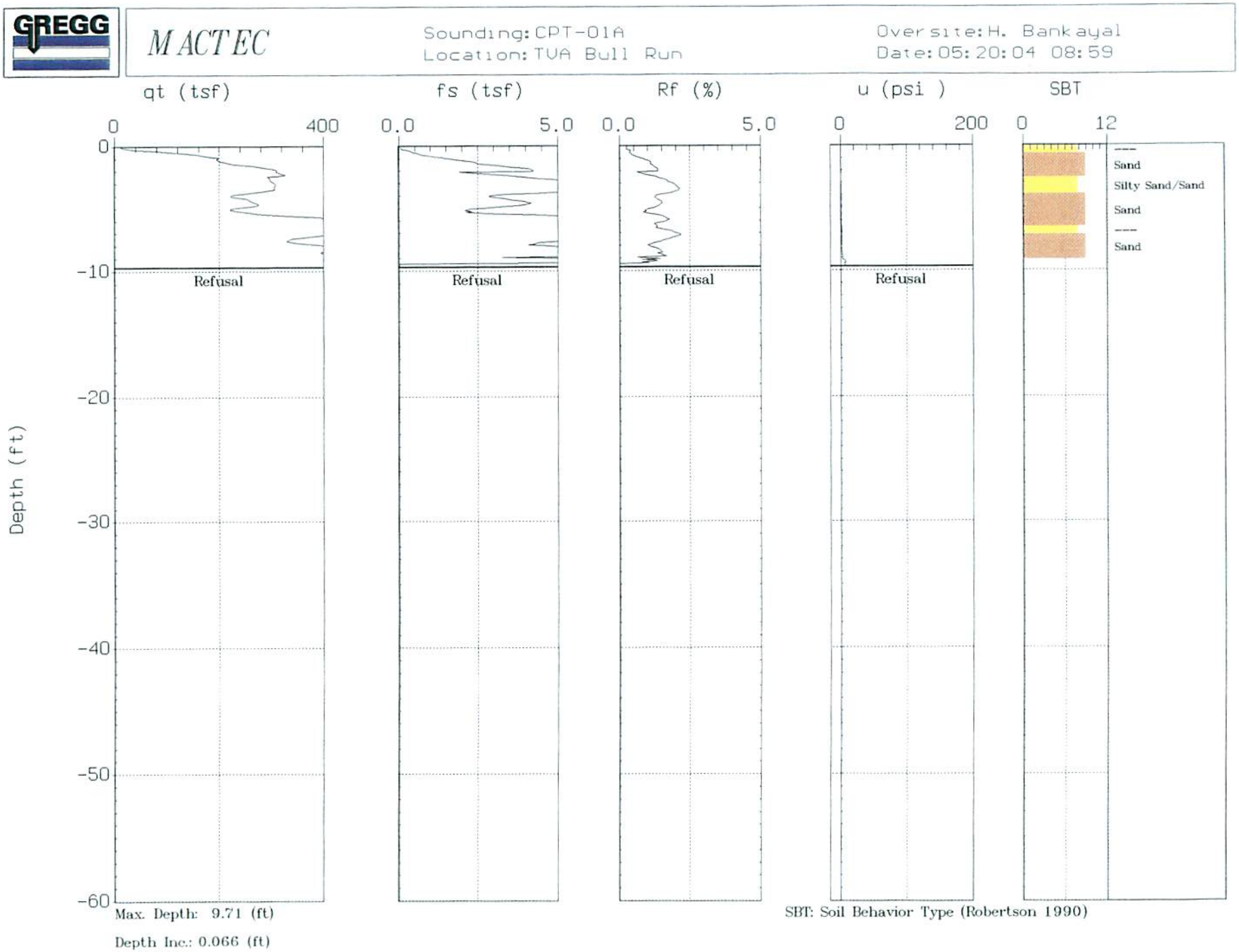
Oversite: H. Bankayal
Date: 05:20:04 08:40



Max. Depth: 9.78 (ft)

Depth Inc.: 0.066 (ft)

SBT: Soil Behavior Type (Robertson 1990)

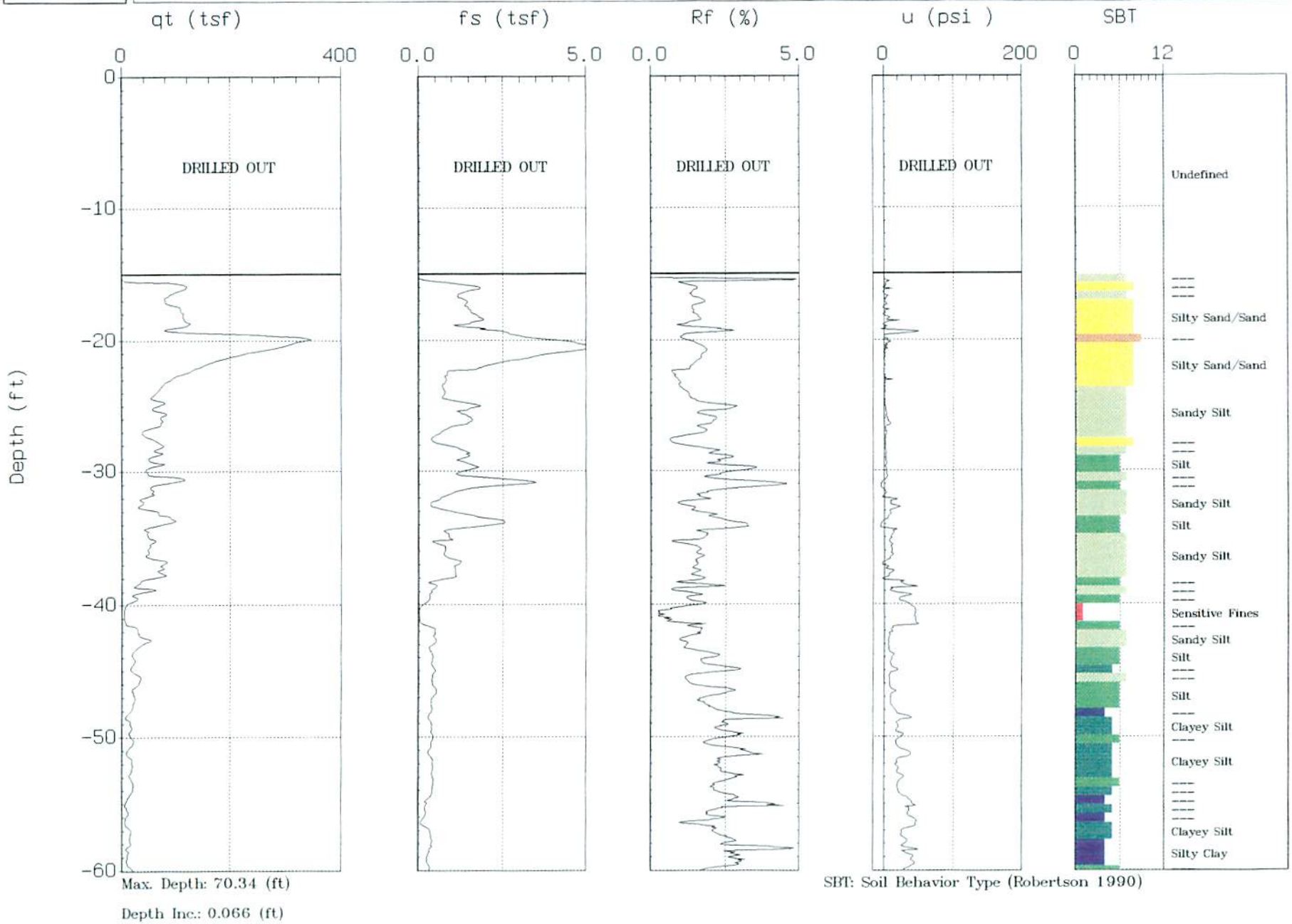

GREGG
MACTEC
Sounding: CPT-01A
Location: TVA Bull Run
Oversite: H. Bankayal
Date: 05:20:04 08:59
qt (tsf)
fs (tsf)
Rf (%)
u (psi)
SBT
0
400
0.0
5.0
0.0
5.0
0
200
0
12
Refusal
Refusal
Refusal
Refusal
Sand
Silty Sand/Sand
Sand
Sand
Depth (ft)
0
-10
-20
-30
-40
-50
-60
Max. Depth: 9.71 (ft)
Depth Inc.: 0.066 (ft)
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-01B
Location: TVA Bull Run

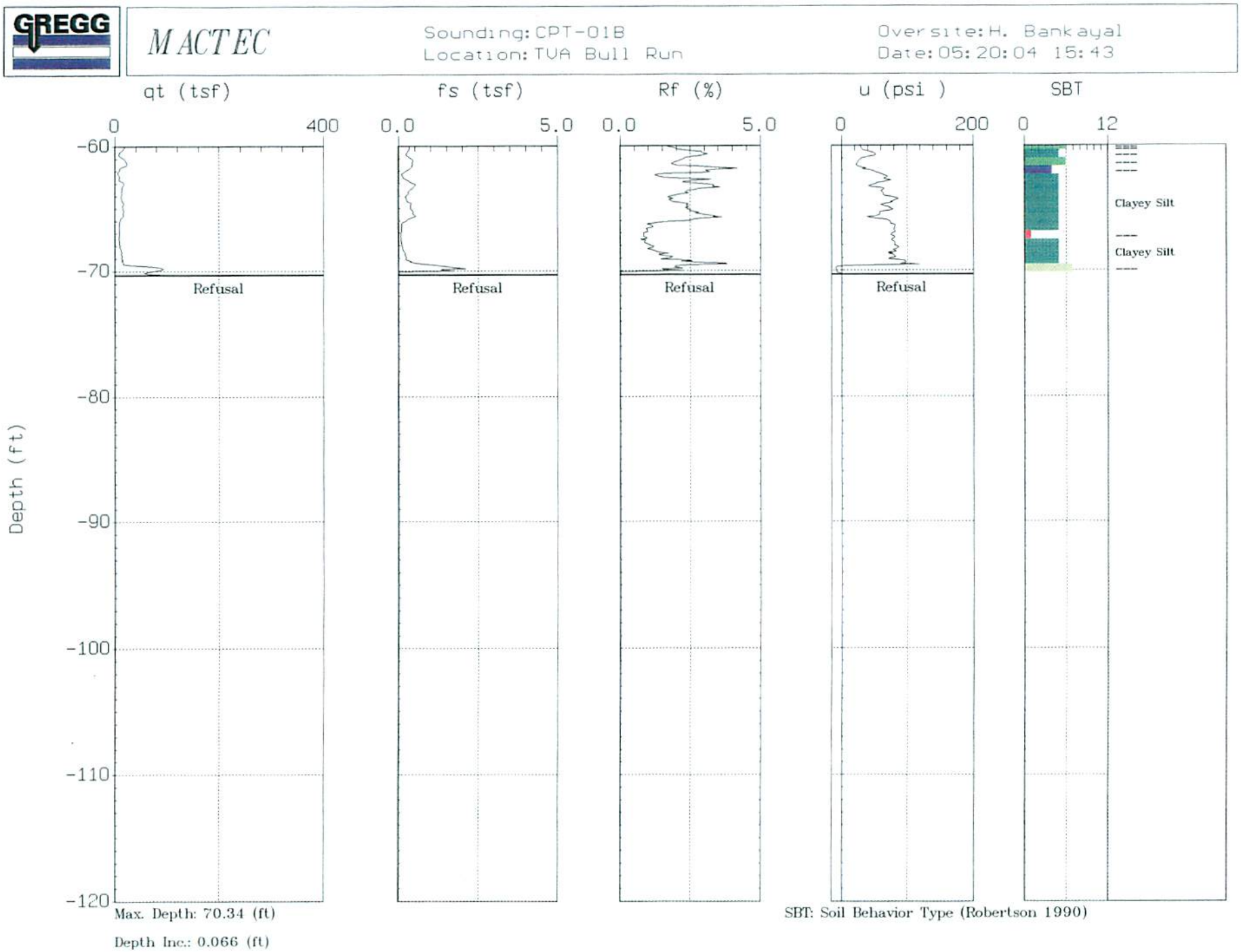
Oversite: H. Bankayal
Date: 05:20:04 15:43



Max. Depth: 70.34 (ft)

Depth Inc.: 0.066 (ft)

SBT: Soil Behavior Type (Robertson 1990)

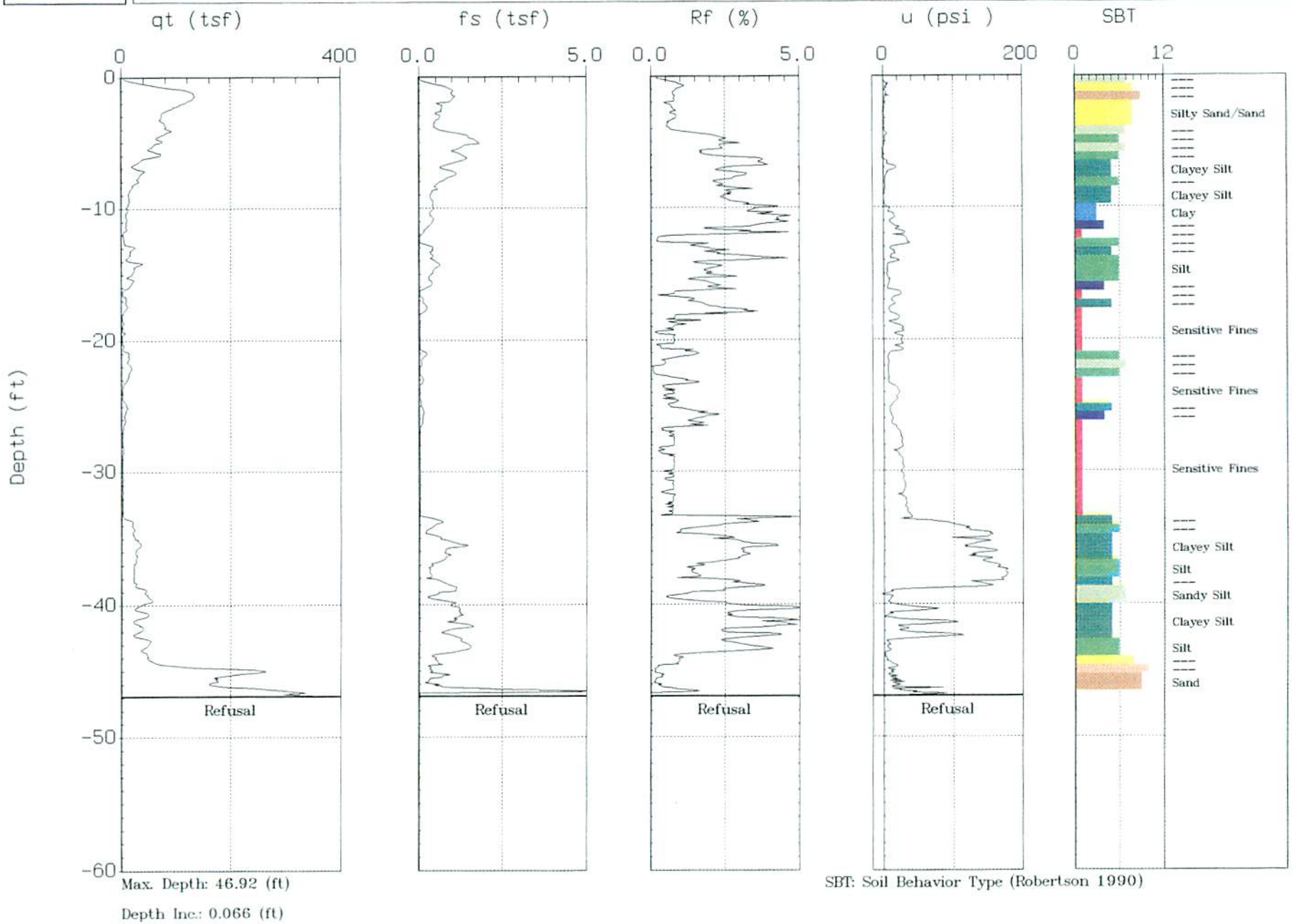

GREGG
MACTEC
Sounding: CPT-01B
Location: TVA Bull Run
Oversite: H. Bankayal
Date: 05: 20: 04 15: 43
qt (tsf)
fs (tsf)
Rf (%)
u (psi)
SBT
0
400
0.0
5.0
0.0
5.0
0
200
0
12
-60
-70
-80
-90
-100
-110
-120
Depth (ft)
Refusal
Refusal
Refusal
Refusal
Clayey Silt
Clayey Silt
Max. Depth: 70.34 (ft)
Depth Inc.: 0.066 (ft)
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-02
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:20:04 09:28



Max. Depth: 46.92 (ft)

Depth Inc.: 0.066 (ft)

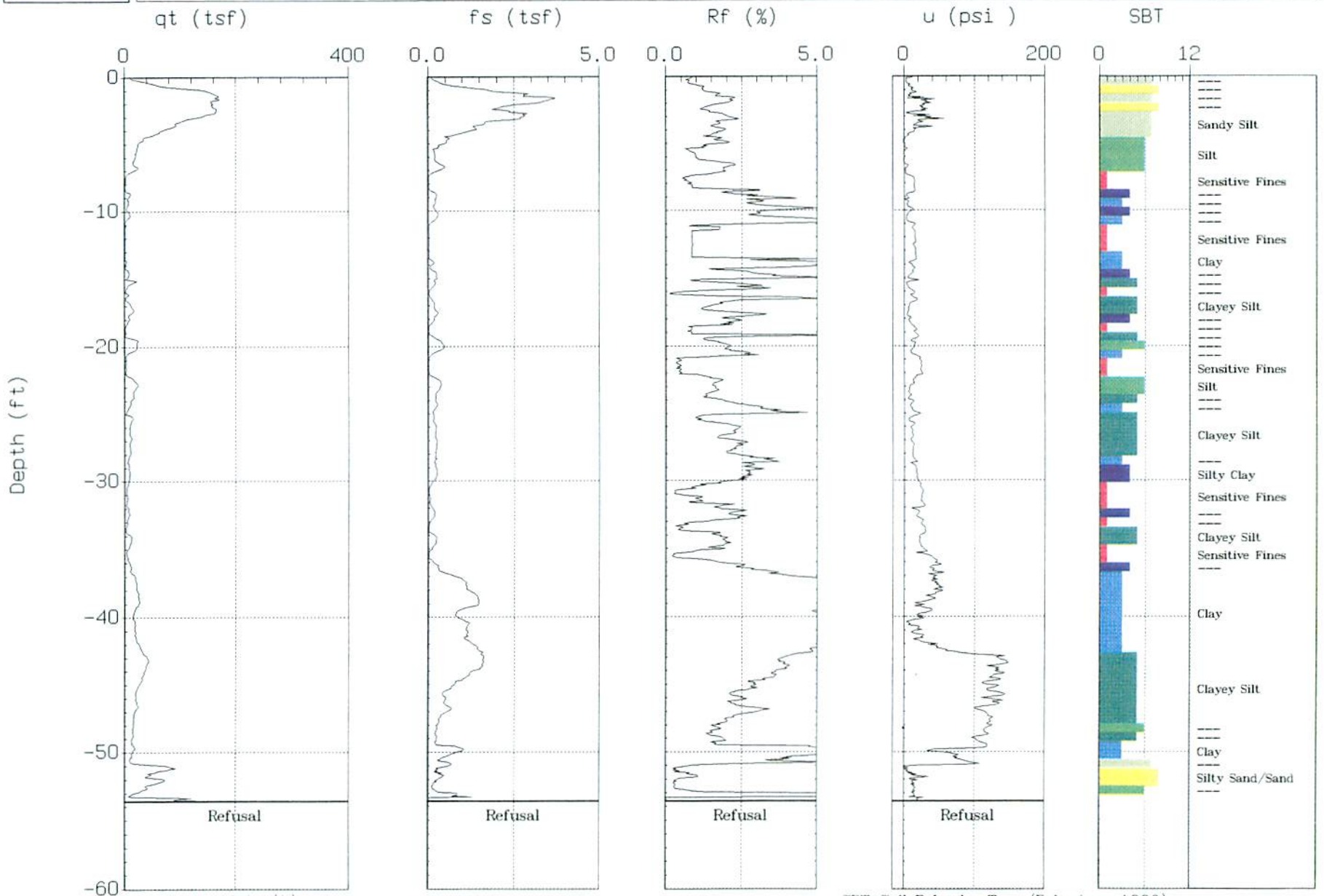
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-03
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:20:04 10:28



Max. Depth: 53.61 (ft)

Depth Inc.: 0.066 (ft)

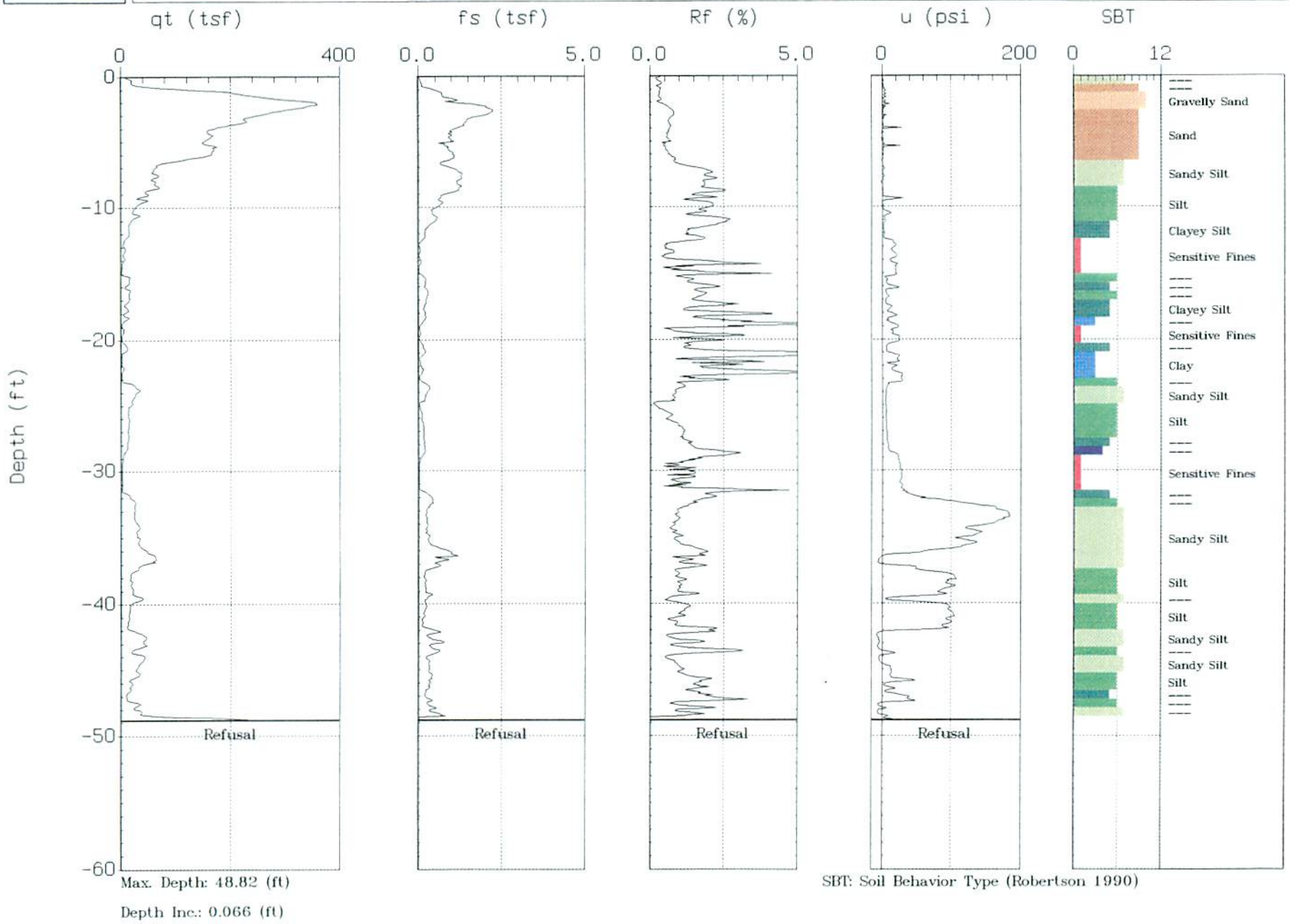
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-04
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05: 20: 04 12: 28



Max. Depth: 48.82 (ft)

Depth Inc.: 0.066 (ft)

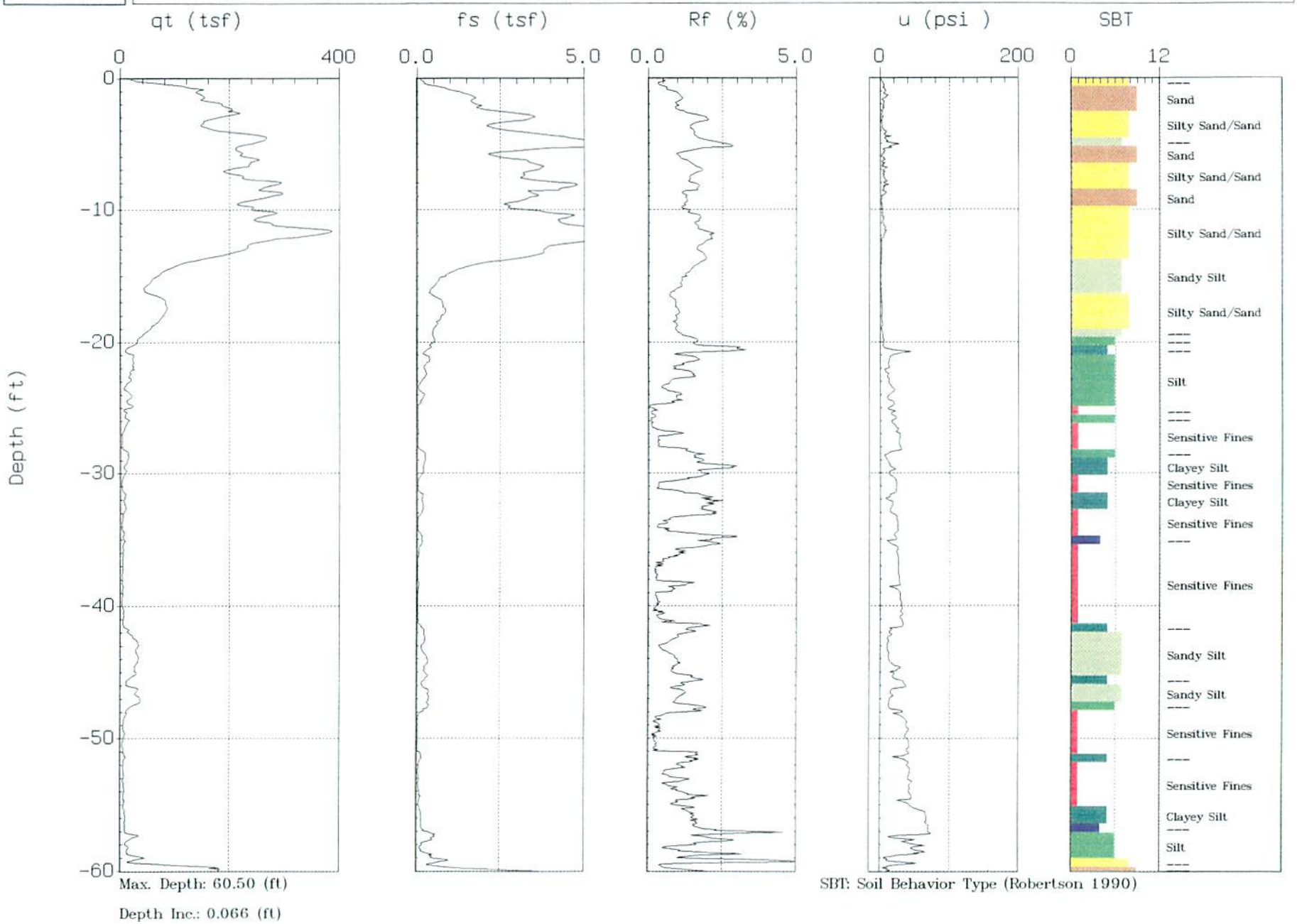
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-05
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:20:04 13:07



Max. Depth: 60.50 (ft)

Depth Inc.: 0.066 (ft)

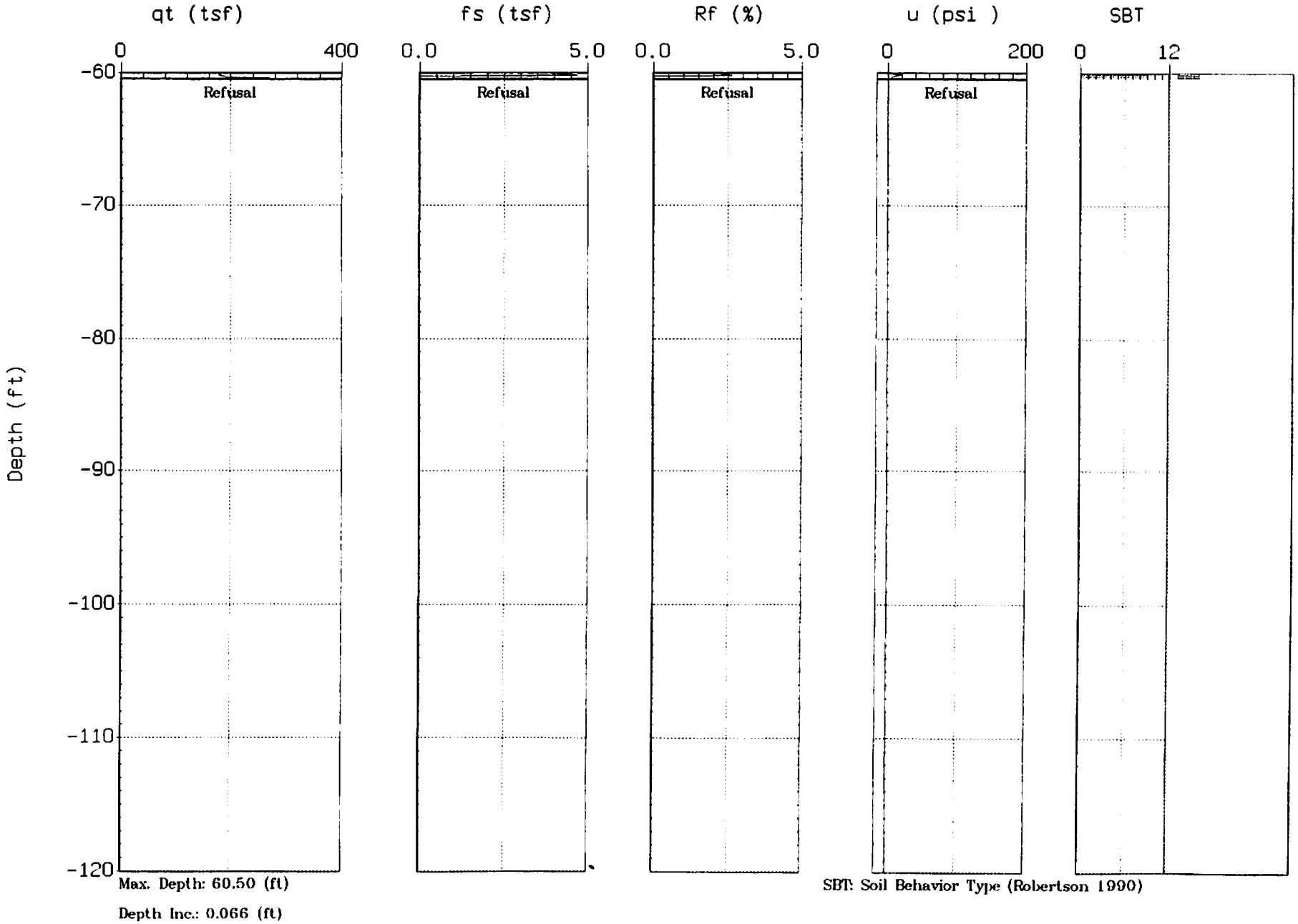
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-05
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:20:04 13:07



Max. Depth: 60.50 (ft)

Depth Inc.: 0.066 (ft)

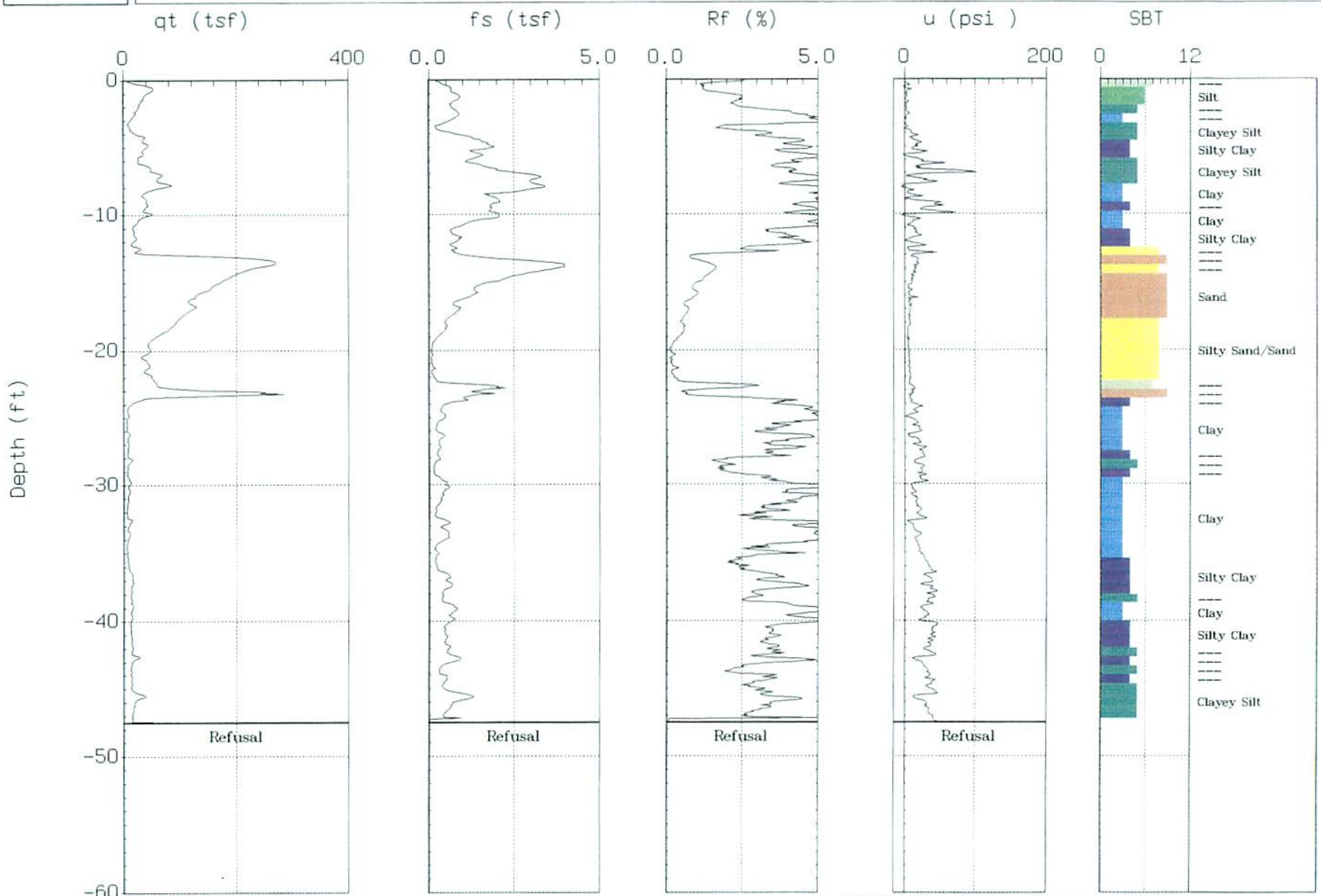
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-06
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:21:04 09:42



Max. Depth: 47.51 (ft)

Depth Inc.: 0.066 (ft)

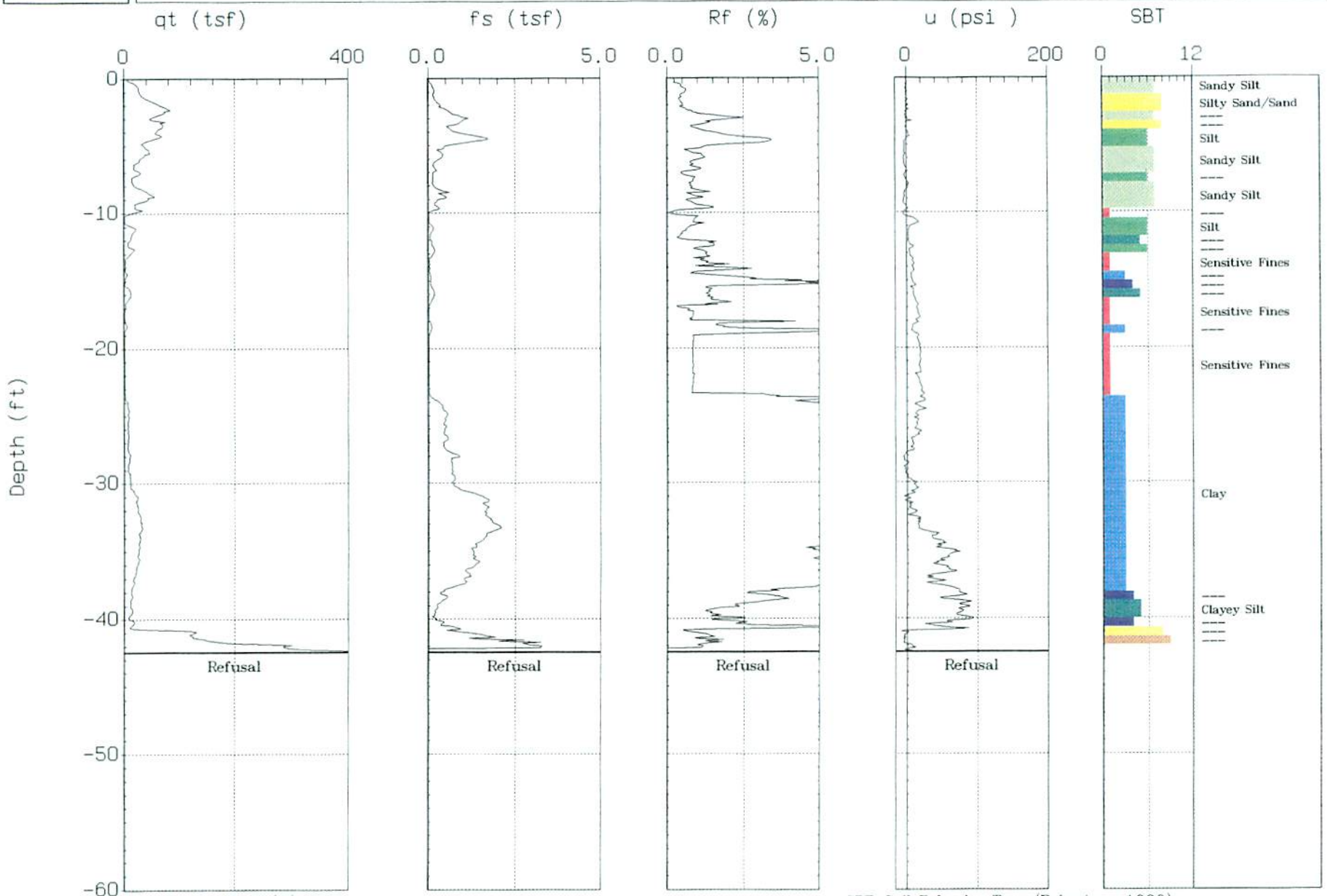
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-07
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:20:04 13:56



Max. Depth: 42.45 (ft)

Depth Inc.: 0.066 (ft)

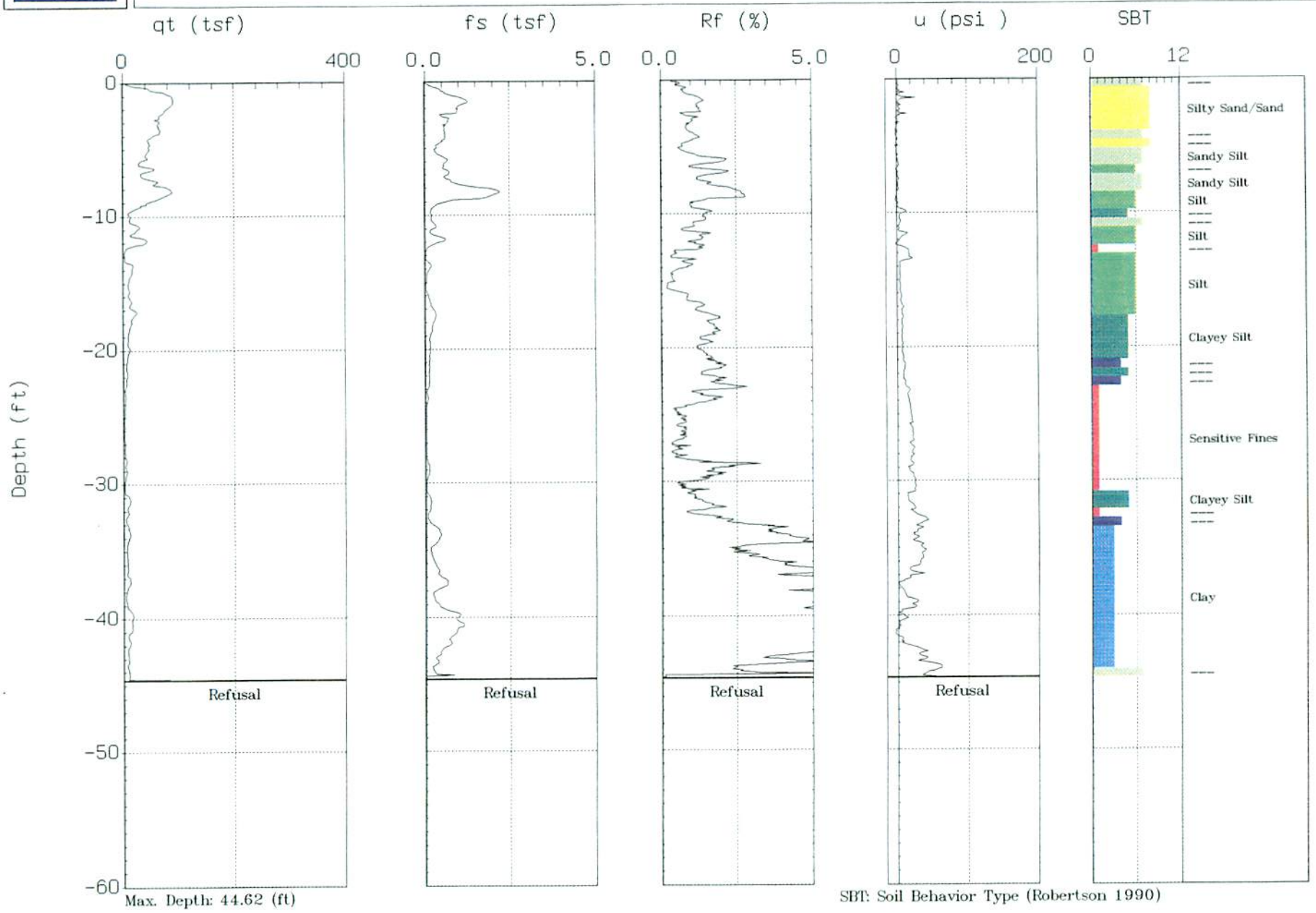
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-08
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:20:04 14:33



Max. Depth: 44.62 (ft)

Depth Inc.: 0.066 (ft)

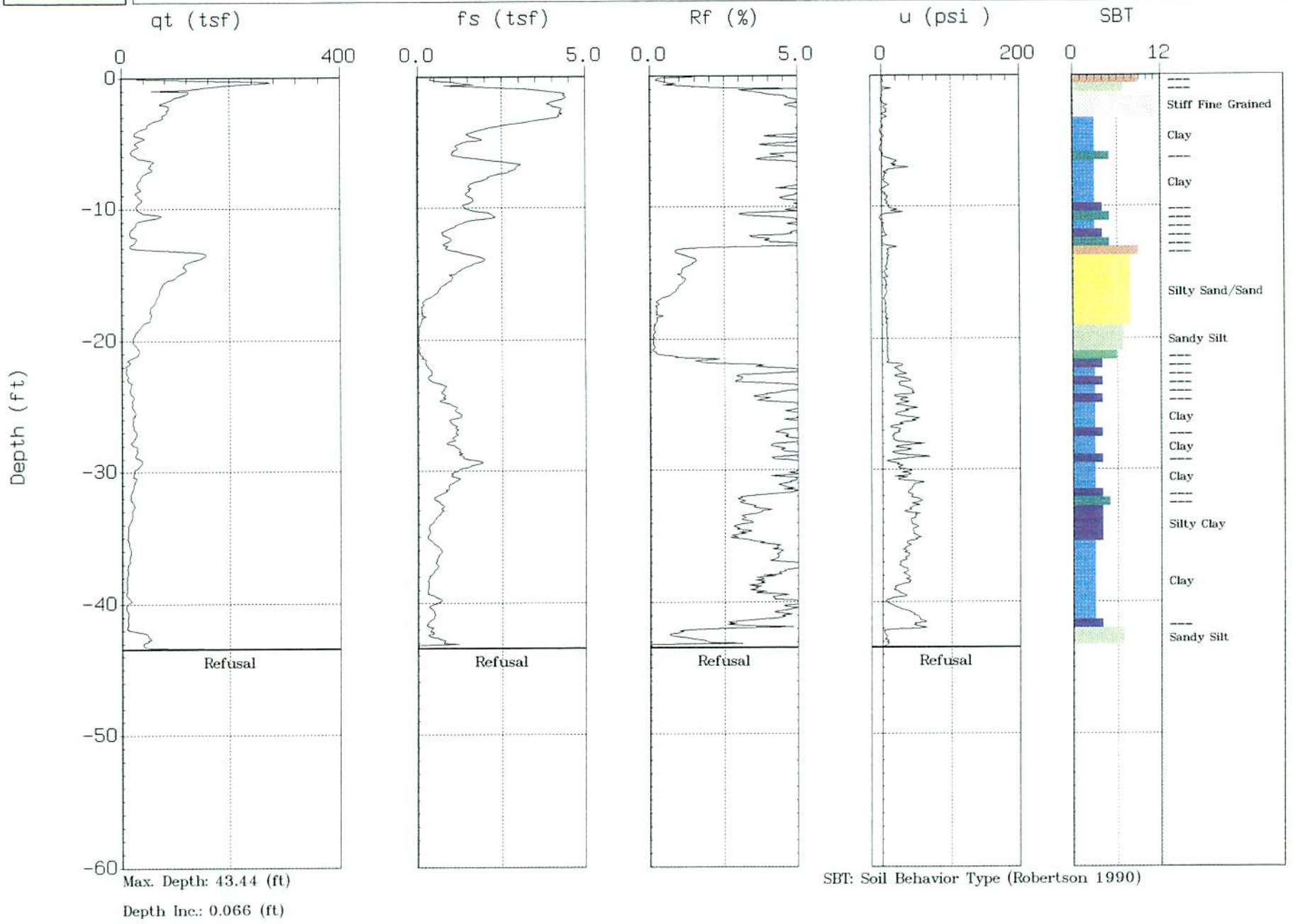
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-09
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:21:04 10:28



Max. Depth: 43.44 (ft)

Depth Inc.: 0.066 (ft)

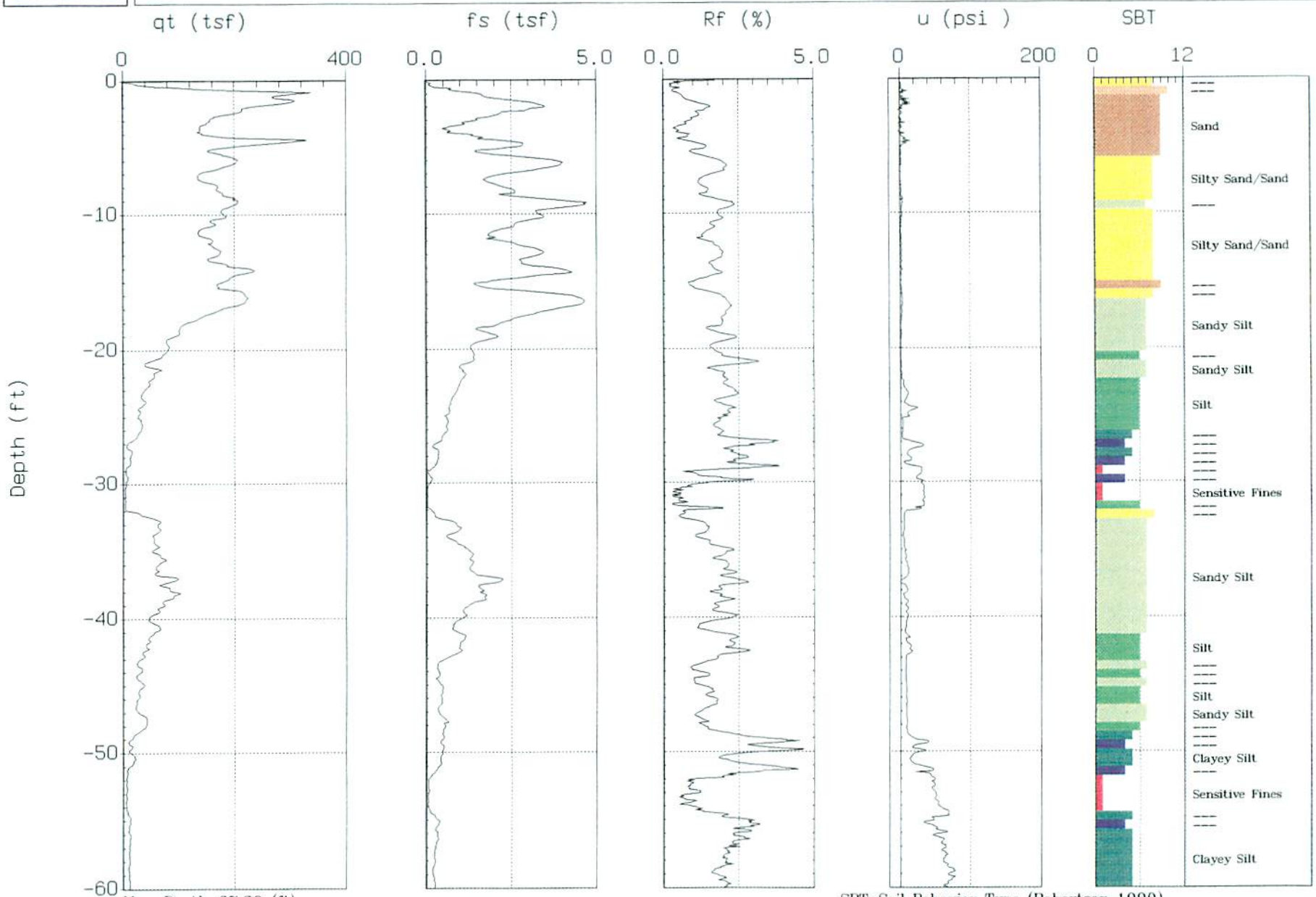
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-10
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:21:04 08:01



Max. Depth: 67.39 (ft)

Depth Inc.: 0.066 (ft)

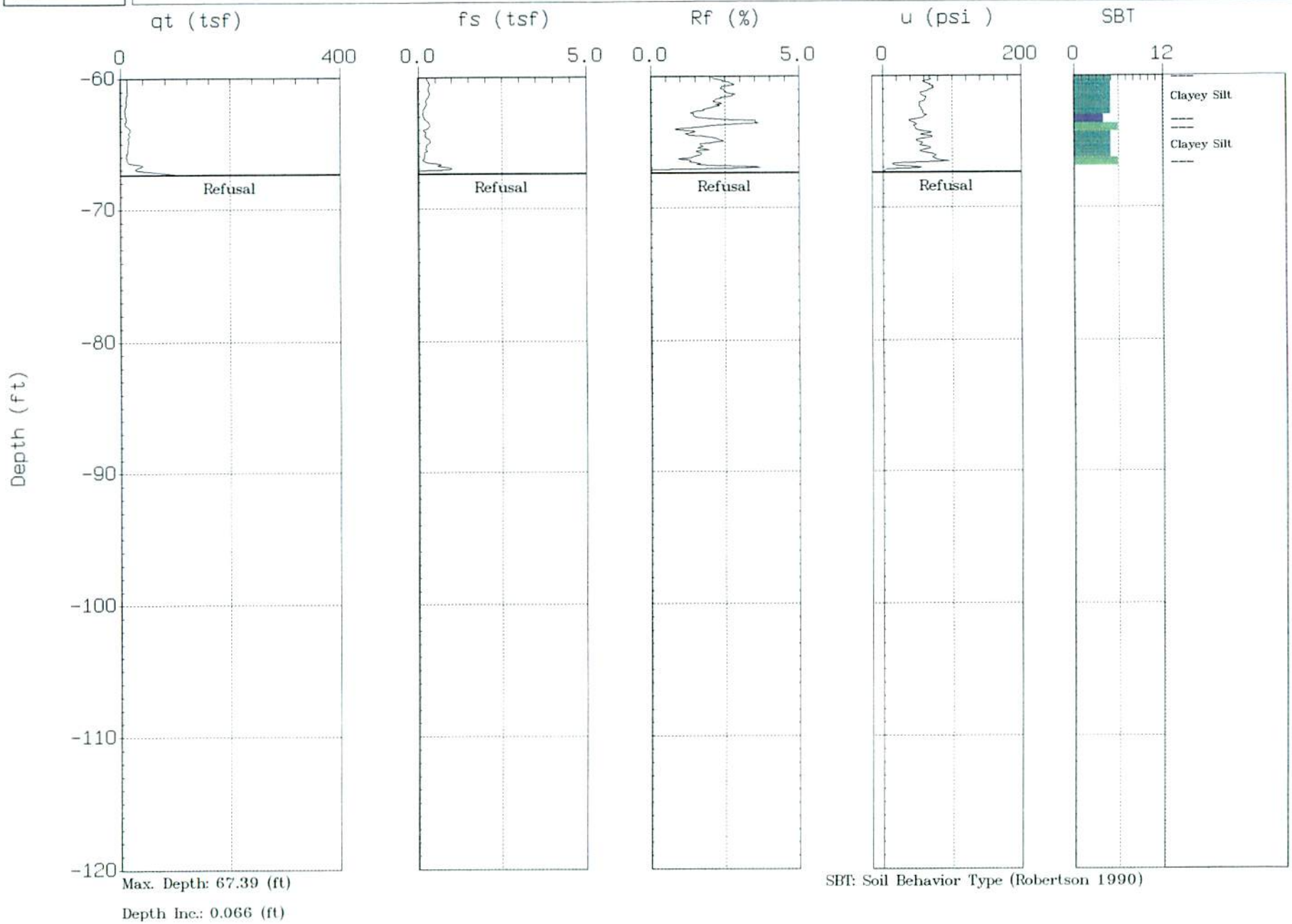
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-10
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:21:04 08:01



Max. Depth: 67.39 (ft)

Depth Inc.: 0.066 (ft)

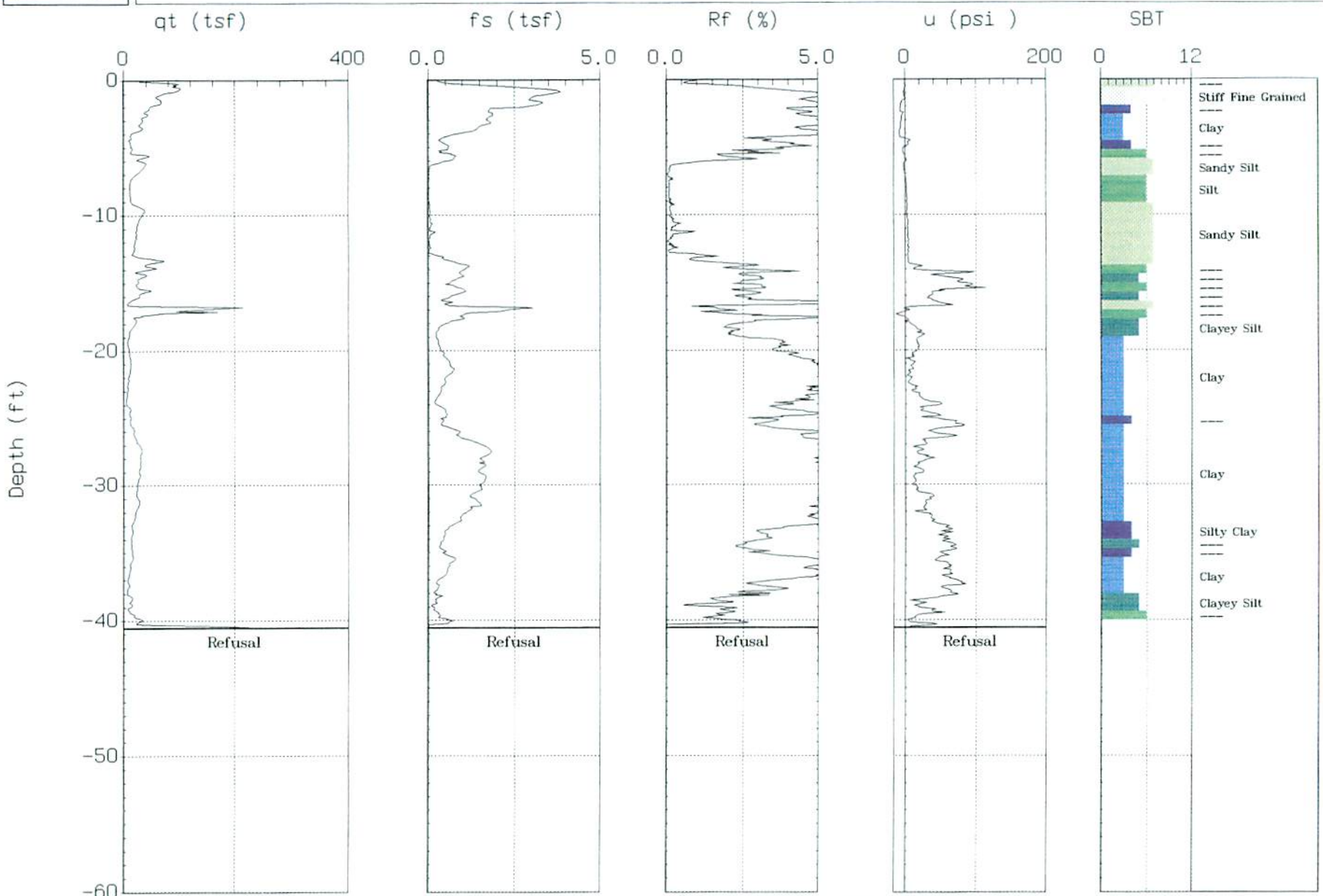
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-11
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:21:04 08:58



Max. Depth: 40.55 (ft)

Depth Inc.: 0.066 (ft)

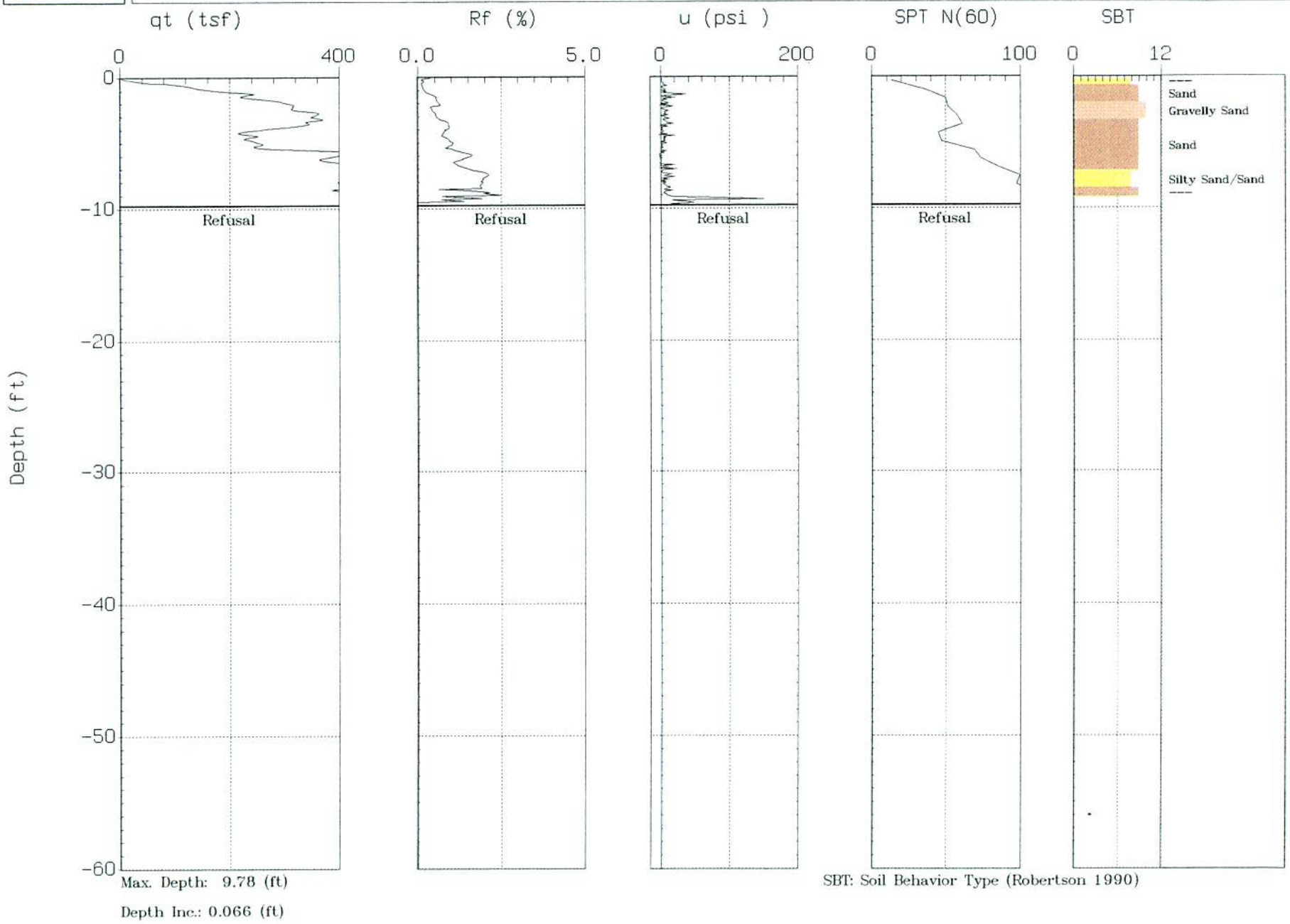
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-01
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:20:04 08:40



Max. Depth: 9.78 (ft)

Depth Inc.: 0.066 (ft)

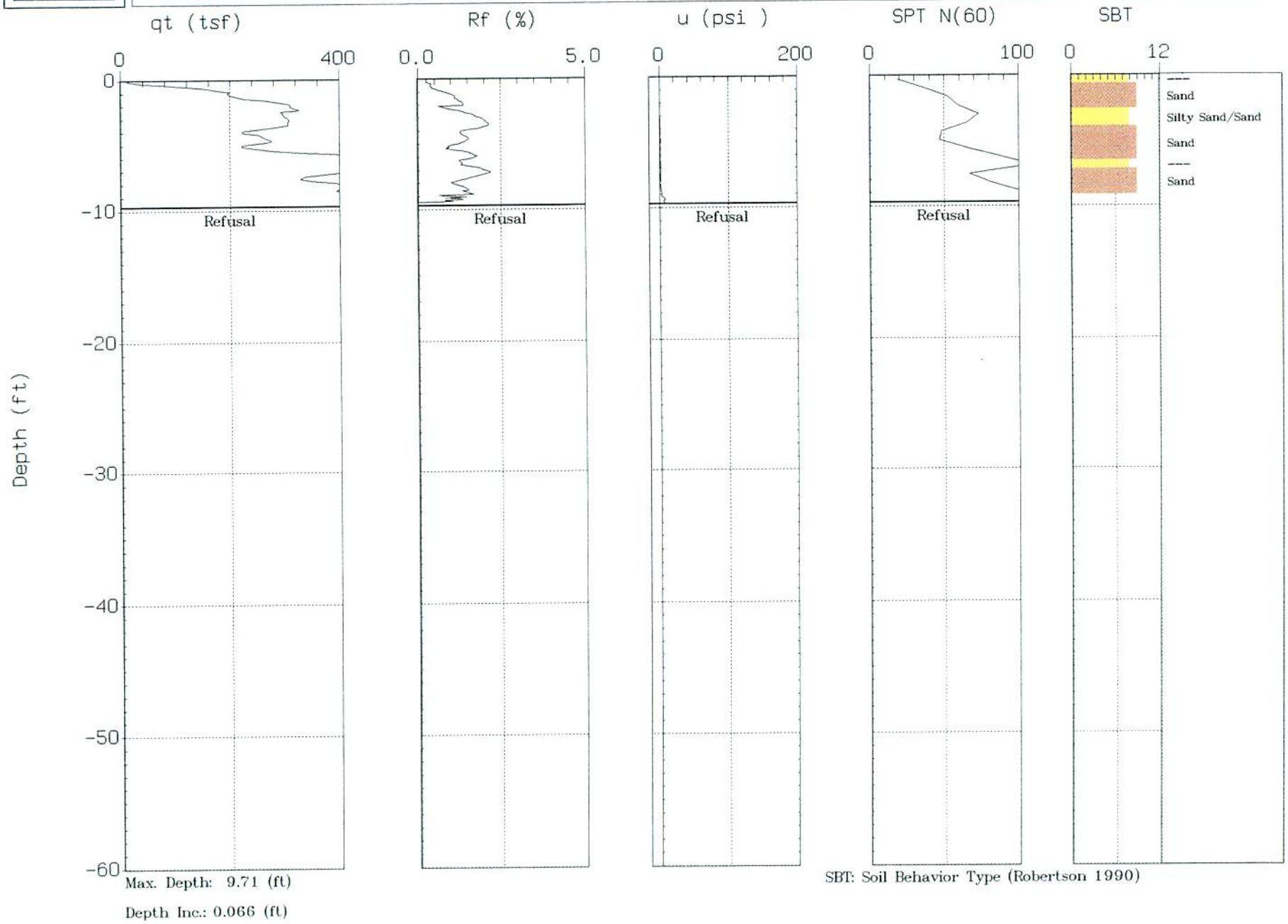
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-01A
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:20:04 08:59

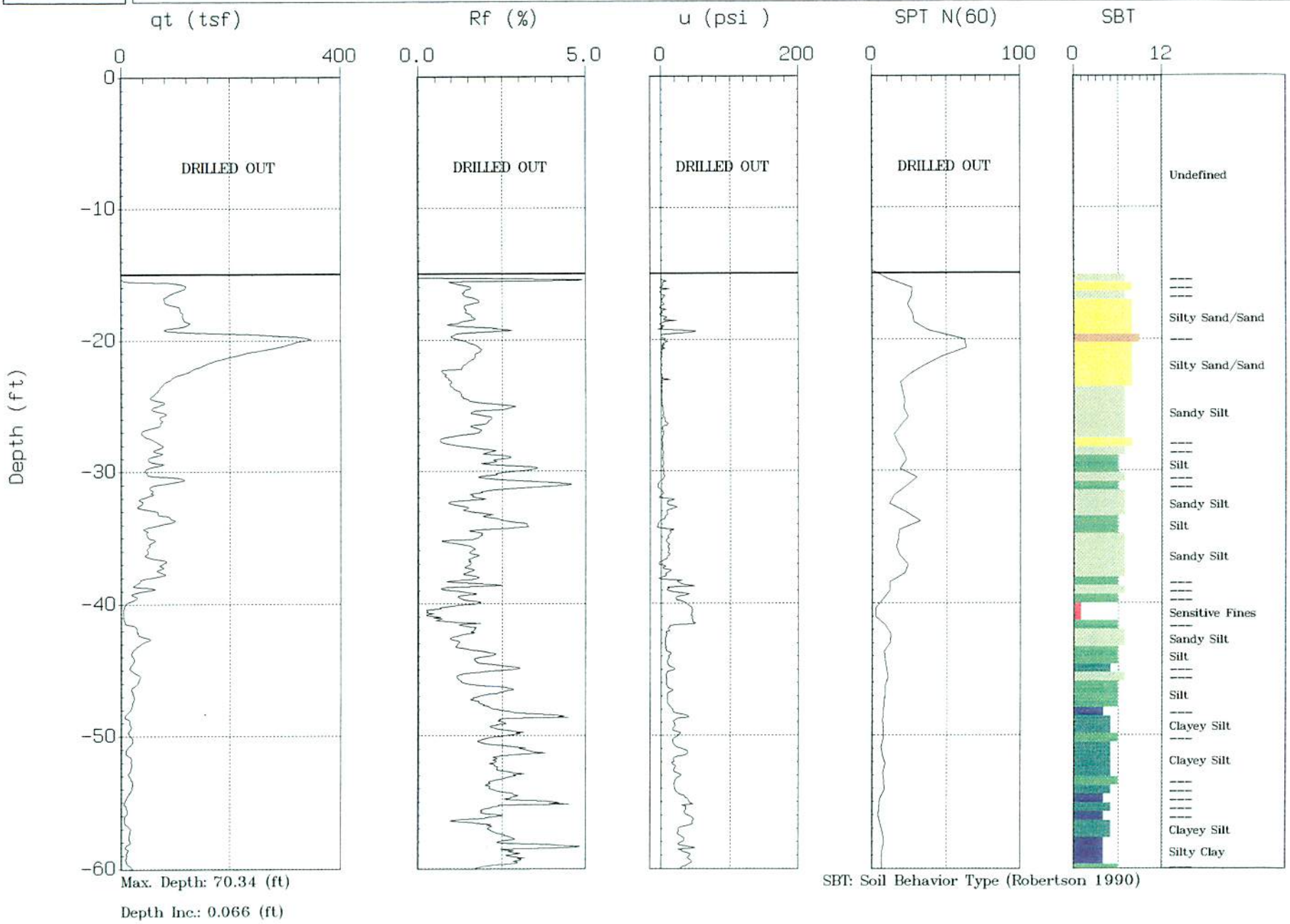


GREGG

MACTEC

Sounding: CPT-01B
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:20:04 15:43



Max. Depth: 70.34 (ft)

Depth Inc.: 0.066 (ft)

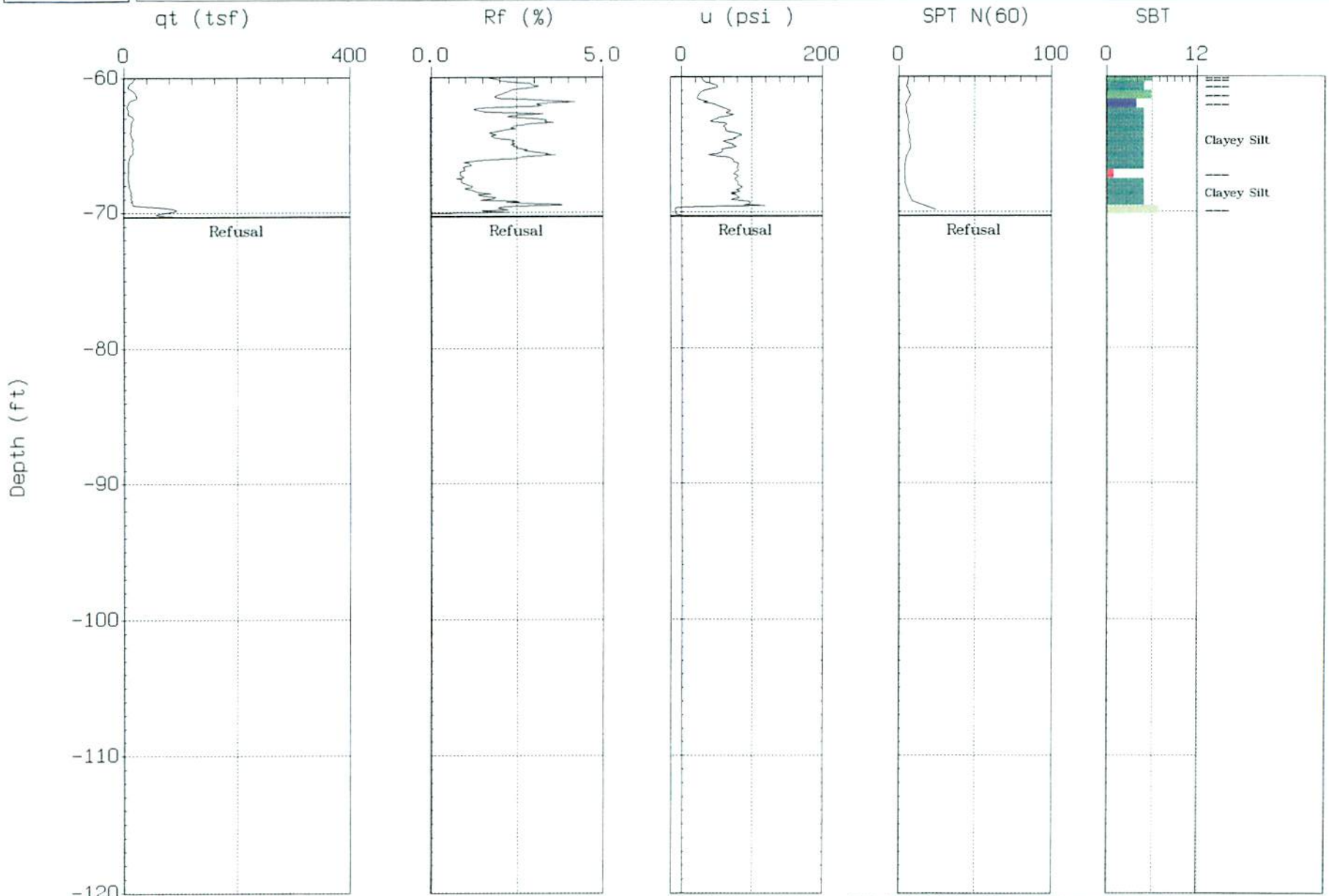
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-01B
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:20:04 15:43



Max. Depth: 70.34 (ft)

Depth Inc.: 0.066 (ft)

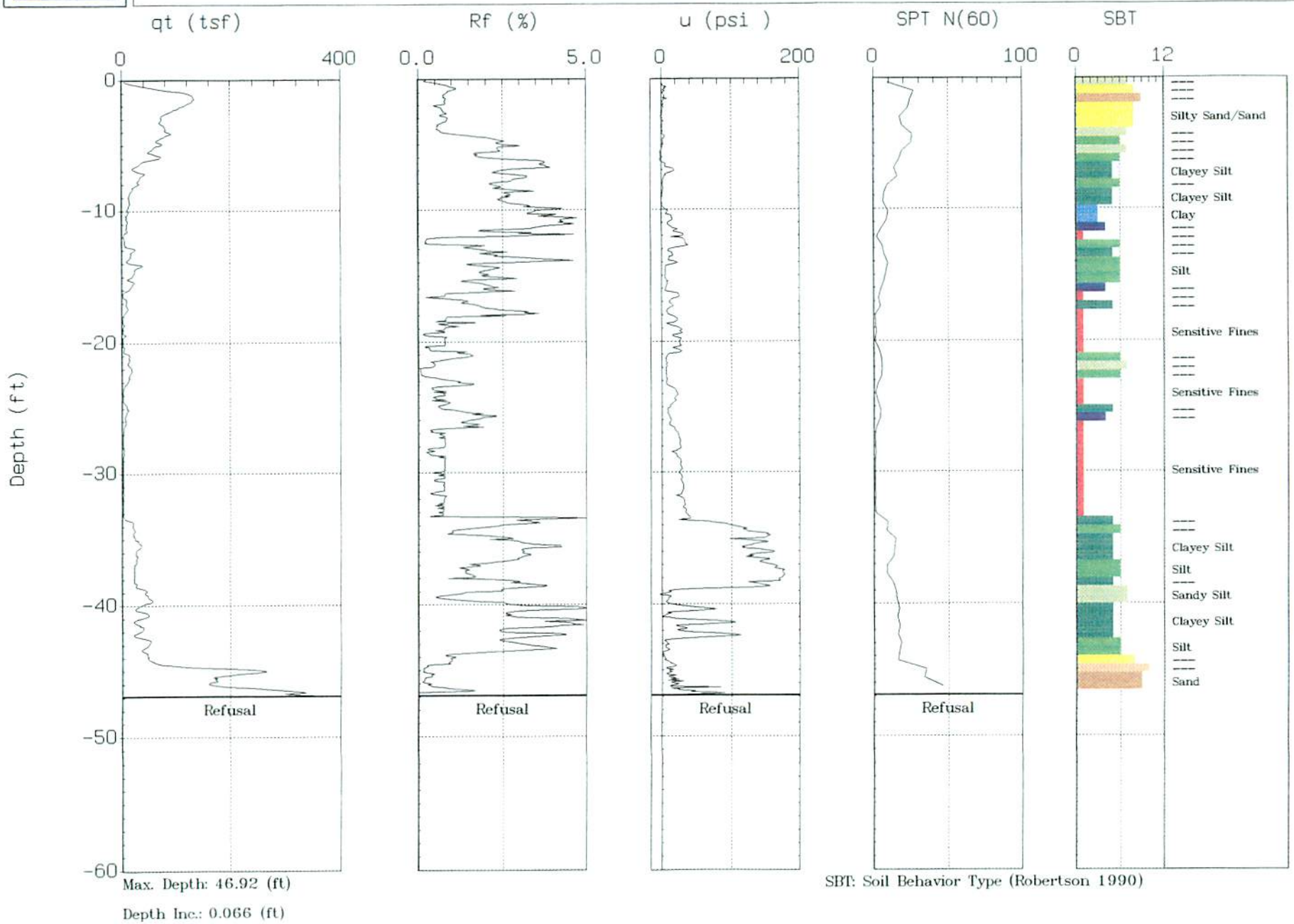
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-02
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:20:04 09:28



Max. Depth: 46.92 (ft)

Depth Inc.: 0.066 (ft)

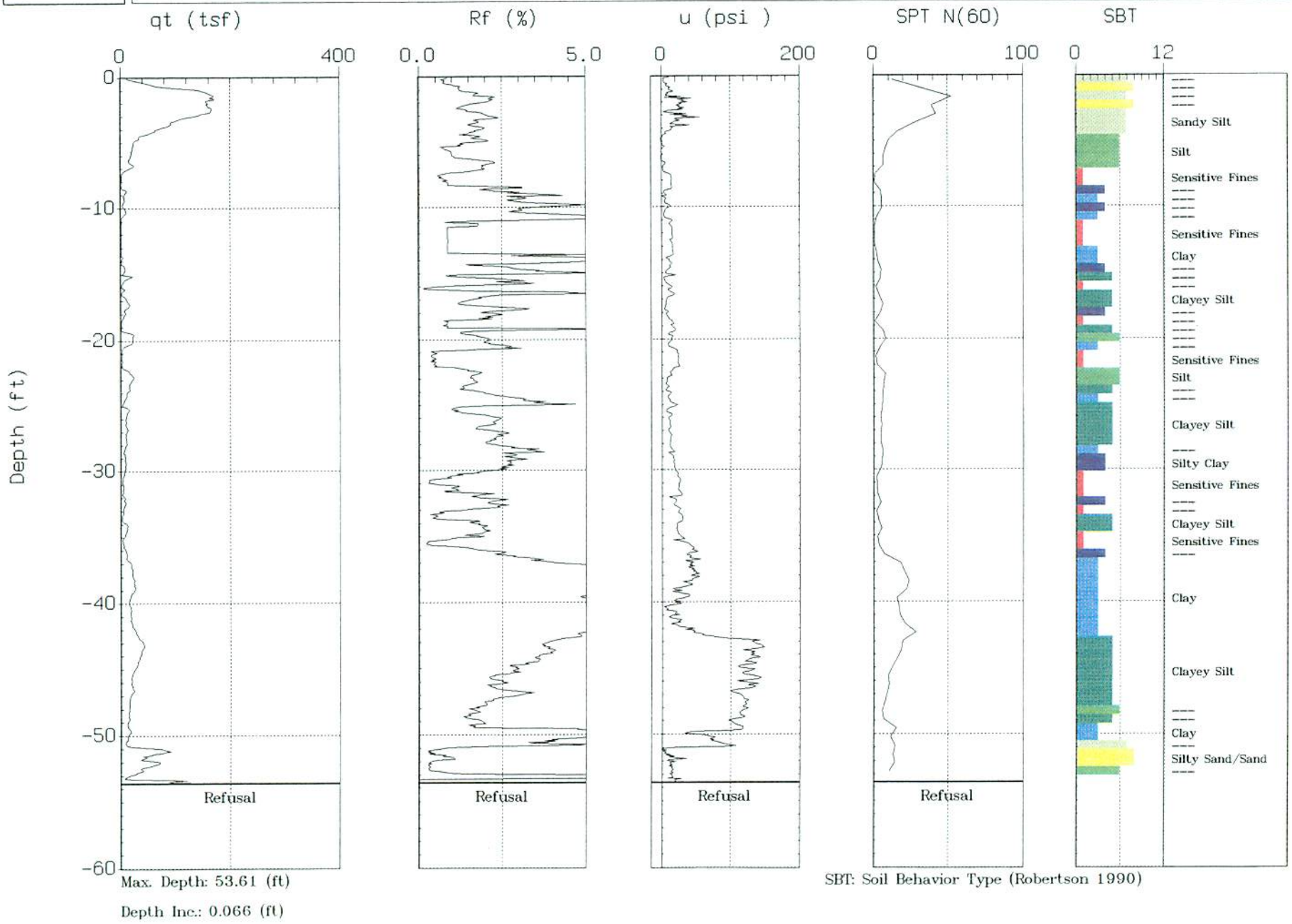
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-03
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:20:04 10:28



Max. Depth: 53.61 (ft)

Depth Inc.: 0.066 (ft)

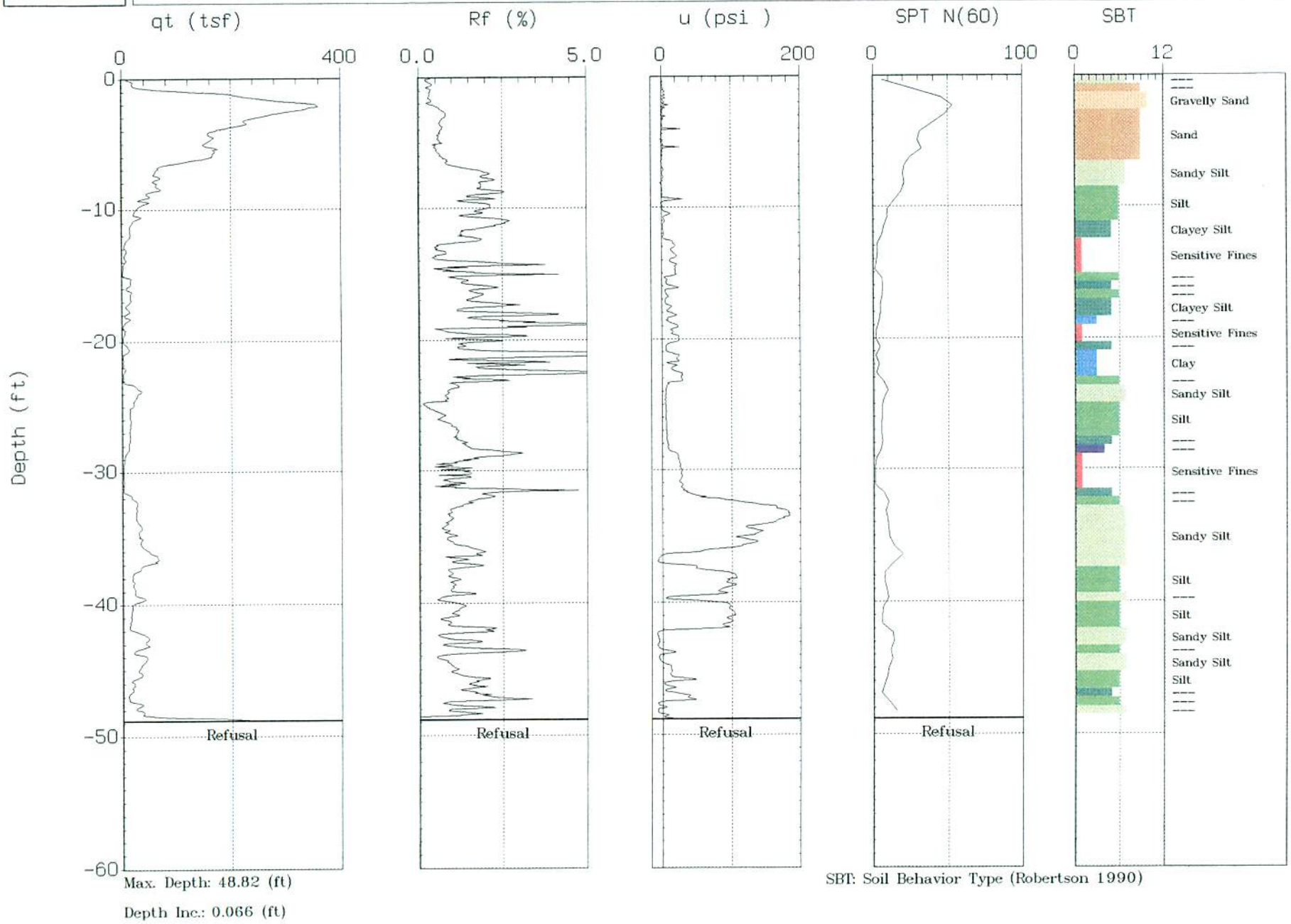
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-04
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05: 20: 04 12: 28



Max. Depth: 48.82 (ft)

Depth Inc.: 0.066 (ft)

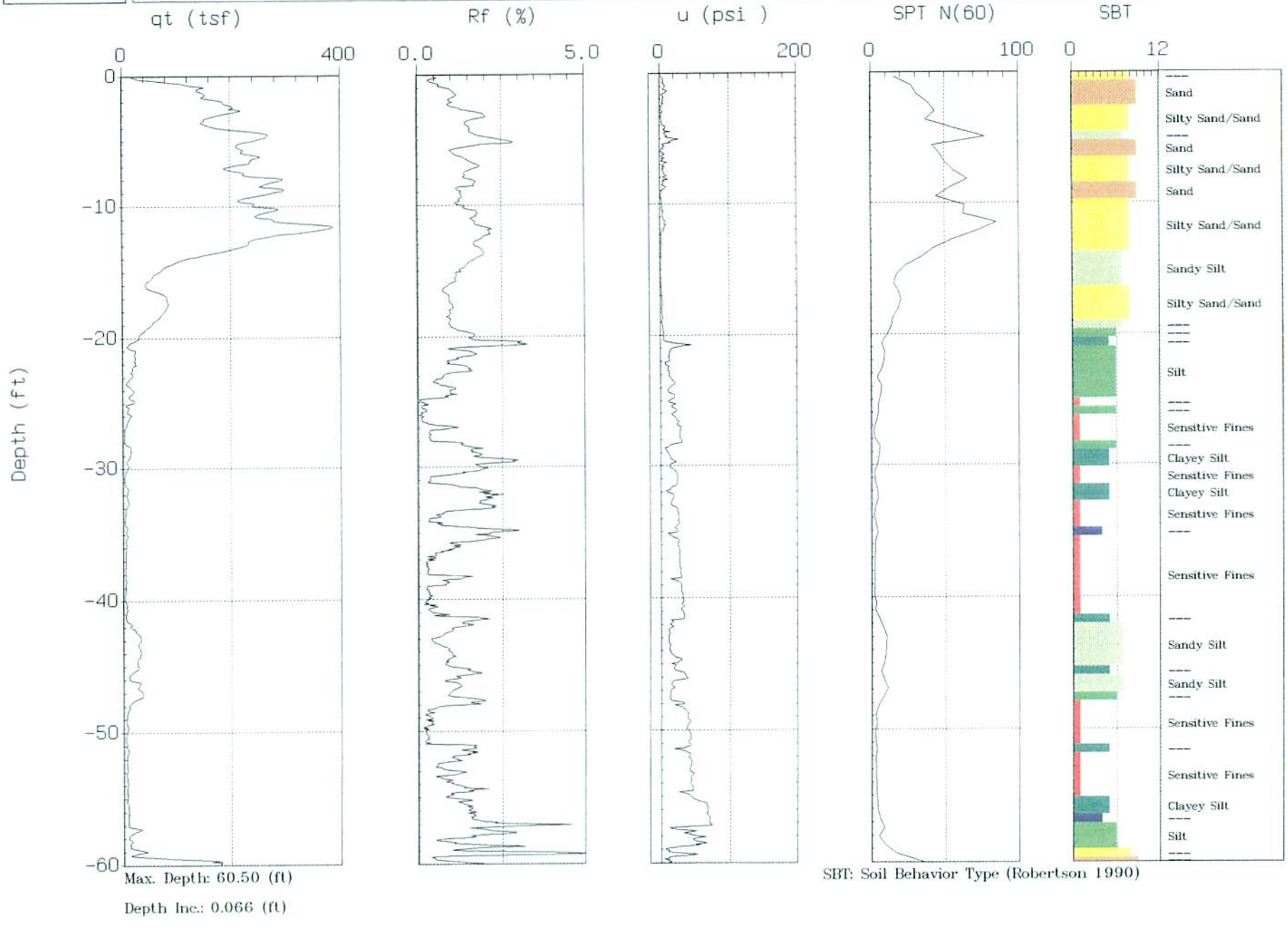
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-05
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:20:04 13:07



Max. Depth: 60.50 (ft)

Depth Inc.: 0.066 (ft)

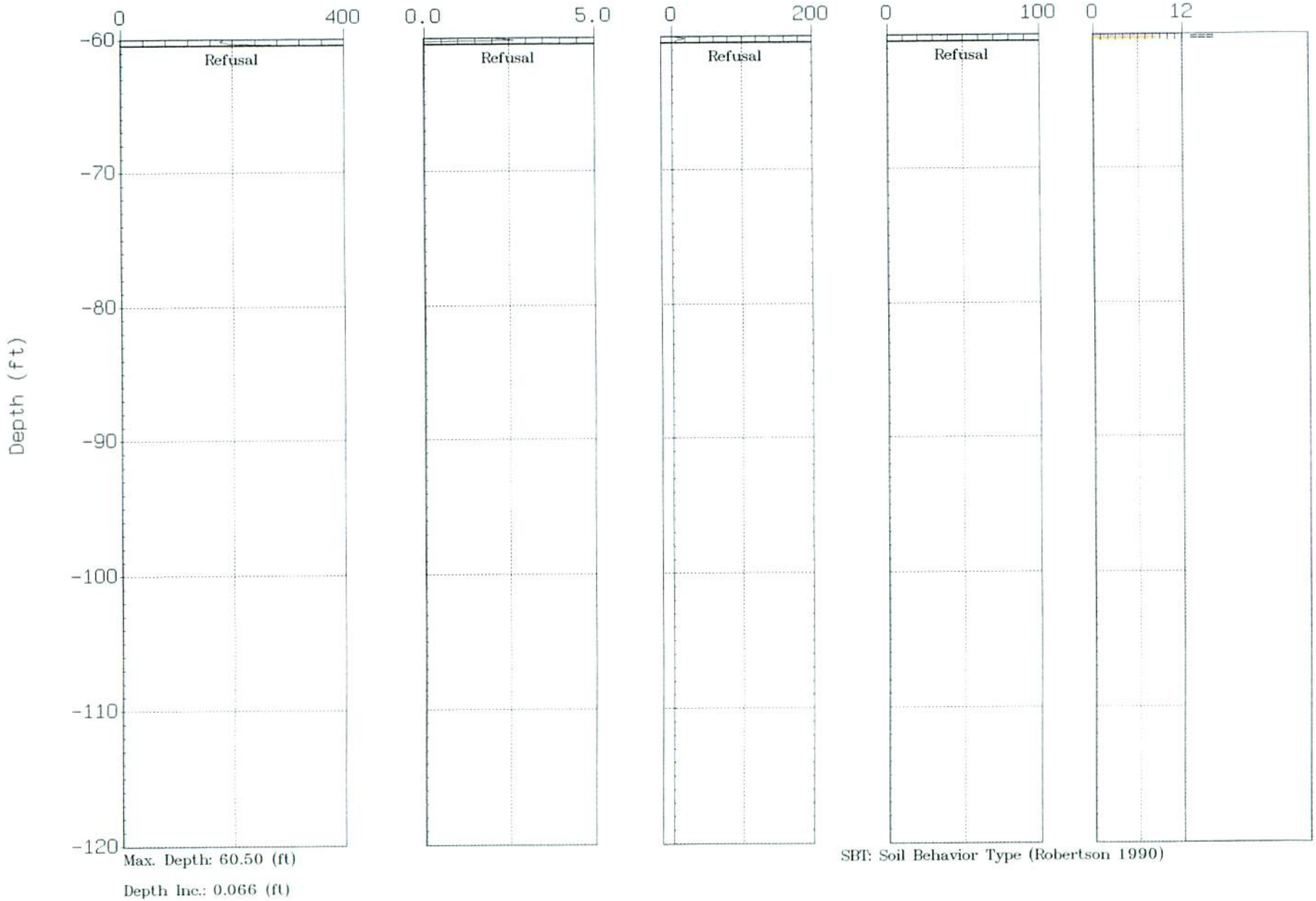
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-05
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:20:04 13:07



Max. Depth: 60.50 (ft)

Depth Inc.: 0.066 (ft)

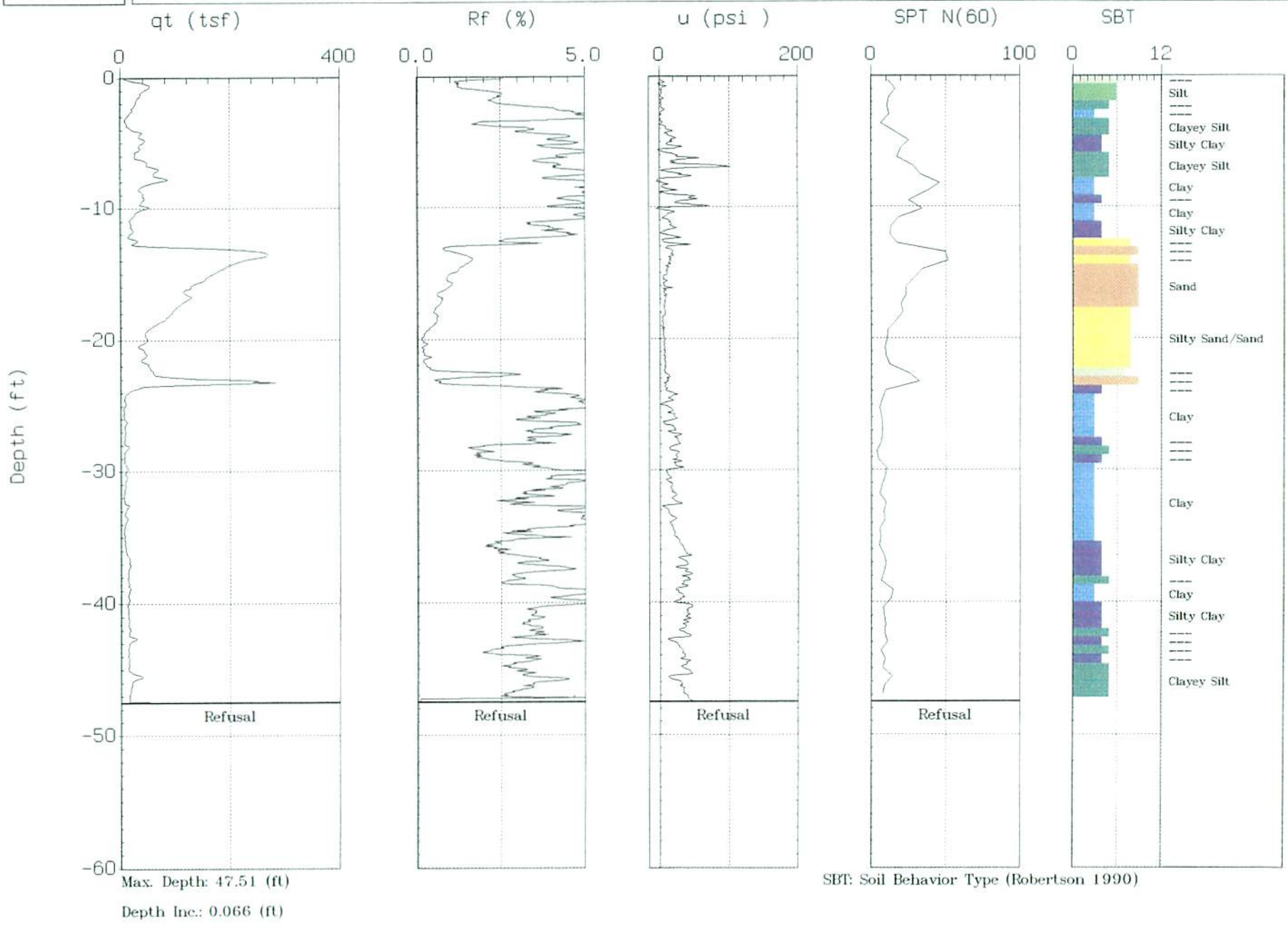
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-06
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:21:04 09:42



Max. Depth: 47.51 (ft)

Depth Inc.: 0.066 (ft)

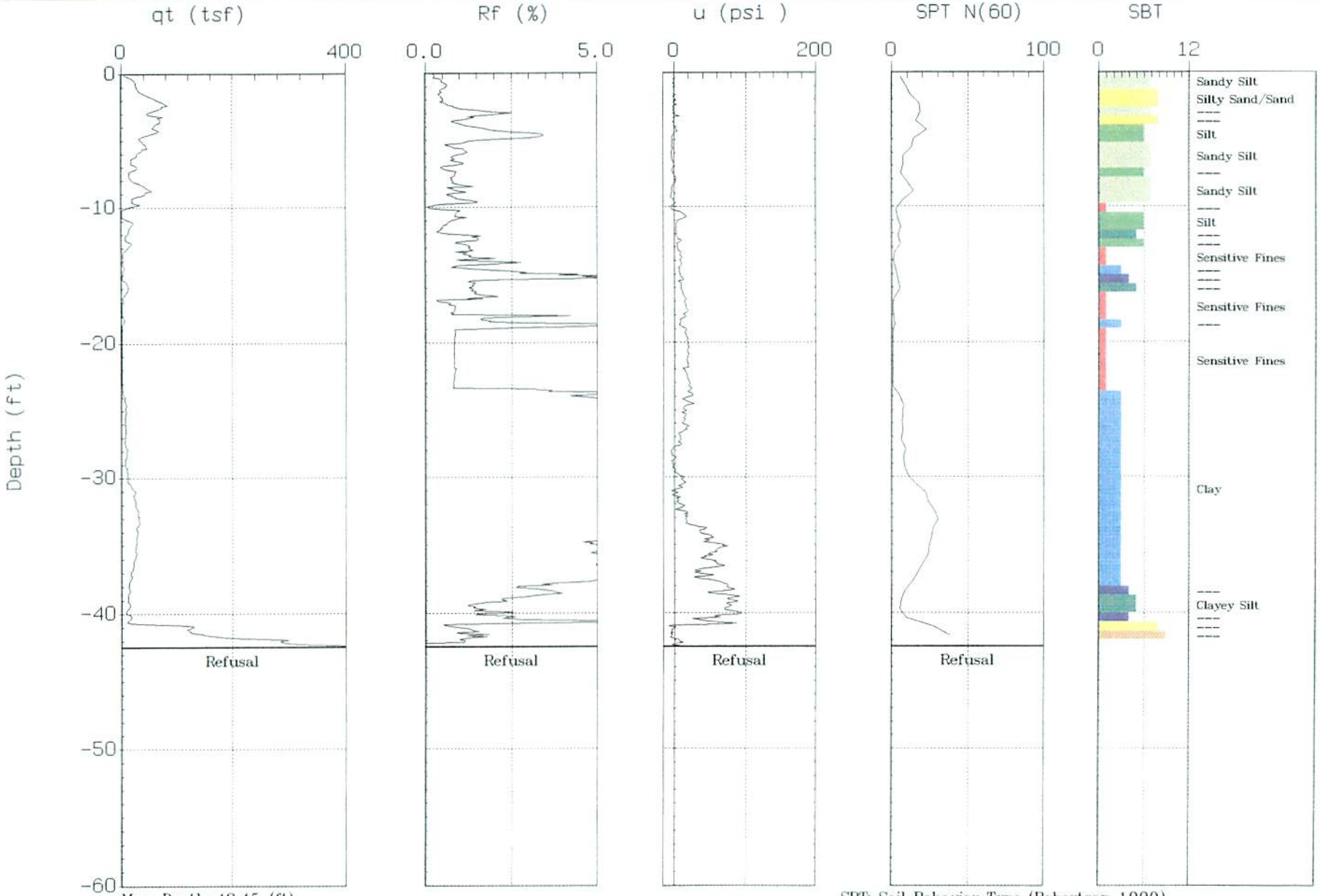
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-07
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:20:04 13:56



Max. Depth: 42.45 (ft)

Depth Inc.: 0.066 (ft)

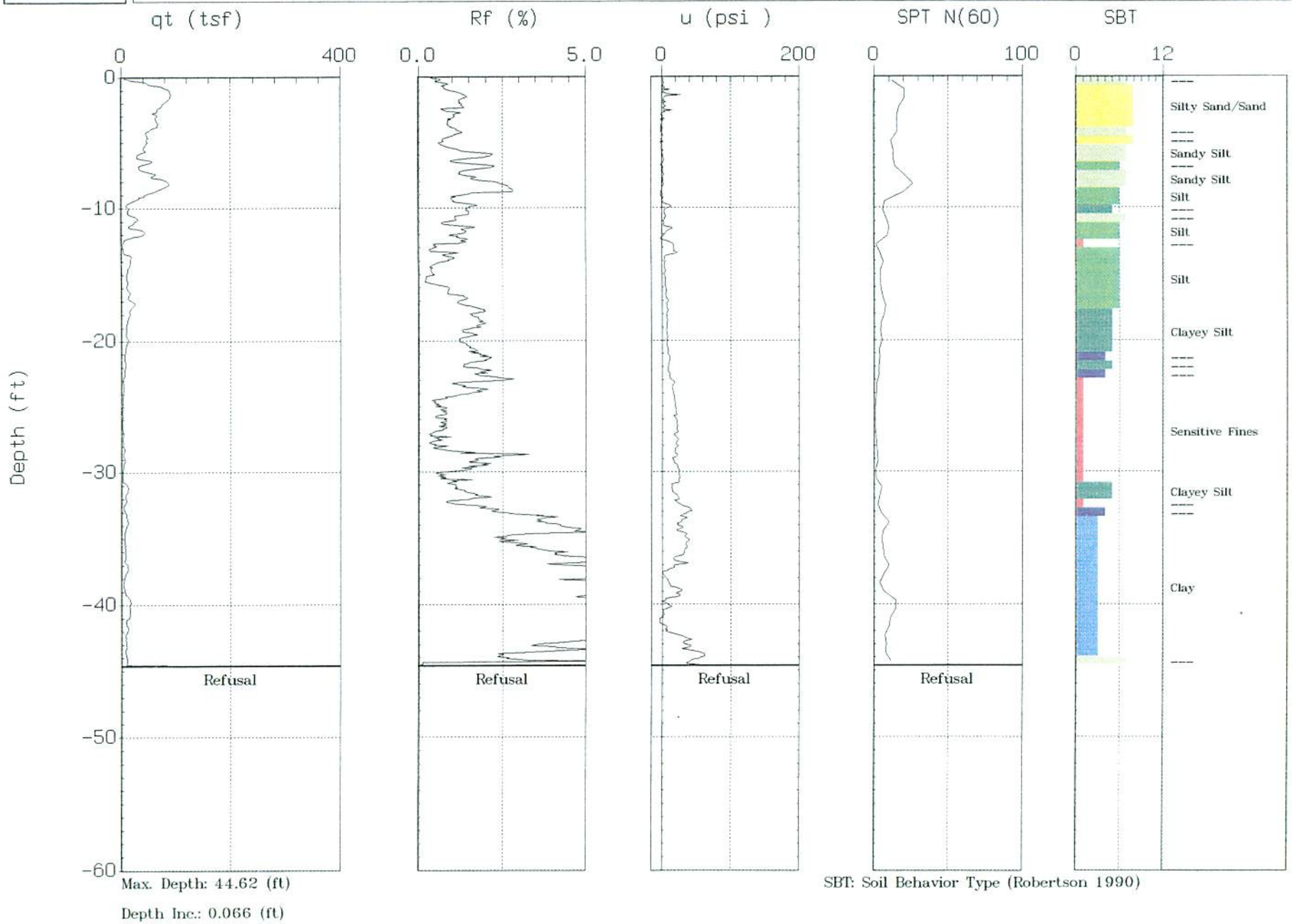
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-08
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:20:04 14:33



Max. Depth: 44.62 (ft)

Depth Inc.: 0.066 (ft)

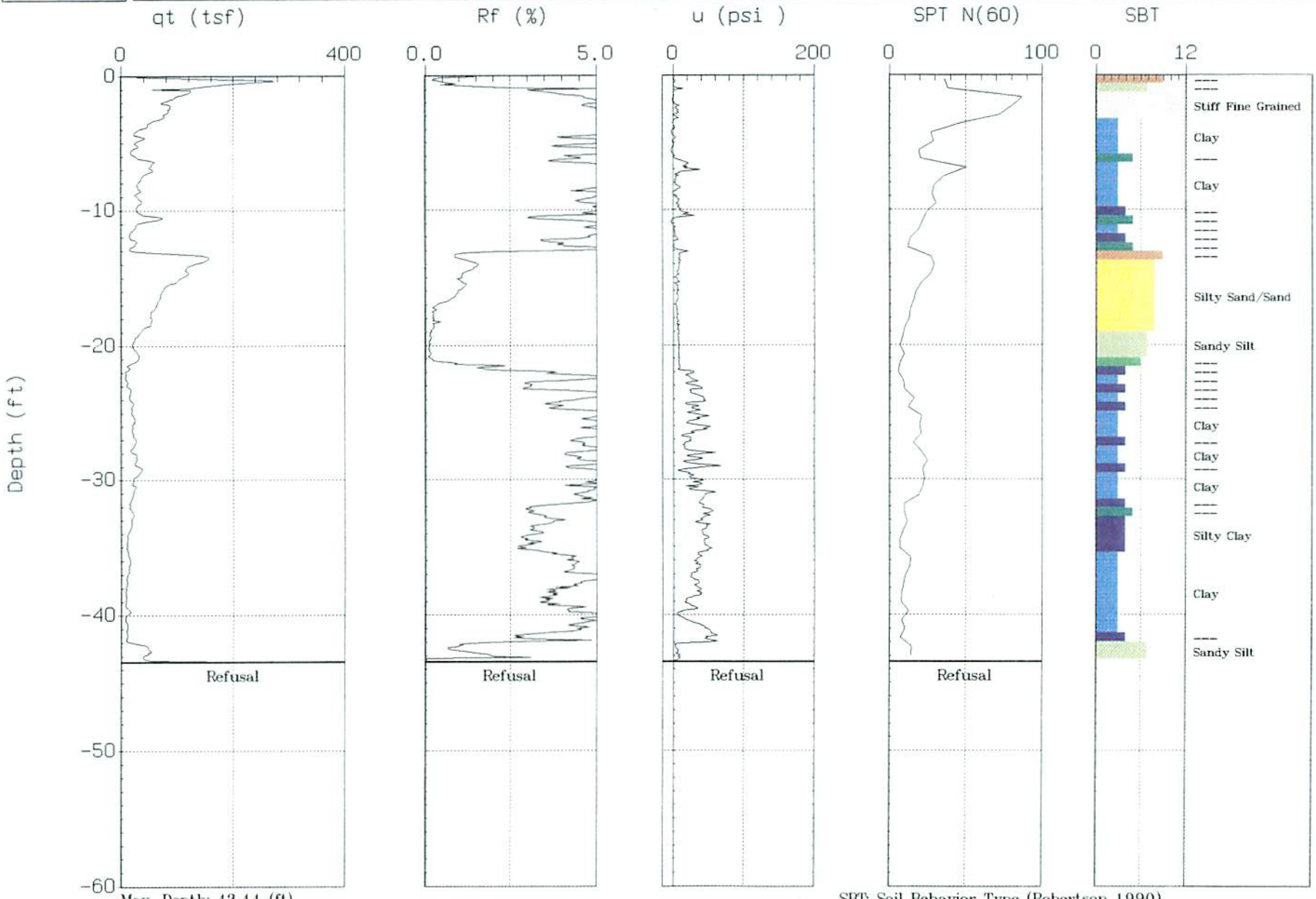
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-09
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:21:04 10:28



Max. Depth: 43.44 (ft)

Depth Inc.: 0.066 (ft)

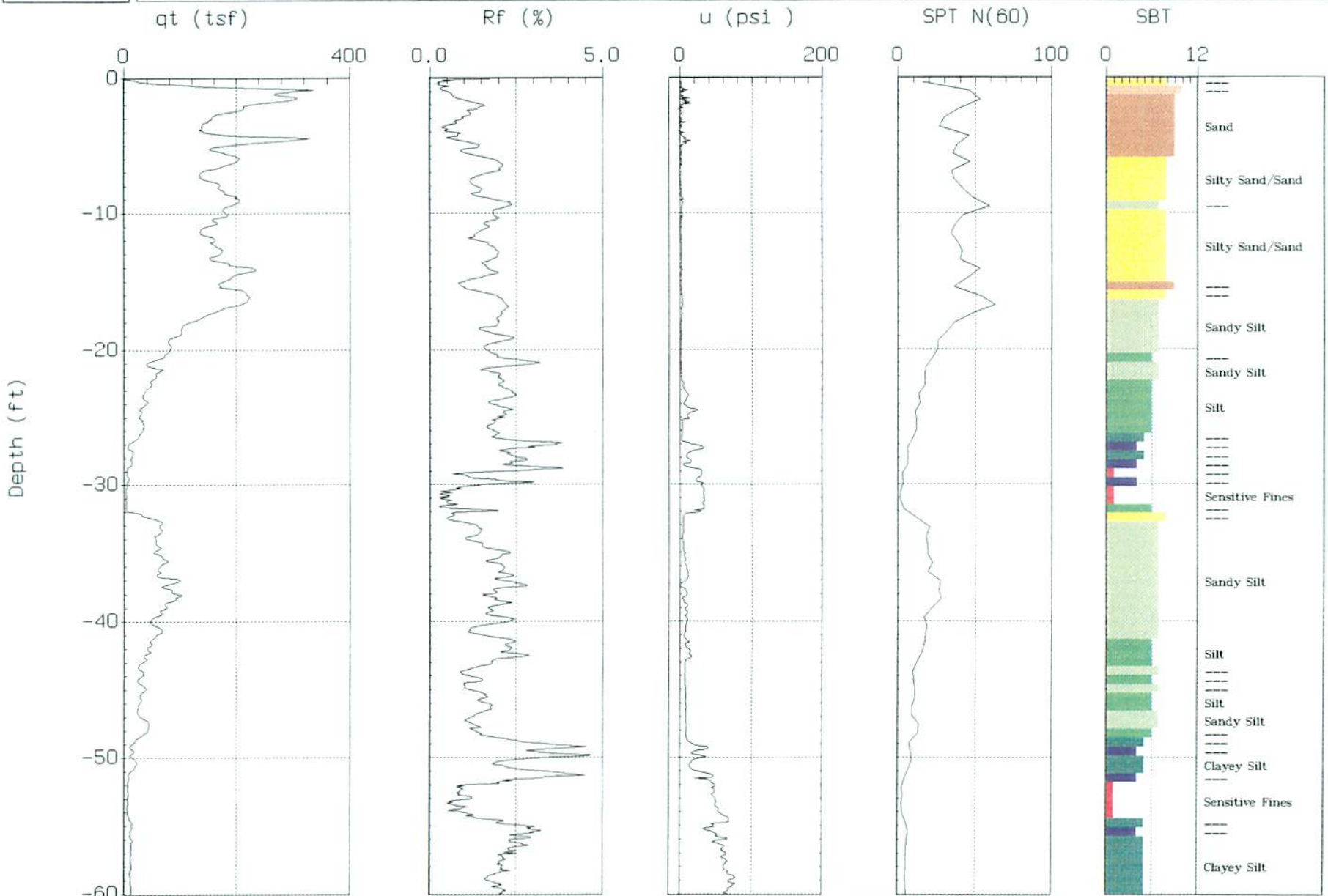
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-10
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:21:04 08:01



Max. Depth: 67.39 (ft)

Depth Inc.: 0.066 (ft)

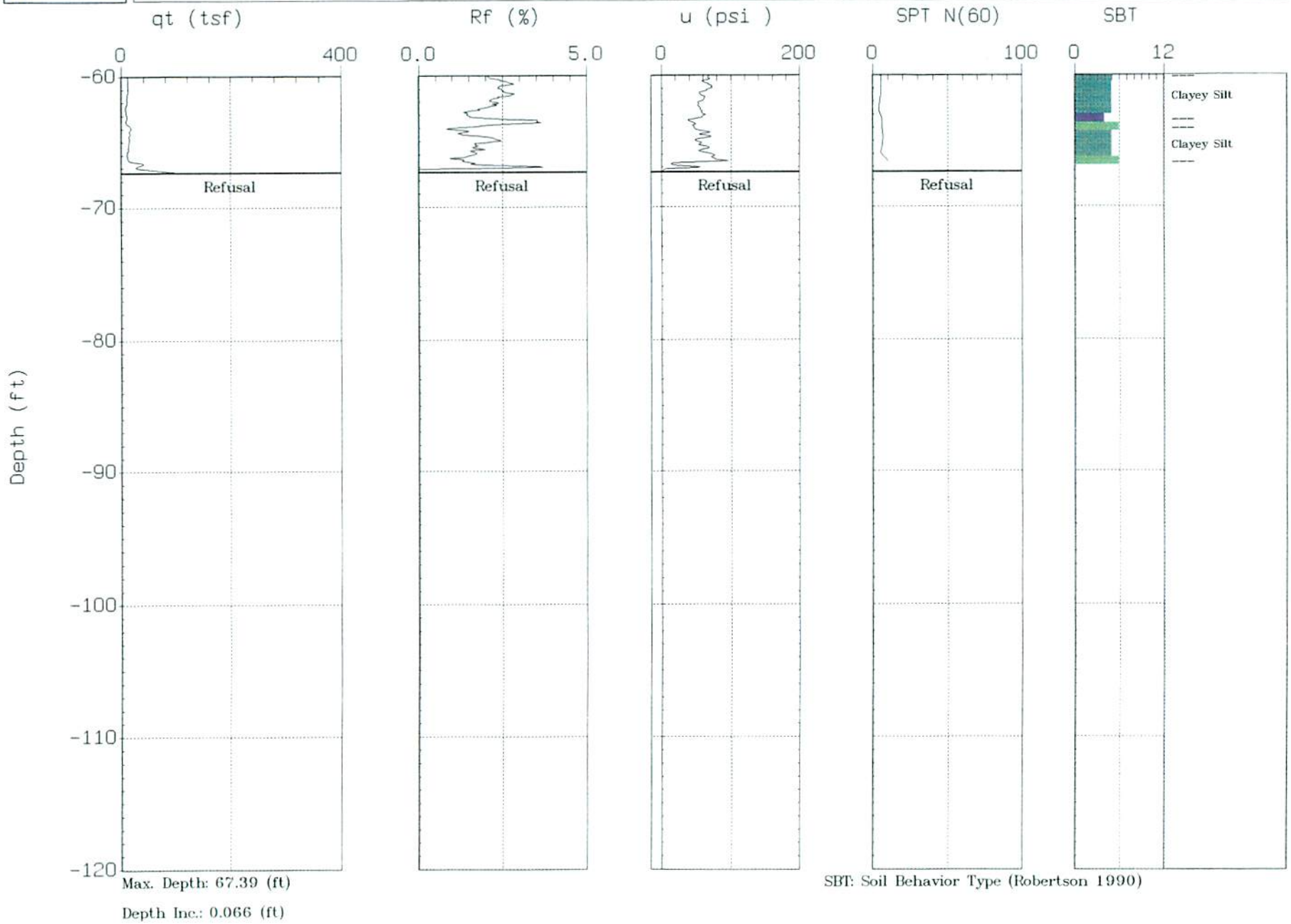
SBT: Soil Behavior Type (Robertson 1990)

GREGG

MACTEC

Sounding: CPT-10
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:21:04 08:01

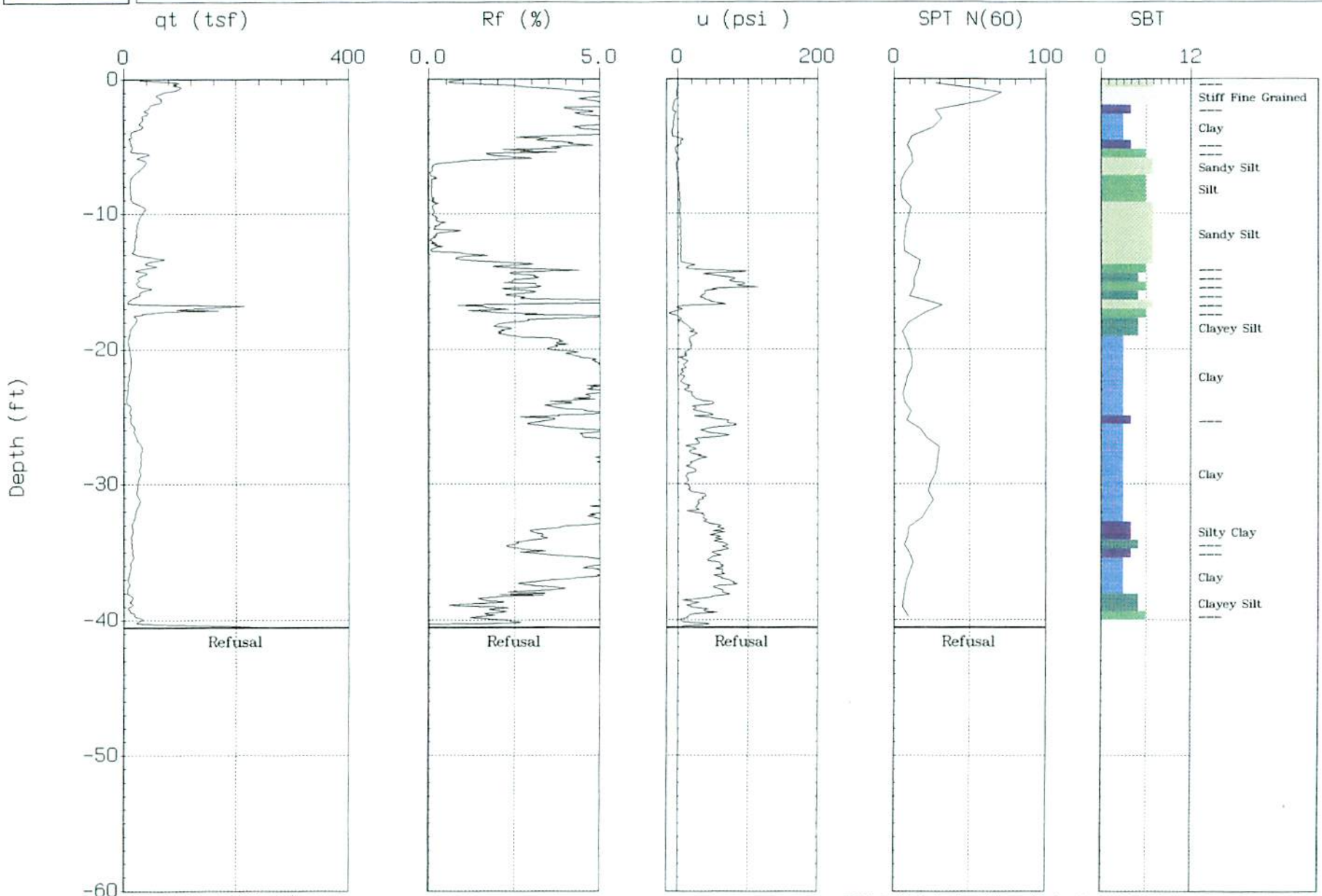


GREGG

MACTEC

Sounding: CPT-11
Location: TVA Bull Run

Oversite: H. Bankayal
Date: 05:21:04 08:58



Max. Depth: 40.55 (ft)

Depth Inc.: 0.066 (ft)

SBT: Soil Behavior Type (Robertson 1990)

Pore Pressure Dissipation Tests (PPDT)

Pore Pressure Dissipation Tests (PPDT's) conducted at various intervals measured hydrostatic water pressures and determined the approximate depth of the ground water table. A PPDT is conducted when the cone is halted at specific intervals determined by the field representative. The variation of the penetration pore pressure (u) with time is measured behind the tip of the cone and recorded by a computer system.

Pore pressure dissipation data can be interpreted to provide estimates of:

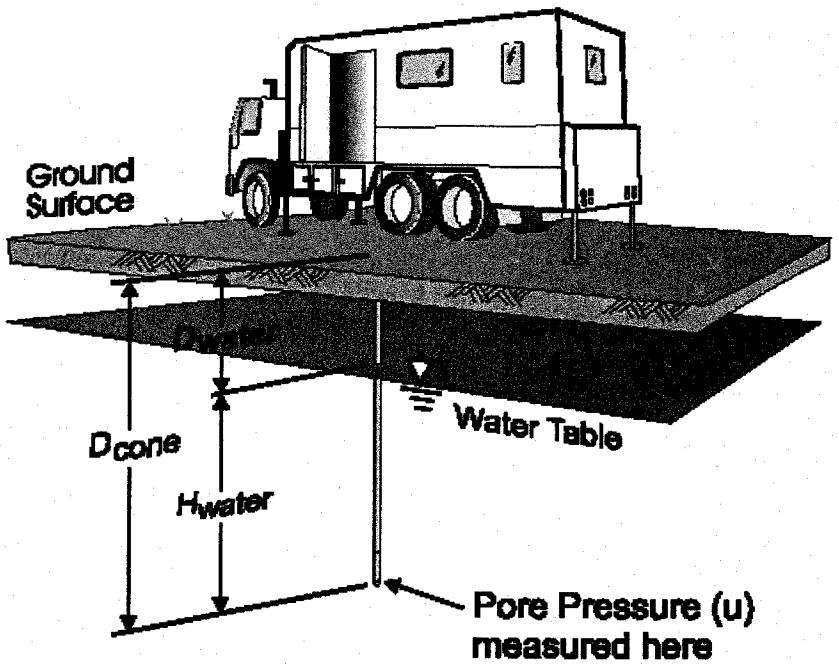
- Equilibrium piezometric pressure
- Phreatic Surface
- In situ horizontal coefficient of consolidation (c_h)
- In situ horizontal coefficient of permability (k_h)

In order to correctly interpret the equilibrium piezometric pressure and/or the phreatic surface, the pore pressure must be monitored until such time as there is no variation in pore pressure with time (refer to Figure PPD). This time is commonly referred to as t_{100}, the point at which 100% of the excess pore pressure has dissipated.

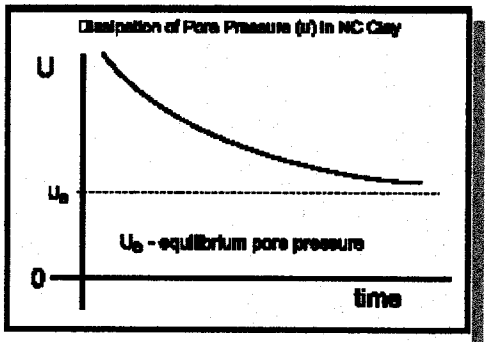
Interpretation of either c_h and k_h from dissipation results can be most easily achieved using either of two analytical approaches: cavity-expansion theory or the strain-path approach. Comparisons of the available solutions and results from field studies suggest that the cavity-expansion method of Torstensson (1977) and the strain-path approaches of Levadous (1980) and Teh (1987) all provide similar predications of consolidation parameters from CPTU dissipation data (Gillespie 1981; Kabir and Lutenegger 1990; Robertson et al. (1991). Robertson et al. (1991) have shown that these methods, although developed for normally consolidated soils, can be equally applied to overconsolidated soils. Furthermore, comparisons of field and laboratory data indicate that the trends in the measured (laboratory) and predicated (CPTU) data are consistent provided the micro fabric and nature of the soils being tested are taken into consideration. (Danziger 1990; Robertson et al. 1991).

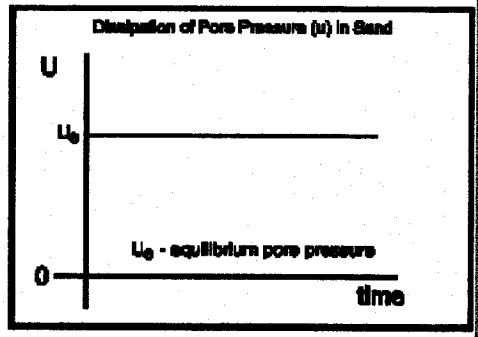
A complete reference on pore pressure dissipation tests is presented by Robertson et al. 1991.

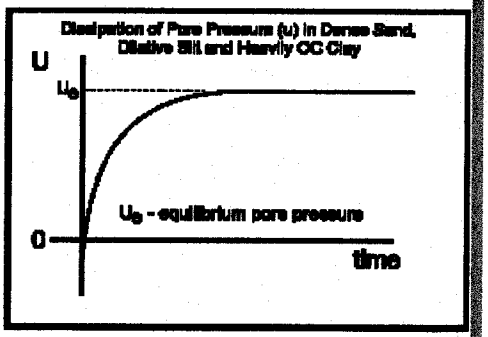
A summary of the pore pressure dissipation tests is summarized in Table PPD (Appendix PPD). Pore pressure dissipation data is presented in Appendix PPD.



D_{cone} - Depth of Cone
D_{water} - Depth to Water Table
H_{water} - Head of Water







Water Table Calculation

$$D_{water} = D_{cone} - H_{water}$$

where $H_{water} = U_e$ (depth units)

Useful Conversion Factors:

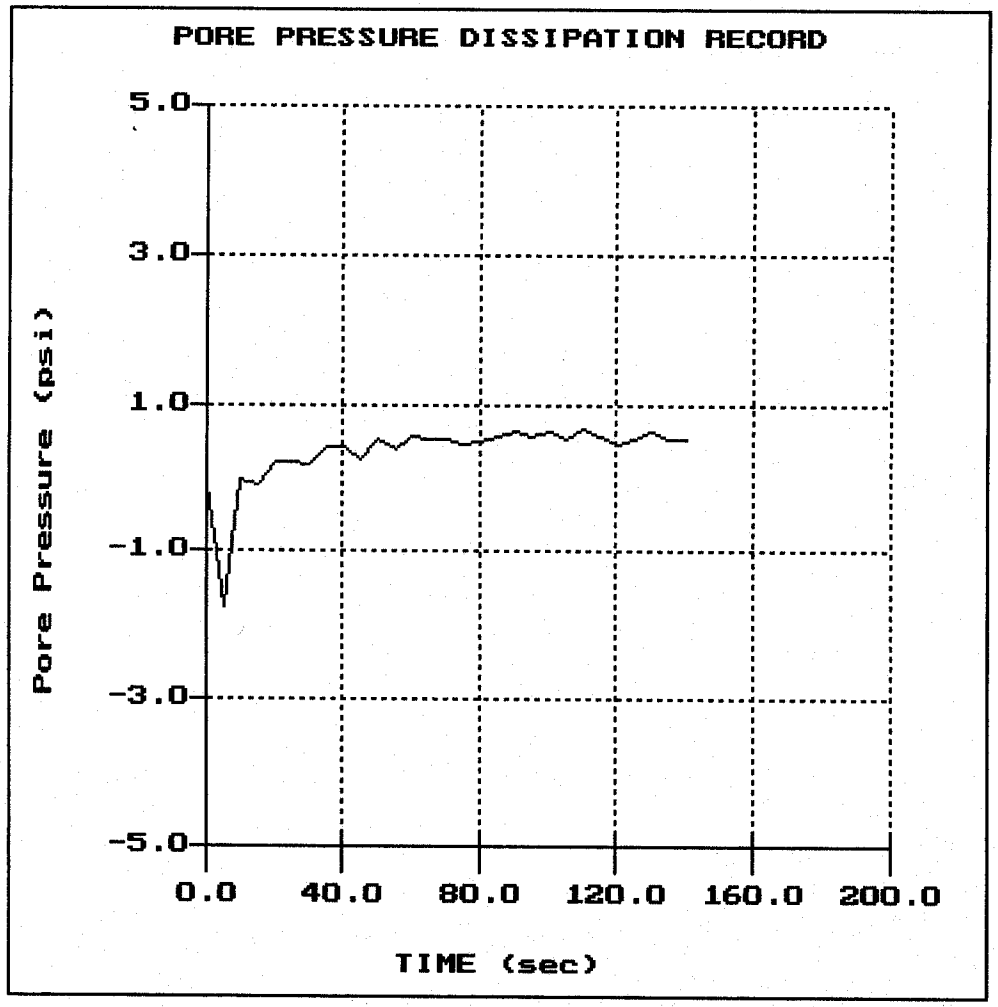
1psi = 0.704m = 2.31 feet (water)
1tsf = 0.958 bar = 13.9 psi
1m = 3.28 feet

Figure PPD

MACTEC

Sounding:CPT-01B
Location:TVA Bull Run

Oversight:H. Bankaya
Date:05:20:04 15:43

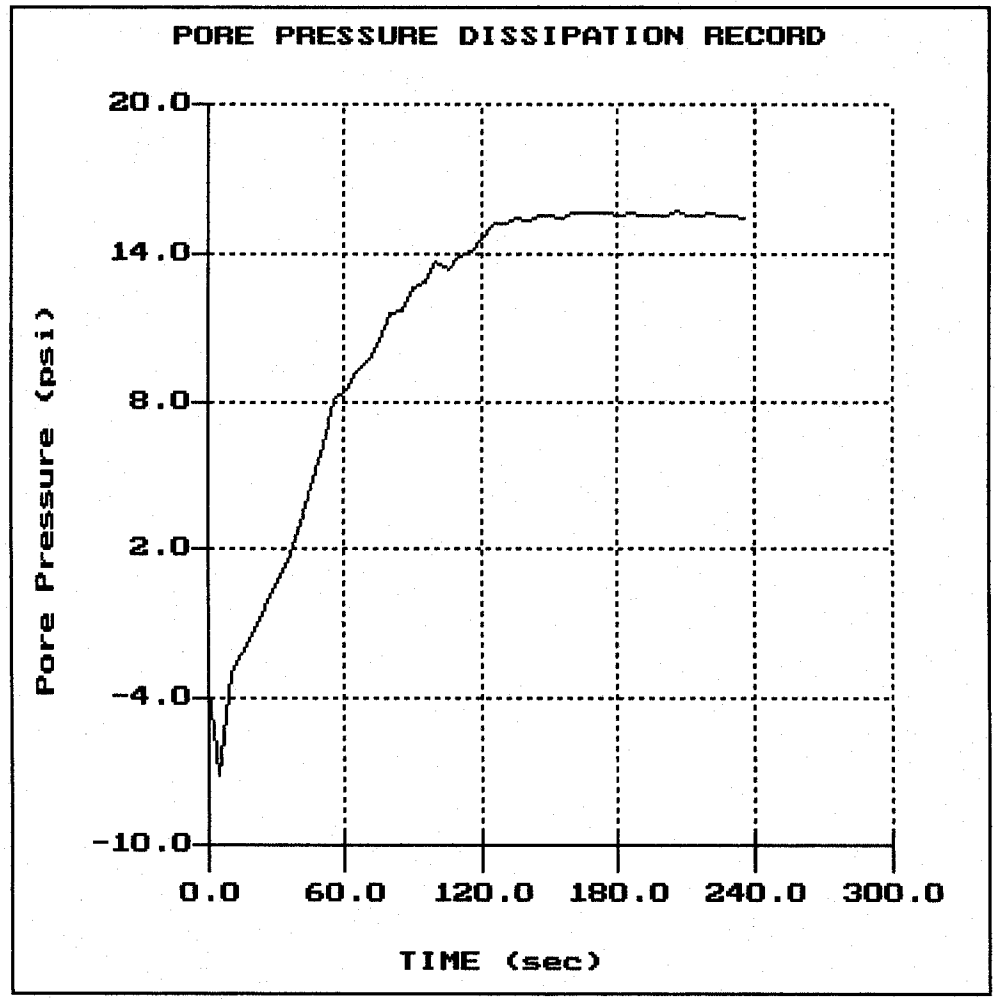


File: 073CP01B.PPD
Depth (m): 6.88
(ft): 22.57
Duration : 140.0s
U-min: -1.77 5.0s
U-max: 0.67 110.0s

MACTEC

Sounding:CPT-01B
Location:TVA Bull Run

Oversight:H. Bankaya
Date:05:20:04 15:43

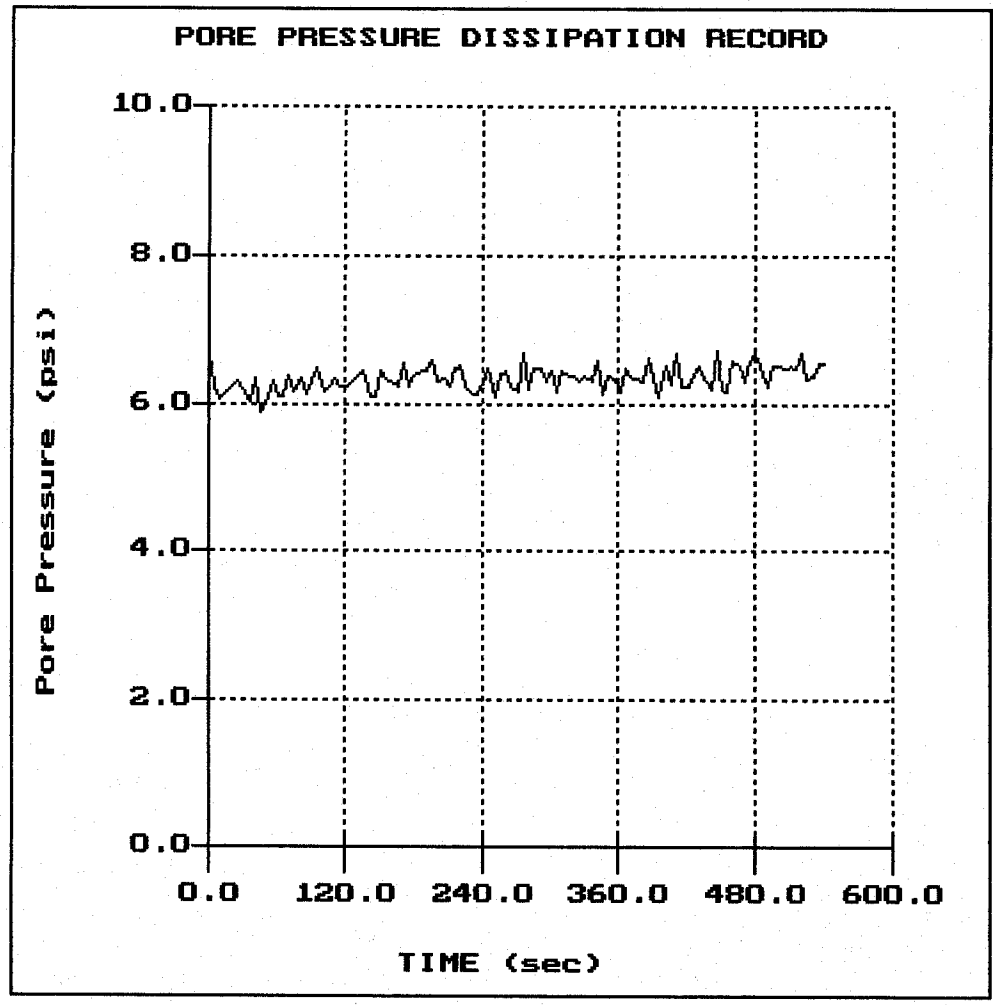


File: 073CP01B.PPD
Depth (m): 21.44
(ft): 70.34
Duration : 235.0s
U-min: -7.16 5.0s
U-max: 15.69 205.0s

MACTEC

Sounding:CPT-02
Location:TVA Bull Run

Oversight:H. Bankaya
Date:05:20:04 09:28

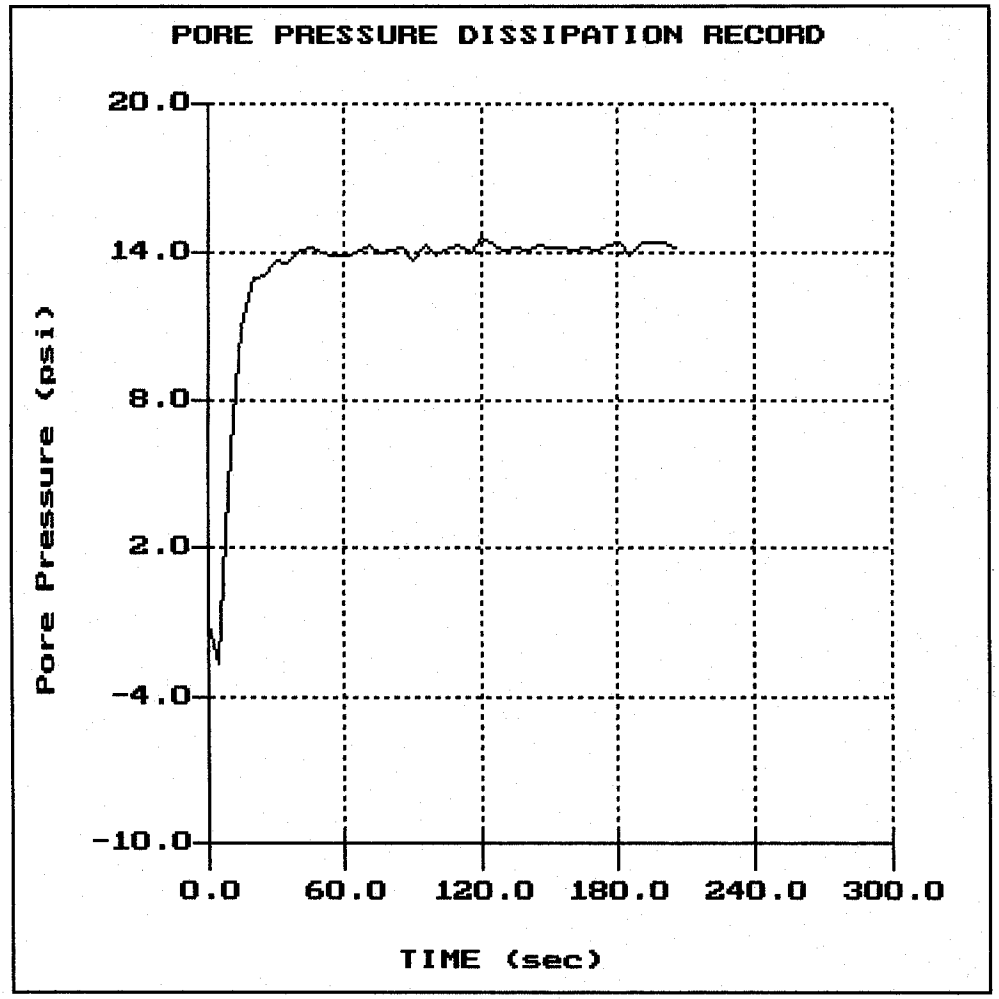


File: 073CP02.PPD
Depth (m): 6.78
(ft): 22.24
Duration : 540.0s
U-min: 5.86 45.0s
U-max: 6.69 445.0s

MACTEC

Sounding:CPT-02
Location:TVA Bull Run

Oversight:H. Bankaya
Date:05:20:04 09:28

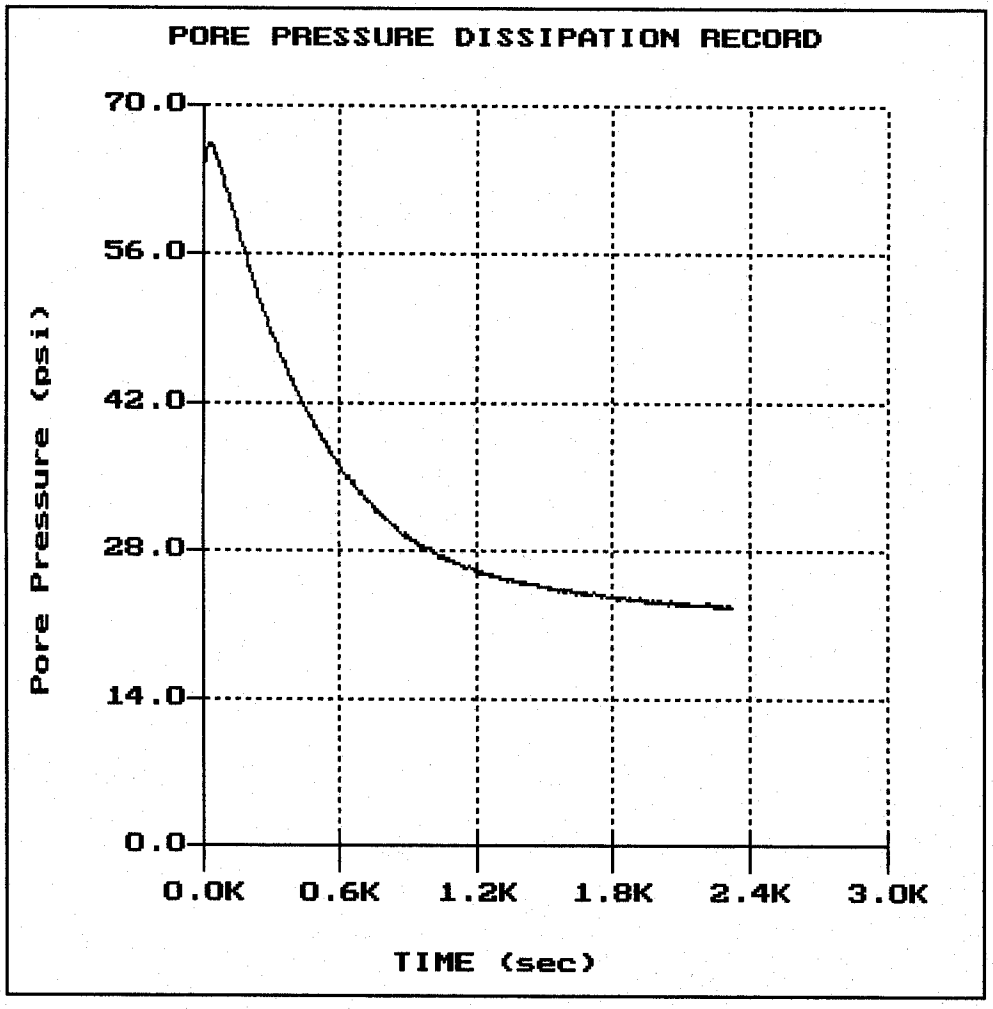


File: 073CP02.PPD
Depth (m): 11.98
(ft): 39.30
Duration : 205.0s
U-min: -2.71 5.0s
U-max: 14.55 120.0s

MACTEC

Sounding:CPT-03
Location:TVA Bull Run

Oversight:H. Bankaya
Date:05:20:04 10:28

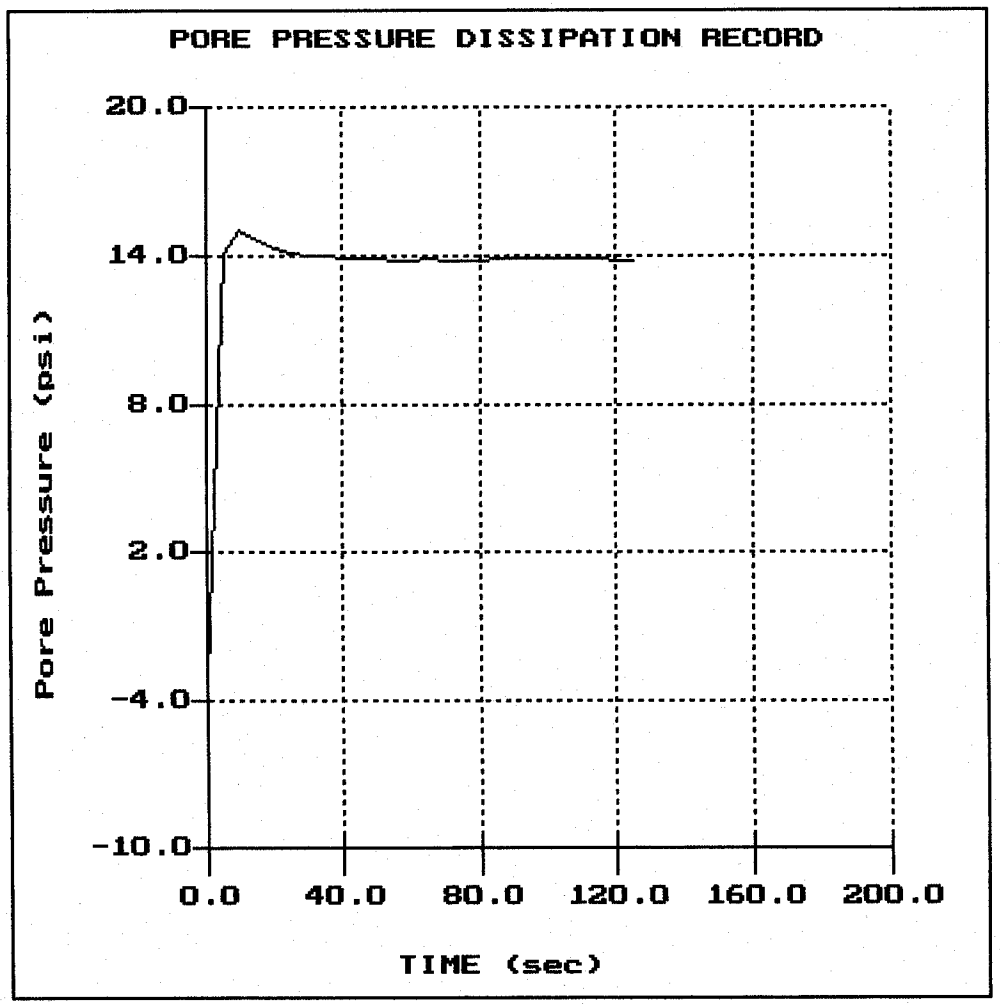


File: 073CP03.PPD
Depth (m): 15.18
(ft): 49.80
Duration : 2320.0s
U-min: 22.60 2300.0s
U-max: 66.45 30.0s

MACTEC

Sounding:CPT-04
Location:TVA Bull Run

Oversight:H. Bankaya
Date:05:20:04 12:28

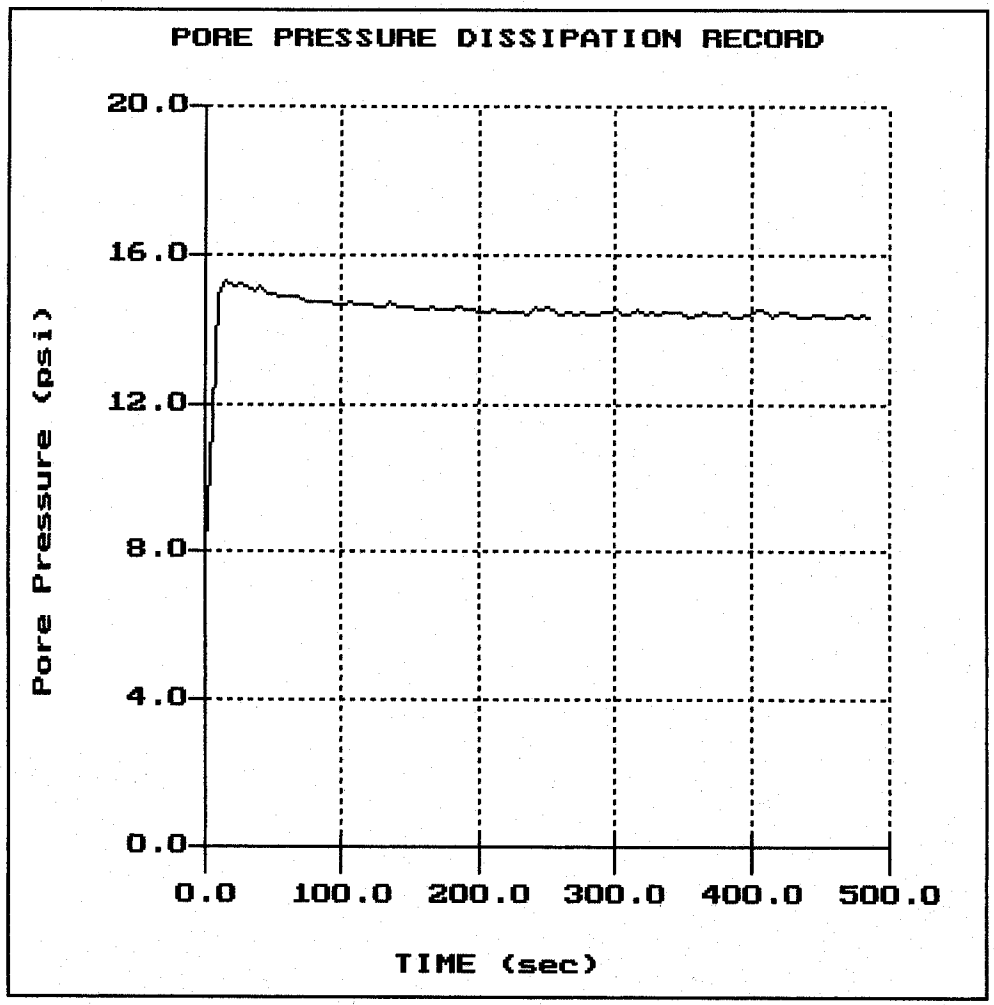


File: 073CP04.PPD
Depth (m): 14.74
(ft): 48.36
Duration : 125.0s
U-min: -3.40 0.0s
U-max: 15.01 10.0s

MACTEC

Sounding:CPT-05
Location:TVA Bull Run

Oversight:H. Bankaya
Date:05:20:04 13:07

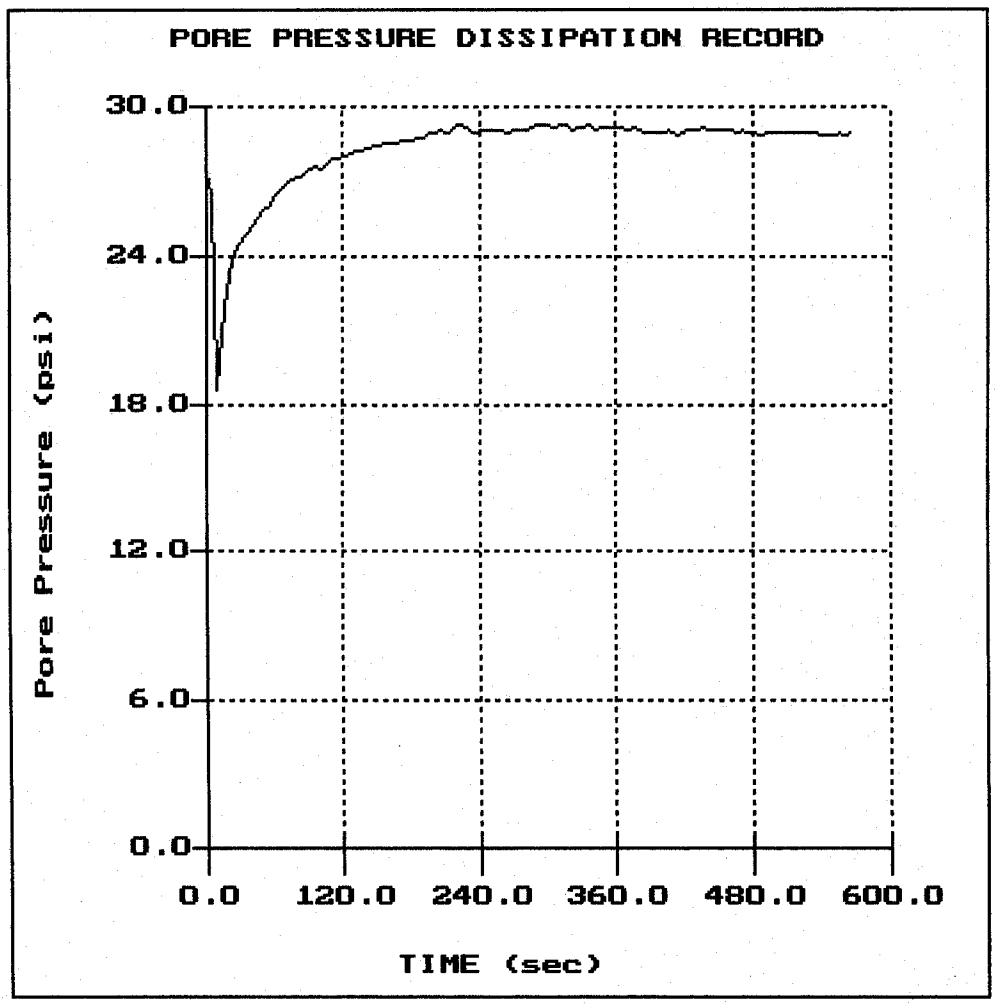


File: 073CP05.PPD
Depth (m): 18.20
(ft): 59.71
Duration : 485.0s
U-min: 7.89 0.0s
U-max: 15.26 15.0s

MACTEC

Sounding:CPT-06
Location:TVA Bull Run

Oversight:H. Bankaya
Date:05:21:04 09:42

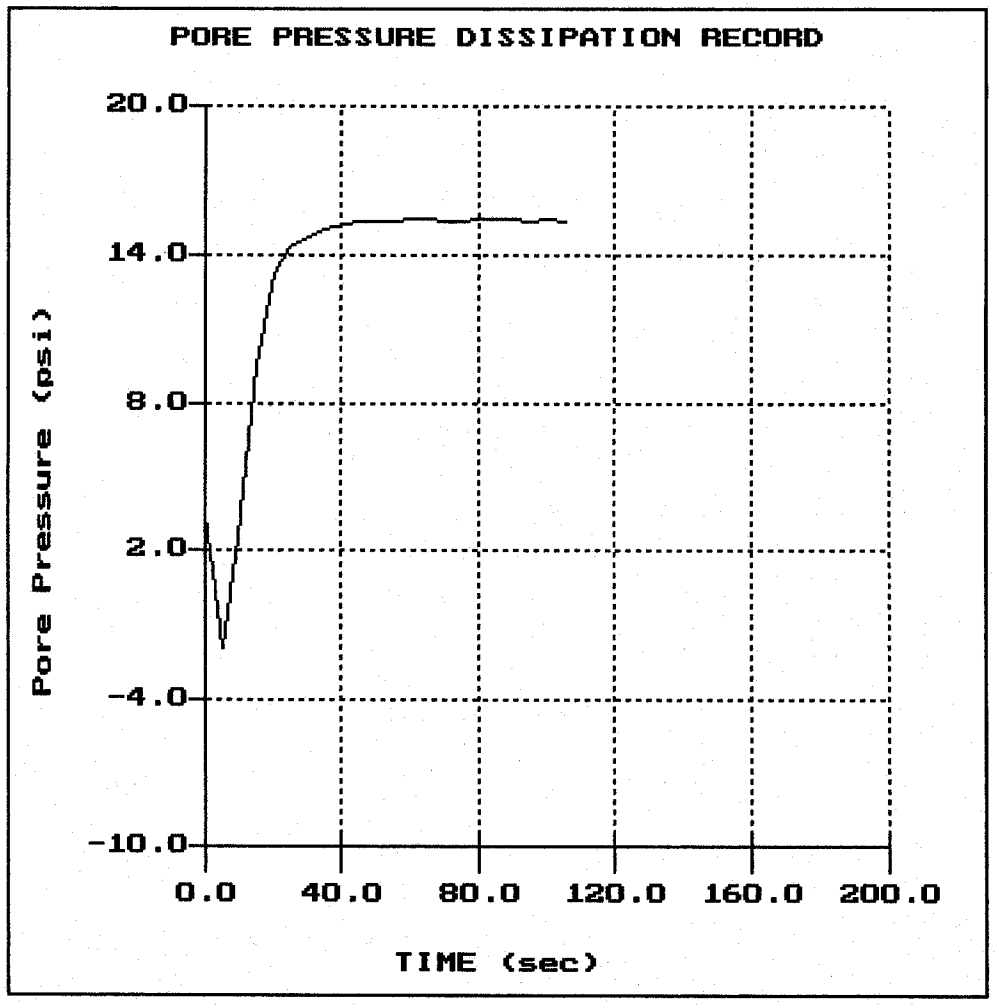


File: 073CP06.PPD
Depth (m): 14.48
(ft): 47.51
Duration : 565.0s
U-min: 18.55 10.0s
U-max: 29.26 310.0s

MACTEC

Sounding:CPT-07
Location:TVA Bull Run

Oversight:H. Bankaya
Date:05:20:04 13:56

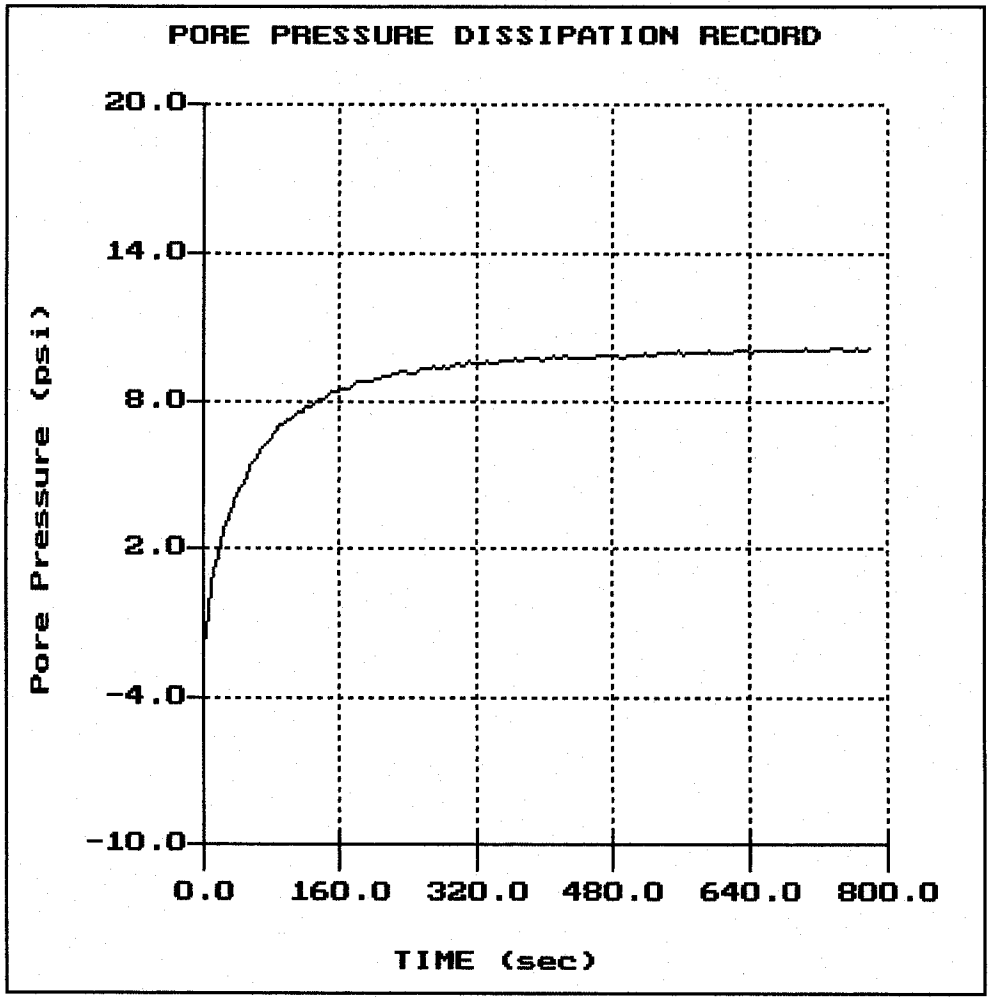


File: 073CP07.PPD
Depth (m): 12.52
(ft): 41.08
Duration : 105.0s
U-min: -1.93 5.0s
U-max: 15.42 100.0s

MACTEC

Sounding:CPT-08
Location:TVA Bull Run

Oversight:H. Bankaya
Date:05:20:04 14:33

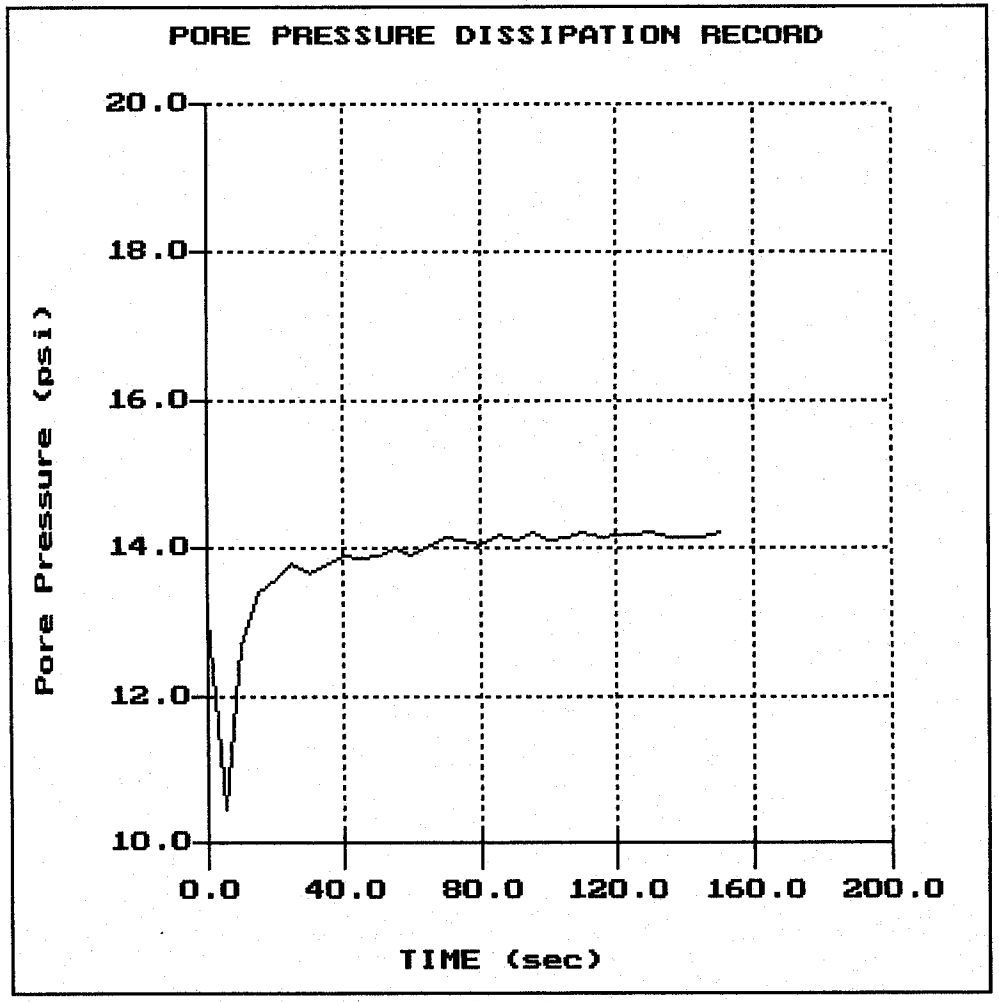


File: 073CP08.PPD
Depth (m): 12.50
(ft): 41.01
Duration : 780.0s
U-min: -2.05 0.0s
U-max: 10.13 780.0s

MACTEC

Sounding:CPT-09
Location:TVA Bull Run

Oversight:H. Bankaya
Date:05:21:04 10:28

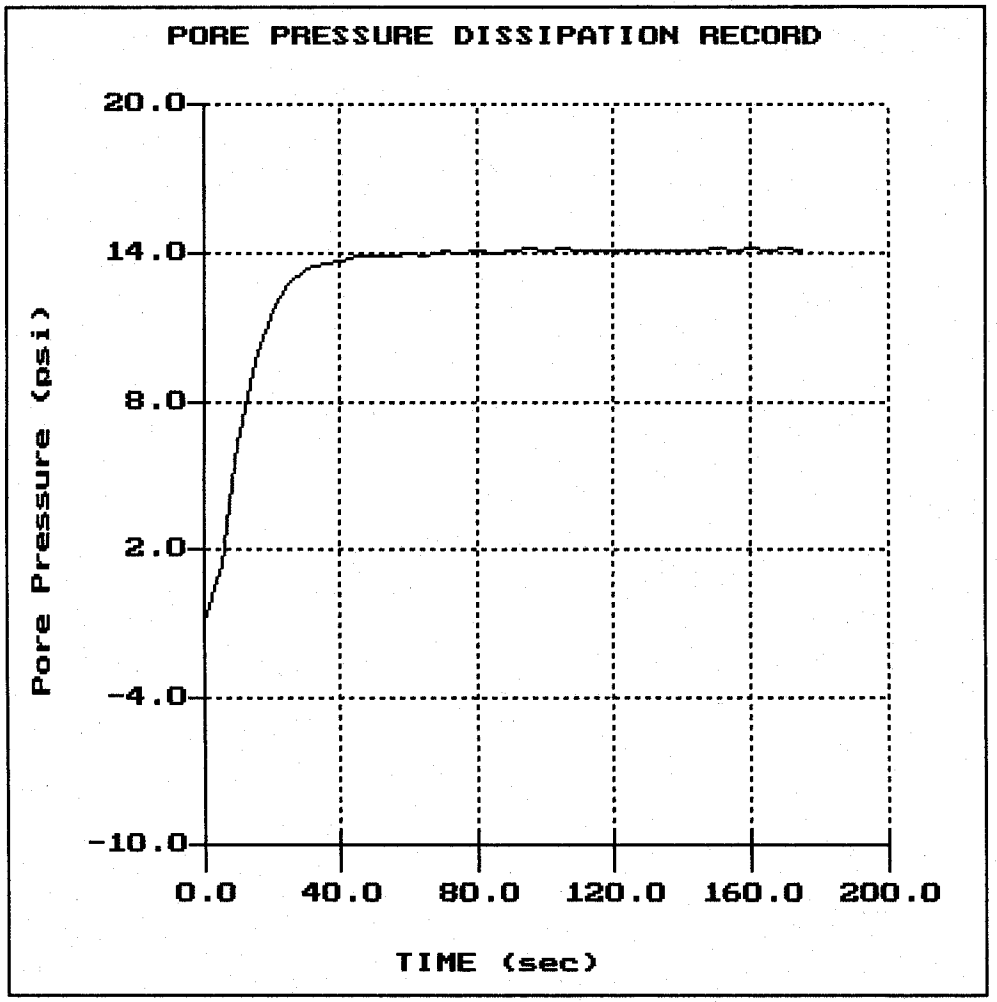


File: 073CP09.PPD
Depth (m): 13.24
(ft): 43.44
Duration : 150.0s
U-min: 10.44 5.0s
U-max: 14.20 150.0s

MACTEC

Sounding:CPT-10
Location:TVA Bull Run

Oversight:H. Bankaya
Date:05:21:04 08:01

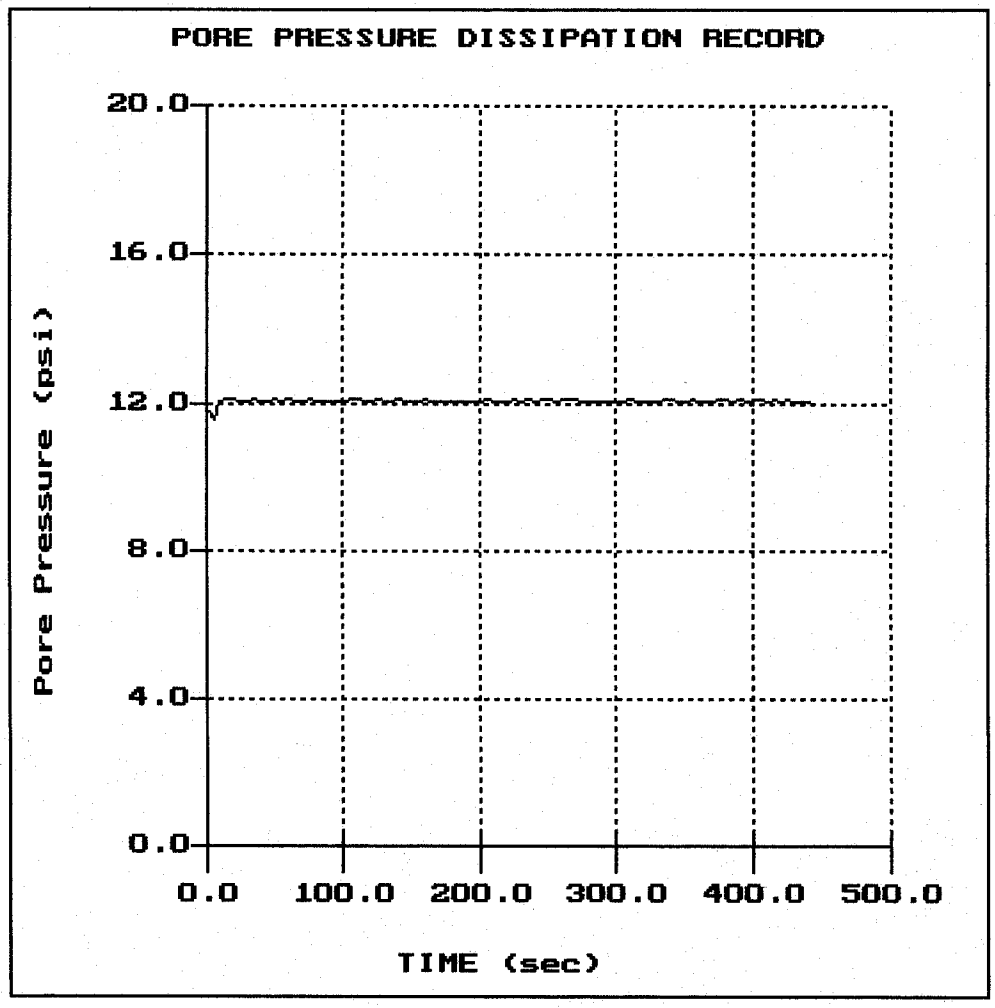


File: 073CP10.PPD
Depth (m): 20.54
(ft): 67.39
Duration : 175.0s
U-min: -0.94 0.0s
U-max: 14.16 95.0s

MACTEC

Sounding:CPT-11
Location:TVA Bull Run

Oversight:H. Bankaya
Date:05:21:04 08:58



File: 073CP11.PPD
Depth (m): 12.36
(ft): 40.55
Duration : 440.0s
U-min: 11.56 5.0s
U-max: 12.11 310.0s

GREGG IN SITU CPT Interpretations as of July 31, 2002 (Release 1.20c)

GREGG IN SITU's interpretation routine provides a tabular output of geotechnical parameters based on current published CPT correlations and is subject to change to reflect the current state of practice. The interpreted values are not considered valid for all soil types. The interpretations are presented only as a guide for geotechnical use and should be carefully scrutinized for consideration in any geotechnical design. Reference to current literature is strongly recommended. GREGG IN SITU, Inc. and GREGG DRILLING & TESTING Inc. do not warranty the correctness or the applicability of any of the geotechnical parameters interpreted by the program and can not assume liability for any use of the results in any design or review. Representative hand calculations should be made for any parameter that is critical for design purposes. The end user of the interpreted output should also be fully aware of the techniques and the limitations of any method used in this program. The purpose of this document is to inform the user as to which methods were used and what the appropriate papers and/or publications are for further reference.

The CPT interpretations are based on values of tip, sleeve friction and pore pressure averaged over a user specified interval (e.g. 0.20m). Note that q_t is the recorded tip value, q_c, corrected for pore pressure effects. Since all GREGG IN SITU cones have equal end area friction sleeves, pore pressure corrections to sleeve friction, Fs, are not required.

The tip correction is: $q_t = q_c + (1-a) \bullet u_2$

where: q_t is the corrected tip resistance
q_c is the recorded tip resistance
u_2 is the recorded dynamic pore pressure behind the tip (u_2 position)
a is the Net Area Ratio for the cone (typically 0.85 for GREGG IN SITU cones)

The total stress calculations are based on soil unit weights that have been assigned to the Soil Behavior Type zones, from a user defined unit weight profile or by using a single value throughout the profile. Effective vertical overburden stresses are calculated based on a hydrostatic distribution of equilibrium pore pressures below the water table or from a user defined equilibrium pore pressure profile (this can be obtained from CPT dissipation tests). For over water projects the effects of the column of water have been taken in to account as has the appropriate unit weight of water. How this is done depends on where the instruments were zeroed (i.e. on deck or at mud line).

Details regarding the interpretation methods for all of the interpreted parameters are provided in Table 1. The appropriate references cited in Table 1 are listed in Table 2. Where methods are based on charts or techniques that are too complex to describe in this summary the user should reference to the cited references.

The estimated Soil Behavior Types (normalized and non-normalized) are based on the charts developed by Robertson and Campanella shown in Figures 1 and 2.

Where the results of a calculation/interpretation are declared *'invalid'* the value will be represented by the text strings "-9999" or "-9999.0". Invalid results will occur because of (and not limited to) one or a combination of:

1. Invalid or undefined CPT data (e.g. drilled out section or data gap).
2. Where the interpretation method is inappropriate, for example, drained parameters in an undrained material (and vice versa).
3. Where interpretation input values are beyond the range of the referenced charts or specified limitations of the interpretation method.
4. Where pre-requisite or intermediate interpretation calculations are invalid.

CPT Interpretations

Interpreted Parameter	Description	Equation	Ref
q_{c1}	q_t normalized for overburden stress used for seismic analysis	$q_{c1} = q_t \bullet (Pa/\sigma_v')^{0.5}$ where: Pa = atm. Pressure q_t is in MPa	3
q_{c1N}	q_{c1} in dimensionless form used for seismic analysis	$q_{c1N} = q_{c1} / Pa$ where: Pa = atm. pressure	3
K_c	Equivalent clean sand correction for q_{c1N}	*$K_c = 1.0$ for $I_c \le 1.64$* *$K_c = f(I_c)$ for $I_c > 1.64$ (see reference)* *$K_c = 1.0$ for $1.64 < I_c < 2.36$ and $Fc < 0.5\%$*	3
q_{c1Ncs}	Clean Sand equivalent q_{c1N}	*$q_{c1Ncs} = q_{c1N} \bullet K_c$*	3
I_c	Soil index for estimating grain characteristics	*$Ic = [(3.47 - \log_{10}Q)^2 + (\log_{10} Fr + 1.22)^2]^{0.5}$* *Where:* $Q = \left(\frac{qt - \sigma_v}{P_{a2}}\right)\left(\frac{P_a}{\sigma_v'}\right)^n$ *And Fr is in percent* *P_a = atmospheric pressure* *P_{a2} = atmospheric pressure* *n varies from 0.5 to 1.0 and is selected in an iterative manner based on the resulting I_c*	3, 8
FC	Apparent fines content (%)	*$FC = 1.75(Ic^{3.25}) - 3.7$* *$FC = 100$ for $Ic > 3.5$* *$FC = 0$ for $Ic < 1.26$* *$FC = 5\%$ if $1.64 < Ic < 2.6$ AND $F_r < 0.5$*	3
Ic Zone	This parameter is the Soil Behavior Type zone based on the Ic parameter (valid for zones 2 through 7 on SBTn chart)	Ic < 1.31 Zone = 7 1.31 < Ic < 2.05 Zone = 6 2.05 < Ic < 2.60 Zone = 5 2.60 < Ic < 2.95 Zone = 4 2.95 < Ic < 3.60 Zone = 3 Ic > 3.60 Zone = 2	3
PHI ϕ	Friction Angle determined from one of the following user selectable options: a) Campanella and Robertson b) Durgunoglu and Mitchel c) Janbu	See reference	5
Dr	Relative Density determined from one of the following user selectable options: a) Ticino Sand b) Hokksund Sand c) Schmertmann 1976 d) Jamiolkowski - All Sands	See reference	5
OCR	Over Consolidation Ratio – 2 methods available	a) Based on Schmertmann's method involving a plot of S_u/σ_v' /($S_u/\sigma_v')_{NC}$ and OCR b) Based on $OCR = K \bullet \left(\frac{qt - \sigma_v}{\sigma_v'}\right)$ where an average value of k=0.3 is used	5
State Parameter	The state parameter is used to describe whether a soil is contractive (SP is positive) or dilative (SP is negative) at large strains based on the work by Been and Jefferies	See reference	9, 7, 5

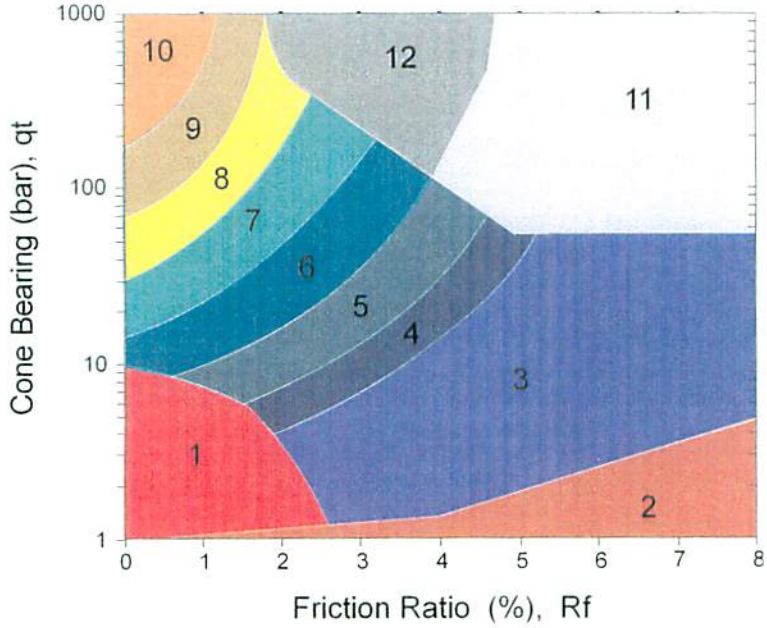
CPT Interpretations

Interpreted Parameter	Description	Equation	Ref
CRR	Cyclic Resistance Ratio (for M=7.5)	*For* $(q_{c1N})_{cs} < 160$: $CRR = 93 \bullet \left(\frac{(q_{c1N})cs}{1000}\right)^3 + 0.08$ *For* $(q_{c1N})_{cs} < 50$: $CRR = 0.833 \bullet \left(\frac{(q_{c1N})cs}{1000}\right)^3 + 0.05$	5
Youngs Modulus E	Youngs Modulus based on the work by Baldi. There are three types of sands considered in this technique. The user selects the approriate type for the site from: a) OC Sands b) Aged NC Sands c) Recent NC Sands Each sand type has a family of curves that depend on mean normal stress. The program calculates mean normal stress and linearly interpolates between the two extremes provided in Baldi's chart.	Mean normal stress is evaluated from: $\sigma'_m = \frac{1}{3} \bullet (\sigma'_v + \sigma'_h + \sigma'_h)^3$ where σ_v'= vertical effective stress σ_h'= horizontal effective stress and $\sigma_h = K_o * \sigma_v'$ with Ko assumed to be 0.5	5
K_o	Coefficient of lateral earth pressure at rest.	$K_o = 0.1 \bullet \left(\frac{q_t - \sigma_{v0}}{\sigma'_v}\right)$	5

Savannah River Site Specific Parameters

Interpreted Parameter	Description	Equation	Ref
Ic	Ic based on normalized data at the Savannah River Site; developed by Frank Syms and SGS	*Ic = [(1.95 – $log_{10}Q)^2$ + (log_{10} Fr + 1.78)^2]$^{0.5}$* *Where: Q is the normalized tip resistance And Fr is the normalized friction ratio*	10
FC	Fines content based on the normalized Savannah River Site Ic parameter; developed by Frank Syms and SGS	*FC =(5.31 * (I_c)$^{2.31}$) + 9.61* For FC > 100 and q_t < 15 tsf the material is flagged as a soft zone	10
FC	Fines Content directly from non-normalized data at the Savannah River Site; developed by Frank Syms and SGS	*FC = [(3.58 – log_{10}(qtsf))^2 + (1.43 + log_{10} (Rf))^2)$^{1.8}$* For FC > 100 and q_t < 15 tsf the material is flagged as a soft zone *Where: qtsf is the non-normalized tip resistance in tsf Rf is the non-normalized friction ratio*	11

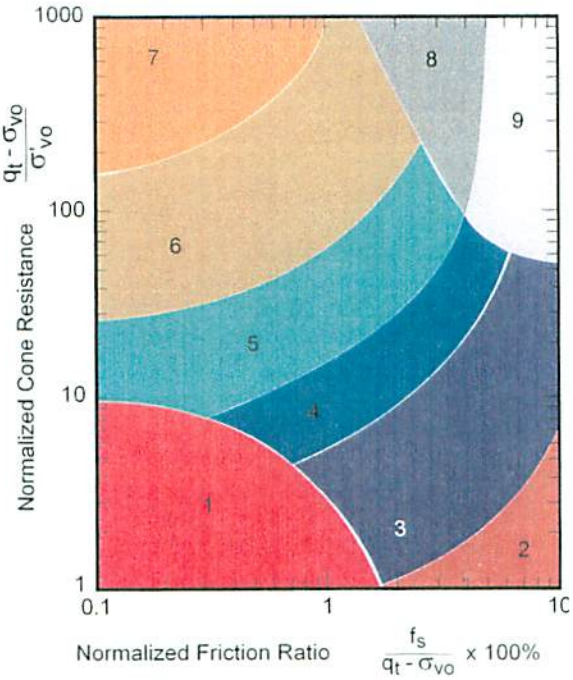
Figure 1
Non-Normalized Behavior Type Classification Chart



Zone	qt / N	Soil Behavior Type
1	2	sensitive fine grained
2	1	organic material
3	1	clay
4	1.5	silty clay to clay
5	2	clayey silt to silty clay
6	2.5	sandy silt to clayey silt
7	3	silty sand to sandy silt
8	4	sand to silty sand
9	5	sand
10	6	gravelly sand to sand
11	1	very stiff fine grained *
12	2	sand to clayey sand *

* overconsolidated or cemented

Figure 2
Normalized Behavior Type Classification Chart



Zone	Normalized Soil Behavior Type
1	sensitive fine grained
2	organic material
3	clay to silty clay
4	clayey silt to silty clay
5	silty sand to sandy silt
6	clean sands to silty sands
7	gravelly sand to sand
8	very stiff sand to clayey sand
9	very stiff fine grained

Table 2
References

No.	References
1	Robertson, P.K., Campanella, R.G., Gillespie, D. and Greig, J., 1986, "Use of Piezometer Cone Data", Proceedings of InSitu 86, ASCE Specialty Conference, Blacksburg, Virginia.
2	Robertson, P.K., 1990, "Soil Classification Using the Cone Penetration Test", Canadian Geotechnical Journal, Volume 27.
3	Robertson, P.K. and Fear, C.E., 1998, "Evaluating cyclic liquefaction potential using the cone penetration test", Canadian Geotechnical Journal, 35: 442-459.
4	Robertson, P.K. and Wride, C.E., 1998, "Cyclic Liquefaction and its Evaluation Based on SPT and CPT", NCEER Workshop Paper, January 22, 1997
5	Lunne, T., Robertson, P.K. and Powell, J. J. M., 1997, " Cone Penetration Testing in Geotechnical Practice," Blackie Academic and Professional.
6	GREGG IN SITU Internal Report
7	Plewes, H.D., Davies, M.P. and Jefferies, M.G., 1992, "CPT Based Screening Procedure for Evaluating Liquefaction Susceptibility", 45th Canadian Geotechnical Conference, Toronto, Ontario, October 1992.
8	Jefferies, M.G. and Davies, M.P., 1993. "Use of CPTu to Estimate equivalent N_{60}", Geotechnical Testing Journal, 16(4): 458-467.
9	Been, K. and Jefferies, M.P., 1985, "A state parameter for sands", Geotechnique, 35(2), 99-112.
10	Frank Syms, Bechtel Corp (Savannah River Site), 2001, "CPTU Fines Content Determination", Calculation No. K-CIC-G-00065 Revision 0.
11	Frank Syms, Bechtel Corp (Savannah River Site) – personal communication

Gregg In Situ, Inc. - CPT Interpretation	
Interpretation Output - Release	1.20I
Run No:	04-0524-0703-3424
Job No:	04-073SC
Client:	MACTEC
Project:	TVA Bull Run Ash Disposal Facility
Site:	CPT-01B
Location:	TVA Bull Run
Cone:	H. Bankayal
CPT Date:	4/20/2005
CPT Time:	15:43
CPT File:	073CP01B.COR
Northing (m):	0
Easting (m):	0
Elevation (m):	0

Water Table (m):	10.36 (ft): 34
Unit Weight of Water (default):	62.4 pcf
Averaging Increment (m):	0 (Every Data Point)
Phi Method :	Robertson and Campanella, 1983
Su Nkt used:	15 Su/P' (nc): 0.3
Dr Method :	Jamiolkowski - All Sands
State Parameter M:	1.2
Used Unit Weights Assigned to Soil Zones	

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
0.066	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.003	0.000	0.003	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
0.131	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.005	0.000	0.005	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
0.197	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.008	0.000	0.008	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
0.262	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.011	0.000	0.011	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
0.328	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.014	0.000	0.014	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
0.394	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.016	0.000	0.016	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
0.459	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.019	0.000	0.019	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
0.525	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.022	0.000	0.022	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
0.591	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.024	0.000	0.024	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
0.656	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.027	0.000	0.027	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
0.722	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.030	0.000	0.030	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
0.787	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.033	0.000	0.033	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
0.853	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.035	0.000	0.035	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
0.919	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.038	0.000	0.038	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
0.984	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.041	0.000	0.041	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
1.050	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.043	0.000	0.043	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
1.115	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.046	0.000	0.046	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
1.181	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.049	0.000	0.049	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
1.247	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.052	0.000	0.052	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
1.312	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.054	0.000	0.054	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
1.378	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.057	0.000	0.057	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
1.444	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.060	0.000	0.060	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
1.509	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.062	0.000	0.062	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
1.575	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.065	0.000	0.065	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
1.640	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.068	0.000	0.068	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
1.706	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.071	0.000	0.071	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
1.772	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.073	0.000	0.073	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
1.837	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.076	0.000	0.076	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
1.903	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.079	0.000	0.079	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
1.968	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.081	0.000	0.081	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
2.034	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.084	0.000	0.084	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
2.100	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.087	0.000	0.087	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
2.165	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.090	0.000	0.090	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
2.231	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.092	0.000	0.092	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
2.297	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.095	0.000	0.095	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
2.362	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.098	0.000	0.098	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
2.428	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.100	0.000	0.100	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
2.493	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.103	0.000	0.103	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
2.559	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.106	0.000	0.106	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
2.625	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.109	0.000	0.109	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
2.690	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.111	0.000	0.111	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
2.756	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.114	0.000	0.114	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
2.821	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.117	0.000	0.117	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
2.887	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.119	0.000	0.119	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
2.953	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.122	0.000	0.122	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
3.018	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.125	0.000	0.125	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
3.084	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.128	0.000	0.128	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
3.150	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.130	0.000	0.130	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
3.215	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.133	0.000	0.133	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
3.281	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.136	0.000	0.136	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
3.346	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.138	0.000	0.138	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
3.412	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.141	0.000	0.141	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
3.478	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.144	0.000	0.144	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
3.543	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.147	0.000	0.147	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
3.609	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.149	0.000	0.149	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
3.674	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.152	0.000	0.152	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
3.740	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.155	0.000	0.155	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
3.806	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.157	0.000	0.157	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
3.871	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.160	0.000	0.160	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
3.937	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.163	0.000	0.163	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
4.003	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.166	0.000	0.166	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
4.068	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.168	0.000	0.168	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
4.134	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.171	0.000	0.171	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
4.199	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.174	0.000	0.174	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
4.265	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.176	0.000	0.176	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
4.331	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.179	0.000	0.179	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
4.396	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.182	0.000	0.182	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
4.462	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.185	0.000	0.185	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
4.528	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.187	0.000	0.187	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
4.593	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.190	0.000	0.190	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
4.659	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.193	0.000	0.193	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
4.724	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.195	0.000	0.195	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
4.790	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.198	0.000	0.198	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
4.856	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.201	0.000	0.201	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
4.921	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.204	0.000	0.204	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
4.987	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.206	0.000	0.206	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
5.052	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.209	0.000	0.209	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
5.118	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.212	0.000	0.212	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
5.184	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.214	0.000	0.214	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
5.249	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.217	0.000	0.217	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
5.315	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.220	0.000	0.220	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
5.381	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.223	0.000	0.223	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
5.446	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.225	0.000	0.225	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
5.512	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.228	0.000	0.228	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
5.577	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.231	0.000	0.231	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
5.643	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.233	0.000	0.233	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
5.709	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.236	0.000	0.236	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
5.774	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.239	0.000	0.239	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
5.840	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.242	0.000	0.242	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
5.905	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.244	0.000	0.244	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
5.971	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.247	0.000	0.247	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
6.037	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.250	0.000	0.250	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
6.102	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.252	0.000	0.252	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
6.168	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.255	0.000	0.255	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
6.234	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.258	0.000	0.258	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
6.299	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.261	0.000	0.261	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
6.365	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.263	0.000	0.263	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
6.430	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.266	0.000	0.266	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
6.496	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.269	0.000	0.269	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
6.562	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.271	0.000	0.271	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
6.627	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.274	0.000	0.274	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
6.693	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.277	0.000	0.277	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
6.758	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.280	0.000	0.280	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
6.824	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.282	0.000	0.282	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
6.890	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.285	0.000	0.285	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
6.955	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.288	0.000	0.288	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
7.021	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.290	0.000	0.290	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
7.087	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.293	0.000	0.293	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
7.152	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.296	0.000	0.296	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
7.218	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.299	0.000	0.299	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
7.283	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.301	0.000	0.301	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
7.349	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.304	0.000	0.304	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
7.415	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.307	0.000	0.307	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
7.480	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.310	0.000	0.310	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
7.546	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.312	0.000	0.312	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
7.611	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.315	0.000	0.315	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
7.677	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.318	0.000	0.318	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
7.743	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.320	0.000	0.320	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
7.808	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.323	0.000	0.323	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
7.874	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.326	0.000	0.326	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
7.940	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.329	0.000	0.329	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
8.005	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.331	0.000	0.331	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
8.071	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.334	0.000	0.334	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
8.136	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.337	0.000	0.337	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
8.202	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.339	0.000	0.339	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
8.268	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.342	0.000	0.342	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
8.333	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.345	0.000	0.345	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
8.399	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.348	0.000	0.348	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
8.464	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.350	0.000	0.350	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
8.530	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.353	0.000	0.353	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
8.596	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.356	0.000	0.356	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
8.661	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.358	0.000	0.358	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
8.727	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.361	0.000	0.361	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
8.793	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.364	0.000	0.364	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
8.858	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.367	0.000	0.367	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
8.924	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.369	0.000	0.369	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
8.989	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.372	0.000	0.372	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
9.055	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.375	0.000	0.375	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
9.121	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.377	0.000	0.377	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
9.186	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.380	0.000	0.380	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
9.252	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.383	0.000	0.383	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
9.317	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.386	0.000	0.386	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
9.383	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.388	0.000	0.388	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
9.449	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.391	0.000	0.391	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
9.514	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.394	0.000	0.394	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
9.580	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.396	0.000	0.396	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
9.646	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.399	0.000	0.399	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
9.711	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.402	0.000	0.402	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
9.777	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.405	0.000	0.405	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
9.842	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.407	0.000	0.407	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
9.908	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.410	0.000	0.410	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
9.974	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.413	0.000	0.413	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
10.039	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.415	0.000	0.415	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
10.105	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.418	0.000	0.418	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
10.170	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.421	0.000	0.421	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
10.236	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.424	0.000	0.424	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
10.302	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.426	0.000	0.426	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
10.367	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.429	0.000	0.429	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
10.433	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.432	0.000	0.432	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
10.499	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.434	0.000	0.434	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
10.564	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.437	0.000	0.437	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
10.630	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.440	0.000	0.440	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
10.695	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.443	0.000	0.443	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
10.761	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.445	0.000	0.445	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
10.827	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.448	0.000	0.448	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
10.892	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.451	0.000	0.451	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
10.958	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.453	0.000	0.453	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
11.023	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.456	0.000	0.456	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
11.089	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.459	0.000	0.459	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
11.155	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.462	0.000	0.462	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
11.220	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.464	0.000	0.464	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
11.286	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.467	0.000	0.467	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
11.352	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.470	0.000	0.470	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
11.417	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.472	0.000	0.472	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
11.483	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.475	0.000	0.475	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
11.548	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.478	0.000	0.478	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
11.614	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.481	0.000	0.481	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
11.680	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.483	0.000	0.483	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
11.745	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.486	0.000	0.486	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
11.811	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.489	0.000	0.489	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
11.876	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.491	0.000	0.491	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
11.942	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.494	0.000	0.494	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
12.008	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.497	0.000	0.497	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
12.073	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.500	0.000	0.500	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
12.139	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.502	0.000	0.502	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
12.205	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.505	0.000	0.505	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
12.270	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.508	0.000	0.508	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
12.336	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.510	0.000	0.510	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
12.401	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.513	0.000	0.513	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
12.467	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.516	0.000	0.516	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
12.533	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.519	0.000	0.519	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
12.598	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.521	0.000	0.521	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
12.664	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.524	0.000	0.524	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
12.730	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.527	0.000	0.527	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
12.795	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.529	0.000	0.529	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
12.861	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.532	0.000	0.532	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
12.926	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.535	0.000	0.535	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
12.992	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.538	0.000	0.538	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
13.058	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.540	0.000	0.540	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
13.123	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.543	0.000	0.543	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
13.189	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.546	0.000	0.546	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
13.254	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.548	0.000	0.548	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
13.320	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.551	0.000	0.551	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
13.386	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.554	0.000	0.554	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
13.451	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.557	0.000	0.557	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
13.517	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.559	0.000	0.559	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
13.583	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.562	0.000	0.562	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
13.648	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.565	0.000	0.565	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
13.714	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.567	0.000	0.567	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
13.779	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.570	0.000	0.570	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
13.845	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.573	0.000	0.573	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
13.911	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.576	0.000	0.576	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
13.976	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.578	0.000	0.578	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
14.042	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.581	0.000	0.581	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
14.107	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.584	0.000	0.584	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
14.173	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.586	0.000	0.586	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
14.239	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.589	0.000	0.589	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
14.304	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.592	0.000	0.592	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
14.370	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.595	0.000	0.595	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
14.436	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.597	0.000	0.597	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
14.501	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.600	0.000	0.600	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
14.567	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.603	0.000	0.603	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
14.632	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.605	0.000	0.605	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
14.698	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.608	0.000	0.608	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
14.764	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.611	0.000	0.611	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
14.829	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.614	0.000	0.614	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
14.895	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.616	0.000	0.616	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
14.960	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.619	0.000	0.619	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
15.026	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.622	0.000	0.622	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
15.092	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.624	0.000	0.624	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
15.157	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.627	0.000	0.627	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
15.223	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.630	0.000	0.630	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
15.289	-9999.0	-9999.0	0.00	0.00	-9999.0	82.7	0.633	0.000	0.633	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
15.354	2.04	2.05	0.06	0.41	2.93	111.4	0.636	0.000	0.636	2.0	2.5	5.0E-08	-9999.0	-9999.0	0.094	0.6	-9999.0	-9999.0
15.420	3.26	3.27	0.16	0.90	4.91	111.4	0.639	0.000	0.639	3.1	3.9	5.0E-08	-9999.0	-9999.0	0.175	0.9	-9999.0	-9999.0
15.485	6.71	6.73	0.32	2.49	4.76	111.4	0.643	0.000	0.643	6.4	8.0	5.0E-08	-9999.0	-9999.0	0.406	2.4	-9999.0	-9999.0
15.551	32.45	32.54	0.55	8.32	1.69	114.6	0.647	0.000	0.647	12.5	15.5	5.0E-05	40.7	38.0	2.126	10.0	107.6	3.305
15.617	84.26	84.32	0.76	5.39	0.90	120.9	0.651	0.000	0.651	20.2	25.0	5.0E-03	67.9	44.0	-9999.0	-9999.0	180.0	2.135
15.682	100.35	100.39	0.99	3.04	0.99	120.9	0.655	0.000	0.655	24.0	29.7	5.0E-03	72.8	44.0	-9999.0	-9999.0	203.4	2.026
15.748	110.13	110.15	1.21	2.37	1.10	120.9	0.659	0.000	0.659	26.4	32.5	5.0E-03	75.4	44.0	-9999.0	-9999.0	217.5	1.975
15.813	116.20	116.23	1.41	2.15	1.22	120.9	0.663	0.000	0.663	27.8	34.2	5.0E-03	76.9	44.0	-9999.0	-9999.0	226.3	1.947
15.879	119.46	119.49	1.63	3.02	1.37	120.9	0.667	0.000	0.667	28.6	35.0	5.0E-03	77.6	44.0	-9999.0	-9999.0	231.1	1.934
15.945	119.46	119.47	1.78	1.27	1.49	120.9	0.670	0.000	0.670	28.6	34.9	5.0E-03	77.5	44.0	-9999.0	-9999.0	231.3	1.936
16.010	117.93	117.92	1.83	-0.28	1.56	120.9	0.674	0.000	0.674	28.2	34.4	5.0E-03	77.0	44.0	-9999.0	-9999.0	229.3	1.944
16.076	116.96	116.95	1.81	-0.94	1.55	120.9	0.678	0.000	0.678	28.0	34.0	5.0E-03	76.7	44.0	-9999.0	-9999.0	228.1	1.950
16.142	111.09	111.22	1.71	11.97	1.54	120.9	0.682	0.000	0.682	26.6	32.2	5.0E-03	75.2	44.0	-9999.0	-9999.0	220.2	1.979
16.207	109.37	109.39	1.56	2.61	1.43	120.9	0.686	0.000	0.686	26.2	31.6	5.0E-03	74.6	44.0	-9999.0	-9999.0	217.7	1.990
16.273	104.57	104.58	1.45	0.92	1.39	120.9	0.690	0.000	0.690	25.0	30.1	5.0E-03	73.3	44.0	-9999.0	-9999.0	211.1	2.018
16.338	99.53	99.53	1.35	-0.57	1.36	120.9	0.694	0.000	0.694	23.8	28.6	5.0E-03	71.7	44.0	-9999.0	-9999.0	203.9	2.049
16.404	95.69	95.68	1.30	-1.12	1.36	120.9	0.698	0.000	0.698	22.9	27.4	5.0E-03	70.5	44.0	-9999.0	-9999.0	198.5	2.075
16.470	92.05	92.05	1.19	-0.55	1.30	120.9	0.702	0.000	0.702	22.0	26.3	5.0E-03	69.3	44.0	-9999.0	-9999.0	193.4	2.101
16.535	88.22	88.23	1.18	0.16	1.34	120.9	0.706	0.000	0.706	21.1	25.1	5.0E-03	68.1	42.0	-9999.0	-9999.0	188.1	2.132
16.601	86.62	86.64	1.16	1.70	1.34	120.9	0.710	0.000	0.710	20.7	24.6	5.0E-03	67.4	42.0	-9999.0	-9999.0	186.0	2.146
16.666	83.30	83.37	1.15	6.20	1.38	120.9	0.714	0.000	0.714	20.0	23.6	5.0E-03	66.3	42.0	-9999.0	-9999.0	181.4	2.176
16.732	80.36	80.42	1.16	4.82	1.45	117.7	0.718	0.000	0.718	25.7	30.3	5.0E-04	65.2	42.0	-9999.0	-9999.0	177.4	2.206
16.798	78.89	78.93	1.24	3.12	1.57	117.7	0.722	0.000	0.722	25.2	29.7	5.0E-04	64.5	42.0	-9999.0	-9999.0	175.5	2.224
16.863	78.96	79.00	1.31	3.18	1.66	117.7	0.726	0.000	0.726	25.2	29.6	5.0E-04	64.5	42.0	-9999.0	-9999.0	175.8	2.225
16.929	79.21	79.22	1.36	0.98	1.72	117.7	0.730	0.000	0.730	25.3	29.6	5.0E-04	64.5	42.0	-9999.0	-9999.0	176.3	2.225
16.995	79.85	79.86	1.42	0.65	1.78	117.7	0.733	0.000	0.733	25.5	29.8	5.0E-04	64.7	42.0	-9999.0	-9999.0	177.3	2.221
17.060	80.10	80.12	1.43	1.00	1.79	117.7	0.737	0.000	0.737	25.6	29.8	5.0E-04	64.7	42.0	-9999.0	-9999.0	177.9	2.220
17.126	80.62	80.62	1.45	0.69	1.80	117.7	0.741	0.000	0.741	25.7	29.9	5.0E-04	64.8	42.0	-9999.0	-9999.0	178.7	2.217
17.191	83.30	83.33	1.41	2.88	1.70	117.7	0.745	0.000	0.745	26.6	30.8	5.0E-04	65.6	42.0	-9999.0	-9999.0	182.7	2.193
17.257	87.83	87.87	1.38	3.44	1.57	117.7	0.749	0.000	0.749	28.1	32.4	5.0E-04	67.1	42.0	-9999.0	-9999.0	189.4	2.155
17.323	94.10	94.15	1.37	4.58	1.46	120.9	0.753	0.000	0.753	22.5	26.0	5.0E-03	69.0	42.0	-9999.0	-9999.0	198.6	2.109

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
17.388	99.02	99.04	1.36	2.29	1.38	120.9	0.757	0.000	0.757	23.7	27.3	5.0E-03	70.4	44.0	-9999.0	-9999.0	205.9	2.079
17.454	105.66	105.65	1.45	-0.79	1.38	120.9	0.761	0.000	0.761	25.3	29.0	5.0E-03	72.1	44.0	-9999.0	-9999.0	215.6	2.041
17.519	107.26	107.26	1.46	-0.33	1.36	120.9	0.765	0.000	0.765	25.7	29.4	5.0E-03	72.5	44.0	-9999.0	-9999.0	218.1	2.033
17.585	107.45	107.43	1.46	-1.54	1.36	120.9	0.769	0.000	0.769	25.7	29.3	5.0E-03	72.5	44.0	-9999.0	-9999.0	218.5	2.034
17.651	108.72	108.73	1.50	0.31	1.38	120.9	0.773	0.000	0.773	26.0	29.6	5.0E-03	72.7	44.0	-9999.0	-9999.0	220.5	2.028
17.716	108.02	108.11	1.54	8.06	1.43	120.9	0.777	0.000	0.777	25.9	29.4	5.0E-03	72.5	44.0	-9999.0	-9999.0	219.8	2.033
17.782	108.60	108.63	1.54	2.09	1.42	120.9	0.781	0.000	0.781	26.0	29.4	5.0E-03	72.6	44.0	-9999.0	-9999.0	220.7	2.032
17.848	110.58	110.59	1.55	0.83	1.41	120.9	0.785	0.000	0.785	26.5	29.9	5.0E-03	73.0	44.0	-9999.0	-9999.0	223.7	2.023
17.913	113.32	113.35	1.58	2.43	1.40	120.9	0.789	0.000	0.789	27.1	30.6	5.0E-03	73.7	44.0	-9999.0	-9999.0	227.9	2.011
17.979	114.22	114.23	1.64	1.54	1.44	120.9	0.793	0.000	0.793	27.3	30.7	5.0E-03	73.8	44.0	-9999.0	-9999.0	229.4	2.008
18.044	113.13	113.12	1.70	-1.43	1.51	120.9	0.797	0.000	0.797	27.1	30.3	5.0E-03	73.4	44.0	-9999.0	-9999.0	228.1	2.016
18.110	112.05	112.04	1.75	-0.83	1.57	120.9	0.800	0.000	0.800	26.8	30.0	5.0E-03	73.1	44.0	-9999.0	-9999.0	226.8	2.024
18.176	112.62	112.63	1.77	0.92	1.58	120.9	0.804	0.000	0.804	27.0	30.1	5.0E-03	73.2	44.0	-9999.0	-9999.0	227.8	2.023
18.241	112.62	112.67	1.77	4.56	1.57	120.9	0.808	0.000	0.808	27.0	30.0	5.0E-03	73.1	44.0	-9999.0	-9999.0	228.1	2.025
18.307	113.39	113.48	1.85	8.87	1.63	120.9	0.812	0.000	0.812	27.2	30.1	5.0E-03	73.3	44.0	-9999.0	-9999.0	229.5	2.023
18.372	115.18	115.24	1.93	5.85	1.68	120.9	0.816	0.000	0.816	27.6	30.5	5.0E-03	73.6	44.0	-9999.0	-9999.0	232.3	2.016
18.438	115.24	115.28	1.93	4.09	1.68	120.9	0.820	0.000	0.820	27.6	30.5	5.0E-03	73.6	44.0	-9999.0	-9999.0	232.6	2.018
18.504	115.88	115.93	1.79	4.17	1.55	120.9	0.824	0.000	0.824	27.8	30.6	5.0E-03	73.7	44.0	-9999.0	-9999.0	233.8	2.016
18.569	118.38	118.62	1.70	22.32	1.44	120.9	0.828	0.000	0.828	28.4	31.2	5.0E-03	74.3	44.0	-9999.0	-9999.0	237.8	2.005
18.635	121.83	121.91	1.55	7.48	1.27	120.9	0.832	0.000	0.832	29.2	32.0	5.0E-03	75.0	44.0	-9999.0	-9999.0	242.8	1.991
18.701	126.62	126.65	1.54	3.27	1.22	120.9	0.836	0.000	0.836	30.3	33.2	5.0E-03	76.0	44.0	-9999.0	-9999.0	249.7	1.972
18.766	123.93	123.95	1.48	1.54	1.20	120.9	0.840	0.000	0.840	29.7	32.4	5.0E-03	75.3	44.0	-9999.0	-9999.0	246.1	1.986
18.832	121.95	121.92	1.04	-2.02	0.86	124.1	0.844	0.000	0.844	23.4	25.4	5.0E-02	74.8	44.0	-9999.0	-9999.0	243.5	1.997
18.897	117.28	117.28	1.13	-0.53	0.97	120.9	0.848	0.000	0.848	28.1	30.5	5.0E-03	73.6	44.0	-9999.0	-9999.0	237.1	2.022
18.963	111.09	111.14	1.33	4.92	1.20	120.9	0.852	0.000	0.852	26.6	28.8	5.0E-03	72.0	44.0	-9999.0	-9999.0	228.5	2.056
19.029	98.51	98.50	1.78	-0.53	1.81	117.7	0.856	0.000	0.856	31.4	34.0	5.0E-04	68.5	42.0	-9999.0	-9999.0	210.4	2.136
19.094	85.28	85.31	1.98	3.02	2.33	117.7	0.860	0.000	0.860	27.2	29.4	5.0E-04	64.3	42.0	-9999.0	-9999.0	191.7	2.247
19.160	81.45	81.46	1.81	1.04	2.23	117.7	0.864	0.000	0.864	26.0	28.0	5.0E-04	62.9	42.0	-9999.0	-9999.0	186.5	2.289
19.225	79.08	79.03	2.07	-4.39	2.61	114.6	0.868	0.000	0.868	30.3	32.5	5.0E-05	61.9	42.0	5.211	10.0	183.4	2.320
19.291	86.24	86.51	2.42	25.30	2.79	114.6	0.871	0.000	0.871	33.1	35.5	5.0E-05	64.5	42.0	5.709	10.0	194.0	2.243
19.357	107.51	108.05	2.55	49.99	2.36	117.7	0.875	0.000	0.875	34.5	36.9	5.0E-04	70.8	42.0	-9999.0	-9999.0	225.4	2.086
19.422	144.82	145.34	2.66	48.16	1.83	120.9	0.879	0.000	0.879	34.8	37.1	5.0E-03	79.2	44.0	-9999.0	-9999.0	278.9	1.919
19.488	199.31	199.70	2.68	36.05	1.34	120.9	0.883	0.000	0.883	47.8	50.9	5.0E-03	88.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0
19.554	247.29	247.49	2.75	18.70	1.11	124.1	0.887	0.000	0.887	47.4	50.3	5.0E-02	94.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0
19.619	271.63	271.65	2.95	2.02	1.08	124.1	0.891	0.000	0.891	52.0	55.1	5.0E-02	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
19.685	295.33	295.33	3.07	0.39	1.04	124.1	0.895	0.000	0.895	56.6	59.8	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
19.750	318.38	318.39	3.12	1.12	0.98	124.1	0.899	0.000	0.899	61.0	64.3	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
19.816	332.89	332.89	3.27	-0.06	0.98	124.1	0.903	0.000	0.903	63.8	67.1	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
19.882	343.36	343.38	3.57	1.25	1.04	124.1	0.907	0.000	0.907	65.8	69.0	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
19.947	346.30	346.36	3.89	5.79	1.12	124.1	0.912	0.000	0.912	66.3	69.5	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
20.013	337.81	337.87	4.20	5.75	1.24	124.1	0.916	0.000	0.916	64.7	67.6	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
20.078	327.91	327.95	4.48	4.46	1.37	124.1	0.920	0.000	0.920	62.8	65.5	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
20.144	319.08	319.19	4.64	9.77	1.45	124.1	0.924	0.000	0.924	61.1	63.6	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
20.210	314.74	314.81	4.73	6.26	1.50	124.1	0.928	0.000	0.928	60.3	62.6	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
20.275	310.72	310.77	4.81	3.97	1.55	120.9	0.932	0.000	0.932	74.4	77.1	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
20.341	306.25	306.28	4.96	2.45	1.62	120.9	0.936	0.000	0.936	73.3	75.8	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
20.407	301.33	301.39	5.09	5.59	1.69	120.9	0.940	0.000	0.940	72.2	74.4	5.0E-03	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
20.472	295.71	295.71	5.14	0.22	1.74	120.9	0.944	0.000	0.944	70.8	72.9	5.0E-03	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
20.538	286.90	286.94	5.12	4.37	1.79	120.9	0.948	0.000	0.948	68.7	70.6	5.0E-03	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
20.603	280.18	280.19	5.06	1.00	1.81	120.9	0.952	0.000	0.952	67.1	68.8	5.0E-03	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
20.669	270.80	270.86	4.99	5.93	1.84	120.9	0.956	0.000	0.956	64.8	66.3	5.0E-03	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
20.735	260.95	260.96	4.91	0.83	1.88	120.9	0.960	0.000	0.960	62.5	63.8	5.0E-03	94.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0
20.800	252.39	252.41	4.69	1.90	1.86	120.9	0.964	0.000	0.964	60.4	61.6	5.0E-03	93.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0
20.866	243.07	243.08	4.47	1.06	1.84	120.9	0.968	0.000	0.968	58.2	59.2	5.0E-03	92.6	46.0	-9999.0	-9999.0	-9999.0	-9999.0
20.932	234.83	234.83	4.28	-0.06	1.82	120.9	0.972	0.000	0.972	56.2	57.0	5.0E-03	91.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0
20.997	229.66	229.65	4.03	-0.63	1.75	120.9	0.975	0.000	0.975	55.0	55.7	5.0E-03	90.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0
21.063	222.95	222.96	3.79	0.61	1.70	120.9	0.979	0.000	0.979	53.4	53.9	5.0E-03	89.9	46.0	-9999.0	-9999.0	-9999.0	-9999.0
21.128	217.07	217.08	3.64	1.35	1.68	120.9	0.983	0.000	0.983	52.0	52.4	5.0E-03	89.1	46.0	-9999.0	-9999.0	-9999.0	-9999.0
21.194	208.77	208.77	3.50	-0.04	1.68	120.9	0.987	0.000	0.987	50.0	50.3	5.0E-03	87.9	46.0	-9999.0	-9999.0	-9999.0	-9999.0
21.260	201.16	201.18	3.38	1.72	1.68	120.9	0.991	0.000	0.991	48.2	48.4	5.0E-03	86.8	46.0	-9999.0	-9999.0	408.2	2.029
21.325	195.03	195.05	3.28	1.19	1.68	120.9	0.995	0.000	0.995	46.7	46.8	5.0E-03	85.9	44.0	-9999.0	-9999.0	384.1	1.969
21.391	188.58	188.58	3.13	0.22	1.66	120.9	0.999	0.000	0.999	45.1	45.2	5.0E-03	84.8	44.0	-9999.0	-9999.0	363.8	1.929
21.456	181.68	181.67	2.98	-0.73	1.64	120.9	1.003	0.000	1.003	43.5	43.4	5.0E-03	83.7	44.0	-9999.0	-9999.0	346.4	1.907
21.522	177.46	177.46	2.79	-0.39	1.57	120.9	1.007	0.000	1.007	42.5	42.3	5.0E-03	83.0	44.0	-9999.0	-9999.0	337.5	1.902
21.588	171.91	171.91	2.65	0.31	1.54	120.9	1.011	0.000	1.011	41.2	40.9	5.0E-03	82.0	44.0	-9999.0	-9999.0	327.1	1.903
21.653	167.76	167.76	2.50	0.55	1.49	120.9	1.015	0.000	1.015	40.2	39.9	5.0E-03	81.3	44.0	-9999.0	-9999.0	320.2	1.909
21.719	162.45	162.46	2.39	0.33	1.47	120.9	1.019	0.000	1.019	38.9	38.5	5.0E-03	80.3	44.0	-9999.0	-9999.0	312.0	1.920
21.785	158.17	158.17	2.27	0.10	1.43	120.9	1.023	0.000	1.023	37.9	37.4	5.0E-03	79.5	44.0	-9999.0	-9999.0	305.8	1.933
21.850	154.21	154.23	2.17	1.78	1.40	120.9	1.027	0.000	1.027	36.9	36.4	5.0E-03	78.7	44.0	-9999.0	-9999.0	300.3	1.947
21.916	149.93	149.94	2.01	0.28	1.34	120.9	1.031	0.000	1.031	35.9	35.4	5.0E-03	77.8	44.0	-9999.0	-9999.0	294.5	1.964
21.981	146.36	146.37	1.91	1.00	1.31	120.9	1.035	0.000	1.035	35.0	34.4	5.0E-03	77.1	44.0	-9999.0	-9999.0	289.7	1.979
22.047	142.52	142.51	1.87	-0.10	1.32	120.9	1.039	0.000	1.039	34.1	33.5	5.0E-03	76.3	44.0	-9999.0	-9999.0	284.6	1.997
22.113	137.98	137.98	1.78	-0.06	1.29	120.9	1.043	0.000	1.043	33.0	32.4	5.0E-03	75.3	44.0	-9999.0	-9999.0	278.4	2.018
22.178	133.32	133.32	1.72	-0.16	1.29	120.9	1.047	0.000	1.047	31.9	31.2	5.0E-03	74.2	44.0	-9999.0	-9999.0	272.0	2.040
22.244	129.74	129.74	1.66	-0.24	1.28	120.9	1.051	0.000	1.051	31.1	30.3	5.0E-03	73.4	42.0	-9999.0	-9999.0	267.1	2.059
22.309	127.57	127.58	0.89	0.77	0.70	124.1	1.055	0.000	1.055	24.4	23.8	5.0E-02	72.9	42.0	-9999.0	-9999.0	264.2	2.071
22.375	126.17	126.17	0.86	0.08	0.68	124.1	1.059	0.000	1.059	24.2	23.5	5.0E-02	72.5	42.0	-9999.0	-9999.0	262.4	2.080
22.441	120.61	120.61	0.84	-0.61	0.70	124.1	1.063	0.000	1.063	23.1	22.4	5.0E-02	71.1	42.0	-9999.0	-9999.0	254.5	2.111
22.506	116.07	116.07	0.85	0.02	0.73	124.1	1.067	0.000	1.067	22.2	21.5	5.0E-02	70.0	42.0	-9999.0	-9999.0	248.1	2.138
22.572	110.64	110.64	0.86	-0.28	0.78	124.1	1.071	0.000	1.071	21.2	20.5	5.0E-02	68.6	42.0	-9999.0	-9999.0	240.3	2.172
22.638	103.23	103.25	0.85	1.58	0.83	120.9	1.075	0.000	1.075	24.7	23.8	5.0E-03	66.5	42.0	-9999.0	-9999.0	229.7	2.225
22.703	100.67	100.69	0.80	1.60	0.80	120.9	1.079	0.000	1.079	24.1	23.2	5.0E-03	65.8	42.0	-9999.0	-9999.0	226.2	2.246
22.769	97.55	97.56	0.76	1.66	0.78	120.9	1.083	0.000	1.083	23.4	22.4	5.0E-03	64.8	42.0	-9999.0	-9999.0	221.9	2.274
22.834	94.80	94.81	0.78	1.13	0.82	120.9	1.087	0.000	1.087	22.7	21.8	5.0E-03	63.9	42.0	-9999.0	-9999.0	218.1	2.301
22.900	93.02	93.05	0.81	2.86	0.87	120.9	1.091	0.000	1.091	22.3	21.3	5.0E-03	63.3	42.0	-9999.0	-9999.0	215.8	2.320
22.966	90.84	90.85	0.82	0.94	0.90	120.9	1.095	0.000	1.095	21.8	20.8	5.0E-03	62.6	42.0	-9999.0	-9999.0	212.9	2.344
23.031	90.14	90.29	0.81	13.57	0.90	120.9	1.099	0.000	1.099	21.6	20.6	5.0E-03	62.4	42.0	-9999.0	-9999.0	212.3	2.352
23.097	84.90	84.90	0.81	0.31	0.96	120.9	1.103	0.000	1.103	20.3	19.4	5.0E-03	60.6	40.0	-9999.0	-9999.0	205.0	2.415

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
23.162	81.52	81.53	0.79	1.43	0.97	120.9	1.107	0.000	1.107	19.5	18.6	5.0E-03	59.3	40.0	-9999.0	-9999.0	200.6	2.460
23.228	79.85	79.86	0.79	0.90	0.99	120.9	1.111	0.000	1.111	19.1	18.1	5.0E-03	58.7	40.0	-9999.0	-9999.0	198.5	2.486
23.294	78.83	78.86	0.77	2.29	0.98	120.9	1.115	0.000	1.115	18.9	17.9	5.0E-03	58.3	40.0	-9999.0	-9999.0	197.4	2.503
23.359	77.49	77.50	0.72	1.17	0.93	120.9	1.119	0.000	1.119	18.6	17.5	5.0E-03	57.7	40.0	-9999.0	-9999.0	195.7	2.525
23.425	75.63	75.64	0.71	1.04	0.94	120.9	1.123	0.000	1.123	18.1	17.1	5.0E-03	57.0	40.0	-9999.0	-9999.0	193.4	2.557
23.491	74.17	74.18	0.70	1.00	0.95	120.9	1.127	0.000	1.127	17.8	16.7	5.0E-03	56.4	40.0	-9999.0	-9999.0	191.6	2.583
23.556	72.12	72.14	0.70	1.62	0.97	120.9	1.131	0.000	1.131	17.3	16.2	5.0E-03	55.5	40.0	-9999.0	-9999.0	189.1	2.621
23.622	71.42	71.44	0.73	1.52	1.02	120.9	1.135	0.000	1.135	17.1	16.1	5.0E-03	55.2	40.0	-9999.0	-9999.0	188.4	2.637
23.687	70.08	70.09	0.73	1.04	1.04	120.9	1.139	0.000	1.139	16.8	15.7	5.0E-03	54.6	40.0	-9999.0	-9999.0	186.7	2.664
23.753	68.10	68.11	0.74	0.96	1.09	120.9	1.143	0.000	1.143	16.3	15.3	5.0E-03	53.7	40.0	-9999.0	-9999.0	184.2	2.705
23.819	67.01	67.03	0.76	1.25	1.14	120.9	1.147	0.000	1.147	16.0	15.0	5.0E-03	53.2	40.0	-9999.0	-9999.0	183.0	2.730
23.884	67.39	67.40	0.78	1.06	1.16	120.9	1.151	0.000	1.151	16.1	15.0	5.0E-03	53.3	40.0	-9999.0	-9999.0	183.7	2.726
23.950	64.52	64.53	0.79	1.23	1.23	117.7	1.155	0.000	1.155	20.6	19.2	5.0E-04	52.0	40.0	-9999.0	-9999.0	180.0	2.789
24.015	62.60	62.61	0.78	0.71	1.25	117.7	1.158	0.000	1.158	20.0	18.6	5.0E-04	51.1	40.0	-9999.0	-9999.0	177.5	2.835
24.081	61.26	61.27	0.77	0.81	1.26	117.7	1.162	0.000	1.162	19.6	18.1	5.0E-04	50.5	38.0	-9999.0	-9999.0	175.8	2.869
24.147	59.41	59.42	0.76	0.67	1.28	117.7	1.166	0.000	1.166	19.0	17.6	5.0E-04	49.5	38.0	-9999.0	-9999.0	173.4	2.918
24.212	57.30	57.31	0.73	0.61	1.28	117.7	1.170	0.000	1.170	18.3	16.9	5.0E-04	48.4	38.0	-9999.0	-9999.0	170.5	2.975
24.278	55.19	55.20	0.70	0.81	1.27	117.7	1.174	0.000	1.174	17.6	16.3	5.0E-04	47.3	38.0	-9999.0	-9999.0	167.6	3.036
24.344	53.28	53.28	0.71	0.51	1.34	117.7	1.178	0.000	1.178	17.0	15.7	5.0E-04	46.3	38.0	-9999.0	-9999.0	164.9	3.094
24.409	54.17	54.18	0.71	0.73	1.31	117.7	1.182	0.000	1.182	17.3	15.9	5.0E-04	46.7	38.0	-9999.0	-9999.0	166.4	3.072
24.475	57.11	57.12	0.78	1.02	1.37	117.7	1.185	0.000	1.185	18.2	16.7	5.0E-04	48.2	38.0	-9999.0	-9999.0	171.0	2.994
24.540	61.01	61.02	0.91	0.83	1.50	117.7	1.189	0.000	1.189	19.5	17.9	5.0E-04	50.0	38.0	-9999.0	-9999.0	176.8	2.898
24.606	68.36	68.37	1.02	1.19	1.50	117.7	1.193	0.000	1.193	21.8	20.0	5.0E-04	53.2	40.0	-9999.0	-9999.0	187.3	2.740
24.672	77.11	77.12	1.19	1.37	1.55	117.7	1.197	0.000	1.197	24.6	22.5	5.0E-04	56.6	40.0	-9999.0	-9999.0	199.6	2.588
24.737	79.59	79.60	1.37	1.04	1.73	117.7	1.201	0.000	1.201	25.4	23.2	5.0E-04	57.5	40.0	-9999.0	-9999.0	203.2	2.552
24.803	79.27	79.29	1.53	1.37	1.93	117.7	1.205	0.000	1.205	25.3	23.1	5.0E-04	57.3	40.0	-9999.0	-9999.0	203.0	2.560
24.868	73.98	73.99	1.68	1.37	2.28	117.7	1.209	0.000	1.209	23.6	21.5	5.0E-04	55.3	40.0	-9999.0	-9999.0	195.9	2.648
24.934	69.95	69.96	1.79	1.13	2.56	114.6	1.212	0.000	1.212	26.8	24.3	5.0E-05	53.7	40.0	4.583	10.0	190.6	2.724
25.000	65.10	65.11	1.84	1.54	2.83	114.6	1.216	0.000	1.216	24.9	22.6	5.0E-05	51.6	38.0	4.260	10.0	184.0	2.826
25.065	60.75	60.77	1.76	1.68	2.90	114.6	1.220	0.000	1.220	23.3	21.1	5.0E-05	49.5	38.0	3.970	10.0	178.1	2.930
25.131	58.13	58.16	1.63	2.35	2.81	114.6	1.224	0.000	1.224	22.3	20.1	5.0E-05	48.2	38.0	3.796	10.0	174.4	2.999
25.197	56.28	56.30	1.51	2.49	2.69	114.6	1.227	0.000	1.227	21.6	19.5	5.0E-05	47.3	38.0	3.672	10.0	171.9	3.052
25.262	56.60	56.63	1.48	2.76	2.62	114.6	1.231	0.000	1.231	21.7	19.6	5.0E-05	47.4	38.0	3.693	10.0	172.5	3.047
25.328	60.18	60.21	1.42	2.84	2.36	114.6	1.235	0.000	1.235	23.1	20.8	5.0E-05	49.1	38.0	3.931	10.0	178.0	2.956
25.393	66.63	66.66	1.13	2.53	1.70	117.7	1.239	0.000	1.239	21.3	19.1	5.0E-04	52.0	40.0	-9999.0	-9999.0	187.4	2.811
25.459	74.17	74.20	1.20	2.96	1.62	117.7	1.243	0.000	1.243	23.7	21.3	5.0E-04	55.0	40.0	-9999.0	-9999.0	198.1	2.669
25.525	79.98	80.02	1.24	3.42	1.55	117.7	1.247	0.000	1.247	25.5	22.9	5.0E-04	57.1	40.0	-9999.0	-9999.0	206.3	2.578
25.590	82.41	82.44	1.28	3.18	1.56	117.7	1.250	0.000	1.250	26.3	23.5	5.0E-04	57.9	40.0	-9999.0	-9999.0	209.9	2.545
25.656	82.41	82.45	1.38	3.50	1.68	117.7	1.254	0.000	1.254	26.3	23.5	5.0E-04	57.9	40.0	-9999.0	-9999.0	210.1	2.548
25.721	79.08	79.13	1.44	4.15	1.82	117.7	1.258	0.000	1.258	25.3	22.5	5.0E-04	56.7	40.0	-9999.0	-9999.0	205.7	2.599
25.787	73.98	74.00	1.45	2.07	1.96	117.7	1.262	0.000	1.262	23.6	21.0	5.0E-04	54.7	40.0	-9999.0	-9999.0	198.8	2.687
25.853	71.03	71.06	1.53	2.57	2.16	117.7	1.266	0.000	1.266	22.7	20.2	5.0E-04	53.5	40.0	-9999.0	-9999.0	195.0	2.744
25.918	71.03	71.08	1.55	4.48	2.19	117.7	1.270	0.000	1.270	22.7	20.1	5.0E-04	53.4	40.0	-9999.0	-9999.0	195.2	2.746
25.984	71.86	71.92	1.57	5.41	2.19	117.7	1.274	0.000	1.274	23.0	20.3	5.0E-04	53.7	40.0	-9999.0	-9999.0	196.6	2.733

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
26.050	73.78	73.84	1.59	5.33	2.16	117.7	1.277	0.000	1.277	23.6	20.9	5.0E-04	54.5	40.0	-9999.0	-9999.0	199.4	2.701
26.115	76.34	76.40	1.59	5.67	2.09	117.7	1.281	0.000	1.281	24.4	21.5	5.0E-04	55.4	40.0	-9999.0	-9999.0	203.2	2.660
26.181	75.25	75.32	1.55	5.91	2.06	117.7	1.285	0.000	1.285	24.0	21.2	5.0E-04	54.9	40.0	-9999.0	-9999.0	201.9	2.681
26.246	73.02	73.08	1.51	6.07	2.07	117.7	1.289	0.000	1.289	23.3	20.6	5.0E-04	54.0	40.0	-9999.0	-9999.0	199.0	2.723
26.312	72.25	72.33	1.47	7.70	2.04	117.7	1.293	0.000	1.293	23.1	20.3	5.0E-04	53.7	40.0	-9999.0	-9999.0	198.2	2.740
26.378	72.05	72.17	1.45	10.20	2.01	117.7	1.297	0.000	1.297	23.0	20.2	5.0E-04	53.6	40.0	-9999.0	-9999.0	198.1	2.746
26.443	71.67	71.78	1.32	9.58	1.84	117.7	1.301	0.000	1.301	22.9	20.1	5.0E-04	53.4	40.0	-9999.0	-9999.0	197.8	2.756
26.509	70.59	70.68	1.12	8.08	1.59	117.7	1.304	0.000	1.304	22.6	19.8	5.0E-04	52.9	40.0	-9999.0	-9999.0	196.5	2.780
26.574	64.40	64.44	0.99	3.68	1.54	117.7	1.308	0.000	1.308	20.6	18.0	5.0E-04	50.2	38.0	-9999.0	-9999.0	187.8	2.915
26.640	56.67	56.69	0.92	2.27	1.63	117.7	1.312	0.000	1.312	18.1	15.8	5.0E-04	46.5	38.0	-9999.0	-9999.0	176.5	3.113
26.706	50.72	50.75	0.87	2.33	1.72	117.7	1.316	0.000	1.316	16.2	14.1	5.0E-04	43.3	38.0	-9999.0	-9999.0	167.1	3.293
26.771	45.48	45.49	0.82	1.25	1.81	117.7	1.320	0.000	1.320	14.5	12.6	5.0E-04	40.1	36.0	-9999.0	-9999.0	158.1	3.475
26.837	41.46	41.48	0.77	1.50	1.86	114.6	1.324	0.000	1.324	15.9	13.8	5.0E-05	37.4	36.0	2.677	10.0	150.6	3.630
26.903	39.23	39.26	0.73	3.02	1.86	114.6	1.327	0.000	1.327	15.0	13.1	5.0E-05	35.8	36.0	2.529	10.0	146.2	3.723
26.968	37.62	37.66	0.68	3.85	1.81	114.6	1.331	0.000	1.331	14.4	12.5	5.0E-05	34.6	36.0	2.422	10.0	142.9	3.794
27.034	36.92	36.96	0.67	3.70	1.82	114.6	1.335	0.000	1.335	14.2	12.3	5.0E-05	34.0	36.0	2.375	10.0	141.5	3.827
27.099	37.24	37.28	0.64	3.35	1.72	114.6	1.339	0.000	1.339	14.3	12.3	5.0E-05	34.2	36.0	2.396	10.0	142.3	3.817
27.165	39.42	39.45	0.59	3.40	1.50	117.7	1.343	0.000	1.343	12.6	10.9	5.0E-04	35.8	36.0	-9999.0	-9999.0	147.1	3.728
27.231	41.65	41.69	0.52	3.25	1.25	117.7	1.346	0.000	1.346	13.3	11.5	5.0E-04	37.3	36.0	-9999.0	-9999.0	151.8	3.642
27.296	43.70	43.72	0.48	2.25	1.10	117.7	1.350	0.000	1.350	14.0	12.0	5.0E-04	38.6	36.0	-9999.0	-9999.0	155.9	3.567
27.362	46.57	46.60	0.45	2.11	0.97	117.7	1.354	0.000	1.354	14.9	12.8	5.0E-04	40.4	36.0	-9999.0	-9999.0	161.5	3.465
27.427	50.59	50.61	0.41	1.86	0.81	120.9	1.358	0.000	1.358	12.1	10.4	5.0E-03	42.8	38.0	-9999.0	-9999.0	168.7	3.334
27.493	54.81	54.83	0.39	1.88	0.71	120.9	1.362	0.000	1.362	13.1	11.2	5.0E-03	45.0	38.0	-9999.0	-9999.0	175.9	3.207
27.559	58.51	58.53	0.37	1.50	0.63	120.9	1.366	0.000	1.366	14.0	12.0	5.0E-03	46.8	38.0	-9999.0	-9999.0	181.9	3.107
27.624	61.45	61.47	0.39	1.74	0.64	120.9	1.370	0.000	1.370	14.7	12.6	5.0E-03	48.2	38.0	-9999.0	-9999.0	186.5	3.035
27.690	64.46	64.47	0.41	1.58	0.64	120.9	1.374	0.000	1.374	15.4	13.2	5.0E-03	49.5	38.0	-9999.0	-9999.0	191.2	2.965
27.756	67.07	67.09	0.46	1.70	0.69	120.9	1.378	0.000	1.378	16.1	13.7	5.0E-03	50.6	38.0	-9999.0	-9999.0	195.2	2.909
27.821	69.63	69.65	0.50	1.82	0.72	120.9	1.382	0.000	1.382	16.7	14.2	5.0E-03	51.7	38.0	-9999.0	-9999.0	199.1	2.858
27.887	72.64	72.66	0.61	1.86	0.84	120.9	1.386	0.000	1.386	17.4	14.8	5.0E-03	52.8	38.0	-9999.0	-9999.0	203.5	2.801
27.952	74.87	74.89	0.73	1.92	0.98	120.9	1.390	0.000	1.390	17.9	15.2	5.0E-03	53.7	40.0	-9999.0	-9999.0	206.9	2.762
28.018	77.11	77.13	0.82	2.25	1.07	120.9	1.394	0.000	1.394	18.5	15.6	5.0E-03	54.5	40.0	-9999.0	-9999.0	210.2	2.726
28.084	77.43	77.45	0.94	1.84	1.22	120.9	1.398	0.000	1.398	18.5	15.7	5.0E-03	54.5	40.0	-9999.0	-9999.0	210.9	2.723
28.149	74.87	74.89	1.10	2.09	1.47	117.7	1.402	0.000	1.402	23.9	20.2	5.0E-04	53.5	38.0	-9999.0	-9999.0	207.5	2.771
28.215	69.95	69.97	1.18	1.90	1.69	117.7	1.406	0.000	1.406	22.3	18.8	5.0E-04	51.5	38.0	-9999.0	-9999.0	200.7	2.869
28.280	64.78	64.80	1.19	1.80	1.84	117.7	1.409	0.000	1.409	20.7	17.4	5.0E-04	49.3	38.0	-9999.0	-9999.0	193.4	2.985
28.346	59.66	59.68	1.28	1.68	2.15	117.7	1.413	0.000	1.413	19.1	16.0	5.0E-04	46.9	38.0	-9999.0	-9999.0	185.9	3.114
28.412	59.41	59.44	1.37	2.57	2.31	114.6	1.417	0.000	1.417	22.8	19.1	5.0E-05	46.7	38.0	3.868	10.0	185.7	3.124
28.477	65.16	65.19	1.42	3.08	2.18	117.7	1.421	0.000	1.421	20.8	17.5	5.0E-04	49.4	38.0	-9999.0	-9999.0	194.6	2.984
28.543	72.05	72.09	1.46	3.62	2.03	117.7	1.425	0.000	1.425	23.0	19.3	5.0E-04	52.2	38.0	-9999.0	-9999.0	204.8	2.840
28.609	75.95	75.99	1.53	3.42	2.02	117.7	1.429	0.000	1.429	24.3	20.3	5.0E-04	53.7	38.0	-9999.0	-9999.0	210.5	2.770
28.674	73.27	73.29	1.40	2.47	1.91	117.7	1.432	0.000	1.432	23.4	19.6	5.0E-04	52.6	38.0	-9999.0	-9999.0	206.9	2.822
28.740	66.37	66.40	1.48	2.49	2.23	117.7	1.436	0.000	1.436	21.2	17.7	5.0E-04	49.7	38.0	-9999.0	-9999.0	197.1	2.968
28.805	59.53	59.56	1.52	2.61	2.56	114.6	1.440	0.000	1.440	22.8	19.0	5.0E-05	46.6	38.0	3.875	10.0	186.9	3.139
28.871	53.85	53.88	1.47	2.90	2.73	114.6	1.444	0.000	1.444	20.6	17.2	5.0E-05	43.7	38.0	3.496	10.0	177.9	3.302

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
28.937	50.15	50.18	1.38	2.80	2.76	114.6	1.448	0.000	1.448	19.2	16.0	5.0E-05	41.6	36.0	3.249	10.0	171.7	3.422
29.002	49.00	49.03	1.29	2.70	2.64	114.6	1.451	0.000	1.451	18.8	15.6	5.0E-05	40.9	36.0	3.172	10.0	169.8	3.463
29.068	50.15	50.18	1.20	2.80	2.40	114.6	1.455	0.000	1.455	19.2	15.9	5.0E-05	41.5	36.0	3.248	10.0	172.0	3.428
29.134	50.66	50.69	1.12	2.86	2.21	114.6	1.459	0.000	1.459	19.4	16.1	5.0E-05	41.8	36.0	3.282	10.0	173.1	3.414
29.199	52.32	52.35	1.19	2.80	2.28	114.6	1.463	0.000	1.463	20.1	16.6	5.0E-05	42.7	36.0	3.392	10.0	176.1	3.365
29.265	56.35	56.38	1.31	2.94	2.33	114.6	1.466	0.000	1.466	21.6	17.8	5.0E-05	44.7	38.0	3.661	10.0	183.1	3.247
29.330	63.95	63.98	1.41	3.42	2.21	117.7	1.470	0.000	1.470	20.4	16.8	5.0E-04	48.3	38.0	-9999.0	-9999.0	195.2	3.050
29.396	79.08	79.13	1.47	4.07	1.86	117.7	1.474	0.000	1.474	25.3	20.8	5.0E-04	54.4	38.0	-9999.0	-9999.0	217.3	2.746
29.462	75.50	75.54	1.54	3.74	2.04	117.7	1.478	0.000	1.478	24.1	19.8	5.0E-04	53.0	38.0	-9999.0	-9999.0	212.4	2.812
29.527	66.63	66.67	1.61	3.44	2.42	114.6	1.482	0.000	1.482	25.5	21.0	5.0E-05	49.4	38.0	4.346	10.0	199.7	2.996
29.593	56.86	56.88	1.70	2.37	3.00	114.6	1.486	0.000	1.486	21.8	17.9	5.0E-05	44.8	38.0	3.693	10.0	184.7	3.248
29.658	51.10	51.12	1.77	1.76	3.47	114.6	1.489	0.000	1.489	24.5	20.1	5.0E-06	-9999.0	-9999.0	3.309	10.0	-9999.0	-9999.0
29.724	47.91	47.94	1.70	2.88	3.55	114.6	1.493	0.000	1.493	23.0	18.8	5.0E-06	-9999.0	-9999.0	3.096	10.0	-9999.0	-9999.0
29.790	45.87	45.91	1.62	3.50	3.54	114.6	1.497	0.000	1.497	22.0	18.0	5.0E-06	-9999.0	-9999.0	2.961	10.0	-9999.0	-9999.0
29.855	44.97	45.01	1.53	3.66	3.41	114.6	1.501	0.000	1.501	21.6	17.6	5.0E-06	-9999.0	-9999.0	2.901	10.0	-9999.0	-9999.0
29.921	43.89	43.92	1.42	3.56	3.24	114.6	1.504	0.000	1.504	21.0	17.1	5.0E-06	-9999.0	-9999.0	2.828	10.0	-9999.0	-9999.0
29.987	44.34	44.38	1.30	3.52	2.94	114.6	1.508	0.000	1.508	17.0	13.8	5.0E-05	37.5	36.0	2.858	10.0	163.0	3.674
30.052	46.63	46.67	1.23	3.83	2.64	114.6	1.512	0.000	1.512	17.9	14.5	5.0E-05	38.9	36.0	3.011	10.0	167.7	3.594
30.118	47.85	47.89	1.16	3.83	2.43	114.6	1.516	0.000	1.516	18.3	14.9	5.0E-05	39.6	36.0	3.091	10.0	170.2	3.554
30.183	47.79	47.82	1.10	3.48	2.31	114.6	1.519	0.000	1.519	18.3	14.9	5.0E-05	39.5	36.0	3.087	10.0	170.2	3.559
30.249	49.70	49.74	1.16	3.60	2.34	114.6	1.523	0.000	1.523	19.1	15.4	5.0E-05	40.6	36.0	3.214	10.0	173.9	3.497
30.315	60.37	60.42	1.26	4.66	2.09	117.7	1.527	0.000	1.527	19.3	15.6	5.0E-04	46.1	38.0	-9999.0	-9999.0	192.3	3.183
30.380	80.04	80.10	1.51	5.29	1.89	117.7	1.531	0.000	1.531	25.6	20.7	5.0E-04	54.2	38.0	-9999.0	-9999.0	221.7	2.767
30.446	102.72	102.77	1.81	4.76	1.77	117.7	1.535	0.000	1.535	32.8	26.5	5.0E-04	61.3	40.0	-9999.0	-9999.0	254.4	2.475
30.511	111.35	111.39	2.14	3.48	1.92	117.7	1.539	0.000	1.539	35.6	28.7	5.0E-04	63.6	40.0	-9999.0	-9999.0	267.3	2.400
30.577	116.07	116.11	2.52	3.76	2.17	117.7	1.542	0.000	1.542	37.1	29.8	5.0E-04	64.7	40.0	-9999.0	-9999.0	274.6	2.365
30.643	115.63	115.65	2.90	1.96	2.50	117.7	1.546	0.000	1.546	36.9	29.7	5.0E-04	64.6	40.0	-9999.0	-9999.0	274.1	2.370
30.708	107.07	107.07	3.20	0.12	2.99	114.6	1.550	0.000	1.550	41.0	32.9	5.0E-05	62.3	40.0	7.035	10.0	261.5	2.443
30.774	97.23	97.21	3.41	-1.52	3.51	114.6	1.554	0.000	1.554	37.2	29.9	5.0E-05	59.5	40.0	6.377	10.0	247.3	2.544
30.840	87.64	87.62	3.50	-2.53	3.99	114.6	1.558	0.000	1.558	42.0	33.6	5.0E-06	-9999.0	-9999.0	5.737	10.0	-9999.0	-9999.0
30.905	77.94	77.90	3.36	-3.27	4.31	114.6	1.561	0.000	1.561	37.3	29.9	5.0E-06	-9999.0	-9999.0	5.089	10.0	-9999.0	-9999.0
30.971	67.65	67.60	3.08	-4.74	4.55	114.6	1.565	0.000	1.565	32.4	25.9	5.0E-06	-9999.0	-9999.0	4.403	10.0	-9999.0	-9999.0
31.036	59.99	59.94	2.74	-4.64	4.57	114.6	1.569	0.000	1.569	38.3	30.6	5.0E-07	-9999.0	-9999.0	3.891	10.0	-9999.0	-9999.0
31.102	55.57	55.52	2.36	-4.64	4.24	114.6	1.573	0.000	1.573	26.6	21.2	5.0E-06	-9999.0	-9999.0	3.597	10.0	-9999.0	-9999.0
31.168	52.26	52.21	1.98	-4.74	3.80	114.6	1.576	0.000	1.576	25.0	19.9	5.0E-06	-9999.0	-9999.0	3.375	10.0	-9999.0	-9999.0
31.233	51.88	51.83	1.70	-4.44	3.29	114.6	1.580	0.000	1.580	19.9	15.8	5.0E-05	41.3	36.0	3.350	10.0	180.0	3.474
31.299	53.21	53.18	1.48	-2.94	2.79	114.6	1.584	0.000	1.584	20.4	16.2	5.0E-05	42.0	36.0	3.440	10.0	182.6	3.434
31.364	56.60	56.59	1.38	-0.73	2.44	114.6	1.588	0.000	1.588	21.7	17.2	5.0E-05	43.7	36.0	3.667	10.0	188.7	3.335
31.430	59.21	59.22	1.25	0.77	2.12	117.7	1.592	0.000	1.592	18.9	15.0	5.0E-04	45.0	38.0	-9999.0	-9999.0	193.3	3.263
31.496	58.19	58.21	1.13	1.29	1.95	117.7	1.595	0.000	1.595	18.6	14.7	5.0E-04	44.4	38.0	-9999.0	-9999.0	191.8	3.294
31.561	56.67	56.69	1.06	1.72	1.87	117.7	1.599	0.000	1.599	18.1	14.3	5.0E-04	43.7	36.0	-9999.0	-9999.0	189.4	3.341
31.627	54.36	54.39	1.03	2.61	1.90	117.7	1.603	0.000	1.603	17.4	13.7	5.0E-04	42.4	36.0	-9999.0	-9999.0	185.6	3.411
31.693	59.47	59.51	0.98	3.25	1.65	117.7	1.607	0.000	1.607	19.0	15.0	5.0E-04	45.0	38.0	-9999.0	-9999.0	194.4	3.267
31.758	57.69	57.71	0.87	2.13	1.51	117.7	1.611	0.000	1.611	18.4	14.5	5.0E-04	44.1	38.0	-9999.0	-9999.0	191.6	3.320

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
31.824	49.57	49.57	0.81	0.20	1.64	117.7	1.615	0.000	1.615	15.8	12.5	5.0E-04	39.7	36.0	-9999.0	-9999.0	177.2	3.574
31.889	47.01	47.01	0.75	-0.24	1.60	117.7	1.619	0.000	1.619	15.0	11.8	5.0E-04	38.1	36.0	-9999.0	-9999.0	172.3	3.666
31.955	40.82	40.79	0.67	-2.59	1.65	117.7	1.622	0.000	1.622	13.0	10.2	5.0E-04	34.0	34.0	-9999.0	-9999.0	159.2	3.903
32.021	34.87	34.85	0.64	-2.66	1.84	114.6	1.626	0.000	1.626	13.3	10.5	5.0E-05	30.0	34.0	2.215	7.3	-9999.0	-9999.0
32.086	31.88	32.03	0.64	14.16	2.00	114.6	1.630	0.000	1.630	12.3	9.6	5.0E-05	30.0	32.0	2.027	6.4	-9999.0	-9999.0
32.152	33.28	33.49	0.62	19.38	1.86	114.6	1.634	0.000	1.634	12.8	10.0	5.0E-05	30.0	32.0	2.124	6.8	-9999.0	-9999.0
32.217	37.37	37.55	0.54	16.97	1.44	117.7	1.638	0.000	1.638	12.0	9.4	5.0E-04	31.5	34.0	-9999.0	-9999.0	-9999.0	-9999.0
32.283	39.74	39.83	0.43	8.53	1.08	117.7	1.641	0.000	1.641	12.7	9.9	5.0E-04	33.2	34.0	-9999.0	-9999.0	157.6	3.957
32.349	39.80	39.90	0.36	9.85	0.90	117.7	1.645	0.000	1.645	12.7	9.9	5.0E-04	33.2	34.0	-9999.0	-9999.0	157.9	3.957
32.414	39.09	39.20	0.35	9.38	0.90	117.7	1.649	0.000	1.649	12.5	9.7	5.0E-04	32.6	34.0	-9999.0	-9999.0	-9999.0	-9999.0
32.480	36.03	36.12	0.35	8.59	0.97	117.7	1.653	0.000	1.653	11.5	9.0	5.0E-04	30.3	34.0	-9999.0	-9999.0	-9999.0	-9999.0
32.546	31.94	32.04	0.35	9.81	1.09	117.7	1.657	0.000	1.657	10.2	7.9	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
32.611	29.58	29.75	0.37	15.74	1.25	117.7	1.661	0.000	1.661	9.5	7.4	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
32.677	29.45	29.68	0.42	21.61	1.42	114.6	1.665	0.000	1.665	11.4	8.8	5.0E-05	30.0	32.0	1.868	5.4	-9999.0	-9999.0
32.742	33.66	33.91	0.50	23.22	1.48	117.7	1.668	0.000	1.668	10.8	8.4	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
32.808	40.44	40.65	0.60	19.46	1.48	117.7	1.672	0.000	1.672	13.0	10.0	5.0E-04	33.5	34.0	-9999.0	-9999.0	160.5	3.947
32.874	50.21	50.37	0.71	14.94	1.41	117.7	1.676	0.000	1.676	16.1	12.4	5.0E-04	39.6	36.0	-9999.0	-9999.0	181.1	3.594
32.939	61.58	61.69	0.82	10.06	1.33	117.7	1.680	0.000	1.680	19.7	15.2	5.0E-04	45.4	38.0	-9999.0	-9999.0	201.2	3.262
33.005	66.63	66.72	0.97	7.78	1.46	117.7	1.684	0.000	1.684	21.3	16.4	5.0E-04	47.6	38.0	-9999.0	-9999.0	209.5	3.140
33.070	67.01	67.10	1.07	8.10	1.60	117.7	1.688	0.000	1.688	21.4	16.5	5.0E-04	47.7	38.0	-9999.0	-9999.0	210.2	3.133
33.136	67.07	67.17	1.24	8.85	1.85	117.7	1.692	0.000	1.692	21.4	16.5	5.0E-04	47.7	38.0	-9999.0	-9999.0	210.5	3.134
33.202	67.90	68.01	1.40	9.34	2.06	117.7	1.695	0.000	1.695	21.7	16.7	5.0E-04	48.0	38.0	-9999.0	-9999.0	212.0	3.118
33.267	69.50	69.60	1.54	9.14	2.22	117.7	1.699	0.000	1.699	22.2	17.0	5.0E-04	48.7	38.0	-9999.0	-9999.0	214.7	3.084
33.333	81.07	81.15	1.64	8.10	2.03	117.7	1.703	0.000	1.703	25.9	19.9	5.0E-04	53.0	38.0	-9999.0	-9999.0	232.1	2.860
33.399	88.47	88.55	1.69	6.87	1.91	117.7	1.707	0.000	1.707	28.3	21.6	5.0E-04	55.5	38.0	-9999.0	-9999.0	243.0	2.744
33.464	89.37	89.43	1.80	6.20	2.02	117.7	1.711	0.000	1.711	28.5	21.8	5.0E-04	55.8	38.0	-9999.0	-9999.0	244.5	2.734
33.530	90.07	90.13	1.98	5.61	2.20	117.7	1.715	0.000	1.715	28.8	22.0	5.0E-04	55.9	38.0	-9999.0	-9999.0	245.7	2.726
33.595	93.53	93.58	2.25	5.35	2.40	117.7	1.719	0.000	1.719	29.9	22.8	5.0E-04	57.0	40.0	-9999.0	-9999.0	250.9	2.681
33.661	99.08	99.11	2.41	2.98	2.43	117.7	1.722	0.000	1.722	31.6	24.1	5.0E-04	58.6	40.0	-9999.0	-9999.0	259.2	2.615
33.727	98.63	98.63	2.53	-0.24	2.56	117.7	1.726	0.000	1.726	31.5	24.0	5.0E-04	58.4	40.0	-9999.0	-9999.0	258.7	2.623
33.792	93.72	93.70	2.57	-1.50	2.74	114.6	1.730	0.000	1.730	35.9	27.3	5.0E-05	56.9	40.0	6.131	10.0	251.7	2.686
33.858	87.26	87.24	2.56	-2.35	2.93	114.6	1.734	0.000	1.734	33.4	25.4	5.0E-05	54.9	38.0	5.700	10.0	242.5	2.780
33.923	80.62	80.58	2.53	-3.40	3.13	114.6	1.738	0.000	1.738	30.9	23.4	5.0E-05	52.5	38.0	5.256	10.0	233.0	2.891
33.989	73.78	73.73	2.38	-4.17	3.22	114.6	1.741	0.000	1.741	28.2	21.4	5.0E-05	50.0	38.0	4.800	10.0	223.0	3.024
34.055	66.44	66.39	2.15	-4.33	3.23	114.6	1.745	0.002	1.743	25.4	19.3	5.0E-05	46.9	38.0	4.310	10.0	211.7	3.189
34.120	58.51	58.46	1.89	-4.68	3.24	114.6	1.749	0.004	1.745	22.4	17.0	5.0E-05	43.3	36.0	3.781	10.0	198.6	3.397
34.186	49.32	49.27	1.61	-4.80	3.28	114.6	1.753	0.006	1.747	18.9	14.3	5.0E-05	38.4	36.0	3.168	10.0	181.5	3.684
34.252	45.67	45.62	1.32	-4.96	2.90	114.6	1.756	0.008	1.749	17.5	13.2	5.0E-05	36.1	34.0	2.924	10.0	174.0	3.814
34.317	40.50	40.53	1.05	3.04	2.60	114.6	1.760	0.010	1.750	15.5	11.7	5.0E-05	32.7	34.0	2.585	8.3	-9999.0	-9999.0
34.383	42.99	43.19	0.85	18.47	1.97	114.6	1.764	0.012	1.752	16.5	12.5	5.0E-05	34.6	34.0	2.762	9.2	168.8	3.908
34.448	48.11	48.28	0.75	15.76	1.56	117.7	1.768	0.014	1.754	15.4	11.6	5.0E-04	37.7	36.0	-9999.0	-9999.0	179.8	3.723
34.514	49.19	49.32	0.74	12.20	1.50	117.7	1.772	0.016	1.756	15.7	11.9	5.0E-04	38.3	36.0	-9999.0	-9999.0	181.9	3.689
34.580	47.41	47.55	0.79	12.98	1.67	117.7	1.776	0.018	1.757	15.2	11.5	5.0E-04	37.3	34.0	-9999.0	-9999.0	178.4	3.752
34.645	46.31	46.47	0.84	14.45	1.81	117.7	1.779	0.020	1.759	14.8	11.2	5.0E-04	36.6	34.0	-9999.0	-9999.0	176.2	3.791

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
34.711	46.63	46.77	0.89	13.04	1.91	117.7	1.783	0.022	1.761	14.9	11.3	5.0E-04	36.8	34.0	-9999.0	-9999.0	176.9	3.782
34.776	47.79	47.92	0.89	12.24	1.86	117.7	1.787	0.024	1.763	15.3	11.5	5.0E-04	37.4	34.0	-9999.0	-9999.0	179.3	3.743
34.842	48.11	48.23	0.91	11.57	1.89	117.7	1.791	0.026	1.765	15.4	11.6	5.0E-04	37.6	34.0	-9999.0	-9999.0	180.0	3.733
34.908	49.06	49.16	0.89	9.81	1.81	117.7	1.795	0.028	1.766	15.7	11.8	5.0E-04	38.2	36.0	-9999.0	-9999.0	182.0	3.702
34.973	50.53	50.64	0.91	9.97	1.80	117.7	1.799	0.030	1.768	16.2	12.2	5.0E-04	39.0	36.0	-9999.0	-9999.0	185.0	3.654
35.039	54.04	54.16	0.95	11.28	1.76	117.7	1.803	0.032	1.770	17.3	13.0	5.0E-04	40.9	36.0	-9999.0	-9999.0	191.9	3.542
35.105	59.21	59.32	0.98	9.58	1.66	117.7	1.806	0.034	1.772	18.9	14.2	5.0E-04	43.5	36.0	-9999.0	-9999.0	201.2	3.392
35.170	62.16	62.25	1.01	8.02	1.63	117.7	1.810	0.037	1.774	19.9	14.9	5.0E-04	44.9	36.0	-9999.0	-9999.0	206.3	3.314
35.236	61.84	61.93	0.43	7.89	0.70	120.9	1.814	0.039	1.776	14.8	11.1	5.0E-03	44.7	36.0	-9999.0	-9999.0	205.8	3.324
35.301	58.00	58.08	0.41	7.64	0.71	120.9	1.818	0.041	1.778	13.9	10.4	5.0E-03	42.8	36.0	-9999.0	-9999.0	199.3	3.431
35.367	55.44	55.54	0.47	8.48	0.85	120.9	1.822	0.043	1.779	13.3	10.0	5.0E-03	41.5	36.0	-9999.0	-9999.0	194.8	3.507
35.433	52.07	52.17	0.56	9.64	1.08	117.7	1.826	0.045	1.781	16.7	12.5	5.0E-04	39.7	36.0	-9999.0	-9999.0	188.5	3.613
35.498	51.42	51.56	0.64	12.08	1.24	117.7	1.830	0.047	1.783	16.5	12.3	5.0E-04	39.4	36.0	-9999.0	-9999.0	187.4	3.635
35.564	52.96	53.09	0.73	11.79	1.38	117.7	1.834	0.049	1.785	16.9	12.7	5.0E-04	40.2	36.0	-9999.0	-9999.0	190.4	3.587
35.629	52.32	52.42	0.80	9.97	1.53	117.7	1.838	0.051	1.787	16.7	12.5	5.0E-04	39.8	36.0	-9999.0	-9999.0	189.2	3.609
35.695	51.04	51.15	0.80	9.50	1.57	117.7	1.841	0.053	1.789	16.3	12.2	5.0E-04	39.1	36.0	-9999.0	-9999.0	186.8	3.652
35.761	49.44	49.55	0.79	9.81	1.60	117.7	1.845	0.055	1.790	15.8	11.8	5.0E-04	38.2	36.0	-9999.0	-9999.0	183.6	3.707
35.826	47.66	47.77	0.79	10.79	1.66	117.7	1.849	0.057	1.792	15.3	11.4	5.0E-04	37.1	34.0	-9999.0	-9999.0	180.1	3.769
35.892	47.41	47.53	0.80	11.51	1.69	117.7	1.853	0.059	1.794	15.2	11.3	5.0E-04	37.0	34.0	-9999.0	-9999.0	179.6	3.779
35.958	49.06	49.18	0.79	11.51	1.61	117.7	1.857	0.061	1.796	15.7	11.7	5.0E-04	37.9	34.0	-9999.0	-9999.0	183.1	3.723
36.023	49.70	49.82	0.78	11.12	1.57	117.7	1.861	0.063	1.798	15.9	11.9	5.0E-04	38.3	36.0	-9999.0	-9999.0	184.5	3.703
36.089	49.95	50.07	0.76	10.92	1.52	117.7	1.865	0.065	1.799	16.0	11.9	5.0E-04	38.4	36.0	-9999.0	-9999.0	185.0	3.696
36.154	48.62	48.72	0.74	9.89	1.52	117.7	1.869	0.067	1.801	15.6	11.6	5.0E-04	37.6	34.0	-9999.0	-9999.0	182.4	3.743
36.220	46.50	46.64	0.74	12.86	1.59	117.7	1.872	0.069	1.803	14.9	11.1	5.0E-04	36.3	34.0	-9999.0	-9999.0	178.0	3.817
36.286	43.76	43.89	0.75	12.82	1.71	117.7	1.876	0.071	1.805	14.0	10.4	5.0E-04	34.6	34.0	-9999.0	-9999.0	172.1	3.920
36.351	43.89	44.01	0.79	11.75	1.80	117.7	1.880	0.073	1.807	14.1	10.5	5.0E-04	34.7	34.0	-9999.0	-9999.0	172.4	3.917
36.417	47.60	47.70	0.83	9.71	1.74	117.7	1.884	0.075	1.809	15.2	11.3	5.0E-04	36.9	34.0	-9999.0	-9999.0	180.5	3.784
36.482	52.96	53.05	0.87	8.89	1.64	117.7	1.888	0.078	1.810	16.9	12.6	5.0E-04	40.0	36.0	-9999.0	-9999.0	191.3	3.606
36.548	58.39	58.48	0.94	7.74	1.61	117.7	1.892	0.080	1.812	18.7	13.9	5.0E-04	42.8	36.0	-9999.0	-9999.0	201.4	3.444
36.614	70.33	70.43	1.07	8.77	1.52	117.7	1.896	0.082	1.814	22.5	16.7	5.0E-04	48.1	38.0	-9999.0	-9999.0	221.4	3.143
36.679	80.29	80.35	1.18	5.03	1.47	117.7	1.899	0.084	1.816	25.6	19.0	5.0E-04	51.8	38.0	-9999.0	-9999.0	236.6	2.944
36.745	83.36	83.40	1.28	3.10	1.54	117.7	1.903	0.086	1.818	26.6	19.7	5.0E-04	52.9	38.0	-9999.0	-9999.0	241.2	2.892
36.811	82.66	82.67	1.23	1.21	1.49	117.7	1.907	0.088	1.819	26.4	19.6	5.0E-04	52.6	38.0	-9999.0	-9999.0	240.2	2.906
36.876	79.66	79.64	1.23	-1.90	1.55	117.7	1.911	0.090	1.821	25.4	18.8	5.0E-04	51.5	38.0	-9999.0	-9999.0	235.8	2.961
36.942	77.68	77.65	1.22	-2.41	1.57	117.7	1.915	0.092	1.823	24.8	18.4	5.0E-04	50.8	38.0	-9999.0	-9999.0	232.9	2.999
37.007	75.63	75.61	1.16	-2.59	1.54	117.7	1.919	0.094	1.825	24.1	17.9	5.0E-04	50.0	38.0	-9999.0	-9999.0	229.9	3.041
37.073	70.78	70.75	1.08	-2.57	1.53	117.7	1.923	0.096	1.827	22.6	16.7	5.0E-04	48.1	38.0	-9999.0	-9999.0	222.5	3.144
37.139	72.76	72.81	1.05	5.27	1.45	117.7	1.926	0.098	1.828	23.2	17.2	5.0E-04	48.9	38.0	-9999.0	-9999.0	225.8	3.101
37.204	76.79	76.86	1.07	6.66	1.40	117.7	1.930	0.100	1.830	24.5	18.1	5.0E-04	50.4	38.0	-9999.0	-9999.0	232.0	3.019
37.270	78.00	78.03	1.08	3.08	1.39	117.7	1.934	0.102	1.832	24.9	18.4	5.0E-04	50.9	38.0	-9999.0	-9999.0	233.9	2.998
37.336	71.73	71.76	1.09	2.68	1.52	117.7	1.938	0.104	1.834	22.9	16.9	5.0E-04	48.5	38.0	-9999.0	-9999.0	224.4	3.127
37.401	66.05	66.13	1.08	7.25	1.64	117.7	1.942	0.106	1.836	21.1	15.6	5.0E-04	46.1	38.0	-9999.0	-9999.0	215.5	3.258
37.467	65.42	65.57	1.09	14.08	1.67	117.7	1.946	0.108	1.838	20.9	15.4	5.0E-04	45.8	36.0	-9999.0	-9999.0	214.6	3.273
37.532	67.90	68.05	1.09	13.82	1.61	117.7	1.950	0.110	1.839	21.7	16.0	5.0E-04	46.9	38.0	-9999.0	-9999.0	218.8	3.214

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
37.598	72.70	72.82	1.08	11.83	1.49	117.7	1.954	0.112	1.841	23.2	17.1	5.0E-04	48.8	38.0	-9999.0	-9999.0	226.4	3.109
37.664	75.57	75.67	1.10	9.32	1.46	117.7	1.957	0.114	1.843	24.2	17.8	5.0E-04	49.9	38.0	-9999.0	-9999.0	230.9	3.051
37.729	81.01	81.08	1.08	6.97	1.34	120.9	1.961	0.116	1.845	19.4	14.3	5.0E-03	51.9	38.0	-9999.0	-9999.0	239.1	2.949
37.795	81.32	81.39	1.09	6.83	1.34	120.9	1.965	0.118	1.847	19.5	14.3	5.0E-03	52.0	38.0	-9999.0	-9999.0	239.7	2.945
37.860	72.05	72.13	1.12	7.36	1.56	117.7	1.969	0.121	1.849	23.0	16.9	5.0E-04	48.5	38.0	-9999.0	-9999.0	225.7	3.128
37.926	62.92	62.99	1.07	6.22	1.70	117.7	1.973	0.123	1.850	20.1	14.8	5.0E-04	44.6	36.0	-9999.0	-9999.0	210.9	3.348
37.992	53.21	53.23	0.96	2.17	1.81	117.7	1.977	0.125	1.852	17.0	12.5	5.0E-04	39.7	36.0	-9999.0	-9999.0	193.2	3.630
38.057	45.99	45.98	0.82	-1.29	1.79	117.7	1.981	0.127	1.854	14.7	10.8	5.0E-04	35.5	34.0	-9999.0	-9999.0	178.3	3.878
38.123	39.80	39.76	0.68	-3.36	1.71	117.7	1.985	0.129	1.856	12.7	9.3	5.0E-04	31.4	34.0	-9999.0	-9999.0	-9999.0	-9999.0
38.189	35.08	35.10	0.55	2.68	1.57	117.7	1.989	0.131	1.858	11.2	8.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
38.254	34.30	34.63	0.40	30.00	1.16	117.7	1.992	0.133	1.860	11.1	8.1	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
38.320	33.92	34.17	0.28	23.28	0.82	117.7	1.996	0.135	1.861	10.9	8.0	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
38.385	30.79	31.06	0.32	24.41	1.03	117.7	2.000	0.137	1.863	9.9	7.3	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
38.451	27.66	27.95	0.45	26.67	1.61	114.6	2.004	0.139	1.865	10.7	7.8	5.0E-05	30.0	32.0	1.729	4.1	-9999.0	-9999.0
38.517	25.42	25.74	0.52	29.61	2.02	114.6	2.008	0.141	1.867	9.9	7.2	5.0E-05	30.0	30.0	1.582	3.6	-9999.0	-9999.0
38.582	22.35	22.73	0.55	34.87	2.43	114.6	2.011	0.143	1.868	10.9	8.0	5.0E-06	-9999.0	-9999.0	1.381	2.9	-9999.0	-9999.0
38.648	21.40	21.88	0.54	43.81	2.47	114.6	2.015	0.145	1.870	10.5	7.7	5.0E-06	-9999.0	-9999.0	1.324	2.8	-9999.0	-9999.0
38.713	29.26	29.78	0.52	48.36	1.75	114.6	2.019	0.147	1.872	11.4	8.3	5.0E-05	30.0	32.0	1.851	4.5	-9999.0	-9999.0
38.779	56.28	56.38	0.47	9.68	0.84	120.9	2.023	0.149	1.874	13.5	9.9	5.0E-03	41.2	36.0	-9999.0	-9999.0	200.1	3.548
38.845	62.86	62.99	0.42	11.95	0.67	120.9	2.027	0.151	1.876	15.1	11.0	5.0E-03	44.4	36.0	-9999.0	-9999.0	211.9	3.365
38.910	56.86	56.95	0.39	8.50	0.69	120.9	2.031	0.153	1.877	13.6	10.0	5.0E-03	41.5	36.0	-9999.0	-9999.0	201.3	3.534
38.976	44.27	44.36	0.37	8.63	0.84	117.7	2.035	0.155	1.879	14.2	10.3	5.0E-04	34.3	34.0	-9999.0	-9999.0	175.5	3.956
39.042	34.81	34.94	0.41	11.69	1.18	117.7	2.039	0.157	1.881	11.2	8.1	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
39.107	26.96	27.15	0.37	17.97	1.37	114.6	2.042	0.159	1.883	10.4	7.6	5.0E-05	30.0	32.0	1.674	3.8	-9999.0	-9999.0
39.173	21.33	21.62	0.33	26.86	1.53	114.6	2.046	0.162	1.885	8.3	6.0	5.0E-05	30.0	30.0	1.305	2.7	-9999.0	-9999.0
39.238	19.04	19.41	0.33	34.67	1.70	114.6	2.050	0.164	1.886	7.4	5.4	5.0E-05	30.0	30.0	1.157	2.3	-9999.0	-9999.0
39.304	18.79	19.22	0.33	40.00	1.72	114.6	2.054	0.166	1.888	7.4	5.4	5.0E-05	30.0	30.0	1.144	2.2	-9999.0	-9999.0
39.370	23.58	23.98	0.33	36.90	1.38	114.6	2.057	0.168	1.890	9.2	6.7	5.0E-05	30.0	30.0	1.461	3.1	-9999.0	-9999.0
39.435	28.24	28.55	0.34	28.70	1.19	117.7	2.061	0.170	1.891	9.1	6.6	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
39.501	28.75	28.99	0.34	22.26	1.18	117.7	2.065	0.172	1.893	9.3	6.7	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
39.566	27.03	27.26	0.33	21.49	1.21	117.7	2.069	0.174	1.895	8.7	6.3	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
39.632	23.77	23.99	0.31	20.91	1.30	114.6	2.073	0.176	1.897	9.2	6.7	5.0E-05	30.0	30.0	1.461	3.1	-9999.0	-9999.0
39.698	20.44	20.68	0.28	22.12	1.36	114.6	2.076	0.178	1.899	7.9	5.7	5.0E-05	30.0	30.0	1.240	2.5	-9999.0	-9999.0
39.763	16.67	16.95	0.26	25.90	1.54	114.6	2.080	0.180	1.900	6.5	4.7	5.0E-05	30.0	30.0	0.991	1.8	-9999.0	-9999.0
39.829	13.16	13.49	0.23	30.12	1.71	114.6	2.084	0.182	1.902	6.5	4.7	5.0E-06	-9999.0	-9999.0	0.760	1.3	-9999.0	-9999.0
39.895	9.90	10.26	0.19	32.79	1.86	114.6	2.088	0.184	1.904	4.9	3.6	5.0E-06	-9999.0	-9999.0	0.545	1.0	-9999.0	-9999.0
39.960	8.11	8.50	0.15	35.79	1.77	114.6	2.092	0.186	1.905	4.1	2.9	5.0E-06	-9999.0	-9999.0	0.427	0.8	-9999.0	-9999.0
40.026	6.84	7.24	0.12	37.53	1.66	114.6	2.095	0.188	1.907	3.5	2.5	5.0E-06	-9999.0	-9999.0	0.343	0.7	-9999.0	-9999.0
40.091	6.13	6.55	0.08	38.36	1.22	111.4	2.099	0.190	1.909	3.1	2.3	1.0E-07	-9999.0	-9999.0	0.297	0.6	-9999.0	-9999.0
40.157	5.17	5.61	0.06	40.12	1.07	111.4	2.103	0.192	1.910	2.7	1.9	1.0E-07	-9999.0	-9999.0	0.234	0.6	-9999.0	-9999.0
40.223	4.28	4.74	0.04	42.94	0.85	111.4	2.106	0.194	1.912	2.3	1.6	1.0E-07	-9999.0	-9999.0	0.176	0.5	-9999.0	-9999.0
40.288	4.22	4.70	0.03	44.05	0.64	111.4	2.110	0.196	1.914	2.2	1.6	1.0E-07	-9999.0	-9999.0	0.172	0.5	-9999.0	-9999.0
40.354	4.02	4.50	0.03	44.03	0.67	111.4	2.114	0.198	1.915	2.2	1.6	1.0E-07	-9999.0	-9999.0	0.159	0.5	-9999.0	-9999.0
40.419	3.20	3.67	0.02	43.99	0.55	111.4	2.117	0.200	1.917	1.8	1.3	1.0E-07	-9999.0	-9999.0	0.104	0.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
40.485	3.83	4.31	0.01	44.62	0.23	111.4	2.121	0.202	1.918	2.1	1.5	1.0E-07	-9999.0	-9999.0	0.146	0.5	-9999.0	-9999.0
40.551	3.58	4.06	0.01	44.82	0.25	111.4	2.125	0.205	1.920	1.9	1.4	1.0E-07	-9999.0	-9999.0	0.129	0.5	-9999.0	-9999.0
40.616	3.01	3.48	0.01	44.11	0.29	111.4	2.128	0.207	1.922	1.7	1.2	1.0E-07	-9999.0	-9999.0	0.090	0.5	-9999.0	-9999.0
40.682	3.90	4.38	0.01	44.54	0.23	111.4	2.132	0.209	1.923	2.1	1.5	1.0E-07	-9999.0	-9999.0	0.150	0.5	-9999.0	-9999.0
40.748	3.83	4.30	0.02	43.97	0.47	111.4	2.136	0.211	1.925	2.1	1.5	1.0E-07	-9999.0	-9999.0	0.145	0.5	-9999.0	-9999.0
40.813	3.77	4.24	0.01	43.27	0.24	111.4	2.139	0.213	1.926	2.0	1.5	1.0E-07	-9999.0	-9999.0	0.140	0.5	-9999.0	-9999.0
40.879	3.64	4.10	0.01	43.14	0.24	111.4	2.143	0.215	1.928	2.0	1.4	1.0E-07	-9999.0	-9999.0	0.131	0.5	-9999.0	-9999.0
40.944	3.77	4.25	0.02	44.88	0.47	111.4	2.147	0.217	1.930	2.0	1.5	1.0E-07	-9999.0	-9999.0	0.141	0.5	-9999.0	-9999.0
41.010	4.09	4.57	0.03	44.88	0.66	111.4	2.150	0.219	1.931	2.2	1.6	1.0E-07	-9999.0	-9999.0	0.162	0.5	-9999.0	-9999.0
41.076	4.02	4.50	0.02	44.64	0.45	111.4	2.154	0.221	1.933	2.2	1.6	1.0E-07	-9999.0	-9999.0	0.157	0.5	-9999.0	-9999.0
41.141	3.77	4.25	0.03	44.40	0.71	111.4	2.157	0.223	1.935	2.0	1.5	1.0E-07	-9999.0	-9999.0	0.139	0.5	-9999.0	-9999.0
41.207	4.47	4.95	0.03	44.54	0.61	111.4	2.161	0.225	1.936	2.4	1.7	1.0E-07	-9999.0	-9999.0	0.186	0.5	-9999.0	-9999.0
41.272	5.30	5.80	0.03	45.64	0.52	111.4	2.165	0.227	1.938	2.8	2.0	1.0E-07	-9999.0	-9999.0	0.242	0.6	-9999.0	-9999.0
41.338	6.46	6.95	0.06	45.41	0.87	111.4	2.168	0.229	1.939	3.3	2.4	1.0E-07	-9999.0	-9999.0	0.319	0.7	-9999.0	-9999.0
41.404	6.46	6.95	0.08	45.68	1.15	111.4	2.172	0.231	1.941	3.3	2.4	1.0E-07	-9999.0	-9999.0	0.318	0.7	-9999.0	-9999.0
41.469	7.09	7.62	0.14	49.46	1.84	114.6	2.176	0.233	1.943	3.6	2.6	5.0E-06	-9999.0	-9999.0	0.363	0.7	-9999.0	-9999.0
41.535	14.51	15.03	0.20	48.36	1.33	114.6	2.180	0.235	1.944	5.8	4.1	5.0E-05	30.0	30.0	0.857	1.5	-9999.0	-9999.0
41.601	22.42	22.74	0.27	29.37	1.19	114.6	2.183	0.237	1.946	8.7	6.2	5.0E-05	30.0	30.0	1.371	2.7	-9999.0	-9999.0
41.666	25.61	25.75	0.33	13.10	1.28	114.6	2.187	0.239	1.948	9.9	7.1	5.0E-05	30.0	30.0	1.571	3.3	-9999.0	-9999.0
41.732	26.76	26.89	0.39	11.87	1.45	114.6	2.191	0.241	1.949	10.3	7.4	5.0E-05	30.0	30.0	1.647	3.5	-9999.0	-9999.0
41.797	27.92	28.05	0.48	12.59	1.72	114.6	2.195	0.243	1.951	10.7	7.7	5.0E-05	30.0	32.0	1.724	3.8	-9999.0	-9999.0
41.863	29.96	30.08	0.50	10.67	1.67	114.6	2.198	0.246	1.953	11.5	8.2	5.0E-05	30.0	32.0	1.859	4.2	-9999.0	-9999.0
41.929	29.19	29.30	0.49	9.91	1.68	114.6	2.202	0.248	1.955	11.2	8.0	5.0E-05	30.0	32.0	1.806	4.0	-9999.0	-9999.0
41.994	29.26	29.38	0.48	11.42	1.64	114.6	2.206	0.250	1.956	11.3	8.0	5.0E-05	30.0	32.0	1.812	4.1	-9999.0	-9999.0
42.060	29.13	29.27	0.48	12.90	1.64	114.6	2.210	0.252	1.958	11.2	8.0	5.0E-05	30.0	32.0	1.804	4.0	-9999.0	-9999.0
42.125	31.18	31.26	0.48	7.70	1.54	114.6	2.213	0.254	1.960	12.0	8.6	5.0E-05	30.0	32.0	1.936	4.5	-9999.0	-9999.0
42.191	29.89	29.97	0.50	7.25	1.67	114.6	2.217	0.256	1.961	11.5	8.2	5.0E-05	30.0	32.0	1.850	4.2	-9999.0	-9999.0
42.257	30.34	30.43	0.49	7.62	1.61	114.6	2.221	0.258	1.963	11.7	8.3	5.0E-05	30.0	32.0	1.880	4.3	-9999.0	-9999.0
42.322	32.52	32.61	0.44	8.40	1.35	117.7	2.225	0.260	1.965	10.4	7.4	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
42.388	34.43	34.52	0.43	7.64	1.25	117.7	2.229	0.262	1.967	11.0	7.9	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
42.454	38.84	38.92	0.46	7.27	1.18	117.7	2.232	0.264	1.969	12.4	8.9	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
42.519	46.44	46.52	0.48	7.33	1.03	117.7	2.236	0.266	1.970	14.9	10.6	5.0E-04	35.0	34.0	-9999.0	-9999.0	183.3	3.940
42.585	52.77	52.84	0.51	6.36	0.97	117.7	2.240	0.268	1.972	16.9	12.0	5.0E-04	38.6	34.0	-9999.0	-9999.0	196.9	3.726
42.650	53.98	54.05	0.51	6.54	0.95	117.7	2.244	0.270	1.974	17.3	12.3	5.0E-04	39.3	34.0	-9999.0	-9999.0	199.4	3.689
42.716	51.29	51.36	0.52	6.11	1.01	117.7	2.248	0.272	1.976	16.4	11.7	5.0E-04	37.8	34.0	-9999.0	-9999.0	194.0	3.777
42.782	47.72	47.78	0.52	6.24	1.09	117.7	2.252	0.274	1.978	15.3	10.8	5.0E-04	35.7	34.0	-9999.0	-9999.0	186.4	3.900
42.847	43.24	43.31	0.52	6.30	1.20	117.7	2.256	0.276	1.979	13.8	9.8	5.0E-04	32.9	34.0	-9999.0	-9999.0	176.1	4.066
42.913	39.55	39.62	0.49	6.62	1.24	117.7	2.259	0.278	1.981	12.6	9.0	5.0E-04	30.3	32.0	-9999.0	-9999.0	-9999.0	-9999.0
42.978	37.05	37.12	0.44	6.11	1.19	117.7	2.263	0.280	1.983	11.8	8.4	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
43.044	34.62	34.69	0.41	6.13	1.18	117.7	2.267	0.282	1.985	11.1	7.9	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
43.110	31.88	31.94	0.37	6.09	1.16	117.7	2.271	0.284	1.987	10.2	7.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
43.175	29.13	29.20	0.33	6.44	1.13	117.7	2.275	0.286	1.988	9.3	6.6	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
43.241	28.36	28.43	0.31	6.70	1.09	117.7	2.279	0.289	1.990	9.1	6.4	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
43.307	26.63	26.71	0.31	7.21	1.16	117.7	2.283	0.291	1.992	8.5	6.0	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
43.372	24.47	24.53	0.32	6.05	1.31	114.6	2.286	0.293	1.994	9.4	6.7	5.0E-05	30.0	30.0	1.483	3.0	-9999.0	-9999.0
43.438	23.26	23.33	0.34	6.68	1.46	114.6	2.290	0.295	1.996	8.9	6.3	5.0E-05	30.0	30.0	1.403	2.7	-9999.0	-9999.0
43.503	21.84	21.92	0.34	7.38	1.55	114.6	2.294	0.297	1.997	8.4	5.9	5.0E-05	30.0	30.0	1.309	2.5	-9999.0	-9999.0
43.569	20.76	20.84	0.38	7.19	1.83	114.6	2.298	0.299	1.999	8.0	5.6	5.0E-05	30.0	30.0	1.236	2.3	-9999.0	-9999.0
43.635	19.55	19.65	0.39	9.16	1.99	114.6	2.302	0.301	2.001	7.5	5.3	5.0E-05	30.0	30.0	1.156	2.1	-9999.0	-9999.0
43.700	19.10	19.23	0.40	12.33	2.09	114.6	2.305	0.303	2.002	7.4	5.2	5.0E-05	30.0	30.0	1.128	2.0	-9999.0	-9999.0
43.766	17.69	17.85	0.41	14.58	2.30	114.6	2.309	0.305	2.004	8.5	6.0	5.0E-06	-9999.0	-9999.0	1.036	1.8	-9999.0	-9999.0
43.831	18.66	18.81	0.43	14.08	2.29	114.6	2.313	0.307	2.006	9.0	6.4	5.0E-06	-9999.0	-9999.0	1.100	2.0	-9999.0	-9999.0
43.897	19.87	20.00	0.44	12.20	2.21	114.6	2.317	0.309	2.008	7.7	5.4	5.0E-05	30.0	30.0	1.179	2.1	-9999.0	-9999.0
43.963	20.32	20.44	0.44	11.06	2.16	114.6	2.320	0.311	2.009	7.8	5.5	5.0E-05	30.0	30.0	1.208	2.2	-9999.0	-9999.0
44.028	21.59	21.71	0.42	10.85	1.94	114.6	2.324	0.313	2.011	8.3	5.9	5.0E-05	30.0	30.0	1.292	2.4	-9999.0	-9999.0
44.094	23.13	23.25	0.41	11.20	1.77	114.6	2.328	0.315	2.013	8.9	6.3	5.0E-05	30.0	30.0	1.395	2.7	-9999.0	-9999.0
44.160	24.15	24.27	0.40	11.51	1.65	114.6	2.332	0.317	2.014	9.3	6.6	5.0E-05	30.0	30.0	1.463	2.9	-9999.0	-9999.0
44.225	23.77	23.88	0.40	10.67	1.68	114.6	2.335	0.319	2.016	9.1	6.4	5.0E-05	30.0	30.0	1.437	2.8	-9999.0	-9999.0
44.291	23.96	24.06	0.40	9.05	1.67	114.6	2.339	0.321	2.018	9.2	6.5	5.0E-05	30.0	30.0	1.448	2.8	-9999.0	-9999.0
44.356	22.61	22.72	0.39	9.42	1.72	114.6	2.343	0.323	2.020	8.7	6.1	5.0E-05	30.0	30.0	1.358	2.6	-9999.0	-9999.0
44.422	21.84	21.94	0.38	9.32	1.74	114.6	2.347	0.325	2.021	8.4	5.9	5.0E-05	30.0	30.0	1.306	2.4	-9999.0	-9999.0
44.488	20.82	20.93	0.38	9.68	1.82	114.6	2.350	0.327	2.023	8.0	5.6	5.0E-05	30.0	30.0	1.238	2.3	-9999.0	-9999.0
44.553	20.19	20.29	0.40	9.28	1.98	114.6	2.354	0.330	2.025	7.8	5.5	5.0E-05	30.0	30.0	1.196	2.2	-9999.0	-9999.0
44.619	18.07	18.18	0.41	9.85	2.26	114.6	2.358	0.332	2.026	8.7	6.1	5.0E-06	-9999.0	-9999.0	1.055	1.8	-9999.0	-9999.0
44.684	17.37	17.49	0.43	10.45	2.47	114.6	2.362	0.334	2.028	8.4	5.9	5.0E-06	-9999.0	-9999.0	1.008	1.7	-9999.0	-9999.0
44.750	16.23	16.36	0.44	11.83	2.70	114.6	2.365	0.336	2.030	7.8	5.5	5.0E-06	-9999.0	-9999.0	0.933	1.6	-9999.0	-9999.0
44.816	15.33	15.49	0.46	15.03	2.98	114.6	2.369	0.338	2.031	7.4	5.2	5.0E-06	-9999.0	-9999.0	0.875	1.5	-9999.0	-9999.0
44.881	15.72	15.92	0.48	18.29	3.02	114.6	2.373	0.340	2.033	7.6	5.3	5.0E-06	-9999.0	-9999.0	0.903	1.5	-9999.0	-9999.0
44.947	17.05	17.27	0.50	20.03	2.90	114.6	2.377	0.342	2.035	8.3	5.8	5.0E-06	-9999.0	-9999.0	0.993	1.7	-9999.0	-9999.0
45.013	19.42	19.61	0.50	18.27	2.56	114.6	2.380	0.344	2.037	9.4	6.6	5.0E-06	-9999.0	-9999.0	1.149	2.0	-9999.0	-9999.0
45.078	21.65	21.80	0.47	13.88	2.16	114.6	2.384	0.346	2.038	8.4	5.9	5.0E-05	30.0	30.0	1.295	2.4	-9999.0	-9999.0
45.144	23.07	23.18	0.46	10.33	1.99	114.6	2.388	0.348	2.040	8.9	6.2	5.0E-05	30.0	30.0	1.386	2.6	-9999.0	-9999.0
45.209	25.10	25.20	0.45	8.71	1.79	114.6	2.392	0.350	2.042	9.7	6.8	5.0E-05	30.0	30.0	1.520	3.0	-9999.0	-9999.0
45.275	29.26	29.35	0.42	8.59	1.43	114.6	2.395	0.352	2.043	11.2	7.9	5.0E-05	30.0	32.0	1.797	3.8	-9999.0	-9999.0
45.341	32.13	32.22	0.41	8.32	1.28	117.7	2.399	0.354	2.045	10.3	7.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
45.406	34.30	34.38	0.41	6.95	1.20	117.7	2.403	0.356	2.047	11.0	7.7	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
45.472	35.14	35.22	0.40	7.66	1.14	117.7	2.407	0.358	2.049	11.2	7.9	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
45.538	34.81	34.89	0.40	7.27	1.15	117.7	2.411	0.360	2.051	11.1	7.8	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
45.603	33.79	33.87	0.39	7.64	1.15	117.7	2.415	0.362	2.052	10.8	7.5	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
45.669	32.90	32.99	0.39	8.10	1.19	117.7	2.419	0.364	2.054	10.5	7.3	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
45.734	32.77	32.86	0.39	7.91	1.19	117.7	2.422	0.366	2.056	10.5	7.3	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
45.800	32.52	32.60	0.40	7.91	1.23	117.7	2.426	0.368	2.058	10.4	7.3	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
45.866	30.72	30.81	0.39	8.00	1.27	117.7	2.430	0.370	2.060	9.8	6.9	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
45.931	31.31	31.40	0.40	8.28	1.28	117.7	2.434	0.373	2.062	10.0	7.0	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
45.997	29.64	29.73	0.40	8.14	1.35	117.7	2.438	0.375	2.063	9.5	6.6	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
46.062	28.30	28.38	0.41	7.96	1.45	114.6	2.442	0.377	2.065	10.9	7.6	5.0E-05	30.0	30.0	1.730	3.5	-9999.0	-9999.0
46.128	26.00	26.09	0.43	7.98	1.65	114.6	2.446	0.379	2.067	10.0	7.0	5.0E-05	30.0	30.0	1.576	3.1	-9999.0	-9999.0
46.194	23.96	24.04	0.45	7.96	1.88	114.6	2.449	0.381	2.069	9.2	6.4	5.0E-05	30.0	30.0	1.440	2.7	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
46.259	22.48	22.58	0.47	8.87	2.09	114.6	2.453	0.383	2.070	8.6	6.0	5.0E-05	30.0	30.0	1.342	2.4	-9999.0	-9999.0
46.325	19.42	19.52	0.50	9.14	2.57	114.6	2.457	0.385	2.072	9.3	6.5	5.0E-06	-9999.0	-9999.0	1.137	2.0	-9999.0	-9999.0
46.391	19.17	19.28	0.51	10.33	2.65	114.6	2.461	0.387	2.074	9.2	6.4	5.0E-06	-9999.0	-9999.0	1.121	1.9	-9999.0	-9999.0
46.456	18.33	18.48	0.52	13.33	2.82	114.6	2.464	0.389	2.075	8.8	6.1	5.0E-06	-9999.0	-9999.0	1.068	1.8	-9999.0	-9999.0
46.522	18.27	18.45	0.52	16.69	2.82	114.6	2.468	0.391	2.077	8.8	6.1	5.0E-06	-9999.0	-9999.0	1.066	1.8	-9999.0	-9999.0
46.587	20.44	20.62	0.53	16.83	2.58	114.6	2.472	0.393	2.079	9.9	6.8	5.0E-06	-9999.0	-9999.0	1.210	2.1	-9999.0	-9999.0
46.653	20.82	20.97	0.53	13.59	2.53	114.6	2.476	0.395	2.081	10.0	7.0	5.0E-06	-9999.0	-9999.0	1.233	2.2	-9999.0	-9999.0
46.719	21.78	21.90	0.52	10.61	2.38	114.6	2.479	0.397	2.082	10.5	7.3	5.0E-06	-9999.0	-9999.0	1.295	2.3	-9999.0	-9999.0
46.784	21.02	21.12	0.49	9.62	2.33	114.6	2.483	0.399	2.084	10.1	7.0	5.0E-06	-9999.0	-9999.0	1.243	2.2	-9999.0	-9999.0
46.850	21.97	22.07	0.46	9.07	2.09	114.6	2.487	0.401	2.086	8.5	5.9	5.0E-05	30.0	30.0	1.306	2.3	-9999.0	-9999.0
46.915	22.23	22.33	0.44	9.24	1.97	114.6	2.491	0.403	2.087	8.6	5.9	5.0E-05	30.0	30.0	1.323	2.4	-9999.0	-9999.0
46.981	23.45	23.55	0.43	9.12	1.83	114.6	2.494	0.405	2.089	9.0	6.2	5.0E-05	30.0	30.0	1.403	2.6	-9999.0	-9999.0
47.047	23.00	23.10	0.41	9.44	1.78	114.6	2.498	0.407	2.091	8.8	6.1	5.0E-05	30.0	30.0	1.373	2.5	-9999.0	-9999.0
47.112	23.58	23.68	0.38	9.16	1.61	114.6	2.502	0.409	2.093	9.1	6.3	5.0E-05	30.0	30.0	1.412	2.6	-9999.0	-9999.0
47.178	23.19	23.28	0.38	9.09	1.64	114.6	2.506	0.411	2.094	8.9	6.2	5.0E-05	30.0	30.0	1.385	2.5	-9999.0	-9999.0
47.244	23.45	23.55	0.36	9.28	1.53	114.6	2.509	0.414	2.096	9.0	6.2	5.0E-05	30.0	30.0	1.403	2.5	-9999.0	-9999.0
47.309	22.10	22.21	0.36	9.56	1.63	114.6	2.513	0.416	2.098	8.5	5.9	5.0E-05	30.0	30.0	1.313	2.3	-9999.0	-9999.0
47.375	21.08	21.18	0.38	9.52	1.80	114.6	2.517	0.418	2.099	8.1	5.6	5.0E-05	30.0	30.0	1.244	2.2	-9999.0	-9999.0
47.440	20.76	20.86	0.37	9.36	1.78	114.6	2.521	0.420	2.101	8.0	5.5	5.0E-05	30.0	30.0	1.223	2.1	-9999.0	-9999.0
47.506	20.63	20.73	0.37	9.60	1.79	114.6	2.524	0.422	2.103	7.9	5.5	5.0E-05	30.0	30.0	1.214	2.1	-9999.0	-9999.0
47.572	20.00	20.10	0.37	9.54	1.85	114.6	2.528	0.424	2.104	7.7	5.3	5.0E-05	30.0	30.0	1.172	2.0	-9999.0	-9999.0
47.637	19.36	19.47	0.38	10.55	1.96	114.6	2.532	0.426	2.106	7.5	5.1	5.0E-05	30.0	30.0	1.129	1.9	-9999.0	-9999.0
47.703	19.68	19.80	0.38	11.59	1.92	114.6	2.536	0.428	2.108	7.6	5.2	5.0E-05	30.0	30.0	1.151	1.9	-9999.0	-9999.0
47.768	18.59	18.72	0.39	12.39	2.09	114.6	2.539	0.430	2.110	7.2	4.9	5.0E-05	30.0	30.0	1.079	1.8	-9999.0	-9999.0
47.834	18.98	19.12	0.40	13.63	2.10	114.6	2.543	0.432	2.111	7.3	5.0	5.0E-05	30.0	30.0	1.105	1.8	-9999.0	-9999.0
47.900	17.82	17.98	0.39	14.62	2.17	114.6	2.547	0.434	2.113	8.6	5.9	5.0E-06	-9999.0	-9999.0	1.029	1.7	-9999.0	-9999.0
47.965	17.44	17.61	0.39	15.86	2.22	114.6	2.551	0.436	2.115	8.4	5.8	5.0E-06	-9999.0	-9999.0	1.004	1.6	-9999.0	-9999.0
48.031	16.35	16.53	0.39	16.69	2.37	114.6	2.555	0.438	2.116	7.9	5.4	5.0E-06	-9999.0	-9999.0	0.932	1.5	-9999.0	-9999.0
48.097	15.14	15.32	0.38	17.13	2.49	114.6	2.558	0.440	2.118	7.3	5.0	5.0E-06	-9999.0	-9999.0	0.851	1.3	-9999.0	-9999.0
48.162	13.09	13.28	0.36	17.27	2.72	114.6	2.562	0.442	2.120	6.4	4.4	5.0E-06	-9999.0	-9999.0	0.714	1.1	-9999.0	-9999.0
48.228	11.76	11.95	0.33	18.07	2.77	114.6	2.566	0.444	2.122	5.7	3.9	5.0E-06	-9999.0	-9999.0	0.626	1.0	-9999.0	-9999.0
48.293	9.58	9.81	0.30	21.28	3.06	114.6	2.570	0.446	2.123	6.3	4.3	5.0E-07	-9999.0	-9999.0	0.483	0.8	-9999.0	-9999.0
48.359	8.37	8.68	0.31	28.25	3.58	111.4	2.573	0.448	2.125	8.3	5.7	5.0E-08	-9999.0	-9999.0	0.407	0.7	-9999.0	-9999.0
48.425	6.90	7.28	0.30	35.02	4.13	111.4	2.577	0.450	2.127	7.0	4.8	5.0E-08	-9999.0	-9999.0	0.313	0.6	-9999.0	-9999.0
48.490	6.27	6.68	0.29	37.96	4.35	111.4	2.581	0.452	2.128	6.4	4.4	5.0E-08	-9999.0	-9999.0	0.273	0.6	-9999.0	-9999.0
48.556	6.33	6.75	0.28	39.13	4.16	111.4	2.584	0.454	2.130	6.5	4.4	5.0E-08	-9999.0	-9999.0	0.278	0.6	-9999.0	-9999.0
48.621	6.06	6.50	0.29	40.47	4.47	111.4	2.588	0.457	2.131	6.2	4.3	5.0E-08	-9999.0	-9999.0	0.261	0.6	-9999.0	-9999.0
48.687	11.50	11.76	0.31	23.96	2.64	114.6	2.592	0.459	2.133	5.6	3.9	5.0E-06	-9999.0	-9999.0	0.611	1.0	-9999.0	-9999.0
48.753	13.86	14.11	0.34	22.63	2.42	114.6	2.595	0.461	2.135	6.8	4.6	5.0E-06	-9999.0	-9999.0	0.768	1.2	-9999.0	-9999.0
48.818	14.51	14.72	0.36	20.28	2.45	114.6	2.599	0.463	2.136	7.1	4.8	5.0E-06	-9999.0	-9999.0	0.808	1.3	-9999.0	-9999.0
48.884	15.53	15.72	0.37	17.82	2.36	114.6	2.603	0.465	2.138	7.5	5.1	5.0E-06	-9999.0	-9999.0	0.874	1.4	-9999.0	-9999.0
48.950	15.08	15.26	0.38	17.19	2.50	114.6	2.607	0.467	2.140	7.3	5.0	5.0E-06	-9999.0	-9999.0	0.844	1.3	-9999.0	-9999.0
49.015	14.70	14.89	0.38	18.43	2.56	114.6	2.610	0.469	2.142	7.1	4.9	5.0E-06	-9999.0	-9999.0	0.819	1.3	-9999.0	-9999.0
49.081	15.21	15.42	0.40	19.95	2.60	114.6	2.614	0.471	2.143	7.4	5.0	5.0E-06	-9999.0	-9999.0	0.854	1.3	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
49.146	16.10	16.31	0.38	19.36	2.34	114.6	2.618	0.473	2.145	7.8	5.3	5.0E-06	-9999.0	-9999.0	0.913	1.4	-9999.0	-9999.0
49.212	15.97	16.18	0.38	19.66	2.35	114.6	2.622	0.475	2.147	7.7	5.3	5.0E-06	-9999.0	-9999.0	0.904	1.4	-9999.0	-9999.0
49.278	18.01	18.23	0.39	20.28	2.14	114.6	2.625	0.477	2.148	8.7	6.0	5.0E-06	-9999.0	-9999.0	1.040	1.7	-9999.0	-9999.0
49.343	17.63	17.84	0.38	19.22	2.14	114.6	2.629	0.479	2.150	8.5	5.8	5.0E-06	-9999.0	-9999.0	1.014	1.6	-9999.0	-9999.0
49.409	17.18	17.37	0.39	17.86	2.25	114.6	2.633	0.481	2.152	8.3	5.7	5.0E-06	-9999.0	-9999.0	0.983	1.6	-9999.0	-9999.0
49.474	16.67	16.86	0.39	17.52	2.32	114.6	2.637	0.483	2.154	8.1	5.5	5.0E-06	-9999.0	-9999.0	0.948	1.5	-9999.0	-9999.0
49.540	15.21	15.39	0.38	17.03	2.47	114.6	2.640	0.485	2.155	7.4	5.0	5.0E-06	-9999.0	-9999.0	0.850	1.3	-9999.0	-9999.0
49.606	13.41	13.60	0.37	17.56	2.73	114.6	2.644	0.487	2.157	6.5	4.4	5.0E-06	-9999.0	-9999.0	0.731	1.1	-9999.0	-9999.0
49.671	13.09	13.33	0.38	21.75	2.86	114.6	2.648	0.489	2.159	6.4	4.3	5.0E-06	-9999.0	-9999.0	0.712	1.1	-9999.0	-9999.0
49.737	12.52	12.80	0.40	25.59	3.13	114.6	2.652	0.491	2.160	8.2	5.6	5.0E-07	-9999.0	-9999.0	0.676	1.0	-9999.0	-9999.0
49.803	13.86	14.17	0.41	28.50	2.90	114.6	2.656	0.493	2.162	6.8	4.6	5.0E-06	-9999.0	-9999.0	0.768	1.2	-9999.0	-9999.0
49.868	13.99	14.29	0.43	27.81	3.02	114.6	2.659	0.495	2.164	6.8	4.7	5.0E-06	-9999.0	-9999.0	0.776	1.2	-9999.0	-9999.0
49.934	15.40	15.67	0.44	25.12	2.81	114.6	2.663	0.497	2.166	7.5	5.1	5.0E-06	-9999.0	-9999.0	0.867	1.3	-9999.0	-9999.0
49.999	16.86	17.11	0.44	23.47	2.58	114.6	2.667	0.500	2.167	8.2	5.6	5.0E-06	-9999.0	-9999.0	0.963	1.5	-9999.0	-9999.0
50.065	18.07	18.32	0.44	23.22	2.41	114.6	2.671	0.502	2.169	8.8	6.0	5.0E-06	-9999.0	-9999.0	1.044	1.7	-9999.0	-9999.0
50.131	19.49	19.71	0.42	20.80	2.14	114.6	2.674	0.504	2.171	7.6	5.1	5.0E-05	30.0	30.0	1.136	1.8	-9999.0	-9999.0
50.196	20.63	20.83	0.42	18.23	2.02	114.6	2.678	0.506	2.172	8.0	5.4	5.0E-05	30.0	30.0	1.210	2.0	-9999.0	-9999.0
50.262	20.76	20.95	0.40	17.38	1.91	114.6	2.682	0.508	2.174	8.0	5.4	5.0E-05	30.0	30.0	1.218	2.0	-9999.0	-9999.0
50.327	20.51	20.69	0.38	16.73	1.84	114.6	2.686	0.510	2.176	7.9	5.4	5.0E-05	30.0	30.0	1.200	2.0	-9999.0	-9999.0
50.393	20.25	20.43	0.36	16.93	1.77	114.6	2.689	0.512	2.177	7.8	5.3	5.0E-05	30.0	30.0	1.183	1.9	-9999.0	-9999.0
50.459	20.32	20.50	0.36	16.85	1.76	114.6	2.693	0.514	2.179	7.9	5.3	5.0E-05	30.0	30.0	1.187	1.9	-9999.0	-9999.0
50.524	19.74	19.92	0.37	17.13	1.86	114.6	2.697	0.516	2.181	7.6	5.2	5.0E-05	30.0	30.0	1.148	1.9	-9999.0	-9999.0
50.590	18.27	18.46	0.36	17.48	1.95	114.6	2.701	0.518	2.183	7.1	4.8	5.0E-05	30.0	30.0	1.051	1.7	-9999.0	-9999.0
50.656	16.99	17.19	0.36	18.31	2.10	114.6	2.704	0.520	2.184	8.2	5.6	5.0E-06	-9999.0	-9999.0	0.966	1.5	-9999.0	-9999.0
50.721	15.08	15.28	0.37	19.12	2.43	114.6	2.708	0.522	2.186	7.3	5.0	5.0E-06	-9999.0	-9999.0	0.838	1.3	-9999.0	-9999.0
50.787	13.16	13.38	0.36	20.54	2.70	114.6	2.712	0.524	2.188	6.4	4.3	5.0E-06	-9999.0	-9999.0	0.711	1.1	-9999.0	-9999.0
50.852	11.82	12.07	0.35	23.24	2.91	114.6	2.716	0.526	2.189	7.7	5.2	5.0E-07	-9999.0	-9999.0	0.624	1.0	-9999.0	-9999.0
50.918	10.09	10.38	0.33	25.96	3.19	114.6	2.719	0.528	2.191	6.6	4.5	5.0E-07	-9999.0	-9999.0	0.510	0.8	-9999.0	-9999.0
50.984	9.71	10.03	0.30	29.02	3.00	114.6	2.723	0.530	2.193	6.4	4.3	5.0E-07	-9999.0	-9999.0	0.487	0.8	-9999.0	-9999.0
51.049	8.94	9.29	0.29	32.07	3.13	114.6	2.727	0.532	2.195	5.9	4.0	5.0E-07	-9999.0	-9999.0	0.437	0.7	-9999.0	-9999.0
51.115	8.30	8.69	0.28	35.85	3.23	114.6	2.731	0.534	2.196	5.5	3.7	5.0E-07	-9999.0	-9999.0	0.397	0.7	-9999.0	-9999.0
51.180	7.67	8.08	0.27	37.81	3.35	111.4	2.734	0.536	2.198	7.7	5.2	5.0E-08	-9999.0	-9999.0	0.356	0.6	-9999.0	-9999.0
51.246	7.67	8.08	0.28	38.14	3.47	111.4	2.738	0.538	2.200	7.7	5.2	5.0E-08	-9999.0	-9999.0	0.356	0.6	-9999.0	-9999.0
51.312	7.54	7.95	0.30	37.94	3.78	111.4	2.742	0.541	2.201	7.6	5.1	5.0E-08	-9999.0	-9999.0	0.347	0.6	-9999.0	-9999.0
51.377	9.71	10.12	0.32	37.20	3.17	114.6	2.745	0.543	2.203	6.5	4.4	5.0E-07	-9999.0	-9999.0	0.491	0.8	-9999.0	-9999.0
51.443	12.39	12.77	0.35	34.83	2.75	114.6	2.749	0.545	2.205	6.1	4.1	5.0E-06	-9999.0	-9999.0	0.668	1.0	-9999.0	-9999.0
51.509	14.82	15.14	0.37	29.63	2.45	114.6	2.753	0.547	2.206	7.2	4.9	5.0E-06	-9999.0	-9999.0	0.826	1.2	-9999.0	-9999.0
51.574	16.42	16.68	0.39	23.65	2.34	114.6	2.757	0.549	2.208	8.0	5.4	5.0E-06	-9999.0	-9999.0	0.928	1.4	-9999.0	-9999.0
51.640	17.50	17.72	0.39	19.97	2.21	114.6	2.760	0.551	2.210	8.5	5.7	5.0E-06	-9999.0	-9999.0	0.997	1.5	-9999.0	-9999.0
51.705	18.33	18.53	0.43	18.49	2.33	114.6	2.764	0.553	2.211	8.9	6.0	5.0E-06	-9999.0	-9999.0	1.051	1.6	-9999.0	-9999.0
51.771	17.88	18.07	0.42	17.56	2.33	114.6	2.768	0.555	2.213	8.7	5.8	5.0E-06	-9999.0	-9999.0	1.020	1.6	-9999.0	-9999.0
51.837	18.39	18.59	0.41	17.72	2.21	114.6	2.772	0.557	2.215	8.9	6.0	5.0E-06	-9999.0	-9999.0	1.054	1.6	-9999.0	-9999.0
51.902	17.63	17.83	0.41	18.03	2.31	114.6	2.775	0.559	2.217	8.5	5.7	5.0E-06	-9999.0	-9999.0	1.003	1.5	-9999.0	-9999.0
51.968	17.56	17.77	0.41	19.03	2.31	114.6	2.779	0.561	2.218	8.5	5.7	5.0E-06	-9999.0	-9999.0	0.999	1.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
52.033	18.14	18.31	0.41	15.07	2.25	114.6	2.783	0.563	2.220	8.8	5.9	5.0E-06	-9999.0	-9999.0	1.035	1.6	-9999.0	-9999.0
52.099	18.91	19.08	0.40	15.98	2.10	114.6	2.787	0.565	2.222	7.3	4.9	5.0E-05	30.0	30.0	1.086	1.7	-9999.0	-9999.0
52.165	18.20	18.39	0.41	16.83	2.24	114.6	2.791	0.567	2.223	8.8	5.9	5.0E-06	-9999.0	-9999.0	1.040	1.6	-9999.0	-9999.0
52.230	18.46	18.67	0.42	18.58	2.26	114.6	2.794	0.569	2.225	8.9	6.0	5.0E-06	-9999.0	-9999.0	1.058	1.6	-9999.0	-9999.0
52.296	18.39	18.62	0.42	20.60	2.26	114.6	2.798	0.571	2.227	8.9	6.0	5.0E-06	-9999.0	-9999.0	1.055	1.6	-9999.0	-9999.0
52.362	17.63	17.85	0.42	20.44	2.36	114.6	2.802	0.573	2.228	8.5	5.7	5.0E-06	-9999.0	-9999.0	1.003	1.5	-9999.0	-9999.0
52.427	17.31	17.53	0.41	19.91	2.34	114.6	2.806	0.575	2.230	8.4	5.6	5.0E-06	-9999.0	-9999.0	0.981	1.5	-9999.0	-9999.0
52.493	17.31	17.52	0.41	19.18	2.35	114.6	2.809	0.577	2.232	8.4	5.6	5.0E-06	-9999.0	-9999.0	0.981	1.5	-9999.0	-9999.0
52.558	17.05	17.25	0.40	18.56	2.32	114.6	2.813	0.579	2.234	8.3	5.5	5.0E-06	-9999.0	-9999.0	0.963	1.5	-9999.0	-9999.0
52.624	16.16	16.36	0.39	18.13	2.39	114.6	2.817	0.581	2.235	7.8	5.2	5.0E-06	-9999.0	-9999.0	0.903	1.4	-9999.0	-9999.0
52.690	14.82	15.01	0.39	18.23	2.60	114.6	2.821	0.584	2.237	7.2	4.8	5.0E-06	-9999.0	-9999.0	0.813	1.2	-9999.0	-9999.0
52.755	14.30	14.52	0.39	19.50	2.69	114.6	2.824	0.586	2.239	7.0	4.6	5.0E-06	-9999.0	-9999.0	0.779	1.2	-9999.0	-9999.0
52.821	13.22	13.47	0.38	23.07	2.83	114.6	2.828	0.588	2.240	6.5	4.3	5.0E-06	-9999.0	-9999.0	0.710	1.1	-9999.0	-9999.0
52.886	12.46	12.74	0.40	25.80	3.15	114.6	2.832	0.590	2.242	8.1	5.4	5.0E-07	-9999.0	-9999.0	0.660	1.0	-9999.0	-9999.0
52.952	13.92	14.23	0.40	28.66	2.82	114.6	2.836	0.592	2.244	6.8	4.6	5.0E-06	-9999.0	-9999.0	0.760	1.1	-9999.0	-9999.0
53.018	13.86	14.17	0.41	28.66	2.90	114.6	2.839	0.594	2.246	6.8	4.5	5.0E-06	-9999.0	-9999.0	0.756	1.1	-9999.0	-9999.0
53.083	15.33	15.61	0.43	26.49	2.76	114.6	2.843	0.596	2.247	7.5	5.0	5.0E-06	-9999.0	-9999.0	0.851	1.3	-9999.0	-9999.0
53.149	16.48	16.74	0.44	23.86	2.64	114.6	2.847	0.598	2.249	8.0	5.3	5.0E-06	-9999.0	-9999.0	0.926	1.4	-9999.0	-9999.0
53.215	17.50	17.74	0.45	22.26	2.54	114.6	2.851	0.600	2.251	8.5	5.7	5.0E-06	-9999.0	-9999.0	0.993	1.5	-9999.0	-9999.0
53.280	17.37	17.60	0.43	20.82	2.45	114.6	2.854	0.602	2.252	8.4	5.6	5.0E-06	-9999.0	-9999.0	0.983	1.5	-9999.0	-9999.0
53.346	18.72	18.94	0.44	20.66	2.33	114.6	2.858	0.604	2.254	9.1	6.0	5.0E-06	-9999.0	-9999.0	1.072	1.6	-9999.0	-9999.0
53.411	19.49	19.71	0.44	20.23	2.24	114.6	2.862	0.606	2.256	9.4	6.3	5.0E-06	-9999.0	-9999.0	1.123	1.7	-9999.0	-9999.0
53.477	19.81	20.02	0.42	19.77	2.10	114.6	2.866	0.608	2.258	7.7	5.1	5.0E-05	30.0	30.0	1.144	1.8	-9999.0	-9999.0
53.543	20.57	20.78	0.43	19.28	2.07	114.6	2.869	0.610	2.259	8.0	5.3	5.0E-05	30.0	30.0	1.194	1.9	-9999.0	-9999.0
53.608	19.87	20.07	0.43	18.94	2.15	114.6	2.873	0.612	2.261	7.7	5.1	5.0E-05	30.0	30.0	1.147	1.8	-9999.0	-9999.0
53.674	20.51	20.71	0.42	18.49	2.03	114.6	2.877	0.614	2.263	7.9	5.3	5.0E-05	30.0	30.0	1.189	1.9	-9999.0	-9999.0
53.740	20.51	20.71	0.41	18.92	1.98	114.6	2.881	0.616	2.264	7.9	5.3	5.0E-05	30.0	30.0	1.189	1.8	-9999.0	-9999.0
53.805	19.74	19.94	0.42	19.01	2.11	114.6	2.885	0.618	2.266	7.6	5.1	5.0E-05	30.0	30.0	1.137	1.7	-9999.0	-9999.0
53.871	19.23	19.44	0.41	19.46	2.11	114.6	2.888	0.620	2.268	7.4	4.9	5.0E-05	30.0	30.0	1.103	1.7	-9999.0	-9999.0
53.936	19.68	19.89	0.42	19.52	2.12	114.6	2.892	0.622	2.270	7.6	5.1	5.0E-05	30.0	30.0	1.133	1.7	-9999.0	-9999.0
54.002	19.36	19.57	0.41	19.77	2.10	114.6	2.896	0.625	2.271	7.5	5.0	5.0E-05	30.0	30.0	1.112	1.7	-9999.0	-9999.0
54.068	17.95	18.17	0.40	19.81	2.21	114.6	2.900	0.627	2.273	8.7	5.8	5.0E-06	-9999.0	-9999.0	1.018	1.5	-9999.0	-9999.0
54.133	17.31	17.53	0.40	20.36	2.29	114.6	2.903	0.629	2.275	8.4	5.6	5.0E-06	-9999.0	-9999.0	0.975	1.4	-9999.0	-9999.0
54.199	16.55	16.78	0.40	21.32	2.39	114.6	2.907	0.631	2.276	8.0	5.3	5.0E-06	-9999.0	-9999.0	0.925	1.4	-9999.0	-9999.0
54.264	15.21	15.46	0.39	23.28	2.53	114.6	2.911	0.633	2.278	7.4	4.9	5.0E-06	-9999.0	-9999.0	0.837	1.2	-9999.0	-9999.0
54.330	13.35	13.62	0.38	24.37	2.80	114.6	2.915	0.635	2.280	6.5	4.3	5.0E-06	-9999.0	-9999.0	0.713	1.0	-9999.0	-9999.0
54.396	12.58	12.86	0.36	26.02	2.81	114.6	2.918	0.637	2.282	6.2	4.1	5.0E-06	-9999.0	-9999.0	0.663	1.0	-9999.0	-9999.0
54.461	11.95	12.27	0.35	29.39	2.86	114.6	2.922	0.639	2.283	5.9	3.9	5.0E-06	-9999.0	-9999.0	0.623	0.9	-9999.0	-9999.0
54.527	10.48	10.83	0.32	32.83	2.96	114.6	2.926	0.641	2.285	6.9	4.6	5.0E-07	-9999.0	-9999.0	0.527	0.8	-9999.0	-9999.0
54.593	9.90	10.27	0.30	33.83	2.93	114.6	2.930	0.643	2.287	6.6	4.3	5.0E-07	-9999.0	-9999.0	0.489	0.8	-9999.0	-9999.0
54.658	9.45	9.82	0.27	34.05	2.76	114.6	2.933	0.645	2.288	6.3	4.1	5.0E-07	-9999.0	-9999.0	0.459	0.7	-9999.0	-9999.0
54.724	7.99	8.39	0.23	37.14	2.75	114.6	2.937	0.647	2.290	5.4	3.5	5.0E-07	-9999.0	-9999.0	0.364	0.6	-9999.0	-9999.0
54.789	7.86	8.28	0.21	38.57	2.54	114.6	2.941	0.649	2.292	5.3	3.5	5.0E-07	-9999.0	-9999.0	0.356	0.6	-9999.0	-9999.0
54.855	6.06	6.49	0.18	39.51	2.78	114.6	2.945	0.651	2.293	4.1	2.7	5.0E-07	-9999.0	-9999.0	0.236	0.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
54.921	6.20	6.62	0.25	39.68	3.78	111.4	2.948	0.653	2.295	6.3	4.2	5.0E-08	-9999.0	-9999.0	0.245	0.5	-9999.0	-9999.0
54.986	5.43	5.87	0.24	40.33	4.10	111.4	2.952	0.655	2.297	5.6	3.7	5.0E-08	-9999.0	-9999.0	0.194	0.5	-9999.0	-9999.0
55.052	4.79	5.24	0.22	41.68	4.21	111.4	2.956	0.657	2.298	5.0	3.3	5.0E-08	-9999.0	-9999.0	0.152	0.5	-9999.0	-9999.0
55.117	4.66	5.13	0.20	43.58	3.91	111.4	2.959	0.659	2.300	4.9	3.2	5.0E-08	-9999.0	-9999.0	0.145	0.5	-9999.0	-9999.0
55.183	3.96	4.46	0.20	45.87	4.50	111.4	2.963	0.661	2.302	4.3	2.8	5.0E-08	-9999.0	-9999.0	0.099	0.5	-9999.0	-9999.0
55.249	7.67	7.99	0.19	29.72	2.38	114.6	2.967	0.663	2.303	5.1	3.4	5.0E-07	-9999.0	-9999.0	0.335	0.6	-9999.0	-9999.0
55.314	7.54	7.92	0.19	35.79	2.40	114.6	2.970	0.665	2.305	5.1	3.3	5.0E-07	-9999.0	-9999.0	0.330	0.6	-9999.0	-9999.0
55.380	8.24	8.62	0.19	35.48	2.21	114.6	2.974	0.668	2.307	4.1	2.7	5.0E-06	-9999.0	-9999.0	0.377	0.6	-9999.0	-9999.0
55.446	8.05	8.43	0.18	35.40	2.14	114.6	2.978	0.670	2.308	4.0	2.7	5.0E-06	-9999.0	-9999.0	0.364	0.6	-9999.0	-9999.0
55.511	9.71	10.10	0.20	35.91	1.98	114.6	2.982	0.672	2.310	4.8	3.2	5.0E-06	-9999.0	-9999.0	0.475	0.7	-9999.0	-9999.0
55.577	10.80	11.18	0.21	35.38	1.88	114.6	2.985	0.674	2.312	5.4	3.5	5.0E-06	-9999.0	-9999.0	0.546	0.8	-9999.0	-9999.0
55.642	10.54	10.90	0.20	34.05	1.84	114.6	2.989	0.676	2.313	5.2	3.4	5.0E-06	-9999.0	-9999.0	0.528	0.8	-9999.0	-9999.0
55.708	10.74	11.10	0.21	34.09	1.90	114.6	2.993	0.678	2.315	5.3	3.5	5.0E-06	-9999.0	-9999.0	0.541	0.8	-9999.0	-9999.0
55.774	10.48	10.83	0.20	33.20	1.85	114.6	2.997	0.680	2.317	5.2	3.4	5.0E-06	-9999.0	-9999.0	0.522	0.8	-9999.0	-9999.0
55.839	10.42	10.78	0.20	33.64	1.86	114.6	3.001	0.682	2.319	5.2	3.4	5.0E-06	-9999.0	-9999.0	0.519	0.8	-9999.0	-9999.0
55.905	8.62	9.00	0.18	35.14	2.00	114.6	3.004	0.684	2.320	4.3	2.8	5.0E-06	-9999.0	-9999.0	0.400	0.7	-9999.0	-9999.0
55.970	6.65	7.05	0.17	37.59	2.42	114.6	3.008	0.686	2.322	4.5	3.0	5.0E-07	-9999.0	-9999.0	0.270	0.6	-9999.0	-9999.0
56.036	5.55	6.00	0.15	41.00	2.51	114.6	3.012	0.688	2.324	3.8	2.5	5.0E-07	-9999.0	-9999.0	0.199	0.5	-9999.0	-9999.0
56.102	5.24	5.71	0.13	43.33	2.28	114.6	3.016	0.690	2.325	3.6	2.4	5.0E-07	-9999.0	-9999.0	0.180	0.5	-9999.0	-9999.0
56.167	5.04	5.52	0.11	44.54	2.00	114.6	3.019	0.692	2.327	3.5	2.3	5.0E-07	-9999.0	-9999.0	0.167	0.5	-9999.0	-9999.0
56.233	4.09	4.58	0.09	45.15	1.97	114.6	3.023	0.694	2.329	2.9	1.9	5.0E-07	-9999.0	-9999.0	0.104	0.5	-9999.0	-9999.0
56.299	4.47	4.98	0.08	46.75	1.61	111.4	3.027	0.696	2.331	2.4	1.6	1.0E-07	-9999.0	-9999.0	0.130	0.5	-9999.0	-9999.0
56.364	4.73	5.24	0.06	46.66	1.15	111.4	3.030	0.698	2.332	2.5	1.6	1.0E-07	-9999.0	-9999.0	0.147	0.5	-9999.0	-9999.0
56.430	4.85	5.34	0.05	45.43	0.94	111.4	3.034	0.700	2.334	2.6	1.7	1.0E-07	-9999.0	-9999.0	0.154	0.5	-9999.0	-9999.0
56.495	5.11	5.59	0.06	44.54	1.08	111.4	3.038	0.702	2.335	2.7	1.8	1.0E-07	-9999.0	-9999.0	0.170	0.5	-9999.0	-9999.0
56.561	5.17	5.65	0.09	44.52	1.60	111.4	3.041	0.704	2.337	2.7	1.8	1.0E-07	-9999.0	-9999.0	0.174	0.5	-9999.0	-9999.0
56.627	6.46	6.95	0.12	45.31	1.73	114.6	3.045	0.706	2.339	3.3	2.2	5.0E-06	-9999.0	-9999.0	0.260	0.6	-9999.0	-9999.0
56.692	8.37	8.84	0.19	43.47	2.15	114.6	3.049	0.709	2.340	4.2	2.8	5.0E-06	-9999.0	-9999.0	0.386	0.7	-9999.0	-9999.0
56.758	10.93	11.34	0.23	38.24	2.03	114.6	3.053	0.711	2.342	5.4	3.5	5.0E-06	-9999.0	-9999.0	0.552	0.8	-9999.0	-9999.0
56.823	11.88	12.24	0.27	33.07	2.21	114.6	3.056	0.713	2.344	5.9	3.8	5.0E-06	-9999.0	-9999.0	0.612	0.9	-9999.0	-9999.0
56.889	14.18	14.50	0.31	28.86	2.14	114.6	3.060	0.715	2.345	6.9	4.5	5.0E-06	-9999.0	-9999.0	0.762	1.1	-9999.0	-9999.0
56.955	15.14	15.42	0.32	25.82	2.08	114.6	3.064	0.717	2.347	7.4	4.8	5.0E-06	-9999.0	-9999.0	0.823	1.2	-9999.0	-9999.0
57.020	15.91	16.17	0.33	24.37	2.05	114.6	3.068	0.719	2.349	7.7	5.1	5.0E-06	-9999.0	-9999.0	0.874	1.2	-9999.0	-9999.0
57.086	16.10	16.36	0.34	24.14	2.08	114.6	3.071	0.721	2.351	7.8	5.1	5.0E-06	-9999.0	-9999.0	0.886	1.3	-9999.0	-9999.0
57.152	15.59	15.86	0.34	24.85	2.15	114.6	3.075	0.723	2.352	7.6	5.0	5.0E-06	-9999.0	-9999.0	0.852	1.2	-9999.0	-9999.0
57.217	15.72	15.99	0.35	25.04	2.19	114.6	3.079	0.725	2.354	7.7	5.0	5.0E-06	-9999.0	-9999.0	0.861	1.2	-9999.0	-9999.0
57.283	15.02	15.28	0.35	24.43	2.30	114.6	3.083	0.727	2.356	7.3	4.8	5.0E-06	-9999.0	-9999.0	0.813	1.1	-9999.0	-9999.0
57.348	15.02	15.27	0.35	23.45	2.30	114.6	3.086	0.729	2.357	7.3	4.8	5.0E-06	-9999.0	-9999.0	0.812	1.1	-9999.0	-9999.0
57.414	14.24	14.51	0.36	24.41	2.49	114.6	3.090	0.731	2.359	6.9	4.5	5.0E-06	-9999.0	-9999.0	0.761	1.1	-9999.0	-9999.0
57.480	13.79	14.07	0.36	25.96	2.56	114.6	3.094	0.733	2.361	6.7	4.4	5.0E-06	-9999.0	-9999.0	0.732	1.0	-9999.0	-9999.0
57.545	13.86	14.16	0.36	27.57	2.55	114.6	3.098	0.735	2.363	6.8	4.4	5.0E-06	-9999.0	-9999.0	0.738	1.0	-9999.0	-9999.0
57.611	13.35	13.67	0.37	29.63	2.71	114.6	3.101	0.737	2.364	6.5	4.3	5.0E-06	-9999.0	-9999.0	0.705	1.0	-9999.0	-9999.0
57.676	13.54	13.89	0.38	32.31	2.74	114.6	3.105	0.739	2.366	6.7	4.3	5.0E-06	-9999.0	-9999.0	0.719	1.0	-9999.0	-9999.0
57.742	13.79	14.16	0.40	33.89	2.83	114.6	3.109	0.741	2.368	6.8	4.4	5.0E-06	-9999.0	-9999.0	0.737	1.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
57.808	13.60	13.96	0.40	33.30	2.87	114.6	3.113	0.743	2.369	6.7	4.3	5.0E-06	-9999.0	-9999.0	0.723	1.0	-9999.0	-9999.0
57.873	14.24	14.60	0.38	32.73	2.61	114.6	3.117	0.745	2.371	7.0	4.5	5.0E-06	-9999.0	-9999.0	0.765	1.1	-9999.0	-9999.0
57.939	15.40	15.74	0.38	31.68	2.42	114.6	3.120	0.747	2.373	7.5	4.9	5.0E-06	-9999.0	-9999.0	0.841	1.2	-9999.0	-9999.0
58.005	15.97	16.28	0.38	28.58	2.34	114.6	3.124	0.749	2.375	7.8	5.1	5.0E-06	-9999.0	-9999.0	0.877	1.2	-9999.0	-9999.0
58.070	15.21	15.50	0.36	27.28	2.33	114.6	3.128	0.752	2.376	7.4	4.8	5.0E-06	-9999.0	-9999.0	0.825	1.2	-9999.0	-9999.0
58.136	12.90	13.17	0.36	24.59	2.74	114.6	3.132	0.754	2.378	6.3	4.1	5.0E-06	-9999.0	-9999.0	0.669	0.9	-9999.0	-9999.0
58.201	10.03	10.30	0.40	24.83	3.89	111.4	3.135	0.756	2.380	9.9	6.4	5.0E-08	-9999.0	-9999.0	0.478	0.7	-9999.0	-9999.0
58.267	8.75	9.07	0.38	29.68	4.20	111.4	3.139	0.758	2.381	8.7	5.6	5.0E-08	-9999.0	-9999.0	0.396	0.7	-9999.0	-9999.0
58.333	6.65	7.05	0.34	36.94	4.84	111.4	3.143	0.760	2.383	6.7	4.4	5.0E-08	-9999.0	-9999.0	0.260	0.6	-9999.0	-9999.0
58.398	6.33	6.82	0.32	45.93	4.70	111.4	3.146	0.762	2.384	6.5	4.2	5.0E-08	-9999.0	-9999.0	0.245	0.5	-9999.0	-9999.0
58.464	7.35	7.88	0.31	49.69	3.94	111.4	3.150	0.764	2.386	7.6	4.9	5.0E-08	-9999.0	-9999.0	0.316	0.6	-9999.0	-9999.0
58.529	12.46	12.72	0.31	24.37	2.44	114.6	3.154	0.766	2.388	6.1	3.9	5.0E-06	-9999.0	-9999.0	0.638	0.9	-9999.0	-9999.0
58.595	12.01	12.33	0.32	29.70	2.60	114.6	3.157	0.768	2.389	5.9	3.8	5.0E-06	-9999.0	-9999.0	0.612	0.9	-9999.0	-9999.0
58.661	10.28	10.60	0.30	29.61	2.84	114.6	3.161	0.770	2.391	6.8	4.4	5.0E-07	-9999.0	-9999.0	0.496	0.7	-9999.0	-9999.0
58.726	10.15	10.49	0.28	31.35	2.67	114.6	3.165	0.772	2.393	5.0	3.2	5.0E-06	-9999.0	-9999.0	0.489	0.7	-9999.0	-9999.0
58.792	9.71	10.10	0.28	35.40	2.78	114.6	3.169	0.774	2.395	6.4	4.2	5.0E-07	-9999.0	-9999.0	0.462	0.7	-9999.0	-9999.0
58.858	8.50	8.94	0.27	40.47	3.03	114.6	3.172	0.776	2.396	5.7	3.7	5.0E-07	-9999.0	-9999.0	0.384	0.6	-9999.0	-9999.0
58.923	8.69	9.14	0.26	41.96	2.85	114.6	3.176	0.778	2.398	5.8	3.8	5.0E-07	-9999.0	-9999.0	0.398	0.7	-9999.0	-9999.0
58.989	9.58	10.03	0.26	41.37	2.60	114.6	3.180	0.780	2.400	4.8	3.1	5.0E-06	-9999.0	-9999.0	0.457	0.7	-9999.0	-9999.0
59.054	8.81	9.25	0.25	40.14	2.71	114.6	3.184	0.782	2.401	5.9	3.8	5.0E-07	-9999.0	-9999.0	0.404	0.7	-9999.0	-9999.0
59.120	8.30	8.72	0.25	38.83	2.87	114.6	3.187	0.784	2.403	5.6	3.6	5.0E-07	-9999.0	-9999.0	0.369	0.6	-9999.0	-9999.0
59.186	7.79	8.20	0.26	38.30	3.18	114.6	3.191	0.786	2.405	5.2	3.4	5.0E-07	-9999.0	-9999.0	0.334	0.6	-9999.0	-9999.0
59.251	8.11	8.53	0.25	39.11	2.94	114.6	3.195	0.788	2.407	5.4	3.5	5.0E-07	-9999.0	-9999.0	0.356	0.6	-9999.0	-9999.0
59.317	7.41	7.85	0.24	40.73	3.07	114.6	3.199	0.790	2.408	5.0	3.2	5.0E-07	-9999.0	-9999.0	0.310	0.6	-9999.0	-9999.0
59.382	7.79	8.25	0.25	42.64	3.04	114.6	3.202	0.793	2.410	5.3	3.4	5.0E-07	-9999.0	-9999.0	0.336	0.6	-9999.0	-9999.0
59.448	8.75	9.23	0.26	44.05	2.82	114.6	3.206	0.795	2.412	5.9	3.8	5.0E-07	-9999.0	-9999.0	0.401	0.7	-9999.0	-9999.0
59.514	9.01	9.49	0.28	44.34	2.96	114.6	3.210	0.797	2.413	6.1	3.9	5.0E-07	-9999.0	-9999.0	0.419	0.7	-9999.0	-9999.0
59.579	9.71	10.16	0.30	41.56	2.96	114.6	3.214	0.799	2.415	6.5	4.2	5.0E-07	-9999.0	-9999.0	0.463	0.7	-9999.0	-9999.0
59.645	11.12	11.54	0.31	38.91	2.69	114.6	3.218	0.801	2.417	5.5	3.6	5.0E-06	-9999.0	-9999.0	0.555	0.8	-9999.0	-9999.0
59.711	14.24	14.65	0.33	37.69	2.26	114.6	3.221	0.803	2.419	7.0	4.5	5.0E-06	-9999.0	-9999.0	0.762	1.0	-9999.0	-9999.0
59.776	15.91	16.29	0.34	35.69	2.09	114.6	3.225	0.805	2.420	7.8	5.0	5.0E-06	-9999.0	-9999.0	0.871	1.2	-9999.0	-9999.0
59.842	17.37	17.72	0.34	31.74	1.92	114.6	3.229	0.807	2.422	6.8	4.4	5.0E-05	30.0	30.0	0.966	1.3	-9999.0	-9999.0
59.907	18.07	18.39	0.33	29.23	1.80	114.6	3.233	0.809	2.424	7.0	4.5	5.0E-05	30.0	30.0	1.010	1.4	-9999.0	-9999.0
59.973	19.30	19.61	0.33	28.58	1.69	114.6	3.236	0.811	2.425	7.5	4.8	5.0E-05	30.0	30.0	1.091	1.5	-9999.0	-9999.0
60.039	18.72	19.03	0.32	28.66	1.69	114.6	3.240	0.813	2.427	7.3	4.7	5.0E-05	30.0	30.0	1.052	1.5	-9999.0	-9999.0
60.104	17.69	18.01	0.33	28.90	1.84	114.6	3.244	0.815	2.429	6.9	4.4	5.0E-05	30.0	30.0	0.984	1.4	-9999.0	-9999.0
60.170	16.55	16.87	0.33	29.96	1.96	114.6	3.248	0.817	2.430	6.5	4.1	5.0E-05	30.0	30.0	0.908	1.2	-9999.0	-9999.0
60.235	15.59	15.92	0.32	31.03	2.01	114.6	3.251	0.819	2.432	7.6	4.9	5.0E-06	-9999.0	-9999.0	0.845	1.2	-9999.0	-9999.0
60.301	13.41	13.76	0.31	32.29	2.26	114.6	3.255	0.821	2.434	6.6	4.2	5.0E-06	-9999.0	-9999.0	0.700	1.0	-9999.0	-9999.0
60.367	11.18	11.55	0.29	34.69	2.52	114.6	3.259	0.823	2.436	5.5	3.5	5.0E-06	-9999.0	-9999.0	0.553	0.8	-9999.0	-9999.0
60.432	9.32	9.74	0.28	39.07	2.88	114.6	3.263	0.825	2.437	6.2	4.0	5.0E-07	-9999.0	-9999.0	0.432	0.7	-9999.0	-9999.0
60.498	8.50	8.97	0.26	43.51	2.91	114.6	3.266	0.827	2.439	5.7	3.7	5.0E-07	-9999.0	-9999.0	0.380	0.6	-9999.0	-9999.0
60.564	7.67	8.18	0.24	47.68	2.94	114.6	3.270	0.829	2.441	5.2	3.3	5.0E-07	-9999.0	-9999.0	0.328	0.6	-9999.0	-9999.0
60.629	6.84	7.38	0.23	50.45	3.12	111.4	3.274	0.831	2.442	7.1	4.5	5.0E-08	-9999.0	-9999.0	0.274	0.6	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
60.695	7.09	7.65	0.23	51.67	3.02	114.6	3.278	0.833	2.444	4.9	3.1	5.0E-07	-9999.0	-9999.0	0.291	0.6	-9999.0	-9999.0
60.760	8.56	9.11	0.26	51.26	2.86	114.6	3.281	0.836	2.446	5.8	3.7	5.0E-07	-9999.0	-9999.0	0.389	0.6	-9999.0	-9999.0
60.826	11.31	11.79	0.30	44.86	2.55	114.6	3.285	0.838	2.447	5.6	3.6	5.0E-06	-9999.0	-9999.0	0.567	0.8	-9999.0	-9999.0
60.892	13.60	14.01	0.33	37.98	2.36	114.6	3.289	0.840	2.449	6.7	4.3	5.0E-06	-9999.0	-9999.0	0.715	1.0	-9999.0	-9999.0
60.957	15.84	16.20	0.37	33.07	2.29	114.6	3.293	0.842	2.451	7.8	5.0	5.0E-06	-9999.0	-9999.0	0.860	1.2	-9999.0	-9999.0
61.023	16.80	17.13	0.39	30.44	2.28	114.6	3.296	0.844	2.453	8.2	5.2	5.0E-06	-9999.0	-9999.0	0.922	1.3	-9999.0	-9999.0
61.088	18.79	19.10	0.42	29.09	2.20	114.6	3.300	0.846	2.454	9.1	5.8	5.0E-06	-9999.0	-9999.0	1.053	1.4	-9999.0	-9999.0
61.154	20.57	20.87	0.44	27.37	2.11	114.6	3.304	0.848	2.456	8.0	5.1	5.0E-05	30.0	30.0	1.171	1.6	-9999.0	-9999.0
61.220	20.76	21.04	0.43	26.04	2.05	114.6	3.308	0.850	2.458	8.1	5.1	5.0E-05	30.0	30.0	1.182	1.7	-9999.0	-9999.0
61.285	21.33	21.60	0.42	24.59	1.95	114.6	3.311	0.852	2.459	8.3	5.3	5.0E-05	30.0	30.0	1.219	1.7	-9999.0	-9999.0
61.351	22.16	22.42	0.42	24.16	1.88	114.6	3.315	0.854	2.461	8.6	5.5	5.0E-05	30.0	30.0	1.274	1.8	-9999.0	-9999.0
61.417	22.81	23.05	0.42	23.03	1.83	114.6	3.319	0.856	2.463	8.8	5.6	5.0E-05	30.0	30.0	1.316	1.9	-9999.0	-9999.0
61.482	21.78	22.02	0.42	21.99	1.91	114.6	3.323	0.858	2.465	8.4	5.4	5.0E-05	30.0	30.0	1.247	1.8	-9999.0	-9999.0
61.548	19.74	19.98	0.41	22.44	2.06	114.6	3.326	0.860	2.466	7.7	4.9	5.0E-05	30.0	30.0	1.110	1.5	-9999.0	-9999.0
61.613	14.82	15.08	0.41	24.06	2.73	114.6	3.330	0.862	2.468	7.2	4.6	5.0E-06	-9999.0	-9999.0	0.783	1.1	-9999.0	-9999.0
61.679	12.39	12.68	0.39	26.69	3.08	114.6	3.334	0.864	2.470	8.1	5.2	5.0E-07	-9999.0	-9999.0	0.623	0.9	-9999.0	-9999.0
61.745	9.71	10.05	0.37	30.70	3.69	111.4	3.338	0.866	2.471	9.6	6.1	5.0E-08	-9999.0	-9999.0	0.447	0.7	-9999.0	-9999.0
61.810	7.73	8.14	0.34	37.83	4.19	111.4	3.341	0.868	2.473	7.8	5.0	5.0E-08	-9999.0	-9999.0	0.320	0.6	-9999.0	-9999.0
61.876	8.30	8.64	0.30	31.01	3.48	111.4	3.345	0.870	2.475	8.3	5.3	5.0E-08	-9999.0	-9999.0	0.353	0.6	-9999.0	-9999.0
61.942	7.73	8.19	0.25	42.76	3.06	114.6	3.349	0.872	2.476	5.2	3.3	5.0E-07	-9999.0	-9999.0	0.323	0.6	-9999.0	-9999.0
62.007	6.27	6.78	0.21	48.02	3.10	111.4	3.352	0.874	2.478	6.5	4.1	5.0E-08	-9999.0	-9999.0	0.229	0.5	-9999.0	-9999.0
62.073	5.04	5.59	0.18	50.96	3.23	111.4	3.356	0.877	2.480	5.4	3.4	5.0E-08	-9999.0	-9999.0	0.149	0.5	-9999.0	-9999.0
62.138	4.34	4.92	0.14	53.29	2.85	111.4	3.360	0.879	2.481	4.7	3.0	5.0E-08	-9999.0	-9999.0	0.104	0.5	-9999.0	-9999.0
62.204	4.98	5.59	0.11	56.04	1.97	114.6	3.363	0.881	2.483	3.6	2.3	5.0E-07	-9999.0	-9999.0	0.148	0.5	-9999.0	-9999.0
62.270	5.11	5.75	0.08	59.24	1.39	111.4	3.367	0.883	2.484	2.8	1.7	1.0E-07	-9999.0	-9999.0	0.159	0.5	-9999.0	-9999.0
62.335	6.65	7.33	0.09	63.38	1.23	114.6	3.371	0.885	2.486	3.5	2.2	5.0E-06	-9999.0	-9999.0	0.264	0.5	-9999.0	-9999.0
62.401	7.92	8.63	0.11	65.96	1.28	114.6	3.375	0.887	2.488	4.1	2.6	5.0E-06	-9999.0	-9999.0	0.350	0.6	-9999.0	-9999.0
62.466	7.73	8.49	0.12	70.04	1.42	114.6	3.378	0.889	2.490	4.1	2.6	5.0E-06	-9999.0	-9999.0	0.340	0.6	-9999.0	-9999.0
62.532	7.60	8.34	0.13	68.82	1.56	114.6	3.382	0.891	2.491	4.0	2.5	5.0E-06	-9999.0	-9999.0	0.331	0.6	-9999.0	-9999.0
62.598	6.97	7.66	0.17	64.29	2.22	114.6	3.386	0.893	2.493	4.9	3.1	5.0E-07	-9999.0	-9999.0	0.285	0.6	-9999.0	-9999.0
62.663	6.39	7.08	0.23	64.35	3.26	111.4	3.390	0.895	2.495	6.8	4.3	5.0E-08	-9999.0	-9999.0	0.246	0.5	-9999.0	-9999.0
62.729	9.26	10.03	0.29	71.27	2.90	114.6	3.393	0.897	2.496	6.4	4.1	5.0E-07	-9999.0	-9999.0	0.443	0.7	-9999.0	-9999.0
62.795	11.31	12.11	0.31	74.70	2.57	114.6	3.397	0.899	2.498	5.8	3.7	5.0E-06	-9999.0	-9999.0	0.581	0.8	-9999.0	-9999.0
62.860	13.79	14.53	0.33	68.23	2.28	114.6	3.401	0.901	2.500	7.0	4.4	5.0E-06	-9999.0	-9999.0	0.742	1.0	-9999.0	-9999.0
62.926	15.53	16.21	0.36	62.89	2.23	114.6	3.405	0.903	2.501	7.8	4.9	5.0E-06	-9999.0	-9999.0	0.854	1.1	-9999.0	-9999.0
62.991	15.78	16.35	0.43	53.15	2.64	114.6	3.408	0.905	2.503	7.8	4.9	5.0E-06	-9999.0	-9999.0	0.863	1.1	-9999.0	-9999.0
63.057	16.42	16.99	0.52	52.68	3.07	114.6	3.412	0.907	2.505	8.1	5.1	5.0E-06	-9999.0	-9999.0	0.905	1.2	-9999.0	-9999.0
63.123	15.08	15.59	0.52	47.93	3.34	114.6	3.416	0.909	2.507	10.0	6.3	5.0E-07	-9999.0	-9999.0	0.812	1.1	-9999.0	-9999.0
63.188	14.18	14.66	0.49	44.42	3.35	114.6	3.420	0.911	2.508	9.4	5.9	5.0E-07	-9999.0	-9999.0	0.750	1.0	-9999.0	-9999.0
63.254	13.54	13.98	0.46	40.92	3.30	114.6	3.423	0.913	2.510	8.9	5.6	5.0E-07	-9999.0	-9999.0	0.704	0.9	-9999.0	-9999.0
63.319	12.14	12.64	0.45	46.60	3.57	114.6	3.427	0.915	2.512	8.1	5.1	5.0E-07	-9999.0	-9999.0	0.614	0.8	-9999.0	-9999.0
63.385	12.90	13.54	0.43	59.05	3.18	114.6	3.431	0.917	2.513	8.6	5.5	5.0E-07	-9999.0	-9999.0	0.674	0.9	-9999.0	-9999.0
63.451	13.48	14.18	0.39	64.79	2.76	114.6	3.435	0.920	2.515	6.8	4.3	5.0E-06	-9999.0	-9999.0	0.717	1.0	-9999.0	-9999.0
63.516	12.27	12.97	0.35	64.83	2.71	114.6	3.438	0.922	2.517	6.2	3.9	5.0E-06	-9999.0	-9999.0	0.635	0.9	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
63.582	12.71	13.37	0.32	61.11	2.40	114.6	3.442	0.924	2.518	6.4	4.0	5.0E-06	-9999.0	-9999.0	0.662	0.9	-9999.0	-9999.0
63.648	12.07	12.72	0.30	60.03	2.36	114.6	3.446	0.926	2.520	6.1	3.8	5.0E-06	-9999.0	-9999.0	0.618	0.8	-9999.0	-9999.0
63.713	11.88	12.55	0.29	61.96	2.32	114.6	3.450	0.928	2.522	6.0	3.8	5.0E-06	-9999.0	-9999.0	0.607	0.8	-9999.0	-9999.0
63.779	11.95	12.62	0.31	62.57	2.46	114.6	3.453	0.930	2.524	6.0	3.8	5.0E-06	-9999.0	-9999.0	0.611	0.8	-9999.0	-9999.0
63.844	12.46	13.15	0.29	64.02	2.21	114.6	3.457	0.932	2.525	6.3	4.0	5.0E-06	-9999.0	-9999.0	0.646	0.9	-9999.0	-9999.0
63.910	12.07	12.75	0.26	62.89	2.04	114.6	3.461	0.934	2.527	6.1	3.8	5.0E-06	-9999.0	-9999.0	0.619	0.8	-9999.0	-9999.0
63.976	11.37	12.05	0.24	63.05	2.00	114.6	3.465	0.936	2.529	5.8	3.6	5.0E-06	-9999.0	-9999.0	0.572	0.8	-9999.0	-9999.0
64.041	10.80	11.51	0.21	65.75	1.83	114.6	3.468	0.938	2.530	5.5	3.5	5.0E-06	-9999.0	-9999.0	0.536	0.8	-9999.0	-9999.0
64.107	11.12	11.91	0.20	73.79	1.68	114.6	3.472	0.940	2.532	5.7	3.6	5.0E-06	-9999.0	-9999.0	0.563	0.8	-9999.0	-9999.0
64.172	11.56	12.42	0.22	79.72	1.78	114.6	3.476	0.942	2.534	5.9	3.7	5.0E-06	-9999.0	-9999.0	0.596	0.8	-9999.0	-9999.0
64.238	11.76	12.68	0.24	84.97	1.90	114.6	3.480	0.944	2.536	6.1	3.8	5.0E-06	-9999.0	-9999.0	0.613	0.8	-9999.0	-9999.0
64.304	12.90	13.83	0.24	85.97	1.74	114.6	3.483	0.946	2.537	6.6	4.2	5.0E-06	-9999.0	-9999.0	0.690	0.9	-9999.0	-9999.0
64.369	12.58	13.45	0.24	80.51	1.79	114.6	3.487	0.948	2.539	6.4	4.0	5.0E-06	-9999.0	-9999.0	0.664	0.9	-9999.0	-9999.0
64.435	13.54	14.40	0.26	79.29	1.81	114.6	3.491	0.950	2.541	6.9	4.3	5.0E-06	-9999.0	-9999.0	0.727	1.0	-9999.0	-9999.0
64.501	15.40	16.20	0.31	74.50	1.92	114.6	3.495	0.952	2.542	7.8	4.9	5.0E-06	-9999.0	-9999.0	0.847	1.1	-9999.0	-9999.0
64.566	16.35	17.18	0.36	76.79	2.10	114.6	3.499	0.954	2.544	8.2	5.2	5.0E-06	-9999.0	-9999.0	0.912	1.2	-9999.0	-9999.0
64.632	15.91	16.70	0.39	73.60	2.34	114.6	3.502	0.956	2.546	8.0	5.0	5.0E-06	-9999.0	-9999.0	0.880	1.1	-9999.0	-9999.0
64.697	14.89	15.58	0.38	64.37	2.44	114.6	3.506	0.958	2.548	7.5	4.7	5.0E-06	-9999.0	-9999.0	0.805	1.0	-9999.0	-9999.0
64.763	14.30	14.95	0.35	59.40	2.35	114.6	3.510	0.961	2.549	7.2	4.5	5.0E-06	-9999.0	-9999.0	0.762	1.0	-9999.0	-9999.0
64.829	14.51	15.19	0.36	63.32	2.38	114.6	3.514	0.963	2.551	7.3	4.6	5.0E-06	-9999.0	-9999.0	0.778	1.0	-9999.0	-9999.0
64.894	14.37	15.10	0.37	67.51	2.46	114.6	3.517	0.965	2.553	7.2	4.5	5.0E-06	-9999.0	-9999.0	0.772	1.0	-9999.0	-9999.0
64.960	14.76	15.55	0.36	73.62	2.32	114.6	3.521	0.967	2.554	7.4	4.7	5.0E-06	-9999.0	-9999.0	0.802	1.0	-9999.0	-9999.0
65.025	14.51	15.28	0.37	72.11	2.43	114.6	3.525	0.969	2.556	7.3	4.6	5.0E-06	-9999.0	-9999.0	0.784	1.0	-9999.0	-9999.0
65.091	15.14	15.97	0.38	77.04	2.39	114.6	3.529	0.971	2.558	7.6	4.8	5.0E-06	-9999.0	-9999.0	0.829	1.1	-9999.0	-9999.0
65.157	15.91	16.76	0.42	78.45	2.51	114.6	3.532	0.973	2.560	8.0	5.0	5.0E-06	-9999.0	-9999.0	0.882	1.1	-9999.0	-9999.0
65.222	16.55	17.35	0.43	74.32	2.48	114.6	3.536	0.975	2.561	8.3	5.2	5.0E-06	-9999.0	-9999.0	0.921	1.2	-9999.0	-9999.0
65.288	16.16	16.86	0.44	64.71	2.62	114.6	3.540	0.977	2.563	8.1	5.0	5.0E-06	-9999.0	-9999.0	0.888	1.1	-9999.0	-9999.0
65.354	15.46	16.08	0.45	57.40	2.81	114.6	3.544	0.979	2.565	7.7	4.8	5.0E-06	-9999.0	-9999.0	0.836	1.1	-9999.0	-9999.0
65.419	15.02	15.65	0.42	58.31	2.69	114.6	3.547	0.981	2.566	7.5	4.7	5.0E-06	-9999.0	-9999.0	0.807	1.0	-9999.0	-9999.0
65.485	14.89	15.52	0.45	58.50	2.91	114.6	3.551	0.983	2.568	7.4	4.6	5.0E-06	-9999.0	-9999.0	0.798	1.0	-9999.0	-9999.0
65.550	15.59	16.22	0.50	58.11	3.09	114.6	3.555	0.985	2.570	7.8	4.8	5.0E-06	-9999.0	-9999.0	0.844	1.1	-9999.0	-9999.0
65.616	15.08	15.66	0.53	54.41	3.39	114.6	3.559	0.987	2.572	10.0	6.2	5.0E-07	-9999.0	-9999.0	0.807	1.0	-9999.0	-9999.0
65.682	13.60	14.13	0.47	49.16	3.33	114.6	3.562	0.989	2.573	9.0	5.6	5.0E-07	-9999.0	-9999.0	0.705	0.9	-9999.0	-9999.0
65.747	11.44	11.85	0.43	38.22	3.64	114.6	3.566	0.991	2.575	7.6	4.7	5.0E-07	-9999.0	-9999.0	0.552	0.8	-9999.0	-9999.0
65.813	11.18	11.64	0.36	42.62	3.10	114.6	3.570	0.993	2.577	7.4	4.6	5.0E-07	-9999.0	-9999.0	0.538	0.8	-9999.0	-9999.0
65.878	9.90	10.46	0.28	51.79	2.68	114.6	3.574	0.995	2.578	6.7	4.2	5.0E-07	-9999.0	-9999.0	0.459	0.7	-9999.0	-9999.0
65.944	9.45	10.18	0.26	67.06	2.56	114.6	3.577	0.997	2.580	4.9	3.0	5.0E-06	-9999.0	-9999.0	0.440	0.7	-9999.0	-9999.0
66.010	8.88	9.64	0.24	70.12	2.50	114.6	3.581	0.999	2.582	4.6	2.9	5.0E-06	-9999.0	-9999.0	0.404	0.6	-9999.0	-9999.0
66.075	8.69	9.48	0.17	73.05	1.80	114.6	3.585	1.001	2.583	4.5	2.8	5.0E-06	-9999.0	-9999.0	0.393	0.6	-9999.0	-9999.0
66.141	7.92	8.72	0.12	73.95	1.38	114.6	3.589	1.004	2.585	4.2	2.6	5.0E-06	-9999.0	-9999.0	0.342	0.6	-9999.0	-9999.0
66.207	7.79	8.59	0.10	74.30	1.17	114.6	3.592	1.006	2.587	4.1	2.6	5.0E-06	-9999.0	-9999.0	0.333	0.6	-9999.0	-9999.0
66.272	7.79	8.59	0.08	74.05	0.93	114.6	3.596	1.008	2.589	4.1	2.6	5.0E-06	-9999.0	-9999.0	0.333	0.6	-9999.0	-9999.0
66.338	7.99	8.82	0.09	77.33	1.02	114.6	3.600	1.010	2.590	4.2	2.6	5.0E-06	-9999.0	-9999.0	0.348	0.6	-9999.0	-9999.0
66.403	7.22	8.09	0.09	80.86	1.12	114.6	3.604	1.012	2.592	3.9	2.4	5.0E-06	-9999.0	-9999.0	0.299	0.6	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
66.469	7.03	7.91	0.09	81.41	1.14	114.6	3.608	1.014	2.594	3.8	2.4	5.0E-06	-9999.0	-9999.0	0.287	0.6	-9999.0	-9999.0
66.535	7.73	8.60	0.10	81.08	1.16	114.6	3.611	1.016	2.595	4.1	2.6	5.0E-06	-9999.0	-9999.0	0.333	0.6	-9999.0	-9999.0
66.600	7.35	8.22	0.08	80.51	0.98	114.6	3.615	1.018	2.597	3.9	2.4	5.0E-06	-9999.0	-9999.0	0.307	0.6	-9999.0	-9999.0
66.666	7.79	8.65	0.08	80.08	0.93	114.6	3.619	1.020	2.599	4.1	2.6	5.0E-06	-9999.0	-9999.0	0.336	0.6	-9999.0	-9999.0
66.731	7.48	8.34	0.08	79.31	0.96	114.6	3.623	1.022	2.601	4.0	2.5	5.0E-06	-9999.0	-9999.0	0.314	0.6	-9999.0	-9999.0
66.797	7.54	8.40	0.08	79.88	0.95	114.6	3.626	1.024	2.602	4.0	2.5	5.0E-06	-9999.0	-9999.0	0.318	0.6	-9999.0	-9999.0
66.863	7.48	8.35	0.08	80.69	0.96	114.6	3.630	1.026	2.604	4.0	2.5	5.0E-06	-9999.0	-9999.0	0.315	0.6	-9999.0	-9999.0
66.928	7.35	8.23	0.08	81.54	0.97	114.6	3.634	1.028	2.606	3.9	2.4	5.0E-06	-9999.0	-9999.0	0.306	0.6	-9999.0	-9999.0
66.994	7.48	8.35	0.07	80.49	0.84	111.4	3.638	1.030	2.607	4.0	2.5	1.0E-07	-9999.0	-9999.0	0.314	0.6	-9999.0	-9999.0
67.060	7.67	8.50	0.07	77.10	0.83	111.4	3.641	1.032	2.609	4.1	2.5	1.0E-07	-9999.0	-9999.0	0.324	0.6	-9999.0	-9999.0
67.125	7.60	8.41	0.07	75.38	0.83	111.4	3.645	1.034	2.611	4.0	2.5	1.0E-07	-9999.0	-9999.0	0.318	0.6	-9999.0	-9999.0
67.191	7.73	8.54	0.07	74.68	0.82	111.4	3.649	1.036	2.612	4.1	2.5	1.0E-07	-9999.0	-9999.0	0.326	0.6	-9999.0	-9999.0
67.256	6.39	7.23	0.06	78.24	0.83	111.4	3.652	1.038	2.614	3.5	2.1	1.0E-07	-9999.0	-9999.0	0.239	0.5	-9999.0	-9999.0
67.322	7.03	7.90	0.07	80.63	0.89	111.4	3.656	1.040	2.615	3.8	2.3	1.0E-07	-9999.0	-9999.0	0.283	0.6	-9999.0	-9999.0
67.388	6.52	7.38	0.07	80.31	0.95	111.4	3.659	1.042	2.617	3.5	2.2	1.0E-07	-9999.0	-9999.0	0.248	0.5	-9999.0	-9999.0
67.453	6.84	7.69	0.07	78.65	0.91	111.4	3.663	1.045	2.619	3.7	2.3	1.0E-07	-9999.0	-9999.0	0.268	0.5	-9999.0	-9999.0
67.519	7.54	8.37	0.06	77.16	0.72	111.4	3.667	1.047	2.620	4.0	2.5	1.0E-07	-9999.0	-9999.0	0.314	0.6	-9999.0	-9999.0
67.584	7.22	8.03	0.07	75.40	0.87	111.4	3.670	1.049	2.622	3.8	2.4	1.0E-07	-9999.0	-9999.0	0.291	0.6	-9999.0	-9999.0
67.650	7.09	7.92	0.07	76.85	0.89	111.4	3.674	1.051	2.623	3.8	2.3	1.0E-07	-9999.0	-9999.0	0.283	0.6	-9999.0	-9999.0
67.716	7.35	8.20	0.07	78.81	0.86	111.4	3.678	1.053	2.625	3.9	2.4	1.0E-07	-9999.0	-9999.0	0.301	0.6	-9999.0	-9999.0
67.781	8.43	9.30	0.08	80.37	0.86	114.6	3.681	1.055	2.627	4.5	2.7	5.0E-06	-9999.0	-9999.0	0.374	0.6	-9999.0	-9999.0
67.847	7.67	8.54	0.08	81.08	0.94	114.6	3.685	1.057	2.628	4.1	2.5	5.0E-06	-9999.0	-9999.0	0.324	0.6	-9999.0	-9999.0
67.913	7.86	8.74	0.09	81.20	1.03	114.6	3.689	1.059	2.630	4.2	2.6	5.0E-06	-9999.0	-9999.0	0.336	0.6	-9999.0	-9999.0
67.978	8.75	9.62	0.10	80.45	1.04	114.6	3.693	1.061	2.632	4.6	2.8	5.0E-06	-9999.0	-9999.0	0.395	0.6	-9999.0	-9999.0
68.044	7.48	8.37	0.10	82.39	1.20	114.6	3.696	1.063	2.634	4.0	2.5	5.0E-06	-9999.0	-9999.0	0.311	0.6	-9999.0	-9999.0
68.109	8.43	9.35	0.11	84.95	1.18	114.6	3.700	1.065	2.635	4.5	2.8	5.0E-06	-9999.0	-9999.0	0.377	0.6	-9999.0	-9999.0
68.175	9.32	10.26	0.12	86.56	1.17	114.6	3.704	1.067	2.637	4.9	3.0	5.0E-06	-9999.0	-9999.0	0.437	0.7	-9999.0	-9999.0
68.241	10.54	11.45	0.11	84.99	0.96	114.6	3.708	1.069	2.639	4.4	2.7	5.0E-05	30.0	30.0	0.516	0.7	-9999.0	-9999.0
68.306	10.80	11.69	0.12	82.86	1.03	114.6	3.712	1.071	2.640	4.5	2.8	5.0E-05	30.0	30.0	0.532	0.7	-9999.0	-9999.0
68.372	11.05	11.89	0.14	77.65	1.18	114.6	3.715	1.073	2.642	4.6	2.8	5.0E-05	30.0	30.0	0.545	0.7	-9999.0	-9999.0
68.437	11.25	12.12	0.15	81.16	1.24	114.6	3.719	1.075	2.644	4.6	2.9	5.0E-05	30.0	30.0	0.560	0.8	-9999.0	-9999.0
68.503	12.07	12.97	0.17	83.61	1.31	114.6	3.723	1.077	2.646	5.0	3.1	5.0E-05	30.0	30.0	0.617	0.8	-9999.0	-9999.0
68.569	11.76	12.52	0.19	70.54	1.52	114.6	3.727	1.079	2.647	6.0	3.7	5.0E-06	-9999.0	-9999.0	0.586	0.8	-9999.0	-9999.0
68.634	10.61	11.44	0.20	77.35	1.75	114.6	3.730	1.081	2.649	5.5	3.4	5.0E-06	-9999.0	-9999.0	0.514	0.7	-9999.0	-9999.0
68.700	12.52	13.29	0.18	71.40	1.36	114.6	3.734	1.083	2.651	5.1	3.1	5.0E-05	30.0	30.0	0.637	0.8	-9999.0	-9999.0
68.766	12.78	13.62	0.19	77.45	1.40	114.6	3.738	1.085	2.652	5.2	3.2	5.0E-05	30.0	30.0	0.659	0.9	-9999.0	-9999.0
68.831	12.90	13.76	0.21	79.64	1.53	114.6	3.742	1.088	2.654	5.3	3.2	5.0E-05	30.0	30.0	0.668	0.9	-9999.0	-9999.0
68.897	11.50	12.36	0.23	79.98	1.87	114.6	3.745	1.090	2.656	5.9	3.6	5.0E-06	-9999.0	-9999.0	0.574	0.8	-9999.0	-9999.0
68.962	11.63	12.52	0.23	82.37	1.84	114.6	3.749	1.092	2.657	6.0	3.7	5.0E-06	-9999.0	-9999.0	0.585	0.8	-9999.0	-9999.0
69.028	12.14	12.93	0.22	73.58	1.71	114.6	3.753	1.094	2.659	6.2	3.8	5.0E-06	-9999.0	-9999.0	0.612	0.8	-9999.0	-9999.0
69.094	14.70	15.46	0.22	70.93	1.43	114.6	3.757	1.096	2.661	5.9	3.6	5.0E-05	30.0	30.0	0.780	1.0	-9999.0	-9999.0
69.159	11.37	12.28	0.30	84.54	2.45	114.6	3.760	1.098	2.663	5.9	3.6	5.0E-06	-9999.0	-9999.0	0.568	0.8	-9999.0	-9999.0
69.225	13.86	14.91	0.38	96.64	2.56	114.6	3.764	1.100	2.664	7.1	4.4	5.0E-06	-9999.0	-9999.0	0.743	0.9	-9999.0	-9999.0
69.290	14.57	15.60	0.34	96.19	2.18	114.6	3.768	1.102	2.666	7.5	4.6	5.0E-06	-9999.0	-9999.0	0.789	1.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
69.356	14.63	15.69	0.43	98.60	2.75	114.6	3.772	1.104	2.668	7.5	4.6	5.0E-06	-9999.0	-9999.0	0.795	1.0	-9999.0	-9999.0
69.422	15.02	16.07	0.60	97.06	3.74	114.6	3.775	1.106	2.669	10.3	6.3	5.0E-07	-9999.0	-9999.0	0.819	1.0	-9999.0	-9999.0
69.487	21.59	22.56	0.86	89.16	3.82	114.6	3.779	1.108	2.671	14.4	8.8	5.0E-07	-9999.0	-9999.0	1.252	1.6	-9999.0	-9999.0
69.553	44.97	46.26	1.14	119.14	2.47	114.6	3.783	1.110	2.673	17.7	10.8	5.0E-05	30.5	32.0	2.832	5.0	-9999.0	-9999.0
69.619	68.80	69.08	1.38	25.84	2.00	117.7	3.787	1.112	2.675	22.1	13.5	5.0E-04	42.0	34.0	-9999.0	-9999.0	255.8	3.704
69.684	83.30	83.23	1.61	-6.36	1.94	117.7	3.791	1.114	2.676	26.6	16.2	5.0E-04	47.3	36.0	-9999.0	-9999.0	281.8	3.386
69.750	91.54	91.45	1.89	-8.42	2.07	117.7	3.794	1.116	2.678	29.2	17.8	5.0E-04	50.0	36.0	-9999.0	-9999.0	295.8	3.235
69.815	93.91	93.81	2.11	-9.03	2.24	117.7	3.798	1.118	2.680	29.9	18.3	5.0E-04	50.7	36.0	-9999.0	-9999.0	299.8	3.196
69.881	91.60	91.51	1.34	-8.71	1.47	120.9	3.802	1.120	2.682	21.9	13.4	5.0E-03	50.0	36.0	-9999.0	-9999.0	296.1	3.235
69.947	84.32	84.23	1.32	-8.69	1.57	117.7	3.806	1.122	2.684	26.9	16.4	5.0E-04	47.6	36.0	-9999.0	-9999.0	283.9	3.370
70.012	74.61	74.52	1.70	-8.48	2.29	117.7	3.810	1.124	2.686	23.8	14.5	5.0E-04	44.1	36.0	-9999.0	-9999.0	266.7	3.578
70.078	63.43	63.34	0.01	-8.28	0.02	120.9	3.814	1.126	2.688	15.2	9.3	5.0E-03	39.4	34.0	-9999.0	-9999.0	244.7	3.863
70.144	56.47	56.38	0.01	-7.83	0.02	120.9	3.818	1.129	2.689	13.5	8.2	5.0E-03	36.1	34.0	-9999.0	-9999.0	229.4	4.069
70.209	64.33	64.31	0.01	-1.50	0.02	120.9	3.822	1.131	2.691	15.4	9.4	5.0E-03	39.8	34.0	-9999.0	-9999.0	246.9	3.839
70.275	93.84	93.83	0.01	-0.59	0.01	124.1	3.826	1.133	2.693	18.0	11.0	5.0E-02	50.6	36.0	-9999.0	-9999.0	300.4	3.202
70.340	210.17	210.14	0.01	-2.92	0.00	127.3	3.830	1.135	2.695	33.5	20.4	5.0E+00	73.7	40.0	-9999.0	-9999.0	487.6	2.320

Interpretation Output - Release	1.20I
Run No:	04-0524-0703-3484
Job No:	04-073SC
Client:	MACTEC
Project:	TVA Bull Run Ash Disposal Facility
Site:	CPT-02
Location:	TVA Bull Run
Cone:	H. Bankayal
CPT Date:	04/20/05
CPT Time:	09:28
CPT File:	073CP02.COR
Northing (m):	0.000000
Easting (m):	0.000000
Elevation (m):	0.000000

Water Table (m):	2.13	(ft):	7.0
Unit Weight of Water (default):	62.40 pcf		
Averaging Increment (m):	0.0 (Every Data Point)		
Phi Method :	Robertson and Campanella, 1983		
Su Nkt used:	15.00	Su/P' (nc):	0.30
Dr Method :	Jamiolkowski - All Sands		
State Parameter M:	1.20		

Used Unit Weights Assigned to Soil Zones

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
0.066	4.28	4.28	0.01	0.06	0.23	111.4	0.004	0.000	0.004	2.0	4.1	1.0E-07	-9999.0	-9999.0	0.285	10.0	-9999.0	-9999.0
0.131	6.20	6.20	0.01	0.00	0.16	111.4	0.007	0.000	0.007	3.0	5.9	1.0E-07	-9999.0	-9999.0	0.413	10.0	-9999.0	-9999.0
0.197	10.67	10.67	0.04	0.02	0.38	114.6	0.011	0.000	0.011	4.1	8.2	5.0E-05	67.1	50.0	0.710	10.0	-9999.0	-9999.0
0.262	16.23	16.23	0.09	-0.02	0.56	114.6	0.015	0.000	0.015	6.2	12.4	5.0E-05	74.9	50.0	1.081	10.0	59.9	3.688
0.328	20.57	20.57	0.12	0.39	0.58	117.7	0.019	0.000	0.019	6.6	13.1	5.0E-04	78.5	50.0	-9999.0	-9999.0	68.2	3.313
0.394	29.77	29.79	0.21	1.80	0.71	117.7	0.022	0.000	0.022	9.5	19.0	5.0E-04	86.4	50.0	-9999.0	-9999.0	81.9	2.748
0.459	36.73	36.74	0.32	1.21	0.87	117.7	0.026	0.000	0.026	11.7	23.5	5.0E-04	90.1	50.0	-9999.0	-9999.0	91.0	2.477
0.525	46.50	46.53	0.41	2.33	0.88	117.7	0.030	0.000	0.030	14.9	29.7	5.0E-04	94.9	50.0	-9999.0	-9999.0	104.2	2.240
0.591	55.13	55.22	0.55	8.22	1.00	117.7	0.034	0.000	0.034	17.6	35.3	5.0E-04	95.0	50.0	-9999.0	-9999.0	116.6	2.112
0.656	63.56	63.61	0.71	4.37	1.12	120.9	0.038	0.000	0.038	15.2	30.5	5.0E-03	95.0	50.0	-9999.0	-9999.0	128.8	2.024
0.722	71.42	71.49	0.80	5.79	1.12	120.9	0.042	0.000	0.042	17.1	34.2	5.0E-03	95.0	50.0	-9999.0	-9999.0	140.0	1.958
0.787	81.71	81.74	0.84	2.57	1.03	120.9	0.046	0.000	0.046	19.6	39.1	5.0E-03	95.0	50.0	-9999.0	-9999.0	154.8	1.894
0.853	94.80	94.83	0.91	2.39	0.96	120.9	0.050	0.000	0.050	22.7	45.4	5.0E-03	95.0	50.0	-9999.0	-9999.0	180.0	1.898
0.919	106.62	106.68	0.93	5.47	0.87	120.9	0.054	0.000	0.054	25.5	51.1	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.984	115.82	115.86	1.00	3.44	0.87	120.9	0.058	0.000	0.058	27.7	55.5	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.050	122.66	122.69	1.01	2.82	0.83	124.1	0.062	0.000	0.062	23.5	47.0	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.115	126.17	126.18	1.01	1.23	0.80	124.1	0.066	0.000	0.066	24.2	48.3	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.181	130.26	130.29	0.96	2.86	0.74	124.1	0.070	0.000	0.070	25.0	49.9	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.247	131.53	131.57	0.96	3.97	0.73	124.1	0.074	0.000	0.074	25.2	50.4	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.312	130.83	130.87	0.99	4.23	0.76	124.1	0.078	0.000	0.078	25.1	50.1	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.378	132.43	132.48	0.99	4.17	0.75	124.1	0.082	0.000	0.082	25.4	50.7	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.444	133.89	133.92	1.08	2.31	0.81	124.1	0.086	0.000	0.086	25.7	51.3	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.509	132.36	132.46	1.07	9.16	0.81	124.1	0.090	0.000	0.090	25.4	50.7	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.575	129.67	129.70	1.04	2.72	0.80	124.1	0.094	0.000	0.094	24.8	49.7	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.640	129.74	129.77	1.01	2.68	0.78	124.1	0.098	0.000	0.098	24.9	49.7	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.706	128.15	128.18	0.99	2.35	0.77	124.1	0.103	0.000	0.103	24.6	49.1	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.772	123.55	123.56	0.98	1.35	0.80	124.1	0.107	0.000	0.107	23.7	47.3	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.837	119.65	119.68	0.95	2.29	0.80	124.1	0.111	0.000	0.111	22.9	45.8	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.903	117.61	117.63	0.91	2.31	0.78	124.1	0.115	0.000	0.115	22.5	45.1	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.968	114.10	114.14	0.51	3.70	0.45	124.1	0.119	0.000	0.119	21.9	43.7	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.034	109.75	109.77	0.56	1.76	0.51	124.1	0.123	0.000	0.123	21.0	42.0	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.100	105.79	105.80	0.58	1.27	0.55	124.1	0.127	0.000	0.127	20.3	40.5	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.165	105.02	105.06	0.69	3.36	0.66	124.1	0.131	0.000	0.131	20.1	40.2	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.231	102.79	102.81	0.69	2.00	0.67	124.1	0.135	0.000	0.135	19.7	39.4	5.0E-02	95.0	50.0	-9999.0	-9999.0	206.0	2.004
2.297	94.74	94.75	0.67	1.35	0.71	120.9	0.139	0.000	0.139	22.7	45.4	5.0E-03	93.4	50.0	-9999.0	-9999.0	179.8	1.898
2.362	93.59	93.59	0.66	0.67	0.71	120.9	0.143	0.000	0.143	22.4	44.8	5.0E-03	92.6	50.0	-9999.0	-9999.0	177.0	1.891
2.428	90.65	90.67	0.68	1.50	0.75	120.9	0.147	0.000	0.147	21.7	43.4	5.0E-03	91.3	50.0	-9999.0	-9999.0	170.5	1.880
2.493	86.24	86.25	0.64	0.63	0.74	120.9	0.151	0.000	0.151	20.6	41.3	5.0E-03	89.5	50.0	-9999.0	-9999.0	162.1	1.880
2.559	81.52	81.53	0.67	1.23	0.82	120.9	0.155	0.000	0.155	19.5	39.0	5.0E-03	87.5	48.0	-9999.0	-9999.0	154.5	1.895
2.625	78.64	78.65	0.66	0.61	0.84	120.9	0.159	0.000	0.159	18.8	37.7	5.0E-03	86.1	48.0	-9999.0	-9999.0	150.2	1.910
2.690	76.34	76.34	0.54	0.24	0.71	120.9	0.163	0.000	0.163	18.3	36.6	5.0E-03	84.9	48.0	-9999.0	-9999.0	146.9	1.924

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
2.756	73.66	73.67	0.47	1.41	0.64	120.9	0.167	0.000	0.167	17.6	35.3	5.0E-03	83.6	48.0	-9999.0	-9999.0	143.1	1.942
2.821	72.76	72.76	0.49	0.45	0.68	120.9	0.171	0.000	0.171	17.4	34.8	5.0E-03	82.9	48.0	-9999.0	-9999.0	141.8	1.949
2.887	71.80	71.80	0.59	-0.22	0.82	120.9	0.175	0.000	0.175	17.2	34.4	5.0E-03	82.2	48.0	-9999.0	-9999.0	140.4	1.956
2.953	72.89	72.89	0.63	-0.02	0.87	120.9	0.179	0.000	0.179	17.5	34.9	5.0E-03	82.3	48.0	-9999.0	-9999.0	142.0	1.948
3.018	73.27	73.27	0.63	0.55	0.86	120.9	0.183	0.000	0.183	17.5	35.1	5.0E-03	82.1	48.0	-9999.0	-9999.0	142.5	1.945
3.084	72.96	72.96	0.61	0.22	0.84	120.9	0.187	0.000	0.187	17.5	34.9	5.0E-03	81.7	48.0	-9999.0	-9999.0	142.1	1.947
3.150	71.35	71.37	0.60	1.25	0.84	120.9	0.191	0.000	0.191	17.1	34.2	5.0E-03	80.7	48.0	-9999.0	-9999.0	139.8	1.959
3.215	68.99	69.02	0.57	3.44	0.83	120.9	0.195	0.000	0.195	16.5	33.1	5.0E-03	79.5	48.0	-9999.0	-9999.0	136.5	1.978
3.281	69.19	69.21	0.51	1.84	0.74	120.9	0.199	0.000	0.199	16.6	33.1	5.0E-03	79.3	48.0	-9999.0	-9999.0	136.8	1.976
3.346	70.91	70.92	0.49	0.96	0.69	120.9	0.203	0.000	0.203	17.0	34.0	5.0E-03	79.7	48.0	-9999.0	-9999.0	139.2	1.963
3.412	73.72	73.73	0.47	1.13	0.64	120.9	0.207	0.000	0.207	17.7	35.3	5.0E-03	80.5	48.0	-9999.0	-9999.0	143.2	1.942
3.478	77.94	77.95	0.43	1.35	0.55	120.9	0.211	0.000	0.211	18.7	37.3	5.0E-03	81.8	48.0	-9999.0	-9999.0	149.2	1.914
3.543	77.87	77.88	0.46	1.12	0.59	120.9	0.215	0.000	0.215	18.6	37.3	5.0E-03	81.6	48.0	-9999.0	-9999.0	149.1	1.914
3.609	79.34	79.36	0.44	1.52	0.56	120.9	0.218	0.000	0.218	19.0	38.0	5.0E-03	81.8	48.0	-9999.0	-9999.0	151.2	1.906
3.674	79.72	79.73	0.44	1.00	0.55	120.9	0.222	0.000	0.222	19.1	38.2	5.0E-03	81.7	48.0	-9999.0	-9999.0	151.8	1.904
3.740	80.69	80.70	0.45	1.33	0.56	120.9	0.226	0.000	0.226	19.3	38.6	5.0E-03	81.8	48.0	-9999.0	-9999.0	153.2	1.899
3.806	81.52	81.53	0.44	0.73	0.54	120.9	0.230	0.000	0.230	19.5	39.0	5.0E-03	81.8	48.0	-9999.0	-9999.0	154.5	1.895
3.871	79.02	79.03	0.47	0.77	0.60	120.9	0.234	0.000	0.234	18.9	37.8	5.0E-03	80.7	48.0	-9999.0	-9999.0	150.8	1.908
3.937	80.23	80.24	0.52	0.63	0.65	120.9	0.238	0.000	0.238	19.2	38.4	5.0E-03	80.9	48.0	-9999.0	-9999.0	152.6	1.901
4.003	84.90	84.91	0.55	1.15	0.65	120.9	0.242	0.000	0.242	20.3	40.7	5.0E-03	82.3	48.0	-9999.0	-9999.0	159.9	1.883
4.068	89.95	89.96	0.62	1.52	0.69	120.9	0.246	0.000	0.246	21.5	43.1	5.0E-03	83.7	48.0	-9999.0	-9999.0	169.0	1.879
4.134	90.97	90.98	0.78	1.10	0.86	120.9	0.250	0.000	0.250	21.8	43.5	5.0E-03	83.8	48.0	-9999.0	-9999.0	171.1	1.881
4.199	85.54	85.56	0.90	1.74	1.05	120.9	0.254	0.000	0.254	20.5	40.6	5.0E-03	81.8	48.0	-9999.0	-9999.0	161.0	1.881
4.265	80.36	80.39	1.07	2.70	1.33	120.9	0.258	0.000	0.258	19.2	37.9	5.0E-03	79.8	46.0	-9999.0	-9999.0	152.8	1.900
4.331	79.02	79.08	1.24	5.09	1.57	117.7	0.262	0.000	0.262	25.2	49.3	5.0E-04	79.1	46.0	-9999.0	-9999.0	150.9	1.908
4.396	75.89	75.94	1.35	4.50	1.78	117.7	0.266	0.000	0.266	24.2	47.0	5.0E-04	77.7	46.0	-9999.0	-9999.0	146.7	1.931
4.462	72.38	72.44	1.45	5.57	2.01	117.7	0.270	0.000	0.270	23.1	44.5	5.0E-04	76.2	46.0	-9999.0	-9999.0	142.0	1.960
4.528	68.93	68.96	1.48	3.04	2.15	117.7	0.274	0.000	0.274	22.0	42.1	5.0E-04	74.6	46.0	-9999.0	-9999.0	137.3	1.991
4.593	65.22	65.25	1.47	2.70	2.26	117.7	0.278	0.000	0.278	20.8	39.5	5.0E-04	72.8	46.0	-9999.0	-9999.0	132.3	2.028
4.659	62.67	62.69	1.49	2.04	2.38	114.6	0.281	0.000	0.281	24.0	45.3	5.0E-05	71.4	46.0	4.161	10.0	128.9	2.055
4.724	63.62	63.64	1.63	1.68	2.57	114.6	0.285	0.000	0.285	24.4	45.7	5.0E-05	71.7	46.0	4.224	10.0	130.5	2.050
4.790	68.68	68.70	1.67	2.15	2.44	114.6	0.289	0.000	0.289	26.3	49.0	5.0E-05	73.7	46.0	4.561	10.0	138.0	2.009
4.856	73.47	73.49	1.69	2.39	2.31	117.7	0.293	0.000	0.293	23.5	43.4	5.0E-04	75.4	46.0	-9999.0	-9999.0	145.1	1.974
4.921	74.68	74.70	1.75	2.02	2.35	117.7	0.297	0.000	0.297	23.8	43.8	5.0E-04	75.7	46.0	-9999.0	-9999.0	147.1	1.969
4.987	70.84	70.88	1.79	3.20	2.53	114.6	0.300	0.000	0.300	27.2	49.5	5.0E-05	74.0	46.0	4.705	10.0	141.9	2.002
5.052	64.46	64.48	1.80	2.21	2.80	114.6	0.304	0.000	0.304	24.7	44.8	5.0E-05	71.1	46.0	4.278	10.0	133.0	2.062
5.118	60.12	60.13	1.81	1.76	3.02	114.6	0.308	0.000	0.308	23.0	41.5	5.0E-05	69.0	44.0	3.988	10.0	126.9	2.110
5.184	59.28	59.30	1.41	1.45	2.38	114.6	0.312	0.000	0.312	22.7	40.7	5.0E-05	68.4	44.0	3.933	10.0	125.9	2.124
5.249	57.49	57.50	1.34	1.31	2.34	114.6	0.315	0.000	0.315	22.0	39.2	5.0E-05	67.3	44.0	3.813	10.0	123.6	2.149
5.315	55.96	55.97	1.30	1.02	2.33	114.6	0.319	0.000	0.319	21.4	38.0	5.0E-05	66.4	44.0	3.710	10.0	121.6	2.173
5.381	53.02	53.03	1.25	0.75	2.36	114.6	0.323	0.000	0.323	20.3	35.7	5.0E-05	64.7	44.0	3.514	10.0	117.7	2.220

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
5.446	50.34	50.35	1.21	0.39	2.41	114.6	0.327	0.000	0.327	19.3	33.7	5.0E-05	63.0	44.0	3.335	10.0	114.2	2.269
5.512	48.04	48.02	1.16	-1.08	2.42	114.6	0.330	0.000	0.330	18.4	32.0	5.0E-05	61.5	44.0	3.180	10.0	111.3	2.318
5.577	51.04	51.03	1.05	-1.62	2.06	114.6	0.334	0.000	0.334	19.5	33.8	5.0E-05	63.1	44.0	3.379	10.0	115.7	2.267
5.643	56.98	56.96	0.97	-1.41	1.71	117.7	0.338	0.000	0.338	18.2	31.3	5.0E-04	66.1	44.0	-9999.0	-9999.0	124.3	2.182
5.709	60.37	60.35	0.99	-1.45	1.64	117.7	0.342	0.000	0.342	19.3	33.0	5.0E-04	67.6	44.0	-9999.0	-9999.0	129.4	2.144
5.774	63.95	63.93	1.12	-1.15	1.76	117.7	0.346	0.000	0.346	20.4	34.7	5.0E-04	69.1	44.0	-9999.0	-9999.0	134.8	2.108
5.840	72.12	72.12	1.20	-0.87	1.67	117.7	0.350	0.000	0.350	23.0	38.9	5.0E-04	72.3	46.0	-9999.0	-9999.0	146.9	2.037
5.905	72.45	72.43	1.25	-1.29	1.73	117.7	0.353	0.000	0.353	23.1	38.9	5.0E-04	72.3	46.0	-9999.0	-9999.0	147.6	2.037
5.971	70.52	70.51	1.30	-0.87	1.85	117.7	0.357	0.000	0.357	22.5	37.7	5.0E-04	71.4	46.0	-9999.0	-9999.0	145.0	2.057
6.037	63.56	63.56	1.34	-0.71	2.11	117.7	0.361	0.000	0.361	20.3	33.8	5.0E-04	68.3	44.0	-9999.0	-9999.0	135.2	2.127
6.102	55.13	55.12	1.40	-1.27	2.55	114.6	0.365	0.000	0.365	21.1	35.0	5.0E-05	64.0	44.0	3.650	10.0	123.4	2.239
6.168	47.53	47.51	1.44	-1.72	3.04	114.6	0.369	0.000	0.369	18.2	30.0	5.0E-05	59.6	44.0	3.143	10.0	113.3	2.384
6.234	40.95	40.93	1.44	-1.92	3.53	114.6	0.373	0.000	0.373	19.6	32.1	5.0E-06	-9999.0	-9999.0	2.704	10.0	-9999.0	-9999.0
6.299	37.62	37.61	1.39	-1.13	3.70	114.6	0.376	0.000	0.376	18.0	29.4	5.0E-06	-9999.0	-9999.0	2.482	10.0	-9999.0	-9999.0
6.365	35.33	35.33	1.33	0.55	3.77	114.6	0.380	0.000	0.380	16.9	27.4	5.0E-06	-9999.0	-9999.0	2.330	10.0	-9999.0	-9999.0
6.430	33.41	33.44	1.25	2.68	3.75	114.6	0.384	0.000	0.384	16.0	25.8	5.0E-06	-9999.0	-9999.0	2.204	10.0	-9999.0	-9999.0
6.496	31.37	31.43	1.13	5.95	3.60	114.6	0.388	0.000	0.388	15.0	24.2	5.0E-06	-9999.0	-9999.0	2.070	10.0	-9999.0	-9999.0
6.562	28.68	28.74	1.04	6.05	3.63	114.6	0.391	0.000	0.391	13.8	22.0	5.0E-06	-9999.0	-9999.0	1.890	10.0	-9999.0	-9999.0
6.627	25.04	25.10	0.95	5.49	3.79	114.6	0.395	0.000	0.395	16.0	25.5	5.0E-07	-9999.0	-9999.0	1.647	10.0	-9999.0	-9999.0
6.693	21.84	21.90	0.83	5.57	3.80	114.6	0.399	0.000	0.399	14.0	22.1	5.0E-07	-9999.0	-9999.0	1.434	10.0	-9999.0	-9999.0
6.758	18.98	19.06	0.75	7.38	3.95	114.6	0.403	0.000	0.403	12.2	19.2	5.0E-07	-9999.0	-9999.0	1.244	10.0	-9999.0	-9999.0
6.824	18.59	18.71	0.69	12.01	3.70	114.6	0.406	0.000	0.406	11.9	18.7	5.0E-07	-9999.0	-9999.0	1.221	10.0	-9999.0	-9999.0
6.890	22.16	22.34	0.63	16.55	2.83	114.6	0.410	0.000	0.410	10.7	16.7	5.0E-06	-9999.0	-9999.0	1.462	10.0	-9999.0	-9999.0
6.955	24.66	24.85	0.63	18.01	2.54	114.6	0.414	0.000	0.414	9.5	14.8	5.0E-05	39.4	40.0	1.629	10.0	84.0	3.379
7.021	29.00	29.20	0.69	18.86	2.37	114.6	0.418	0.001	0.417	11.2	17.3	5.0E-05	43.9	40.0	1.919	10.0	91.4	3.129
7.087	35.52	35.70	0.81	16.89	2.27	114.6	0.421	0.003	0.419	13.7	21.1	5.0E-05	49.6	42.0	2.352	10.0	100.9	2.827
7.152	43.05	43.20	0.94	13.45	2.18	114.6	0.425	0.005	0.420	16.5	25.5	5.0E-05	55.0	42.0	2.852	10.0	111.0	2.570
7.218	41.46	41.55	1.03	8.55	2.48	114.6	0.429	0.007	0.422	15.9	24.5	5.0E-05	53.8	42.0	2.742	10.0	109.0	2.623
7.283	38.33	38.39	1.08	5.61	2.82	114.6	0.433	0.009	0.424	14.7	22.6	5.0E-05	51.5	42.0	2.531	10.0	104.9	2.732
7.349	36.35	36.42	1.11	6.58	3.06	114.6	0.436	0.011	0.426	17.4	26.7	5.0E-06	-9999.0	-9999.0	2.399	10.0	-9999.0	-9999.0
7.415	34.75	34.81	1.12	4.98	3.23	114.6	0.440	0.013	0.427	16.7	25.5	5.0E-06	-9999.0	-9999.0	2.291	10.0	-9999.0	-9999.0
7.480	34.11	34.16	1.10	4.80	3.23	114.6	0.444	0.015	0.429	16.4	25.0	5.0E-06	-9999.0	-9999.0	2.248	10.0	-9999.0	-9999.0
7.546	33.09	33.13	1.06	3.58	3.21	114.6	0.448	0.017	0.431	15.9	24.2	5.0E-06	-9999.0	-9999.0	2.179	10.0	-9999.0	-9999.0
7.611	32.20	32.23	0.96	3.16	2.99	114.6	0.451	0.019	0.432	15.4	23.5	5.0E-06	-9999.0	-9999.0	2.119	10.0	-9999.0	-9999.0
7.677	31.18	31.21	0.87	2.80	2.79	114.6	0.455	0.021	0.434	12.0	18.1	5.0E-05	45.2	40.0	2.050	10.0	95.4	3.057
7.743	29.26	29.29	0.81	2.55	2.77	114.6	0.459	0.023	0.436	14.0	21.2	5.0E-06	-9999.0	-9999.0	1.922	10.0	-9999.0	-9999.0
7.808	28.43	28.45	0.78	2.35	2.75	114.6	0.463	0.025	0.437	13.6	20.6	5.0E-06	-9999.0	-9999.0	1.866	10.0	-9999.0	-9999.0
7.874	30.66	30.69	0.74	2.37	2.42	114.6	0.466	0.027	0.439	11.8	17.7	5.0E-05	44.6	40.0	2.015	10.0	94.9	3.092
7.940	32.20	32.23	0.69	2.49	2.15	114.6	0.470	0.029	0.441	12.3	18.6	5.0E-05	45.9	40.0	2.117	10.0	97.3	3.020
8.005	30.02	30.05	0.63	2.23	2.10	114.6	0.474	0.031	0.443	11.5	17.3	5.0E-05	43.9	40.0	1.972	10.0	94.1	3.131
8.071	26.90	26.91	0.58	1.78	2.16	114.6	0.478	0.033	0.444	10.3	15.5	5.0E-05	40.7	40.0	1.762	10.0	89.1	3.309

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
8.136	24.21	24.23	0.55	1.82	2.28	114.6	0.482	0.035	0.446	9.3	13.9	5.0E-05	37.6	40.0	1.583	10.0	84.3	3.479
8.202	21.21	21.23	0.51	1.80	2.41	114.6	0.485	0.038	0.448	10.2	15.2	5.0E-06	-9999.0	-9999.0	1.383	10.0	-9999.0	-9999.0
8.268	19.23	19.25	0.47	1.90	2.45	114.6	0.489	0.040	0.449	9.2	13.7	5.0E-06	-9999.0	-9999.0	1.251	10.0	-9999.0	-9999.0
8.333	20.38	20.41	0.45	2.59	2.21	114.6	0.493	0.042	0.451	7.8	11.6	5.0E-05	32.5	38.0	1.328	10.0	-9999.0	-9999.0
8.399	19.87	19.90	0.49	2.84	2.47	114.6	0.497	0.044	0.453	9.5	14.2	5.0E-06	-9999.0	-9999.0	1.293	10.0	-9999.0	-9999.0
8.464	18.14	18.17	0.51	2.47	2.81	114.6	0.500	0.046	0.455	8.7	12.9	5.0E-06	-9999.0	-9999.0	1.178	10.0	-9999.0	-9999.0
8.530	16.74	16.77	0.54	2.29	3.23	114.6	0.504	0.048	0.456	8.0	11.9	5.0E-06	-9999.0	-9999.0	1.084	10.0	-9999.0	-9999.0
8.596	15.72	15.74	0.54	2.23	3.44	114.6	0.508	0.050	0.458	10.1	14.9	5.0E-07	-9999.0	-9999.0	1.016	10.0	-9999.0	-9999.0
8.661	15.02	15.04	0.39	1.86	2.60	114.6	0.512	0.052	0.460	7.2	10.6	5.0E-06	-9999.0	-9999.0	0.968	10.0	-9999.0	-9999.0
8.727	15.02	15.04	0.38	1.78	2.53	114.6	0.515	0.054	0.461	7.2	10.6	5.0E-06	-9999.0	-9999.0	0.968	10.0	-9999.0	-9999.0
8.793	14.11	14.13	0.38	1.50	2.70	114.6	0.519	0.056	0.463	6.8	9.9	5.0E-06	-9999.0	-9999.0	0.907	10.0	-9999.0	-9999.0
8.858	13.54	13.56	0.37	1.33	2.74	114.6	0.523	0.058	0.465	6.5	9.5	5.0E-06	-9999.0	-9999.0	0.869	10.0	-9999.0	-9999.0
8.924	13.29	13.30	0.34	1.10	2.56	114.6	0.527	0.060	0.467	6.4	9.3	5.0E-06	-9999.0	-9999.0	0.852	10.0	-9999.0	-9999.0
8.989	12.20	12.20	0.33	0.49	2.71	114.6	0.530	0.062	0.468	5.8	8.5	5.0E-06	-9999.0	-9999.0	0.778	10.0	-9999.0	-9999.0
9.055	13.16	13.16	0.32	-0.18	2.44	114.6	0.534	0.064	0.470	6.3	9.2	5.0E-06	-9999.0	-9999.0	0.842	10.0	-9999.0	-9999.0
9.121	13.09	13.09	0.32	0.14	2.45	114.6	0.538	0.066	0.472	6.3	9.1	5.0E-06	-9999.0	-9999.0	0.837	10.0	-9999.0	-9999.0
9.186	13.67	13.67	0.32	0.04	2.35	114.6	0.542	0.068	0.473	6.5	9.5	5.0E-06	-9999.0	-9999.0	0.875	10.0	-9999.0	-9999.0
9.252	13.41	13.41	0.32	0.10	2.39	114.6	0.545	0.070	0.475	6.4	9.3	5.0E-06	-9999.0	-9999.0	0.858	10.0	-9999.0	-9999.0
9.317	14.11	14.12	0.35	0.37	2.49	114.6	0.549	0.072	0.477	6.8	9.8	5.0E-06	-9999.0	-9999.0	0.905	10.0	-9999.0	-9999.0
9.383	14.30	14.31	0.37	0.12	2.59	114.6	0.553	0.074	0.479	6.9	9.9	5.0E-06	-9999.0	-9999.0	0.917	10.0	-9999.0	-9999.0
9.449	14.95	14.95	0.39	0.35	2.62	114.6	0.557	0.076	0.480	7.2	10.3	5.0E-06	-9999.0	-9999.0	0.960	10.0	-9999.0	-9999.0
9.514	14.44	14.44	0.40	0.55	2.78	114.6	0.560	0.079	0.482	6.9	10.0	5.0E-06	-9999.0	-9999.0	0.925	10.0	-9999.0	-9999.0
9.580	13.29	13.30	0.41	0.61	3.09	114.6	0.564	0.081	0.484	8.5	12.2	5.0E-07	-9999.0	-9999.0	0.849	10.0	-9999.0	-9999.0
9.646	12.52	12.53	0.41	0.77	3.28	114.6	0.568	0.083	0.485	8.0	11.5	5.0E-07	-9999.0	-9999.0	0.797	9.9	-9999.0	-9999.0
9.711	12.39	12.40	0.41	1.13	3.31	114.6	0.572	0.085	0.487	7.9	11.3	5.0E-07	-9999.0	-9999.0	0.789	9.6	-9999.0	-9999.0
9.777	12.52	12.53	0.39	0.96	3.12	114.6	0.576	0.087	0.489	8.0	11.4	5.0E-07	-9999.0	-9999.0	0.797	9.7	-9999.0	-9999.0
9.842	10.86	10.89	0.39	2.76	3.59	114.6	0.579	0.089	0.491	7.0	9.9	5.0E-07	-9999.0	-9999.0	0.687	7.7	-9999.0	-9999.0
9.908	9.32	9.37	0.40	4.09	4.28	111.4	0.583	0.091	0.492	9.0	12.8	5.0E-08	-9999.0	-9999.0	0.586	5.9	-9999.0	-9999.0
9.974	10.15	10.22	0.42	5.69	4.12	111.4	0.587	0.093	0.494	9.8	13.9	5.0E-08	-9999.0	-9999.0	0.642	6.8	-9999.0	-9999.0
10.039	12.07	12.16	0.42	7.94	3.46	114.6	0.590	0.095	0.495	7.8	11.0	5.0E-07	-9999.0	-9999.0	0.771	9.0	-9999.0	-9999.0
10.105	11.69	11.78	0.41	8.55	3.49	114.6	0.594	0.097	0.497	7.5	10.7	5.0E-07	-9999.0	-9999.0	0.746	8.5	-9999.0	-9999.0
10.170	11.18	11.27	0.38	8.46	3.38	114.6	0.598	0.099	0.499	7.2	10.2	5.0E-07	-9999.0	-9999.0	0.711	7.9	-9999.0	-9999.0
10.236	10.48	10.56	0.34	7.44	3.23	114.6	0.602	0.101	0.501	6.7	9.5	5.0E-07	-9999.0	-9999.0	0.664	7.0	-9999.0	-9999.0
10.302	9.77	9.84	0.32	6.20	3.26	114.6	0.605	0.103	0.502	6.3	8.9	5.0E-07	-9999.0	-9999.0	0.616	6.2	-9999.0	-9999.0
10.367	7.73	7.81	0.32	7.48	4.11	111.4	0.609	0.105	0.504	7.5	10.5	5.0E-08	-9999.0	-9999.0	0.480	4.2	-9999.0	-9999.0
10.433	7.73	7.87	0.31	12.64	3.95	111.4	0.613	0.107	0.506	7.5	10.6	5.0E-08	-9999.0	-9999.0	0.484	4.3	-9999.0	-9999.0
10.499	8.56	8.72	0.31	14.82	3.56	111.4	0.616	0.109	0.507	8.4	11.7	5.0E-08	-9999.0	-9999.0	0.540	5.0	-9999.0	-9999.0
10.564	7.73	7.89	0.33	14.66	4.19	111.4	0.620	0.111	0.509	7.6	10.6	5.0E-08	-9999.0	-9999.0	0.484	4.2	-9999.0	-9999.0
10.630	7.48	7.64	0.36	14.60	4.73	111.4	0.624	0.113	0.510	7.3	10.2	5.0E-08	-9999.0	-9999.0	0.467	4.0	-9999.0	-9999.0
10.695	8.69	8.86	0.39	15.72	4.41	111.4	0.627	0.115	0.512	8.5	11.9	5.0E-08	-9999.0	-9999.0	0.549	5.1	-9999.0	-9999.0
10.761	9.58	9.75	0.41	15.76	4.21	111.4	0.631	0.117	0.514	9.3	13.0	5.0E-08	-9999.0	-9999.0	0.608	5.9	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
10.827	10.03	10.18	0.43	13.65	4.23	111.4	0.635	0.119	0.515	9.8	13.6	5.0E-08	-9999.0	-9999.0	0.636	6.3	-9999.0	-9999.0
10.892	9.64	9.76	0.42	11.20	4.31	111.4	0.638	0.122	0.517	9.4	13.0	5.0E-08	-9999.0	-9999.0	0.608	5.8	-9999.0	-9999.0
10.958	9.52	9.63	0.40	9.99	4.16	111.4	0.642	0.124	0.518	9.2	12.8	5.0E-08	-9999.0	-9999.0	0.599	5.7	-9999.0	-9999.0
11.023	8.81	8.91	0.39	9.18	4.39	111.4	0.646	0.126	0.520	8.5	11.8	5.0E-08	-9999.0	-9999.0	0.551	5.0	-9999.0	-9999.0
11.089	8.11	8.20	0.38	8.61	4.64	111.4	0.649	0.128	0.522	7.9	10.9	5.0E-08	-9999.0	-9999.0	0.504	4.3	-9999.0	-9999.0
11.155	8.94	9.04	0.38	9.28	4.21	111.4	0.653	0.130	0.523	8.7	12.0	5.0E-08	-9999.0	-9999.0	0.559	5.0	-9999.0	-9999.0
11.220	8.94	9.06	0.34	11.20	3.76	111.4	0.657	0.132	0.525	8.7	12.0	5.0E-08	-9999.0	-9999.0	0.560	5.0	-9999.0	-9999.0
11.286	8.43	8.58	0.31	14.26	3.62	111.4	0.660	0.134	0.526	8.2	11.3	5.0E-08	-9999.0	-9999.0	0.528	4.6	-9999.0	-9999.0
11.352	7.73	7.89	0.27	14.82	3.43	111.4	0.664	0.136	0.528	7.6	10.4	5.0E-08	-9999.0	-9999.0	0.482	4.0	-9999.0	-9999.0
11.417	7.35	7.53	0.25	17.17	3.33	111.4	0.668	0.138	0.530	7.2	9.9	5.0E-08	-9999.0	-9999.0	0.458	3.7	-9999.0	-9999.0
11.483	9.07	9.32	0.24	23.13	2.58	114.6	0.671	0.140	0.531	6.0	8.2	5.0E-07	-9999.0	-9999.0	0.577	5.2	-9999.0	-9999.0
11.548	10.48	10.71	0.20	21.95	1.87	114.6	0.675	0.142	0.533	5.1	7.0	5.0E-06	-9999.0	-9999.0	0.669	6.5	-9999.0	-9999.0
11.614	9.39	9.58	0.17	17.66	1.78	114.6	0.679	0.144	0.535	4.6	6.3	5.0E-06	-9999.0	-9999.0	0.594	5.3	-9999.0	-9999.0
11.680	6.06	6.25	0.14	16.77	2.25	114.6	0.683	0.146	0.536	4.0	5.4	5.0E-07	-9999.0	-9999.0	0.371	2.7	-9999.0	-9999.0
11.745	4.22	4.47	0.15	23.11	3.36	111.4	0.686	0.148	0.538	4.3	5.8	5.0E-08	-9999.0	-9999.0	0.252	1.6	-9999.0	-9999.0
11.811	4.09	4.40	0.13	28.62	2.96	111.4	0.690	0.150	0.540	4.2	5.7	5.0E-08	-9999.0	-9999.0	0.247	1.6	-9999.0	-9999.0
11.876	2.04	2.38	0.11	30.93	4.63	111.4	0.694	0.152	0.541	2.3	3.1	5.0E-08	-9999.0	-9999.0	0.112	0.7	-9999.0	-9999.0
11.942	1.91	2.25	0.08	30.97	3.57	111.4	0.697	0.154	0.543	2.2	2.9	5.0E-08	-9999.0	-9999.0	0.103	0.7	-9999.0	-9999.0
12.008	2.18	2.50	0.06	29.70	2.41	111.4	0.701	0.156	0.545	2.4	3.2	5.0E-08	-9999.0	-9999.0	0.120	0.8	-9999.0	-9999.0
12.073	3.96	4.10	0.03	13.14	0.73	111.4	0.705	0.158	0.546	2.0	2.7	1.0E-07	-9999.0	-9999.0	0.226	1.4	-9999.0	-9999.0
12.139	3.26	3.53	0.02	25.26	0.57	111.4	0.708	0.160	0.548	1.7	2.3	1.0E-07	-9999.0	-9999.0	0.188	1.1	-9999.0	-9999.0
12.205	3.51	3.83	0.01	30.10	0.26	111.4	0.712	0.163	0.549	1.8	2.5	1.0E-07	-9999.0	-9999.0	0.208	1.3	-9999.0	-9999.0
12.270	3.77	4.11	0.01	31.82	0.24	111.4	0.715	0.165	0.551	2.0	2.7	1.0E-07	-9999.0	-9999.0	0.226	1.4	-9999.0	-9999.0
12.336	4.22	4.57	0.01	32.83	0.22	111.4	0.719	0.167	0.553	2.2	2.9	1.0E-07	-9999.0	-9999.0	0.257	1.6	-9999.0	-9999.0
12.401	4.66	5.03	0.01	33.70	0.20	111.4	0.723	0.169	0.554	2.4	3.2	1.0E-07	-9999.0	-9999.0	0.287	1.8	-9999.0	-9999.0
12.467	4.02	4.38	0.01	33.48	0.23	111.4	0.726	0.171	0.556	2.1	2.8	1.0E-07	-9999.0	-9999.0	0.244	1.5	-9999.0	-9999.0
12.533	4.92	5.28	0.01	33.42	0.19	111.4	0.730	0.173	0.557	2.5	3.4	1.0E-07	-9999.0	-9999.0	0.304	1.9	-9999.0	-9999.0
12.598	5.11	5.48	0.02	34.42	0.37	111.4	0.734	0.175	0.559	2.6	3.5	1.0E-07	-9999.0	-9999.0	0.317	2.0	-9999.0	-9999.0
12.664	5.36	5.75	0.09	36.18	1.57	111.4	0.737	0.177	0.561	2.8	3.7	1.0E-07	-9999.0	-9999.0	0.334	2.2	-9999.0	-9999.0
12.730	7.22	7.63	0.15	38.36	1.97	114.6	0.741	0.179	0.562	3.7	4.9	5.0E-06	-9999.0	-9999.0	0.459	3.4	-9999.0	-9999.0
12.795	14.11	14.48	0.23	33.62	1.59	114.6	0.745	0.181	0.564	5.5	7.4	5.0E-05	30.0	34.0	0.916	9.7	-9999.0	-9999.0
12.861	22.42	22.69	0.30	24.61	1.33	114.6	0.749	0.183	0.566	8.7	11.6	5.0E-05	32.3	38.0	1.463	10.0	-9999.0	-9999.0
12.926	25.04	25.21	0.39	15.68	1.55	114.6	0.752	0.185	0.567	9.7	12.8	5.0E-05	35.3	38.0	1.631	10.0	90.9	3.607
12.992	23.13	23.24	0.41	10.65	1.77	114.6	0.756	0.187	0.569	8.9	11.8	5.0E-05	32.9	38.0	1.499	10.0	86.8	3.736
13.058	19.93	20.03	0.40	9.07	2.00	114.6	0.760	0.189	0.571	7.7	10.2	5.0E-05	30.0	36.0	1.284	10.0	-9999.0	-9999.0
13.123	18.01	18.12	0.37	9.52	2.05	114.6	0.764	0.191	0.572	6.9	9.2	5.0E-05	30.0	36.0	1.157	10.0	-9999.0	-9999.0
13.189	15.02	15.14	0.40	11.40	2.65	114.6	0.767	0.193	0.574	7.2	9.6	5.0E-06	-9999.0	-9999.0	0.958	10.0	-9999.0	-9999.0
13.254	16.48	16.65	0.35	15.62	2.11	114.6	0.771	0.195	0.576	8.0	10.5	5.0E-06	-9999.0	-9999.0	1.059	10.0	-9999.0	-9999.0
13.320	17.63	17.80	0.32	15.07	1.80	114.6	0.775	0.197	0.578	6.8	9.0	5.0E-05	30.0	36.0	1.135	10.0	-9999.0	-9999.0
13.386	15.65	15.80	0.33	14.49	2.09	114.6	0.779	0.199	0.579	7.6	9.9	5.0E-06	-9999.0	-9999.0	1.002	10.0	-9999.0	-9999.0
13.451	14.37	14.56	0.34	16.69	2.34	114.6	0.782	0.201	0.581	7.0	9.1	5.0E-06	-9999.0	-9999.0	0.918	9.3	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
13.517	16.42	16.60	0.37	16.83	2.23	114.6	0.786	0.203	0.583	7.9	10.4	5.0E-06	-9999.0	-9999.0	1.054	10.0	-9999.0	-9999.0
13.583	13.79	13.91	0.40	10.69	2.88	114.6	0.790	0.206	0.584	6.7	8.7	5.0E-06	-9999.0	-9999.0	0.875	8.5	-9999.0	-9999.0
13.648	12.07	12.19	0.40	11.49	3.29	114.6	0.794	0.208	0.586	7.8	10.2	5.0E-07	-9999.0	-9999.0	0.760	6.8	-9999.0	-9999.0
13.714	10.61	10.72	0.38	10.41	3.55	114.6	0.798	0.210	0.588	6.8	8.9	5.0E-07	-9999.0	-9999.0	0.661	5.4	-9999.0	-9999.0
13.779	7.79	7.89	0.33	9.32	4.19	111.4	0.801	0.212	0.590	7.6	9.8	5.0E-08	-9999.0	-9999.0	0.473	3.3	-9999.0	-9999.0
13.845	7.92	8.03	0.37	10.71	4.62	111.4	0.805	0.214	0.591	7.7	10.0	5.0E-08	-9999.0	-9999.0	0.482	3.4	-9999.0	-9999.0
13.911	10.54	10.72	0.41	17.15	3.83	111.4	0.809	0.216	0.593	10.3	13.3	5.0E-08	-9999.0	-9999.0	0.661	5.4	-9999.0	-9999.0
13.976	14.11	14.33	0.45	20.17	3.15	114.6	0.812	0.218	0.594	6.9	8.9	5.0E-06	-9999.0	-9999.0	0.901	8.7	-9999.0	-9999.0
14.042	23.58	23.83	0.49	23.17	2.06	114.6	0.816	0.220	0.596	9.1	11.8	5.0E-05	33.0	38.0	1.534	10.0	89.0	3.733
14.107	37.18	37.38	0.53	18.31	1.42	117.7	0.820	0.222	0.598	11.9	15.4	5.0E-04	45.8	40.0	-9999.0	-9999.0	113.1	3.026
14.173	38.26	38.40	0.58	12.92	1.51	117.7	0.824	0.224	0.600	12.3	15.8	5.0E-04	46.6	40.0	-9999.0	-9999.0	114.7	2.987
14.239	33.66	33.73	0.60	6.52	1.78	114.6	0.827	0.226	0.601	12.9	16.7	5.0E-05	42.8	40.0	2.194	10.0	107.6	3.191
14.304	28.49	28.55	0.62	5.99	2.18	114.6	0.831	0.228	0.603	10.9	14.1	5.0E-05	38.0	38.0	1.848	10.0	98.7	3.458
14.370	24.79	24.85	0.60	5.35	2.42	114.6	0.835	0.230	0.605	9.5	12.2	5.0E-05	33.9	38.0	1.601	10.0	91.4	3.679
14.436	23.89	23.94	0.55	5.21	2.30	114.6	0.839	0.232	0.607	9.2	11.8	5.0E-05	32.8	38.0	1.540	10.0	89.5	3.739
14.501	22.29	22.35	0.50	5.51	2.24	114.6	0.843	0.234	0.608	8.6	11.0	5.0E-05	30.8	38.0	1.434	10.0	-9999.0	-9999.0
14.567	22.94	23.00	0.48	5.61	2.09	114.6	0.846	0.236	0.610	8.8	11.3	5.0E-05	31.6	38.0	1.477	10.0	-9999.0	-9999.0
14.632	23.19	23.25	0.45	5.47	1.94	114.6	0.850	0.238	0.612	8.9	11.4	5.0E-05	31.9	38.0	1.493	10.0	-9999.0	-9999.0
14.698	23.26	23.31	0.42	5.37	1.81	114.6	0.854	0.240	0.613	8.9	11.4	5.0E-05	31.9	38.0	1.497	10.0	-9999.0	-9999.0
14.764	22.16	22.22	0.40	5.45	1.80	114.6	0.858	0.242	0.615	8.5	10.9	5.0E-05	30.5	38.0	1.424	10.0	-9999.0	-9999.0
14.829	20.51	20.57	0.40	5.23	1.95	114.6	0.861	0.244	0.617	7.9	10.0	5.0E-05	30.0	36.0	1.314	10.0	-9999.0	-9999.0
14.895	19.68	19.74	0.41	5.35	2.08	114.6	0.865	0.246	0.619	7.6	9.6	5.0E-05	30.0	36.0	1.258	10.0	-9999.0	-9999.0
14.960	18.91	18.96	0.35	5.25	1.85	114.6	0.869	0.249	0.620	7.3	9.2	5.0E-05	30.0	36.0	1.206	10.0	-9999.0	-9999.0
15.026	17.12	17.18	0.34	5.01	1.98	114.6	0.873	0.251	0.622	6.6	8.3	5.0E-05	30.0	36.0	1.087	10.0	-9999.0	-9999.0
15.092	14.11	14.17	0.32	4.94	2.26	114.6	0.876	0.253	0.624	6.8	8.6	5.0E-06	-9999.0	-9999.0	0.886	7.8	-9999.0	-9999.0
15.157	11.12	11.17	0.29	4.78	2.60	114.6	0.880	0.255	0.625	5.3	6.8	5.0E-06	-9999.0	-9999.0	0.686	5.2	-9999.0	-9999.0
15.223	9.52	9.58	0.28	5.23	2.93	114.6	0.884	0.257	0.627	6.1	7.7	5.0E-07	-9999.0	-9999.0	0.580	4.0	-9999.0	-9999.0
15.289	15.84	15.91	0.27	6.24	1.70	114.6	0.888	0.259	0.629	6.1	7.7	5.0E-05	30.0	34.0	1.001	9.4	-9999.0	-9999.0
15.354	21.02	21.10	0.28	7.50	1.33	114.6	0.891	0.261	0.631	8.1	10.2	5.0E-05	30.0	36.0	1.347	10.0	-9999.0	-9999.0
15.420	23.00	23.09	0.29	9.16	1.26	114.6	0.895	0.263	0.632	8.8	11.1	5.0E-05	31.2	38.0	1.480	10.0	-9999.0	-9999.0
15.485	21.14	21.22	0.34	7.56	1.61	114.6	0.899	0.265	0.634	8.1	10.2	5.0E-05	30.0	36.0	1.355	10.0	-9999.0	-9999.0
15.551	19.30	19.39	0.36	8.22	1.86	114.6	0.903	0.267	0.636	7.4	9.3	5.0E-05	30.0	36.0	1.232	10.0	-9999.0	-9999.0
15.617	19.68	19.77	0.38	8.46	1.93	114.6	0.906	0.269	0.637	7.6	9.5	5.0E-05	30.0	36.0	1.258	10.0	-9999.0	-9999.0
15.682	18.79	18.87	0.37	7.91	1.97	114.6	0.910	0.271	0.639	7.2	9.0	5.0E-05	30.0	36.0	1.197	10.0	-9999.0	-9999.0
15.748	17.25	17.33	0.37	7.27	2.14	114.6	0.914	0.273	0.641	8.3	10.4	5.0E-06	-9999.0	-9999.0	1.094	10.0	-9999.0	-9999.0
15.813	16.42	16.50	0.36	7.23	2.19	114.6	0.918	0.275	0.643	7.9	9.9	5.0E-06	-9999.0	-9999.0	1.039	9.6	-9999.0	-9999.0
15.879	14.24	14.32	0.34	6.77	2.38	114.6	0.921	0.277	0.644	6.9	8.5	5.0E-06	-9999.0	-9999.0	0.893	7.5	-9999.0	-9999.0
15.945	13.86	13.93	0.27	6.30	1.94	114.6	0.925	0.279	0.646	6.7	8.3	5.0E-06	-9999.0	-9999.0	0.867	7.2	-9999.0	-9999.0
16.010	10.86	10.92	0.21	5.87	1.93	114.6	0.929	0.281	0.648	5.2	6.5	5.0E-06	-9999.0	-9999.0	0.666	4.8	-9999.0	-9999.0
16.076	6.65	6.70	0.16	5.39	2.39	114.6	0.933	0.283	0.649	4.3	5.3	5.0E-07	-9999.0	-9999.0	0.385	2.2	-9999.0	-9999.0
16.142	3.77	3.83	0.11	5.65	2.88	111.4	0.936	0.285	0.651	3.7	4.5	5.0E-08	-9999.0	-9999.0	0.193	1.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
16.207	3.07	3.15	0.07	7.50	2.23	111.4	0.940	0.287	0.653	3.0	3.7	5.0E-08	-9999.0	-9999.0	0.147	0.8	-9999.0	-9999.0
16.273	1.00	1.17	0.02	15.49	1.71	79.6	0.943	0.290	0.654	1.1	1.4	1.0E-15	-9999.0	-9999.0	0.015	0.5	-9999.0	-9999.0
16.338	1.00	1.24	0.01	22.44	0.81	111.4	0.946	0.292	0.655	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.020	0.5	-9999.0	-9999.0
16.404	1.00	1.27	0.01	24.39	0.79	111.4	0.950	0.294	0.656	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.021	0.5	-9999.0	-9999.0
16.470	1.00	1.27	0.01	24.71	0.79	111.4	0.954	0.296	0.658	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.021	0.5	-9999.0	-9999.0
16.535	1.00	1.28	0.01	25.28	0.79	111.4	0.957	0.298	0.660	0.6	0.8	1.0E-07	-9999.0	-9999.0	0.021	0.5	-9999.0	-9999.0
16.601	4.41	4.68	0.01	25.28	0.21	111.4	0.961	0.300	0.661	2.2	2.8	1.0E-07	-9999.0	-9999.0	0.248	1.2	-9999.0	-9999.0
16.666	7.99	8.22	0.04	21.63	0.49	111.4	0.965	0.302	0.663	3.9	4.8	1.0E-07	-9999.0	-9999.0	0.484	2.9	-9999.0	-9999.0
16.732	7.48	7.65	0.07	16.21	0.92	111.4	0.968	0.304	0.664	3.7	4.5	1.0E-07	-9999.0	-9999.0	0.446	2.6	-9999.0	-9999.0
16.798	8.62	8.78	0.09	14.36	1.03	114.6	0.972	0.306	0.666	4.2	5.1	5.0E-06	-9999.0	-9999.0	0.520	3.2	-9999.0	-9999.0
16.863	8.30	8.44	0.12	13.29	1.42	114.6	0.976	0.308	0.668	4.0	4.9	5.0E-06	-9999.0	-9999.0	0.498	3.0	-9999.0	-9999.0
16.929	7.99	8.12	0.12	12.01	1.48	114.6	0.980	0.310	0.670	3.9	4.8	5.0E-06	-9999.0	-9999.0	0.476	2.8	-9999.0	-9999.0
16.995	8.18	8.30	0.11	11.20	1.33	114.6	0.983	0.312	0.671	4.0	4.9	5.0E-06	-9999.0	-9999.0	0.488	2.9	-9999.0	-9999.0
17.060	7.86	7.98	0.10	11.34	1.26	114.6	0.987	0.314	0.673	3.8	4.7	5.0E-06	-9999.0	-9999.0	0.466	2.7	-9999.0	-9999.0
17.126	6.90	7.04	0.11	12.98	1.57	114.6	0.991	0.316	0.675	3.4	4.1	5.0E-06	-9999.0	-9999.0	0.403	2.2	-9999.0	-9999.0
17.191	8.05	8.21	0.14	14.82	1.71	114.6	0.995	0.318	0.676	3.9	4.8	5.0E-06	-9999.0	-9999.0	0.481	2.8	-9999.0	-9999.0
17.257	8.62	8.79	0.16	15.80	1.82	114.6	0.998	0.320	0.678	4.2	5.1	5.0E-06	-9999.0	-9999.0	0.520	3.1	-9999.0	-9999.0
17.323	9.71	9.89	0.18	16.51	1.82	114.6	1.002	0.322	0.680	4.7	5.7	5.0E-06	-9999.0	-9999.0	0.593	3.7	-9999.0	-9999.0
17.388	10.80	10.95	0.21	14.26	1.92	114.6	1.006	0.324	0.681	5.2	6.4	5.0E-06	-9999.0	-9999.0	0.663	4.4	-9999.0	-9999.0
17.454	11.50	11.62	0.23	11.30	1.98	114.6	1.010	0.326	0.683	5.6	6.7	5.0E-06	-9999.0	-9999.0	0.707	4.8	-9999.0	-9999.0
17.519	9.77	9.88	0.23	9.75	2.33	114.6	1.013	0.328	0.685	4.7	5.7	5.0E-06	-9999.0	-9999.0	0.591	3.7	-9999.0	-9999.0
17.585	9.13	9.22	0.22	8.30	2.39	114.6	1.017	0.330	0.687	4.4	5.3	5.0E-06	-9999.0	-9999.0	0.547	3.3	-9999.0	-9999.0
17.651	7.28	7.36	0.22	7.76	3.00	114.6	1.021	0.333	0.688	4.7	5.7	5.0E-07	-9999.0	-9999.0	0.423	2.3	-9999.0	-9999.0
17.716	6.06	6.15	0.20	7.70	3.26	111.4	1.025	0.335	0.690	5.9	7.1	5.0E-08	-9999.0	-9999.0	0.342	1.7	-9999.0	-9999.0
17.782	5.04	5.13	0.16	8.02	3.13	111.4	1.028	0.337	0.692	4.9	5.9	5.0E-08	-9999.0	-9999.0	0.273	1.3	-9999.0	-9999.0
17.848	3.26	3.35	0.12	8.42	3.59	111.4	1.032	0.339	0.693	3.2	3.9	5.0E-08	-9999.0	-9999.0	0.154	0.8	-9999.0	-9999.0
17.913	2.88	2.98	0.09	9.16	3.03	111.4	1.036	0.341	0.695	2.8	3.4	5.0E-08	-9999.0	-9999.0	0.129	0.7	-9999.0	-9999.0
17.979	2.62	2.73	0.05	10.88	1.83	111.4	1.039	0.343	0.696	1.3	1.6	1.0E-07	-9999.0	-9999.0	0.113	0.6	-9999.0	-9999.0
18.044	1.00	1.16	0.03	14.56	2.59	79.6	1.042	0.345	0.697	1.1	1.3	1.0E-15	-9999.0	-9999.0	0.008	0.5	-9999.0	-9999.0
18.110	1.00	1.19	0.01	17.66	0.84	111.4	1.045	0.347	0.699	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.010	0.5	-9999.0	-9999.0
18.176	1.00	1.22	0.01	20.01	0.82	111.4	1.049	0.349	0.700	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.011	0.5	-9999.0	-9999.0
18.241	1.00	1.24	0.01	22.24	0.81	111.4	1.053	0.351	0.702	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.013	0.5	-9999.0	-9999.0
18.307	1.00	1.25	0.01	22.81	0.80	111.4	1.056	0.353	0.703	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.013	0.5	-9999.0	-9999.0
18.372	1.00	1.24	0.01	22.18	0.81	111.4	1.060	0.355	0.705	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.012	0.5	-9999.0	-9999.0
18.438	1.78	2.01	0.01	20.89	0.50	111.4	1.064	0.357	0.707	1.0	1.1	1.0E-07	-9999.0	-9999.0	0.063	0.5	-9999.0	-9999.0
18.504	1.59	1.80	0.03	19.46	1.67	111.4	1.067	0.359	0.708	0.9	1.0	1.0E-07	-9999.0	-9999.0	0.049	0.5	-9999.0	-9999.0
18.569	2.18	2.36	0.04	17.42	1.70	111.4	1.071	0.361	0.710	1.1	1.3	1.0E-07	-9999.0	-9999.0	0.086	0.6	-9999.0	-9999.0
18.635	5.11	5.19	0.03	7.33	0.58	111.4	1.075	0.363	0.711	2.5	2.9	1.0E-07	-9999.0	-9999.0	0.274	1.3	-9999.0	-9999.0
18.701	4.09	4.20	0.03	10.14	0.72	111.4	1.078	0.365	0.713	2.0	2.4	1.0E-07	-9999.0	-9999.0	0.208	1.0	-9999.0	-9999.0
18.766	3.07	3.21	0.03	13.35	0.94	111.4	1.082	0.367	0.715	1.5	1.8	1.0E-07	-9999.0	-9999.0	0.142	0.7	-9999.0	-9999.0
18.832	1.47	1.66	0.02	17.29	1.21	111.4	1.086	0.369	0.716	0.8	0.9	1.0E-07	-9999.0	-9999.0	0.038	0.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
18.897	1.00	1.25	0.01	22.97	0.80	111.4	1.089	0.371	0.718	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.011	0.5	-9999.0	-9999.0
18.963	1.00	1.27	0.01	25.20	0.79	111.4	1.093	0.374	0.719	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.012	0.5	-9999.0	-9999.0
19.029	1.00	1.30	0.01	27.41	0.77	111.4	1.097	0.376	0.721	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.013	0.5	-9999.0	-9999.0
19.094	1.15	1.46	0.01	28.78	0.68	111.4	1.100	0.378	0.723	0.7	0.8	1.0E-07	-9999.0	-9999.0	0.024	0.5	-9999.0	-9999.0
19.160	1.72	2.02	0.01	27.45	0.50	111.4	1.104	0.380	0.724	1.0	1.1	1.0E-07	-9999.0	-9999.0	0.061	0.5	-9999.0	-9999.0
19.225	1.02	1.30	0.01	25.46	0.77	111.4	1.108	0.382	0.726	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.013	0.5	-9999.0	-9999.0
19.291	1.00	1.30	0.01	27.81	0.77	111.4	1.111	0.384	0.727	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.013	0.5	-9999.0	-9999.0
19.357	4.47	4.79	0.01	29.49	0.21	111.4	1.115	0.386	0.729	2.3	2.7	1.0E-07	-9999.0	-9999.0	0.245	1.1	-9999.0	-9999.0
19.422	7.03	7.30	0.01	25.04	0.14	111.4	1.119	0.388	0.731	3.5	4.1	1.0E-07	-9999.0	-9999.0	0.412	2.0	-9999.0	-9999.0
19.488	5.17	5.36	0.01	17.42	0.19	111.4	1.122	0.390	0.732	2.6	3.0	1.0E-07	-9999.0	-9999.0	0.283	1.3	-9999.0	-9999.0
19.554	2.94	3.10	0.01	15.19	0.32	111.4	1.126	0.392	0.734	1.5	1.7	1.0E-07	-9999.0	-9999.0	0.132	0.7	-9999.0	-9999.0
19.619	1.00	1.20	0.01	18.25	0.84	111.4	1.130	0.394	0.736	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.005	0.5	-9999.0	-9999.0
19.685	1.00	1.26	0.01	23.40	0.80	111.4	1.133	0.396	0.737	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.008	0.5	-9999.0	-9999.0
19.750	1.00	1.29	0.01	26.84	0.78	111.4	1.137	0.398	0.739	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.010	0.5	-9999.0	-9999.0
19.816	1.00	1.31	0.01	28.03	0.77	111.4	1.140	0.400	0.740	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.011	0.5	-9999.0	-9999.0
19.882	1.00	1.30	0.01	27.18	0.77	111.4	1.144	0.402	0.742	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.010	0.5	-9999.0	-9999.0
19.947	1.00	1.28	0.01	25.80	0.78	111.4	1.148	0.404	0.744	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.009	0.5	-9999.0	-9999.0
20.013	1.00	1.28	0.01	25.50	0.78	111.4	1.151	0.406	0.745	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.008	0.5	-9999.0	-9999.0
20.078	1.00	1.28	0.01	25.78	0.78	111.4	1.155	0.408	0.747	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.008	0.5	-9999.0	-9999.0
20.144	1.00	1.28	0.01	25.98	0.78	111.4	1.159	0.410	0.748	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.008	0.5	-9999.0	-9999.0
20.210	1.00	1.28	0.01	25.67	0.78	111.4	1.162	0.412	0.750	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.008	0.5	-9999.0	-9999.0
20.275	1.00	1.30	0.01	27.53	0.77	111.4	1.166	0.414	0.752	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.009	0.5	-9999.0	-9999.0
20.341	4.09	4.40	0.01	28.45	0.23	111.4	1.170	0.417	0.753	2.1	2.4	1.0E-07	-9999.0	-9999.0	0.215	1.0	-9999.0	-9999.0
20.407	5.04	5.30	0.01	24.28	0.19	111.4	1.173	0.419	0.755	2.5	2.9	1.0E-07	-9999.0	-9999.0	0.275	1.2	-9999.0	-9999.0
20.472	2.75	2.92	0.01	16.25	0.34	111.4	1.177	0.421	0.756	1.4	1.6	1.0E-07	-9999.0	-9999.0	0.116	0.6	-9999.0	-9999.0
20.538	3.07	3.27	0.01	18.64	0.31	111.4	1.181	0.423	0.758	1.6	1.8	1.0E-07	-9999.0	-9999.0	0.139	0.7	-9999.0	-9999.0
20.603	2.75	3.01	0.01	24.73	0.33	111.4	1.184	0.425	0.760	1.4	1.7	1.0E-07	-9999.0	-9999.0	0.122	0.6	-9999.0	-9999.0
20.669	2.30	2.58	0.01	26.69	0.39	111.4	1.188	0.427	0.761	1.2	1.4	1.0E-07	-9999.0	-9999.0	0.093	0.6	-9999.0	-9999.0
20.735	3.20	3.50	0.05	28.13	1.43	111.4	1.192	0.429	0.763	1.7	1.9	1.0E-07	-9999.0	-9999.0	0.154	0.7	-9999.0	-9999.0
20.800	9.45	9.74	0.11	27.02	1.13	114.6	1.195	0.431	0.764	4.7	5.3	5.0E-06	-9999.0	-9999.0	0.570	3.0	-9999.0	-9999.0
20.866	12.97	13.20	0.16	20.74	1.22	114.6	1.199	0.433	0.766	5.1	5.8	5.0E-05	30.0	32.0	0.800	4.9	-9999.0	-9999.0
20.932	12.52	12.64	0.19	11.30	1.51	114.6	1.203	0.435	0.768	6.1	6.9	5.0E-06	-9999.0	-9999.0	0.763	4.5	-9999.0	-9999.0
20.997	13.92	14.03	0.22	9.56	1.57	114.6	1.207	0.437	0.770	5.4	6.1	5.0E-05	30.0	32.0	0.855	5.3	-9999.0	-9999.0
21.063	13.48	13.57	0.22	8.16	1.63	114.6	1.210	0.439	0.771	6.5	7.4	5.0E-06	-9999.0	-9999.0	0.824	5.0	-9999.0	-9999.0
21.128	13.35	13.44	0.20	7.68	1.49	114.6	1.214	0.441	0.773	5.1	5.9	5.0E-05	30.0	32.0	0.815	4.9	-9999.0	-9999.0
21.194	12.46	12.54	0.17	7.07	1.36	114.6	1.218	0.443	0.775	4.8	5.5	5.0E-05	30.0	32.0	0.755	4.4	-9999.0	-9999.0
21.260	13.73	13.80	0.14	6.26	1.02	114.6	1.222	0.445	0.776	5.3	6.0	5.0E-05	30.0	32.0	0.839	5.1	-9999.0	-9999.0
21.325	12.90	12.96	0.11	5.89	0.85	114.6	1.225	0.447	0.778	5.0	5.6	5.0E-05	30.0	32.0	0.783	4.6	-9999.0	-9999.0
21.391	13.29	13.36	0.09	5.89	0.68	114.6	1.229	0.449	0.780	5.1	5.8	5.0E-05	30.0	32.0	0.808	4.8	-9999.0	-9999.0
21.456	11.63	11.69	0.06	6.03	0.51	114.6	1.233	0.451	0.782	4.5	5.1	5.0E-05	30.0	32.0	0.697	3.8	-9999.0	-9999.0
21.522	11.44	11.50	0.04	6.18	0.35	114.6	1.237	0.453	0.783	4.4	5.0	5.0E-05	30.0	32.0	0.685	3.7	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
21.588	10.86	10.93	0.05	7.03	0.46	114.6	1.240	0.455	0.785	4.2	4.7	5.0E-05	30.0	30.0	0.646	3.4	-9999.0	-9999.0
21.653	10.99	11.07	0.05	7.80	0.45	114.6	1.244	0.458	0.787	4.2	4.8	5.0E-05	30.0	30.0	0.655	3.5	-9999.0	-9999.0
21.719	12.14	12.21	0.06	6.89	0.49	114.6	1.248	0.460	0.788	4.7	5.3	5.0E-05	30.0	32.0	0.731	4.1	-9999.0	-9999.0
21.785	14.24	14.32	0.07	6.70	0.49	114.6	1.252	0.462	0.790	5.5	6.2	5.0E-05	30.0	32.0	0.871	5.3	-9999.0	-9999.0
21.850	15.84	15.92	0.07	7.23	0.44	114.6	1.255	0.464	0.792	6.1	6.9	5.0E-05	30.0	32.0	0.977	6.3	-9999.0	-9999.0
21.916	17.44	17.52	0.07	7.21	0.40	117.7	1.259	0.466	0.794	5.6	6.3	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
21.981	17.63	17.70	0.01	6.30	0.06	117.7	1.263	0.468	0.795	5.7	6.3	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
22.047	17.31	17.38	0.01	6.26	0.06	117.7	1.267	0.470	0.797	5.5	6.2	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
22.113	18.27	18.34	0.01	6.48	0.05	117.7	1.271	0.472	0.799	5.9	6.6	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
22.178	18.27	18.34	0.01	6.50	0.05	117.7	1.275	0.474	0.801	5.9	6.5	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
22.244	17.56	17.63	0.01	6.32	0.06	117.7	1.279	0.476	0.803	5.6	6.3	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
22.309	16.04	16.11	0.01	6.85	0.06	117.7	1.282	0.478	0.804	5.1	5.7	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
22.375	14.82	14.89	0.01	6.58	0.07	114.6	1.286	0.480	0.806	5.7	6.4	5.0E-05	30.0	32.0	0.907	5.4	-9999.0	-9999.0
22.441	13.67	13.74	0.01	6.28	0.07	114.6	1.290	0.482	0.808	5.3	5.9	5.0E-05	30.0	32.0	0.830	4.7	-9999.0	-9999.0
22.506	13.16	13.23	0.01	6.50	0.08	114.6	1.294	0.484	0.810	5.1	5.6	5.0E-05	30.0	32.0	0.796	4.4	-9999.0	-9999.0
22.572	12.52	12.59	0.02	6.58	0.16	114.6	1.298	0.486	0.811	4.8	5.4	5.0E-05	30.0	32.0	0.753	4.1	-9999.0	-9999.0
22.638	13.67	13.74	0.03	6.54	0.22	114.6	1.301	0.488	0.813	5.3	5.8	5.0E-05	30.0	32.0	0.830	4.7	-9999.0	-9999.0
22.703	12.27	12.34	0.05	6.79	0.41	114.6	1.305	0.490	0.815	4.7	5.2	5.0E-05	30.0	32.0	0.736	3.9	-9999.0	-9999.0
22.769	12.33	12.41	0.07	7.01	0.57	114.6	1.309	0.492	0.817	4.8	5.3	5.0E-05	30.0	32.0	0.740	3.9	-9999.0	-9999.0
22.834	12.14	12.22	0.08	7.40	0.66	114.6	1.313	0.494	0.818	4.7	5.2	5.0E-05	30.0	32.0	0.727	3.8	-9999.0	-9999.0
22.900	11.76	11.84	0.10	7.58	0.85	114.6	1.316	0.496	0.820	4.5	5.0	5.0E-05	30.0	32.0	0.702	3.6	-9999.0	-9999.0
22.966	10.15	10.24	0.11	7.48	1.08	114.6	1.320	0.498	0.822	4.9	5.4	5.0E-06	-9999.0	-9999.0	0.594	2.8	-9999.0	-9999.0
23.031	9.64	9.72	0.12	6.97	1.24	114.6	1.324	0.501	0.823	4.7	5.1	5.0E-06	-9999.0	-9999.0	0.560	2.6	-9999.0	-9999.0
23.097	9.39	9.47	0.11	7.03	1.16	114.6	1.328	0.503	0.825	4.5	5.0	5.0E-06	-9999.0	-9999.0	0.543	2.5	-9999.0	-9999.0
23.162	6.13	6.21	0.10	6.70	1.61	114.6	1.331	0.505	0.827	4.0	4.4	5.0E-07	-9999.0	-9999.0	0.325	1.3	-9999.0	-9999.0
23.228	5.43	5.51	0.09	6.74	1.64	111.4	1.335	0.507	0.828	2.6	2.9	1.0E-07	-9999.0	-9999.0	0.278	1.1	-9999.0	-9999.0
23.294	4.53	4.61	0.07	7.62	1.52	111.4	1.339	0.509	0.830	2.2	2.4	1.0E-07	-9999.0	-9999.0	0.218	0.9	-9999.0	-9999.0
23.359	3.51	3.61	0.04	9.20	1.11	111.4	1.342	0.511	0.832	1.7	1.9	1.0E-07	-9999.0	-9999.0	0.151	0.7	-9999.0	-9999.0
23.425	3.32	3.44	0.02	11.53	0.58	111.4	1.346	0.513	0.833	1.6	1.8	1.0E-07	-9999.0	-9999.0	0.140	0.7	-9999.0	-9999.0
23.491	2.50	2.66	0.01	15.51	0.38	111.4	1.350	0.515	0.835	1.3	1.4	1.0E-07	-9999.0	-9999.0	0.088	0.5	-9999.0	-9999.0
23.556	2.18	2.36	0.01	17.54	0.42	111.4	1.353	0.517	0.836	1.1	1.2	1.0E-07	-9999.0	-9999.0	0.067	0.5	-9999.0	-9999.0
23.622	2.24	2.44	0.01	18.88	0.41	111.4	1.357	0.519	0.838	1.2	1.3	1.0E-07	-9999.0	-9999.0	0.072	0.5	-9999.0	-9999.0
23.687	1.66	1.88	0.01	19.66	0.53	111.4	1.361	0.521	0.840	0.9	1.0	1.0E-07	-9999.0	-9999.0	0.034	0.5	-9999.0	-9999.0
23.753	1.00	1.23	0.01	20.62	0.82	111.4	1.364	0.523	0.841	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
23.819	1.98	2.21	0.01	20.80	0.45	111.4	1.368	0.525	0.843	1.1	1.2	1.0E-07	-9999.0	-9999.0	0.056	0.5	-9999.0	-9999.0
23.884	1.00	1.23	0.01	21.45	0.81	111.4	1.372	0.527	0.844	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
23.950	1.15	1.39	0.01	22.02	0.72	111.4	1.375	0.529	0.846	0.7	0.7	1.0E-07	-9999.0	-9999.0	0.001	0.5	-9999.0	-9999.0
24.015	1.08	1.32	0.01	22.30	0.76	111.4	1.379	0.531	0.848	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
24.081	1.00	1.24	0.01	22.36	0.81	111.4	1.383	0.533	0.849	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
24.147	1.66	1.89	0.01	21.03	0.53	111.4	1.386	0.535	0.851	0.9	1.0	1.0E-07	-9999.0	-9999.0	0.034	0.5	-9999.0	-9999.0
24.212	2.18	2.39	0.01	20.15	0.42	111.4	1.390	0.537	0.853	1.1	1.2	1.0E-07	-9999.0	-9999.0	0.067	0.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
24.278	1.72	1.92	0.01	18.49	0.52	111.4	1.394	0.539	0.854	0.9	1.0	1.0E-07	-9999.0	-9999.0	0.035	0.5	-9999.0	-9999.0
24.344	1.78	1.98	0.01	18.21	0.51	111.4	1.397	0.542	0.856	0.9	1.0	1.0E-07	-9999.0	-9999.0	0.039	0.5	-9999.0	-9999.0
24.409	1.00	1.21	0.01	19.42	0.83	111.4	1.401	0.544	0.857	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
24.475	2.30	2.52	0.01	20.42	0.40	111.4	1.405	0.546	0.859	1.2	1.3	1.0E-07	-9999.0	-9999.0	0.074	0.5	-9999.0	-9999.0
24.540	3.96	4.17	0.03	19.71	0.72	111.4	1.408	0.548	0.861	2.0	2.2	1.0E-07	-9999.0	-9999.0	0.184	0.8	-9999.0	-9999.0
24.606	4.09	4.29	0.04	18.09	0.94	111.4	1.412	0.550	0.862	2.1	2.2	1.0E-07	-9999.0	-9999.0	0.192	0.8	-9999.0	-9999.0
24.672	5.24	5.42	0.05	16.47	0.92	111.4	1.416	0.552	0.864	2.6	2.8	1.0E-07	-9999.0	-9999.0	0.267	1.0	-9999.0	-9999.0
24.737	6.97	7.13	0.06	15.05	0.84	111.4	1.419	0.554	0.865	3.4	3.7	1.0E-07	-9999.0	-9999.0	0.381	1.5	-9999.0	-9999.0
24.803	7.79	7.94	0.06	14.10	0.76	111.4	1.423	0.556	0.867	3.8	4.1	1.0E-07	-9999.0	-9999.0	0.435	1.7	-9999.0	-9999.0
24.868	8.56	8.70	0.05	12.94	0.58	111.4	1.426	0.558	0.869	4.2	4.5	1.0E-07	-9999.0	-9999.0	0.485	2.0	-9999.0	-9999.0
24.934	8.50	8.63	0.05	12.01	0.58	111.4	1.430	0.560	0.870	4.1	4.4	1.0E-07	-9999.0	-9999.0	0.480	2.0	-9999.0	-9999.0
25.000	9.26	9.39	0.06	11.87	0.64	114.6	1.434	0.562	0.872	3.6	3.9	5.0E-05	30.0	30.0	0.530	2.2	-9999.0	-9999.0
25.065	10.74	10.85	0.07	10.92	0.65	114.6	1.438	0.564	0.874	4.2	4.4	5.0E-05	30.0	30.0	0.628	2.8	-9999.0	-9999.0
25.131	12.07	12.16	0.08	8.38	0.66	114.6	1.441	0.566	0.875	4.7	5.0	5.0E-05	30.0	30.0	0.715	3.4	-9999.0	-9999.0
25.197	9.64	9.74	0.10	8.81	1.03	114.6	1.445	0.568	0.877	4.7	5.0	5.0E-06	-9999.0	-9999.0	0.553	2.3	-9999.0	-9999.0
25.262	9.32	9.42	0.11	9.01	1.17	114.6	1.449	0.570	0.879	4.5	4.8	5.0E-06	-9999.0	-9999.0	0.531	2.2	-9999.0	-9999.0
25.328	8.11	8.21	0.11	9.20	1.34	114.6	1.453	0.572	0.880	3.9	4.2	5.0E-06	-9999.0	-9999.0	0.450	1.8	-9999.0	-9999.0
25.393	8.24	8.33	0.12	8.79	1.44	114.6	1.456	0.574	0.882	4.0	4.2	5.0E-06	-9999.0	-9999.0	0.459	1.8	-9999.0	-9999.0
25.459	6.71	6.80	0.13	8.69	1.92	114.6	1.460	0.576	0.884	4.3	4.6	5.0E-07	-9999.0	-9999.0	0.356	1.3	-9999.0	-9999.0
25.525	7.48	7.58	0.12	9.20	1.59	114.6	1.464	0.578	0.886	3.6	3.9	5.0E-06	-9999.0	-9999.0	0.408	1.6	-9999.0	-9999.0
25.590	6.71	6.81	0.13	9.95	1.91	114.6	1.468	0.580	0.887	4.4	4.6	5.0E-07	-9999.0	-9999.0	0.356	1.3	-9999.0	-9999.0
25.656	5.11	5.23	0.12	10.43	2.30	114.6	1.471	0.582	0.889	3.3	3.5	5.0E-07	-9999.0	-9999.0	0.250	0.9	-9999.0	-9999.0
25.721	4.73	4.85	0.11	10.94	2.27	111.4	1.475	0.585	0.891	4.6	4.9	5.0E-08	-9999.0	-9999.0	0.225	0.9	-9999.0	-9999.0
25.787	5.24	5.37	0.10	11.40	1.87	114.6	1.479	0.587	0.892	3.4	3.6	5.0E-07	-9999.0	-9999.0	0.259	1.0	-9999.0	-9999.0
25.853	5.81	5.94	0.11	12.10	1.85	114.6	1.483	0.589	0.894	3.8	4.0	5.0E-07	-9999.0	-9999.0	0.297	1.1	-9999.0	-9999.0
25.918	6.33	6.47	0.11	13.06	1.71	114.6	1.486	0.591	0.896	4.1	4.4	5.0E-07	-9999.0	-9999.0	0.332	1.2	-9999.0	-9999.0
25.984	6.58	6.72	0.10	13.02	1.49	114.6	1.490	0.593	0.897	3.2	3.4	5.0E-06	-9999.0	-9999.0	0.348	1.3	-9999.0	-9999.0
26.050	6.20	6.34	0.09	12.98	1.42	111.4	1.494	0.595	0.899	3.0	3.2	1.0E-07	-9999.0	-9999.0	0.323	1.2	-9999.0	-9999.0
26.115	7.09	7.22	0.09	12.43	1.25	114.6	1.498	0.597	0.901	3.5	3.6	5.0E-06	-9999.0	-9999.0	0.382	1.4	-9999.0	-9999.0
26.181	6.58	6.71	0.09	11.97	1.35	111.4	1.501	0.599	0.902	3.2	3.4	1.0E-07	-9999.0	-9999.0	0.347	1.3	-9999.0	-9999.0
26.246	5.75	5.87	0.09	10.96	1.54	111.4	1.505	0.601	0.904	2.8	3.0	1.0E-07	-9999.0	-9999.0	0.291	1.1	-9999.0	-9999.0
26.312	4.85	4.97	0.09	11.12	1.81	114.6	1.509	0.603	0.906	3.2	3.3	5.0E-07	-9999.0	-9999.0	0.231	0.9	-9999.0	-9999.0
26.378	4.92	5.04	0.08	11.18	1.59	111.4	1.512	0.605	0.907	2.4	2.5	1.0E-07	-9999.0	-9999.0	0.235	0.9	-9999.0	-9999.0
26.443	4.41	4.55	0.06	13.18	1.32	111.4	1.516	0.607	0.909	2.2	2.3	1.0E-07	-9999.0	-9999.0	0.202	0.8	-9999.0	-9999.0
26.509	2.43	2.60	0.05	15.96	1.93	111.4	1.520	0.609	0.911	1.2	1.3	1.0E-07	-9999.0	-9999.0	0.072	0.5	-9999.0	-9999.0
26.574	3.01	3.21	0.04	18.31	1.25	111.4	1.523	0.611	0.912	1.5	1.6	1.0E-07	-9999.0	-9999.0	0.112	0.6	-9999.0	-9999.0
26.640	3.26	3.46	0.02	18.56	0.58	111.4	1.527	0.613	0.914	1.7	1.7	1.0E-07	-9999.0	-9999.0	0.129	0.6	-9999.0	-9999.0
26.706	2.75	2.94	0.01	18.27	0.34	111.4	1.531	0.615	0.915	1.4	1.5	1.0E-07	-9999.0	-9999.0	0.094	0.5	-9999.0	-9999.0
26.771	2.37	2.58	0.01	19.42	0.39	111.4	1.534	0.617	0.917	1.2	1.3	1.0E-07	-9999.0	-9999.0	0.069	0.5	-9999.0	-9999.0
26.837	2.24	2.45	0.01	19.73	0.41	111.4	1.538	0.619	0.919	1.2	1.2	1.0E-07	-9999.0	-9999.0	0.061	0.5	-9999.0	-9999.0
26.903	2.62	2.85	0.01	21.30	0.35	111.4	1.542	0.621	0.920	1.4	1.4	1.0E-07	-9999.0	-9999.0	0.087	0.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
26.968	1.02	1.27	0.01	22.67	0.79	111.4	1.545	0.623	0.922	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
27.034	1.40	1.66	0.01	23.63	0.60	111.4	1.549	0.626	0.923	0.8	0.8	1.0E-07	-9999.0	-9999.0	0.007	0.5	-9999.0	-9999.0
27.099	1.27	1.53	0.01	23.63	0.66	111.4	1.553	0.628	0.925	0.7	0.8	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
27.165	1.08	1.34	0.01	23.67	0.75	111.4	1.556	0.630	0.927	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
27.231	1.02	1.28	0.01	24.14	0.78	111.4	1.560	0.632	0.928	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
27.296	1.40	1.67	0.01	24.26	0.60	111.4	1.563	0.634	0.930	0.8	0.8	1.0E-07	-9999.0	-9999.0	0.007	0.5	-9999.0	-9999.0
27.362	1.00	1.27	0.01	24.77	0.79	111.4	1.567	0.636	0.931	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
27.427	1.00	1.28	0.01	25.70	0.78	111.4	1.571	0.638	0.933	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
27.493	1.00	1.28	0.01	25.72	0.78	111.4	1.574	0.640	0.935	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
27.559	1.02	1.31	0.01	26.27	0.77	111.4	1.578	0.642	0.936	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
27.624	1.00	1.29	0.01	26.45	0.78	111.4	1.582	0.644	0.938	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
27.690	1.00	1.28	0.01	26.02	0.78	111.4	1.585	0.646	0.939	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
27.756	1.00	1.28	0.01	26.06	0.78	111.4	1.589	0.648	0.941	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
27.821	1.00	1.28	0.01	26.02	0.78	111.4	1.593	0.650	0.943	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
27.887	1.00	1.28	0.01	25.96	0.78	111.4	1.596	0.652	0.944	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
27.952	1.00	1.29	0.01	26.31	0.78	111.4	1.600	0.654	0.946	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
28.018	1.00	1.29	0.01	26.39	0.78	111.4	1.604	0.656	0.947	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
28.084	1.08	1.38	0.01	27.35	0.73	111.4	1.607	0.658	0.949	0.7	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
28.149	2.81	3.10	0.01	27.35	0.32	111.4	1.611	0.660	0.951	1.5	1.5	1.0E-07	-9999.0	-9999.0	0.099	0.5	-9999.0	-9999.0
28.215	3.58	3.84	0.01	24.65	0.26	111.4	1.615	0.662	0.952	1.8	1.9	1.0E-07	-9999.0	-9999.0	0.149	0.6	-9999.0	-9999.0
28.280	2.56	2.79	0.01	21.51	0.36	111.4	1.618	0.664	0.954	1.3	1.4	1.0E-07	-9999.0	-9999.0	0.078	0.5	-9999.0	-9999.0
28.346	1.85	2.09	0.01	22.12	0.48	111.4	1.622	0.666	0.955	1.0	1.0	1.0E-07	-9999.0	-9999.0	0.031	0.5	-9999.0	-9999.0
28.412	4.34	4.49	0.01	13.71	0.22	111.4	1.626	0.669	0.957	2.1	2.2	1.0E-07	-9999.0	-9999.0	0.191	0.7	-9999.0	-9999.0
28.477	3.39	3.57	0.01	17.05	0.28	111.4	1.629	0.671	0.959	1.7	1.7	1.0E-07	-9999.0	-9999.0	0.130	0.6	-9999.0	-9999.0
28.543	2.88	3.09	0.01	19.71	0.32	111.4	1.633	0.673	0.960	1.5	1.5	1.0E-07	-9999.0	-9999.0	0.097	0.5	-9999.0	-9999.0
28.609	2.88	3.10	0.01	20.62	0.32	111.4	1.637	0.675	0.962	1.5	1.5	1.0E-07	-9999.0	-9999.0	0.098	0.5	-9999.0	-9999.0
28.674	2.30	2.52	0.01	20.91	0.40	111.4	1.640	0.677	0.963	1.2	1.2	1.0E-07	-9999.0	-9999.0	0.059	0.5	-9999.0	-9999.0
28.740	1.00	1.23	0.01	20.91	0.82	111.4	1.644	0.679	0.965	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
28.805	1.47	1.71	0.01	21.79	0.59	111.4	1.648	0.681	0.967	0.8	0.8	1.0E-07	-9999.0	-9999.0	0.004	0.5	-9999.0	-9999.0
28.871	1.00	1.26	0.01	23.69	0.80	111.4	1.651	0.683	0.968	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
28.937	1.00	1.28	0.01	25.30	0.79	111.4	1.655	0.685	0.970	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.002	1.00	1.29	0.01	26.74	0.78	111.4	1.659	0.687	0.972	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.068	1.00	1.30	0.01	27.37	0.77	111.4	1.662	0.689	0.973	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.134	1.00	1.29	0.01	27.02	0.77	111.4	1.666	0.691	0.975	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.199	1.00	1.30	0.01	27.63	0.77	111.4	1.669	0.693	0.976	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.265	1.00	1.30	0.01	27.41	0.77	111.4	1.673	0.695	0.978	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.330	1.00	1.29	0.01	26.82	0.78	111.4	1.677	0.697	0.980	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.396	1.00	1.29	0.01	26.31	0.78	111.4	1.680	0.699	0.981	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.462	1.00	1.29	0.01	26.69	0.78	111.4	1.684	0.701	0.983	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.527	1.00	1.29	0.01	26.86	0.78	111.4	1.688	0.703	0.984	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.593	1.00	1.30	0.01	27.67	0.77	111.4	1.691	0.705	0.986	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
29.658	1.00	1.31	0.01	28.23	0.77	111.4	1.695	0.707	0.988	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.724	1.00	1.31	0.01	28.90	0.76	111.4	1.699	0.710	0.989	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.790	1.00	1.30	0.01	27.90	0.77	111.4	1.702	0.712	0.991	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.855	1.00	1.30	0.01	27.22	0.77	111.4	1.706	0.714	0.992	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.921	1.21	1.49	0.01	26.02	0.67	111.4	1.710	0.716	0.994	0.7	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.987	2.24	2.51	0.01	25.34	0.40	111.4	1.713	0.718	0.996	1.2	1.2	1.0E-07	-9999.0	-9999.0	0.053	0.5	-9999.0	-9999.0
30.052	1.27	1.54	0.01	24.53	0.65	111.4	1.717	0.720	0.997	0.7	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.118	1.00	1.28	0.01	26.13	0.78	111.4	1.721	0.722	0.999	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.183	1.47	1.77	0.01	27.69	0.57	111.4	1.724	0.724	1.000	0.8	0.8	1.0E-07	-9999.0	-9999.0	0.003	0.5	-9999.0	-9999.0
30.249	1.00	1.30	0.01	27.87	0.77	111.4	1.728	0.726	1.002	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.315	1.00	1.31	0.01	28.15	0.77	111.4	1.732	0.728	1.004	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.380	1.00	1.31	0.01	28.29	0.77	111.4	1.735	0.730	1.005	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.446	1.00	1.32	0.01	29.11	0.76	111.4	1.739	0.732	1.007	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.511	1.78	2.09	0.01	27.91	0.48	111.4	1.743	0.734	1.008	1.0	1.0	1.0E-07	-9999.0	-9999.0	0.023	0.5	-9999.0	-9999.0
30.577	1.91	2.21	0.01	27.37	0.45	111.4	1.746	0.736	1.010	1.1	1.1	1.0E-07	-9999.0	-9999.0	0.031	0.5	-9999.0	-9999.0
30.643	1.72	2.02	0.01	27.43	0.50	111.4	1.750	0.738	1.012	1.0	1.0	1.0E-07	-9999.0	-9999.0	0.018	0.5	-9999.0	-9999.0
30.708	1.00	1.31	0.01	28.50	0.76	111.4	1.754	0.740	1.013	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.774	1.00	1.32	0.01	29.07	0.76	111.4	1.757	0.742	1.015	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.840	1.00	1.32	0.01	29.57	0.76	111.4	1.761	0.744	1.016	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.905	1.08	1.41	0.01	30.12	0.71	111.4	1.764	0.746	1.018	0.7	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.971	1.00	1.33	0.01	30.60	0.75	111.4	1.768	0.748	1.020	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
31.036	1.00	1.34	0.01	30.85	0.75	111.4	1.772	0.750	1.021	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
31.102	1.00	1.33	0.01	30.46	0.75	111.4	1.775	0.753	1.023	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
31.168	1.00	1.33	0.01	30.58	0.75	111.4	1.779	0.755	1.025	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
31.233	1.00	1.33	0.01	30.70	0.75	111.4	1.783	0.757	1.026	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
31.299	1.00	1.33	0.01	30.56	0.75	111.4	1.786	0.759	1.028	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
31.364	1.00	1.32	0.01	29.86	0.76	111.4	1.790	0.761	1.029	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
31.430	1.53	1.86	0.01	29.96	0.54	111.4	1.794	0.763	1.031	0.9	0.9	1.0E-07	-9999.0	-9999.0	0.004	0.5	-9999.0	-9999.0
31.496	1.91	2.23	0.01	29.19	0.45	111.4	1.797	0.765	1.033	1.1	1.1	1.0E-07	-9999.0	-9999.0	0.029	0.5	-9999.0	-9999.0
31.561	2.69	2.99	0.01	28.01	0.34	111.4	1.801	0.767	1.034	1.4	1.4	1.0E-07	-9999.0	-9999.0	0.079	0.5	-9999.0	-9999.0
31.627	2.24	2.53	0.01	27.51	0.40	111.4	1.805	0.769	1.036	1.2	1.2	1.0E-07	-9999.0	-9999.0	0.049	0.5	-9999.0	-9999.0
31.693	1.53	1.84	0.01	27.93	0.55	111.4	1.808	0.771	1.037	0.9	0.9	1.0E-07	-9999.0	-9999.0	0.002	0.5	-9999.0	-9999.0
31.758	1.00	1.22	0.01	19.75	0.82	111.4	1.812	0.773	1.039	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
31.824	1.00	1.27	0.01	24.87	0.79	111.4	1.816	0.775	1.041	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
31.889	1.00	1.31	0.01	28.01	0.77	111.4	1.819	0.777	1.042	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
31.955	1.00	1.32	0.01	29.84	0.76	111.4	1.823	0.779	1.044	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
32.021	1.00	1.34	0.01	31.05	0.75	111.4	1.827	0.781	1.045	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
32.086	1.00	1.34	0.01	31.37	0.75	111.4	1.830	0.783	1.047	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
32.152	1.00	1.35	0.01	32.03	0.74	111.4	1.834	0.785	1.049	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
32.217	1.00	1.34	0.01	31.66	0.75	111.4	1.838	0.787	1.050	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
32.283	1.00	1.35	0.01	31.90	0.74	111.4	1.841	0.789	1.052	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
32.349	1.40	1.75	0.01	32.46	0.57	111.4	1.845	0.791	1.053	0.8	0.8	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
32.414	1.00	1.35	0.01	32.59	0.74	111.4	1.849	0.794	1.055	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
32.480	1.78	2.14	0.01	32.93	0.47	111.4	1.852	0.796	1.057	1.0	1.0	1.0E-07	-9999.0	-9999.0	0.019	0.5	-9999.0	-9999.0
32.546	1.00	1.35	0.01	31.88	0.74	111.4	1.856	0.798	1.058	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
32.611	1.00	1.33	0.01	30.60	0.75	111.4	1.860	0.800	1.060	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
32.677	1.53	1.86	0.01	30.19	0.54	111.4	1.863	0.802	1.061	0.9	0.9	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
32.742	1.00	1.35	0.01	32.38	0.74	111.4	1.867	0.804	1.063	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
32.808	1.00	1.37	0.01	33.95	0.73	111.4	1.870	0.806	1.065	0.7	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
32.874	1.00	1.38	0.01	34.54	0.73	111.4	1.874	0.808	1.066	0.7	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
32.939	1.00	1.37	0.01	34.38	0.73	111.4	1.878	0.810	1.068	0.7	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
33.005	1.34	1.71	0.01	33.97	0.59	111.4	1.881	0.812	1.069	0.8	0.8	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
33.070	1.00	1.37	0.01	33.97	0.73	111.4	1.885	0.814	1.071	0.7	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
33.136	1.00	1.38	0.01	35.22	0.72	111.4	1.889	0.816	1.073	0.7	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
33.202	1.00	1.40	0.01	36.62	0.72	111.4	1.892	0.818	1.074	0.7	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
33.267	2.30	2.70	0.01	37.12	0.37	111.4	1.896	0.820	1.076	1.3	1.2	1.0E-07	-9999.0	-9999.0	0.053	0.5	-9999.0	-9999.0
33.333	2.69	3.10	0.01	38.02	0.32	111.4	1.900	0.822	1.078	1.5	1.4	1.0E-07	-9999.0	-9999.0	0.080	0.5	-9999.0	-9999.0
33.399	3.45	3.88	0.15	39.55	3.88	111.4	1.903	0.824	1.079	3.7	3.6	5.0E-08	-9999.0	-9999.0	0.131	0.6	-9999.0	-9999.0
33.464	5.36	5.79	0.29	39.94	5.02	111.4	1.907	0.826	1.081	5.5	5.3	5.0E-08	-9999.0	-9999.0	0.259	0.8	-9999.0	-9999.0
33.530	10.61	11.04	0.42	40.04	3.81	111.4	1.911	0.828	1.082	10.6	10.2	5.0E-08	-9999.0	-9999.0	0.609	2.0	-9999.0	-9999.0
33.595	17.44	17.70	0.51	23.63	2.89	114.6	1.914	0.830	1.084	8.5	8.1	5.0E-06	-9999.0	-9999.0	1.052	4.4	-9999.0	-9999.0
33.661	18.27	18.70	0.62	38.99	3.32	114.6	1.918	0.832	1.086	9.0	8.6	5.0E-06	-9999.0	-9999.0	1.118	4.8	-9999.0	-9999.0
33.727	19.81	20.53	0.69	67.06	3.37	114.6	1.922	0.834	1.087	9.8	9.4	5.0E-06	-9999.0	-9999.0	1.241	5.6	-9999.0	-9999.0
33.792	18.85	19.64	0.71	73.36	3.62	114.6	1.926	0.837	1.089	12.5	12.0	5.0E-07	-9999.0	-9999.0	1.181	5.1	-9999.0	-9999.0
33.858	18.85	19.78	0.61	86.71	3.09	114.6	1.929	0.839	1.091	9.5	9.1	5.0E-06	-9999.0	-9999.0	1.190	5.2	-9999.0	-9999.0
33.923	18.52	19.53	0.54	92.74	2.77	114.6	1.933	0.841	1.093	9.4	8.9	5.0E-06	-9999.0	-9999.0	1.173	5.1	-9999.0	-9999.0
33.989	18.39	19.44	0.47	96.35	2.42	114.6	1.937	0.843	1.094	9.3	8.9	5.0E-06	-9999.0	-9999.0	1.167	5.0	-9999.0	-9999.0
34.055	17.76	18.86	0.44	101.11	2.34	114.6	1.941	0.845	1.096	9.0	8.6	5.0E-06	-9999.0	-9999.0	1.128	4.8	-9999.0	-9999.0
34.120	19.36	20.53	0.42	108.62	2.05	114.6	1.944	0.847	1.098	7.9	7.5	5.0E-05	30.0	32.0	1.239	5.5	-9999.0	-9999.0
34.186	20.70	21.94	0.38	114.76	1.74	114.6	1.948	0.849	1.099	8.4	8.0	5.0E-05	30.0	32.0	1.333	6.1	-9999.0	-9999.0
34.252	20.89	22.22	0.32	123.13	1.44	114.6	1.952	0.851	1.101	8.5	8.1	5.0E-05	30.0	32.0	1.351	6.2	-9999.0	-9999.0
34.317	22.75	24.00	0.28	116.12	1.17	114.6	1.956	0.853	1.103	9.2	8.8	5.0E-05	30.0	34.0	1.470	7.1	-9999.0	-9999.0
34.383	21.33	22.64	0.22	121.47	0.97	114.6	1.959	0.855	1.105	8.7	8.3	5.0E-05	30.0	32.0	1.379	6.4	-9999.0	-9999.0
34.448	19.68	21.00	0.21	122.58	1.00	114.6	1.963	0.857	1.106	8.0	7.6	5.0E-05	30.0	32.0	1.269	5.6	-9999.0	-9999.0
34.514	18.14	19.51	0.20	126.07	1.03	114.6	1.967	0.859	1.108	7.5	7.1	5.0E-05	30.0	32.0	1.169	4.9	-9999.0	-9999.0
34.580	18.59	20.10	0.19	140.22	0.95	114.6	1.971	0.861	1.110	7.7	7.3	5.0E-05	30.0	32.0	1.209	5.2	-9999.0	-9999.0
34.645	19.68	21.34	0.18	153.40	0.85	114.6	1.975	0.863	1.111	8.2	7.8	5.0E-05	30.0	32.0	1.291	5.7	-9999.0	-9999.0
34.711	18.46	20.10	0.32	151.50	1.60	114.6	1.978	0.865	1.113	7.7	7.3	5.0E-05	30.0	32.0	1.208	5.2	-9999.0	-9999.0
34.776	20.57	22.26	0.45	156.28	2.03	114.6	1.982	0.867	1.115	8.5	8.1	5.0E-05	30.0	32.0	1.352	6.1	-9999.0	-9999.0
34.842	21.53	23.19	0.55	153.08	2.38	114.6	1.986	0.869	1.116	8.9	8.4	5.0E-05	30.0	32.0	1.413	6.5	-9999.0	-9999.0
34.908	22.29	23.91	0.64	149.84	2.68	114.6	1.990	0.871	1.118	11.5	10.8	5.0E-06	-9999.0	-9999.0	1.462	6.9	-9999.0	-9999.0
34.973	21.97	23.58	0.66	148.87	2.81	114.6	1.993	0.873	1.120	11.3	10.7	5.0E-06	-9999.0	-9999.0	1.439	6.7	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
35.039	29.19	30.24	0.63	96.76	2.09	114.6	1.997	0.875	1.122	11.6	10.9	5.0E-05	30.7	34.0	1.883	10.0	-9999.0	-9999.0
35.105	27.03	28.22	0.72	110.79	2.56	114.6	2.001	0.878	1.123	10.8	10.2	5.0E-05	30.0	34.0	1.748	9.0	-9999.0	-9999.0
35.170	27.66	29.01	0.84	125.21	2.90	114.6	2.005	0.880	1.125	13.9	13.1	5.0E-06	-9999.0	-9999.0	1.800	9.4	-9999.0	-9999.0
35.236	29.38	30.99	0.93	148.78	3.01	114.6	2.008	0.882	1.127	14.8	14.0	5.0E-06	-9999.0	-9999.0	1.932	10.0	-9999.0	-9999.0
35.301	32.20	33.86	1.03	153.63	3.05	114.6	2.012	0.884	1.128	16.2	15.3	5.0E-06	-9999.0	-9999.0	2.123	10.0	-9999.0	-9999.0
35.367	32.45	33.97	1.12	140.91	3.30	114.6	2.016	0.886	1.130	16.3	15.3	5.0E-06	-9999.0	-9999.0	2.130	10.0	-9999.0	-9999.0
35.433	34.30	35.73	1.21	131.77	3.40	114.6	2.020	0.888	1.132	17.1	16.1	5.0E-06	-9999.0	-9999.0	2.247	10.0	-9999.0	-9999.0
35.498	33.47	34.88	1.47	130.64	4.22	114.6	2.023	0.890	1.134	22.3	20.9	5.0E-07	-9999.0	-9999.0	2.191	10.0	-9999.0	-9999.0
35.564	32.39	33.70	1.42	121.45	4.22	114.6	2.027	0.892	1.135	21.5	20.2	5.0E-07	-9999.0	-9999.0	2.112	10.0	-9999.0	-9999.0
35.629	29.13	30.37	1.29	114.60	4.26	114.6	2.031	0.894	1.137	19.4	18.2	5.0E-07	-9999.0	-9999.0	1.889	10.0	-9999.0	-9999.0
35.695	28.36	29.63	1.01	118.04	3.42	114.6	2.035	0.896	1.139	14.2	13.3	5.0E-06	-9999.0	-9999.0	1.840	9.6	-9999.0	-9999.0
35.761	25.81	27.07	0.85	116.00	3.15	114.6	2.038	0.898	1.140	13.0	12.1	5.0E-06	-9999.0	-9999.0	1.668	8.2	-9999.0	-9999.0
35.826	24.34	25.85	0.78	140.08	3.02	114.6	2.042	0.900	1.142	12.4	11.6	5.0E-06	-9999.0	-9999.0	1.587	7.6	-9999.0	-9999.0
35.892	24.08	25.66	0.79	146.29	3.09	114.6	2.046	0.902	1.144	12.3	11.5	5.0E-06	-9999.0	-9999.0	1.574	7.4	-9999.0	-9999.0
35.958	23.58	25.30	0.79	159.14	3.13	114.6	2.050	0.904	1.146	12.1	11.3	5.0E-06	-9999.0	-9999.0	1.550	7.2	-9999.0	-9999.0
36.023	22.81	24.56	0.75	162.03	3.06	114.6	2.053	0.906	1.147	11.8	11.0	5.0E-06	-9999.0	-9999.0	1.500	6.9	-9999.0	-9999.0
36.089	22.94	24.65	0.76	158.41	3.09	114.6	2.057	0.908	1.149	11.8	11.0	5.0E-06	-9999.0	-9999.0	1.506	6.9	-9999.0	-9999.0
36.154	24.02	25.49	0.84	136.41	3.30	114.6	2.061	0.910	1.151	12.2	11.4	5.0E-06	-9999.0	-9999.0	1.562	7.3	-9999.0	-9999.0
36.220	27.54	28.93	0.96	129.06	3.33	114.6	2.065	0.912	1.152	13.9	12.9	5.0E-06	-9999.0	-9999.0	1.791	9.0	-9999.0	-9999.0
36.286	26.19	27.55	0.89	125.09	3.24	114.6	2.069	0.914	1.154	13.2	12.3	5.0E-06	-9999.0	-9999.0	1.698	8.3	-9999.0	-9999.0
36.351	25.68	27.12	0.83	132.81	3.07	114.6	2.072	0.916	1.156	13.0	12.1	5.0E-06	-9999.0	-9999.0	1.670	8.0	-9999.0	-9999.0
36.417	25.04	26.34	0.80	120.29	3.04	114.6	2.076	0.918	1.158	12.6	11.7	5.0E-06	-9999.0	-9999.0	1.618	7.6	-9999.0	-9999.0
36.482	25.30	26.73	0.78	132.49	2.92	114.6	2.080	0.921	1.159	12.8	11.9	5.0E-06	-9999.0	-9999.0	1.644	7.8	-9999.0	-9999.0
36.548	24.34	26.01	0.77	154.44	2.97	114.6	2.084	0.923	1.161	12.5	11.6	5.0E-06	-9999.0	-9999.0	1.595	7.4	-9999.0	-9999.0
36.614	24.47	26.14	0.72	154.83	2.76	114.6	2.087	0.925	1.163	12.5	11.6	5.0E-06	-9999.0	-9999.0	1.604	7.5	-9999.0	-9999.0
36.679	24.28	25.83	0.66	143.52	2.56	114.6	2.091	0.927	1.164	9.9	9.2	5.0E-05	30.0	34.0	1.583	7.3	-9999.0	-9999.0
36.745	24.59	26.11	0.59	140.46	2.27	114.6	2.095	0.929	1.166	10.0	9.3	5.0E-05	30.0	34.0	1.601	7.4	-9999.0	-9999.0
36.811	23.07	24.60	0.52	142.24	2.12	114.6	2.099	0.931	1.168	9.4	8.7	5.0E-05	30.0	34.0	1.500	6.7	-9999.0	-9999.0
36.876	21.14	22.74	0.44	147.63	1.94	114.6	2.102	0.933	1.170	8.7	8.1	5.0E-05	30.0	32.0	1.376	5.8	-9999.0	-9999.0
36.942	21.14	22.77	0.34	151.11	1.50	114.6	2.106	0.935	1.171	8.7	8.1	5.0E-05	30.0	32.0	1.378	5.8	-9999.0	-9999.0
37.007	21.14	22.87	0.40	159.86	1.75	114.6	2.110	0.937	1.173	8.8	8.1	5.0E-05	30.0	32.0	1.384	5.9	-9999.0	-9999.0
37.073	20.12	21.89	0.40	164.36	1.83	114.6	2.114	0.939	1.175	8.4	7.7	5.0E-05	30.0	32.0	1.319	5.4	-9999.0	-9999.0
37.139	19.68	21.48	0.32	166.67	1.49	114.6	2.117	0.941	1.176	8.2	7.6	5.0E-05	30.0	32.0	1.291	5.2	-9999.0	-9999.0
37.204	20.95	22.72	0.27	163.86	1.19	114.6	2.121	0.943	1.178	8.7	8.0	5.0E-05	30.0	32.0	1.373	5.8	-9999.0	-9999.0
37.270	20.57	22.33	0.31	162.46	1.39	114.6	2.125	0.945	1.180	8.6	7.9	5.0E-05	30.0	32.0	1.347	5.6	-9999.0	-9999.0
37.336	19.55	21.40	0.32	171.84	1.50	114.6	2.129	0.947	1.181	8.2	7.5	5.0E-05	30.0	32.0	1.285	5.2	-9999.0	-9999.0
37.401	21.02	22.94	0.31	177.19	1.35	114.6	2.132	0.949	1.183	8.8	8.1	5.0E-05	30.0	32.0	1.387	5.8	-9999.0	-9999.0
37.467	19.36	21.25	0.30	174.82	1.42	114.6	2.136	0.951	1.185	8.1	7.5	5.0E-05	30.0	32.0	1.274	5.1	-9999.0	-9999.0
37.532	19.81	21.69	0.30	174.25	1.39	114.6	2.140	0.953	1.187	8.3	7.6	5.0E-05	30.0	32.0	1.303	5.3	-9999.0	-9999.0
37.598	20.57	22.45	0.31	174.47	1.38	114.6	2.144	0.955	1.188	8.6	7.9	5.0E-05	30.0	32.0	1.354	5.6	-9999.0	-9999.0
37.664	20.32	22.22	0.33	175.70	1.49	114.6	2.147	0.957	1.190	8.5	7.8	5.0E-05	30.0	32.0	1.338	5.4	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
37.729	20.12	22.03	0.35	177.13	1.59	114.6	2.151	0.959	1.192	8.4	7.7	5.0E-05	30.0	32.0	1.325	5.4	-9999.0	-9999.0
37.795	20.51	22.42	0.36	176.68	1.61	114.6	2.155	0.962	1.193	8.6	7.9	5.0E-05	30.0	32.0	1.351	5.5	-9999.0	-9999.0
37.860	19.93	21.82	0.37	175.12	1.70	114.6	2.159	0.964	1.195	8.4	7.6	5.0E-05	30.0	32.0	1.311	5.2	-9999.0	-9999.0
37.926	20.76	22.65	0.34	174.57	1.50	114.6	2.162	0.966	1.197	8.7	7.9	5.0E-05	30.0	32.0	1.366	5.6	-9999.0	-9999.0
37.992	20.06	21.93	0.19	172.83	0.87	117.7	2.166	0.968	1.199	7.0	6.4	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
38.057	20.57	22.40	0.39	169.12	1.75	114.6	2.170	0.970	1.200	8.6	7.8	5.0E-05	30.0	32.0	1.348	5.4	-9999.0	-9999.0
38.123	20.82	22.64	0.55	168.32	2.44	114.6	2.174	0.972	1.202	10.8	9.9	5.0E-06	-9999.0	-9999.0	1.364	5.5	-9999.0	-9999.0
38.189	19.61	21.45	0.62	170.10	2.90	114.6	2.178	0.974	1.204	10.3	9.4	5.0E-06	-9999.0	-9999.0	1.285	5.0	-9999.0	-9999.0
38.254	20.12	21.96	0.66	170.82	3.01	114.6	2.181	0.976	1.206	10.5	9.6	5.0E-06	-9999.0	-9999.0	1.319	5.2	-9999.0	-9999.0
38.320	25.68	27.02	0.73	123.37	2.71	114.6	2.185	0.978	1.207	12.9	11.8	5.0E-06	-9999.0	-9999.0	1.655	7.4	-9999.0	-9999.0
38.385	24.85	26.29	0.82	133.68	3.13	114.6	2.189	0.980	1.209	12.6	11.5	5.0E-06	-9999.0	-9999.0	1.607	7.1	-9999.0	-9999.0
38.451	24.08	25.60	0.86	141.30	3.37	114.6	2.193	0.982	1.211	12.3	11.1	5.0E-06	-9999.0	-9999.0	1.561	6.7	-9999.0	-9999.0
38.517	23.51	25.09	0.95	146.27	3.80	114.6	2.196	0.984	1.212	16.0	14.5	5.0E-07	-9999.0	-9999.0	1.526	6.5	-9999.0	-9999.0
38.582	25.68	27.36	1.04	154.91	3.81	114.6	2.200	0.986	1.214	13.1	11.9	5.0E-06	-9999.0	-9999.0	1.677	7.5	-9999.0	-9999.0
38.648	28.62	30.31	1.11	156.67	3.67	114.6	2.204	0.988	1.216	14.5	13.2	5.0E-06	-9999.0	-9999.0	1.874	8.9	-9999.0	-9999.0
38.713	35.33	36.88	1.12	144.00	3.04	114.6	2.208	0.990	1.218	17.7	16.0	5.0E-06	-9999.0	-9999.0	2.312	10.0	-9999.0	-9999.0
38.779	41.59	42.66	1.11	99.31	2.61	114.6	2.211	0.992	1.219	16.3	14.8	5.0E-05	39.4	36.0	2.697	10.0	148.9	3.490
38.845	44.34	44.82	1.09	44.70	2.44	114.6	2.215	0.994	1.221	17.2	15.5	5.0E-05	40.8	38.0	2.840	10.0	152.9	3.411
38.910	45.10	45.29	1.11	17.80	2.46	114.6	2.219	0.996	1.223	17.3	15.7	5.0E-05	41.1	38.0	2.872	10.0	153.8	3.395
38.976	43.32	43.43	1.06	10.22	2.45	114.6	2.223	0.998	1.224	16.6	15.0	5.0E-05	39.8	36.0	2.747	10.0	150.5	3.466
39.042	41.46	41.60	0.58	12.98	1.40	117.7	2.227	1.000	1.226	13.3	12.0	5.0E-04	38.6	36.0	-9999.0	-9999.0	147.2	3.537
39.107	43.18	43.29	0.58	9.44	1.34	117.7	2.230	1.002	1.228	13.8	12.5	5.0E-04	39.7	36.0	-9999.0	-9999.0	150.4	3.474
39.173	46.69	46.73	0.56	3.46	1.20	117.7	2.234	1.005	1.230	14.9	13.5	5.0E-04	41.9	38.0	-9999.0	-9999.0	156.6	3.351
39.238	47.66	47.63	0.50	-2.31	1.05	117.7	2.238	1.007	1.232	15.2	13.7	5.0E-04	42.4	38.0	-9999.0	-9999.0	158.2	3.322
39.304	47.33	47.31	0.39	-2.41	0.83	117.7	2.242	1.009	1.233	15.1	13.6	5.0E-04	42.2	38.0	-9999.0	-9999.0	157.7	3.334
39.370	48.23	48.36	0.26	12.37	0.54	120.9	2.246	1.011	1.235	11.6	10.4	5.0E-03	42.8	38.0	-9999.0	-9999.0	159.6	3.300
39.435	49.89	50.03	0.25	12.70	0.50	120.9	2.250	1.013	1.237	12.0	10.8	5.0E-03	43.8	38.0	-9999.0	-9999.0	162.5	3.248
39.501	52.90	53.01	0.33	10.33	0.62	120.9	2.254	1.015	1.239	12.7	11.4	5.0E-03	45.4	38.0	-9999.0	-9999.0	167.3	3.157
39.566	54.43	54.54	0.45	9.68	0.83	120.9	2.258	1.017	1.241	13.1	11.7	5.0E-03	46.2	38.0	-9999.0	-9999.0	169.8	3.114
39.632	56.28	56.38	0.65	9.18	1.16	117.7	2.262	1.019	1.243	18.0	16.1	5.0E-04	47.1	38.0	-9999.0	-9999.0	172.7	3.064
39.698	54.23	54.32	0.82	8.12	1.51	117.7	2.266	1.021	1.245	17.3	15.5	5.0E-04	46.0	38.0	-9999.0	-9999.0	169.6	3.123
39.763	50.66	50.73	0.95	6.11	1.88	117.7	2.269	1.023	1.246	16.2	14.5	5.0E-04	44.0	38.0	-9999.0	-9999.0	164.0	3.233
39.829	44.65	44.71	1.11	6.13	2.49	114.6	2.273	1.025	1.248	17.1	15.3	5.0E-05	40.4	38.0	2.829	10.0	153.8	3.440
39.895	39.93	40.02	1.02	8.34	2.56	114.6	2.277	1.027	1.250	15.3	13.7	5.0E-05	37.2	36.0	2.516	10.0	145.0	3.622
39.960	36.61	36.72	0.96	10.69	2.62	114.6	2.281	1.029	1.252	14.1	12.6	5.0E-05	34.7	36.0	2.296	10.0	138.2	3.763
40.026	32.20	32.39	0.94	17.95	2.91	114.6	2.285	1.031	1.253	15.5	13.9	5.0E-06	-9999.0	-9999.0	2.007	9.5	-9999.0	-9999.0
40.091	30.15	30.43	0.98	25.36	3.23	114.6	2.288	1.033	1.255	14.6	13.0	5.0E-06	-9999.0	-9999.0	1.876	8.5	-9999.0	-9999.0
40.157	25.42	25.83	1.21	37.49	4.70	111.4	2.292	1.035	1.257	24.7	22.1	5.0E-08	-9999.0	-9999.0	1.569	6.4	-9999.0	-9999.0
40.223	23.58	24.10	1.19	48.12	4.95	111.4	2.296	1.037	1.258	23.1	20.6	5.0E-08	-9999.0	-9999.0	1.453	5.7	-9999.0	-9999.0
40.288	23.38	24.07	1.20	64.57	5.00	111.4	2.299	1.039	1.260	23.1	20.5	5.0E-08	-9999.0	-9999.0	1.452	5.6	-9999.0	-9999.0
40.354	25.61	26.46	1.23	78.26	4.66	111.4	2.303	1.041	1.262	25.3	22.6	5.0E-08	-9999.0	-9999.0	1.610	6.6	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
40.419	31.56	32.33	1.21	71.62	3.75	114.6	2.307	1.043	1.263	15.5	13.8	5.0E-06	-9999.0	-9999.0	2.002	9.3	-9999.0	-9999.0
40.485	38.71	39.34	1.18	58.23	3.01	114.6	2.310	1.046	1.265	15.1	13.4	5.0E-05	36.5	36.0	2.469	10.0	144.1	3.664
40.551	45.16	45.50	1.24	31.82	2.73	114.6	2.314	1.048	1.267	17.4	15.5	5.0E-05	40.7	38.0	2.879	10.0	156.0	3.428
40.616	47.33	47.42	1.22	7.50	2.58	114.6	2.318	1.050	1.268	18.2	16.1	5.0E-05	41.9	38.0	3.007	10.0	159.4	3.362
40.682	48.49	48.63	1.25	13.00	2.58	114.6	2.322	1.052	1.270	18.6	16.5	5.0E-05	42.6	38.0	3.087	10.0	161.6	3.323
40.748	48.49	48.57	1.33	7.72	2.74	114.6	2.325	1.054	1.272	18.6	16.5	5.0E-05	42.5	38.0	3.083	10.0	161.5	3.326
40.813	46.57	46.63	1.19	5.35	2.56	114.6	2.329	1.056	1.274	17.9	15.8	5.0E-05	41.3	38.0	2.953	10.0	158.3	3.394
40.879	42.03	42.06	1.16	2.27	2.76	114.6	2.333	1.058	1.275	16.1	14.3	5.0E-05	38.3	36.0	2.648	10.0	149.9	3.564
40.944	36.80	36.82	1.08	1.76	2.94	114.6	2.337	1.060	1.277	14.1	12.5	5.0E-05	34.5	36.0	2.299	10.0	139.2	3.782
41.010	30.40	30.52	1.01	10.71	3.32	114.6	2.341	1.062	1.279	14.6	12.9	5.0E-06	-9999.0	-9999.0	1.879	8.3	-9999.0	-9999.0
41.076	25.87	26.04	1.15	15.25	4.43	114.6	2.344	1.064	1.280	16.6	14.7	5.0E-07	-9999.0	-9999.0	1.580	6.3	-9999.0	-9999.0
41.141	22.42	22.72	1.06	26.90	4.68	111.4	2.348	1.066	1.282	21.8	19.2	5.0E-08	-9999.0	-9999.0	1.358	5.0	-9999.0	-9999.0
41.207	20.19	20.80	1.08	56.33	5.21	111.4	2.352	1.068	1.284	19.9	17.6	5.0E-08	-9999.0	-9999.0	1.230	4.3	-9999.0	-9999.0
41.272	21.33	22.28	0.83	88.18	3.73	114.6	2.355	1.070	1.285	14.2	12.6	5.0E-07	-9999.0	-9999.0	1.329	4.8	-9999.0	-9999.0
41.338	23.58	24.69	1.06	102.85	4.30	114.6	2.359	1.072	1.287	15.8	13.9	5.0E-07	-9999.0	-9999.0	1.489	5.7	-9999.0	-9999.0
41.404	27.98	29.12	1.33	106.03	4.58	114.6	2.363	1.074	1.289	18.6	16.4	5.0E-07	-9999.0	-9999.0	1.784	7.5	-9999.0	-9999.0
41.469	32.13	32.91	1.51	72.59	4.60	114.6	2.367	1.076	1.290	21.0	18.5	5.0E-07	-9999.0	-9999.0	2.036	9.2	-9999.0	-9999.0
41.535	31.82	32.42	1.59	55.39	4.92	111.4	2.370	1.078	1.292	31.0	27.3	5.0E-08	-9999.0	-9999.0	2.003	9.0	-9999.0	-9999.0
41.601	38.07	38.30	1.61	20.70	4.21	114.6	2.374	1.080	1.294	24.4	21.5	5.0E-07	-9999.0	-9999.0	2.395	10.0	-9999.0	-9999.0
41.666	39.15	39.38	1.62	20.80	4.12	114.6	2.378	1.082	1.295	18.9	16.6	5.0E-06	-9999.0	-9999.0	2.467	10.0	-9999.0	-9999.0
41.732	37.69	37.98	1.37	26.27	3.62	114.6	2.382	1.084	1.297	18.2	16.0	5.0E-06	-9999.0	-9999.0	2.373	10.0	-9999.0	-9999.0
41.797	38.20	38.58	1.04	34.94	2.70	114.6	2.385	1.086	1.299	14.8	13.0	5.0E-05	35.6	36.0	2.413	10.0	143.7	3.726
41.863	37.31	37.69	0.93	35.22	2.47	114.6	2.389	1.089	1.301	14.4	12.7	5.0E-05	34.9	36.0	2.353	10.0	141.9	3.765
41.929	35.33	35.56	0.84	21.95	2.37	114.6	2.393	1.091	1.302	13.6	11.9	5.0E-05	33.2	34.0	2.211	10.0	137.3	3.860
41.994	30.66	30.93	0.75	24.32	2.43	114.6	2.397	1.093	1.304	11.8	10.4	5.0E-05	30.0	34.0	1.902	8.2	-9999.0	-9999.0
42.060	27.34	27.70	0.67	33.91	2.42	114.6	2.400	1.095	1.306	10.6	9.3	5.0E-05	30.0	34.0	1.687	6.7	-9999.0	-9999.0
42.125	23.26	23.77	0.70	47.17	2.95	114.6	2.404	1.097	1.307	11.4	10.0	5.0E-06	-9999.0	-9999.0	1.424	5.2	-9999.0	-9999.0
42.191	20.19	20.94	0.82	69.90	3.92	114.6	2.408	1.099	1.309	13.4	11.7	5.0E-07	-9999.0	-9999.0	1.236	4.2	-9999.0	-9999.0
42.257	20.70	21.69	0.94	91.69	4.34	114.6	2.412	1.101	1.311	13.8	12.1	5.0E-07	-9999.0	-9999.0	1.285	4.4	-9999.0	-9999.0
42.322	22.35	23.54	1.03	109.29	4.39	114.6	2.415	1.103	1.313	15.0	13.1	5.0E-07	-9999.0	-9999.0	1.408	5.1	-9999.0	-9999.0
42.388	27.98	29.21	1.10	113.81	3.78	114.6	2.419	1.105	1.314	14.0	12.2	5.0E-06	-9999.0	-9999.0	1.786	7.3	-9999.0	-9999.0
42.454	35.33	36.23	1.19	83.39	3.29	114.6	2.423	1.107	1.316	17.3	15.1	5.0E-06	-9999.0	-9999.0	2.254	10.0	-9999.0	-9999.0
42.519	43.51	44.12	1.27	56.43	2.89	114.6	2.427	1.109	1.318	16.9	14.7	5.0E-05	39.2	36.0	2.779	10.0	155.4	3.524
42.585	49.13	49.49	1.28	32.99	2.59	114.6	2.430	1.111	1.319	19.0	16.5	5.0E-05	42.5	38.0	3.137	10.0	165.1	3.337
42.650	52.77	52.92	1.25	13.82	2.37	114.6	2.434	1.113	1.321	20.3	17.6	5.0E-05	44.4	38.0	3.366	10.0	170.9	3.230
42.716	51.75	51.79	1.25	3.97	2.42	114.6	2.438	1.115	1.323	19.8	17.3	5.0E-05	43.8	38.0	3.290	10.0	169.2	3.266
42.782	51.81	51.84	1.29	3.46	2.49	114.6	2.442	1.117	1.324	19.9	17.3	5.0E-05	43.8	38.0	3.293	10.0	169.3	3.266
42.847	50.53	50.60	1.37	5.87	2.71	114.6	2.445	1.119	1.326	19.4	16.8	5.0E-05	43.1	38.0	3.210	10.0	167.3	3.307
42.913	49.83	49.90	1.44	6.50	2.89	114.6	2.449	1.121	1.328	19.1	16.6	5.0E-05	42.7	38.0	3.163	10.0	166.2	3.331
42.978	49.13	49.21	1.48	7.11	3.02	114.6	2.453	1.123	1.330	18.8	16.3	5.0E-05	42.2	38.0	3.117	10.0	165.1	3.355
43.044	47.20	47.31	1.52	10.20	3.22	114.6	2.457	1.125	1.331	18.1	15.7	5.0E-05	41.1	36.0	2.991	10.0	161.8	3.421

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
43.110	46.57	46.63	1.56	4.86	3.35	114.6	2.461	1.127	1.333	22.3	19.3	5.0E-06	-9999.0	-9999.0	2.944	10.0	-9999.0	-9999.0
43.175	42.54	42.60	1.56	5.15	3.67	114.6	2.464	1.129	1.335	20.4	17.7	5.0E-06	-9999.0	-9999.0	2.676	10.0	-9999.0	-9999.0
43.241	39.74	39.79	1.53	4.54	3.85	114.6	2.468	1.132	1.336	19.1	16.5	5.0E-06	-9999.0	-9999.0	2.488	10.0	-9999.0	-9999.0
43.307	37.05	37.12	1.49	6.26	4.02	114.6	2.472	1.134	1.338	17.8	15.4	5.0E-06	-9999.0	-9999.0	2.310	10.0	-9999.0	-9999.0
43.372	34.56	34.65	1.42	8.10	4.11	114.6	2.476	1.136	1.340	22.1	19.1	5.0E-07	-9999.0	-9999.0	2.145	9.5	-9999.0	-9999.0
43.438	36.22	36.33	1.28	10.35	3.53	114.6	2.479	1.138	1.342	17.4	15.0	5.0E-06	-9999.0	-9999.0	2.257	10.0	-9999.0	-9999.0
43.503	38.84	38.94	1.16	9.12	2.99	114.6	2.483	1.140	1.343	14.9	12.9	5.0E-05	35.4	36.0	2.431	10.0	146.0	3.750
43.569	43.95	44.01	1.04	5.55	2.37	114.6	2.487	1.142	1.345	16.9	14.5	5.0E-05	38.9	36.0	2.768	10.0	156.3	3.551
43.635	46.57	46.59	0.85	1.17	1.83	117.7	2.491	1.144	1.347	14.9	12.8	5.0E-04	40.5	36.0	-9999.0	-9999.0	161.2	3.459
43.700	45.74	45.74	0.63	0.18	1.38	117.7	2.494	1.146	1.349	14.6	12.6	5.0E-04	40.0	36.0	-9999.0	-9999.0	159.7	3.491
43.766	47.20	47.23	0.42	2.61	0.89	117.7	2.498	1.148	1.350	15.1	13.0	5.0E-04	40.9	36.0	-9999.0	-9999.0	162.5	3.440
43.831	46.76	46.77	0.36	1.06	0.77	117.7	2.502	1.150	1.352	14.9	12.8	5.0E-04	40.6	36.0	-9999.0	-9999.0	161.7	3.457
43.897	48.62	48.65	0.41	2.78	0.84	117.7	2.506	1.152	1.354	15.5	13.3	5.0E-04	41.7	38.0	-9999.0	-9999.0	165.1	3.395
43.963	46.12	46.15	0.49	2.88	1.06	117.7	2.510	1.154	1.356	14.7	12.7	5.0E-04	40.1	36.0	-9999.0	-9999.0	160.7	3.483
44.028	47.27	47.32	0.52	4.25	1.10	117.7	2.514	1.156	1.358	15.1	13.0	5.0E-04	40.8	36.0	-9999.0	-9999.0	162.9	3.443
44.094	48.93	48.98	0.46	4.42	0.94	117.7	2.518	1.158	1.359	15.6	13.4	5.0E-04	41.8	38.0	-9999.0	-9999.0	165.9	3.388
44.160	51.62	51.67	0.50	5.51	0.97	117.7	2.522	1.160	1.361	16.5	14.1	5.0E-04	43.3	38.0	-9999.0	-9999.0	170.7	3.302
44.225	55.06	55.10	0.54	3.62	0.98	117.7	2.525	1.162	1.363	17.6	15.1	5.0E-04	45.1	38.0	-9999.0	-9999.0	176.4	3.201
44.291	57.62	57.71	0.56	8.32	0.97	120.9	2.529	1.164	1.365	13.8	11.8	5.0E-03	46.4	38.0	-9999.0	-9999.0	180.6	3.129
44.356	62.28	62.39	0.56	10.10	0.90	120.9	2.533	1.166	1.367	14.9	12.8	5.0E-03	48.7	38.0	-9999.0	-9999.0	187.8	3.009
44.422	67.26	67.39	0.59	11.65	0.88	120.9	2.537	1.168	1.369	16.1	13.8	5.0E-03	50.8	38.0	-9999.0	-9999.0	195.2	2.896
44.488	74.36	74.51	0.71	13.61	0.96	120.9	2.541	1.170	1.371	17.8	15.2	5.0E-03	53.7	40.0	-9999.0	-9999.0	205.3	2.756
44.553	86.88	87.06	0.42	16.41	0.48	120.9	2.545	1.173	1.373	20.8	17.8	5.0E-03	58.1	40.0	-9999.0	-9999.0	223.0	2.562
44.619	102.79	103.00	0.24	19.24	0.23	124.1	2.549	1.175	1.375	19.7	16.8	5.0E-02	62.9	40.0	-9999.0	-9999.0	245.9	2.388
44.684	120.03	120.24	0.32	19.56	0.27	124.1	2.553	1.177	1.377	23.0	19.6	5.0E-02	67.4	42.0	-9999.0	-9999.0	271.7	2.259
44.750	153.25	153.43	0.35	16.45	0.23	124.1	2.557	1.179	1.379	29.4	25.0	5.0E-02	74.3	42.0	-9999.0	-9999.0	320.9	2.092
44.816	204.36	204.43	0.31	6.81	0.15	127.3	2.561	1.181	1.381	32.6	27.8	5.0E+00	82.5	44.0	-9999.0	-9999.0	396.4	1.939
44.881	240.70	240.77	0.31	6.28	0.13	127.3	2.566	1.183	1.383	38.4	32.7	5.0E+00	87.2	44.0	-9999.0	-9999.0	-9999.0	-9999.0
44.947	261.72	261.91	0.39	16.71	0.15	127.3	2.570	1.185	1.385	41.8	35.5	5.0E+00	89.6	44.0	-9999.0	-9999.0	-9999.0	-9999.0
45.013	265.81	265.93	0.39	10.29	0.15	127.3	2.574	1.187	1.387	42.4	36.0	5.0E+00	90.0	44.0	-9999.0	-9999.0	-9999.0	-9999.0
45.078	252.84	252.96	0.31	10.79	0.12	127.3	2.578	1.189	1.389	40.4	34.3	5.0E+00	88.5	44.0	-9999.0	-9999.0	-9999.0	-9999.0
45.144	247.29	247.45	0.41	14.78	0.17	127.3	2.582	1.191	1.391	39.5	33.5	5.0E+00	87.9	44.0	-9999.0	-9999.0	-9999.0	-9999.0
45.209	220.91	221.01	0.75	10.08	0.34	124.1	2.586	1.193	1.393	42.3	35.9	5.0E-02	84.6	44.0	-9999.0	-9999.0	432.6	1.958
45.275	206.08	206.15	0.95	6.09	0.46	124.1	2.591	1.195	1.395	39.5	33.4	5.0E-02	82.6	44.0	-9999.0	-9999.0	400.0	1.940
45.341	195.41	195.51	0.69	8.46	0.35	124.1	2.595	1.197	1.398	37.4	31.7	5.0E-02	81.1	44.0	-9999.0	-9999.0	382.0	1.954
45.406	177.65	177.87	0.70	20.23	0.39	124.1	2.599	1.199	1.400	34.1	28.8	5.0E-02	78.3	44.0	-9999.0	-9999.0	356.4	2.004
45.472	168.39	168.49	0.67	9.01	0.40	124.1	2.603	1.201	1.402	32.3	27.3	5.0E-02	76.8	42.0	-9999.0	-9999.0	343.6	2.039
45.538	176.76	176.90	0.32	12.98	0.18	124.1	2.607	1.203	1.404	33.9	28.6	5.0E-02	78.1	44.0	-9999.0	-9999.0	355.3	2.009
45.603	172.42	172.63	0.33	19.34	0.19	124.1	2.611	1.205	1.406	33.1	27.9	5.0E-02	77.4	42.0	-9999.0	-9999.0	349.6	2.025
45.669	174.14	174.26	0.28	11.02	0.16	124.1	2.615	1.207	1.408	33.4	28.1	5.0E-02	77.7	42.0	-9999.0	-9999.0	351.9	2.020
45.734	176.32	176.57	0.28	23.59	0.16	124.1	2.619	1.209	1.410	33.8	28.5	5.0E-02	78.0	42.0	-9999.0	-9999.0	355.3	2.012

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
45.800	177.08	177.17	0.28	8.50	0.16	124.1	2.623	1.211	1.412	33.9	28.6	5.0E-02	78.1	42.0	-9999.0	-9999.0	356.2	2.011
45.866	162.97	163.29	0.16	30.12	0.10	124.1	2.627	1.213	1.414	31.3	26.3	5.0E-02	75.7	42.0	-9999.0	-9999.0	337.1	2.064
45.931	160.79	160.93	0.27	12.88	0.17	124.1	2.631	1.216	1.416	30.8	25.9	5.0E-02	75.3	42.0	-9999.0	-9999.0	333.9	2.075
45.997	160.22	160.41	0.61	17.74	0.38	124.1	2.635	1.218	1.418	30.7	25.8	5.0E-02	75.2	42.0	-9999.0	-9999.0	333.3	2.078
46.062	170.18	170.45	0.43	24.59	0.25	124.1	2.639	1.220	1.420	32.6	27.4	5.0E-02	76.9	42.0	-9999.0	-9999.0	347.4	2.038
46.128	181.87	182.04	0.66	15.64	0.36	124.1	2.643	1.222	1.422	34.9	29.2	5.0E-02	78.8	44.0	-9999.0	-9999.0	363.7	1.998
46.194	198.16	198.29	0.72	11.61	0.36	124.1	2.648	1.224	1.424	38.0	31.8	5.0E-02	81.2	44.0	-9999.0	-9999.0	387.7	1.955
46.259	224.48	224.62	1.09	12.51	0.49	124.1	2.652	1.226	1.426	43.0	36.0	5.0E-02	84.8	44.0	-9999.0	-9999.0	441.1	1.964
46.325	252.90	253.81	2.04	83.99	0.81	124.1	2.656	1.228	1.428	48.6	40.7	5.0E-02	88.2	44.0	-9999.0	-9999.0	-9999.0	-9999.0
46.391	268.05	268.19	2.40	12.64	0.89	124.1	2.660	1.230	1.430	51.4	43.0	5.0E-02	89.8	44.0	-9999.0	-9999.0	-9999.0	-9999.0
46.456	292.13	292.40	4.00	24.75	1.37	124.1	2.664	1.232	1.432	56.0	46.8	5.0E-02	92.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0
46.522	308.10	308.36	5.15	24.08	1.67	120.9	2.668	1.234	1.434	73.8	61.7	5.0E-03	93.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0
46.587	330.97	331.48	4.82	46.87	1.45	124.1	2.672	1.236	1.436	63.5	53.0	5.0E-02	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
46.653	336.72	337.16	0.01	41.33	0.00	127.3	2.676	1.238	1.438	53.8	44.9	5.0E+00	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
46.719	297.62	298.60	0.01	90.36	0.00	127.3	2.680	1.240	1.440	47.7	39.7	5.0E+00	92.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0
46.784	320.24	321.00	0.01	70.75	0.00	127.3	2.684	1.242	1.442	51.2	42.7	5.0E+00	94.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0
46.850	333.59	334.03	0.01	40.53	0.00	127.3	2.689	1.244	1.444	53.3	44.4	5.0E+00	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
46.915	451.00	451.27	0.01	24.73	0.00	127.3	2.693	1.246	1.446	72.0	59.9	5.0E+00	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0

Gregg In Situ, Inc. - CPT Interpretation

Interpretation Output - Release	1.20I
Run No:	04-0524-0703-3622
Job No:	04-073SC
Client:	MACTEC
Project:	TVA Bull Run Ash Disposal Facility
Site:	CPT-03
Location:	TVA Bull Run
Cone:	H. Bankayal
CPT Date:	04/20/05
CPT Time:	10:28
CPT File:	073CP03.COR
Northing (m):	0.000000
Easting (m):	0.000000
Elevation (m):	0.000000

Water Table (m):	3.96	(ft):	13.0
Unit Weight of Water (default):	62.40 pcf		
Averaging Increment (m):	0.0 (Every Data Point)		
Phi Method :	Robertson and Campanella, 1983		
Su Nkt used:	15.00	Su/P' (nc):	0.30
Dr Method :	Jamiolkowski - All Sands		
State Parameter M:	1.20		

Used Unit Weights Assigned to Soil Zones

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
0.066	11.76	11.88	0.10	11.02	0.84	114.6	0.004	0.000	0.004	4.5	9.1	5.0E-05	85.6	50.0	0.792	10.0	-9999.0	-9999.0
0.131	15.21	15.24	0.12	3.08	0.79	114.6	0.008	0.000	0.008	5.8	11.7	5.0E-05	82.8	50.0	1.016	10.0	-9999.0	-9999.0
0.197	24.47	24.50	0.16	2.80	0.65	117.7	0.011	0.000	0.011	7.8	15.6	5.0E-04	90.6	50.0	-9999.0	-9999.0	74.4	3.038
0.262	29.58	29.62	0.23	3.62	0.78	117.7	0.015	0.000	0.015	9.5	18.9	5.0E-04	91.8	50.0	-9999.0	-9999.0	81.6	2.756
0.328	35.27	35.30	0.27	3.46	0.77	117.7	0.019	0.000	0.019	11.3	22.5	5.0E-04	93.6	50.0	-9999.0	-9999.0	89.1	2.525
0.394	42.41	42.44	0.31	2.68	0.73	117.7	0.023	0.000	0.023	13.5	27.1	5.0E-04	95.0	50.0	-9999.0	-9999.0	98.6	2.323
0.459	48.93	48.97	0.36	3.74	0.74	120.9	0.027	0.000	0.027	11.7	23.4	5.0E-03	95.0	50.0	-9999.0	-9999.0	107.7	2.199
0.525	55.13	55.19	0.43	4.82	0.78	120.9	0.031	0.000	0.031	13.2	26.4	5.0E-03	95.0	50.0	-9999.0	-9999.0	116.6	2.113
0.591	59.80	59.89	0.58	8.48	0.97	120.9	0.035	0.000	0.035	14.3	28.7	5.0E-03	95.0	50.0	-9999.0	-9999.0	123.4	2.061
0.656	67.01	67.07	0.70	5.75	1.05	120.9	0.039	0.000	0.039	16.1	32.1	5.0E-03	95.0	50.0	-9999.0	-9999.0	133.7	1.994
0.722	78.32	78.39	0.98	6.72	1.25	120.9	0.043	0.000	0.043	18.8	37.5	5.0E-03	95.0	50.0	-9999.0	-9999.0	149.8	1.911
0.787	98.82	98.93	1.19	10.37	1.21	120.9	0.047	0.000	0.047	23.7	47.4	5.0E-03	95.0	50.0	-9999.0	-9999.0	191.8	1.939
0.853	117.99	118.13	1.39	13.55	1.18	120.9	0.051	0.000	0.051	28.3	56.6	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.919	132.81	132.92	1.62	10.16	1.22	120.9	0.055	0.000	0.055	31.8	63.6	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.984	144.31	144.43	1.74	11.16	1.21	120.9	0.059	0.000	0.059	34.6	69.2	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.050	147.89	148.00	1.83	10.63	1.24	120.9	0.063	0.000	0.063	35.4	70.9	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.115	153.63	153.80	2.02	15.17	1.32	120.9	0.067	0.000	0.067	36.8	73.6	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.181	159.20	159.38	2.55	17.11	1.60	120.9	0.070	0.000	0.070	38.2	76.3	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.247	162.57	162.66	2.92	8.00	1.79	120.9	0.074	0.000	0.074	38.9	77.9	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.312	165.01	165.12	2.79	10.22	1.69	120.9	0.078	0.000	0.078	39.5	79.1	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.378	169.41	169.47	2.80	5.75	1.65	120.9	0.082	0.000	0.082	40.6	81.1	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.444	169.99	170.08	2.77	8.24	1.63	120.9	0.086	0.000	0.086	40.7	81.4	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.509	167.37	167.43	3.40	5.87	2.03	117.7	0.090	0.000	0.090	53.4	106.9	5.0E-04	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.575	161.94	162.25	3.71	28.23	2.29	117.7	0.094	0.000	0.094	51.8	103.6	5.0E-04	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.640	171.14	171.19	3.70	4.66	2.16	117.7	0.098	0.000	0.098	54.6	109.3	5.0E-04	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.706	170.11	170.58	3.55	43.60	2.08	117.7	0.102	0.000	0.102	54.5	108.9	5.0E-04	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.772	156.13	156.38	3.49	23.51	2.23	117.7	0.106	0.000	0.106	49.9	99.8	5.0E-04	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.837	155.68	156.04	3.33	33.22	2.13	117.7	0.110	0.000	0.110	49.8	99.6	5.0E-04	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.903	156.51	156.82	3.27	28.96	2.08	117.7	0.113	0.000	0.113	50.1	100.1	5.0E-04	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.968	159.13	159.54	3.07	38.12	1.92	120.9	0.117	0.000	0.117	38.2	76.4	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.034	156.32	156.59	2.65	25.18	1.69	120.9	0.121	0.000	0.121	37.5	75.0	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.100	157.53	157.85	2.47	29.80	1.56	120.9	0.125	0.000	0.125	37.8	75.6	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.165	157.85	158.14	2.34	26.74	1.48	120.9	0.129	0.000	0.129	37.9	75.7	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.231	159.20	159.43	2.14	21.87	1.34	120.9	0.133	0.000	0.133	38.2	76.3	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.297	161.68	161.97	2.07	26.23	1.27	120.9	0.137	0.000	0.137	38.8	77.6	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.362	166.28	166.55	1.95	24.59	1.17	124.1	0.141	0.000	0.141	31.9	63.8	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.428	165.71	166.07	1.86	33.15	1.12	124.1	0.145	0.000	0.145	31.8	63.6	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.493	166.28	166.54	2.24	23.90	1.34	120.9	0.149	0.000	0.149	39.9	79.7	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.559	163.99	164.32	2.38	31.07	1.45	120.9	0.153	0.000	0.153	39.3	78.7	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.625	164.37	164.47	2.35	9.24	1.43	120.9	0.157	0.000	0.157	39.4	78.8	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.690	164.30	164.38	2.50	7.50	1.52	120.9	0.161	0.000	0.161	39.4	78.7	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.756	158.42	158.45	2.89	2.76	1.82	120.9	0.165	0.000	0.165	37.9	75.9	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.821	144.50	144.62	2.76	11.04	1.91	117.7	0.169	0.000	0.169	46.2	92.3	5.0E-04	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.887	143.29	143.68	2.82	36.26	1.96	117.7	0.173	0.000	0.173	45.9	91.7	5.0E-04	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.953	137.47	137.62	2.80	13.16	2.03	117.7	0.177	0.000	0.177	43.9	87.9	5.0E-04	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.018	127.25	127.67	2.68	38.89	2.10	117.7	0.181	0.000	0.181	40.8	81.5	5.0E-04	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.084	116.39	116.71	2.69	29.27	2.30	117.7	0.185	0.000	0.185	37.3	74.5	5.0E-04	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.150	108.47	109.09	2.63	56.84	2.41	117.7	0.188	0.000	0.188	34.8	69.6	5.0E-04	93.1	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.215	106.43	106.67	2.30	22.38	2.15	117.7	0.192	0.000	0.192	34.1	68.1	5.0E-04	92.1	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.281	102.85	103.05	1.92	18.94	1.87	117.7	0.196	0.000	0.196	32.9	65.8	5.0E-04	90.9	48.0	-9999.0	-9999.0	207.0	2.009
3.346	101.07	101.30	1.66	21.65	1.64	117.7	0.200	0.000	0.200	32.3	64.7	5.0E-04	90.1	48.0	-9999.0	-9999.0	200.1	1.975

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
3.412	93.72	94.01	1.64	27.04	1.75	117.7	0.204	0.000	0.204	30.0	60.0	5.0E-04	87.7	48.0	-9999.0	-9999.0	178.0	1.893
3.478	91.22	91.42	1.64	18.56	1.80	117.7	0.208	0.000	0.208	29.2	58.4	5.0E-04	86.6	48.0	-9999.0	-9999.0	172.1	1.882
3.543	92.43	92.63	1.61	17.70	1.74	117.7	0.212	0.000	0.212	29.6	59.1	5.0E-04	86.7	48.0	-9999.0	-9999.0	174.7	1.886
3.609	92.69	92.85	1.45	13.94	1.57	117.7	0.215	0.000	0.215	29.6	59.3	5.0E-04	86.5	48.0	-9999.0	-9999.0	175.2	1.887
3.674	88.74	88.88	1.30	13.04	1.47	120.9	0.219	0.000	0.219	21.3	42.6	5.0E-03	85.0	48.0	-9999.0	-9999.0	166.9	1.878
3.740	84.58	85.02	1.34	41.04	1.58	117.7	0.223	0.000	0.223	27.1	54.3	5.0E-04	83.5	48.0	-9999.0	-9999.0	160.1	1.883
3.806	78.26	78.56	1.35	27.73	1.72	117.7	0.227	0.000	0.227	25.1	50.2	5.0E-04	81.0	48.0	-9999.0	-9999.0	150.1	1.910
3.871	75.06	75.20	1.40	12.49	1.87	117.7	0.231	0.000	0.231	24.0	48.0	5.0E-04	79.5	48.0	-9999.0	-9999.0	145.2	1.931
3.937	71.23	71.41	1.41	16.37	1.98	117.7	0.235	0.000	0.235	22.8	45.6	5.0E-04	77.8	46.0	-9999.0	-9999.0	139.9	1.959
4.003	64.72	64.88	1.25	14.72	1.93	117.7	0.239	0.000	0.239	20.7	41.4	5.0E-04	74.8	46.0	-9999.0	-9999.0	130.6	2.013
4.068	62.98	63.14	1.17	14.92	1.86	117.7	0.243	0.000	0.243	20.2	40.3	5.0E-04	73.8	46.0	-9999.0	-9999.0	128.1	2.029
4.134	63.37	63.52	1.06	13.92	1.67	117.7	0.246	0.000	0.246	20.3	40.6	5.0E-04	73.7	46.0	-9999.0	-9999.0	128.7	2.025
4.199	57.18	57.27	0.97	8.75	1.70	117.7	0.250	0.000	0.250	18.3	36.5	5.0E-04	70.5	46.0	-9999.0	-9999.0	119.6	2.088
4.265	55.00	55.07	0.84	6.36	1.53	117.7	0.254	0.000	0.254	17.6	34.9	5.0E-04	69.2	46.0	-9999.0	-9999.0	116.4	2.114
4.331	50.85	50.92	0.76	5.73	1.50	117.7	0.258	0.000	0.258	16.3	32.0	5.0E-04	66.7	46.0	-9999.0	-9999.0	110.4	2.169
4.396	44.91	44.98	0.64	6.64	1.43	117.7	0.262	0.000	0.262	14.4	28.1	5.0E-04	63.0	44.0	-9999.0	-9999.0	102.2	2.271
4.462	39.29	39.33	0.48	4.60	1.22	117.7	0.266	0.000	0.266	12.6	24.4	5.0E-04	58.9	44.0	-9999.0	-9999.0	94.8	2.411
4.528	34.62	34.66	0.56	3.08	1.62	114.6	0.270	0.000	0.270	13.3	25.6	5.0E-05	55.1	44.0	2.293	10.0	89.0	2.568
4.593	33.41	33.42	0.62	1.10	1.86	114.6	0.273	0.000	0.273	12.8	24.5	5.0E-05	53.8	42.0	2.210	10.0	87.7	2.623
4.659	33.79	33.81	0.57	1.35	1.69	114.6	0.277	0.000	0.277	13.0	24.6	5.0E-05	54.0	42.0	2.235	10.0	88.5	2.617
4.724	33.79	33.78	0.53	-0.94	1.57	114.6	0.281	0.000	0.281	12.9	24.4	5.0E-05	53.7	42.0	2.233	10.0	88.7	2.627
4.790	28.56	28.57	0.53	0.65	1.86	114.6	0.285	0.000	0.285	10.9	20.5	5.0E-05	48.7	42.0	1.885	10.0	82.0	2.871
4.856	26.51	26.51	0.54	-0.83	2.04	114.6	0.288	0.000	0.288	10.2	18.9	5.0E-05	46.4	42.0	1.748	10.0	79.4	2.994
4.921	24.85	24.85	0.52	-0.45	2.10	114.6	0.292	0.000	0.292	9.5	17.6	5.0E-05	44.4	42.0	1.637	10.0	77.1	3.104
4.987	23.70	23.70	0.45	-0.18	1.90	114.6	0.296	0.000	0.296	9.1	16.7	5.0E-05	42.8	42.0	1.560	10.0	75.6	3.188
5.052	24.08	24.09	0.35	0.77	1.46	114.6	0.300	0.000	0.300	9.2	16.9	5.0E-05	43.1	42.0	1.586	10.0	76.4	3.172
5.118	23.64	23.64	0.29	0.18	1.23	114.6	0.303	0.000	0.303	9.1	16.4	5.0E-05	42.4	40.0	1.556	10.0	75.9	3.212
5.184	23.83	23.85	0.32	1.62	1.35	114.6	0.307	0.000	0.307	9.1	16.5	5.0E-05	42.5	40.0	1.569	10.0	76.5	3.208
5.249	22.94	22.94	0.27	0.26	1.18	114.6	0.311	0.000	0.311	8.8	15.8	5.0E-05	41.2	40.0	1.508	10.0	75.2	3.279
5.315	22.29	22.31	0.28	1.27	1.26	114.6	0.315	0.000	0.315	8.5	15.2	5.0E-05	40.2	40.0	1.466	10.0	74.4	3.333
5.381	22.16	22.22	0.14	4.90	0.63	117.7	0.319	0.000	0.319	7.1	12.6	5.0E-04	39.9	40.0	-9999.0	-9999.0	74.4	3.349
5.446	22.23	22.27	0.16	3.76	0.72	117.7	0.322	0.000	0.322	7.1	12.5	5.0E-04	39.8	40.0	-9999.0	-9999.0	74.7	3.355
5.512	21.40	21.41	0.16	0.98	0.75	117.7	0.326	0.000	0.326	6.8	12.0	5.0E-04	38.5	40.0	-9999.0	-9999.0	73.4	3.427
5.577	21.46	21.47	0.17	0.55	0.79	117.7	0.330	0.000	0.330	6.9	11.9	5.0E-04	38.4	40.0	-9999.0	-9999.0	73.7	3.432
5.643	21.27	21.27	0.18	-0.39	0.85	114.6	0.334	0.000	0.334	8.1	14.1	5.0E-05	38.0	40.0	1.396	10.0	73.5	3.456
5.709	19.17	19.17	0.18	0.06	0.94	114.6	0.338	0.000	0.338	7.3	12.6	5.0E-05	34.9	40.0	1.255	10.0	69.6	3.630
5.774	19.93	19.93	0.19	0.26	0.96	114.6	0.341	0.000	0.341	7.6	13.1	5.0E-05	35.8	40.0	1.306	10.0	71.3	3.577
5.840	19.55	19.54	0.19	-0.26	0.97	114.6	0.345	0.000	0.345	7.5	12.7	5.0E-05	35.1	40.0	1.280	10.0	70.7	3.616
5.905	19.61	19.61	0.19	0.12	0.97	114.6	0.349	0.000	0.349	7.5	12.7	5.0E-05	35.0	40.0	1.284	10.0	71.0	3.620
5.971	19.04	19.05	0.19	1.12	1.00	114.6	0.353	0.000	0.353	7.3	12.3	5.0E-05	34.1	40.0	1.246	10.0	70.0	3.673
6.037	19.30	19.30	0.19	0.53	0.99	114.6	0.356	0.000	0.356	7.4	12.4	5.0E-05	34.3	40.0	1.263	10.0	70.7	3.661
6.102	18.20	18.20	0.19	-0.33	1.05	114.6	0.360	0.000	0.360	7.0	11.6	5.0E-05	32.5	38.0	1.189	10.0	-9999.0	-9999.0
6.168	17.12	17.12	0.18	-0.24	1.05	114.6	0.364	0.000	0.364	6.6	10.9	5.0E-05	30.5	38.0	1.117	10.0	-9999.0	-9999.0
6.234	17.18	17.18	0.19	0.04	1.11	114.6	0.368	0.000	0.368	6.6	10.9	5.0E-05	30.5	38.0	1.121	10.0	-9999.0	-9999.0
6.299	15.21	15.20	0.21	-0.59	1.38	114.6	0.372	0.000	0.372	5.8	9.6	5.0E-05	30.0	38.0	0.989	10.0	-9999.0	-9999.0
6.365	15.65	15.65	0.26	-0.10	1.67	114.6	0.375	0.000	0.375	6.0	9.8	5.0E-05	30.0	38.0	1.018	10.0	-9999.0	-9999.0
6.430	15.14	15.13	0.28	-0.35	1.85	114.6	0.379	0.000	0.379	7.2	11.8	5.0E-06	-9999.0	-9999.0	0.984	10.0	-9999.0	-9999.0
6.496	15.33	15.33	0.34	0.02	2.22	114.6	0.383	0.000	0.383	7.3	11.9	5.0E-06	-9999.0	-9999.0	0.996	10.0	-9999.0	-9999.0
6.562	17.18	17.22	0.39	3.36	2.27	114.6	0.387	0.000	0.387	8.2	13.3	5.0E-06	-9999.0	-9999.0	1.122	10.0	-9999.0	-9999.0
6.627	19.68	19.74	0.45	5.99	2.28	114.6	0.390	0.000	0.390	9.5	15.1	5.0E-06	-9999.0	-9999.0	1.290	10.0	-9999.0	-9999.0
6.693	23.77	23.82	0.49	5.21	2.06	114.6	0.394	0.000	0.394	9.1	14.5	5.0E-05	38.9	40.0	1.562	10.0	81.2	3.407

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
6.758	24.66	24.71	0.49	4.94	1.99	114.6	0.398	0.000	0.398	9.5	15.0	5.0E-05	39.8	40.0	1.621	10.0	82.9	3.357
6.824	23.96	24.00	0.45	3.50	1.88	114.6	0.402	0.000	0.402	9.2	14.5	5.0E-05	38.8	40.0	1.573	10.0	81.8	3.411
6.890	20.82	20.85	0.40	2.49	1.92	114.6	0.405	0.000	0.405	8.0	12.5	5.0E-05	34.7	38.0	1.363	10.0	75.9	3.641
6.955	17.95	17.98	0.34	2.17	1.90	114.6	0.409	0.000	0.409	6.9	10.8	5.0E-05	30.3	38.0	1.171	10.0	-9999.0	-9999.0
7.021	14.37	14.40	0.27	2.15	1.88	114.6	0.413	0.000	0.413	6.9	10.7	5.0E-06	-9999.0	-9999.0	0.932	10.0	-9999.0	-9999.0
7.087	10.61	10.63	0.21	2.13	1.98	114.6	0.417	0.000	0.417	5.1	7.9	5.0E-06	-9999.0	-9999.0	0.681	9.8	-9999.0	-9999.0
7.152	7.73	7.75	0.14	2.00	1.81	114.6	0.420	0.000	0.420	3.7	5.7	5.0E-06	-9999.0	-9999.0	0.489	5.7	-9999.0	-9999.0
7.218	5.62	5.65	0.09	2.31	1.60	111.4	0.424	0.000	0.424	2.7	4.2	1.0E-07	-9999.0	-9999.0	0.348	3.4	-9999.0	-9999.0
7.283	4.09	4.12	0.06	3.02	1.46	111.4	0.428	0.000	0.428	2.0	3.0	1.0E-07	-9999.0	-9999.0	0.246	2.1	-9999.0	-9999.0
7.349	2.75	2.80	0.03	4.88	1.07	111.4	0.431	0.000	0.431	1.3	2.0	1.0E-07	-9999.0	-9999.0	0.158	1.2	-9999.0	-9999.0
7.415	2.37	2.45	0.02	7.58	0.82	111.4	0.435	0.000	0.435	1.2	1.8	1.0E-07	-9999.0	-9999.0	0.134	1.0	-9999.0	-9999.0
7.480	2.43	2.54	0.02	10.65	0.79	111.4	0.439	0.000	0.439	1.2	1.8	1.0E-07	-9999.0	-9999.0	0.140	1.1	-9999.0	-9999.0
7.546	1.59	1.73	0.01	12.90	0.58	111.4	0.442	0.000	0.442	0.8	1.2	1.0E-07	-9999.0	-9999.0	0.086	0.7	-9999.0	-9999.0
7.611	1.66	1.82	0.01	13.98	0.55	111.4	0.446	0.000	0.446	0.9	1.3	1.0E-07	-9999.0	-9999.0	0.091	0.7	-9999.0	-9999.0
7.677	1.34	1.49	0.01	14.00	0.67	111.4	0.450	0.000	0.450	0.7	1.1	1.0E-07	-9999.0	-9999.0	0.070	0.6	-9999.0	-9999.0
7.743	1.53	1.69	0.01	14.20	0.59	111.4	0.453	0.000	0.453	0.8	1.2	1.0E-07	-9999.0	-9999.0	0.082	0.7	-9999.0	-9999.0
7.808	1.21	1.37	0.01	14.52	0.73	111.4	0.457	0.000	0.457	0.7	1.0	1.0E-07	-9999.0	-9999.0	0.061	0.6	-9999.0	-9999.0
7.874	1.15	1.31	0.01	14.56	0.77	111.4	0.461	0.000	0.461	0.6	0.9	1.0E-07	-9999.0	-9999.0	0.057	0.6	-9999.0	-9999.0
7.940	1.00	1.16	0.01	14.32	0.87	111.4	0.464	0.000	0.464	0.6	0.8	1.0E-07	-9999.0	-9999.0	0.046	0.5	-9999.0	-9999.0
8.005	1.27	1.43	0.01	14.41	0.70	111.4	0.468	0.000	0.468	0.7	1.0	1.0E-07	-9999.0	-9999.0	0.064	0.6	-9999.0	-9999.0
8.071	1.08	1.23	0.01	14.04	0.81	111.4	0.472	0.000	0.472	0.6	0.9	1.0E-07	-9999.0	-9999.0	0.051	0.6	-9999.0	-9999.0
8.136	1.00	1.15	0.01	13.86	0.87	111.4	0.475	0.000	0.475	0.6	0.8	1.0E-07	-9999.0	-9999.0	0.045	0.5	-9999.0	-9999.0
8.202	1.00	1.16	0.01	14.18	0.87	111.4	0.479	0.000	0.479	0.6	0.8	1.0E-07	-9999.0	-9999.0	0.045	0.5	-9999.0	-9999.0
8.268	1.00	1.16	0.01	14.38	0.87	111.4	0.483	0.000	0.483	0.6	0.8	1.0E-07	-9999.0	-9999.0	0.045	0.5	-9999.0	-9999.0
8.333	1.00	1.16	0.01	14.28	0.87	111.4	0.486	0.000	0.486	0.6	0.8	1.0E-07	-9999.0	-9999.0	0.045	0.5	-9999.0	-9999.0
8.399	1.59	1.75	0.03	14.32	1.72	111.4	0.490	0.000	0.490	0.8	1.2	1.0E-07	-9999.0	-9999.0	0.084	0.7	-9999.0	-9999.0
8.464	1.78	1.94	0.06	14.38	3.10	111.4	0.494	0.000	0.494	1.9	2.6	5.0E-08	-9999.0	-9999.0	0.096	0.7	-9999.0	-9999.0
8.530	3.07	3.23	0.10	15.05	3.10	111.4	0.497	0.000	0.497	3.1	4.4	5.0E-08	-9999.0	-9999.0	0.182	1.2	-9999.0	-9999.0
8.596	6.39	6.55	0.15	14.78	2.30	114.6	0.501	0.000	0.501	4.2	5.9	5.0E-07	-9999.0	-9999.0	0.403	3.3	-9999.0	-9999.0
8.661	10.28	10.44	0.19	14.08	1.82	114.6	0.505	0.000	0.505	5.0	7.0	5.0E-06	-9999.0	-9999.0	0.662	6.9	-9999.0	-9999.0
8.727	10.48	10.56	0.22	7.64	2.09	114.6	0.508	0.000	0.508	5.1	7.1	5.0E-06	-9999.0	-9999.0	0.670	7.0	-9999.0	-9999.0
8.793	10.42	10.46	0.24	3.95	2.30	114.6	0.512	0.000	0.512	5.0	7.0	5.0E-06	-9999.0	-9999.0	0.663	6.8	-9999.0	-9999.0
8.858	8.24	8.28	0.25	3.54	3.03	114.6	0.516	0.000	0.516	5.3	7.4	5.0E-07	-9999.0	-9999.0	0.517	4.6	-9999.0	-9999.0
8.924	8.62	8.66	0.23	3.52	2.66	114.6	0.520	0.000	0.520	5.5	7.7	5.0E-07	-9999.0	-9999.0	0.543	4.9	-9999.0	-9999.0
8.989	6.65	6.70	0.23	4.60	3.44	111.4	0.523	0.000	0.523	6.4	8.9	5.0E-08	-9999.0	-9999.0	0.411	3.2	-9999.0	-9999.0
9.055	5.36	5.43	0.22	5.97	4.06	111.4	0.527	0.000	0.527	5.2	7.2	5.0E-08	-9999.0	-9999.0	0.327	2.3	-9999.0	-9999.0
9.121	4.79	4.87	0.21	7.62	4.32	111.4	0.531	0.000	0.531	4.7	6.4	5.0E-08	-9999.0	-9999.0	0.290	1.9	-9999.0	-9999.0
9.186	7.16	7.17	0.19	0.94	2.66	114.6	0.534	0.000	0.534	4.6	6.3	5.0E-07	-9999.0	-9999.0	0.442	3.4	-9999.0	-9999.0
9.252	6.52	6.54	0.20	2.17	3.07	111.4	0.538	0.000	0.538	6.3	8.5	5.0E-08	-9999.0	-9999.0	0.400	3.0	-9999.0	-9999.0
9.317	6.46	6.51	0.21	5.21	3.23	111.4	0.542	0.000	0.542	6.2	8.5	5.0E-08	-9999.0	-9999.0	0.398	2.9	-9999.0	-9999.0
9.383	6.84	6.91	0.21	6.44	3.05	111.4	0.545	0.000	0.545	6.6	9.0	5.0E-08	-9999.0	-9999.0	0.424	3.1	-9999.0	-9999.0
9.449	7.48	7.54	0.20	5.69	2.66	114.6	0.549	0.000	0.549	4.8	6.5	5.0E-07	-9999.0	-9999.0	0.466	3.6	-9999.0	-9999.0
9.514	6.39	6.43	0.18	4.54	2.80	114.6	0.553	0.000	0.553	4.1	5.5	5.0E-07	-9999.0	-9999.0	0.392	2.8	-9999.0	-9999.0
9.580	5.30	5.35	0.16	4.23	3.00	111.4	0.557	0.000	0.557	5.1	6.9	5.0E-08	-9999.0	-9999.0	0.319	2.1	-9999.0	-9999.0
9.646	4.47	4.52	0.15	4.70	3.33	111.4	0.560	0.000	0.560	4.3	5.8	5.0E-08	-9999.0	-9999.0	0.264	1.6	-9999.0	-9999.0
9.711	3.71	3.77	0.15	5.59	3.99	111.4	0.564	0.000	0.564	3.6	4.8	5.0E-08	-9999.0	-9999.0	0.214	1.3	-9999.0	-9999.0
9.777	3.58	3.66	0.16	7.94	4.38	111.4	0.568	0.000	0.568	3.5	4.7	5.0E-08	-9999.0	-9999.0	0.206	1.2	-9999.0	-9999.0
9.842	3.07	3.18	0.17	10.67	5.35	111.4	0.571	0.000	0.571	3.0	4.0	5.0E-08	-9999.0	-9999.0	0.174	1.0	-9999.0	-9999.0
9.908	4.15	4.29	0.19	12.74	4.44	111.4	0.575	0.000	0.575	4.1	5.4	5.0E-08	-9999.0	-9999.0	0.248	1.5	-9999.0	-9999.0
9.974	5.68	5.82	0.22	12.92	3.79	111.4	0.579	0.000	0.579	5.6	7.3	5.0E-08	-9999.0	-9999.0	0.350	2.2	-9999.0	-9999.0
10.039	7.67	7.78	0.25	10.53	3.22	111.4	0.582	0.000	0.582	7.5	9.8	5.0E-08	-9999.0	-9999.0	0.480	3.4	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
10.105	8.69	8.77	0.26	7.36	2.97	114.6	0.586	0.000	0.586	5.6	7.3	5.0E-07	-9999.0	-9999.0	0.546	4.1	-9999.0	-9999.0
10.170	8.69	8.76	0.27	5.93	3.09	114.6	0.590	0.000	0.590	5.6	7.3	5.0E-07	-9999.0	-9999.0	0.544	4.0	-9999.0	-9999.0
10.236	8.94	9.00	0.28	5.65	3.12	114.6	0.593	0.000	0.593	5.7	7.5	5.0E-07	-9999.0	-9999.0	0.561	4.2	-9999.0	-9999.0
10.302	10.67	10.72	0.29	5.13	2.71	114.6	0.597	0.000	0.597	6.8	8.9	5.0E-07	-9999.0	-9999.0	0.675	5.5	-9999.0	-9999.0
10.367	10.22	10.27	0.29	4.33	2.83	114.6	0.601	0.000	0.601	6.6	8.5	5.0E-07	-9999.0	-9999.0	0.645	5.1	-9999.0	-9999.0
10.433	8.81	8.86	0.27	4.35	3.06	114.6	0.605	0.000	0.605	5.7	7.3	5.0E-07	-9999.0	-9999.0	0.550	4.0	-9999.0	-9999.0
10.499	6.71	6.74	0.25	3.27	3.72	111.4	0.608	0.000	0.608	6.5	8.3	5.0E-08	-9999.0	-9999.0	0.409	2.6	-9999.0	-9999.0
10.564	5.17	5.21	0.23	3.18	4.43	111.4	0.612	0.000	0.612	5.0	6.4	5.0E-08	-9999.0	-9999.0	0.306	1.7	-9999.0	-9999.0
10.630	3.96	4.00	0.21	3.40	5.27	111.4	0.616	0.000	0.616	3.8	4.9	5.0E-08	-9999.0	-9999.0	0.225	1.2	-9999.0	-9999.0
10.695	2.43	2.46	0.18	3.20	7.33	79.6	0.619	0.000	0.619	2.4	3.0	1.0E-15	-9999.0	-9999.0	0.123	0.7	-9999.0	-9999.0
10.761	1.00	1.04	0.14	3.85	13.44	82.7	0.622	0.000	0.622	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
10.827	1.00	1.07	0.10	6.18	9.38	82.7	0.624	0.000	0.624	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
10.892	1.00	1.11	0.07	9.75	6.33	79.6	0.627	0.000	0.627	1.1	1.3	1.0E-15	-9999.0	-9999.0	0.032	0.5	-9999.0	-9999.0
10.958	1.00	1.15	0.05	13.59	4.36	79.6	0.629	0.000	0.629	1.1	1.4	1.0E-15	-9999.0	-9999.0	0.035	0.5	-9999.0	-9999.0
11.023	1.00	1.17	0.03	15.82	2.56	79.6	0.632	0.000	0.632	1.1	1.4	1.0E-15	-9999.0	-9999.0	0.036	0.5	-9999.0	-9999.0
11.089	1.72	1.89	0.02	15.05	1.06	111.4	0.635	0.000	0.635	0.9	1.1	1.0E-07	-9999.0	-9999.0	0.083	0.6	-9999.0	-9999.0
11.155	1.15	1.30	0.01	13.53	0.77	111.4	0.639	0.000	0.639	0.6	0.8	1.0E-07	-9999.0	-9999.0	0.044	0.5	-9999.0	-9999.0
11.220	1.00	1.13	0.02	11.77	1.77	79.6	0.642	0.000	0.642	1.1	1.4	1.0E-15	-9999.0	-9999.0	0.033	0.5	-9999.0	-9999.0
11.286	1.00	1.12	0.02	11.20	1.78	79.6	0.645	0.000	0.645	1.1	1.3	1.0E-15	-9999.0	-9999.0	0.032	0.5	-9999.0	-9999.0
11.352	1.00	1.13	0.02	11.95	1.77	79.6	0.647	0.000	0.647	1.1	1.3	1.0E-15	-9999.0	-9999.0	0.032	0.5	-9999.0	-9999.0
11.417	1.00	1.15	0.02	13.57	1.74	79.6	0.650	0.000	0.650	1.1	1.4	1.0E-15	-9999.0	-9999.0	0.033	0.5	-9999.0	-9999.0
11.483	1.00	1.16	0.01	14.82	0.86	111.4	0.653	0.000	0.653	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.034	0.5	-9999.0	-9999.0
11.548	1.00	1.17	0.01	15.11	0.86	111.4	0.657	0.000	0.657	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.034	0.5	-9999.0	-9999.0
11.614	1.00	1.17	0.01	15.17	0.86	111.4	0.660	0.000	0.660	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.034	0.5	-9999.0	-9999.0
11.680	1.00	1.17	0.01	15.21	0.86	111.4	0.664	0.000	0.664	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.034	0.5	-9999.0	-9999.0
11.745	1.00	1.17	0.01	15.23	0.86	111.4	0.668	0.000	0.668	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.033	0.5	-9999.0	-9999.0
11.811	1.00	1.17	0.01	15.17	0.86	111.4	0.671	0.000	0.671	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.033	0.5	-9999.0	-9999.0
11.876	1.00	1.17	0.01	15.05	0.86	111.4	0.675	0.000	0.675	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.033	0.5	-9999.0	-9999.0
11.942	1.00	1.17	0.01	15.11	0.86	111.4	0.679	0.000	0.679	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.032	0.5	-9999.0	-9999.0
12.008	1.00	1.17	0.01	15.29	0.86	111.4	0.682	0.000	0.682	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.032	0.5	-9999.0	-9999.0
12.073	1.00	1.17	0.01	15.35	0.86	111.4	0.686	0.000	0.686	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.032	0.5	-9999.0	-9999.0
12.139	1.00	1.17	0.01	15.47	0.86	111.4	0.690	0.000	0.690	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.032	0.5	-9999.0	-9999.0
12.205	1.00	1.17	0.01	15.88	0.85	111.4	0.693	0.000	0.693	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.032	0.5	-9999.0	-9999.0
12.270	1.00	1.17	0.01	15.76	0.85	111.4	0.697	0.000	0.697	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.032	0.5	-9999.0	-9999.0
12.336	1.00	1.17	0.01	15.90	0.85	111.4	0.701	0.000	0.701	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.032	0.5	-9999.0	-9999.0
12.401	1.00	1.18	0.01	16.21	0.85	111.4	0.704	0.000	0.704	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.032	0.5	-9999.0	-9999.0
12.467	1.00	1.13	0.01	11.97	0.89	111.4	0.708	0.000	0.708	0.5	0.6	1.0E-07	-9999.0	-9999.0	0.028	0.5	-9999.0	-9999.0
12.533	1.00	1.14	0.01	12.96	0.88	111.4	0.711	0.000	0.711	0.5	0.6	1.0E-07	-9999.0	-9999.0	0.029	0.5	-9999.0	-9999.0
12.598	1.00	1.15	0.01	13.92	0.87	111.4	0.715	0.000	0.715	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.029	0.5	-9999.0	-9999.0
12.664	1.00	1.16	0.01	14.70	0.86	111.4	0.719	0.000	0.719	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.030	0.5	-9999.0	-9999.0
12.730	1.00	1.17	0.01	15.35	0.86	111.4	0.722	0.000	0.722	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.030	0.5	-9999.0	-9999.0
12.795	1.00	1.17	0.01	15.51	0.86	111.4	0.726	0.000	0.726	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.030	0.5	-9999.0	-9999.0
12.861	1.00	1.17	0.01	15.82	0.85	111.4	0.730	0.000	0.730	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.030	0.5	-9999.0	-9999.0
12.926	1.00	1.17	0.01	15.74	0.85	111.4	0.733	0.000	0.733	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.029	0.5	-9999.0	-9999.0
12.992	1.00	1.18	0.01	16.12	0.85	111.4	0.737	0.000	0.737	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.029	0.5	-9999.0	-9999.0
13.058	1.00	1.17	0.01	15.92	0.85	111.4	0.741	0.002	0.739	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.029	0.5	-9999.0	-9999.0
13.123	1.00	1.18	0.01	16.23	0.85	111.4	0.744	0.004	0.741	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.029	0.5	-9999.0	-9999.0
13.189	1.00	1.18	0.01	16.00	0.85	111.4	0.748	0.006	0.742	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.028	0.5	-9999.0	-9999.0
13.254	1.00	1.17	0.01	15.96	0.85	111.4	0.752	0.008	0.744	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.028	0.5	-9999.0	-9999.0
13.320	1.00	1.18	0.01	16.14	0.85	111.4	0.755	0.010	0.745	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.028	0.5	-9999.0	-9999.0
13.386	1.00	1.18	0.01	16.39	0.85	111.4	0.759	0.012	0.747	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.028	0.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
13.451	1.00	1.18	0.01	16.41	0.85	111.4	0.763	0.014	0.749	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.028	0.5	-9999.0	-9999.0
13.517	1.00	1.18	0.03	16.87	2.54	79.6	0.766	0.016	0.750	1.1	1.3	1.0E-15	-9999.0	-9999.0	0.028	0.5	-9999.0	-9999.0
13.583	1.00	1.19	0.07	17.25	5.90	79.6	0.768	0.018	0.750	1.1	1.3	1.0E-15	-9999.0	-9999.0	0.028	0.5	-9999.0	-9999.0
13.648	3.45	3.62	0.10	15.58	2.77	111.4	0.772	0.020	0.751	3.5	4.0	5.0E-08	-9999.0	-9999.0	0.190	0.9	-9999.0	-9999.0
13.714	3.71	3.85	0.14	12.98	3.65	111.4	0.775	0.022	0.753	3.7	4.2	5.0E-08	-9999.0	-9999.0	0.205	0.9	-9999.0	-9999.0
13.779	2.94	3.02	0.16	7.83	5.31	111.4	0.779	0.024	0.754	2.9	3.3	5.0E-08	-9999.0	-9999.0	0.150	0.7	-9999.0	-9999.0
13.845	1.66	1.74	0.16	6.87	9.23	82.7	0.782	0.026	0.756	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
13.911	1.02	1.10	0.14	7.56	12.71	82.7	0.785	0.028	0.756	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
13.976	1.27	1.40	0.11	11.51	7.89	79.6	0.787	0.030	0.757	1.3	1.5	1.0E-15	-9999.0	-9999.0	0.041	0.5	-9999.0	-9999.0
14.042	1.00	1.12	0.08	10.73	7.17	79.6	0.790	0.033	0.757	1.1	1.2	1.0E-15	-9999.0	-9999.0	0.022	0.5	-9999.0	-9999.0
14.107	1.00	1.12	0.06	11.18	5.35	79.6	0.793	0.035	0.758	1.1	1.2	1.0E-15	-9999.0	-9999.0	0.022	0.5	-9999.0	-9999.0
14.173	1.00	1.15	0.05	13.35	4.37	79.6	0.795	0.037	0.759	1.1	1.3	1.0E-15	-9999.0	-9999.0	0.023	0.5	-9999.0	-9999.0
14.239	1.59	1.76	0.06	15.51	3.41	111.4	0.798	0.039	0.760	1.7	1.9	5.0E-08	-9999.0	-9999.0	0.064	0.5	-9999.0	-9999.0
14.304	5.55	5.70	0.08	13.65	1.41	111.4	0.802	0.041	0.761	2.7	3.1	1.0E-07	-9999.0	-9999.0	0.327	1.4	-9999.0	-9999.0
14.370	6.78	6.91	0.12	12.55	1.74	114.6	0.806	0.043	0.763	3.3	3.8	5.0E-06	-9999.0	-9999.0	0.407	1.9	-9999.0	-9999.0
14.436	6.90	7.02	0.17	11.12	2.43	114.6	0.809	0.045	0.765	4.5	5.1	5.0E-07	-9999.0	-9999.0	0.414	1.9	-9999.0	-9999.0
14.501	7.41	7.54	0.20	12.16	2.66	114.6	0.813	0.047	0.766	4.8	5.5	5.0E-07	-9999.0	-9999.0	0.448	2.1	-9999.0	-9999.0
14.567	8.18	8.33	0.23	13.51	2.77	114.6	0.817	0.049	0.768	5.3	6.1	5.0E-07	-9999.0	-9999.0	0.501	2.5	-9999.0	-9999.0
14.632	7.99	8.11	0.23	11.61	2.84	114.6	0.821	0.051	0.770	5.2	5.9	5.0E-07	-9999.0	-9999.0	0.486	2.4	-9999.0	-9999.0
14.698	7.99	8.10	0.25	9.79	3.10	114.6	0.824	0.053	0.771	5.2	5.9	5.0E-07	-9999.0	-9999.0	0.485	2.3	-9999.0	-9999.0
14.764	6.84	6.92	0.25	7.87	3.62	111.4	0.828	0.055	0.773	6.6	7.5	5.0E-08	-9999.0	-9999.0	0.406	1.9	-9999.0	-9999.0
14.829	6.20	6.27	0.22	6.89	3.52	111.4	0.832	0.057	0.775	6.0	6.8	5.0E-08	-9999.0	-9999.0	0.363	1.6	-9999.0	-9999.0
14.895	5.17	5.24	0.24	5.79	4.60	111.4	0.836	0.059	0.776	5.0	5.7	5.0E-08	-9999.0	-9999.0	0.293	1.3	-9999.0	-9999.0
14.960	4.47	4.53	0.26	5.67	5.75	111.4	0.839	0.061	0.778	4.3	4.9	5.0E-08	-9999.0	-9999.0	0.246	1.1	-9999.0	-9999.0
15.026	5.87	5.96	0.20	7.68	3.37	111.4	0.843	0.063	0.780	5.7	6.5	5.0E-08	-9999.0	-9999.0	0.341	1.5	-9999.0	-9999.0
15.092	15.14	15.27	0.19	12.68	1.25	114.6	0.847	0.065	0.781	5.9	6.6	5.0E-05	30.0	32.0	0.962	6.3	-9999.0	-9999.0
15.157	22.29	22.53	0.18	21.40	0.80	117.7	0.850	0.067	0.783	7.2	8.1	5.0E-04	30.0	36.0	-9999.0	-9999.0	-9999.0	-9999.0
15.223	17.44	17.56	0.17	10.55	0.97	114.6	0.854	0.069	0.785	6.7	7.6	5.0E-05	30.0	34.0	1.113	7.8	-9999.0	-9999.0
15.289	13.54	13.60	0.21	4.92	1.55	114.6	0.858	0.071	0.786	5.2	5.9	5.0E-05	30.0	32.0	0.849	5.1	-9999.0	-9999.0
15.354	9.58	9.61	0.21	2.76	2.19	114.6	0.862	0.074	0.788	4.6	5.2	5.0E-06	-9999.0	-9999.0	0.583	2.9	-9999.0	-9999.0
15.420	7.48	7.52	0.19	3.64	2.53	114.6	0.865	0.076	0.790	4.8	5.4	5.0E-07	-9999.0	-9999.0	0.443	2.0	-9999.0	-9999.0
15.485	6.06	6.11	0.18	4.31	2.95	111.4	0.869	0.078	0.792	5.9	6.6	5.0E-08	-9999.0	-9999.0	0.349	1.5	-9999.0	-9999.0
15.551	4.66	4.71	0.15	4.56	3.19	111.4	0.873	0.080	0.793	4.5	5.1	5.0E-08	-9999.0	-9999.0	0.256	1.1	-9999.0	-9999.0
15.617	5.11	5.16	0.12	4.50	2.33	114.6	0.877	0.082	0.795	3.3	3.7	5.0E-07	-9999.0	-9999.0	0.286	1.2	-9999.0	-9999.0
15.682	3.71	3.77	0.10	5.81	2.66	111.4	0.880	0.084	0.796	3.6	4.0	5.0E-08	-9999.0	-9999.0	0.193	0.8	-9999.0	-9999.0
15.748	2.24	2.31	0.08	6.83	3.47	111.4	0.884	0.086	0.798	2.2	2.5	5.0E-08	-9999.0	-9999.0	0.095	0.6	-9999.0	-9999.0
15.813	1.53	1.63	0.05	9.03	3.07	111.4	0.888	0.088	0.800	1.6	1.7	5.0E-08	-9999.0	-9999.0	0.050	0.5	-9999.0	-9999.0
15.879	1.15	1.27	0.02	10.88	1.58	111.4	0.891	0.090	0.801	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.025	0.5	-9999.0	-9999.0
15.945	1.00	1.14	0.01	12.59	0.88	111.4	0.895	0.092	0.803	0.5	0.6	1.0E-07	-9999.0	-9999.0	0.016	0.5	-9999.0	-9999.0
16.010	2.24	2.40	0.01	15.11	0.42	111.4	0.898	0.094	0.804	1.1	1.3	1.0E-07	-9999.0	-9999.0	0.100	0.6	-9999.0	-9999.0
16.076	6.52	6.67	0.01	14.43	0.15	111.4	0.902	0.096	0.806	3.2	3.6	1.0E-07	-9999.0	-9999.0	0.385	1.6	-9999.0	-9999.0
16.142	7.16	7.30	0.01	13.49	0.14	111.4	0.906	0.098	0.808	3.5	3.9	1.0E-07	-9999.0	-9999.0	0.426	1.9	-9999.0	-9999.0
16.207	5.36	5.47	0.02	9.52	0.37	111.4	0.909	0.100	0.809	2.6	2.9	1.0E-07	-9999.0	-9999.0	0.304	1.2	-9999.0	-9999.0
16.273	3.64	3.74	0.04	9.52	1.07	111.4	0.913	0.102	0.811	1.8	2.0	1.0E-07	-9999.0	-9999.0	0.189	0.8	-9999.0	-9999.0
16.338	2.04	2.16	0.04	11.02	1.85	111.4	0.917	0.104	0.813	1.0	1.1	1.0E-07	-9999.0	-9999.0	0.083	0.5	-9999.0	-9999.0
16.404	1.21	1.35	0.06	12.61	4.46	79.6	0.920	0.106	0.814	1.3	1.4	1.0E-15	-9999.0	-9999.0	0.029	0.5	-9999.0	-9999.0
16.470	1.59	1.76	0.08	15.53	4.55	111.4	0.923	0.108	0.815	1.7	1.9	5.0E-08	-9999.0	-9999.0	0.056	0.5	-9999.0	-9999.0
16.535	1.34	1.54	0.10	18.27	6.51	79.6	0.926	0.110	0.816	1.5	1.6	1.0E-15	-9999.0	-9999.0	0.041	0.5	-9999.0	-9999.0
16.601	4.28	4.48	0.11	18.39	2.46	111.4	0.929	0.112	0.817	4.3	4.7	5.0E-08	-9999.0	-9999.0	0.237	1.0	-9999.0	-9999.0
16.666	6.20	6.38	0.14	16.71	2.20	114.6	0.933	0.114	0.819	4.1	4.5	5.0E-07	-9999.0	-9999.0	0.363	1.5	-9999.0	-9999.0
16.732	7.92	8.05	0.16	12.33	1.99	114.6	0.937	0.117	0.820	3.9	4.3	5.0E-06	-9999.0	-9999.0	0.474	2.1	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
16.798	9.45	9.56	0.17	9.83	1.78	114.6	0.941	0.119	0.822	4.6	5.0	5.0E-06	-9999.0	-9999.0	0.575	2.7	-9999.0	-9999.0
16.863	9.58	9.68	0.18	8.57	1.86	114.6	0.944	0.121	0.824	4.6	5.1	5.0E-06	-9999.0	-9999.0	0.582	2.7	-9999.0	-9999.0
16.929	10.54	10.62	0.18	7.50	1.70	114.6	0.948	0.123	0.825	5.1	5.6	5.0E-06	-9999.0	-9999.0	0.645	3.2	-9999.0	-9999.0
16.995	11.82	11.90	0.18	7.23	1.52	114.6	0.952	0.125	0.827	5.7	6.3	5.0E-06	-9999.0	-9999.0	0.730	3.8	-9999.0	-9999.0
17.060	12.58	12.66	0.18	7.33	1.43	114.6	0.956	0.127	0.829	4.8	5.3	5.0E-05	30.0	32.0	0.780	4.2	-9999.0	-9999.0
17.126	13.99	14.07	0.18	6.93	1.28	114.6	0.959	0.129	0.830	5.4	5.9	5.0E-05	30.0	32.0	0.874	4.9	-9999.0	-9999.0
17.191	15.21	15.27	0.18	6.30	1.18	114.6	0.963	0.131	0.832	5.9	6.4	5.0E-05	30.0	32.0	0.954	5.6	-9999.0	-9999.0
17.257	16.35	16.42	0.19	6.58	1.16	114.6	0.967	0.133	0.834	6.3	6.9	5.0E-05	30.0	32.0	1.030	6.3	-9999.0	-9999.0
17.323	16.42	16.49	0.21	6.38	1.28	114.6	0.971	0.135	0.836	6.3	6.9	5.0E-05	30.0	32.0	1.035	6.3	-9999.0	-9999.0
17.388	15.72	15.79	0.23	6.42	1.46	114.6	0.974	0.137	0.837	6.0	6.6	5.0E-05	30.0	32.0	0.988	5.9	-9999.0	-9999.0
17.454	14.44	14.50	0.26	5.93	1.80	114.6	0.978	0.139	0.839	6.9	7.6	5.0E-06	-9999.0	-9999.0	0.901	5.1	-9999.0	-9999.0
17.519	12.27	12.32	0.28	5.05	2.28	114.6	0.982	0.141	0.841	5.9	6.4	5.0E-06	-9999.0	-9999.0	0.756	3.9	-9999.0	-9999.0
17.585	9.83	9.89	0.27	5.35	2.74	114.6	0.986	0.143	0.842	6.3	6.9	5.0E-07	-9999.0	-9999.0	0.594	2.7	-9999.0	-9999.0
17.651	7.79	7.84	0.26	4.78	3.32	111.4	0.989	0.145	0.844	7.5	8.2	5.0E-08	-9999.0	-9999.0	0.457	1.9	-9999.0	-9999.0
17.716	7.16	7.20	0.23	4.39	3.20	111.4	0.993	0.147	0.846	6.9	7.5	5.0E-08	-9999.0	-9999.0	0.414	1.7	-9999.0	-9999.0
17.782	6.90	6.95	0.19	5.05	2.74	114.6	0.997	0.149	0.847	4.4	4.8	5.0E-07	-9999.0	-9999.0	0.397	1.6	-9999.0	-9999.0
17.848	8.24	8.33	0.18	8.67	2.17	114.6	1.000	0.151	0.849	4.0	4.3	5.0E-06	-9999.0	-9999.0	0.489	2.1	-9999.0	-9999.0
17.913	9.71	9.82	0.18	9.83	1.84	114.6	1.004	0.153	0.851	4.7	5.1	5.0E-06	-9999.0	-9999.0	0.588	2.7	-9999.0	-9999.0
17.979	8.75	8.84	0.17	8.44	1.93	114.6	1.008	0.155	0.853	4.2	4.6	5.0E-06	-9999.0	-9999.0	0.522	2.3	-9999.0	-9999.0
18.044	7.54	7.61	0.18	6.97	2.37	114.6	1.012	0.158	0.854	4.9	5.3	5.0E-07	-9999.0	-9999.0	0.440	1.8	-9999.0	-9999.0
18.110	6.33	6.40	0.16	6.89	2.51	114.6	1.015	0.160	0.856	4.1	4.4	5.0E-07	-9999.0	-9999.0	0.359	1.4	-9999.0	-9999.0
18.176	5.75	5.84	0.13	7.54	2.23	114.6	1.019	0.162	0.858	3.7	4.0	5.0E-07	-9999.0	-9999.0	0.321	1.2	-9999.0	-9999.0
18.241	5.43	5.52	0.11	7.94	2.00	114.6	1.023	0.164	0.859	3.5	3.8	5.0E-07	-9999.0	-9999.0	0.300	1.2	-9999.0	-9999.0
18.307	3.96	4.05	0.09	8.59	2.23	111.4	1.027	0.166	0.861	3.9	4.2	5.0E-08	-9999.0	-9999.0	0.202	0.8	-9999.0	-9999.0
18.372	3.26	3.36	0.06	9.81	1.79	111.4	1.030	0.168	0.863	1.6	1.7	1.0E-07	-9999.0	-9999.0	0.156	0.7	-9999.0	-9999.0
18.438	1.72	1.84	0.04	10.51	2.18	111.4	1.034	0.170	0.864	0.9	0.9	1.0E-07	-9999.0	-9999.0	0.054	0.5	-9999.0	-9999.0
18.504	1.72	1.86	0.02	12.88	1.08	111.4	1.038	0.172	0.866	0.9	1.0	1.0E-07	-9999.0	-9999.0	0.055	0.5	-9999.0	-9999.0
18.569	1.21	1.36	0.01	13.79	0.74	111.4	1.041	0.174	0.867	0.7	0.7	1.0E-07	-9999.0	-9999.0	0.021	0.5	-9999.0	-9999.0
18.635	1.02	1.18	0.01	14.84	0.85	111.4	1.045	0.176	0.869	0.6	0.6	1.0E-07	-9999.0	-9999.0	0.009	0.5	-9999.0	-9999.0
18.701	1.00	1.17	0.01	15.86	0.85	111.4	1.049	0.178	0.871	0.6	0.6	1.0E-07	-9999.0	-9999.0	0.008	0.5	-9999.0	-9999.0
18.766	1.00	1.19	0.01	17.09	0.84	111.4	1.052	0.180	0.872	0.6	0.6	1.0E-07	-9999.0	-9999.0	0.009	0.5	-9999.0	-9999.0
18.832	1.00	1.20	0.01	17.97	0.84	111.4	1.056	0.182	0.874	0.6	0.6	1.0E-07	-9999.0	-9999.0	0.009	0.5	-9999.0	-9999.0
18.897	1.27	1.41	0.01	12.98	0.71	111.4	1.060	0.184	0.875	0.7	0.7	1.0E-07	-9999.0	-9999.0	0.024	0.5	-9999.0	-9999.0
18.963	1.00	1.16	0.01	14.36	0.87	111.4	1.063	0.186	0.877	0.6	0.6	1.0E-07	-9999.0	-9999.0	0.006	0.5	-9999.0	-9999.0
19.029	1.02	1.19	0.01	15.82	0.84	111.4	1.067	0.188	0.879	0.6	0.6	1.0E-07	-9999.0	-9999.0	0.008	0.5	-9999.0	-9999.0
19.094	1.00	1.19	0.01	17.05	0.84	111.4	1.071	0.190	0.880	0.6	0.6	1.0E-07	-9999.0	-9999.0	0.008	0.5	-9999.0	-9999.0
19.160	1.00	1.20	0.05	18.25	4.18	79.6	1.074	0.192	0.881	1.1	1.2	1.0E-15	-9999.0	-9999.0	0.008	0.5	-9999.0	-9999.0
19.225	1.02	1.23	0.10	19.16	8.15	82.7	1.076	0.194	0.882	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
19.291	3.71	3.93	0.13	20.44	3.32	111.4	1.080	0.196	0.883	3.8	4.0	5.0E-08	-9999.0	-9999.0	0.190	0.8	-9999.0	-9999.0
19.357	9.96	10.17	0.17	19.05	1.68	114.6	1.083	0.198	0.885	4.9	5.2	5.0E-06	-9999.0	-9999.0	0.606	2.6	-9999.0	-9999.0
19.422	17.44	17.63	0.22	16.95	1.25	114.6	1.087	0.201	0.886	6.8	7.2	5.0E-05	30.0	32.0	1.103	6.4	-9999.0	-9999.0
19.488	21.84	21.98	0.27	12.24	1.23	114.6	1.091	0.203	0.888	8.4	8.9	5.0E-05	30.0	34.0	1.392	9.1	-9999.0	-9999.0
19.554	24.40	24.51	0.32	10.67	1.31	114.6	1.095	0.205	0.890	9.4	10.0	5.0E-05	30.0	36.0	1.561	10.0	-9999.0	-9999.0
19.619	22.94	23.04	0.36	9.52	1.57	114.6	1.098	0.207	0.892	8.8	9.3	5.0E-05	30.0	34.0	1.463	9.8	-9999.0	-9999.0
19.685	22.16	22.30	0.39	12.49	1.75	114.6	1.102	0.209	0.893	8.5	9.0	5.0E-05	30.0	34.0	1.413	9.3	-9999.0	-9999.0
19.750	21.91	22.08	0.38	15.60	1.73	114.6	1.106	0.211	0.895	8.5	8.9	5.0E-05	30.0	34.0	1.398	9.1	-9999.0	-9999.0
19.816	21.84	22.01	0.41	15.90	1.87	114.6	1.110	0.213	0.897	8.4	8.9	5.0E-05	30.0	34.0	1.394	9.0	-9999.0	-9999.0
19.882	21.84	22.00	0.44	14.90	2.00	114.6	1.113	0.215	0.898	8.4	8.9	5.0E-05	30.0	34.0	1.393	9.0	-9999.0	-9999.0
19.947	21.84	22.00	0.46	14.30	2.10	114.6	1.117	0.217	0.900	8.4	8.9	5.0E-05	30.0	34.0	1.392	8.9	-9999.0	-9999.0
20.013	22.04	22.19	0.47	13.77	2.12	114.6	1.121	0.219	0.902	8.5	9.0	5.0E-05	30.0	34.0	1.405	9.1	-9999.0	-9999.0
20.078	22.04	22.20	0.46	14.45	2.08	114.6	1.125	0.221	0.904	8.5	8.9	5.0E-05	30.0	34.0	1.405	9.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
20.144	21.78	21.92	0.43	12.68	1.97	114.6	1.128	0.223	0.905	8.4	8.8	5.0E-05	30.0	34.0	1.386	8.8	-9999.0	-9999.0
20.210	19.55	19.67	0.38	11.59	1.94	114.6	1.132	0.225	0.907	7.5	7.9	5.0E-05	30.0	34.0	1.236	7.3	-9999.0	-9999.0
20.275	16.35	16.47	0.35	11.57	2.13	114.6	1.136	0.227	0.909	7.9	8.3	5.0E-06	-9999.0	-9999.0	1.023	5.4	-9999.0	-9999.0
20.341	13.86	13.96	0.29	9.24	2.08	114.6	1.140	0.229	0.910	6.7	7.0	5.0E-06	-9999.0	-9999.0	0.855	4.1	-9999.0	-9999.0
20.407	10.67	10.77	0.25	9.46	2.33	114.6	1.143	0.231	0.912	5.2	5.4	5.0E-06	-9999.0	-9999.0	0.642	2.7	-9999.0	-9999.0
20.472	6.65	6.74	0.18	9.05	2.68	114.6	1.147	0.233	0.914	4.3	4.5	5.0E-07	-9999.0	-9999.0	0.373	1.4	-9999.0	-9999.0
20.538	4.92	5.03	0.14	10.20	2.79	111.4	1.151	0.235	0.916	4.8	5.0	5.0E-08	-9999.0	-9999.0	0.259	0.9	-9999.0	-9999.0
20.603	3.77	3.91	0.10	12.80	2.57	111.4	1.155	0.237	0.917	3.7	3.9	5.0E-08	-9999.0	-9999.0	0.184	0.7	-9999.0	-9999.0
20.669	2.11	2.28	0.07	16.65	3.07	111.4	1.158	0.239	0.919	2.2	2.3	5.0E-08	-9999.0	-9999.0	0.075	0.5	-9999.0	-9999.0
20.735	1.98	2.19	0.04	19.36	1.83	111.4	1.162	0.241	0.920	1.1	1.1	1.0E-07	-9999.0	-9999.0	0.069	0.5	-9999.0	-9999.0
20.800	2.04	2.28	0.03	22.02	1.32	111.4	1.165	0.244	0.922	1.1	1.1	1.0E-07	-9999.0	-9999.0	0.074	0.5	-9999.0	-9999.0
20.866	2.56	2.80	0.01	22.89	0.36	111.4	1.169	0.246	0.924	1.3	1.4	1.0E-07	-9999.0	-9999.0	0.109	0.6	-9999.0	-9999.0
20.932	2.43	2.66	0.01	21.99	0.38	111.4	1.173	0.248	0.925	1.3	1.3	1.0E-07	-9999.0	-9999.0	0.099	0.5	-9999.0	-9999.0
20.997	1.98	2.22	0.01	21.99	0.45	111.4	1.176	0.250	0.927	1.1	1.1	1.0E-07	-9999.0	-9999.0	0.070	0.5	-9999.0	-9999.0
21.063	1.66	1.91	0.01	22.56	0.53	111.4	1.180	0.252	0.928	0.9	0.9	1.0E-07	-9999.0	-9999.0	0.049	0.5	-9999.0	-9999.0
21.128	2.18	2.44	0.01	24.47	0.41	111.4	1.184	0.254	0.930	1.2	1.2	1.0E-07	-9999.0	-9999.0	0.084	0.5	-9999.0	-9999.0
21.194	2.62	2.88	0.01	24.28	0.35	111.4	1.187	0.256	0.932	1.4	1.4	1.0E-07	-9999.0	-9999.0	0.113	0.6	-9999.0	-9999.0
21.260	2.56	2.81	0.01	23.45	0.36	111.4	1.191	0.258	0.933	1.3	1.4	1.0E-07	-9999.0	-9999.0	0.108	0.6	-9999.0	-9999.0
21.325	2.30	2.56	0.01	24.18	0.39	111.4	1.195	0.260	0.935	1.2	1.3	1.0E-07	-9999.0	-9999.0	0.091	0.5	-9999.0	-9999.0
21.391	1.85	2.11	0.01	24.10	0.47	111.4	1.198	0.262	0.936	1.0	1.0	1.0E-07	-9999.0	-9999.0	0.061	0.5	-9999.0	-9999.0
21.456	1.72	1.99	0.01	24.20	0.50	111.4	1.202	0.264	0.938	1.0	1.0	1.0E-07	-9999.0	-9999.0	0.052	0.5	-9999.0	-9999.0
21.522	2.37	2.63	0.01	24.53	0.38	111.4	1.206	0.266	0.940	1.3	1.3	1.0E-07	-9999.0	-9999.0	0.095	0.5	-9999.0	-9999.0
21.588	1.85	2.11	0.01	23.94	0.47	111.4	1.209	0.268	0.941	1.0	1.0	1.0E-07	-9999.0	-9999.0	0.060	0.5	-9999.0	-9999.0
21.653	2.69	2.95	0.01	24.04	0.34	111.4	1.213	0.270	0.943	1.4	1.5	1.0E-07	-9999.0	-9999.0	0.116	0.6	-9999.0	-9999.0
21.719	1.72	1.98	0.01	23.75	0.51	111.4	1.217	0.272	0.944	0.9	1.0	1.0E-07	-9999.0	-9999.0	0.051	0.5	-9999.0	-9999.0
21.785	1.85	2.11	0.01	23.40	0.48	111.4	1.220	0.274	0.946	1.0	1.0	1.0E-07	-9999.0	-9999.0	0.059	0.5	-9999.0	-9999.0
21.850	2.11	2.36	0.01	23.75	0.42	111.4	1.224	0.276	0.948	1.1	1.2	1.0E-07	-9999.0	-9999.0	0.076	0.5	-9999.0	-9999.0
21.916	1.78	2.05	0.01	24.57	0.49	111.4	1.228	0.278	0.949	1.0	1.0	1.0E-07	-9999.0	-9999.0	0.055	0.5	-9999.0	-9999.0
21.981	1.66	1.94	0.01	25.42	0.52	111.4	1.231	0.280	0.951	0.9	1.0	1.0E-07	-9999.0	-9999.0	0.047	0.5	-9999.0	-9999.0
22.047	2.04	2.32	0.01	25.70	0.43	111.4	1.235	0.282	0.952	1.1	1.1	1.0E-07	-9999.0	-9999.0	0.073	0.5	-9999.0	-9999.0
22.113	2.69	2.96	0.03	25.67	1.01	111.4	1.239	0.285	0.954	1.4	1.5	1.0E-07	-9999.0	-9999.0	0.115	0.6	-9999.0	-9999.0
22.178	5.94	6.13	0.07	17.19	1.14	111.4	1.242	0.287	0.956	2.9	3.0	1.0E-07	-9999.0	-9999.0	0.326	1.1	-9999.0	-9999.0
22.244	10.74	10.93	0.14	17.58	1.28	114.6	1.246	0.289	0.957	5.2	5.3	5.0E-06	-9999.0	-9999.0	0.645	2.6	-9999.0	-9999.0
22.309	12.71	12.88	0.19	15.29	1.48	114.6	1.250	0.291	0.959	6.2	6.3	5.0E-06	-9999.0	-9999.0	0.775	3.3	-9999.0	-9999.0
22.375	15.78	15.95	0.23	15.66	1.45	114.6	1.253	0.293	0.961	6.1	6.2	5.0E-05	30.0	32.0	0.980	4.7	-9999.0	-9999.0
22.441	15.78	15.93	0.28	13.94	1.76	114.6	1.257	0.295	0.962	6.1	6.2	5.0E-05	30.0	32.0	0.978	4.7	-9999.0	-9999.0
22.506	16.93	17.06	0.32	11.75	1.88	114.6	1.261	0.297	0.964	6.5	6.7	5.0E-05	30.0	32.0	1.053	5.2	-9999.0	-9999.0
22.572	19.36	19.49	0.35	12.61	1.80	114.6	1.265	0.299	0.966	7.5	7.6	5.0E-05	30.0	32.0	1.215	6.5	-9999.0	-9999.0
22.638	20.19	20.34	0.35	14.10	1.72	114.6	1.268	0.301	0.968	7.8	7.9	5.0E-05	30.0	34.0	1.272	6.9	-9999.0	-9999.0
22.703	21.72	21.86	0.36	12.92	1.65	114.6	1.272	0.303	0.969	8.4	8.5	5.0E-05	30.0	34.0	1.373	7.8	-9999.0	-9999.0
22.769	23.64	23.79	0.37	14.34	1.56	114.6	1.276	0.305	0.971	9.1	9.3	5.0E-05	30.0	34.0	1.501	8.9	-9999.0	-9999.0
22.834	23.70	23.83	0.37	12.08	1.56	114.6	1.280	0.307	0.973	9.1	9.3	5.0E-05	30.0	34.0	1.503	8.9	-9999.0	-9999.0
22.900	23.64	23.73	0.36	8.95	1.52	114.6	1.284	0.309	0.974	9.1	9.2	5.0E-05	30.0	34.0	1.497	8.9	-9999.0	-9999.0
22.966	21.53	21.62	0.35	7.94	1.62	114.6	1.287	0.311	0.976	8.3	8.4	5.0E-05	30.0	34.0	1.355	7.5	-9999.0	-9999.0
23.031	20.82	20.91	0.34	8.02	1.63	114.6	1.291	0.313	0.978	8.0	8.1	5.0E-05	30.0	34.0	1.308	7.1	-9999.0	-9999.0
23.097	20.19	20.27	0.33	7.60	1.63	114.6	1.295	0.315	0.980	7.8	7.8	5.0E-05	30.0	32.0	1.265	6.7	-9999.0	-9999.0
23.162	18.91	18.99	0.32	7.40	1.69	114.6	1.299	0.317	0.981	7.3	7.3	5.0E-05	30.0	32.0	1.179	6.0	-9999.0	-9999.0
23.228	17.05	17.13	0.30	7.15	1.76	114.6	1.302	0.319	0.983	6.6	6.6	5.0E-05	30.0	32.0	1.055	5.1	-9999.0	-9999.0
23.294	16.29	16.37	0.28	7.15	1.71	114.6	1.306	0.321	0.985	6.3	6.3	5.0E-05	30.0	32.0	1.004	4.7	-9999.0	-9999.0
23.359	15.97	16.04	0.26	6.99	1.62	114.6	1.310	0.323	0.986	6.1	6.2	5.0E-05	30.0	32.0	0.982	4.5	-9999.0	-9999.0
23.425	15.97	16.04	0.24	6.30	1.50	114.6	1.314	0.325	0.988	6.1	6.2	5.0E-05	30.0	32.0	0.982	4.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
23.491	15.53	15.61	0.22	7.36	1.41	114.6	1.317	0.328	0.990	6.0	6.0	5.0E-05	30.0	32.0	0.953	4.3	-9999.0	-9999.0
23.556	15.53	15.62	0.20	8.46	1.28	114.6	1.321	0.330	0.992	6.0	6.0	5.0E-05	30.0	32.0	0.953	4.3	-9999.0	-9999.0
23.622	15.27	15.38	0.20	10.55	1.30	114.6	1.325	0.332	0.993	5.9	5.9	5.0E-05	30.0	32.0	0.937	4.2	-9999.0	-9999.0
23.687	16.04	16.13	0.22	8.20	1.37	114.6	1.329	0.334	0.995	6.2	6.2	5.0E-05	30.0	32.0	0.987	4.5	-9999.0	-9999.0
23.753	17.31	17.39	0.21	7.29	1.21	114.6	1.332	0.336	0.997	6.7	6.7	5.0E-05	30.0	32.0	1.071	5.1	-9999.0	-9999.0
23.819	16.04	16.10	0.22	5.99	1.37	114.6	1.336	0.338	0.998	6.2	6.2	5.0E-05	30.0	32.0	0.985	4.5	-9999.0	-9999.0
23.884	13.60	13.66	0.22	5.31	1.61	114.6	1.340	0.340	1.000	6.5	6.5	5.0E-06	-9999.0	-9999.0	0.821	3.4	-9999.0	-9999.0
23.950	12.14	12.21	0.21	6.81	1.72	114.6	1.344	0.342	1.002	5.8	5.8	5.0E-06	-9999.0	-9999.0	0.725	2.8	-9999.0	-9999.0
24.015	10.86	10.98	0.21	11.32	1.92	114.6	1.347	0.344	1.004	5.3	5.2	5.0E-06	-9999.0	-9999.0	0.642	2.4	-9999.0	-9999.0
24.081	10.74	10.88	0.21	13.71	1.93	114.6	1.351	0.346	1.005	5.2	5.2	5.0E-06	-9999.0	-9999.0	0.636	2.4	-9999.0	-9999.0
24.147	10.80	10.94	0.23	12.86	2.11	114.6	1.355	0.348	1.007	5.2	5.2	5.0E-06	-9999.0	-9999.0	0.639	2.4	-9999.0	-9999.0
24.212	11.05	11.18	0.25	11.91	2.24	114.6	1.359	0.350	1.009	5.4	5.3	5.0E-06	-9999.0	-9999.0	0.654	2.4	-9999.0	-9999.0
24.278	10.99	11.10	0.26	10.04	2.35	114.6	1.362	0.352	1.010	5.3	5.3	5.0E-06	-9999.0	-9999.0	0.649	2.4	-9999.0	-9999.0
24.344	9.77	9.87	0.26	9.20	2.64	114.6	1.366	0.354	1.012	6.3	6.3	5.0E-07	-9999.0	-9999.0	0.567	2.0	-9999.0	-9999.0
24.409	9.01	9.11	0.25	8.91	2.75	114.6	1.370	0.356	1.014	5.8	5.8	5.0E-07	-9999.0	-9999.0	0.516	1.8	-9999.0	-9999.0
24.475	7.99	8.09	0.24	8.95	2.98	114.6	1.374	0.358	1.015	5.2	5.1	5.0E-07	-9999.0	-9999.0	0.447	1.5	-9999.0	-9999.0
24.540	6.78	6.88	0.22	9.42	3.21	111.4	1.377	0.360	1.017	6.6	6.5	5.0E-08	-9999.0	-9999.0	0.367	1.2	-9999.0	-9999.0
24.606	6.33	6.45	0.20	11.12	3.11	111.4	1.381	0.362	1.019	6.2	6.1	5.0E-08	-9999.0	-9999.0	0.338	1.1	-9999.0	-9999.0
24.672	5.62	5.75	0.18	11.57	3.14	111.4	1.385	0.364	1.020	5.5	5.5	5.0E-08	-9999.0	-9999.0	0.291	1.0	-9999.0	-9999.0
24.737	4.09	4.22	0.16	11.61	3.80	111.4	1.388	0.366	1.022	4.0	4.0	5.0E-08	-9999.0	-9999.0	0.188	0.7	-9999.0	-9999.0
24.803	3.64	3.78	0.13	13.02	3.45	111.4	1.392	0.369	1.024	3.6	3.6	5.0E-08	-9999.0	-9999.0	0.159	0.6	-9999.0	-9999.0
24.868	3.07	3.24	0.12	15.98	3.71	111.4	1.396	0.371	1.025	3.1	3.1	5.0E-08	-9999.0	-9999.0	0.123	0.6	-9999.0	-9999.0
24.934	2.56	2.77	0.13	19.99	4.70	111.4	1.399	0.373	1.027	2.7	2.6	5.0E-08	-9999.0	-9999.0	0.092	0.5	-9999.0	-9999.0
25.000	3.83	4.08	0.14	22.87	3.44	111.4	1.403	0.375	1.028	3.9	3.8	5.0E-08	-9999.0	-9999.0	0.178	0.7	-9999.0	-9999.0
25.065	7.03	7.25	0.15	20.50	2.07	114.6	1.407	0.377	1.030	4.6	4.6	5.0E-07	-9999.0	-9999.0	0.389	1.3	-9999.0	-9999.0
25.131	11.63	11.83	0.15	19.05	1.27	114.6	1.411	0.379	1.032	4.5	4.5	5.0E-05	30.0	30.0	0.695	2.6	-9999.0	-9999.0
25.197	13.29	13.44	0.15	13.53	1.12	114.6	1.414	0.381	1.033	5.1	5.1	5.0E-05	30.0	30.0	0.802	3.1	-9999.0	-9999.0
25.262	15.08	15.19	0.15	10.59	0.99	114.6	1.418	0.383	1.035	5.8	5.7	5.0E-05	30.0	32.0	0.918	3.8	-9999.0	-9999.0
25.328	15.46	15.55	0.15	8.99	0.97	114.6	1.422	0.385	1.037	6.0	5.9	5.0E-05	30.0	32.0	0.942	3.9	-9999.0	-9999.0
25.393	13.60	13.67	0.16	6.50	1.17	114.6	1.426	0.387	1.039	5.2	5.1	5.0E-05	30.0	30.0	0.817	3.2	-9999.0	-9999.0
25.459	12.52	12.59	0.13	6.85	1.03	114.6	1.429	0.389	1.040	4.8	4.7	5.0E-05	30.0	30.0	0.744	2.8	-9999.0	-9999.0
25.525	11.18	11.25	0.14	7.03	1.25	114.6	1.433	0.391	1.042	5.4	5.3	5.0E-06	-9999.0	-9999.0	0.655	2.3	-9999.0	-9999.0
25.590	11.50	11.59	0.15	8.85	1.30	114.6	1.437	0.393	1.044	5.6	5.4	5.0E-06	-9999.0	-9999.0	0.677	2.4	-9999.0	-9999.0
25.656	10.28	10.41	0.16	11.79	1.54	114.6	1.441	0.395	1.045	5.0	4.9	5.0E-06	-9999.0	-9999.0	0.598	2.1	-9999.0	-9999.0
25.721	10.28	10.44	0.18	14.62	1.73	114.6	1.444	0.397	1.047	5.0	4.9	5.0E-06	-9999.0	-9999.0	0.600	2.1	-9999.0	-9999.0
25.787	9.52	9.68	0.20	14.54	2.07	114.6	1.448	0.399	1.049	4.6	4.5	5.0E-06	-9999.0	-9999.0	0.549	1.8	-9999.0	-9999.0
25.853	9.77	9.92	0.21	13.77	2.12	114.6	1.452	0.401	1.051	4.8	4.6	5.0E-06	-9999.0	-9999.0	0.565	1.9	-9999.0	-9999.0
25.918	9.64	9.77	0.22	11.63	2.26	114.6	1.456	0.403	1.052	4.7	4.6	5.0E-06	-9999.0	-9999.0	0.554	1.9	-9999.0	-9999.0
25.984	9.26	9.37	0.23	9.93	2.46	114.6	1.459	0.405	1.054	4.5	4.4	5.0E-06	-9999.0	-9999.0	0.527	1.7	-9999.0	-9999.0
26.050	9.01	9.12	0.22	9.68	2.42	114.6	1.463	0.407	1.056	4.4	4.2	5.0E-06	-9999.0	-9999.0	0.510	1.7	-9999.0	-9999.0
26.115	9.13	9.24	0.22	10.31	2.39	114.6	1.467	0.409	1.057	4.4	4.3	5.0E-06	-9999.0	-9999.0	0.518	1.7	-9999.0	-9999.0
26.181	9.52	9.65	0.22	11.59	2.29	114.6	1.471	0.412	1.059	4.6	4.5	5.0E-06	-9999.0	-9999.0	0.545	1.8	-9999.0	-9999.0
26.246	9.45	9.58	0.22	12.06	2.30	114.6	1.474	0.414	1.061	4.6	4.5	5.0E-06	-9999.0	-9999.0	0.541	1.8	-9999.0	-9999.0
26.312	9.83	9.96	0.22	12.06	2.21	114.6	1.478	0.416	1.063	4.8	4.6	5.0E-06	-9999.0	-9999.0	0.566	1.9	-9999.0	-9999.0
26.378	9.20	9.33	0.21	11.63	2.26	114.6	1.482	0.418	1.064	4.5	4.3	5.0E-06	-9999.0	-9999.0	0.523	1.7	-9999.0	-9999.0
26.443	9.01	9.14	0.21	11.47	2.30	114.6	1.486	0.420	1.066	4.4	4.2	5.0E-06	-9999.0	-9999.0	0.510	1.6	-9999.0	-9999.0
26.509	9.39	9.52	0.21	11.59	2.21	114.6	1.489	0.422	1.068	4.6	4.4	5.0E-06	-9999.0	-9999.0	0.535	1.7	-9999.0	-9999.0
26.574	10.22	10.36	0.20	12.06	1.94	114.6	1.493	0.424	1.069	5.0	4.8	5.0E-06	-9999.0	-9999.0	0.591	2.0	-9999.0	-9999.0
26.640	11.25	11.38	0.20	12.51	1.76	114.6	1.497	0.426	1.071	5.5	5.3	5.0E-06	-9999.0	-9999.0	0.659	2.3	-9999.0	-9999.0
26.706	11.56	11.69	0.20	12.45	1.71	114.6	1.501	0.428	1.073	5.6	5.4	5.0E-06	-9999.0	-9999.0	0.679	2.4	-9999.0	-9999.0
26.771	12.33	12.46	0.21	11.77	1.69	114.6	1.504	0.430	1.075	6.0	5.8	5.0E-06	-9999.0	-9999.0	0.730	2.6	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
26.837	12.90	13.02	0.22	10.73	1.69	114.6	1.508	0.432	1.076	6.2	6.0	5.0E-06	-9999.0	-9999.0	0.767	2.8	-9999.0	-9999.0
26.903	11.44	11.55	0.23	10.08	2.00	114.6	1.512	0.434	1.078	5.5	5.3	5.0E-06	-9999.0	-9999.0	0.669	2.3	-9999.0	-9999.0
26.968	10.74	10.84	0.24	9.64	2.22	114.6	1.516	0.436	1.080	5.2	5.0	5.0E-06	-9999.0	-9999.0	0.622	2.1	-9999.0	-9999.0
27.034	10.35	10.45	0.25	9.71	2.40	114.6	1.520	0.438	1.081	5.0	4.8	5.0E-06	-9999.0	-9999.0	0.595	2.0	-9999.0	-9999.0
27.099	9.39	9.51	0.25	10.57	2.64	114.6	1.523	0.440	1.083	6.1	5.8	5.0E-07	-9999.0	-9999.0	0.532	1.7	-9999.0	-9999.0
27.165	9.13	9.26	0.25	12.20	2.71	114.6	1.527	0.442	1.085	5.9	5.7	5.0E-07	-9999.0	-9999.0	0.516	1.6	-9999.0	-9999.0
27.231	10.15	10.30	0.24	13.41	2.34	114.6	1.531	0.444	1.086	4.9	4.7	5.0E-06	-9999.0	-9999.0	0.585	1.9	-9999.0	-9999.0
27.296	9.07	9.22	0.23	13.61	2.50	114.6	1.535	0.446	1.088	5.9	5.6	5.0E-07	-9999.0	-9999.0	0.512	1.6	-9999.0	-9999.0
27.362	9.32	9.47	0.24	13.63	2.54	114.6	1.538	0.448	1.090	6.0	5.8	5.0E-07	-9999.0	-9999.0	0.529	1.7	-9999.0	-9999.0
27.427	9.83	9.98	0.23	13.25	2.31	114.6	1.542	0.450	1.092	4.8	4.6	5.0E-06	-9999.0	-9999.0	0.562	1.8	-9999.0	-9999.0
27.493	9.83	9.97	0.23	12.72	2.31	114.6	1.546	0.453	1.093	4.8	4.6	5.0E-06	-9999.0	-9999.0	0.562	1.8	-9999.0	-9999.0
27.559	10.15	10.29	0.23	12.80	2.24	114.6	1.550	0.455	1.095	4.9	4.7	5.0E-06	-9999.0	-9999.0	0.583	1.9	-9999.0	-9999.0
27.624	9.83	9.97	0.23	12.57	2.31	114.6	1.553	0.457	1.097	4.8	4.6	5.0E-06	-9999.0	-9999.0	0.561	1.8	-9999.0	-9999.0
27.690	10.22	10.36	0.22	12.55	2.13	114.6	1.557	0.459	1.098	5.0	4.7	5.0E-06	-9999.0	-9999.0	0.587	1.9	-9999.0	-9999.0
27.756	10.09	10.23	0.22	12.22	2.16	114.6	1.561	0.461	1.100	4.9	4.7	5.0E-06	-9999.0	-9999.0	0.578	1.8	-9999.0	-9999.0
27.821	11.05	11.18	0.22	12.51	1.97	114.6	1.565	0.463	1.102	5.4	5.1	5.0E-06	-9999.0	-9999.0	0.641	2.1	-9999.0	-9999.0
27.887	10.42	10.55	0.21	12.14	2.00	114.6	1.568	0.465	1.104	5.0	4.8	5.0E-06	-9999.0	-9999.0	0.599	1.9	-9999.0	-9999.0
27.952	10.80	10.93	0.22	12.06	2.02	114.6	1.572	0.467	1.105	5.2	5.0	5.0E-06	-9999.0	-9999.0	0.624	2.0	-9999.0	-9999.0
28.018	9.58	9.71	0.22	11.89	2.27	114.6	1.576	0.469	1.107	4.7	4.4	5.0E-06	-9999.0	-9999.0	0.542	1.7	-9999.0	-9999.0
28.084	9.20	9.33	0.22	11.93	2.36	114.6	1.580	0.471	1.109	4.5	4.2	5.0E-06	-9999.0	-9999.0	0.517	1.6	-9999.0	-9999.0
28.149	8.50	8.63	0.22	11.79	2.56	114.6	1.583	0.473	1.110	5.5	5.2	5.0E-07	-9999.0	-9999.0	0.470	1.4	-9999.0	-9999.0
28.215	7.22	7.35	0.21	12.01	2.87	114.6	1.587	0.475	1.112	4.7	4.4	5.0E-07	-9999.0	-9999.0	0.384	1.1	-9999.0	-9999.0
28.280	7.48	7.62	0.21	12.68	2.76	114.6	1.591	0.477	1.114	4.9	4.6	5.0E-07	-9999.0	-9999.0	0.402	1.2	-9999.0	-9999.0
28.346	6.52	6.67	0.24	13.86	3.61	111.4	1.595	0.479	1.116	6.4	6.0	5.0E-08	-9999.0	-9999.0	0.338	1.0	-9999.0	-9999.0
28.412	6.06	6.22	0.20	14.78	3.22	111.4	1.598	0.481	1.117	6.0	5.6	5.0E-08	-9999.0	-9999.0	0.308	0.9	-9999.0	-9999.0
28.477	5.30	5.48	0.19	16.14	3.48	111.4	1.602	0.483	1.119	5.2	5.0	5.0E-08	-9999.0	-9999.0	0.258	0.8	-9999.0	-9999.0
28.543	4.85	5.05	0.18	17.99	3.58	111.4	1.606	0.485	1.120	4.8	4.6	5.0E-08	-9999.0	-9999.0	0.229	0.7	-9999.0	-9999.0
28.609	4.60	4.81	0.18	19.50	3.75	111.4	1.609	0.487	1.122	4.6	4.4	5.0E-08	-9999.0	-9999.0	0.214	0.7	-9999.0	-9999.0
28.674	7.41	7.51	0.19	9.28	2.54	114.6	1.613	0.489	1.124	4.8	4.5	5.0E-07	-9999.0	-9999.0	0.393	1.2	-9999.0	-9999.0
28.740	7.09	7.21	0.20	11.49	2.78	114.6	1.617	0.491	1.125	4.6	4.3	5.0E-07	-9999.0	-9999.0	0.373	1.1	-9999.0	-9999.0
28.805	7.03	7.18	0.21	13.75	2.93	114.6	1.620	0.493	1.127	4.6	4.3	5.0E-07	-9999.0	-9999.0	0.370	1.1	-9999.0	-9999.0
28.871	7.16	7.32	0.21	15.09	2.88	114.6	1.624	0.496	1.129	4.7	4.4	5.0E-07	-9999.0	-9999.0	0.380	1.1	-9999.0	-9999.0
28.937	8.05	8.23	0.21	16.49	2.56	114.6	1.628	0.498	1.130	5.3	4.9	5.0E-07	-9999.0	-9999.0	0.440	1.3	-9999.0	-9999.0
29.002	8.18	8.36	0.23	16.45	2.76	114.6	1.632	0.500	1.132	5.3	5.0	5.0E-07	-9999.0	-9999.0	0.448	1.3	-9999.0	-9999.0
29.068	7.48	7.66	0.23	16.43	3.01	114.6	1.636	0.502	1.134	4.9	4.6	5.0E-07	-9999.0	-9999.0	0.401	1.2	-9999.0	-9999.0
29.134	7.22	7.40	0.24	16.91	3.25	111.4	1.639	0.504	1.136	7.1	6.7	5.0E-08	-9999.0	-9999.0	0.384	1.1	-9999.0	-9999.0
29.199	8.24	8.43	0.25	17.21	2.97	114.6	1.643	0.506	1.137	5.4	5.0	5.0E-07	-9999.0	-9999.0	0.452	1.3	-9999.0	-9999.0
29.265	9.01	9.20	0.24	17.70	2.61	114.6	1.647	0.508	1.139	5.9	5.5	5.0E-07	-9999.0	-9999.0	0.504	1.5	-9999.0	-9999.0
29.330	8.88	9.07	0.25	17.29	2.76	114.6	1.650	0.510	1.141	5.8	5.4	5.0E-07	-9999.0	-9999.0	0.495	1.5	-9999.0	-9999.0
29.396	8.69	8.88	0.24	17.29	2.71	114.6	1.654	0.512	1.142	5.7	5.3	5.0E-07	-9999.0	-9999.0	0.482	1.4	-9999.0	-9999.0
29.462	8.81	9.00	0.25	17.46	2.78	114.6	1.658	0.514	1.144	5.7	5.4	5.0E-07	-9999.0	-9999.0	0.489	1.4	-9999.0	-9999.0
29.527	9.26	9.46	0.25	18.64	2.65	114.6	1.662	0.516	1.146	6.0	5.6	5.0E-07	-9999.0	-9999.0	0.520	1.5	-9999.0	-9999.0
29.593	8.24	8.44	0.24	18.76	2.85	114.6	1.665	0.518	1.147	5.4	5.0	5.0E-07	-9999.0	-9999.0	0.452	1.3	-9999.0	-9999.0
29.658	8.43	8.63	0.22	18.15	2.56	114.6	1.669	0.520	1.149	5.5	5.1	5.0E-07	-9999.0	-9999.0	0.464	1.4	-9999.0	-9999.0
29.724	8.75	8.94	0.22	17.82	2.47	114.6	1.673	0.522	1.151	5.7	5.3	5.0E-07	-9999.0	-9999.0	0.485	1.4	-9999.0	-9999.0
29.790	7.99	8.19	0.22	18.15	2.69	114.6	1.677	0.524	1.153	5.2	4.9	5.0E-07	-9999.0	-9999.0	0.434	1.3	-9999.0	-9999.0
29.855	8.11	8.31	0.20	18.70	2.41	114.6	1.681	0.526	1.154	5.3	4.9	5.0E-07	-9999.0	-9999.0	0.442	1.3	-9999.0	-9999.0
29.921	6.65	6.85	0.18	18.92	2.63	114.6	1.684	0.528	1.156	4.4	4.1	5.0E-07	-9999.0	-9999.0	0.344	1.0	-9999.0	-9999.0
29.987	6.84	7.04	0.16	19.16	2.28	114.6	1.688	0.530	1.158	4.5	4.2	5.0E-07	-9999.0	-9999.0	0.357	1.0	-9999.0	-9999.0
30.052	6.52	6.73	0.13	19.87	1.94	114.6	1.692	0.532	1.159	4.3	4.0	5.0E-07	-9999.0	-9999.0	0.336	1.0	-9999.0	-9999.0
30.118	6.13	6.37	0.11	21.73	1.73	114.6	1.696	0.534	1.161	4.1	3.8	5.0E-07	-9999.0	-9999.0	0.312	0.9	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
30.183	5.30	5.55	0.10	22.79	1.81	114.6	1.699	0.537	1.163	3.5	3.3	5.0E-07	-9999.0	-9999.0	0.257	0.8	-9999.0	-9999.0
30.249	6.00	6.26	0.07	23.49	1.12	111.4	1.703	0.539	1.164	3.0	2.8	1.0E-07	-9999.0	-9999.0	0.304	0.9	-9999.0	-9999.0
30.315	5.11	5.36	0.07	23.38	1.31	111.4	1.707	0.541	1.166	2.6	2.4	1.0E-07	-9999.0	-9999.0	0.244	0.8	-9999.0	-9999.0
30.380	4.15	4.40	0.05	22.87	1.14	111.4	1.710	0.543	1.168	2.1	1.9	1.0E-07	-9999.0	-9999.0	0.179	0.6	-9999.0	-9999.0
30.446	4.15	4.39	0.04	22.67	0.91	111.4	1.714	0.545	1.169	2.1	1.9	1.0E-07	-9999.0	-9999.0	0.179	0.6	-9999.0	-9999.0
30.511	3.39	3.64	0.03	23.24	0.83	111.4	1.718	0.547	1.171	1.7	1.6	1.0E-07	-9999.0	-9999.0	0.128	0.6	-9999.0	-9999.0
30.577	2.81	3.07	0.03	24.57	0.98	111.4	1.721	0.549	1.173	1.5	1.4	1.0E-07	-9999.0	-9999.0	0.090	0.5	-9999.0	-9999.0
30.643	3.51	3.79	0.02	25.76	0.53	111.4	1.725	0.551	1.174	1.8	1.7	1.0E-07	-9999.0	-9999.0	0.137	0.6	-9999.0	-9999.0
30.708	3.07	3.35	0.01	26.27	0.30	111.4	1.729	0.553	1.176	1.6	1.5	1.0E-07	-9999.0	-9999.0	0.108	0.5	-9999.0	-9999.0
30.774	3.07	3.35	0.01	26.47	0.30	111.4	1.732	0.555	1.177	1.6	1.5	1.0E-07	-9999.0	-9999.0	0.108	0.5	-9999.0	-9999.0
30.840	2.88	3.16	0.01	26.51	0.32	111.4	1.736	0.557	1.179	1.5	1.4	1.0E-07	-9999.0	-9999.0	0.095	0.5	-9999.0	-9999.0
30.905	3.32	3.61	0.01	26.67	0.28	111.4	1.740	0.559	1.181	1.7	1.6	1.0E-07	-9999.0	-9999.0	0.124	0.5	-9999.0	-9999.0
30.971	3.45	3.73	0.01	25.90	0.27	111.4	1.743	0.561	1.182	1.8	1.6	1.0E-07	-9999.0	-9999.0	0.132	0.6	-9999.0	-9999.0
31.036	3.90	4.17	0.02	25.38	0.48	111.4	1.747	0.563	1.184	2.0	1.8	1.0E-07	-9999.0	-9999.0	0.162	0.6	-9999.0	-9999.0
31.102	4.53	4.80	0.03	24.89	0.63	111.4	1.751	0.565	1.185	2.3	2.1	1.0E-07	-9999.0	-9999.0	0.203	0.7	-9999.0	-9999.0
31.168	3.96	4.22	0.05	24.41	1.19	111.4	1.754	0.567	1.187	2.0	1.9	1.0E-07	-9999.0	-9999.0	0.165	0.6	-9999.0	-9999.0
31.233	4.79	5.06	0.06	24.98	1.19	111.4	1.758	0.569	1.189	2.4	2.2	1.0E-07	-9999.0	-9999.0	0.220	0.7	-9999.0	-9999.0
31.299	4.98	5.25	0.05	24.79	0.95	111.4	1.762	0.571	1.190	2.5	2.3	1.0E-07	-9999.0	-9999.0	0.233	0.7	-9999.0	-9999.0
31.364	4.41	4.67	0.05	24.34	1.07	111.4	1.765	0.573	1.192	2.2	2.1	1.0E-07	-9999.0	-9999.0	0.194	0.6	-9999.0	-9999.0
31.430	3.26	3.52	0.04	23.84	1.14	111.4	1.769	0.575	1.193	1.7	1.5	1.0E-07	-9999.0	-9999.0	0.116	0.5	-9999.0	-9999.0
31.496	3.90	4.16	0.05	24.12	1.20	111.4	1.772	0.577	1.195	2.0	1.8	1.0E-07	-9999.0	-9999.0	0.159	0.6	-9999.0	-9999.0
31.561	3.77	4.04	0.03	25.06	0.74	111.4	1.776	0.580	1.197	1.9	1.8	1.0E-07	-9999.0	-9999.0	0.151	0.6	-9999.0	-9999.0
31.627	3.51	3.79	0.03	25.80	0.79	111.4	1.780	0.582	1.198	1.8	1.7	1.0E-07	-9999.0	-9999.0	0.134	0.6	-9999.0	-9999.0
31.693	3.26	3.55	0.05	26.96	1.41	111.4	1.783	0.584	1.200	1.7	1.6	1.0E-07	-9999.0	-9999.0	0.118	0.5	-9999.0	-9999.0
31.758	2.37	2.67	0.06	27.93	2.25	111.4	1.787	0.586	1.201	1.3	1.2	1.0E-07	-9999.0	-9999.0	0.059	0.5	-9999.0	-9999.0
31.824	3.39	3.71	0.07	29.51	1.89	111.4	1.791	0.588	1.203	1.8	1.6	1.0E-07	-9999.0	-9999.0	0.128	0.5	-9999.0	-9999.0
31.889	5.36	5.68	0.10	29.17	1.77	114.6	1.794	0.590	1.205	3.6	3.3	5.0E-07	-9999.0	-9999.0	0.259	0.8	-9999.0	-9999.0
31.955	6.78	7.06	0.11	26.59	1.56	114.6	1.798	0.592	1.206	3.4	3.1	5.0E-06	-9999.0	-9999.0	0.351	1.0	-9999.0	-9999.0
32.021	7.22	7.33	0.13	10.49	1.78	114.6	1.802	0.594	1.208	3.5	3.2	5.0E-06	-9999.0	-9999.0	0.369	1.0	-9999.0	-9999.0
32.086	7.60	7.74	0.14	13.35	1.81	114.6	1.806	0.596	1.210	3.7	3.4	5.0E-06	-9999.0	-9999.0	0.396	1.1	-9999.0	-9999.0
32.152	6.33	6.51	0.15	16.93	2.31	114.6	1.809	0.598	1.212	4.2	3.8	5.0E-07	-9999.0	-9999.0	0.313	0.9	-9999.0	-9999.0
32.217	5.81	6.02	0.16	19.28	2.66	114.6	1.813	0.600	1.213	3.8	3.5	5.0E-07	-9999.0	-9999.0	0.281	0.8	-9999.0	-9999.0
32.283	7.48	7.70	0.18	20.97	2.34	114.6	1.817	0.602	1.215	4.9	4.5	5.0E-07	-9999.0	-9999.0	0.393	1.1	-9999.0	-9999.0
32.349	8.50	8.73	0.19	20.91	2.18	114.6	1.821	0.604	1.217	4.2	3.8	5.0E-06	-9999.0	-9999.0	0.460	1.3	-9999.0	-9999.0
32.414	8.50	8.72	0.18	20.21	2.07	114.6	1.825	0.606	1.218	4.2	3.8	5.0E-06	-9999.0	-9999.0	0.460	1.3	-9999.0	-9999.0
32.480	8.05	8.26	0.17	19.28	2.06	114.6	1.828	0.608	1.220	4.0	3.6	5.0E-06	-9999.0	-9999.0	0.429	1.2	-9999.0	-9999.0
32.546	7.16	7.35	0.17	17.97	2.32	114.6	1.832	0.610	1.222	4.7	4.2	5.0E-07	-9999.0	-9999.0	0.368	1.0	-9999.0	-9999.0
32.611	6.52	6.71	0.18	17.52	2.69	114.6	1.836	0.612	1.223	4.3	3.9	5.0E-07	-9999.0	-9999.0	0.325	0.9	-9999.0	-9999.0
32.677	6.27	6.46	0.15	18.43	2.33	114.6	1.840	0.614	1.225	4.1	3.7	5.0E-07	-9999.0	-9999.0	0.308	0.9	-9999.0	-9999.0
32.742	5.68	5.90	0.14	20.46	2.38	114.6	1.843	0.616	1.227	3.8	3.4	5.0E-07	-9999.0	-9999.0	0.271	0.8	-9999.0	-9999.0
32.808	4.28	4.52	0.11	22.24	2.44	111.4	1.847	0.618	1.229	4.3	3.9	5.0E-08	-9999.0	-9999.0	0.178	0.6	-9999.0	-9999.0
32.874	3.71	3.98	0.08	25.24	2.01	111.4	1.851	0.621	1.230	3.8	3.4	5.0E-08	-9999.0	-9999.0	0.142	0.6	-9999.0	-9999.0
32.939	4.53	4.82	0.07	27.00	1.46	111.4	1.854	0.623	1.232	2.3	2.1	1.0E-07	-9999.0	-9999.0	0.198	0.6	-9999.0	-9999.0
33.005	3.96	4.25	0.06	26.53	1.42	111.4	1.858	0.625	1.233	2.0	1.8	1.0E-07	-9999.0	-9999.0	0.159	0.6	-9999.0	-9999.0
33.070	4.92	5.19	0.04	24.93	0.77	111.4	1.862	0.627	1.235	2.5	2.2	1.0E-07	-9999.0	-9999.0	0.222	0.7	-9999.0	-9999.0
33.136	4.92	5.18	0.03	24.32	0.58	111.4	1.865	0.629	1.237	2.5	2.2	1.0E-07	-9999.0	-9999.0	0.221	0.7	-9999.0	-9999.0
33.202	3.77	4.03	0.03	24.02	0.75	111.4	1.869	0.631	1.238	1.9	1.7	1.0E-07	-9999.0	-9999.0	0.144	0.6	-9999.0	-9999.0
33.267	3.58	3.85	0.02	24.93	0.52	111.4	1.873	0.633	1.240	1.8	1.7	1.0E-07	-9999.0	-9999.0	0.132	0.5	-9999.0	-9999.0
33.333	2.94	3.23	0.01	26.94	0.31	111.4	1.876	0.635	1.241	1.5	1.4	1.0E-07	-9999.0	-9999.0	0.090	0.5	-9999.0	-9999.0
33.399	1.72	2.03	0.01	28.17	0.49	111.4	1.880	0.637	1.243	1.0	0.9	1.0E-07	-9999.0	-9999.0	0.010	0.5	-9999.0	-9999.0
33.464	1.47	1.79	0.01	29.33	0.56	111.4	1.884	0.639	1.245	0.9	0.8	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
33.530	1.85	2.18	0.01	29.70	0.46	111.4	1.887	0.641	1.246	1.0	0.9	1.0E-07	-9999.0	-9999.0	0.019	0.5	-9999.0	-9999.0
33.595	2.24	2.56	0.01	29.90	0.39	111.4	1.891	0.643	1.248	1.2	1.1	1.0E-07	-9999.0	-9999.0	0.045	0.5	-9999.0	-9999.0
33.661	1.59	1.92	0.01	29.90	0.52	111.4	1.895	0.645	1.249	0.9	0.8	1.0E-07	-9999.0	-9999.0	0.001	0.5	-9999.0	-9999.0
33.727	1.91	2.24	0.02	30.28	0.89	111.4	1.898	0.647	1.251	1.1	1.0	1.0E-07	-9999.0	-9999.0	0.023	0.5	-9999.0	-9999.0
33.792	3.64	3.97	0.07	30.60	1.77	111.4	1.902	0.649	1.253	1.9	1.7	1.0E-07	-9999.0	-9999.0	0.138	0.6	-9999.0	-9999.0
33.858	5.81	6.13	0.11	29.29	1.80	114.6	1.906	0.651	1.254	3.9	3.5	5.0E-07	-9999.0	-9999.0	0.282	0.8	-9999.0	-9999.0
33.923	9.13	9.43	0.14	27.45	1.49	114.6	1.909	0.653	1.256	4.5	4.0	5.0E-06	-9999.0	-9999.0	0.501	1.3	-9999.0	-9999.0
33.989	10.54	10.79	0.17	23.59	1.58	114.6	1.913	0.655	1.258	5.2	4.6	5.0E-06	-9999.0	-9999.0	0.592	1.6	-9999.0	-9999.0
34.055	11.37	11.61	0.21	22.67	1.81	114.6	1.917	0.657	1.259	5.6	5.0	5.0E-06	-9999.0	-9999.0	0.646	1.8	-9999.0	-9999.0
34.120	12.71	12.94	0.23	21.47	1.78	114.6	1.921	0.659	1.261	6.2	5.5	5.0E-06	-9999.0	-9999.0	0.735	2.1	-9999.0	-9999.0
34.186	11.56	11.79	0.24	21.63	2.04	114.6	1.924	0.661	1.263	5.6	5.0	5.0E-06	-9999.0	-9999.0	0.658	1.8	-9999.0	-9999.0
34.252	11.56	11.80	0.23	22.34	1.95	114.6	1.928	0.664	1.265	5.6	5.0	5.0E-06	-9999.0	-9999.0	0.658	1.8	-9999.0	-9999.0
34.317	12.14	12.37	0.23	21.73	1.86	114.6	1.932	0.666	1.266	5.9	5.3	5.0E-06	-9999.0	-9999.0	0.696	2.0	-9999.0	-9999.0
34.383	11.12	11.35	0.22	21.67	1.94	114.6	1.936	0.668	1.268	5.4	4.8	5.0E-06	-9999.0	-9999.0	0.628	1.7	-9999.0	-9999.0
34.448	10.93	11.16	0.22	21.40	1.98	114.6	1.939	0.670	1.270	5.3	4.7	5.0E-06	-9999.0	-9999.0	0.615	1.7	-9999.0	-9999.0
34.514	11.56	11.79	0.23	21.51	1.96	114.6	1.943	0.672	1.271	5.6	5.0	5.0E-06	-9999.0	-9999.0	0.656	1.8	-9999.0	-9999.0
34.580	10.03	10.27	0.22	21.77	2.15	114.6	1.947	0.674	1.273	4.9	4.4	5.0E-06	-9999.0	-9999.0	0.555	1.5	-9999.0	-9999.0
34.645	10.03	10.28	0.20	22.30	1.95	114.6	1.951	0.676	1.275	4.9	4.4	5.0E-06	-9999.0	-9999.0	0.555	1.5	-9999.0	-9999.0
34.711	9.13	9.38	0.18	22.95	1.92	114.6	1.954	0.678	1.277	4.5	4.0	5.0E-06	-9999.0	-9999.0	0.495	1.3	-9999.0	-9999.0
34.776	7.67	7.92	0.15	22.97	1.90	114.6	1.958	0.680	1.278	3.8	3.4	5.0E-06	-9999.0	-9999.0	0.397	1.0	-9999.0	-9999.0
34.842	8.11	8.37	0.13	24.04	1.56	114.6	1.962	0.682	1.280	4.0	3.5	5.0E-06	-9999.0	-9999.0	0.427	1.1	-9999.0	-9999.0
34.908	7.09	7.36	0.10	25.48	1.36	114.6	1.966	0.684	1.282	3.5	3.1	5.0E-06	-9999.0	-9999.0	0.360	0.9	-9999.0	-9999.0
34.973	5.87	6.16	0.12	26.78	1.95	114.6	1.969	0.686	1.283	3.9	3.5	5.0E-07	-9999.0	-9999.0	0.280	0.8	-9999.0	-9999.0
35.039	4.15	4.45	0.08	27.93	1.80	111.4	1.973	0.688	1.285	2.1	1.9	1.0E-07	-9999.0	-9999.0	0.165	0.6	-9999.0	-9999.0
35.105	4.02	4.34	0.05	29.57	1.16	111.4	1.977	0.690	1.287	2.1	1.8	1.0E-07	-9999.0	-9999.0	0.157	0.6	-9999.0	-9999.0
35.170	2.81	3.15	0.03	31.70	0.95	111.4	1.980	0.692	1.288	1.5	1.3	1.0E-07	-9999.0	-9999.0	0.078	0.5	-9999.0	-9999.0
35.236	3.01	3.36	0.03	32.81	0.89	111.4	1.984	0.694	1.290	1.6	1.4	1.0E-07	-9999.0	-9999.0	0.092	0.5	-9999.0	-9999.0
35.301	3.20	3.37	0.02	16.33	0.59	111.4	1.988	0.696	1.291	1.6	1.4	1.0E-07	-9999.0	-9999.0	0.092	0.5	-9999.0	-9999.0
35.367	3.90	4.17	0.01	24.65	0.24	111.4	1.991	0.698	1.293	2.0	1.8	1.0E-07	-9999.0	-9999.0	0.145	0.6	-9999.0	-9999.0
35.433	3.32	3.66	0.01	31.35	0.27	111.4	1.995	0.700	1.295	1.8	1.5	1.0E-07	-9999.0	-9999.0	0.111	0.5	-9999.0	-9999.0
35.498	4.41	4.79	0.01	35.53	0.21	111.4	1.999	0.702	1.296	2.3	2.0	1.0E-07	-9999.0	-9999.0	0.186	0.6	-9999.0	-9999.0
35.564	4.34	4.76	0.01	38.95	0.21	111.4	2.002	0.705	1.298	2.3	2.0	1.0E-07	-9999.0	-9999.0	0.184	0.6	-9999.0	-9999.0
35.629	5.87	6.31	0.02	39.98	0.32	111.4	2.006	0.707	1.300	3.0	2.6	1.0E-07	-9999.0	-9999.0	0.287	0.8	-9999.0	-9999.0
35.695	4.92	5.36	0.02	40.82	0.37	111.4	2.010	0.709	1.301	2.6	2.3	1.0E-07	-9999.0	-9999.0	0.224	0.7	-9999.0	-9999.0
35.761	4.79	5.25	0.05	42.21	0.96	111.4	2.013	0.711	1.303	2.5	2.2	1.0E-07	-9999.0	-9999.0	0.216	0.7	-9999.0	-9999.0
35.826	6.52	7.00	0.09	44.54	1.29	111.4	2.017	0.713	1.304	3.4	2.9	1.0E-07	-9999.0	-9999.0	0.332	0.9	-9999.0	-9999.0
35.892	7.35	7.85	0.12	46.56	1.53	114.6	2.021	0.715	1.306	3.8	3.3	5.0E-06	-9999.0	-9999.0	0.389	1.0	-9999.0	-9999.0
35.958	7.48	7.98	0.13	46.62	1.63	114.6	2.024	0.717	1.308	3.8	3.3	5.0E-06	-9999.0	-9999.0	0.397	1.0	-9999.0	-9999.0
36.023	8.56	9.03	0.16	43.53	1.78	114.6	2.028	0.719	1.309	4.3	3.8	5.0E-06	-9999.0	-9999.0	0.467	1.2	-9999.0	-9999.0
36.089	9.07	9.58	0.20	47.42	2.09	114.6	2.032	0.721	1.311	4.6	4.0	5.0E-06	-9999.0	-9999.0	0.503	1.3	-9999.0	-9999.0
36.154	9.45	10.02	0.26	52.76	2.60	114.6	2.036	0.723	1.313	4.8	4.2	5.0E-06	-9999.0	-9999.0	0.532	1.4	-9999.0	-9999.0
36.220	11.25	11.76	0.30	47.89	2.56	114.6	2.040	0.725	1.315	5.6	4.9	5.0E-06	-9999.0	-9999.0	0.648	1.7	-9999.0	-9999.0
36.286	11.18	11.61	0.29	39.84	2.50	114.6	2.043	0.727	1.316	5.6	4.8	5.0E-06	-9999.0	-9999.0	0.638	1.7	-9999.0	-9999.0
36.351	11.56	11.96	0.27	37.55	2.26	114.6	2.047	0.729	1.318	5.7	5.0	5.0E-06	-9999.0	-9999.0	0.661	1.7	-9999.0	-9999.0
36.417	11.18	11.56	0.29	35.57	2.51	114.6	2.051	0.731	1.320	5.5	4.8	5.0E-06	-9999.0	-9999.0	0.634	1.7	-9999.0	-9999.0
36.482	10.35	10.79	0.31	41.24	2.88	114.6	2.055	0.733	1.321	6.9	6.0	5.0E-07	-9999.0	-9999.0	0.582	1.5	-9999.0	-9999.0
36.548	10.22	10.69	0.30	43.00	2.81	114.6	2.058	0.735	1.323	6.8	5.9	5.0E-07	-9999.0	-9999.0	0.575	1.5	-9999.0	-9999.0
36.614	9.71	10.14	0.33	39.27	3.26	114.6	2.062	0.737	1.325	6.5	5.6	5.0E-07	-9999.0	-9999.0	0.538	1.4	-9999.0	-9999.0
36.679	10.86	11.32	0.40	42.84	3.54	114.6	2.066	0.739	1.327	7.2	6.3	5.0E-07	-9999.0	-9999.0	0.617	1.6	-9999.0	-9999.0
36.745	12.01	12.62	0.47	56.61	3.73	114.6	2.070	0.741	1.328	8.1	7.0	5.0E-07	-9999.0	-9999.0	0.703	1.9	-9999.0	-9999.0
36.811	15.84	16.40	0.55	52.20	3.36	114.6	2.073	0.743	1.330	10.5	9.1	5.0E-07	-9999.0	-9999.0	0.955	2.8	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
36.876	16.99	17.36	0.62	34.29	3.58	114.6	2.077	0.745	1.332	11.1	9.6	5.0E-07	-9999.0	-9999.0	1.019	3.1	-9999.0	-9999.0
36.942	17.25	17.67	0.69	38.93	3.91	114.6	2.081	0.748	1.333	11.3	9.8	5.0E-07	-9999.0	-9999.0	1.039	3.2	-9999.0	-9999.0
37.007	18.20	18.71	0.76	46.81	4.07	114.6	2.085	0.750	1.335	11.9	10.3	5.0E-07	-9999.0	-9999.0	1.108	3.5	-9999.0	-9999.0
37.073	18.98	19.42	0.86	40.73	4.44	111.4	2.088	0.752	1.337	18.6	16.1	5.0E-08	-9999.0	-9999.0	1.155	3.7	-9999.0	-9999.0
37.139	18.85	19.32	0.96	44.34	4.98	111.4	2.092	0.754	1.338	18.5	16.0	5.0E-08	-9999.0	-9999.0	1.149	3.6	-9999.0	-9999.0
37.204	18.66	19.08	0.97	39.66	5.10	111.4	2.096	0.756	1.340	18.3	15.8	5.0E-08	-9999.0	-9999.0	1.133	3.5	-9999.0	-9999.0
37.270	18.59	19.10	1.02	47.58	5.35	111.4	2.099	0.758	1.342	18.3	15.8	5.0E-08	-9999.0	-9999.0	1.133	3.5	-9999.0	-9999.0
37.336	20.25	20.66	1.04	38.22	5.05	111.4	2.103	0.760	1.343	19.8	17.1	5.0E-08	-9999.0	-9999.0	1.237	4.0	-9999.0	-9999.0
37.401	19.93	20.37	1.07	40.94	5.27	111.4	2.107	0.762	1.345	19.5	16.8	5.0E-08	-9999.0	-9999.0	1.218	3.9	-9999.0	-9999.0
37.467	20.95	21.46	1.11	46.89	5.19	111.4	2.110	0.764	1.346	20.5	17.7	5.0E-08	-9999.0	-9999.0	1.290	4.3	-9999.0	-9999.0
37.532	20.19	20.65	1.11	42.53	5.39	111.4	2.114	0.766	1.348	19.8	17.0	5.0E-08	-9999.0	-9999.0	1.236	4.0	-9999.0	-9999.0
37.598	21.14	21.67	1.09	48.83	5.04	111.4	2.118	0.768	1.350	20.8	17.9	5.0E-08	-9999.0	-9999.0	1.303	4.3	-9999.0	-9999.0
37.664	21.33	21.82	1.10	45.27	5.05	111.4	2.121	0.770	1.351	20.9	18.0	5.0E-08	-9999.0	-9999.0	1.313	4.4	-9999.0	-9999.0
37.729	20.38	20.93	1.11	50.69	5.32	111.4	2.125	0.772	1.353	20.0	17.2	5.0E-08	-9999.0	-9999.0	1.253	4.1	-9999.0	-9999.0
37.795	21.21	21.74	1.12	48.89	5.16	111.4	2.129	0.774	1.354	20.8	17.9	5.0E-08	-9999.0	-9999.0	1.307	4.3	-9999.0	-9999.0
37.860	20.44	21.04	1.12	55.64	5.34	111.4	2.132	0.776	1.356	20.2	17.3	5.0E-08	-9999.0	-9999.0	1.261	4.1	-9999.0	-9999.0
37.926	21.33	21.82	1.11	45.56	5.10	111.4	2.136	0.778	1.358	20.9	17.9	5.0E-08	-9999.0	-9999.0	1.313	4.3	-9999.0	-9999.0
37.992	21.84	22.30	1.15	41.96	5.17	111.4	2.140	0.780	1.359	21.4	18.3	5.0E-08	-9999.0	-9999.0	1.344	4.5	-9999.0	-9999.0
38.057	21.65	22.23	1.21	53.19	5.46	111.4	2.143	0.782	1.361	21.3	18.2	5.0E-08	-9999.0	-9999.0	1.339	4.4	-9999.0	-9999.0
38.123	22.61	23.21	1.23	54.97	5.31	111.4	2.147	0.784	1.362	22.2	19.0	5.0E-08	-9999.0	-9999.0	1.404	4.8	-9999.0	-9999.0
38.189	24.21	24.73	1.27	47.87	5.15	111.4	2.150	0.786	1.364	23.7	20.3	5.0E-08	-9999.0	-9999.0	1.505	5.3	-9999.0	-9999.0
38.254	24.98	25.46	1.34	44.38	5.28	111.4	2.154	0.789	1.366	24.4	20.9	5.0E-08	-9999.0	-9999.0	1.554	5.5	-9999.0	-9999.0
38.320	24.15	24.63	1.36	44.99	5.53	111.4	2.158	0.791	1.367	23.6	20.2	5.0E-08	-9999.0	-9999.0	1.498	5.2	-9999.0	-9999.0
38.385	23.96	24.42	1.40	42.76	5.75	111.4	2.161	0.793	1.369	23.4	20.0	5.0E-08	-9999.0	-9999.0	1.484	5.1	-9999.0	-9999.0
38.451	23.32	23.64	1.41	30.08	5.98	111.4	2.165	0.795	1.370	22.6	19.3	5.0E-08	-9999.0	-9999.0	1.432	4.9	-9999.0	-9999.0
38.517	24.40	24.80	1.44	36.92	5.82	111.4	2.169	0.797	1.372	23.7	20.3	5.0E-08	-9999.0	-9999.0	1.509	5.3	-9999.0	-9999.0
38.582	24.98	25.40	1.44	38.81	5.68	111.4	2.172	0.799	1.374	24.3	20.8	5.0E-08	-9999.0	-9999.0	1.548	5.5	-9999.0	-9999.0
38.648	23.83	24.30	1.42	43.81	5.86	111.4	2.176	0.801	1.375	23.3	19.8	5.0E-08	-9999.0	-9999.0	1.475	5.1	-9999.0	-9999.0
38.713	24.98	25.46	1.45	44.40	5.71	111.4	2.180	0.803	1.377	24.4	20.8	5.0E-08	-9999.0	-9999.0	1.552	5.5	-9999.0	-9999.0
38.779	25.30	25.71	1.46	37.73	5.69	111.4	2.183	0.805	1.378	24.6	21.0	5.0E-08	-9999.0	-9999.0	1.568	5.5	-9999.0	-9999.0
38.845	26.44	26.79	1.45	32.03	5.43	111.4	2.187	0.807	1.380	25.7	21.8	5.0E-08	-9999.0	-9999.0	1.640	5.9	-9999.0	-9999.0
38.910	26.06	26.36	1.45	27.73	5.51	111.4	2.191	0.809	1.382	25.2	21.5	5.0E-08	-9999.0	-9999.0	1.611	5.8	-9999.0	-9999.0
38.976	24.85	25.02	1.47	15.27	5.89	111.4	2.194	0.811	1.383	24.0	20.4	5.0E-08	-9999.0	-9999.0	1.521	5.3	-9999.0	-9999.0
39.042	23.96	24.17	1.45	19.50	6.01	111.4	2.198	0.813	1.385	23.1	19.7	5.0E-08	-9999.0	-9999.0	1.465	5.0	-9999.0	-9999.0
39.107	23.32	23.63	1.43	29.02	6.07	111.4	2.202	0.815	1.387	22.6	19.2	5.0E-08	-9999.0	-9999.0	1.429	4.8	-9999.0	-9999.0
39.173	21.27	21.44	1.34	15.25	6.27	111.4	2.205	0.817	1.388	20.5	17.4	5.0E-08	-9999.0	-9999.0	1.282	4.0	-9999.0	-9999.0
39.238	19.81	19.98	1.23	16.17	6.17	111.4	2.209	0.819	1.390	19.1	16.2	5.0E-08	-9999.0	-9999.0	1.185	3.6	-9999.0	-9999.0
39.304	19.61	19.90	1.13	27.35	5.69	111.4	2.213	0.821	1.391	19.1	16.2	5.0E-08	-9999.0	-9999.0	1.179	3.6	-9999.0	-9999.0
39.370	18.72	19.03	1.05	29.43	5.53	111.4	2.216	0.823	1.393	18.2	15.4	5.0E-08	-9999.0	-9999.0	1.121	3.3	-9999.0	-9999.0
39.435	18.14	18.56	0.96	38.69	5.18	111.4	2.220	0.825	1.395	17.8	15.1	5.0E-08	-9999.0	-9999.0	1.089	3.2	-9999.0	-9999.0
39.501	17.05	17.48	0.89	40.06	5.10	111.4	2.224	0.827	1.396	16.7	14.2	5.0E-08	-9999.0	-9999.0	1.017	2.9	-9999.0	-9999.0
39.566	16.99	17.42	0.84	39.23	4.84	111.4	2.227	0.829	1.398	16.7	14.1	5.0E-08	-9999.0	-9999.0	1.013	2.8	-9999.0	-9999.0
39.632	16.29	16.66	0.81	34.52	4.87	111.4	2.231	0.832	1.399	16.0	13.5	5.0E-08	-9999.0	-9999.0	0.962	2.6	-9999.0	-9999.0
39.698	15.21	15.54	0.81	30.83	5.23	111.4	2.235	0.834	1.401	14.9	12.6	5.0E-08	-9999.0	-9999.0	0.887	2.4	-9999.0	-9999.0
39.763	15.78	16.00	0.80	20.38	5.01	111.4	2.238	0.836	1.403	15.3	12.9	5.0E-08	-9999.0	-9999.0	0.917	2.5	-9999.0	-9999.0
39.829	14.89	15.12	0.79	21.45	5.24	111.4	2.242	0.838	1.404	14.5	12.2	5.0E-08	-9999.0	-9999.0	0.858	2.3	-9999.0	-9999.0
39.895	14.70	14.88	0.78	17.19	5.25	111.4	2.245	0.840	1.406	14.3	12.0	5.0E-08	-9999.0	-9999.0	0.842	2.2	-9999.0	-9999.0
39.960	14.44	14.72	0.82	26.78	5.58	111.4	2.249	0.842	1.407	14.1	11.9	5.0E-08	-9999.0	-9999.0	0.832	2.2	-9999.0	-9999.0
40.026	14.57	14.76	0.86	18.25	5.84	111.4	2.253	0.844	1.409	14.1	11.9	5.0E-08	-9999.0	-9999.0	0.834	2.2	-9999.0	-9999.0
40.091	14.89	15.19	0.91	28.21	6.00	111.4	2.256	0.846	1.411	14.5	12.3	5.0E-08	-9999.0	-9999.0	0.862	2.3	-9999.0	-9999.0
40.157	15.97	16.24	0.98	24.73	6.05	111.4	2.260	0.848	1.412	15.5	13.1	5.0E-08	-9999.0	-9999.0	0.932	2.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
40.223	18.27	18.40	1.04	11.20	5.67	111.4	2.264	0.850	1.414	17.6	14.8	5.0E-08	-9999.0	-9999.0	1.075	3.0	-9999.0	-9999.0
40.288	17.95	18.05	1.06	8.81	5.89	111.4	2.267	0.852	1.415	17.3	14.5	5.0E-08	-9999.0	-9999.0	1.052	3.0	-9999.0	-9999.0
40.354	18.01	18.05	1.14	3.06	6.33	111.4	2.271	0.854	1.417	17.3	14.5	5.0E-08	-9999.0	-9999.0	1.052	2.9	-9999.0	-9999.0
40.419	18.27	18.33	1.18	5.19	6.45	111.4	2.275	0.856	1.419	17.6	14.7	5.0E-08	-9999.0	-9999.0	1.070	3.0	-9999.0	-9999.0
40.485	18.52	18.60	1.19	6.95	6.41	111.4	2.278	0.858	1.420	17.8	14.9	5.0E-08	-9999.0	-9999.0	1.088	3.1	-9999.0	-9999.0
40.551	18.85	18.94	1.16	8.79	6.14	111.4	2.282	0.860	1.422	18.1	15.2	5.0E-08	-9999.0	-9999.0	1.111	3.2	-9999.0	-9999.0
40.616	18.39	18.46	1.15	6.03	6.24	111.4	2.286	0.862	1.423	17.7	14.8	5.0E-08	-9999.0	-9999.0	1.078	3.0	-9999.0	-9999.0
40.682	17.12	17.33	1.12	19.44	6.48	111.4	2.289	0.864	1.425	16.6	13.9	5.0E-08	-9999.0	-9999.0	1.003	2.7	-9999.0	-9999.0
40.748	17.37	17.61	1.11	21.83	6.32	111.4	2.293	0.866	1.427	16.9	14.1	5.0E-08	-9999.0	-9999.0	1.021	2.8	-9999.0	-9999.0
40.813	18.27	18.48	1.11	19.48	6.02	111.4	2.297	0.868	1.428	17.7	14.8	5.0E-08	-9999.0	-9999.0	1.079	3.0	-9999.0	-9999.0
40.879	17.82	18.02	1.10	18.33	6.12	111.4	2.300	0.870	1.430	17.3	14.4	5.0E-08	-9999.0	-9999.0	1.048	2.9	-9999.0	-9999.0
40.944	17.69	17.97	1.10	25.76	6.14	111.4	2.304	0.873	1.431	17.2	14.4	5.0E-08	-9999.0	-9999.0	1.044	2.9	-9999.0	-9999.0
41.010	18.33	18.51	1.12	15.94	6.07	111.4	2.308	0.875	1.433	17.7	14.8	5.0E-08	-9999.0	-9999.0	1.080	3.0	-9999.0	-9999.0
41.076	18.79	18.92	1.15	12.57	6.09	111.4	2.311	0.877	1.435	18.1	15.1	5.0E-08	-9999.0	-9999.0	1.107	3.1	-9999.0	-9999.0
41.141	18.72	18.82	1.15	10.08	6.12	111.4	2.315	0.879	1.436	18.0	15.0	5.0E-08	-9999.0	-9999.0	1.101	3.1	-9999.0	-9999.0
41.207	18.72	18.86	1.13	13.59	6.01	111.4	2.319	0.881	1.438	18.1	15.1	5.0E-08	-9999.0	-9999.0	1.103	3.1	-9999.0	-9999.0
41.272	17.12	17.32	1.10	18.52	6.37	111.4	2.322	0.883	1.440	16.6	13.8	5.0E-08	-9999.0	-9999.0	1.000	2.7	-9999.0	-9999.0
41.338	18.52	18.83	1.11	28.21	5.91	111.4	2.326	0.885	1.441	18.0	15.0	5.0E-08	-9999.0	-9999.0	1.100	3.1	-9999.0	-9999.0
41.404	18.98	19.26	1.15	26.29	5.99	111.4	2.330	0.887	1.443	18.4	15.4	5.0E-08	-9999.0	-9999.0	1.129	3.2	-9999.0	-9999.0
41.469	19.30	19.55	1.05	23.84	5.38	111.4	2.333	0.889	1.444	18.7	15.6	5.0E-08	-9999.0	-9999.0	1.148	3.2	-9999.0	-9999.0
41.535	20.32	20.61	1.04	27.14	5.06	111.4	2.337	0.891	1.446	19.7	16.4	5.0E-08	-9999.0	-9999.0	1.218	3.5	-9999.0	-9999.0
41.601	19.30	19.50	1.06	18.41	5.45	111.4	2.341	0.893	1.448	18.7	15.5	5.0E-08	-9999.0	-9999.0	1.144	3.2	-9999.0	-9999.0
41.666	20.19	20.33	1.11	12.78	5.47	111.4	2.344	0.895	1.449	19.5	16.2	5.0E-08	-9999.0	-9999.0	1.199	3.4	-9999.0	-9999.0
41.732	20.70	20.93	1.16	20.99	5.56	111.4	2.348	0.897	1.451	20.0	16.6	5.0E-08	-9999.0	-9999.0	1.239	3.6	-9999.0	-9999.0
41.797	21.46	21.71	1.21	23.03	5.59	111.4	2.351	0.899	1.452	20.8	17.3	5.0E-08	-9999.0	-9999.0	1.291	3.8	-9999.0	-9999.0
41.863	24.02	24.29	1.23	24.81	5.08	111.4	2.355	0.901	1.454	23.3	19.3	5.0E-08	-9999.0	-9999.0	1.462	4.6	-9999.0	-9999.0
41.929	24.53	24.93	1.26	36.75	5.07	111.4	2.359	0.903	1.456	23.9	19.8	5.0E-08	-9999.0	-9999.0	1.505	4.8	-9999.0	-9999.0
41.994	25.36	25.88	1.30	48.30	5.03	111.4	2.362	0.905	1.457	24.8	20.5	5.0E-08	-9999.0	-9999.0	1.568	5.1	-9999.0	-9999.0
42.060	26.38	26.75	1.36	33.74	5.10	111.4	2.366	0.907	1.459	25.6	21.2	5.0E-08	-9999.0	-9999.0	1.625	5.4	-9999.0	-9999.0
42.125	26.84	27.34	1.39	46.48	5.10	111.4	2.370	0.909	1.460	26.2	21.7	5.0E-08	-9999.0	-9999.0	1.665	5.6	-9999.0	-9999.0
42.191	27.41	27.89	1.41	45.13	5.07	111.4	2.373	0.911	1.462	26.7	22.1	5.0E-08	-9999.0	-9999.0	1.701	5.7	-9999.0	-9999.0
42.257	27.03	27.54	1.43	47.99	5.20	111.4	2.377	0.913	1.464	26.4	21.8	5.0E-08	-9999.0	-9999.0	1.678	5.6	-9999.0	-9999.0
42.322	28.87	29.37	1.41	45.83	4.81	111.4	2.381	0.916	1.465	28.1	23.2	5.0E-08	-9999.0	-9999.0	1.799	6.2	-9999.0	-9999.0
42.388	29.51	30.13	1.43	56.86	4.76	111.4	2.384	0.918	1.467	28.9	23.8	5.0E-08	-9999.0	-9999.0	1.849	6.5	-9999.0	-9999.0
42.454	29.64	30.30	1.46	60.46	4.83	111.4	2.388	0.920	1.468	29.0	23.9	5.0E-08	-9999.0	-9999.0	1.860	6.5	-9999.0	-9999.0
42.519	30.47	31.11	1.51	59.18	4.87	111.4	2.392	0.922	1.470	29.8	24.6	5.0E-08	-9999.0	-9999.0	1.915	6.8	-9999.0	-9999.0
42.585	31.75	32.55	1.58	74.68	4.87	111.4	2.395	0.924	1.472	31.2	25.7	5.0E-08	-9999.0	-9999.0	2.011	7.4	-9999.0	-9999.0
42.650	32.26	33.11	1.54	78.55	4.66	114.6	2.399	0.926	1.473	21.1	17.4	5.0E-07	-9999.0	-9999.0	2.047	7.6	-9999.0	-9999.0
42.716	34.68	35.69	1.52	92.92	4.27	114.6	2.403	0.928	1.475	22.8	18.8	5.0E-07	-9999.0	-9999.0	2.219	8.6	-9999.0	-9999.0
42.782	35.14	36.19	1.54	97.44	4.27	114.6	2.407	0.930	1.477	23.1	19.0	5.0E-07	-9999.0	-9999.0	2.252	8.8	-9999.0	-9999.0
42.847	37.31	38.63	1.59	122.52	4.13	114.6	2.410	0.932	1.478	18.5	15.2	5.0E-06	-9999.0	-9999.0	2.415	9.8	-9999.0	-9999.0
42.913	38.39	39.94	1.60	143.10	4.02	114.6	2.414	0.934	1.480	19.1	15.7	5.0E-06	-9999.0	-9999.0	2.502	10.0	-9999.0	-9999.0
42.978	39.55	40.96	1.60	130.84	3.92	114.6	2.418	0.936	1.482	19.6	16.1	5.0E-06	-9999.0	-9999.0	2.569	10.0	-9999.0	-9999.0
43.044	40.25	41.69	1.60	133.33	3.85	114.6	2.422	0.938	1.484	20.0	16.4	5.0E-06	-9999.0	-9999.0	2.618	10.0	-9999.0	-9999.0
43.110	40.89	42.34	1.58	134.63	3.74	114.6	2.425	0.940	1.485	20.3	16.6	5.0E-06	-9999.0	-9999.0	2.661	10.0	-9999.0	-9999.0
43.175	41.27	42.76	1.57	138.09	3.68	114.6	2.429	0.942	1.487	20.5	16.8	5.0E-06	-9999.0	-9999.0	2.689	10.0	-9999.0	-9999.0
43.241	40.89	42.45	1.60	144.51	3.78	114.6	2.433	0.944	1.489	20.3	16.7	5.0E-06	-9999.0	-9999.0	2.668	10.0	-9999.0	-9999.0
43.307	41.14	42.71	1.59	145.71	3.73	114.6	2.437	0.946	1.490	20.5	16.8	5.0E-06	-9999.0	-9999.0	2.685	10.0	-9999.0	-9999.0
43.372	38.84	40.42	1.58	145.47	3.92	114.6	2.440	0.948	1.492	19.4	15.8	5.0E-06	-9999.0	-9999.0	2.532	10.0	-9999.0	-9999.0
43.438	38.77	40.38	1.58	148.66	3.92	114.6	2.444	0.950	1.494	19.3	15.8	5.0E-06	-9999.0	-9999.0	2.529	10.0	-9999.0	-9999.0
43.503	38.39	39.93	1.54	142.26	3.87	114.6	2.448	0.952	1.496	19.1	15.6	5.0E-06	-9999.0	-9999.0	2.499	10.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
43.569	37.05	38.49	1.56	133.74	4.06	114.6	2.452	0.954	1.497	18.4	15.1	5.0E-06	-9999.0	-9999.0	2.403	9.5	-9999.0	-9999.0
43.635	37.24	38.51	1.57	117.53	4.09	114.6	2.455	0.957	1.499	18.4	15.1	5.0E-06	-9999.0	-9999.0	2.404	9.5	-9999.0	-9999.0
43.700	36.92	38.30	1.52	128.19	3.98	114.6	2.459	0.959	1.501	18.3	15.0	5.0E-06	-9999.0	-9999.0	2.390	9.4	-9999.0	-9999.0
43.766	36.61	38.07	1.49	135.62	3.92	114.6	2.463	0.961	1.502	18.2	14.9	5.0E-06	-9999.0	-9999.0	2.374	9.3	-9999.0	-9999.0
43.831	36.10	37.50	1.50	129.57	4.01	114.6	2.467	0.963	1.504	18.0	14.6	5.0E-06	-9999.0	-9999.0	2.335	9.0	-9999.0	-9999.0
43.897	35.90	37.33	1.40	132.51	3.76	114.6	2.470	0.965	1.506	17.9	14.6	5.0E-06	-9999.0	-9999.0	2.324	8.9	-9999.0	-9999.0
43.963	34.87	36.34	1.32	135.31	3.64	114.6	2.474	0.967	1.507	17.4	14.2	5.0E-06	-9999.0	-9999.0	2.257	8.5	-9999.0	-9999.0
44.028	33.60	34.99	1.26	128.63	3.61	114.6	2.478	0.969	1.509	16.8	13.6	5.0E-06	-9999.0	-9999.0	2.168	8.0	-9999.0	-9999.0
44.094	32.39	33.82	1.22	132.55	3.62	114.6	2.482	0.971	1.511	16.2	13.2	5.0E-06	-9999.0	-9999.0	2.089	7.5	-9999.0	-9999.0
44.160	33.15	34.69	1.20	142.51	3.47	114.6	2.486	0.973	1.513	16.6	13.5	5.0E-06	-9999.0	-9999.0	2.147	7.8	-9999.0	-9999.0
44.225	32.33	33.84	1.18	140.32	3.50	114.6	2.489	0.975	1.514	16.2	13.2	5.0E-06	-9999.0	-9999.0	2.090	7.5	-9999.0	-9999.0
44.291	31.37	32.74	1.19	127.44	3.64	114.6	2.493	0.977	1.516	15.7	12.7	5.0E-06	-9999.0	-9999.0	2.017	7.1	-9999.0	-9999.0
44.356	30.47	31.84	1.14	126.05	3.59	114.6	2.497	0.979	1.518	15.2	12.4	5.0E-06	-9999.0	-9999.0	1.956	6.7	-9999.0	-9999.0
44.422	29.38	30.73	1.10	124.48	3.59	114.6	2.501	0.981	1.519	14.7	11.9	5.0E-06	-9999.0	-9999.0	1.882	6.3	-9999.0	-9999.0
44.488	29.07	30.38	1.07	121.14	3.53	114.6	2.504	0.983	1.521	14.5	11.8	5.0E-06	-9999.0	-9999.0	1.858	6.2	-9999.0	-9999.0
44.553	29.83	31.22	1.02	128.37	3.28	114.6	2.508	0.985	1.523	14.9	12.1	5.0E-06	-9999.0	-9999.0	1.914	6.5	-9999.0	-9999.0
44.619	29.96	31.45	1.00	137.38	3.19	114.6	2.512	0.987	1.525	15.1	12.2	5.0E-06	-9999.0	-9999.0	1.929	6.5	-9999.0	-9999.0
44.684	28.56	30.03	0.99	136.17	3.30	114.6	2.516	0.989	1.526	14.4	11.6	5.0E-06	-9999.0	-9999.0	1.834	6.0	-9999.0	-9999.0
44.750	27.66	29.00	0.79	123.89	2.73	114.6	2.519	0.991	1.528	11.1	9.0	5.0E-05	30.0	32.0	1.765	5.7	-9999.0	-9999.0
44.816	27.54	28.77	0.78	114.09	2.72	114.6	2.523	0.993	1.530	11.0	8.9	5.0E-05	30.0	32.0	1.750	5.6	-9999.0	-9999.0
44.881	25.30	26.50	0.78	110.87	2.95	114.6	2.527	0.995	1.531	12.7	10.3	5.0E-06	-9999.0	-9999.0	1.598	4.9	-9999.0	-9999.0
44.947	25.17	26.39	0.76	112.68	2.89	114.6	2.531	0.997	1.533	12.6	10.2	5.0E-06	-9999.0	-9999.0	1.591	4.8	-9999.0	-9999.0
45.013	23.83	25.13	0.75	120.45	2.99	114.6	2.534	1.000	1.535	12.0	9.7	5.0E-06	-9999.0	-9999.0	1.506	4.4	-9999.0	-9999.0
45.078	22.94	24.40	0.71	135.46	2.92	114.6	2.538	1.002	1.537	11.7	9.4	5.0E-06	-9999.0	-9999.0	1.457	4.2	-9999.0	-9999.0
45.144	22.10	23.53	0.66	132.02	2.81	114.6	2.542	1.004	1.538	11.3	9.1	5.0E-06	-9999.0	-9999.0	1.399	4.0	-9999.0	-9999.0
45.209	22.10	23.52	0.66	131.08	2.81	114.6	2.546	1.006	1.540	11.3	9.1	5.0E-06	-9999.0	-9999.0	1.398	3.9	-9999.0	-9999.0
45.275	20.38	21.73	0.66	125.13	3.04	114.6	2.549	1.008	1.542	10.4	8.4	5.0E-06	-9999.0	-9999.0	1.279	3.5	-9999.0	-9999.0
45.341	20.25	21.52	0.59	117.98	2.75	114.6	2.553	1.010	1.543	10.3	8.3	5.0E-06	-9999.0	-9999.0	1.265	3.4	-9999.0	-9999.0
45.406	18.79	20.06	0.54	117.67	2.70	114.6	2.557	1.012	1.545	9.6	7.7	5.0E-06	-9999.0	-9999.0	1.167	3.0	-9999.0	-9999.0
45.472	19.36	20.65	0.47	119.86	2.28	114.6	2.561	1.014	1.547	9.9	8.0	5.0E-06	-9999.0	-9999.0	1.206	3.2	-9999.0	-9999.0
45.538	17.56	18.98	0.43	130.78	2.27	114.6	2.564	1.016	1.549	9.1	7.3	5.0E-06	-9999.0	-9999.0	1.094	2.7	-9999.0	-9999.0
45.603	17.50	18.98	0.40	137.04	2.11	114.6	2.568	1.018	1.550	7.3	5.8	5.0E-05	30.0	30.0	1.094	2.7	-9999.0	-9999.0
45.669	17.69	19.20	0.40	139.65	2.09	114.6	2.572	1.020	1.552	7.4	5.9	5.0E-05	30.0	30.0	1.109	2.8	-9999.0	-9999.0
45.734	17.82	19.38	0.41	144.21	2.12	114.6	2.576	1.022	1.554	7.4	6.0	5.0E-05	30.0	30.0	1.120	2.8	-9999.0	-9999.0
45.800	18.01	19.55	0.42	141.82	2.15	114.6	2.579	1.024	1.555	7.5	6.0	5.0E-05	30.0	30.0	1.131	2.9	-9999.0	-9999.0
45.866	18.01	19.49	0.45	136.92	2.31	114.6	2.583	1.026	1.557	9.3	7.5	5.0E-06	-9999.0	-9999.0	1.127	2.8	-9999.0	-9999.0
45.931	18.91	20.22	0.51	121.51	2.53	114.6	2.587	1.028	1.559	9.7	7.8	5.0E-06	-9999.0	-9999.0	1.175	3.0	-9999.0	-9999.0
45.997	18.72	19.90	0.49	109.84	2.47	114.6	2.591	1.030	1.561	9.5	7.6	5.0E-06	-9999.0	-9999.0	1.154	2.9	-9999.0	-9999.0
46.062	17.76	19.09	0.51	122.70	2.68	114.6	2.595	1.032	1.562	9.1	7.3	5.0E-06	-9999.0	-9999.0	1.100	2.7	-9999.0	-9999.0
46.128	17.95	19.37	0.48	130.66	2.48	114.6	2.598	1.034	1.564	9.3	7.4	5.0E-06	-9999.0	-9999.0	1.118	2.8	-9999.0	-9999.0
46.194	19.04	20.56	0.47	140.93	2.29	114.6	2.602	1.036	1.566	9.8	7.9	5.0E-06	-9999.0	-9999.0	1.197	3.1	-9999.0	-9999.0
46.259	21.33	22.70	0.46	126.75	2.03	114.6	2.606	1.038	1.567	8.7	6.9	5.0E-05	30.0	32.0	1.340	3.6	-9999.0	-9999.0
46.325	19.17	20.52	0.44	125.40	2.15	114.6	2.610	1.040	1.569	7.9	6.3	5.0E-05	30.0	30.0	1.194	3.1	-9999.0	-9999.0
46.391	20.12	21.59	0.46	135.97	2.14	114.6	2.613	1.043	1.571	8.3	6.6	5.0E-05	30.0	30.0	1.265	3.3	-9999.0	-9999.0
46.456	20.12	21.56	0.49	133.33	2.28	114.6	2.617	1.045	1.572	8.3	6.6	5.0E-05	30.0	30.0	1.263	3.3	-9999.0	-9999.0
46.522	21.40	22.81	0.52	129.89	2.29	114.6	2.621	1.047	1.574	8.7	7.0	5.0E-05	30.0	32.0	1.346	3.6	-9999.0	-9999.0
46.587	22.35	23.62	0.58	117.49	2.46	114.6	2.625	1.049	1.576	9.0	7.2	5.0E-05	30.0	32.0	1.400	3.8	-9999.0	-9999.0
46.653	22.48	23.65	0.63	107.98	2.67	114.6	2.628	1.051	1.578	11.3	9.0	5.0E-06	-9999.0	-9999.0	1.402	3.8	-9999.0	-9999.0
46.719	20.70	21.78	0.66	100.16	3.04	114.6	2.632	1.053	1.579	10.4	8.3	5.0E-06	-9999.0	-9999.0	1.277	3.3	-9999.0	-9999.0
46.784	19.55	20.63	0.67	99.89	3.26	114.6	2.636	1.055	1.581	9.9	7.9	5.0E-06	-9999.0	-9999.0	1.199	3.0	-9999.0	-9999.0
46.850	18.07	19.18	0.66	102.45	3.45	114.6	2.640	1.057	1.583	9.2	7.3	5.0E-06	-9999.0	-9999.0	1.103	2.7	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
46.915	17.88	19.05	0.61	108.06	3.21	114.6	2.643	1.059	1.584	9.1	7.2	5.0E-06	-9999.0	-9999.0	1.094	2.7	-9999.0	-9999.0
46.981	16.61	17.82	0.55	112.33	3.09	114.6	2.647	1.061	1.586	8.5	6.8	5.0E-06	-9999.0	-9999.0	1.012	2.4	-9999.0	-9999.0
47.047	15.97	17.22	0.51	115.55	2.97	114.6	2.651	1.063	1.588	8.2	6.5	5.0E-06	-9999.0	-9999.0	0.971	2.3	-9999.0	-9999.0
47.112	15.65	16.91	0.47	116.69	2.79	114.6	2.655	1.065	1.590	8.1	6.4	5.0E-06	-9999.0	-9999.0	0.950	2.2	-9999.0	-9999.0
47.178	15.40	16.68	0.41	118.45	2.46	114.6	2.658	1.067	1.591	8.0	6.3	5.0E-06	-9999.0	-9999.0	0.935	2.1	-9999.0	-9999.0
47.244	14.51	15.80	0.37	119.88	2.35	114.6	2.662	1.069	1.593	7.6	6.0	5.0E-06	-9999.0	-9999.0	0.876	2.0	-9999.0	-9999.0
47.309	15.02	16.30	0.36	119.04	2.21	114.6	2.666	1.071	1.595	7.8	6.2	5.0E-06	-9999.0	-9999.0	0.909	2.1	-9999.0	-9999.0
47.375	14.44	15.78	0.35	124.50	2.22	114.6	2.670	1.073	1.596	7.6	6.0	5.0E-06	-9999.0	-9999.0	0.874	2.0	-9999.0	-9999.0
47.440	13.86	15.23	0.34	126.38	2.24	114.6	2.673	1.075	1.598	7.3	5.8	5.0E-06	-9999.0	-9999.0	0.837	1.8	-9999.0	-9999.0
47.506	14.44	15.77	0.31	123.39	1.97	114.6	2.677	1.077	1.600	7.6	6.0	5.0E-06	-9999.0	-9999.0	0.873	1.9	-9999.0	-9999.0
47.572	14.11	15.42	0.30	120.84	1.95	114.6	2.681	1.079	1.602	7.4	5.8	5.0E-06	-9999.0	-9999.0	0.849	1.9	-9999.0	-9999.0
47.637	13.60	14.91	0.30	121.14	2.02	114.6	2.685	1.081	1.603	7.1	5.6	5.0E-06	-9999.0	-9999.0	0.815	1.8	-9999.0	-9999.0
47.703	14.05	15.38	0.31	122.64	2.02	114.6	2.689	1.084	1.605	7.4	5.8	5.0E-06	-9999.0	-9999.0	0.846	1.9	-9999.0	-9999.0
47.768	14.11	15.44	0.31	122.92	2.01	114.6	2.692	1.086	1.607	7.4	5.8	5.0E-06	-9999.0	-9999.0	0.850	1.9	-9999.0	-9999.0
47.834	13.67	14.97	0.28	119.70	1.88	114.6	2.696	1.088	1.608	7.2	5.7	5.0E-06	-9999.0	-9999.0	0.818	1.8	-9999.0	-9999.0
47.900	14.63	15.89	0.27	117.49	1.70	114.6	2.700	1.090	1.610	6.1	4.8	5.0E-05	30.0	30.0	0.880	1.9	-9999.0	-9999.0
47.965	13.73	15.03	0.27	119.74	1.80	114.6	2.704	1.092	1.612	7.2	5.7	5.0E-06	-9999.0	-9999.0	0.822	1.8	-9999.0	-9999.0
48.031	13.54	14.90	0.22	125.46	1.48	114.6	2.707	1.094	1.614	5.7	4.5	5.0E-05	30.0	30.0	0.813	1.8	-9999.0	-9999.0
48.097	13.99	15.33	0.24	123.60	1.57	114.6	2.711	1.096	1.615	5.9	4.6	5.0E-05	30.0	30.0	0.841	1.8	-9999.0	-9999.0
48.162	13.67	14.96	0.25	118.83	1.68	114.6	2.715	1.098	1.617	5.7	4.5	5.0E-05	30.0	30.0	0.816	1.8	-9999.0	-9999.0
48.228	12.97	14.23	0.25	116.26	1.76	114.6	2.719	1.100	1.619	6.8	5.4	5.0E-06	-9999.0	-9999.0	0.767	1.6	-9999.0	-9999.0
48.293	13.03	14.27	0.26	114.87	1.83	114.6	2.722	1.102	1.620	6.8	5.4	5.0E-06	-9999.0	-9999.0	0.770	1.6	-9999.0	-9999.0
48.359	12.90	14.12	0.23	112.97	1.63	114.6	2.726	1.104	1.622	5.4	4.2	5.0E-05	30.0	30.0	0.760	1.6	-9999.0	-9999.0
48.425	13.35	14.58	0.21	113.91	1.44	114.6	2.730	1.106	1.624	5.6	4.4	5.0E-05	30.0	30.0	0.790	1.7	-9999.0	-9999.0
48.490	13.22	14.46	0.22	114.56	1.53	114.6	2.734	1.108	1.626	5.5	4.3	5.0E-05	30.0	30.0	0.782	1.7	-9999.0	-9999.0
48.556	12.52	13.76	0.21	114.93	1.53	114.6	2.737	1.110	1.627	5.3	4.1	5.0E-05	30.0	30.0	0.735	1.5	-9999.0	-9999.0
48.621	13.16	14.46	0.19	119.78	1.32	114.6	2.741	1.112	1.629	5.5	4.3	5.0E-05	30.0	30.0	0.781	1.7	-9999.0	-9999.0
48.687	13.86	15.16	0.21	120.27	1.39	114.6	2.745	1.114	1.631	5.8	4.5	5.0E-05	30.0	30.0	0.828	1.8	-9999.0	-9999.0
48.753	14.11	15.38	0.22	117.53	1.43	114.6	2.749	1.116	1.632	5.9	4.6	5.0E-05	30.0	30.0	0.842	1.8	-9999.0	-9999.0
48.818	13.73	14.91	0.24	108.99	1.61	114.6	2.752	1.118	1.634	5.7	4.5	5.0E-05	30.0	30.0	0.811	1.7	-9999.0	-9999.0
48.884	12.71	13.79	0.25	100.09	1.82	114.6	2.756	1.120	1.636	6.6	5.2	5.0E-06	-9999.0	-9999.0	0.736	1.5	-9999.0	-9999.0
48.950	11.88	12.92	0.24	96.55	1.86	114.6	2.760	1.122	1.637	6.2	4.8	5.0E-06	-9999.0	-9999.0	0.677	1.4	-9999.0	-9999.0
49.015	10.99	12.09	0.23	102.45	1.91	114.6	2.764	1.124	1.639	5.8	4.5	5.0E-06	-9999.0	-9999.0	0.622	1.3	-9999.0	-9999.0
49.081	10.86	11.96	0.23	102.22	1.93	114.6	2.767	1.127	1.641	5.7	4.5	5.0E-06	-9999.0	-9999.0	0.613	1.2	-9999.0	-9999.0
49.146	10.42	11.55	0.23	104.92	2.00	114.6	2.771	1.129	1.643	5.5	4.3	5.0E-06	-9999.0	-9999.0	0.585	1.2	-9999.0	-9999.0
49.212	10.99	12.13	0.21	105.98	1.74	114.6	2.775	1.131	1.644	5.8	4.5	5.0E-06	-9999.0	-9999.0	0.624	1.3	-9999.0	-9999.0
49.278	11.82	12.99	0.19	108.48	1.47	114.6	2.779	1.133	1.646	5.0	3.9	5.0E-05	30.0	30.0	0.681	1.4	-9999.0	-9999.0
49.343	10.74	11.96	0.20	112.97	1.68	114.6	2.782	1.135	1.648	5.7	4.5	5.0E-06	-9999.0	-9999.0	0.612	1.2	-9999.0	-9999.0
49.409	12.52	13.80	0.22	118.14	1.60	114.6	2.786	1.137	1.649	5.3	4.1	5.0E-05	30.0	30.0	0.734	1.5	-9999.0	-9999.0
49.474	14.05	15.32	0.26	116.85	1.70	114.6	2.790	1.139	1.651	5.9	4.6	5.0E-05	30.0	30.0	0.835	1.8	-9999.0	-9999.0
49.540	15.33	16.61	0.79	118.37	4.77	111.4	2.794	1.141	1.653	15.9	12.4	5.0E-08	-9999.0	-9999.0	0.921	2.0	-9999.0	-9999.0
49.606	16.48	17.76	0.84	118.04	4.74	111.4	2.797	1.143	1.654	17.0	13.2	5.0E-08	-9999.0	-9999.0	0.997	2.2	-9999.0	-9999.0
49.671	16.42	17.63	0.93	112.25	5.29	111.4	2.801	1.145	1.656	16.9	13.1	5.0E-08	-9999.0	-9999.0	0.989	2.2	-9999.0	-9999.0
49.737	17.69	18.56	1.01	79.80	5.46	111.4	2.805	1.147	1.658	17.8	13.8	5.0E-08	-9999.0	-9999.0	1.050	2.4	-9999.0	-9999.0
49.803	16.42	16.89	1.04	43.54	6.17	111.4	2.808	1.149	1.659	16.2	12.6	5.0E-08	-9999.0	-9999.0	0.939	2.0	-9999.0	-9999.0
49.868	14.70	15.10	1.01	37.55	6.70	111.4	2.812	1.151	1.661	14.5	11.2	5.0E-08	-9999.0	-9999.0	0.819	1.7	-9999.0	-9999.0
49.934	13.60	13.96	0.96	33.26	6.89	111.4	2.816	1.153	1.662	13.4	10.4	5.0E-08	-9999.0	-9999.0	0.743	1.5	-9999.0	-9999.0
49.999	11.82	12.41	0.82	54.55	6.62	111.4	2.819	1.155	1.664	11.9	9.2	5.0E-08	-9999.0	-9999.0	0.639	1.3	-9999.0	-9999.0
50.065	11.25	11.96	0.78	65.53	6.54	111.4	2.823	1.157	1.666	11.4	8.9	5.0E-08	-9999.0	-9999.0	0.609	1.2	-9999.0	-9999.0
50.131	11.44	12.18	0.67	68.27	5.52	111.4	2.827	1.159	1.667	11.7	9.0	5.0E-08	-9999.0	-9999.0	0.623	1.2	-9999.0	-9999.0
50.196	11.50	12.33	0.62	77.47	5.04	111.4	2.830	1.161	1.669	11.8	9.1	5.0E-08	-9999.0	-9999.0	0.634	1.3	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
50.262	11.12	11.92	0.55	74.03	4.63	111.4	2.834	1.163	1.670	11.4	8.8	5.0E-08	-9999.0	-9999.0	0.606	1.2	-9999.0	-9999.0
50.327	11.56	12.31	0.49	69.92	3.99	111.4	2.838	1.165	1.672	11.8	9.1	5.0E-08	-9999.0	-9999.0	0.632	1.3	-9999.0	-9999.0
50.393	9.32	10.14	0.42	75.91	4.15	111.4	2.841	1.168	1.674	9.7	7.5	5.0E-08	-9999.0	-9999.0	0.487	1.0	-9999.0	-9999.0
50.459	9.07	9.84	0.37	71.48	3.77	111.4	2.845	1.170	1.675	9.4	7.3	5.0E-08	-9999.0	-9999.0	0.467	0.9	-9999.0	-9999.0
50.524	7.73	8.57	0.35	77.84	4.09	111.4	2.849	1.172	1.677	8.2	6.3	5.0E-08	-9999.0	-9999.0	0.381	0.8	-9999.0	-9999.0
50.590	7.35	8.24	0.27	82.82	3.28	111.4	2.852	1.174	1.679	7.9	6.1	5.0E-08	-9999.0	-9999.0	0.359	0.8	-9999.0	-9999.0
50.656	8.50	9.44	0.33	87.03	3.50	111.4	2.856	1.176	1.680	9.0	7.0	5.0E-08	-9999.0	-9999.0	0.439	0.9	-9999.0	-9999.0
50.721	9.58	10.58	0.54	92.16	5.12	111.4	2.859	1.178	1.682	10.1	7.8	5.0E-08	-9999.0	-9999.0	0.515	1.0	-9999.0	-9999.0
50.787	11.82	12.89	0.62	99.42	4.82	111.4	2.863	1.180	1.683	12.3	9.5	5.0E-08	-9999.0	-9999.0	0.669	1.3	-9999.0	-9999.0
50.852	28.30	29.46	0.68	107.63	2.31	114.6	2.867	1.182	1.685	11.3	8.7	5.0E-05	30.0	32.0	1.773	4.9	-9999.0	-9999.0
50.918	49.89	50.82	0.66	85.88	1.30	117.7	2.871	1.184	1.687	16.2	12.5	5.0E-04	39.8	36.0	-9999.0	-9999.0	182.3	3.588
50.984	70.01	70.26	0.61	22.95	0.87	120.9	2.875	1.186	1.689	16.8	12.9	5.0E-03	49.0	38.0	-9999.0	-9999.0	215.2	3.063
51.049	79.02	79.05	0.55	2.17	0.70	120.9	2.879	1.188	1.691	18.9	14.6	5.0E-03	52.4	38.0	-9999.0	-9999.0	228.4	2.889
51.115	82.60	82.59	0.40	-0.96	0.49	120.9	2.883	1.190	1.692	19.8	15.2	5.0E-03	53.6	38.0	-9999.0	-9999.0	233.6	2.829
51.180	91.99	92.07	0.23	6.97	0.25	124.1	2.887	1.192	1.694	17.6	13.5	5.0E-02	56.7	40.0	-9999.0	-9999.0	247.4	2.688
51.246	80.10	80.11	0.28	0.28	0.35	120.9	2.891	1.194	1.696	19.2	14.7	5.0E-03	52.7	38.0	-9999.0	-9999.0	230.2	2.874
51.312	75.76	75.83	0.19	5.83	0.25	120.9	2.895	1.196	1.698	18.2	13.9	5.0E-03	51.1	38.0	-9999.0	-9999.0	224.0	2.954
51.377	59.09	59.13	0.27	3.46	0.46	120.9	2.898	1.198	1.700	14.2	10.9	5.0E-03	44.0	36.0	-9999.0	-9999.0	197.8	3.346
51.443	57.75	57.81	0.17	5.95	0.29	120.9	2.902	1.200	1.702	13.8	10.6	5.0E-03	43.3	36.0	-9999.0	-9999.0	195.7	3.384
51.509	48.81	48.93	0.39	11.71	0.80	117.7	2.906	1.202	1.704	15.6	12.0	5.0E-04	38.5	36.0	-9999.0	-9999.0	179.3	3.664
51.574	40.63	40.70	0.28	6.28	0.69	117.7	2.910	1.204	1.706	13.0	9.9	5.0E-04	33.2	34.0	-9999.0	-9999.0	161.6	3.971
51.640	48.23	48.42	0.35	18.09	0.72	120.9	2.914	1.206	1.708	11.6	8.9	5.0E-03	38.2	36.0	-9999.0	-9999.0	178.4	3.684
51.705	45.36	45.48	0.46	11.00	1.01	117.7	2.918	1.208	1.710	14.5	11.1	5.0E-04	36.4	34.0	-9999.0	-9999.0	172.4	3.790
51.771	38.20	38.44	0.40	21.85	1.04	117.7	2.922	1.211	1.711	12.3	9.4	5.0E-04	31.5	34.0	-9999.0	-9999.0	-9999.0	-9999.0
51.837	37.24	37.63	0.40	35.61	1.07	117.7	2.926	1.213	1.713	12.0	9.2	5.0E-04	30.9	34.0	-9999.0	-9999.0	-9999.0	-9999.0
51.902	56.98	57.09	0.31	10.77	0.54	120.9	2.930	1.215	1.715	13.7	10.4	5.0E-03	42.9	36.0	-9999.0	-9999.0	194.9	3.414
51.968	71.93	72.02	0.28	7.62	0.39	120.9	2.934	1.217	1.717	17.2	13.2	5.0E-03	49.5	38.0	-9999.0	-9999.0	219.2	3.044
52.033	71.67	71.89	0.23	20.34	0.32	120.9	2.938	1.219	1.719	17.2	13.1	5.0E-03	49.4	38.0	-9999.0	-9999.0	219.1	3.048
52.099	69.31	69.43	0.19	11.53	0.27	120.9	2.942	1.221	1.721	16.6	12.7	5.0E-03	48.4	38.0	-9999.0	-9999.0	215.4	3.103
52.165	66.50	66.64	0.24	12.96	0.36	120.9	2.946	1.223	1.723	16.0	12.2	5.0E-03	47.2	38.0	-9999.0	-9999.0	211.2	3.169
52.230	60.31	60.44	0.16	12.24	0.27	120.9	2.950	1.225	1.725	14.5	11.0	5.0E-03	44.4	36.0	-9999.0	-9999.0	201.1	3.328
52.296	55.90	56.06	0.15	15.33	0.27	120.9	2.954	1.227	1.727	13.4	10.2	5.0E-03	42.2	36.0	-9999.0	-9999.0	193.6	3.453
52.362	48.93	49.04	0.15	10.26	0.31	120.9	2.957	1.229	1.729	11.7	8.9	5.0E-03	38.4	36.0	-9999.0	-9999.0	180.4	3.678
52.427	40.50	40.66	0.13	15.41	0.32	120.9	2.961	1.231	1.730	9.7	7.4	5.0E-03	33.0	34.0	-9999.0	-9999.0	162.3	3.991
52.493	36.22	36.36	0.10	13.43	0.28	120.9	2.965	1.233	1.732	8.7	6.6	5.0E-03	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
52.558	38.96	39.12	0.11	14.60	0.28	120.9	2.969	1.235	1.734	9.4	7.1	5.0E-03	31.9	34.0	-9999.0	-9999.0	-9999.0	-9999.0
52.624	41.27	41.45	0.12	16.31	0.29	120.9	2.973	1.237	1.736	9.9	7.5	5.0E-03	33.5	34.0	-9999.0	-9999.0	164.3	3.964
52.690	39.29	39.44	0.14	14.34	0.36	120.9	2.977	1.239	1.738	9.4	7.2	5.0E-03	32.1	34.0	-9999.0	-9999.0	-9999.0	-9999.0
52.755	33.54	33.69	0.18	13.69	0.54	117.7	2.981	1.241	1.740	10.8	8.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
52.821	28.68	28.82	0.21	13.43	0.73	117.7	2.985	1.243	1.742	9.2	7.0	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
52.886	28.17	28.35	0.25	16.51	0.88	117.7	2.989	1.245	1.744	9.0	6.9	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
52.952	21.40	21.53	0.29	11.57	1.35	114.6	2.993	1.247	1.745	8.2	6.2	5.0E-05	30.0	30.0	1.236	2.8	-9999.0	-9999.0
53.018	15.08	15.23	0.83	14.00	5.46	111.4	2.996	1.249	1.747	14.6	11.0	5.0E-08	-9999.0	-9999.0	0.815	1.6	-9999.0	-9999.0
53.083	11.50	11.65	0.85	14.32	7.31	111.4	3.000	1.252	1.749	11.2	8.4	5.0E-08	-9999.0	-9999.0	0.577	1.1	-9999.0	-9999.0
53.149	8.81	8.97	0.80	14.70	8.94	82.7	3.003	1.254	1.750	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
53.215	6.20	6.37	0.71	16.00	11.18	82.7	3.006	1.256	1.750	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
53.280	21.33	21.42	1.28	8.00	5.99	111.4	3.009	1.258	1.752	20.5	15.5	5.0E-08	-9999.0	-9999.0	1.227	2.7	-9999.0	-9999.0
53.346	92.50	92.80	0.01	27.79	0.01	124.1	3.013	1.260	1.753	17.8	13.4	5.0E-02	56.5	38.0	-9999.0	-9999.0	251.6	2.711
53.411	119.71	119.92	0.01	18.94	0.01	124.1	3.017	1.262	1.755	23.0	17.3	5.0E-02	63.8	40.0	-9999.0	-9999.0	292.0	2.435
53.477	87.39	87.59	0.01	18.33	0.01	124.1	3.021	1.264	1.757	16.8	12.7	5.0E-02	54.8	38.0	-9999.0	-9999.0	244.3	2.789
53.543	96.27	96.49	0.01	20.32	0.01	124.1	3.025	1.266	1.759	18.5	13.9	5.0E-02	57.5	40.0	-9999.0	-9999.0	257.3	2.667

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
53.608	219.88	220.07	0.01	17.42	0.00	127.3	3.029	1.268	1.762	35.1	26.5	5.0E+00	81.2	42.0	-9999.0	-9999.0	438.8	1.994

Gregg In Situ, Inc. - CPT Interpretation

Interpretation Output - Release	1.20I
Run No:	04-0524-0703-3671
Job No:	04-073SC
Client:	MACTEC
Project:	TVA Bull Run Ash Disposal Facility
Site:	CPT-04
Location:	TVA Bull Run
Cone:	H. Bankayal
CPT Date:	04/20/05
CPT Time:	12:28
CPT File:	073CP04.COR
Northing (m):	0.000000
Easting (m):	0.000000
Elevation (m):	0.000000

Water Table (m):	4.88		(ft):	16.0
Unit Weight of Water (default):	62.40	pcf		
Averaging Increment (m):	0.0	(Every Data Point)		
Phi Method :	Robertson and Campanella, 1983			
Su Nkt used:	15.00		Su/P' (nc):	0.30
Dr Method :	Jamiolkowski - All Sands			
State Parameter M:	1.20			

Used Unit Weights Assigned to Soil Zones

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
0.066	8.88	8.89	0.03	0.41	0.34	111.4	0.004	0.000	0.004	4.3	8.5	1.0E-07	-9999.0	-9999.0	0.592	10.0	-9999.0	-9999.0
0.131	15.84	15.85	0.03	0.87	0.19	117.7	0.007	0.000	0.007	5.1	10.1	5.0E-04	84.1	50.0	-9999.0	-9999.0	59.0	3.725
0.197	19.17	19.17	0.04	0.77	0.21	117.7	0.011	0.000	0.011	6.1	12.2	5.0E-04	83.6	50.0	-9999.0	-9999.0	65.7	3.425
0.262	19.74	19.74	0.05	0.65	0.25	117.7	0.015	0.000	0.015	6.3	12.6	5.0E-04	80.2	50.0	-9999.0	-9999.0	66.7	3.378
0.328	18.98	18.98	0.05	0.71	0.26	117.7	0.019	0.000	0.019	6.1	12.1	5.0E-04	75.8	50.0	-9999.0	-9999.0	65.3	3.441
0.394	18.66	18.68	0.06	2.39	0.32	117.7	0.023	0.000	0.023	6.0	11.9	5.0E-04	72.7	50.0	-9999.0	-9999.0	64.8	3.467
0.459	18.91	18.91	0.07	0.83	0.37	117.7	0.027	0.000	0.027	6.0	12.1	5.0E-04	70.8	50.0	-9999.0	-9999.0	65.2	3.447
0.525	20.00	20.00	0.08	0.55	0.40	117.7	0.031	0.000	0.031	6.4	12.8	5.0E-04	70.5	50.0	-9999.0	-9999.0	67.2	3.358
0.591	23.58	23.59	0.09	0.98	0.38	117.7	0.034	0.000	0.034	7.5	15.1	5.0E-04	73.5	50.0	-9999.0	-9999.0	73.1	3.097
0.656	28.87	28.89	0.09	1.52	0.31	117.7	0.038	0.000	0.038	9.2	18.4	5.0E-04	77.8	50.0	-9999.0	-9999.0	80.7	2.792
0.722	42.29	42.30	0.09	0.90	0.21	120.9	0.042	0.000	0.042	10.1	20.3	5.0E-03	87.3	50.0	-9999.0	-9999.0	98.4	2.327
0.787	58.70	58.73	0.16	2.39	0.27	120.9	0.046	0.000	0.046	14.1	28.1	5.0E-03	95.0	50.0	-9999.0	-9999.0	121.7	2.073
0.853	76.01	76.03	0.26	1.31	0.34	120.9	0.050	0.000	0.050	18.2	36.4	5.0E-03	95.0	50.0	-9999.0	-9999.0	146.4	1.926
0.919	95.63	95.66	0.35	2.86	0.37	124.1	0.054	0.000	0.054	18.3	36.6	5.0E-02	95.0	50.0	-9999.0	-9999.0	182.2	1.905
0.984	116.33	116.37	0.40	3.18	0.34	124.1	0.058	0.000	0.058	22.3	44.6	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.050	141.62	141.66	0.49	3.04	0.35	124.1	0.062	0.000	0.062	27.1	54.3	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.115	182.76	182.82	0.58	5.37	0.32	124.1	0.066	0.000	0.066	35.0	70.0	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.181	201.42	201.45	0.63	3.22	0.31	124.1	0.070	0.000	0.070	38.6	77.2	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.247	205.64	205.67	0.70	2.90	0.34	124.1	0.075	0.000	0.075	39.4	78.8	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.312	217.07	217.11	0.71	3.76	0.33	124.1	0.079	0.000	0.079	41.6	83.2	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.378	224.35	224.42	0.69	6.09	0.31	127.3	0.083	0.000	0.083	35.8	71.6	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.444	236.87	236.90	0.71	1.94	0.30	127.3	0.087	0.000	0.087	37.8	75.6	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.509	245.17	245.19	0.72	1.21	0.29	127.3	0.091	0.000	0.091	39.1	78.3	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.575	257.31	257.36	0.73	4.05	0.28	127.3	0.095	0.000	0.095	41.1	82.2	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.640	270.48	270.54	0.88	6.24	0.33	127.3	0.099	0.000	0.099	43.2	86.4	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.706	283.64	283.65	1.03	1.04	0.36	127.3	0.104	0.000	0.104	45.3	90.5	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.772	302.60	302.62	1.12	1.37	0.37	127.3	0.108	0.000	0.108	48.3	96.6	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.837	326.50	326.52	1.19	1.90	0.37	127.3	0.112	0.000	0.112	52.1	104.2	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.903	344.84	344.89	0.80	4.94	0.23	127.3	0.116	0.000	0.116	55.0	110.1	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.968	356.78	356.83	1.03	4.92	0.29	127.3	0.120	0.000	0.120	57.0	113.9	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.034	356.97	356.99	1.23	2.19	0.35	127.3	0.125	0.000	0.125	57.0	114.0	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.100	359.27	359.29	1.55	2.04	0.43	127.3	0.129	0.000	0.129	57.3	114.7	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.165	359.91	360.03	1.72	11.20	0.48	127.3	0.133	0.000	0.133	57.5	114.9	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.231	343.23	343.25	1.86	1.82	0.54	127.3	0.137	0.000	0.137	54.8	109.6	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.297	340.37	340.36	2.05	-0.20	0.60	127.3	0.141	0.000	0.141	54.3	108.7	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.362	335.76	335.83	2.03	6.26	0.61	127.3	0.145	0.000	0.145	53.6	107.2	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.428	322.92	322.93	2.09	0.81	0.65	127.3	0.150	0.000	0.150	51.5	103.1	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.493	311.75	311.78	2.17	3.36	0.69	127.3	0.154	0.000	0.154	49.8	99.5	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.559	300.05	300.04	2.25	-0.35	0.75	124.1	0.158	0.000	0.158	57.5	114.9	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.625	292.00	292.02	2.25	2.09	0.77	124.1	0.162	0.000	0.162	55.9	111.9	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.690	282.22	282.22	2.24	-0.53	0.79	124.1	0.166	0.000	0.166	54.1	108.1	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.756	274.05	274.06	2.19	0.69	0.80	124.1	0.170	0.000	0.170	52.5	105.0	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.821	269.26	269.28	2.18	1.70	0.81	124.1	0.174	0.000	0.174	51.6	103.2	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.887	260.95	260.95	2.10	0.08	0.80	124.1	0.178	0.000	0.178	50.0	100.0	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.953	252.71	252.71	2.03	-0.22	0.81	124.1	0.182	0.000	0.182	48.4	96.8	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.018	243.45	243.52	1.90	6.46	0.78	124.1	0.186	0.000	0.186	46.6	93.3	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.084	236.87	236.88	1.71	0.59	0.72	124.1	0.190	0.000	0.190	45.4	90.7	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.150	228.25	228.28	1.57	2.84	0.69	124.1	0.195	0.000	0.195	43.7	87.4	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.215	224.60	224.61	1.52	0.49	0.68	124.1	0.199	0.000	0.199	43.0	86.0	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.281	224.68	224.71	1.46	3.02	0.65	124.1	0.203	0.000	0.203	43.0	86.1	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.346	227.29	227.30	1.47	0.67	0.65	124.1	0.207	0.000	0.207	43.5	87.1	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
3.412	229.21	229.22	1.43	0.85	0.63	124.1	0.211	0.000	0.211	43.9	87.8	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.478	230.80	230.81	1.43	0.69	0.62	124.1	0.215	0.000	0.215	44.2	88.4	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.543	223.46	223.47	1.39	0.39	0.62	124.1	0.219	0.000	0.219	42.8	85.6	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.609	214.32	214.33	1.37	1.29	0.64	124.1	0.223	0.000	0.223	41.1	82.1	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.674	204.11	204.11	1.34	0.02	0.66	124.1	0.227	0.000	0.227	39.1	78.2	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.740	194.26	194.28	1.38	1.90	0.71	124.1	0.231	0.000	0.231	37.2	74.4	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.806	189.09	189.09	1.30	0.47	0.69	124.1	0.235	0.000	0.235	36.2	72.4	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.871	178.23	178.25	1.25	1.43	0.70	124.1	0.239	0.000	0.239	34.1	68.3	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.937	173.88	173.91	1.19	3.04	0.69	124.1	0.243	0.000	0.243	33.3	66.6	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.003	170.18	170.49	1.11	28.72	0.65	124.1	0.247	0.000	0.247	32.7	65.3	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.068	160.60	160.63	1.03	2.55	0.64	124.1	0.252	0.000	0.252	30.8	61.3	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.134	157.27	157.28	1.00	0.45	0.64	124.1	0.256	0.000	0.256	30.1	59.6	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.199	157.34	157.34	0.94	0.14	0.60	124.1	0.260	0.000	0.260	30.1	59.1	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.265	157.53	157.53	1.02	-0.37	0.65	124.1	0.264	0.000	0.264	30.2	58.8	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.331	159.58	159.60	0.92	2.19	0.58	124.1	0.268	0.000	0.268	30.6	59.1	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.396	163.48	163.47	0.89	-0.69	0.55	124.1	0.272	0.000	0.272	31.3	60.0	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.462	166.41	166.41	0.99	-0.37	0.60	124.1	0.276	0.000	0.276	31.9	60.7	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.528	169.41	169.41	1.00	-0.20	0.59	124.1	0.280	0.000	0.280	32.4	61.3	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.593	164.50	164.51	0.96	0.57	0.58	124.1	0.284	0.000	0.284	31.5	59.1	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.659	164.24	164.24	0.90	0.43	0.55	124.1	0.288	0.000	0.288	31.5	58.6	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.724	160.73	160.74	0.92	0.53	0.57	124.1	0.292	0.000	0.292	30.8	57.0	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.790	157.98	157.96	0.96	-1.90	0.61	124.1	0.296	0.000	0.296	30.3	55.6	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
4.856	155.94	155.97	0.99	2.92	0.64	124.1	0.300	0.000	0.300	29.9	54.5	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
4.921	152.80	152.79	0.96	-0.92	0.63	124.1	0.304	0.000	0.304	29.3	53.0	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
4.987	150.51	150.50	1.08	-0.22	0.72	124.1	0.309	0.000	0.309	28.8	51.9	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.052	147.89	147.89	0.93	0.02	0.63	124.1	0.313	0.000	0.313	28.3	50.7	5.0E-02	94.5	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.118	149.67	149.67	0.60	-0.08	0.40	124.1	0.317	0.000	0.317	28.7	50.9	5.0E-02	94.7	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.184	152.10	152.13	0.79	2.47	0.52	124.1	0.321	0.000	0.321	29.1	51.5	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.249	162.32	162.35	0.77	2.88	0.48	124.1	0.325	0.000	0.325	31.1	54.6	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.315	173.12	173.12	0.78	0.08	0.45	124.1	0.329	0.000	0.329	33.2	57.8	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.381	176.51	176.79	0.89	26.33	0.50	124.1	0.333	0.000	0.333	33.9	58.7	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.446	166.60	166.62	0.86	1.60	0.52	124.1	0.337	0.000	0.337	31.9	55.0	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.512	170.94	170.98	0.89	2.82	0.52	124.1	0.341	0.000	0.341	32.7	56.1	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.577	171.01	171.03	0.89	1.04	0.52	124.1	0.345	0.000	0.345	32.8	55.8	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.643	170.94	170.96	0.90	1.68	0.53	124.1	0.349	0.000	0.349	32.7	55.4	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.709	167.69	167.70	0.94	0.92	0.56	124.1	0.353	0.000	0.353	32.1	54.0	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.774	165.58	165.60	0.97	1.98	0.59	124.1	0.357	0.000	0.357	31.7	53.1	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.840	166.85	166.87	1.03	1.10	0.62	124.1	0.362	0.000	0.362	32.0	53.2	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.905	165.13	165.13	1.04	-0.08	0.63	124.1	0.366	0.000	0.366	31.6	52.3	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.971	166.03	166.05	1.01	1.21	0.61	124.1	0.370	0.000	0.370	31.8	52.3	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
6.037	159.39	159.40	1.09	1.04	0.69	124.1	0.374	0.000	0.374	30.5	49.9	5.0E-02	94.1	48.0	-9999.0	-9999.0	-9999.0	-9999.0
6.102	152.55	152.56	1.08	1.31	0.71	124.1	0.378	0.000	0.378	29.2	47.5	5.0E-02	92.7	48.0	-9999.0	-9999.0	-9999.0	-9999.0
6.168	145.77	145.78	1.04	0.33	0.72	124.1	0.382	0.000	0.382	27.9	45.2	5.0E-02	91.3	48.0	-9999.0	-9999.0	-9999.0	-9999.0
6.234	134.67	134.67	1.07	0.63	0.80	124.1	0.386	0.000	0.386	25.8	41.5	5.0E-02	88.8	48.0	-9999.0	-9999.0	-9999.0	-9999.0
6.299	124.18	124.18	1.06	0.12	0.86	124.1	0.390	0.000	0.390	23.8	38.1	5.0E-02	86.4	46.0	-9999.0	-9999.0	245.9	1.980
6.365	115.88	115.89	0.96	1.23	0.83	124.1	0.394	0.000	0.394	22.2	35.4	5.0E-02	84.2	46.0	-9999.0	-9999.0	219.6	1.895
6.430	109.37	109.37	0.95	0.04	0.87	120.9	0.398	0.000	0.398	26.2	41.5	5.0E-03	82.4	46.0	-9999.0	-9999.0	205.4	1.878
6.496	98.63	98.61	0.79	-1.41	0.80	120.9	0.402	0.000	0.402	23.6	37.2	5.0E-03	79.3	46.0	-9999.0	-9999.0	187.9	1.905
6.562	85.79	85.79	0.70	-0.14	0.82	120.9	0.406	0.000	0.406	20.5	32.2	5.0E-03	75.2	46.0	-9999.0	-9999.0	169.8	1.980
6.627	76.28	76.28	0.64	0.37	0.84	120.9	0.410	0.000	0.410	18.3	28.5	5.0E-03	71.7	44.0	-9999.0	-9999.0	156.4	2.051
6.693	70.72	70.73	0.67	0.57	0.95	120.9	0.414	0.000	0.414	16.9	26.3	5.0E-03	69.4	44.0	-9999.0	-9999.0	148.6	2.101

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
6.758	65.48	65.48	0.67	-0.12	1.03	120.9	0.418	0.000	0.418	15.7	24.3	5.0E-03	67.0	44.0	-9999.0	-9999.0	141.2	2.157
6.824	64.52	64.52	0.74	0.14	1.15	117.7	0.422	0.000	0.422	20.6	31.7	5.0E-04	66.5	44.0	-9999.0	-9999.0	140.1	2.171
6.890	67.01	67.02	0.82	0.53	1.23	117.7	0.426	0.000	0.426	21.4	32.8	5.0E-04	67.4	44.0	-9999.0	-9999.0	143.9	2.147
6.955	64.65	64.65	0.91	0.71	1.41	117.7	0.430	0.000	0.430	20.6	31.5	5.0E-04	66.3	44.0	-9999.0	-9999.0	140.7	2.176
7.021	62.41	62.44	0.97	2.21	1.56	117.7	0.433	0.000	0.433	19.9	30.3	5.0E-04	65.1	44.0	-9999.0	-9999.0	137.8	2.207
7.087	61.33	61.36	1.08	2.68	1.76	117.7	0.437	0.000	0.437	19.6	29.6	5.0E-04	64.5	44.0	-9999.0	-9999.0	136.5	2.225
7.152	60.69	60.73	1.14	3.74	1.88	117.7	0.441	0.000	0.441	19.4	29.2	5.0E-04	64.1	44.0	-9999.0	-9999.0	135.8	2.237
7.218	60.82	60.83	1.16	1.60	1.91	117.7	0.445	0.000	0.445	19.4	29.1	5.0E-04	64.0	44.0	-9999.0	-9999.0	136.2	2.239
7.283	57.81	57.82	1.19	1.10	2.06	117.7	0.449	0.000	0.449	18.5	27.6	5.0E-04	62.4	44.0	-9999.0	-9999.0	132.3	2.288
7.349	57.49	57.50	1.22	0.87	2.13	117.7	0.453	0.000	0.453	18.4	27.3	5.0E-04	62.1	44.0	-9999.0	-9999.0	132.1	2.297
7.415	60.69	60.70	1.29	1.10	2.13	117.7	0.457	0.000	0.457	19.4	28.7	5.0E-04	63.6	44.0	-9999.0	-9999.0	136.7	2.252
7.480	66.05	66.06	1.32	0.92	2.00	117.7	0.460	0.000	0.460	21.1	31.1	5.0E-04	65.9	44.0	-9999.0	-9999.0	144.4	2.187
7.546	69.70	69.71	1.30	1.04	1.87	117.7	0.464	0.000	0.464	22.3	32.7	5.0E-04	67.3	44.0	-9999.0	-9999.0	149.9	2.150
7.611	69.31	69.33	1.27	2.23	1.84	117.7	0.468	0.000	0.468	22.1	32.3	5.0E-04	67.0	44.0	-9999.0	-9999.0	149.5	2.157
7.677	66.75	66.79	1.27	3.46	1.91	117.7	0.472	0.000	0.472	21.3	31.0	5.0E-04	65.8	44.0	-9999.0	-9999.0	146.1	2.188
7.743	61.52	61.55	1.30	2.92	2.12	117.7	0.476	0.000	0.476	19.6	28.5	5.0E-04	63.4	44.0	-9999.0	-9999.0	139.0	2.258
7.808	56.92	56.93	1.30	1.41	2.29	114.6	0.480	0.000	0.480	21.8	31.5	5.0E-05	61.0	42.0	3.764	10.0	132.9	2.334
7.874	56.54	56.54	1.26	0.41	2.23	114.6	0.484	0.000	0.484	21.7	31.2	5.0E-05	60.7	42.0	3.737	10.0	132.6	2.344
7.940	60.18	60.18	1.21	0.22	2.02	117.7	0.487	0.000	0.487	19.2	27.5	5.0E-04	62.4	42.0	-9999.0	-9999.0	137.7	2.289
8.005	63.49	63.50	1.17	0.92	1.85	117.7	0.491	0.000	0.491	20.3	28.9	5.0E-04	63.8	44.0	-9999.0	-9999.0	142.5	2.244
8.071	63.81	63.81	1.14	-0.08	1.79	117.7	0.495	0.000	0.495	20.4	29.0	5.0E-04	63.9	44.0	-9999.0	-9999.0	143.2	2.244
8.136	62.86	62.85	1.16	-1.60	1.85	117.7	0.499	0.000	0.499	20.1	28.4	5.0E-04	63.3	42.0	-9999.0	-9999.0	142.0	2.260
8.202	61.71	61.70	1.15	-1.19	1.87	117.7	0.503	0.000	0.503	19.7	27.8	5.0E-04	62.7	42.0	-9999.0	-9999.0	140.7	2.280
8.268	62.98	62.98	1.16	-0.22	1.85	117.7	0.507	0.000	0.507	20.1	28.2	5.0E-04	63.1	42.0	-9999.0	-9999.0	142.7	2.265
8.333	66.56	66.57	1.23	0.87	1.85	117.7	0.511	0.000	0.511	21.3	29.7	5.0E-04	64.6	44.0	-9999.0	-9999.0	147.9	2.221
8.399	69.44	69.44	1.30	0.47	1.88	117.7	0.514	0.000	0.514	22.2	30.9	5.0E-04	65.7	44.0	-9999.0	-9999.0	152.1	2.191
8.464	71.23	71.24	1.24	0.26	1.74	117.7	0.518	0.000	0.518	22.7	31.6	5.0E-04	66.4	44.0	-9999.0	-9999.0	154.9	2.174
8.530	69.06	69.06	1.22	0.69	1.77	117.7	0.522	0.000	0.522	22.0	30.5	5.0E-04	65.4	44.0	-9999.0	-9999.0	152.0	2.201
8.596	61.39	61.40	1.20	1.00	1.96	117.7	0.526	0.000	0.526	19.6	27.0	5.0E-04	61.9	42.0	-9999.0	-9999.0	141.5	2.305
8.661	54.11	54.12	1.21	1.02	2.24	114.6	0.530	0.000	0.530	20.7	28.5	5.0E-05	58.2	42.0	3.573	10.0	132.0	2.439
8.727	47.33	47.34	1.20	0.51	2.54	114.6	0.534	0.000	0.534	18.1	24.8	5.0E-05	54.2	42.0	3.120	10.0	123.3	2.605
8.793	44.59	44.60	1.14	1.21	2.56	114.6	0.537	0.000	0.537	17.1	23.3	5.0E-05	52.4	42.0	2.938	10.0	119.9	2.689
8.858	44.34	44.34	1.07	0.59	2.42	114.6	0.541	0.000	0.541	17.0	23.1	5.0E-05	52.1	42.0	2.920	10.0	119.8	2.702
8.924	47.27	47.28	0.94	0.45	1.99	114.6	0.545	0.000	0.545	18.1	24.5	5.0E-05	53.9	42.0	3.116	10.0	123.9	2.621
8.989	51.23	51.24	0.81	0.61	1.58	117.7	0.549	0.000	0.549	16.4	22.1	5.0E-04	56.1	42.0	-9999.0	-9999.0	129.3	2.524
9.055	50.91	50.92	0.73	0.75	1.44	117.7	0.552	0.000	0.552	16.3	21.9	5.0E-04	55.8	42.0	-9999.0	-9999.0	129.1	2.535
9.121	46.38	46.39	0.67	0.94	1.45	117.7	0.556	0.000	0.556	14.8	19.9	5.0E-04	53.0	42.0	-9999.0	-9999.0	123.4	2.660
9.186	38.77	38.78	0.66	0.79	1.71	114.6	0.560	0.000	0.560	14.9	19.9	5.0E-05	47.8	40.0	2.548	10.0	113.2	2.920
9.252	32.01	32.02	0.67	1.02	2.10	114.6	0.564	0.000	0.564	12.3	16.3	5.0E-05	42.2	40.0	2.097	10.0	103.2	3.222
9.317	28.62	28.77	0.66	13.71	2.30	114.6	0.568	0.000	0.568	11.0	14.6	5.0E-05	39.1	38.0	1.880	10.0	97.7	3.398
9.383	41.84	42.18	0.59	31.15	1.40	117.7	0.571	0.000	0.571	13.5	17.8	5.0E-04	49.9	40.0	-9999.0	-9999.0	118.6	2.811
9.449	50.72	50.93	0.58	19.03	1.14	117.7	0.575	0.000	0.575	16.3	21.4	5.0E-04	55.2	42.0	-9999.0	-9999.0	130.4	2.560
9.514	46.38	46.44	0.64	5.55	1.38	117.7	0.579	0.000	0.579	14.8	19.5	5.0E-04	52.5	42.0	-9999.0	-9999.0	124.7	2.685
9.580	40.06	40.07	0.69	1.41	1.73	117.7	0.583	0.000	0.583	12.8	16.8	5.0E-04	48.2	40.0	-9999.0	-9999.0	116.3	2.901
9.646	36.16	36.15	0.73	-0.39	2.02	114.6	0.587	0.000	0.587	13.8	18.1	5.0E-05	45.1	40.0	2.371	10.0	110.7	3.063
9.711	33.41	33.40	0.70	-0.71	2.10	114.6	0.591	0.000	0.591	12.8	16.7	5.0E-05	42.8	40.0	2.188	10.0	106.6	3.192
9.777	31.37	31.36	0.67	-0.26	2.14	114.6	0.594	0.000	0.594	12.0	15.6	5.0E-05	40.9	38.0	2.051	10.0	103.4	3.297
9.842	30.02	30.03	0.64	0.85	2.14	114.6	0.598	0.000	0.598	11.5	14.9	5.0E-05	39.5	38.0	1.962	10.0	101.2	3.371
9.908	28.49	28.50	0.61	1.15	2.15	114.6	0.602	0.000	0.602	10.9	14.1	5.0E-05	38.0	38.0	1.860	10.0	98.6	3.459
9.974	26.51	26.53	0.56	1.12	2.12	114.6	0.606	0.000	0.606	10.2	13.1	5.0E-05	35.8	38.0	1.728	10.0	94.9	3.578
10.039	25.42	25.43	0.51	0.87	2.01	114.6	0.609	0.000	0.609	9.7	12.5	5.0E-05	34.5	38.0	1.655	10.0	92.8	3.649

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
10.105	24.21	24.22	0.46	1.00	1.90	114.6	0.613	0.000	0.613	9.3	11.8	5.0E-05	33.0	38.0	1.574	10.0	90.3	3.730
10.170	23.13	23.14	0.39	1.35	1.69	114.6	0.617	0.000	0.617	8.9	11.3	5.0E-05	31.6	38.0	1.502	10.0	-9999.0	-9999.0
10.236	22.75	22.77	0.38	2.11	1.67	114.6	0.621	0.000	0.621	8.7	11.1	5.0E-05	31.1	38.0	1.476	10.0	-9999.0	-9999.0
10.302	21.65	21.69	0.41	3.91	1.89	114.6	0.624	0.000	0.624	8.3	10.5	5.0E-05	30.0	36.0	1.405	10.0	-9999.0	-9999.0
10.367	21.72	21.81	0.42	8.36	1.93	114.6	0.628	0.000	0.628	8.4	10.5	5.0E-05	30.0	36.0	1.412	10.0	-9999.0	-9999.0
10.433	21.78	21.90	0.40	10.85	1.83	114.6	0.632	0.000	0.632	8.4	10.6	5.0E-05	30.0	36.0	1.418	10.0	-9999.0	-9999.0
10.499	28.24	28.37	0.40	12.47	1.41	114.6	0.636	0.000	0.636	10.9	13.6	5.0E-05	37.0	38.0	1.849	10.0	99.6	3.510
10.564	35.59	35.69	0.43	9.89	1.21	117.7	0.640	0.000	0.640	11.4	14.2	5.0E-04	43.5	40.0	-9999.0	-9999.0	112.4	3.150
10.630	34.75	34.82	0.47	5.91	1.35	117.7	0.643	0.000	0.643	11.1	13.9	5.0E-04	42.7	40.0	-9999.0	-9999.0	111.2	3.194
10.695	29.58	29.62	0.52	3.36	1.76	114.6	0.647	0.000	0.647	11.3	14.1	5.0E-05	38.0	38.0	1.931	10.0	102.4	3.456
10.761	25.23	25.25	0.56	2.07	2.22	114.6	0.651	0.000	0.651	9.7	12.0	5.0E-05	33.4	38.0	1.640	10.0	93.7	3.711
10.827	22.68	22.70	0.56	2.57	2.47	114.6	0.655	0.000	0.655	10.9	13.4	5.0E-06	-9999.0	-9999.0	1.470	10.0	-9999.0	-9999.0
10.892	20.63	20.66	0.54	3.20	2.62	114.6	0.659	0.000	0.659	9.9	12.2	5.0E-06	-9999.0	-9999.0	1.334	10.0	-9999.0	-9999.0
10.958	19.10	19.14	0.52	3.68	2.72	114.6	0.662	0.000	0.662	9.2	11.3	5.0E-06	-9999.0	-9999.0	1.232	10.0	-9999.0	-9999.0
11.023	18.98	19.03	0.51	5.09	2.69	114.6	0.666	0.000	0.666	9.1	11.2	5.0E-06	-9999.0	-9999.0	1.224	10.0	-9999.0	-9999.0
11.089	18.33	18.38	0.47	4.46	2.56	114.6	0.670	0.000	0.670	8.8	10.8	5.0E-06	-9999.0	-9999.0	1.181	10.0	-9999.0	-9999.0
11.155	16.93	16.97	0.44	3.25	2.60	114.6	0.674	0.000	0.674	8.1	9.9	5.0E-06	-9999.0	-9999.0	1.086	9.6	-9999.0	-9999.0
11.220	15.97	16.00	0.39	2.74	2.44	114.6	0.677	0.000	0.677	7.7	9.3	5.0E-06	-9999.0	-9999.0	1.021	8.6	-9999.0	-9999.0
11.286	15.02	15.04	0.34	2.43	2.27	114.6	0.681	0.000	0.681	7.2	8.7	5.0E-06	-9999.0	-9999.0	0.957	7.7	-9999.0	-9999.0
11.352	13.92	13.95	0.32	2.25	2.30	114.6	0.685	0.000	0.685	6.7	8.1	5.0E-06	-9999.0	-9999.0	0.884	6.7	-9999.0	-9999.0
11.417	14.37	14.40	0.29	2.35	2.02	114.6	0.689	0.000	0.689	6.9	8.3	5.0E-06	-9999.0	-9999.0	0.914	7.0	-9999.0	-9999.0
11.483	14.70	14.72	0.28	2.37	1.91	114.6	0.692	0.000	0.692	7.0	8.5	5.0E-06	-9999.0	-9999.0	0.935	7.2	-9999.0	-9999.0
11.548	14.51	14.53	0.25	1.94	1.73	114.6	0.696	0.000	0.696	7.0	8.3	5.0E-06	-9999.0	-9999.0	0.922	7.0	-9999.0	-9999.0
11.614	14.82	14.84	0.25	1.94	1.69	114.6	0.700	0.000	0.700	5.7	6.8	5.0E-05	30.0	34.0	0.942	7.2	-9999.0	-9999.0
11.680	14.95	14.97	0.19	1.80	1.27	114.6	0.704	0.000	0.704	5.7	6.8	5.0E-05	30.0	34.0	0.951	7.2	-9999.0	-9999.0
11.745	15.02	15.04	0.20	2.33	1.33	114.6	0.707	0.000	0.707	5.8	6.9	5.0E-05	30.0	34.0	0.956	7.2	-9999.0	-9999.0
11.811	15.21	15.23	0.19	2.53	1.25	114.6	0.711	0.000	0.711	5.8	6.9	5.0E-05	30.0	34.0	0.968	7.3	-9999.0	-9999.0
11.876	15.08	15.11	0.19	2.88	1.26	114.6	0.715	0.000	0.715	5.8	6.8	5.0E-05	30.0	34.0	0.960	7.2	-9999.0	-9999.0
11.942	15.46	15.49	0.19	2.88	1.23	114.6	0.719	0.000	0.719	5.9	7.0	5.0E-05	30.0	34.0	0.985	7.4	-9999.0	-9999.0
12.008	14.44	14.47	0.19	3.58	1.32	114.6	0.722	0.000	0.722	5.5	6.5	5.0E-05	30.0	32.0	0.917	6.6	-9999.0	-9999.0
12.073	15.33	15.36	0.18	3.22	1.17	114.6	0.726	0.000	0.726	5.9	6.9	5.0E-05	30.0	34.0	0.976	7.2	-9999.0	-9999.0
12.139	14.30	14.33	0.19	2.66	1.33	114.6	0.730	0.000	0.730	5.5	6.4	5.0E-05	30.0	32.0	0.907	6.3	-9999.0	-9999.0
12.205	12.33	12.35	0.20	2.29	1.62	114.6	0.734	0.000	0.734	5.9	6.9	5.0E-06	-9999.0	-9999.0	0.775	4.9	-9999.0	-9999.0
12.270	10.67	10.69	0.18	2.11	1.69	114.6	0.737	0.000	0.737	5.1	6.0	5.0E-06	-9999.0	-9999.0	0.663	3.9	-9999.0	-9999.0
12.336	9.01	9.03	0.17	2.11	1.89	114.6	0.741	0.000	0.741	4.3	5.0	5.0E-06	-9999.0	-9999.0	0.553	3.0	-9999.0	-9999.0
12.401	7.54	7.57	0.14	3.22	1.85	114.6	0.745	0.000	0.745	3.6	4.2	5.0E-06	-9999.0	-9999.0	0.455	2.3	-9999.0	-9999.0
12.467	6.52	6.61	0.12	8.53	1.82	114.6	0.749	0.000	0.749	4.2	4.9	5.0E-07	-9999.0	-9999.0	0.391	1.8	-9999.0	-9999.0
12.533	5.81	5.98	0.09	15.09	1.51	111.4	0.752	0.000	0.752	2.9	3.3	1.0E-07	-9999.0	-9999.0	0.348	1.6	-9999.0	-9999.0
12.598	5.30	5.48	0.06	16.23	1.10	111.4	0.756	0.000	0.756	2.6	3.0	1.0E-07	-9999.0	-9999.0	0.315	1.4	-9999.0	-9999.0
12.664	5.17	5.34	0.05	15.78	0.94	111.4	0.760	0.000	0.760	2.6	2.9	1.0E-07	-9999.0	-9999.0	0.306	1.3	-9999.0	-9999.0
12.730	4.22	4.40	0.03	16.23	0.68	111.4	0.763	0.000	0.763	2.1	2.4	1.0E-07	-9999.0	-9999.0	0.242	1.1	-9999.0	-9999.0
12.795	3.64	3.83	0.02	17.62	0.52	111.4	0.767	0.000	0.767	1.8	2.1	1.0E-07	-9999.0	-9999.0	0.204	0.9	-9999.0	-9999.0
12.861	3.26	3.46	0.02	19.12	0.58	111.4	0.771	0.000	0.771	1.7	1.9	1.0E-07	-9999.0	-9999.0	0.180	0.8	-9999.0	-9999.0
12.926	3.96	4.18	0.02	20.11	0.48	111.4	0.774	0.000	0.774	2.0	2.3	1.0E-07	-9999.0	-9999.0	0.227	1.0	-9999.0	-9999.0
12.992	6.20	6.40	0.03	18.78	0.47	111.4	0.778	0.000	0.778	3.1	3.5	1.0E-07	-9999.0	-9999.0	0.375	1.7	-9999.0	-9999.0
13.058	7.09	7.26	0.04	16.43	0.55	111.4	0.782	0.000	0.782	3.5	3.9	1.0E-07	-9999.0	-9999.0	0.432	2.0	-9999.0	-9999.0
13.123	8.05	8.21	0.04	14.41	0.49	111.4	0.785	0.000	0.785	3.9	4.4	1.0E-07	-9999.0	-9999.0	0.495	2.3	-9999.0	-9999.0
13.189	7.92	8.06	0.05	12.86	0.62	111.4	0.789	0.000	0.789	3.9	4.3	1.0E-07	-9999.0	-9999.0	0.485	2.3	-9999.0	-9999.0
13.254	7.54	7.68	0.06	12.98	0.78	111.4	0.793	0.000	0.793	3.7	4.1	1.0E-07	-9999.0	-9999.0	0.459	2.1	-9999.0	-9999.0
13.320	6.06	6.22	0.05	14.62	0.81	111.4	0.796	0.000	0.796	3.0	3.3	1.0E-07	-9999.0	-9999.0	0.362	1.5	-9999.0	-9999.0
13.386	6.13	6.30	0.05	15.53	0.80	111.4	0.800	0.000	0.800	3.0	3.4	1.0E-07	-9999.0	-9999.0	0.367	1.6	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
13.451	4.66	4.84	0.04	16.63	0.83	111.4	0.804	0.000	0.804	2.3	2.6	1.0E-07	-9999.0	-9999.0	0.269	1.1	-9999.0	-9999.0
13.517	4.34	4.54	0.03	18.31	0.66	111.4	0.807	0.000	0.807	2.2	2.4	1.0E-07	-9999.0	-9999.0	0.249	1.0	-9999.0	-9999.0
13.583	4.02	4.24	0.02	19.93	0.47	111.4	0.811	0.000	0.811	2.0	2.3	1.0E-07	-9999.0	-9999.0	0.228	0.9	-9999.0	-9999.0
13.648	3.71	3.94	0.02	20.95	0.51	111.4	0.815	0.000	0.815	1.9	2.1	1.0E-07	-9999.0	-9999.0	0.208	0.9	-9999.0	-9999.0
13.714	4.92	5.15	0.02	20.99	0.39	111.4	0.818	0.000	0.818	2.5	2.7	1.0E-07	-9999.0	-9999.0	0.289	1.2	-9999.0	-9999.0
13.779	6.33	6.54	0.03	19.99	0.46	111.4	0.822	0.000	0.822	3.1	3.5	1.0E-07	-9999.0	-9999.0	0.381	1.6	-9999.0	-9999.0
13.845	8.05	8.24	0.04	17.54	0.49	111.4	0.826	0.000	0.826	3.9	4.3	1.0E-07	-9999.0	-9999.0	0.494	2.2	-9999.0	-9999.0
13.911	7.28	7.43	0.05	13.96	0.67	111.4	0.829	0.000	0.829	3.6	3.9	1.0E-07	-9999.0	-9999.0	0.440	1.9	-9999.0	-9999.0
13.976	6.46	6.59	0.06	11.99	0.91	111.4	0.833	0.000	0.833	3.2	3.5	1.0E-07	-9999.0	-9999.0	0.383	1.6	-9999.0	-9999.0
14.042	4.66	4.78	0.08	11.36	1.68	111.4	0.837	0.000	0.837	2.3	2.5	1.0E-07	-9999.0	-9999.0	0.263	1.0	-9999.0	-9999.0
14.107	3.71	3.84	0.08	11.77	2.09	111.4	0.840	0.000	0.840	3.7	4.0	5.0E-08	-9999.0	-9999.0	0.200	0.8	-9999.0	-9999.0
14.173	2.75	2.90	0.07	14.14	2.42	111.4	0.844	0.000	0.844	2.8	3.0	5.0E-08	-9999.0	-9999.0	0.137	0.6	-9999.0	-9999.0
14.239	2.18	2.37	0.07	17.66	2.97	111.4	0.847	0.000	0.847	2.3	2.5	5.0E-08	-9999.0	-9999.0	0.101	0.6	-9999.0	-9999.0
14.304	1.08	1.32	0.05	22.30	3.79	79.6	0.851	0.000	0.851	1.3	1.4	1.0E-15	-9999.0	-9999.0	0.032	0.5	-9999.0	-9999.0
14.370	2.24	2.47	0.04	21.28	1.63	111.4	0.854	0.000	0.854	1.2	1.3	1.0E-07	-9999.0	-9999.0	0.107	0.6	-9999.0	-9999.0
14.436	2.11	2.31	0.02	19.12	0.87	111.4	0.857	0.000	0.857	1.1	1.2	1.0E-07	-9999.0	-9999.0	0.097	0.6	-9999.0	-9999.0
14.501	1.15	1.35	0.02	18.56	1.48	111.4	0.861	0.000	0.861	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.033	0.5	-9999.0	-9999.0
14.567	2.11	2.32	0.01	19.81	0.43	111.4	0.865	0.000	0.865	1.1	1.2	1.0E-07	-9999.0	-9999.0	0.097	0.6	-9999.0	-9999.0
14.632	1.47	1.69	0.01	19.87	0.59	111.4	0.868	0.000	0.868	0.8	0.9	1.0E-07	-9999.0	-9999.0	0.055	0.5	-9999.0	-9999.0
14.698	1.72	1.93	0.02	19.38	1.04	111.4	0.872	0.000	0.872	0.9	1.0	1.0E-07	-9999.0	-9999.0	0.071	0.5	-9999.0	-9999.0
14.764	1.21	1.42	0.01	19.40	0.70	111.4	0.876	0.000	0.876	0.7	0.7	1.0E-07	-9999.0	-9999.0	0.036	0.5	-9999.0	-9999.0
14.829	1.00	1.21	0.02	19.58	1.65	111.4	0.879	0.000	0.879	0.6	0.6	1.0E-07	-9999.0	-9999.0	0.022	0.5	-9999.0	-9999.0
14.895	1.00	1.22	0.02	19.73	1.65	111.4	0.883	0.000	0.883	0.6	0.6	1.0E-07	-9999.0	-9999.0	0.022	0.5	-9999.0	-9999.0
14.960	1.00	1.21	0.03	19.40	2.48	79.6	0.886	0.000	0.886	1.2	1.2	1.0E-15	-9999.0	-9999.0	0.022	0.5	-9999.0	-9999.0
15.026	1.47	1.69	0.07	19.62	4.16	111.4	0.889	0.000	0.889	1.6	1.7	5.0E-08	-9999.0	-9999.0	0.053	0.5	-9999.0	-9999.0
15.092	3.07	3.29	0.09	21.03	2.74	111.4	0.893	0.000	0.893	3.2	3.3	5.0E-08	-9999.0	-9999.0	0.160	0.7	-9999.0	-9999.0
15.157	10.22	10.43	0.12	18.97	1.15	114.6	0.897	0.000	0.897	5.0	5.3	5.0E-06	-9999.0	-9999.0	0.636	2.8	-9999.0	-9999.0
15.223	16.10	16.24	0.14	12.90	0.86	114.6	0.900	0.000	0.900	6.2	6.6	5.0E-05	30.0	32.0	1.023	5.5	-9999.0	-9999.0
15.289	16.48	16.52	0.18	3.56	1.09	114.6	0.904	0.000	0.904	6.3	6.7	5.0E-05	30.0	32.0	1.041	5.6	-9999.0	-9999.0
15.354	16.10	16.15	0.20	4.94	1.24	114.6	0.908	0.000	0.908	6.2	6.5	5.0E-05	30.0	32.0	1.016	5.4	-9999.0	-9999.0
15.420	14.89	14.95	0.22	6.34	1.47	114.6	0.912	0.000	0.912	5.7	6.0	5.0E-05	30.0	32.0	0.936	4.7	-9999.0	-9999.0
15.485	14.82	14.90	0.22	8.00	1.48	114.6	0.915	0.000	0.915	5.7	6.0	5.0E-05	30.0	32.0	0.932	4.7	-9999.0	-9999.0
15.551	15.46	15.53	0.20	7.15	1.29	114.6	0.919	0.000	0.919	6.0	6.2	5.0E-05	30.0	32.0	0.974	5.0	-9999.0	-9999.0
15.617	15.72	15.79	0.20	6.28	1.27	114.6	0.923	0.000	0.923	6.0	6.3	5.0E-05	30.0	32.0	0.991	5.1	-9999.0	-9999.0
15.682	15.72	15.78	0.20	6.05	1.27	114.6	0.927	0.000	0.927	6.0	6.3	5.0E-05	30.0	32.0	0.990	5.0	-9999.0	-9999.0
15.748	14.70	14.76	0.21	5.99	1.43	114.6	0.930	0.000	0.930	5.7	5.9	5.0E-05	30.0	32.0	0.922	4.5	-9999.0	-9999.0
15.813	12.46	12.53	0.21	6.56	1.68	114.6	0.934	0.000	0.934	6.0	6.2	5.0E-06	-9999.0	-9999.0	0.773	3.4	-9999.0	-9999.0
15.879	9.39	9.48	0.19	8.18	2.01	114.6	0.938	0.000	0.938	4.5	4.7	5.0E-06	-9999.0	-9999.0	0.570	2.2	-9999.0	-9999.0
15.945	8.43	8.59	0.19	14.74	2.22	114.6	0.942	0.000	0.942	4.1	4.2	5.0E-06	-9999.0	-9999.0	0.510	1.9	-9999.0	-9999.0
16.010	7.35	7.56	0.18	19.89	2.39	114.6	0.945	0.000	0.945	4.8	5.0	5.0E-07	-9999.0	-9999.0	0.441	1.6	-9999.0	-9999.0
16.076	9.07	9.34	0.20	25.08	2.15	114.6	0.949	0.002	0.947	4.5	4.6	5.0E-06	-9999.0	-9999.0	0.560	2.2	-9999.0	-9999.0
16.142	13.60	13.82	0.23	19.85	1.67	114.6	0.953	0.004	0.949	6.6	6.8	5.0E-06	-9999.0	-9999.0	0.858	3.9	-9999.0	-9999.0
16.207	16.10	16.20	0.25	9.66	1.55	114.6	0.957	0.006	0.950	6.2	6.4	5.0E-05	30.0	32.0	1.016	5.0	-9999.0	-9999.0
16.273	18.07	18.13	0.27	5.41	1.49	114.6	0.961	0.009	0.952	6.9	7.1	5.0E-05	30.0	32.0	1.145	6.0	-9999.0	-9999.0
16.338	16.80	16.85	0.27	4.98	1.61	114.6	0.964	0.011	0.954	6.5	6.6	5.0E-05	30.0	32.0	1.059	5.3	-9999.0	-9999.0
16.404	15.91	15.97	0.27	5.33	1.70	114.6	0.968	0.013	0.955	6.1	6.3	5.0E-05	30.0	32.0	1.000	4.9	-9999.0	-9999.0
16.470	15.14	15.20	0.29	5.57	1.91	114.6	0.972	0.015	0.957	7.3	7.4	5.0E-06	-9999.0	-9999.0	0.948	4.5	-9999.0	-9999.0
16.535	14.95	15.01	0.29	5.91	1.94	114.6	0.976	0.017	0.959	7.2	7.3	5.0E-06	-9999.0	-9999.0	0.936	4.4	-9999.0	-9999.0
16.601	15.02	15.09	0.28	6.81	1.86	114.6	0.979	0.019	0.961	7.2	7.4	5.0E-06	-9999.0	-9999.0	0.941	4.4	-9999.0	-9999.0
16.666	14.57	14.65	0.26	8.08	1.78	114.6	0.983	0.021	0.962	7.0	7.2	5.0E-06	-9999.0	-9999.0	0.911	4.2	-9999.0	-9999.0
16.732	14.44	14.54	0.25	9.91	1.72	114.6	0.987	0.023	0.964	7.0	7.1	5.0E-06	-9999.0	-9999.0	0.904	4.1	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
16.798	15.53	15.63	0.25	9.91	1.60	114.6	0.991	0.025	0.966	6.0	6.1	5.0E-05	30.0	32.0	0.976	4.6	-9999.0	-9999.0
16.863	15.59	15.67	0.25	7.56	1.60	114.6	0.994	0.027	0.967	6.0	6.1	5.0E-05	30.0	32.0	0.978	4.6	-9999.0	-9999.0
16.929	16.10	16.17	0.23	6.36	1.43	114.6	0.998	0.029	0.969	6.2	6.3	5.0E-05	30.0	32.0	1.011	4.9	-9999.0	-9999.0
16.995	14.76	14.82	0.21	5.69	1.42	114.6	1.002	0.031	0.971	5.7	5.8	5.0E-05	30.0	32.0	0.921	4.2	-9999.0	-9999.0
17.060	14.37	14.43	0.23	5.35	1.60	114.6	1.006	0.033	0.973	5.5	5.6	5.0E-05	30.0	32.0	0.895	4.0	-9999.0	-9999.0
17.126	12.14	12.19	0.23	4.94	1.89	114.6	1.009	0.035	0.974	5.8	5.9	5.0E-06	-9999.0	-9999.0	0.746	3.1	-9999.0	-9999.0
17.191	9.83	9.89	0.23	4.88	2.33	114.6	1.013	0.037	0.976	4.7	4.8	5.0E-06	-9999.0	-9999.0	0.592	2.2	-9999.0	-9999.0
17.257	8.37	8.43	0.21	5.25	2.50	114.6	1.017	0.039	0.978	5.4	5.4	5.0E-07	-9999.0	-9999.0	0.494	1.8	-9999.0	-9999.0
17.323	6.58	6.64	0.20	5.81	3.02	111.4	1.021	0.041	0.979	6.4	6.4	5.0E-08	-9999.0	-9999.0	0.375	1.3	-9999.0	-9999.0
17.388	6.78	6.86	0.18	7.66	2.63	114.6	1.024	0.043	0.981	4.4	4.4	5.0E-07	-9999.0	-9999.0	0.389	1.3	-9999.0	-9999.0
17.454	7.03	7.15	0.18	11.71	2.52	114.6	1.028	0.045	0.983	4.6	4.6	5.0E-07	-9999.0	-9999.0	0.408	1.4	-9999.0	-9999.0
17.519	9.64	9.80	0.17	14.45	1.74	114.6	1.032	0.047	0.984	4.7	4.7	5.0E-06	-9999.0	-9999.0	0.585	2.2	-9999.0	-9999.0
17.585	11.69	11.83	0.16	13.53	1.36	114.6	1.036	0.049	0.986	5.7	5.7	5.0E-06	-9999.0	-9999.0	0.720	2.9	-9999.0	-9999.0
17.651	12.71	12.83	0.15	11.14	1.17	114.6	1.039	0.052	0.988	4.9	4.9	5.0E-05	30.0	30.0	0.786	3.3	-9999.0	-9999.0
17.716	13.03	13.14	0.15	10.37	1.14	114.6	1.043	0.054	0.990	5.0	5.1	5.0E-05	30.0	30.0	0.807	3.4	-9999.0	-9999.0
17.782	14.05	14.14	0.16	8.36	1.13	114.6	1.047	0.056	0.991	5.4	5.4	5.0E-05	30.0	30.0	0.873	3.8	-9999.0	-9999.0
17.848	10.15	10.23	0.19	7.07	1.86	114.6	1.051	0.058	0.993	4.9	4.9	5.0E-06	-9999.0	-9999.0	0.612	2.3	-9999.0	-9999.0
17.913	7.86	7.95	0.21	7.98	2.65	114.6	1.054	0.060	0.995	5.1	5.1	5.0E-07	-9999.0	-9999.0	0.459	1.6	-9999.0	-9999.0
17.979	5.94	6.09	0.19	13.49	3.13	111.4	1.058	0.062	0.996	5.8	5.8	5.0E-08	-9999.0	-9999.0	0.335	1.1	-9999.0	-9999.0
18.044	4.66	4.83	0.20	15.25	4.15	111.4	1.062	0.064	0.998	4.6	4.6	5.0E-08	-9999.0	-9999.0	0.251	0.9	-9999.0	-9999.0
18.110	4.66	4.86	0.20	18.01	4.13	111.4	1.065	0.066	1.000	4.7	4.7	5.0E-08	-9999.0	-9999.0	0.253	0.9	-9999.0	-9999.0
18.176	6.58	6.81	0.19	21.77	2.80	114.6	1.069	0.068	1.001	4.3	4.3	5.0E-07	-9999.0	-9999.0	0.383	1.3	-9999.0	-9999.0
18.241	13.79	14.00	0.22	19.16	1.58	114.6	1.073	0.070	1.003	5.4	5.4	5.0E-05	30.0	30.0	0.862	3.6	-9999.0	-9999.0
18.307	15.14	15.28	0.22	13.43	1.44	114.6	1.077	0.072	1.005	5.9	5.8	5.0E-05	30.0	32.0	0.947	4.2	-9999.0	-9999.0
18.372	12.39	12.49	0.21	8.87	1.69	114.6	1.080	0.074	1.006	6.0	6.0	5.0E-06	-9999.0	-9999.0	0.760	3.0	-9999.0	-9999.0
18.438	9.77	9.86	0.19	7.76	1.93	114.6	1.084	0.076	1.008	4.7	4.7	5.0E-06	-9999.0	-9999.0	0.585	2.1	-9999.0	-9999.0
18.504	6.58	6.68	0.17	9.40	2.55	114.6	1.088	0.078	1.010	4.3	4.2	5.0E-07	-9999.0	-9999.0	0.373	1.2	-9999.0	-9999.0
18.569	6.13	6.20	0.15	5.79	2.43	114.6	1.092	0.080	1.011	4.0	3.9	5.0E-07	-9999.0	-9999.0	0.340	1.1	-9999.0	-9999.0
18.635	3.96	4.05	0.14	8.71	3.46	111.4	1.095	0.082	1.013	3.9	3.9	5.0E-08	-9999.0	-9999.0	0.197	0.7	-9999.0	-9999.0
18.701	3.77	3.88	0.12	10.61	3.10	111.4	1.099	0.084	1.015	3.7	3.7	5.0E-08	-9999.0	-9999.0	0.186	0.7	-9999.0	-9999.0
18.766	1.91	2.06	0.11	13.10	5.36	79.6	1.102	0.086	1.016	2.0	2.0	1.0E-15	-9999.0	-9999.0	0.064	0.5	-9999.0	-9999.0
18.832	1.15	1.34	0.07	17.01	5.25	79.6	1.105	0.088	1.016	1.3	1.3	1.0E-15	-9999.0	-9999.0	0.015	0.5	-9999.0	-9999.0
18.897	1.00	1.23	0.06	21.11	4.89	79.6	1.107	0.090	1.017	1.2	1.2	1.0E-15	-9999.0	-9999.0	0.008	0.5	-9999.0	-9999.0
18.963	1.27	1.52	0.04	23.03	2.63	111.4	1.111	0.093	1.018	1.5	1.4	5.0E-08	-9999.0	-9999.0	0.027	0.5	-9999.0	-9999.0
19.029	1.00	1.25	0.04	22.95	3.21	79.6	1.114	0.095	1.019	1.2	1.2	1.0E-15	-9999.0	-9999.0	0.009	0.5	-9999.0	-9999.0
19.094	2.88	3.13	0.03	23.15	0.96	111.4	1.117	0.097	1.020	1.5	1.5	1.0E-07	-9999.0	-9999.0	0.134	0.6	-9999.0	-9999.0
19.160	6.27	6.48	0.03	20.19	0.46	111.4	1.120	0.099	1.022	3.1	3.1	1.0E-07	-9999.0	-9999.0	0.358	1.2	-9999.0	-9999.0
19.225	6.00	6.16	0.04	14.54	0.65	111.4	1.124	0.101	1.023	3.0	2.9	1.0E-07	-9999.0	-9999.0	0.336	1.1	-9999.0	-9999.0
19.291	5.11	5.25	0.04	12.88	0.76	111.4	1.128	0.103	1.025	2.5	2.5	1.0E-07	-9999.0	-9999.0	0.275	0.9	-9999.0	-9999.0
19.357	4.85	5.02	0.04	15.15	0.80	111.4	1.131	0.105	1.027	2.4	2.4	1.0E-07	-9999.0	-9999.0	0.259	0.9	-9999.0	-9999.0
19.422	4.92	5.10	0.05	16.14	0.98	111.4	1.135	0.107	1.028	2.4	2.4	1.0E-07	-9999.0	-9999.0	0.264	0.9	-9999.0	-9999.0
19.488	4.15	4.32	0.06	16.17	1.39	111.4	1.139	0.109	1.030	2.1	2.0	1.0E-07	-9999.0	-9999.0	0.212	0.7	-9999.0	-9999.0
19.554	2.88	3.03	0.05	13.90	1.66	111.4	1.142	0.111	1.031	1.4	1.4	1.0E-07	-9999.0	-9999.0	0.126	0.6	-9999.0	-9999.0
19.619	1.47	1.65	0.05	16.59	3.03	111.4	1.146	0.113	1.033	1.6	1.6	5.0E-08	-9999.0	-9999.0	0.034	0.5	-9999.0	-9999.0
19.685	1.00	1.24	0.04	21.79	3.24	79.6	1.149	0.115	1.034	1.2	1.2	1.0E-15	-9999.0	-9999.0	0.006	0.5	-9999.0	-9999.0
19.750	1.02	1.28	0.04	23.53	3.14	79.6	1.152	0.117	1.035	1.2	1.2	1.0E-15	-9999.0	-9999.0	0.008	0.5	-9999.0	-9999.0
19.816	1.00	1.27	0.02	24.34	1.58	111.4	1.155	0.119	1.036	0.6	0.6	1.0E-07	-9999.0	-9999.0	0.007	0.5	-9999.0	-9999.0
19.882	1.02	1.28	0.01	24.14	0.78	111.4	1.159	0.121	1.037	0.6	0.6	1.0E-07	-9999.0	-9999.0	0.008	0.5	-9999.0	-9999.0
19.947	1.00	1.26	0.02	24.06	1.59	111.4	1.162	0.123	1.039	0.6	0.6	1.0E-07	-9999.0	-9999.0	0.007	0.5	-9999.0	-9999.0
20.013	1.00	1.26	0.03	23.90	2.39	111.4	1.166	0.125	1.041	0.6	0.6	1.0E-07	-9999.0	-9999.0	0.006	0.5	-9999.0	-9999.0
20.078	1.34	1.61	0.04	24.85	2.49	111.4	1.170	0.127	1.042	0.8	0.8	1.0E-07	-9999.0	-9999.0	0.029	0.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
20.144	3.26	3.53	0.06	24.79	1.71	111.4	1.173	0.129	1.044	1.7	1.7	1.0E-07	-9999.0	-9999.0	0.157	0.6	-9999.0	-9999.0
20.210	5.75	5.96	0.08	18.66	1.35	111.4	1.177	0.131	1.045	2.9	2.8	1.0E-07	-9999.0	-9999.0	0.319	1.0	-9999.0	-9999.0
20.275	7.60	7.74	0.09	12.74	1.17	114.6	1.181	0.133	1.047	3.7	3.6	5.0E-06	-9999.0	-9999.0	0.437	1.4	-9999.0	-9999.0
20.341	8.37	8.48	0.11	10.03	1.30	114.6	1.184	0.136	1.049	4.1	4.0	5.0E-06	-9999.0	-9999.0	0.486	1.6	-9999.0	-9999.0
20.407	9.20	9.29	0.12	8.16	1.29	114.6	1.188	0.138	1.050	4.4	4.3	5.0E-06	-9999.0	-9999.0	0.540	1.8	-9999.0	-9999.0
20.472	9.96	10.04	0.14	6.72	1.40	114.6	1.192	0.140	1.052	4.8	4.7	5.0E-06	-9999.0	-9999.0	0.590	2.0	-9999.0	-9999.0
20.538	11.31	11.37	0.13	6.18	1.15	114.6	1.196	0.142	1.054	4.4	4.2	5.0E-05	30.0	30.0	0.679	2.4	-9999.0	-9999.0
20.603	12.07	12.14	0.14	6.13	1.16	114.6	1.199	0.144	1.056	4.6	4.5	5.0E-05	30.0	30.0	0.729	2.7	-9999.0	-9999.0
20.669	12.39	12.46	0.15	6.01	1.21	114.6	1.203	0.146	1.057	4.8	4.6	5.0E-05	30.0	30.0	0.750	2.8	-9999.0	-9999.0
20.735	11.25	11.31	0.18	5.95	1.60	114.6	1.207	0.148	1.059	5.4	5.3	5.0E-06	-9999.0	-9999.0	0.674	2.4	-9999.0	-9999.0
20.800	10.03	10.10	0.19	5.91	1.89	114.6	1.211	0.150	1.061	4.8	4.7	5.0E-06	-9999.0	-9999.0	0.593	2.0	-9999.0	-9999.0
20.866	6.84	6.90	0.20	6.15	2.90	114.6	1.214	0.152	1.062	4.4	4.3	5.0E-07	-9999.0	-9999.0	0.379	1.2	-9999.0	-9999.0
20.932	4.73	4.80	0.20	6.77	4.17	111.4	1.218	0.154	1.064	4.6	4.5	5.0E-08	-9999.0	-9999.0	0.239	0.8	-9999.0	-9999.0
20.997	3.07	3.16	0.19	8.48	6.03	111.4	1.222	0.156	1.066	3.0	2.9	5.0E-08	-9999.0	-9999.0	0.129	0.6	-9999.0	-9999.0
21.063	2.37	2.53	0.16	15.25	6.34	79.6	1.225	0.158	1.067	2.4	2.3	1.0E-15	-9999.0	-9999.0	0.087	0.5	-9999.0	-9999.0
21.128	1.34	1.53	0.14	16.97	9.19	82.7	1.228	0.160	1.067	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
21.194	1.00	1.27	0.11	24.71	8.69	82.7	1.230	0.162	1.068	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
21.260	1.00	1.27	0.08	24.87	6.31	79.6	1.233	0.164	1.069	1.2	1.2	1.0E-15	-9999.0	-9999.0	0.003	0.5	-9999.0	-9999.0
21.325	1.59	1.85	0.06	24.02	3.25	111.4	1.236	0.166	1.070	1.8	1.7	5.0E-08	-9999.0	-9999.0	0.041	0.5	-9999.0	-9999.0
21.391	1.59	1.84	0.03	22.75	1.63	111.4	1.240	0.168	1.071	0.9	0.9	1.0E-07	-9999.0	-9999.0	0.040	0.5	-9999.0	-9999.0
21.456	2.04	2.28	0.02	22.08	0.88	111.4	1.243	0.170	1.073	1.1	1.1	1.0E-07	-9999.0	-9999.0	0.069	0.5	-9999.0	-9999.0
21.522	1.98	2.21	0.02	21.17	0.91	111.4	1.247	0.172	1.075	1.1	1.0	1.0E-07	-9999.0	-9999.0	0.064	0.5	-9999.0	-9999.0
21.588	1.02	1.26	0.03	21.75	2.39	111.4	1.251	0.174	1.076	0.6	0.6	1.0E-07	-9999.0	-9999.0	0.000	0.5	-9999.0	-9999.0
21.653	1.21	1.48	0.05	24.89	3.38	111.4	1.254	0.177	1.078	1.4	1.4	5.0E-08	-9999.0	-9999.0	0.015	0.5	-9999.0	-9999.0
21.719	1.02	1.29	0.05	24.71	3.89	79.6	1.257	0.179	1.079	1.2	1.2	1.0E-15	-9999.0	-9999.0	0.002	0.5	-9999.0	-9999.0
21.785	2.75	2.82	0.04	6.62	1.42	111.4	1.261	0.181	1.080	1.3	1.3	1.0E-07	-9999.0	-9999.0	0.104	0.5	-9999.0	-9999.0
21.850	1.85	1.96	0.05	10.04	2.55	111.4	1.264	0.183	1.082	1.9	1.8	5.0E-08	-9999.0	-9999.0	0.047	0.5	-9999.0	-9999.0
21.916	1.72	1.90	0.06	16.73	3.16	111.4	1.268	0.185	1.083	1.8	1.8	5.0E-08	-9999.0	-9999.0	0.042	0.5	-9999.0	-9999.0
21.981	3.01	3.24	0.07	21.63	2.17	111.4	1.272	0.187	1.085	3.1	3.0	5.0E-08	-9999.0	-9999.0	0.131	0.6	-9999.0	-9999.0
22.047	4.53	4.75	0.08	19.97	1.69	111.4	1.275	0.189	1.086	2.3	2.2	1.0E-07	-9999.0	-9999.0	0.231	0.8	-9999.0	-9999.0
22.113	5.49	5.67	0.10	16.63	1.77	114.6	1.279	0.191	1.088	3.6	3.5	5.0E-07	-9999.0	-9999.0	0.293	0.9	-9999.0	-9999.0
22.178	5.49	5.65	0.10	14.51	1.77	114.6	1.283	0.193	1.090	3.6	3.5	5.0E-07	-9999.0	-9999.0	0.291	0.9	-9999.0	-9999.0
22.244	5.11	5.26	0.13	14.12	2.48	111.4	1.286	0.195	1.091	5.0	4.8	5.0E-08	-9999.0	-9999.0	0.265	0.8	-9999.0	-9999.0
22.309	4.28	4.43	0.13	14.22	2.94	111.4	1.290	0.197	1.093	4.2	4.1	5.0E-08	-9999.0	-9999.0	0.210	0.7	-9999.0	-9999.0
22.375	2.75	2.92	0.12	16.17	4.12	111.4	1.294	0.199	1.095	2.8	2.7	5.0E-08	-9999.0	-9999.0	0.109	0.5	-9999.0	-9999.0
22.441	1.85	2.06	0.11	19.26	5.35	79.6	1.297	0.201	1.096	2.0	1.9	1.0E-15	-9999.0	-9999.0	0.051	0.5	-9999.0	-9999.0
22.506	1.00	1.26	0.10	24.04	7.94	79.6	1.299	0.203	1.096	1.2	1.2	1.0E-15	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
22.572	1.21	1.53	0.09	28.98	5.91	79.6	1.302	0.205	1.097	1.5	1.4	1.0E-15	-9999.0	-9999.0	0.015	0.5	-9999.0	-9999.0
22.638	1.53	1.85	0.07	29.00	3.80	111.4	1.305	0.207	1.098	1.8	1.7	5.0E-08	-9999.0	-9999.0	0.036	0.5	-9999.0	-9999.0
22.703	1.66	1.97	0.05	28.70	2.54	111.4	1.309	0.209	1.100	1.9	1.8	5.0E-08	-9999.0	-9999.0	0.044	0.5	-9999.0	-9999.0
22.769	1.72	2.05	0.03	29.72	1.47	111.4	1.312	0.211	1.101	1.0	0.9	1.0E-07	-9999.0	-9999.0	0.049	0.5	-9999.0	-9999.0
22.834	1.72	2.02	0.02	27.31	0.99	111.4	1.316	0.213	1.103	1.0	0.9	1.0E-07	-9999.0	-9999.0	0.047	0.5	-9999.0	-9999.0
22.900	1.66	1.97	0.03	28.68	1.52	111.4	1.320	0.215	1.104	0.9	0.9	1.0E-07	-9999.0	-9999.0	0.044	0.5	-9999.0	-9999.0
22.966	1.27	1.57	0.02	27.04	1.28	111.4	1.323	0.217	1.106	0.7	0.7	1.0E-07	-9999.0	-9999.0	0.016	0.5	-9999.0	-9999.0
23.031	1.27	1.58	0.04	28.48	2.54	111.4	1.327	0.220	1.108	1.5	1.4	5.0E-08	-9999.0	-9999.0	0.017	0.5	-9999.0	-9999.0
23.097	1.91	2.23	0.06	28.84	2.70	111.4	1.331	0.222	1.109	2.1	2.0	5.0E-08	-9999.0	-9999.0	0.060	0.5	-9999.0	-9999.0
23.162	4.15	4.47	0.09	29.96	2.02	114.6	1.334	0.224	1.111	2.9	2.7	5.0E-07	-9999.0	-9999.0	0.209	0.7	-9999.0	-9999.0
23.228	12.20	12.49	0.13	26.53	1.04	114.6	1.338	0.226	1.113	4.8	4.5	5.0E-05	30.0	30.0	0.743	2.5	-9999.0	-9999.0
23.294	18.91	19.05	0.17	13.12	0.89	114.6	1.342	0.228	1.114	7.3	6.9	5.0E-05	30.0	32.0	1.180	5.0	-9999.0	-9999.0
23.359	21.72	21.81	0.23	8.24	1.06	114.6	1.346	0.230	1.116	8.4	7.9	5.0E-05	30.0	32.0	1.364	6.2	-9999.0	-9999.0
23.425	23.70	23.80	0.26	9.73	1.09	114.6	1.349	0.232	1.118	9.1	8.6	5.0E-05	30.0	34.0	1.497	7.1	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
23.491	25.23	25.32	0.29	8.28	1.15	114.6	1.353	0.234	1.119	9.7	9.2	5.0E-05	30.0	34.0	1.598	7.9	-9999.0	-9999.0
23.556	26.84	26.90	0.32	6.46	1.19	117.7	1.357	0.236	1.121	8.6	8.1	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
23.622	28.11	28.18	0.33	6.52	1.17	117.7	1.361	0.238	1.123	9.0	8.5	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
23.687	31.43	31.50	0.31	6.54	0.99	117.7	1.365	0.240	1.125	10.1	9.5	5.0E-04	31.9	36.0	-9999.0	-9999.0	-9999.0	-9999.0
23.753	34.87	34.94	0.32	5.99	0.92	117.7	1.369	0.242	1.127	11.2	10.5	5.0E-04	34.8	36.0	-9999.0	-9999.0	130.1	3.725
23.819	35.08	35.14	0.30	5.65	0.86	117.7	1.372	0.244	1.128	11.2	10.6	5.0E-04	34.9	36.0	-9999.0	-9999.0	130.6	3.718
23.884	33.54	33.60	0.28	5.29	0.84	117.7	1.376	0.246	1.130	10.7	10.1	5.0E-04	33.6	36.0	-9999.0	-9999.0	127.4	3.791
23.950	30.92	30.98	0.26	5.71	0.84	117.7	1.380	0.248	1.132	9.9	9.3	5.0E-04	31.3	34.0	-9999.0	-9999.0	-9999.0	-9999.0
24.015	28.17	28.23	0.25	5.37	0.89	117.7	1.384	0.250	1.134	9.0	8.5	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
24.081	27.66	27.72	0.24	5.49	0.87	117.7	1.388	0.252	1.136	8.8	8.3	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
24.147	26.63	26.69	0.22	5.45	0.83	117.7	1.392	0.254	1.137	8.5	8.0	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
24.212	26.25	26.31	0.20	5.45	0.76	117.7	1.396	0.256	1.139	8.4	7.9	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
24.278	25.04	25.10	0.19	5.13	0.76	117.7	1.400	0.258	1.141	8.0	7.5	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
24.344	24.40	24.45	0.20	4.90	0.82	117.7	1.403	0.261	1.143	7.8	7.3	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
24.409	23.00	23.05	0.19	4.66	0.83	117.7	1.407	0.263	1.145	7.4	6.9	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
24.475	22.04	22.10	0.19	5.11	0.86	117.7	1.411	0.265	1.147	7.1	6.6	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
24.540	21.59	21.65	0.17	5.53	0.79	117.7	1.415	0.267	1.148	6.9	6.5	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
24.606	20.70	20.75	0.16	4.90	0.77	117.7	1.419	0.269	1.150	6.6	6.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
24.672	20.12	20.17	0.17	4.39	0.85	114.6	1.423	0.271	1.152	7.7	7.2	5.0E-05	30.0	32.0	1.250	5.2	-9999.0	-9999.0
24.737	19.81	19.87	0.05	5.29	0.25	117.7	1.426	0.273	1.154	6.3	5.9	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
24.803	21.14	21.20	0.03	5.33	0.14	117.7	1.430	0.275	1.155	6.8	6.3	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
24.868	20.76	20.81	0.02	4.94	0.10	117.7	1.434	0.277	1.157	6.6	6.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
24.934	20.19	20.24	0.03	4.94	0.15	117.7	1.438	0.279	1.159	6.5	6.0	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
25.000	18.33	18.39	0.03	5.03	0.16	117.7	1.442	0.281	1.161	5.9	5.4	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
25.065	14.82	14.87	0.03	5.47	0.20	114.6	1.446	0.283	1.163	5.7	5.3	5.0E-05	30.0	30.0	0.895	3.1	-9999.0	-9999.0
25.131	14.44	14.49	0.03	5.41	0.21	114.6	1.450	0.285	1.164	5.6	5.1	5.0E-05	30.0	30.0	0.870	3.0	-9999.0	-9999.0
25.197	13.48	13.54	0.04	5.15	0.30	114.6	1.453	0.287	1.166	5.2	4.8	5.0E-05	30.0	30.0	0.806	2.7	-9999.0	-9999.0
25.262	14.37	14.43	0.04	5.47	0.28	114.6	1.457	0.289	1.168	5.5	5.1	5.0E-05	30.0	30.0	0.865	2.9	-9999.0	-9999.0
25.328	14.11	14.17	0.06	5.31	0.42	114.6	1.461	0.291	1.170	5.4	5.0	5.0E-05	30.0	30.0	0.847	2.8	-9999.0	-9999.0
25.393	13.60	13.66	0.06	5.19	0.44	114.6	1.465	0.293	1.171	5.2	4.8	5.0E-05	30.0	30.0	0.813	2.7	-9999.0	-9999.0
25.459	13.41	13.47	0.07	5.77	0.52	114.6	1.468	0.295	1.173	5.2	4.8	5.0E-05	30.0	30.0	0.800	2.6	-9999.0	-9999.0
25.525	13.41	13.47	0.08	5.65	0.60	114.6	1.472	0.297	1.175	5.2	4.8	5.0E-05	30.0	30.0	0.800	2.6	-9999.0	-9999.0
25.590	13.54	13.61	0.09	5.83	0.66	114.6	1.476	0.299	1.176	5.2	4.8	5.0E-05	30.0	30.0	0.809	2.6	-9999.0	-9999.0
25.656	13.73	13.80	0.09	5.89	0.65	114.6	1.480	0.301	1.178	5.3	4.9	5.0E-05	30.0	30.0	0.821	2.7	-9999.0	-9999.0
25.721	12.90	12.96	0.10	5.35	0.77	114.6	1.483	0.304	1.180	5.0	4.6	5.0E-05	30.0	30.0	0.765	2.4	-9999.0	-9999.0
25.787	12.90	12.96	0.10	5.65	0.77	114.6	1.487	0.306	1.182	5.0	4.6	5.0E-05	30.0	30.0	0.765	2.4	-9999.0	-9999.0
25.853	13.35	13.41	0.09	5.65	0.67	114.6	1.491	0.308	1.183	5.1	4.7	5.0E-05	30.0	30.0	0.795	2.6	-9999.0	-9999.0
25.918	13.92	13.98	0.09	5.65	0.65	114.6	1.495	0.310	1.185	5.4	4.9	5.0E-05	30.0	30.0	0.833	2.7	-9999.0	-9999.0
25.984	14.95	15.01	0.09	5.73	0.60	114.6	1.498	0.312	1.187	5.7	5.3	5.0E-05	30.0	30.0	0.901	3.0	-9999.0	-9999.0
26.050	15.21	15.27	0.08	5.55	0.53	114.6	1.502	0.314	1.188	5.8	5.4	5.0E-05	30.0	30.0	0.918	3.1	-9999.0	-9999.0
26.115	15.65	15.71	0.10	5.71	0.64	114.6	1.506	0.316	1.190	6.0	5.5	5.0E-05	30.0	30.0	0.947	3.3	-9999.0	-9999.0
26.181	14.63	14.69	0.10	5.71	0.68	114.6	1.510	0.318	1.192	5.6	5.2	5.0E-05	30.0	30.0	0.879	2.9	-9999.0	-9999.0
26.246	14.70	14.76	0.11	5.91	0.75	114.6	1.513	0.320	1.193	5.7	5.2	5.0E-05	30.0	30.0	0.883	2.9	-9999.0	-9999.0
26.312	14.70	14.76	0.12	6.24	0.81	114.6	1.517	0.322	1.195	5.7	5.2	5.0E-05	30.0	30.0	0.883	2.9	-9999.0	-9999.0
26.378	14.05	14.12	0.13	5.75	0.92	114.6	1.521	0.324	1.197	5.4	4.9	5.0E-05	30.0	30.0	0.840	2.7	-9999.0	-9999.0
26.443	14.70	14.76	0.14	6.03	0.95	114.6	1.525	0.326	1.199	5.7	5.2	5.0E-05	30.0	30.0	0.882	2.9	-9999.0	-9999.0
26.509	14.37	14.44	0.14	5.95	0.97	114.6	1.528	0.328	1.200	5.5	5.0	5.0E-05	30.0	30.0	0.861	2.8	-9999.0	-9999.0
26.574	14.63	14.69	0.14	6.15	0.96	114.6	1.532	0.330	1.202	5.6	5.1	5.0E-05	30.0	30.0	0.877	2.9	-9999.0	-9999.0
26.640	14.05	14.12	0.15	6.07	1.06	114.6	1.536	0.332	1.204	5.4	4.9	5.0E-05	30.0	30.0	0.839	2.7	-9999.0	-9999.0
26.706	13.48	13.55	0.15	6.34	1.11	114.6	1.540	0.334	1.205	5.2	4.7	5.0E-05	30.0	30.0	0.801	2.5	-9999.0	-9999.0
26.771	13.48	13.55	0.15	6.40	1.11	114.6	1.543	0.336	1.207	5.2	4.7	5.0E-05	30.0	30.0	0.801	2.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
26.837	12.90	12.97	0.14	6.36	1.08	114.6	1.547	0.338	1.209	5.0	4.5	5.0E-05	30.0	30.0	0.762	2.3	-9999.0	-9999.0
26.903	12.90	12.97	0.15	6.32	1.16	114.6	1.551	0.340	1.211	5.0	4.5	5.0E-05	30.0	30.0	0.761	2.3	-9999.0	-9999.0
26.968	12.65	12.72	0.15	6.20	1.18	114.6	1.555	0.342	1.212	4.9	4.4	5.0E-05	30.0	30.0	0.744	2.3	-9999.0	-9999.0
27.034	13.29	13.36	0.15	6.44	1.13	114.6	1.559	0.345	1.214	5.1	4.6	5.0E-05	30.0	30.0	0.787	2.4	-9999.0	-9999.0
27.099	13.03	13.10	0.15	6.52	1.15	114.6	1.562	0.347	1.216	5.0	4.6	5.0E-05	30.0	30.0	0.769	2.4	-9999.0	-9999.0
27.165	13.29	13.36	0.15	6.60	1.13	114.6	1.566	0.349	1.217	5.1	4.6	5.0E-05	30.0	30.0	0.787	2.4	-9999.0	-9999.0
27.231	13.29	13.36	0.15	6.50	1.13	114.6	1.570	0.351	1.219	5.1	4.6	5.0E-05	30.0	30.0	0.786	2.4	-9999.0	-9999.0
27.296	13.86	13.94	0.15	6.81	1.08	114.6	1.574	0.353	1.221	5.3	4.8	5.0E-05	30.0	30.0	0.824	2.6	-9999.0	-9999.0
27.362	13.60	13.68	0.15	7.11	1.10	114.6	1.577	0.355	1.223	5.2	4.7	5.0E-05	30.0	30.0	0.807	2.5	-9999.0	-9999.0
27.427	13.79	13.87	0.14	6.99	1.01	114.6	1.581	0.357	1.224	5.3	4.8	5.0E-05	30.0	30.0	0.819	2.5	-9999.0	-9999.0
27.493	13.09	13.16	0.15	6.58	1.14	114.6	1.585	0.359	1.226	5.0	4.6	5.0E-05	30.0	30.0	0.772	2.3	-9999.0	-9999.0
27.559	13.73	13.81	0.15	6.95	1.09	114.6	1.589	0.361	1.228	5.3	4.8	5.0E-05	30.0	30.0	0.815	2.5	-9999.0	-9999.0
27.624	12.97	13.05	0.15	6.83	1.15	114.6	1.592	0.363	1.229	5.0	4.5	5.0E-05	30.0	30.0	0.764	2.3	-9999.0	-9999.0
27.690	12.84	12.92	0.16	7.03	1.24	114.6	1.596	0.365	1.231	4.9	4.5	5.0E-05	30.0	30.0	0.755	2.3	-9999.0	-9999.0
27.756	11.88	11.96	0.16	7.07	1.34	114.6	1.600	0.367	1.233	5.7	5.2	5.0E-06	-9999.0	-9999.0	0.690	2.0	-9999.0	-9999.0
27.821	11.69	11.77	0.17	7.48	1.45	114.6	1.604	0.369	1.235	5.6	5.1	5.0E-06	-9999.0	-9999.0	0.678	2.0	-9999.0	-9999.0
27.887	11.76	11.84	0.15	7.87	1.27	114.6	1.607	0.371	1.236	4.5	4.1	5.0E-05	30.0	30.0	0.682	2.0	-9999.0	-9999.0
27.952	11.50	11.59	0.16	8.30	1.38	114.6	1.611	0.373	1.238	5.5	5.0	5.0E-06	-9999.0	-9999.0	0.665	1.9	-9999.0	-9999.0
28.018	11.82	11.92	0.16	9.01	1.35	114.6	1.615	0.375	1.240	5.7	5.1	5.0E-06	-9999.0	-9999.0	0.687	2.0	-9999.0	-9999.0
28.084	11.31	11.40	0.16	8.93	1.41	114.6	1.619	0.377	1.241	5.5	4.9	5.0E-06	-9999.0	-9999.0	0.652	1.9	-9999.0	-9999.0
28.149	11.88	11.98	0.17	9.30	1.42	114.6	1.622	0.379	1.243	5.7	5.1	5.0E-06	-9999.0	-9999.0	0.690	2.0	-9999.0	-9999.0
28.215	11.88	11.97	0.18	8.14	1.51	114.6	1.626	0.381	1.245	5.7	5.1	5.0E-06	-9999.0	-9999.0	0.689	2.0	-9999.0	-9999.0
28.280	11.76	11.85	0.18	8.73	1.52	114.6	1.630	0.383	1.247	5.7	5.1	5.0E-06	-9999.0	-9999.0	0.682	1.9	-9999.0	-9999.0
28.346	10.80	10.89	0.18	8.97	1.66	114.6	1.634	0.385	1.248	5.2	4.7	5.0E-06	-9999.0	-9999.0	0.617	1.7	-9999.0	-9999.0
28.412	8.81	8.91	0.19	9.09	2.14	114.6	1.637	0.388	1.250	4.3	3.8	5.0E-06	-9999.0	-9999.0	0.485	1.3	-9999.0	-9999.0
28.477	7.86	7.96	0.19	9.79	2.39	114.6	1.641	0.390	1.252	5.1	4.5	5.0E-07	-9999.0	-9999.0	0.422	1.1	-9999.0	-9999.0
28.543	6.97	7.09	0.18	11.55	2.54	114.6	1.645	0.392	1.253	4.5	4.0	5.0E-07	-9999.0	-9999.0	0.363	1.0	-9999.0	-9999.0
28.609	5.75	5.92	0.17	15.03	2.88	111.4	1.649	0.394	1.255	5.7	5.1	5.0E-08	-9999.0	-9999.0	0.285	0.8	-9999.0	-9999.0
28.674	4.98	5.18	0.16	18.45	3.10	111.4	1.652	0.396	1.257	5.0	4.4	5.0E-08	-9999.0	-9999.0	0.235	0.7	-9999.0	-9999.0
28.740	4.66	4.89	0.14	21.01	2.87	111.4	1.656	0.398	1.258	4.7	4.2	5.0E-08	-9999.0	-9999.0	0.215	0.7	-9999.0	-9999.0
28.805	4.28	4.51	0.12	21.59	2.67	111.4	1.660	0.400	1.260	4.3	3.9	5.0E-08	-9999.0	-9999.0	0.190	0.6	-9999.0	-9999.0
28.871	3.90	4.14	0.10	22.54	2.42	111.4	1.663	0.402	1.261	4.0	3.5	5.0E-08	-9999.0	-9999.0	0.165	0.6	-9999.0	-9999.0
28.937	4.09	4.34	0.08	22.85	1.85	111.4	1.667	0.404	1.263	2.1	1.8	1.0E-07	-9999.0	-9999.0	0.178	0.6	-9999.0	-9999.0
29.002	4.09	4.34	0.07	22.91	1.62	111.4	1.671	0.406	1.265	2.1	1.8	1.0E-07	-9999.0	-9999.0	0.178	0.6	-9999.0	-9999.0
29.068	3.13	3.38	0.06	23.17	1.78	111.4	1.674	0.408	1.266	1.6	1.4	1.0E-07	-9999.0	-9999.0	0.114	0.5	-9999.0	-9999.0
29.134	3.58	3.83	0.05	23.34	1.31	111.4	1.678	0.410	1.268	1.8	1.6	1.0E-07	-9999.0	-9999.0	0.144	0.6	-9999.0	-9999.0
29.199	3.01	3.27	0.05	24.08	1.53	111.4	1.682	0.412	1.269	1.6	1.4	1.0E-07	-9999.0	-9999.0	0.106	0.5	-9999.0	-9999.0
29.265	3.01	3.27	0.04	24.61	1.23	111.4	1.685	0.414	1.271	1.6	1.4	1.0E-07	-9999.0	-9999.0	0.106	0.5	-9999.0	-9999.0
29.330	2.62	2.88	0.03	24.14	1.05	111.4	1.689	0.416	1.273	1.4	1.2	1.0E-07	-9999.0	-9999.0	0.079	0.5	-9999.0	-9999.0
29.396	2.43	2.69	0.03	24.20	1.12	111.4	1.693	0.418	1.274	1.3	1.1	1.0E-07	-9999.0	-9999.0	0.066	0.5	-9999.0	-9999.0
29.462	1.78	2.05	0.01	25.00	0.49	111.4	1.696	0.420	1.276	1.0	0.9	1.0E-07	-9999.0	-9999.0	0.024	0.5	-9999.0	-9999.0
29.527	2.04	2.32	0.02	25.76	0.86	111.4	1.700	0.422	1.277	1.1	1.0	1.0E-07	-9999.0	-9999.0	0.042	0.5	-9999.0	-9999.0
29.593	1.72	2.01	0.02	26.17	1.00	111.4	1.704	0.424	1.279	1.0	0.8	1.0E-07	-9999.0	-9999.0	0.020	0.5	-9999.0	-9999.0
29.658	1.98	2.27	0.01	25.98	0.44	111.4	1.707	0.426	1.281	1.1	1.0	1.0E-07	-9999.0	-9999.0	0.037	0.5	-9999.0	-9999.0
29.724	2.04	2.32	0.02	25.48	0.86	111.4	1.711	0.429	1.282	1.1	1.0	1.0E-07	-9999.0	-9999.0	0.041	0.5	-9999.0	-9999.0
29.790	1.00	1.27	0.02	25.14	1.57	111.4	1.714	0.431	1.284	0.6	0.5	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.855	1.27	1.56	0.02	26.25	1.29	111.4	1.718	0.433	1.286	0.7	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.921	1.27	1.57	0.01	27.24	0.64	111.4	1.722	0.435	1.287	0.8	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.987	1.00	1.30	0.02	27.99	1.54	111.4	1.725	0.437	1.289	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.052	1.21	1.52	0.02	28.11	1.32	111.4	1.729	0.439	1.290	0.7	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.118	1.00	1.31	0.02	28.09	1.54	111.4	1.733	0.441	1.292	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
30.183	1.00	1.30	0.02	27.67	1.54	111.4	1.736	0.443	1.294	0.6	0.5	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.249	1.02	1.32	0.02	27.57	1.52	111.4	1.740	0.445	1.295	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.315	1.47	1.77	0.01	27.81	0.57	111.4	1.744	0.447	1.297	0.8	0.7	1.0E-07	-9999.0	-9999.0	0.002	0.5	-9999.0	-9999.0
30.380	1.21	1.52	0.02	28.17	1.32	111.4	1.747	0.449	1.298	0.7	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.446	1.00	1.31	0.02	28.07	1.54	111.4	1.751	0.451	1.300	0.6	0.5	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.511	1.00	1.31	0.02	28.35	1.53	111.4	1.755	0.453	1.302	0.6	0.5	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.577	1.53	1.84	0.02	28.68	1.09	111.4	1.758	0.455	1.303	0.9	0.8	1.0E-07	-9999.0	-9999.0	0.006	0.5	-9999.0	-9999.0
30.643	1.00	1.30	0.01	27.87	0.77	111.4	1.762	0.457	1.305	0.6	0.5	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.708	2.62	2.91	0.02	27.37	0.69	111.4	1.766	0.459	1.306	1.4	1.2	1.0E-07	-9999.0	-9999.0	0.076	0.5	-9999.0	-9999.0
30.774	1.98	2.26	0.02	25.92	0.89	111.4	1.769	0.461	1.308	1.1	0.9	1.0E-07	-9999.0	-9999.0	0.033	0.5	-9999.0	-9999.0
30.840	1.98	2.25	0.02	24.57	0.89	111.4	1.773	0.463	1.310	1.1	0.9	1.0E-07	-9999.0	-9999.0	0.032	0.5	-9999.0	-9999.0
30.905	1.21	1.48	0.02	25.10	1.35	111.4	1.777	0.465	1.311	0.7	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.971	1.15	1.44	0.02	26.98	1.39	111.4	1.780	0.467	1.313	0.7	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
31.036	1.00	1.31	0.01	28.60	0.76	111.4	1.784	0.469	1.314	0.6	0.5	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
31.102	1.34	1.66	0.02	29.45	1.21	111.4	1.788	0.472	1.316	0.8	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
31.168	1.91	2.23	0.01	29.63	0.45	111.4	1.791	0.474	1.318	1.1	0.9	1.0E-07	-9999.0	-9999.0	0.030	0.5	-9999.0	-9999.0
31.233	1.53	1.84	0.02	28.07	1.09	111.4	1.795	0.476	1.319	0.9	0.8	1.0E-07	-9999.0	-9999.0	0.003	0.5	-9999.0	-9999.0
31.299	1.59	1.89	0.02	26.98	1.06	111.4	1.799	0.478	1.321	0.9	0.8	1.0E-07	-9999.0	-9999.0	0.006	0.5	-9999.0	-9999.0
31.364	1.15	1.46	0.04	28.84	2.74	111.4	1.802	0.480	1.322	1.4	1.2	5.0E-08	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
31.430	1.59	1.94	0.06	32.01	3.10	111.4	1.806	0.482	1.324	1.9	1.6	5.0E-08	-9999.0	-9999.0	0.009	0.5	-9999.0	-9999.0
31.496	1.98	2.33	0.11	32.15	4.73	111.4	1.809	0.484	1.326	2.2	1.9	5.0E-08	-9999.0	-9999.0	0.035	0.5	-9999.0	-9999.0
31.561	4.22	4.54	0.16	29.94	3.53	111.4	1.813	0.486	1.327	4.4	3.8	5.0E-08	-9999.0	-9999.0	0.182	0.6	-9999.0	-9999.0
31.627	7.73	8.12	0.20	36.26	2.47	114.6	1.817	0.488	1.329	5.2	4.5	5.0E-07	-9999.0	-9999.0	0.420	1.1	-9999.0	-9999.0
31.693	11.76	12.13	0.25	34.46	2.07	114.6	1.821	0.490	1.331	5.8	5.0	5.0E-06	-9999.0	-9999.0	0.687	1.8	-9999.0	-9999.0
31.758	14.18	14.61	0.27	39.57	1.85	114.6	1.824	0.492	1.332	7.0	6.1	5.0E-06	-9999.0	-9999.0	0.853	2.4	-9999.0	-9999.0
31.824	14.89	15.35	0.31	42.49	2.03	114.6	1.828	0.494	1.334	7.3	6.4	5.0E-06	-9999.0	-9999.0	0.901	2.6	-9999.0	-9999.0
31.889	15.72	16.22	0.35	46.54	2.16	114.6	1.832	0.496	1.336	7.8	6.7	5.0E-06	-9999.0	-9999.0	0.959	2.8	-9999.0	-9999.0
31.955	15.84	16.39	0.37	50.65	2.26	114.6	1.836	0.498	1.337	7.8	6.8	5.0E-06	-9999.0	-9999.0	0.970	2.9	-9999.0	-9999.0
32.021	18.20	18.89	0.40	63.48	2.12	114.6	1.839	0.500	1.339	7.2	6.3	5.0E-05	30.0	30.0	1.137	3.6	-9999.0	-9999.0
32.086	20.44	21.04	0.40	55.62	1.91	114.6	1.843	0.502	1.341	8.1	7.0	5.0E-05	30.0	32.0	1.280	4.2	-9999.0	-9999.0
32.152	22.29	23.09	0.40	73.58	1.74	114.6	1.847	0.504	1.343	8.8	7.6	5.0E-05	30.0	32.0	1.416	4.9	-9999.0	-9999.0
32.217	23.70	24.64	0.42	87.64	1.71	114.6	1.851	0.506	1.344	9.4	8.1	5.0E-05	30.0	32.0	1.520	5.5	-9999.0	-9999.0
32.283	24.85	25.83	0.39	90.96	1.51	114.6	1.854	0.508	1.346	9.9	8.5	5.0E-05	30.0	32.0	1.599	5.9	-9999.0	-9999.0
32.349	25.87	27.02	0.39	106.09	1.45	114.6	1.858	0.510	1.348	10.4	8.9	5.0E-05	30.0	32.0	1.677	6.4	-9999.0	-9999.0
32.414	25.23	26.43	0.43	111.09	1.63	114.6	1.862	0.513	1.349	10.1	8.7	5.0E-05	30.0	32.0	1.638	6.1	-9999.0	-9999.0
32.480	24.66	25.96	0.37	120.37	1.43	114.6	1.866	0.515	1.351	9.9	8.6	5.0E-05	30.0	32.0	1.606	5.9	-9999.0	-9999.0
32.546	24.08	25.51	0.33	132.10	1.30	114.6	1.869	0.517	1.353	9.8	8.4	5.0E-05	30.0	32.0	1.576	5.7	-9999.0	-9999.0
32.611	23.70	25.19	0.32	137.75	1.27	114.6	1.873	0.519	1.355	9.6	8.3	5.0E-05	30.0	32.0	1.554	5.6	-9999.0	-9999.0
32.677	23.38	24.96	0.32	146.21	1.29	114.6	1.877	0.521	1.356	9.6	8.2	5.0E-05	30.0	32.0	1.539	5.5	-9999.0	-9999.0
32.742	23.70	25.45	0.28	161.89	1.10	117.7	1.881	0.523	1.358	8.1	7.0	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
32.808	23.07	24.84	0.27	164.54	1.09	114.6	1.885	0.525	1.360	9.5	8.2	5.0E-05	30.0	32.0	1.531	5.5	-9999.0	-9999.0
32.874	23.77	25.55	0.25	164.52	0.98	117.7	1.888	0.527	1.362	8.2	7.0	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
32.939	23.58	25.35	0.23	164.28	0.91	117.7	1.892	0.529	1.363	8.1	6.9	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
33.005	23.19	25.04	0.23	171.57	0.92	117.7	1.896	0.531	1.365	8.0	6.8	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
33.070	22.42	24.35	0.23	178.62	0.95	117.7	1.900	0.533	1.367	7.8	6.6	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
33.136	22.94	24.88	0.24	180.42	0.97	117.7	1.904	0.535	1.369	7.9	6.8	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
33.202	22.55	24.52	0.22	182.00	0.90	117.7	1.908	0.537	1.371	7.8	6.7	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
33.267	22.10	24.06	0.20	181.48	0.83	117.7	1.912	0.539	1.372	7.7	6.6	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
33.333	22.68	24.65	0.22	183.10	0.89	117.7	1.915	0.541	1.374	7.9	6.7	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
33.399	22.16	24.13	0.21	182.04	0.87	117.7	1.919	0.543	1.376	7.7	6.6	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
33.464	22.55	24.54	0.23	183.47	0.94	117.7	1.923	0.545	1.378	7.8	6.7	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
33.530	22.42	24.41	0.24	183.44	0.99	117.7	1.927	0.547	1.380	7.8	6.6	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
33.595	22.81	24.69	0.25	174.43	1.02	117.7	1.931	0.549	1.382	7.9	6.7	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
33.661	23.77	25.67	0.24	176.23	0.94	117.7	1.935	0.551	1.383	8.2	7.0	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
33.727	24.34	26.19	0.25	170.90	0.96	117.7	1.939	0.553	1.385	8.4	7.1	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
33.792	25.93	27.72	0.24	165.74	0.87	117.7	1.943	0.556	1.387	8.9	7.5	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
33.858	26.38	28.17	0.24	165.07	0.85	117.7	1.946	0.558	1.389	9.0	7.6	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
33.923	28.81	30.58	0.23	163.72	0.75	117.7	1.950	0.560	1.391	9.8	8.3	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
33.989	29.26	31.01	0.26	162.29	0.84	117.7	1.954	0.562	1.392	9.9	8.4	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
34.055	31.37	33.03	0.28	154.07	0.85	117.7	1.958	0.564	1.394	10.5	8.9	5.0E-04	30.1	34.0	-9999.0	-9999.0	-9999.0	-9999.0
34.120	31.88	33.46	0.26	146.72	0.78	117.7	1.962	0.566	1.396	10.7	9.0	5.0E-04	30.5	34.0	-9999.0	-9999.0	-9999.0	-9999.0
34.186	33.54	35.00	0.26	135.46	0.74	117.7	1.966	0.568	1.398	11.2	9.5	5.0E-04	31.8	34.0	-9999.0	-9999.0	-9999.0	-9999.0
34.252	33.15	34.47	0.24	122.21	0.70	117.7	1.970	0.570	1.400	11.0	9.3	5.0E-04	31.3	34.0	-9999.0	-9999.0	-9999.0	-9999.0
34.317	32.45	33.75	0.22	120.02	0.65	117.7	1.973	0.572	1.402	10.8	9.1	5.0E-04	30.7	34.0	-9999.0	-9999.0	-9999.0	-9999.0
34.383	30.09	31.41	0.22	121.55	0.70	117.7	1.977	0.574	1.403	10.0	8.5	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
34.448	28.24	29.64	0.23	129.67	0.78	117.7	1.981	0.576	1.405	9.5	8.0	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
34.514	27.34	28.79	0.26	134.41	0.91	117.7	1.985	0.578	1.407	9.2	7.7	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
34.580	27.03	28.50	0.25	136.82	0.88	117.7	1.989	0.580	1.409	9.1	7.7	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
34.645	27.28	28.85	0.21	145.59	0.73	117.7	1.993	0.582	1.411	9.2	7.8	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
34.711	28.11	29.62	0.25	139.79	0.85	117.7	1.997	0.584	1.412	9.5	8.0	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
34.776	28.17	29.66	0.27	138.46	0.91	117.7	2.000	0.586	1.414	9.5	8.0	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
34.842	29.19	30.63	0.33	133.64	1.08	117.7	2.004	0.588	1.416	9.8	8.2	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
34.908	27.73	29.17	0.33	133.70	1.13	117.7	2.008	0.590	1.418	9.3	7.8	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
34.973	33.86	35.16	0.31	120.21	0.88	117.7	2.012	0.592	1.420	11.2	9.4	5.0E-04	31.7	34.0	-9999.0	-9999.0	-9999.0	-9999.0
35.039	34.81	35.97	0.29	106.72	0.81	117.7	2.016	0.594	1.421	11.5	9.6	5.0E-04	32.3	34.0	-9999.0	-9999.0	-9999.0	-9999.0
35.105	32.71	33.86	0.28	106.13	0.83	117.7	2.020	0.596	1.423	10.8	9.1	5.0E-04	30.6	34.0	-9999.0	-9999.0	-9999.0	-9999.0
35.170	32.39	33.63	0.27	114.93	0.80	117.7	2.024	0.599	1.425	10.7	9.0	5.0E-04	30.3	34.0	-9999.0	-9999.0	-9999.0	-9999.0
35.236	31.05	32.35	0.28	121.04	0.87	117.7	2.028	0.601	1.427	10.3	8.6	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
35.301	30.53	31.91	0.29	127.20	0.91	117.7	2.031	0.603	1.429	10.2	8.5	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
35.367	29.83	31.30	0.31	136.21	0.99	117.7	2.035	0.605	1.431	10.0	8.4	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
35.433	30.72	32.21	0.32	137.15	1.00	117.7	2.039	0.607	1.432	10.3	8.6	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
35.498	32.07	33.50	0.34	132.90	1.02	117.7	2.043	0.609	1.434	10.7	8.9	5.0E-04	30.1	34.0	-9999.0	-9999.0	-9999.0	-9999.0
35.564	33.35	34.72	0.38	126.89	1.10	117.7	2.047	0.611	1.436	11.1	9.3	5.0E-04	31.1	34.0	-9999.0	-9999.0	-9999.0	-9999.0
35.629	34.75	36.03	0.46	118.47	1.28	117.7	2.051	0.613	1.438	11.5	9.6	5.0E-04	32.2	34.0	-9999.0	-9999.0	-9999.0	-9999.0
35.695	35.46	36.70	0.53	115.30	1.45	117.7	2.055	0.615	1.440	11.7	9.8	5.0E-04	32.7	34.0	-9999.0	-9999.0	-9999.0	-9999.0
35.761	37.69	38.94	0.57	115.91	1.47	117.7	2.058	0.617	1.441	12.4	10.4	5.0E-04	34.4	34.0	-9999.0	-9999.0	149.3	3.834
35.826	40.18	41.34	0.64	107.78	1.55	117.7	2.062	0.619	1.443	13.2	11.0	5.0E-04	36.1	36.0	-9999.0	-9999.0	154.5	3.738
35.892	43.83	44.86	0.74	96.13	1.65	117.7	2.066	0.621	1.445	14.3	11.9	5.0E-04	38.4	36.0	-9999.0	-9999.0	161.7	3.604
35.958	46.82	47.66	0.85	77.33	1.79	117.7	2.070	0.623	1.447	15.2	12.6	5.0E-04	40.1	36.0	-9999.0	-9999.0	167.1	3.506
36.023	47.41	48.09	0.90	63.30	1.88	117.7	2.074	0.625	1.449	15.4	12.8	5.0E-04	40.4	36.0	-9999.0	-9999.0	168.0	3.493
36.089	48.93	49.57	0.98	59.40	1.98	117.7	2.078	0.627	1.451	15.8	13.1	5.0E-04	41.2	36.0	-9999.0	-9999.0	170.7	3.444
36.154	52.64	53.22	0.99	54.26	1.86	117.7	2.082	0.629	1.452	17.0	14.1	5.0E-04	43.2	38.0	-9999.0	-9999.0	177.2	3.329
36.220	56.54	56.94	0.96	37.35	1.69	117.7	2.085	0.631	1.454	18.2	15.1	5.0E-04	45.1	38.0	-9999.0	-9999.0	183.4	3.221
36.286	60.75	60.94	1.02	17.40	1.68	117.7	2.089	0.633	1.456	19.5	16.1	5.0E-04	47.1	38.0	-9999.0	-9999.0	189.8	3.115
36.351	61.77	61.82	1.11	4.86	1.80	117.7	2.093	0.635	1.458	19.7	16.3	5.0E-04	47.5	38.0	-9999.0	-9999.0	191.3	3.094
36.417	62.92	62.94	1.18	1.25	1.88	117.7	2.097	0.637	1.460	20.1	16.6	5.0E-04	48.0	38.0	-9999.0	-9999.0	193.1	3.068
36.482	63.05	63.03	0.47	-1.90	0.75	120.9	2.101	0.640	1.461	15.1	12.5	5.0E-03	48.0	38.0	-9999.0	-9999.0	193.3	3.067
36.548	63.56	63.53	0.59	-3.36	0.93	120.9	2.105	0.642	1.463	15.2	12.6	5.0E-03	48.2	38.0	-9999.0	-9999.0	194.1	3.056
36.614	64.40	64.35	0.84	-4.54	1.31	117.7	2.109	0.644	1.465	20.5	17.0	5.0E-04	48.5	38.0	-9999.0	-9999.0	195.5	3.038
36.679	61.77	61.71	0.91	-5.77	1.48	117.7	2.113	0.646	1.467	19.7	16.3	5.0E-04	47.3	38.0	-9999.0	-9999.0	191.5	3.104
36.745	57.94	57.88	0.71	-5.37	1.23	117.7	2.117	0.648	1.469	18.5	15.2	5.0E-04	45.5	38.0	-9999.0	-9999.0	185.6	3.207
36.811	63.43	63.38	0.63	-5.43	1.00	120.9	2.121	0.650	1.471	15.2	12.5	5.0E-03	48.1	38.0	-9999.0	-9999.0	194.3	3.065

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
36.876	54.30	54.23	0.52	-7.03	0.96	117.7	2.124	0.652	1.473	17.3	14.3	5.0E-04	43.6	38.0	-9999.0	-9999.0	179.8	3.315
36.942	47.85	47.79	0.48	-5.63	1.01	117.7	2.128	0.654	1.474	15.3	12.6	5.0E-04	39.9	36.0	-9999.0	-9999.0	168.4	3.524
37.007	40.89	40.85	0.58	-3.33	1.42	117.7	2.132	0.656	1.476	13.0	10.7	5.0E-04	35.4	36.0	-9999.0	-9999.0	154.6	3.784
37.073	36.41	36.47	0.64	5.27	1.76	114.6	2.136	0.658	1.478	14.0	11.5	5.0E-05	32.1	34.0	2.289	9.0	-9999.0	-9999.0
37.139	32.71	33.00	0.64	26.80	1.94	114.6	2.140	0.660	1.480	12.6	10.4	5.0E-05	30.0	34.0	2.057	7.6	-9999.0	-9999.0
37.204	31.75	32.25	0.56	46.89	1.74	114.6	2.143	0.662	1.481	12.4	10.2	5.0E-05	30.0	34.0	2.007	7.3	-9999.0	-9999.0
37.270	31.94	32.48	0.45	49.89	1.39	117.7	2.147	0.664	1.483	10.4	8.5	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
37.336	31.94	32.47	0.36	49.73	1.11	117.7	2.151	0.666	1.485	10.4	8.5	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
37.401	29.32	29.84	0.27	47.91	0.91	117.7	2.155	0.668	1.487	9.5	7.8	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
37.467	25.87	26.43	0.22	52.02	0.83	117.7	2.159	0.670	1.489	8.4	6.9	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
37.532	23.13	23.77	0.20	59.48	0.84	117.7	2.163	0.672	1.490	7.6	6.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
37.598	19.10	19.88	0.18	72.27	0.91	114.6	2.167	0.674	1.492	7.6	6.2	5.0E-05	30.0	30.0	1.181	3.2	-9999.0	-9999.0
37.664	18.07	19.00	0.18	85.50	0.95	114.6	2.170	0.676	1.494	7.3	6.0	5.0E-05	30.0	30.0	1.122	3.0	-9999.0	-9999.0
37.729	17.18	18.21	0.18	95.19	0.99	114.6	2.174	0.678	1.496	7.0	5.7	5.0E-05	30.0	30.0	1.069	2.8	-9999.0	-9999.0
37.795	16.42	17.51	0.17	100.66	0.97	114.6	2.178	0.680	1.497	6.7	5.5	5.0E-05	30.0	30.0	1.022	2.6	-9999.0	-9999.0
37.860	16.61	17.74	0.16	104.12	0.90	114.6	2.182	0.683	1.499	6.8	5.5	5.0E-05	30.0	30.0	1.037	2.7	-9999.0	-9999.0
37.926	16.74	17.87	0.15	104.55	0.84	114.6	2.185	0.685	1.501	6.8	5.6	5.0E-05	30.0	30.0	1.046	2.7	-9999.0	-9999.0
37.992	16.10	17.24	0.16	105.61	0.93	114.6	2.189	0.687	1.502	6.6	5.4	5.0E-05	30.0	30.0	1.003	2.5	-9999.0	-9999.0
38.057	16.42	17.56	0.17	105.81	0.97	114.6	2.193	0.689	1.504	6.7	5.5	5.0E-05	30.0	30.0	1.025	2.6	-9999.0	-9999.0
38.123	15.40	16.55	0.19	106.80	1.15	114.6	2.197	0.691	1.506	6.3	5.2	5.0E-05	30.0	30.0	0.957	2.4	-9999.0	-9999.0
38.189	15.84	17.00	0.21	107.78	1.24	114.6	2.200	0.693	1.508	6.5	5.3	5.0E-05	30.0	30.0	0.987	2.5	-9999.0	-9999.0
38.254	19.04	20.05	0.23	93.70	1.15	114.6	2.204	0.695	1.509	7.7	6.3	5.0E-05	30.0	30.0	1.190	3.2	-9999.0	-9999.0
38.320	19.55	20.59	0.20	96.53	0.97	114.6	2.208	0.697	1.511	7.9	6.4	5.0E-05	30.0	30.0	1.225	3.3	-9999.0	-9999.0
38.385	18.72	19.73	0.18	93.88	0.91	114.6	2.212	0.699	1.513	7.6	6.1	5.0E-05	30.0	30.0	1.168	3.1	-9999.0	-9999.0
38.451	17.76	18.76	0.19	92.36	1.02	114.6	2.215	0.701	1.514	7.2	5.8	5.0E-05	30.0	30.0	1.103	2.9	-9999.0	-9999.0
38.517	17.12	18.15	0.19	94.84	1.05	114.6	2.219	0.703	1.516	7.0	5.6	5.0E-05	30.0	30.0	1.062	2.7	-9999.0	-9999.0
38.582	17.50	18.59	0.20	101.03	1.08	114.6	2.223	0.705	1.518	7.1	5.8	5.0E-05	30.0	30.0	1.091	2.8	-9999.0	-9999.0
38.648	17.63	18.78	0.19	106.35	1.01	114.6	2.227	0.707	1.520	7.2	5.8	5.0E-05	30.0	30.0	1.104	2.9	-9999.0	-9999.0
38.713	18.46	19.61	0.19	106.00	0.97	114.6	2.230	0.709	1.521	7.5	6.1	5.0E-05	30.0	30.0	1.159	3.1	-9999.0	-9999.0
38.779	19.30	20.39	0.21	100.81	1.03	114.6	2.234	0.711	1.523	7.8	6.3	5.0E-05	30.0	30.0	1.210	3.2	-9999.0	-9999.0
38.845	21.02	22.04	0.22	94.18	1.00	114.6	2.238	0.713	1.525	8.4	6.8	5.0E-05	30.0	32.0	1.320	3.7	-9999.0	-9999.0
38.910	21.21	22.17	0.21	88.53	0.95	114.6	2.242	0.715	1.526	8.5	6.9	5.0E-05	30.0	32.0	1.328	3.7	-9999.0	-9999.0
38.976	20.95	21.88	0.20	85.82	0.92	114.6	2.246	0.717	1.528	8.4	6.8	5.0E-05	30.0	32.0	1.309	3.6	-9999.0	-9999.0
39.042	20.63	21.53	0.20	82.86	0.93	114.6	2.249	0.719	1.530	8.2	6.7	5.0E-05	30.0	30.0	1.285	3.5	-9999.0	-9999.0
39.107	21.14	22.01	0.21	80.25	0.96	114.6	2.253	0.721	1.532	8.4	6.8	5.0E-05	30.0	32.0	1.317	3.6	-9999.0	-9999.0
39.173	20.19	21.08	0.30	82.64	1.43	114.6	2.257	0.724	1.533	8.1	6.5	5.0E-05	30.0	30.0	1.255	3.4	-9999.0	-9999.0
39.238	21.46	22.41	0.37	88.09	1.65	114.6	2.261	0.726	1.535	8.6	6.9	5.0E-05	30.0	32.0	1.344	3.7	-9999.0	-9999.0
39.304	22.94	23.96	0.40	94.45	1.67	114.6	2.264	0.728	1.537	9.2	7.4	5.0E-05	30.0	32.0	1.446	4.2	-9999.0	-9999.0
39.370	27.73	28.66	0.35	86.12	1.22	117.7	2.268	0.730	1.538	9.1	7.4	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
39.435	33.98	34.65	0.29	62.24	0.84	117.7	2.272	0.732	1.540	11.1	8.9	5.0E-04	30.1	34.0	-9999.0	-9999.0	-9999.0	-9999.0
39.501	39.09	39.42	0.27	30.10	0.69	117.7	2.276	0.734	1.542	12.6	10.1	5.0E-04	33.8	34.0	-9999.0	-9999.0	153.6	3.896
39.566	40.57	40.68	0.25	10.24	0.62	117.7	2.280	0.736	1.544	13.0	10.5	5.0E-04	34.6	34.0	-9999.0	-9999.0	156.5	3.846
39.632	37.88	37.93	0.23	4.46	0.61	117.7	2.284	0.738	1.546	12.1	9.7	5.0E-04	32.6	34.0	-9999.0	-9999.0	-9999.0	-9999.0
39.698	34.24	34.30	0.17	5.31	0.50	117.7	2.287	0.740	1.548	10.9	8.8	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
39.763	28.75	28.93	0.17	16.55	0.59	117.7	2.291	0.742	1.549	9.2	7.4	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
39.829	24.47	24.88	0.17	38.42	0.68	117.7	2.295	0.744	1.551	7.9	6.4	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
39.895	20.44	21.08	0.19	59.22	0.90	114.6	2.299	0.746	1.553	8.1	6.5	5.0E-05	30.0	30.0	1.252	3.3	-9999.0	-9999.0
39.960	18.20	19.02	0.20	75.59	1.05	114.6	2.303	0.748	1.555	7.3	5.8	5.0E-05	30.0	30.0	1.115	2.8	-9999.0	-9999.0
40.026	15.91	16.88	0.20	89.81	1.19	114.6	2.306	0.750	1.556	6.5	5.2	5.0E-05	30.0	30.0	0.971	2.3	-9999.0	-9999.0
40.091	16.29	17.32	0.22	95.21	1.27	114.6	2.310	0.752	1.558	6.6	5.3	5.0E-05	30.0	30.0	1.001	2.4	-9999.0	-9999.0
40.157	15.14	16.18	0.22	96.19	1.36	114.6	2.314	0.754	1.560	6.2	5.0	5.0E-05	30.0	30.0	0.924	2.2	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
40.223	15.78	16.83	0.23	97.30	1.37	114.6	2.318	0.756	1.561	6.4	5.2	5.0E-05	30.0	30.0	0.967	2.3	-9999.0	-9999.0
40.288	15.84	16.90	0.21	98.40	1.25	114.6	2.322	0.758	1.563	6.5	5.2	5.0E-05	30.0	30.0	0.972	2.3	-9999.0	-9999.0
40.354	15.33	16.37	0.20	96.92	1.22	114.6	2.325	0.760	1.565	6.3	5.0	5.0E-05	30.0	30.0	0.937	2.2	-9999.0	-9999.0
40.419	15.21	16.24	0.19	95.42	1.17	114.6	2.329	0.762	1.567	6.2	5.0	5.0E-05	30.0	30.0	0.927	2.2	-9999.0	-9999.0
40.485	14.44	15.47	0.18	95.78	1.17	114.6	2.333	0.764	1.568	5.9	4.7	5.0E-05	30.0	30.0	0.876	2.0	-9999.0	-9999.0
40.551	14.51	15.57	0.18	98.44	1.16	114.6	2.337	0.767	1.570	6.0	4.8	5.0E-05	30.0	30.0	0.882	2.0	-9999.0	-9999.0
40.616	14.37	15.46	0.16	100.66	1.04	114.6	2.340	0.769	1.572	5.9	4.7	5.0E-05	30.0	30.0	0.875	2.0	-9999.0	-9999.0
40.682	13.41	14.51	0.15	101.75	1.04	114.6	2.344	0.771	1.573	5.6	4.4	5.0E-05	30.0	30.0	0.811	1.8	-9999.0	-9999.0
40.748	13.73	14.85	0.14	103.06	0.95	114.6	2.348	0.773	1.575	5.7	4.5	5.0E-05	30.0	30.0	0.833	1.9	-9999.0	-9999.0
40.813	13.86	14.98	0.16	103.26	1.07	114.6	2.352	0.775	1.577	5.7	4.6	5.0E-05	30.0	30.0	0.842	1.9	-9999.0	-9999.0
40.879	13.16	14.28	0.17	103.80	1.19	114.6	2.355	0.777	1.579	5.5	4.4	5.0E-05	30.0	30.0	0.795	1.8	-9999.0	-9999.0
40.944	13.73	14.87	0.17	105.16	1.15	114.6	2.359	0.779	1.580	5.7	4.5	5.0E-05	30.0	30.0	0.834	1.9	-9999.0	-9999.0
41.010	14.44	15.56	0.14	104.04	0.90	114.6	2.363	0.781	1.582	6.0	4.7	5.0E-05	30.0	30.0	0.880	2.0	-9999.0	-9999.0
41.076	13.99	15.05	0.13	97.85	0.87	114.6	2.367	0.783	1.584	5.8	4.6	5.0E-05	30.0	30.0	0.846	1.9	-9999.0	-9999.0
41.141	13.60	14.61	0.09	93.11	0.62	114.6	2.370	0.785	1.585	5.6	4.4	5.0E-05	30.0	30.0	0.816	1.8	-9999.0	-9999.0
41.207	13.92	14.92	0.09	92.64	0.60	114.6	2.374	0.787	1.587	5.7	4.5	5.0E-05	30.0	30.0	0.837	1.9	-9999.0	-9999.0
41.272	12.52	13.56	0.10	96.05	0.74	114.6	2.378	0.789	1.589	5.2	4.1	5.0E-05	30.0	30.0	0.745	1.6	-9999.0	-9999.0
41.338	11.37	12.45	0.11	100.32	0.89	114.6	2.382	0.791	1.591	4.8	3.8	5.0E-05	30.0	30.0	0.671	1.4	-9999.0	-9999.0
41.404	11.82	12.91	0.12	101.23	0.93	114.6	2.385	0.793	1.592	4.9	3.9	5.0E-05	30.0	30.0	0.702	1.5	-9999.0	-9999.0
41.469	11.95	13.02	0.12	98.95	0.92	114.6	2.389	0.795	1.594	5.0	4.0	5.0E-05	30.0	30.0	0.709	1.5	-9999.0	-9999.0
41.535	11.50	12.54	0.11	96.51	0.88	114.6	2.393	0.797	1.596	4.8	3.8	5.0E-05	30.0	30.0	0.677	1.4	-9999.0	-9999.0
41.601	11.18	12.16	0.10	90.84	0.82	114.6	2.397	0.799	1.597	4.7	3.7	5.0E-05	30.0	30.0	0.651	1.4	-9999.0	-9999.0
41.666	10.86	11.80	0.10	86.97	0.85	114.6	2.400	0.801	1.599	4.5	3.6	5.0E-05	30.0	30.0	0.626	1.3	-9999.0	-9999.0
41.732	10.28	11.23	0.12	87.28	1.07	114.6	2.404	0.803	1.601	4.3	3.4	5.0E-05	30.0	30.0	0.588	1.2	-9999.0	-9999.0
41.797	10.61	11.58	0.21	90.61	1.82	114.6	2.408	0.805	1.603	5.5	4.4	5.0E-06	-9999.0	-9999.0	0.612	1.3	-9999.0	-9999.0
41.863	12.52	13.57	0.31	97.18	2.29	114.6	2.412	0.808	1.604	6.5	5.1	5.0E-06	-9999.0	-9999.0	0.744	1.6	-9999.0	-9999.0
41.929	17.31	18.20	0.40	82.50	2.20	114.6	2.415	0.810	1.606	8.7	6.9	5.0E-06	-9999.0	-9999.0	1.053	2.5	-9999.0	-9999.0
41.994	23.38	23.90	0.47	48.87	1.97	114.6	2.419	0.812	1.608	9.2	7.2	5.0E-05	30.0	32.0	1.432	3.8	-9999.0	-9999.0
42.060	27.92	27.99	0.60	6.97	2.15	114.6	2.423	0.814	1.609	10.7	8.5	5.0E-05	30.0	32.0	1.705	5.0	-9999.0	-9999.0
42.125	30.15	30.14	0.67	-1.66	2.23	114.6	2.427	0.816	1.611	11.5	9.1	5.0E-05	30.0	32.0	1.847	5.6	-9999.0	-9999.0
42.191	33.66	33.62	0.61	-4.23	1.82	114.6	2.431	0.818	1.613	12.9	10.1	5.0E-05	30.0	34.0	2.079	6.7	-9999.0	-9999.0
42.257	38.84	38.78	0.44	-6.26	1.14	117.7	2.434	0.820	1.615	12.4	9.7	5.0E-04	32.6	34.0	-9999.0	-9999.0	-9999.0	-9999.0
42.322	40.89	40.81	0.28	-7.64	0.69	117.7	2.438	0.822	1.616	13.0	10.2	5.0E-04	34.1	34.0	-9999.0	-9999.0	159.1	3.898
42.388	43.64	43.55	0.23	-7.83	0.53	120.9	2.442	0.824	1.618	10.4	8.2	5.0E-03	35.9	34.0	-9999.0	-9999.0	165.2	3.792
42.454	45.48	45.40	0.26	-7.56	0.57	120.9	2.446	0.826	1.620	10.9	8.5	5.0E-03	37.1	36.0	-9999.0	-9999.0	169.1	3.725
42.519	46.95	46.88	0.29	-6.52	0.62	120.9	2.450	0.828	1.622	11.2	8.8	5.0E-03	38.0	36.0	-9999.0	-9999.0	172.2	3.673
42.585	46.44	46.38	0.35	-5.87	0.76	117.7	2.454	0.830	1.624	14.8	11.6	5.0E-04	37.7	36.0	-9999.0	-9999.0	171.2	3.692
42.650	45.29	45.23	0.39	-5.43	0.86	117.7	2.458	0.832	1.626	14.4	11.3	5.0E-04	36.9	36.0	-9999.0	-9999.0	169.0	3.735
42.716	43.18	43.13	0.45	-5.47	1.05	117.7	2.462	0.834	1.628	13.8	10.8	5.0E-04	35.6	34.0	-9999.0	-9999.0	164.6	3.816
42.782	41.20	41.15	0.61	-4.72	1.49	117.7	2.466	0.836	1.629	13.1	10.3	5.0E-04	34.2	34.0	-9999.0	-9999.0	160.3	3.894
42.847	40.31	40.26	0.72	-4.23	1.79	114.6	2.469	0.838	1.631	15.4	12.1	5.0E-05	33.6	34.0	2.520	8.9	158.3	3.931
42.913	40.69	40.64	0.76	-4.37	1.87	114.6	2.473	0.840	1.633	15.6	12.2	5.0E-05	33.8	34.0	2.545	9.1	159.2	3.917
42.978	43.18	43.14	0.71	-4.15	1.65	117.7	2.477	0.842	1.635	13.8	10.8	5.0E-04	35.5	34.0	-9999.0	-9999.0	164.8	3.821
43.044	44.91	44.85	0.39	-5.39	0.87	117.7	2.481	0.844	1.636	14.3	11.2	5.0E-04	36.6	36.0	-9999.0	-9999.0	168.5	3.758
43.110	47.85	47.78	0.32	-5.83	0.67	120.9	2.485	0.846	1.638	11.4	8.9	5.0E-03	38.4	36.0	-9999.0	-9999.0	174.6	3.654
43.175	42.48	42.41	0.31	-6.87	0.73	117.7	2.489	0.848	1.640	13.5	10.6	5.0E-04	35.0	34.0	-9999.0	-9999.0	163.4	3.853
43.241	37.82	37.75	0.37	-6.91	0.98	117.7	2.493	0.851	1.642	12.0	9.4	5.0E-04	31.6	34.0	-9999.0	-9999.0	-9999.0	-9999.0
43.307	33.15	33.08	0.38	-6.62	1.15	117.7	2.496	0.853	1.644	10.6	8.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
43.372	28.43	28.37	0.39	-5.75	1.38	114.6	2.500	0.855	1.646	10.9	8.5	5.0E-05	30.0	32.0	1.724	4.9	-9999.0	-9999.0
43.438	23.83	23.78	0.46	-4.78	1.94	114.6	2.504	0.857	1.647	9.1	7.1	5.0E-05	30.0	32.0	1.418	3.6	-9999.0	-9999.0
43.503	21.65	21.62	0.63	-3.22	2.92	114.6	2.508	0.859	1.649	10.4	8.1	5.0E-06	-9999.0	-9999.0	1.274	3.1	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
43.569	19.55	19.56	0.62	1.45	3.18	114.6	2.511	0.861	1.651	9.4	7.3	5.0E-06	-9999.0	-9999.0	1.137	2.7	-9999.0	-9999.0
43.635	19.30	19.40	0.59	9.46	3.05	114.6	2.515	0.863	1.652	9.3	7.2	5.0E-06	-9999.0	-9999.0	1.126	2.6	-9999.0	-9999.0
43.700	21.59	21.79	0.52	18.09	2.39	114.6	2.519	0.865	1.654	10.4	8.1	5.0E-06	-9999.0	-9999.0	1.285	3.1	-9999.0	-9999.0
43.766	30.28	30.49	0.46	19.44	1.51	114.6	2.523	0.867	1.656	11.7	9.1	5.0E-05	30.0	32.0	1.865	5.5	-9999.0	-9999.0
43.831	39.42	39.51	0.38	9.05	0.96	117.7	2.527	0.869	1.658	12.6	9.8	5.0E-04	32.8	34.0	-9999.0	-9999.0	157.4	3.982
43.897	42.10	42.09	0.30	-1.29	0.71	117.7	2.530	0.871	1.659	13.4	10.4	5.0E-04	34.6	34.0	-9999.0	-9999.0	163.3	3.881
43.963	42.86	42.83	0.26	-3.54	0.61	117.7	2.534	0.873	1.661	13.7	10.6	5.0E-04	35.1	34.0	-9999.0	-9999.0	165.0	3.853
44.028	43.51	43.46	0.22	-4.17	0.51	120.9	2.538	0.875	1.663	10.4	8.1	5.0E-03	35.5	34.0	-9999.0	-9999.0	166.5	3.830
44.094	43.57	43.52	0.22	-4.37	0.51	120.9	2.542	0.877	1.665	10.4	8.1	5.0E-03	35.5	34.0	-9999.0	-9999.0	166.7	3.830
44.160	42.16	42.11	0.23	-4.82	0.55	117.7	2.546	0.879	1.667	13.4	10.4	5.0E-04	34.5	34.0	-9999.0	-9999.0	163.6	3.885
44.225	41.65	41.60	0.27	-4.48	0.65	117.7	2.550	0.881	1.669	13.3	10.3	5.0E-04	34.2	34.0	-9999.0	-9999.0	162.5	3.907
44.291	40.25	40.20	0.31	-4.35	0.77	117.7	2.554	0.883	1.670	12.8	9.9	5.0E-04	33.2	34.0	-9999.0	-9999.0	159.4	3.964
44.356	38.07	38.03	0.32	-3.66	0.84	117.7	2.558	0.885	1.672	12.1	9.4	5.0E-04	31.6	34.0	-9999.0	-9999.0	-9999.0	-9999.0
44.422	36.92	36.89	0.30	-2.66	0.82	117.7	2.562	0.887	1.674	11.8	9.1	5.0E-04	30.7	34.0	-9999.0	-9999.0	-9999.0	-9999.0
44.488	34.56	34.55	0.30	-1.23	0.87	117.7	2.565	0.889	1.676	11.0	8.5	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
44.553	33.28	33.29	0.30	0.83	0.90	117.7	2.569	0.892	1.678	10.6	8.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
44.619	32.84	32.88	0.30	3.56	0.91	117.7	2.573	0.894	1.680	10.5	8.1	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
44.684	32.01	32.07	0.30	6.18	0.94	117.7	2.577	0.896	1.681	10.2	7.9	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
44.750	30.85	30.98	0.31	11.79	1.00	117.7	2.581	0.898	1.683	9.9	7.6	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
44.816	30.40	30.54	0.31	12.20	1.02	117.7	2.585	0.900	1.685	9.7	7.5	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
44.881	28.87	29.00	0.30	12.22	1.04	117.7	2.589	0.902	1.687	9.3	7.1	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
44.947	27.54	27.67	0.32	12.39	1.16	117.7	2.592	0.904	1.689	8.8	6.8	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
45.013	27.47	27.60	0.31	12.72	1.13	117.7	2.596	0.906	1.690	8.8	6.8	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
45.078	29.00	29.14	0.30	12.90	1.03	117.7	2.600	0.908	1.692	9.3	7.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
45.144	30.99	31.13	0.29	13.06	0.93	117.7	2.604	0.910	1.694	9.9	7.6	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
45.209	33.22	33.36	0.31	13.16	0.93	117.7	2.608	0.912	1.696	10.7	8.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
45.275	34.30	34.44	0.36	12.98	1.05	117.7	2.612	0.914	1.698	11.0	8.4	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
45.341	33.47	33.60	0.38	11.85	1.13	117.7	2.616	0.916	1.700	10.7	8.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
45.406	33.03	33.15	0.40	10.94	1.21	117.7	2.619	0.918	1.701	10.6	8.1	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
45.472	29.45	29.58	0.38	12.01	1.29	117.7	2.623	0.920	1.703	9.4	7.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
45.538	25.55	25.69	0.38	12.57	1.48	114.6	2.627	0.922	1.705	9.8	7.5	5.0E-05	30.0	32.0	1.537	3.9	-9999.0	-9999.0
45.603	21.97	22.12	0.37	13.31	1.68	114.6	2.631	0.924	1.707	8.5	6.5	5.0E-05	30.0	30.0	1.299	3.1	-9999.0	-9999.0
45.669	18.46	18.68	0.39	19.79	2.09	114.6	2.635	0.926	1.708	7.2	5.5	5.0E-05	30.0	30.0	1.070	2.3	-9999.0	-9999.0
45.734	16.29	16.65	0.35	33.77	2.11	114.6	2.638	0.928	1.710	8.0	6.1	5.0E-06	-9999.0	-9999.0	0.934	1.9	-9999.0	-9999.0
45.800	14.82	15.32	0.29	46.89	1.90	114.6	2.642	0.930	1.712	7.3	5.6	5.0E-06	-9999.0	-9999.0	0.845	1.7	-9999.0	-9999.0
45.866	17.95	18.48	0.31	48.79	1.68	114.6	2.646	0.932	1.713	7.1	5.4	5.0E-05	30.0	30.0	1.056	2.3	-9999.0	-9999.0
45.931	19.68	19.92	0.35	22.67	1.76	114.6	2.650	0.935	1.715	7.6	5.8	5.0E-05	30.0	30.0	1.152	2.6	-9999.0	-9999.0
45.997	20.82	20.92	0.34	8.93	1.63	114.6	2.653	0.937	1.717	8.0	6.1	5.0E-05	30.0	30.0	1.218	2.8	-9999.0	-9999.0
46.062	20.06	20.10	0.30	3.89	1.50	114.6	2.657	0.939	1.719	7.7	5.9	5.0E-05	30.0	30.0	1.163	2.6	-9999.0	-9999.0
46.128	20.57	20.59	0.30	2.02	1.46	114.6	2.661	0.941	1.720	7.9	6.0	5.0E-05	30.0	30.0	1.195	2.7	-9999.0	-9999.0
46.194	18.27	18.30	0.31	2.61	1.70	114.6	2.665	0.943	1.722	7.0	5.3	5.0E-05	30.0	30.0	1.043	2.2	-9999.0	-9999.0
46.259	17.44	17.50	0.28	5.07	1.60	114.6	2.669	0.945	1.724	6.7	5.1	5.0E-05	30.0	30.0	0.989	2.1	-9999.0	-9999.0
46.325	15.78	15.88	0.32	9.01	2.02	114.6	2.672	0.947	1.725	7.6	5.8	5.0E-06	-9999.0	-9999.0	0.880	1.8	-9999.0	-9999.0
46.391	17.95	18.14	0.31	16.91	1.71	114.6	2.676	0.949	1.727	6.9	5.3	5.0E-05	30.0	30.0	1.031	2.2	-9999.0	-9999.0
46.456	17.88	18.09	0.27	19.07	1.50	114.6	2.680	0.951	1.729	6.9	5.3	5.0E-05	30.0	30.0	1.027	2.2	-9999.0	-9999.0
46.522	18.27	18.38	0.22	10.18	1.20	114.6	2.684	0.953	1.731	7.0	5.4	5.0E-05	30.0	30.0	1.047	2.2	-9999.0	-9999.0
46.587	15.65	15.70	0.20	4.62	1.28	114.6	2.687	0.955	1.732	6.0	4.6	5.0E-05	30.0	30.0	0.867	1.7	-9999.0	-9999.0
46.653	14.11	14.16	0.22	4.37	1.56	114.6	2.691	0.957	1.734	5.4	4.1	5.0E-05	30.0	30.0	0.765	1.5	-9999.0	-9999.0
46.719	11.56	11.61	0.20	4.76	1.73	114.6	2.695	0.959	1.736	5.6	4.2	5.0E-06	-9999.0	-9999.0	0.594	1.1	-9999.0	-9999.0
46.784	10.22	10.40	0.17	16.29	1.64	114.6	2.699	0.961	1.737	5.0	3.8	5.0E-06	-9999.0	-9999.0	0.513	1.0	-9999.0	-9999.0
46.850	10.74	10.95	0.18	19.60	1.65	114.6	2.702	0.963	1.739	5.2	4.0	5.0E-06	-9999.0	-9999.0	0.550	1.1	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
46.915	8.69	8.96	0.19	25.28	2.12	114.6	2.706	0.965	1.741	4.3	3.3	5.0E-06	-9999.0	-9999.0	0.417	0.8	-9999.0	-9999.0
46.981	9.26	9.62	0.18	33.20	1.88	114.6	2.710	0.967	1.743	4.6	3.5	5.0E-06	-9999.0	-9999.0	0.461	0.9	-9999.0	-9999.0
47.047	9.20	9.64	0.20	40.29	2.08	114.6	2.714	0.969	1.744	4.6	3.5	5.0E-06	-9999.0	-9999.0	0.462	0.9	-9999.0	-9999.0
47.112	9.96	10.38	0.23	38.36	2.22	114.6	2.717	0.971	1.746	5.0	3.8	5.0E-06	-9999.0	-9999.0	0.511	1.0	-9999.0	-9999.0
47.178	10.48	10.87	0.28	36.60	2.58	114.6	2.721	0.973	1.748	5.2	3.9	5.0E-06	-9999.0	-9999.0	0.543	1.0	-9999.0	-9999.0
47.244	10.35	10.77	0.36	39.33	3.35	114.6	2.725	0.976	1.749	6.9	5.2	5.0E-07	-9999.0	-9999.0	0.536	1.0	-9999.0	-9999.0
47.309	13.67	14.18	0.40	47.25	2.83	114.6	2.729	0.978	1.751	6.8	5.1	5.0E-06	-9999.0	-9999.0	0.764	1.5	-9999.0	-9999.0
47.375	18.85	19.37	0.34	48.14	1.76	114.6	2.732	0.980	1.753	7.4	5.6	5.0E-05	30.0	30.0	1.109	2.4	-9999.0	-9999.0
47.440	27.03	27.21	0.26	17.15	0.96	117.7	2.736	0.982	1.755	8.7	6.6	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
47.506	32.71	32.70	0.25	-0.96	0.77	117.7	2.740	0.984	1.756	10.4	7.9	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
47.572	36.54	36.49	0.24	-4.74	0.66	117.7	2.744	0.986	1.758	11.6	8.8	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
47.637	33.79	33.72	0.29	-6.34	0.86	117.7	2.748	0.988	1.760	10.8	8.1	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
47.703	30.21	30.15	0.30	-5.95	1.00	117.7	2.752	0.990	1.762	9.6	7.3	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
47.768	26.96	26.91	0.37	-4.39	1.38	114.6	2.755	0.992	1.764	10.3	7.8	5.0E-05	30.0	32.0	1.610	4.0	-9999.0	-9999.0
47.834	24.02	24.01	0.49	-0.55	2.05	114.6	2.759	0.994	1.765	9.2	6.9	5.0E-05	30.0	30.0	1.417	3.3	-9999.0	-9999.0
47.900	23.45	23.52	0.53	6.72	2.26	114.6	2.763	0.996	1.767	9.0	6.8	5.0E-05	30.0	30.0	1.384	3.2	-9999.0	-9999.0
47.965	26.25	26.29	0.40	3.14	1.53	114.6	2.767	0.998	1.769	10.1	7.6	5.0E-05	30.0	32.0	1.568	3.8	-9999.0	-9999.0
48.031	34.11	34.06	0.32	-5.07	0.94	117.7	2.771	1.000	1.770	10.9	8.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
48.097	36.41	36.34	0.31	-6.20	0.86	117.7	2.774	1.002	1.772	11.6	8.7	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
48.162	38.39	38.33	0.33	-6.26	0.86	117.7	2.778	1.004	1.774	12.2	9.2	5.0E-04	30.9	34.0	-9999.0	-9999.0	-9999.0	-9999.0
48.228	38.07	38.00	0.49	-6.48	1.29	117.7	2.782	1.006	1.776	12.1	9.1	5.0E-04	30.7	34.0	-9999.0	-9999.0	-9999.0	-9999.0
48.293	36.16	36.09	0.58	-6.26	1.61	114.6	2.786	1.008	1.778	13.8	10.4	5.0E-05	30.0	32.0	2.220	6.4	-9999.0	-9999.0
48.359	35.97	35.91	0.67	-4.94	1.87	114.6	2.790	1.010	1.779	13.8	10.3	5.0E-05	30.0	32.0	2.208	6.3	-9999.0	-9999.0
48.425	51.10	51.15	0.66	4.01	1.29	117.7	2.794	1.012	1.781	16.3	12.2	5.0E-04	39.2	36.0	-9999.0	-9999.0	186.5	3.646
48.490	67.90	68.01	0.80	9.60	1.18	120.9	2.797	1.014	1.783	16.3	12.2	5.0E-03	47.3	38.0	-9999.0	-9999.0	216.1	3.178
48.556	102.98	103.05	0.01	6.13	0.01	124.1	2.801	1.016	1.785	19.7	14.8	5.0E-02	59.2	40.0	-9999.0	-9999.0	268.3	2.604
48.621	154.40	154.43	0.01	2.31	0.01	124.1	2.806	1.019	1.787	29.6	22.1	5.0E-02	70.8	42.0	-9999.0	-9999.0	346.8	2.246
48.687	202.82	202.85	0.01	2.76	0.00	127.3	2.810	1.021	1.789	32.4	24.2	5.0E+00	78.6	42.0	-9999.0	-9999.0	415.9	2.051
48.753	222.37	222.53	0.01	15.19	0.00	127.3	2.814	1.023	1.791	35.5	26.5	5.0E+00	81.2	42.0	-9999.0	-9999.0	444.2	1.996
48.818	261.34	261.50	0.01	14.10	0.00	127.3	2.818	1.025	1.793	41.7	31.2	5.0E+00	85.8	44.0	-9999.0	-9999.0	531.3	2.032

Gregg In Situ, Inc. - CPT Interpretation

Interpretation Output - Release	1.20I
Run No:	04-0524-0703-3715
Job No:	04-073SC
Client:	MACTEC
Project:	TVA Bull Run Ash Disposal Facility
Site:	CPT-05
Location:	TVA Bull Run
Cone:	H. Bankayal
CPT Date:	04/20/05
CPT Time:	13:07
CPT File:	073CP05.COR
Northing (m):	0.000000
Easting (m):	0.000000
Elevation (m):	0.000000

Water Table (m):	7.92	(ft):	26.0
Unit Weight of Water (default):	62.40 pcf		
Averaging Increment (m):	0.0 (Every Data Point)		
Phi Method :	Robertson and Campanella, 1983		
Su Nkt used:	15.00	Su/P' (nc):	0.30
Dr Method :	Jamiolkowski - All Sands		
State Parameter M:	1.20		

Used Unit Weights Assigned to Soil Zones

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
0.066	18.59	18.60	0.09	1.33	0.49	117.7	0.004	0.000	0.004	5.9	11.9	5.0E-04	95.0	50.0	-9999.0	-9999.0	64.6	3.474
0.131	24.85	24.87	0.12	1.80	0.48	117.7	0.008	0.000	0.008	7.9	15.9	5.0E-04	95.0	50.0	-9999.0	-9999.0	75.0	3.015
0.197	29.07	29.09	0.17	2.21	0.59	117.7	0.012	0.000	0.012	9.3	18.6	5.0E-04	95.0	50.0	-9999.0	-9999.0	80.9	2.782
0.262	43.44	43.48	0.19	3.70	0.44	120.9	0.016	0.000	0.016	10.4	20.8	5.0E-03	95.0	50.0	-9999.0	-9999.0	100.0	2.301
0.328	56.67	56.70	0.20	3.20	0.35	120.9	0.019	0.000	0.019	13.6	27.2	5.0E-03	95.0	50.0	-9999.0	-9999.0	118.8	2.095
0.394	69.38	69.43	0.22	4.44	0.32	120.9	0.023	0.000	0.023	16.6	33.2	5.0E-03	95.0	50.0	-9999.0	-9999.0	137.1	1.974
0.459	81.01	81.06	0.27	4.52	0.33	120.9	0.027	0.000	0.027	19.4	38.8	5.0E-03	95.0	50.0	-9999.0	-9999.0	153.8	1.897
0.525	101.07	101.13	0.38	5.99	0.38	124.1	0.031	0.000	0.031	19.4	38.7	5.0E-02	95.0	50.0	-9999.0	-9999.0	199.4	1.972
0.591	114.10	114.15	0.58	5.01	0.51	124.1	0.036	0.000	0.036	21.9	43.7	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.656	119.52	119.59	0.71	6.22	0.60	124.1	0.040	0.000	0.040	22.9	45.8	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.722	127.57	127.62	0.82	4.35	0.64	124.1	0.044	0.000	0.044	24.4	48.9	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.787	146.61	146.68	0.90	6.77	0.62	124.1	0.048	0.000	0.048	28.1	56.2	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.853	153.57	153.65	0.96	7.62	0.63	124.1	0.052	0.000	0.052	29.4	58.9	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.919	144.95	145.03	1.05	7.01	0.73	124.1	0.056	0.000	0.056	27.8	55.6	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.984	139.77	139.86	1.17	8.57	0.84	124.1	0.060	0.000	0.060	26.8	53.6	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.050	137.09	137.17	1.32	7.15	0.96	124.1	0.064	0.000	0.064	26.3	52.5	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.115	139.33	139.39	1.37	6.05	0.99	124.1	0.068	0.000	0.068	26.7	53.4	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.181	143.80	143.86	1.48	5.31	1.03	124.1	0.072	0.000	0.072	27.6	55.1	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.247	148.52	148.61	1.57	8.06	1.06	124.1	0.076	0.000	0.076	28.5	56.9	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.312	151.02	151.15	1.63	12.22	1.08	124.1	0.080	0.000	0.080	29.0	57.9	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.378	152.80	152.90	1.69	8.85	1.11	124.1	0.084	0.000	0.084	29.3	58.6	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.444	153.19	153.29	1.75	9.24	1.14	120.9	0.088	0.000	0.088	36.7	73.4	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.509	153.89	153.97	1.78	7.21	1.16	120.9	0.092	0.000	0.092	36.9	73.7	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.575	148.72	148.78	1.71	5.57	1.15	120.9	0.096	0.000	0.096	35.6	71.2	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.640	146.74	146.76	1.65	2.02	1.13	120.9	0.100	0.000	0.100	35.1	70.3	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.706	152.80	152.85	1.62	4.11	1.06	124.1	0.104	0.000	0.104	29.3	58.6	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.772	163.86	163.93	1.63	6.38	1.00	124.1	0.108	0.000	0.108	31.4	62.8	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.837	177.08	177.14	1.65	5.73	0.93	124.1	0.112	0.000	0.112	33.9	67.9	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.903	185.26	185.32	1.72	5.87	0.93	124.1	0.117	0.000	0.117	35.5	71.0	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.968	186.47	186.52	1.77	4.46	0.95	124.1	0.121	0.000	0.121	35.7	71.5	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.034	187.36	187.41	1.87	3.95	1.00	124.1	0.125	0.000	0.125	35.9	71.8	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.100	188.13	188.19	1.96	5.59	1.04	124.1	0.129	0.000	0.129	36.0	72.1	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.165	191.84	191.89	1.83	5.41	0.96	124.1	0.133	0.000	0.133	36.8	73.5	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.231	198.80	198.84	1.78	3.58	0.90	124.1	0.137	0.000	0.137	38.1	76.2	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.297	204.36	204.42	1.87	6.36	0.92	124.1	0.141	0.000	0.141	39.2	78.3	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.362	203.59	203.64	1.95	4.17	0.96	124.1	0.145	0.000	0.145	39.0	78.0	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.428	206.21	206.26	2.14	4.19	1.04	124.1	0.149	0.000	0.149	39.5	79.0	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.493	197.65	197.66	2.39	0.69	1.21	124.1	0.153	0.000	0.153	37.9	75.7	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.559	213.62	213.66	2.66	3.93	1.24	124.1	0.157	0.000	0.157	40.9	81.8	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.625	220.51	220.54	2.86	2.51	1.30	124.1	0.161	0.000	0.161	42.2	84.5	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.690	217.84	217.87	3.02	3.08	1.38	120.9	0.165	0.000	0.165	52.2	104.3	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.756	210.62	210.64	3.22	2.09	1.53	120.9	0.169	0.000	0.169	50.4	100.9	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.821	200.34	200.36	3.42	1.76	1.71	120.9	0.173	0.000	0.173	48.0	95.9	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.887	190.94	190.99	3.50	4.09	1.83	120.9	0.177	0.000	0.177	45.7	91.5	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.953	182.00	182.05	3.56	4.62	1.95	120.9	0.181	0.000	0.181	43.6	87.2	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.018	176.00	176.03	3.47	2.61	1.97	120.9	0.185	0.000	0.185	42.1	84.3	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.084	169.92	169.96	3.38	3.31	1.99	120.9	0.189	0.000	0.189	40.7	81.4	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.150	162.13	162.16	3.30	2.11	2.03	117.7	0.193	0.000	0.193	51.8	103.5	5.0E-04	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.215	156.89	156.91	3.16	1.43	2.01	117.7	0.197	0.000	0.197	50.1	100.2	5.0E-04	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.281	152.80	152.84	2.94	3.50	1.92	120.9	0.201	0.000	0.201	36.6	73.2	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.346	152.55	152.55	2.68	-0.10	1.75	120.9	0.205	0.000	0.205	36.5	73.0	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
3.412	152.23	152.27	2.49	3.31	1.63	120.9	0.209	0.000	0.209	36.5	72.9	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.478	149.86	149.89	2.30	2.27	1.53	120.9	0.213	0.000	0.213	35.9	71.8	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.543	147.06	147.08	2.16	1.96	1.47	120.9	0.217	0.000	0.217	35.2	70.4	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.609	146.68	146.71	2.10	3.20	1.43	120.9	0.221	0.000	0.221	35.1	70.3	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.674	150.51	150.54	2.15	3.16	1.43	120.9	0.225	0.000	0.225	36.0	72.1	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.740	157.21	157.24	2.24	3.02	1.42	120.9	0.229	0.000	0.229	37.6	75.3	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.806	161.49	161.52	2.32	2.59	1.43	120.9	0.233	0.000	0.233	38.7	77.3	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.871	165.20	165.25	2.43	4.15	1.47	120.9	0.237	0.000	0.237	39.6	79.1	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.937	169.92	169.97	2.58	4.86	1.52	120.9	0.241	0.000	0.241	40.7	81.4	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.003	178.42	178.48	2.75	5.45	1.54	120.9	0.244	0.000	0.244	42.7	85.5	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.068	192.54	192.64	2.99	9.22	1.55	120.9	0.248	0.000	0.248	46.1	92.2	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.134	207.10	207.19	3.27	8.10	1.58	120.9	0.252	0.000	0.252	49.6	98.7	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.199	224.09	224.19	3.46	8.97	1.54	120.9	0.256	0.000	0.256	53.7	106.0	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.265	240.45	240.51	3.71	5.49	1.54	120.9	0.260	0.000	0.260	57.6	112.9	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.331	253.61	253.68	3.95	7.31	1.56	120.9	0.264	0.000	0.264	60.7	118.1	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.396	261.86	261.93	4.17	7.33	1.59	120.9	0.268	0.000	0.268	62.7	121.1	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.462	266.84	267.02	4.40	16.85	1.65	120.9	0.272	0.000	0.272	63.9	122.5	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.528	269.13	269.22	4.51	7.94	1.68	120.9	0.276	0.000	0.276	64.5	122.6	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.593	268.68	268.74	4.65	5.77	1.73	120.9	0.280	0.000	0.280	64.3	121.6	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.659	266.58	266.67	4.87	8.67	1.83	120.9	0.284	0.000	0.284	63.8	119.8	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.724	264.79	264.89	5.19	9.01	1.96	120.9	0.288	0.000	0.288	63.4	118.2	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.790	259.23	259.35	5.49	11.26	2.12	120.9	0.292	0.000	0.292	62.1	114.9	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.856	252.01	252.10	5.75	8.65	2.28	117.7	0.296	0.000	0.296	80.5	147.9	5.0E-04	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.921	246.78	246.92	5.98	13.35	2.42	117.7	0.300	0.000	0.300	78.8	144.0	5.0E-04	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.987	242.18	242.42	6.20	22.50	2.56	117.7	0.304	0.000	0.304	77.4	140.4	5.0E-04	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
5.052	235.08	235.39	6.32	28.41	2.68	117.7	0.308	0.000	0.308	75.1	135.5	5.0E-04	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
5.118	226.14	226.36	6.33	20.78	2.79	117.7	0.311	0.000	0.311	72.3	129.5	5.0E-04	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
5.184	217.65	217.82	6.23	15.96	2.86	117.7	0.315	0.000	0.315	69.5	123.8	5.0E-04	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
5.249	214.70	214.84	5.98	12.55	2.79	117.7	0.319	0.000	0.319	68.6	121.4	5.0E-04	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
5.315	212.08	212.27	4.06	16.97	1.91	120.9	0.323	0.000	0.323	50.8	89.4	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
5.381	211.83	211.90	3.75	6.22	1.77	120.9	0.327	0.000	0.327	50.7	88.7	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
5.446	211.89	211.94	3.41	4.15	1.61	120.9	0.331	0.000	0.331	50.7	88.2	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
5.512	214.45	214.52	3.11	6.54	1.45	120.9	0.335	0.000	0.335	51.4	88.7	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
5.577	218.60	218.68	2.83	7.23	1.29	124.1	0.339	0.000	0.339	41.9	71.9	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
5.643	220.13	220.19	2.59	4.82	1.17	124.1	0.343	0.000	0.343	42.2	72.0	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
5.709	224.54	224.60	2.38	5.09	1.06	124.1	0.347	0.000	0.347	43.0	73.0	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
5.774	224.28	224.35	2.15	5.91	0.96	124.1	0.351	0.000	0.351	43.0	72.5	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
5.840	220.39	220.42	2.18	2.33	0.99	124.1	0.355	0.000	0.355	42.2	70.8	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
5.905	220.07	220.11	2.27	3.12	1.03	124.1	0.359	0.000	0.359	42.2	70.3	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
5.971	225.63	225.64	2.40	1.62	1.06	124.1	0.363	0.000	0.363	43.2	71.7	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
6.037	236.10	236.15	2.53	4.11	1.07	124.1	0.368	0.000	0.368	45.2	74.6	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
6.102	246.58	246.64	2.73	6.13	1.11	124.1	0.372	0.000	0.372	47.2	77.5	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
6.168	254.51	254.56	2.95	4.58	1.16	124.1	0.376	0.000	0.376	48.8	79.6	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
6.234	255.91	256.00	3.21	7.83	1.25	124.1	0.380	0.000	0.380	49.0	79.6	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
6.299	250.55	250.60	3.33	4.82	1.33	124.1	0.384	0.000	0.384	48.0	77.5	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
6.365	243.77	243.79	3.33	2.04	1.37	124.1	0.388	0.000	0.388	46.7	75.0	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
6.430	238.54	238.57	3.39	3.08	1.42	120.9	0.392	0.000	0.392	57.1	91.2	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
6.496	238.98	239.06	3.47	7.23	1.45	120.9	0.396	0.000	0.396	57.2	91.0	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
6.562	236.10	236.13	3.59	2.94	1.52	120.9	0.400	0.000	0.400	56.5	89.4	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
6.627	236.80	236.86	3.67	5.11	1.55	120.9	0.404	0.000	0.404	56.7	89.2	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
6.693	236.42	236.45	3.80	2.72	1.61	120.9	0.408	0.000	0.408	56.6	88.7	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
6.758	230.80	230.83	3.80	2.82	1.65	120.9	0.412	0.000	0.412	55.3	86.1	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
6.824	218.92	219.04	3.73	10.77	1.70	120.9	0.416	0.000	0.416	52.4	81.3	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
6.890	209.09	209.17	3.72	7.91	1.78	120.9	0.420	0.000	0.420	50.1	77.3	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
6.955	201.42	201.49	3.69	6.87	1.83	120.9	0.424	0.000	0.424	48.2	74.1	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
7.021	193.43	193.48	3.57	4.94	1.84	120.9	0.428	0.000	0.428	46.3	70.8	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
7.087	189.03	189.06	3.41	3.25	1.80	120.9	0.432	0.000	0.432	45.3	68.9	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
7.152	191.26	191.34	3.27	7.29	1.71	120.9	0.436	0.000	0.436	45.8	69.4	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
7.218	197.52	197.57	3.18	5.09	1.61	120.9	0.440	0.000	0.440	47.3	71.4	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
7.283	205.76	205.81	3.20	4.27	1.55	120.9	0.444	0.000	0.444	49.3	74.0	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
7.349	214.96	215.02	3.23	5.75	1.50	120.9	0.447	0.000	0.447	51.5	77.0	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
7.415	221.73	221.77	3.23	4.11	1.46	120.9	0.451	0.000	0.451	53.1	79.0	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
7.480	226.01	226.06	3.18	4.70	1.41	120.9	0.455	0.000	0.455	54.1	80.2	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
7.546	226.14	226.19	3.13	5.09	1.38	120.9	0.459	0.000	0.459	54.2	79.9	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
7.611	223.77	223.84	3.11	6.28	1.39	120.9	0.463	0.000	0.463	53.6	78.7	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
7.677	228.25	228.32	3.26	6.42	1.43	120.9	0.467	0.000	0.467	54.7	80.0	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
7.743	241.02	241.10	3.41	6.89	1.41	120.9	0.471	0.000	0.471	57.7	84.1	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
7.808	269.77	269.87	3.64	8.46	1.35	124.1	0.475	0.000	0.475	51.7	75.0	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
7.874	290.79	290.90	3.98	10.59	1.37	124.1	0.479	0.000	0.479	55.7	80.5	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
7.940	296.67	296.72	4.29	4.98	1.45	124.1	0.483	0.000	0.483	56.8	81.7	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
8.005	294.43	294.49	4.59	5.49	1.56	120.9	0.487	0.000	0.487	70.5	101.0	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
8.071	292.51	292.59	4.76	7.87	1.63	120.9	0.491	0.000	0.491	70.1	99.9	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
8.136	283.76	283.90	4.81	12.92	1.69	120.9	0.495	0.000	0.495	68.0	96.6	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
8.202	275.08	275.13	4.76	4.54	1.73	120.9	0.499	0.000	0.499	65.9	93.2	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
8.268	268.88	268.96	4.63	7.11	1.72	120.9	0.503	0.000	0.503	64.4	90.8	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
8.333	263.77	263.81	4.41	3.85	1.67	120.9	0.507	0.000	0.507	63.2	88.7	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
8.399	259.81	259.86	4.28	4.86	1.65	120.9	0.511	0.000	0.511	62.2	87.0	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
8.464	254.70	254.75	4.27	5.15	1.68	120.9	0.515	0.000	0.515	61.0	85.0	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
8.530	254.19	254.22	4.26	3.08	1.68	120.9	0.519	0.000	0.519	60.9	84.5	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
8.596	266.77	266.81	3.32	4.42	1.24	124.1	0.523	0.000	0.523	51.1	70.7	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
8.661	285.36	285.43	3.39	6.60	1.19	124.1	0.527	0.000	0.527	54.7	75.3	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
8.727	299.16	299.26	3.42	9.44	1.14	124.1	0.531	0.000	0.531	57.3	78.6	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
8.793	298.13	298.22	3.47	7.70	1.16	124.1	0.535	0.000	0.535	57.1	78.1	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
8.858	296.79	296.87	3.60	7.36	1.21	124.1	0.540	0.000	0.540	56.9	77.4	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
8.924	282.16	282.20	3.66	3.02	1.30	124.1	0.544	0.000	0.544	54.1	73.3	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
8.989	276.80	276.84	3.61	3.16	1.30	124.1	0.548	0.000	0.548	53.0	71.7	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
9.055	269.77	269.81	3.38	3.02	1.25	124.1	0.552	0.000	0.552	51.7	69.6	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
9.121	262.37	262.40	3.34	2.72	1.27	124.1	0.556	0.000	0.556	50.3	67.4	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
9.186	256.61	256.64	3.31	2.96	1.29	124.1	0.560	0.000	0.560	49.2	65.7	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
9.252	248.75	248.78	3.24	2.04	1.30	124.1	0.564	0.000	0.564	47.6	63.5	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
9.317	239.68	239.69	3.14	1.19	1.31	124.1	0.568	0.000	0.568	45.9	60.9	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
9.383	229.40	229.41	3.04	1.10	1.32	124.1	0.572	0.000	0.572	43.9	58.1	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
9.449	221.54	221.55	2.83	1.37	1.28	124.1	0.576	0.000	0.576	42.4	55.9	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
9.514	216.44	216.46	2.67	2.51	1.23	124.1	0.580	0.000	0.580	41.5	54.4	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
9.580	214.70	214.71	2.61	0.85	1.21	124.1	0.584	0.000	0.584	41.1	53.8	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
9.646	218.03	218.06	2.74	3.20	1.25	124.1	0.588	0.000	0.588	41.8	54.5	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
9.711	229.47	229.49	2.81	2.61	1.22	124.1	0.592	0.000	0.592	44.0	57.1	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
9.777	240.51	240.54	2.78	2.39	1.15	124.1	0.597	0.000	0.597	46.1	59.7	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
9.842	244.79	244.82	2.74	2.72	1.12	124.1	0.601	0.000	0.601	46.9	60.5	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
9.908	243.01	243.04	2.78	3.25	1.14	124.1	0.605	0.000	0.605	46.6	59.9	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
9.974	241.02	241.05	3.08	2.02	1.28	124.1	0.609	0.000	0.609	46.2	59.2	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
10.039	243.32	243.34	3.41	2.00	1.40	124.1	0.613	0.000	0.613	46.6	59.5	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
10.105	265.55	265.59	3.71	3.27	1.40	124.1	0.617	0.000	0.617	50.9	64.8	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
10.170	285.23	285.28	3.82	4.01	1.34	124.1	0.621	0.000	0.621	54.6	69.3	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
10.236	287.92	287.94	3.99	2.41	1.39	124.1	0.625	0.000	0.625	55.2	69.8	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
10.302	283.13	283.17	4.32	3.93	1.53	120.9	0.629	0.000	0.629	67.8	85.5	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
10.367	279.67	279.71	4.59	3.85	1.64	120.9	0.633	0.000	0.633	67.0	84.2	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
10.433	271.50	271.53	4.72	2.92	1.74	120.9	0.637	0.000	0.637	65.0	81.5	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
10.499	263.77	263.80	4.65	2.86	1.76	120.9	0.641	0.000	0.641	63.2	78.9	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
10.564	257.31	257.38	4.54	5.93	1.76	120.9	0.645	0.000	0.645	61.6	76.7	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
10.630	251.06	251.09	4.48	3.18	1.78	120.9	0.649	0.000	0.649	60.1	74.6	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
10.695	248.05	248.11	4.28	5.05	1.73	120.9	0.653	0.000	0.653	59.4	73.5	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
10.761	244.79	244.84	4.21	4.72	1.72	120.9	0.657	0.000	0.657	58.6	72.3	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
10.827	247.67	247.71	4.28	3.31	1.73	120.9	0.661	0.000	0.661	59.3	73.0	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
10.892	256.29	256.34	4.28	4.11	1.67	120.9	0.665	0.000	0.665	61.4	75.3	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
10.958	268.37	268.42	4.27	4.19	1.59	120.9	0.669	0.000	0.669	64.3	78.6	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
11.023	277.31	277.36	4.35	3.97	1.57	120.9	0.673	0.000	0.673	66.4	81.0	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
11.089	278.72	278.78	4.43	5.61	1.59	120.9	0.677	0.000	0.677	66.7	81.1	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
11.155	279.10	279.15	4.60	5.05	1.65	120.9	0.681	0.000	0.681	66.8	81.0	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
11.220	288.11	288.17	4.86	5.57	1.69	120.9	0.685	0.000	0.685	69.0	83.4	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
11.286	308.04	308.12	5.25	7.64	1.70	120.9	0.689	0.000	0.689	73.8	88.9	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
11.352	331.73	331.82	5.59	8.24	1.69	120.9	0.693	0.000	0.693	79.4	95.5	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
11.417	356.39	356.46	6.01	6.46	1.69	120.9	0.697	0.000	0.697	85.3	102.3	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
11.483	375.30	375.38	6.53	6.99	1.74	120.9	0.701	0.000	0.701	89.9	107.4	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
11.548	383.99	384.06	7.01	6.34	1.82	120.9	0.704	0.000	0.704	92.0	109.6	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
11.614	387.44	387.54	7.40	9.26	1.91	120.9	0.708	0.000	0.708	92.8	110.2	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
11.680	385.66	385.73	7.81	6.77	2.02	120.9	0.712	0.000	0.712	92.4	109.4	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
11.745	379.07	379.14	8.10	6.64	2.14	120.9	0.716	0.000	0.716	90.8	107.3	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
11.811	370.00	370.08	8.22	7.68	2.22	120.9	0.720	0.000	0.720	88.6	104.4	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
11.876	359.40	359.46	7.44	5.33	2.07	120.9	0.724	0.000	0.724	86.1	101.1	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
11.942	347.13	347.18	7.35	4.70	2.12	120.9	0.728	0.000	0.728	83.1	97.4	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
12.008	334.35	334.42	7.18	6.34	2.15	120.9	0.732	0.000	0.732	80.1	93.6	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
12.073	324.14	324.20	6.90	5.63	2.13	120.9	0.736	0.000	0.736	77.6	90.5	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
12.139	310.46	310.51	6.60	4.64	2.12	120.9	0.740	0.000	0.740	74.3	86.4	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
12.205	285.93	285.95	6.24	1.80	2.18	120.9	0.744	0.000	0.744	68.5	79.4	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
12.270	279.93	279.93	5.81	-0.08	2.08	120.9	0.748	0.000	0.748	67.0	77.5	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
12.336	271.24	271.27	5.36	2.66	1.98	120.9	0.752	0.000	0.752	64.9	74.9	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
12.401	260.57	260.58	5.03	1.02	1.93	120.9	0.756	0.000	0.756	62.4	71.8	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
12.467	251.37	251.39	4.81	2.07	1.91	120.9	0.760	0.000	0.760	60.2	69.0	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
12.533	242.05	242.08	4.58	2.82	1.89	120.9	0.764	0.000	0.764	58.0	66.3	5.0E-03	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
12.598	237.64	237.65	4.32	1.48	1.82	120.9	0.768	0.000	0.768	56.9	64.9	5.0E-03	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
12.664	234.38	234.41	4.15	2.61	1.77	120.9	0.772	0.000	0.772	56.1	63.9	5.0E-03	94.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0
12.730	234.06	234.09	3.99	2.55	1.70	120.9	0.776	0.000	0.776	56.0	63.6	5.0E-03	94.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0
12.795	233.43	233.45	3.93	1.92	1.68	120.9	0.780	0.000	0.780	55.9	63.3	5.0E-03	94.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0
12.861	234.64	234.66	3.89	1.66	1.66	120.9	0.784	0.000	0.784	56.2	63.5	5.0E-03	94.6	46.0	-9999.0	-9999.0	-9999.0	-9999.0
12.926	233.17	233.19	3.89	1.84	1.67	120.9	0.788	0.000	0.788	55.8	62.9	5.0E-03	94.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0
12.992	230.49	230.51	3.80	2.29	1.65	120.9	0.792	0.000	0.792	55.2	62.0	5.0E-03	93.9	46.0	-9999.0	-9999.0	-9999.0	-9999.0
13.058	224.48	224.51	3.81	2.53	1.70	120.9	0.796	0.000	0.796	53.8	60.3	5.0E-03	93.1	46.0	-9999.0	-9999.0	-9999.0	-9999.0
13.123	216.88	216.90	3.79	2.11	1.75	120.9	0.800	0.000	0.800	51.9	58.1	5.0E-03	92.1	46.0	-9999.0	-9999.0	-9999.0	-9999.0
13.189	209.85	209.87	3.81	2.09	1.82	120.9	0.804	0.000	0.804	50.2	56.1	5.0E-03	91.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
13.254	203.14	203.16	3.80	1.70	1.87	120.9	0.808	0.000	0.808	48.6	54.1	5.0E-03	90.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
13.320	198.48	198.51	3.75	2.72	1.89	120.9	0.812	0.000	0.812	47.5	52.8	5.0E-03	89.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0
13.386	193.50	193.52	3.66	2.11	1.89	120.9	0.816	0.000	0.816	46.3	51.3	5.0E-03	88.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
13.451	186.34	186.36	3.55	1.58	1.90	120.9	0.820	0.000	0.820	44.6	49.3	5.0E-03	87.4	46.0	-9999.0	-9999.0	-9999.0	-9999.0
13.517	176.83	176.85	3.42	1.76	1.93	120.9	0.824	0.000	0.824	42.3	46.7	5.0E-03	85.8	46.0	-9999.0	-9999.0	345.0	1.951
13.583	166.79	166.82	3.28	2.23	1.96	120.9	0.827	0.000	0.827	39.9	43.9	5.0E-03	84.0	46.0	-9999.0	-9999.0	316.2	1.895
13.648	157.91	157.93	3.11	1.56	1.97	117.7	0.831	0.000	0.831	50.4	55.3	5.0E-04	82.4	44.0	-9999.0	-9999.0	297.4	1.883
13.714	149.42	149.44	2.93	1.88	1.96	117.7	0.835	0.000	0.835	47.7	52.2	5.0E-04	80.8	44.0	-9999.0	-9999.0	282.9	1.893
13.779	141.43	141.45	2.74	1.52	1.93	117.7	0.839	0.000	0.839	45.2	49.3	5.0E-04	79.1	44.0	-9999.0	-9999.0	271.0	1.916
13.845	134.16	134.17	2.51	1.25	1.87	117.7	0.843	0.000	0.843	42.8	46.7	5.0E-04	77.5	44.0	-9999.0	-9999.0	260.8	1.943
13.911	126.68	126.69	2.31	1.58	1.82	117.7	0.847	0.000	0.847	40.4	44.0	5.0E-04	75.8	44.0	-9999.0	-9999.0	250.4	1.977
13.976	119.08	119.09	2.11	1.10	1.77	117.7	0.851	0.000	0.851	38.0	41.2	5.0E-04	74.0	44.0	-9999.0	-9999.0	239.9	2.014
14.042	112.49	112.51	1.94	1.52	1.73	117.7	0.855	0.000	0.855	35.9	38.9	5.0E-04	72.3	44.0	-9999.0	-9999.0	230.6	2.050
14.107	107.32	107.34	1.80	1.56	1.68	117.7	0.858	0.000	0.858	34.3	37.0	5.0E-04	70.9	42.0	-9999.0	-9999.0	223.4	2.081
14.173	103.23	103.24	1.67	1.19	1.62	117.7	0.862	0.000	0.862	33.0	35.5	5.0E-04	69.7	42.0	-9999.0	-9999.0	217.6	2.108
14.239	99.72	99.73	1.57	0.83	1.58	120.9	0.866	0.000	0.866	23.9	25.7	5.0E-03	68.6	42.0	-9999.0	-9999.0	212.7	2.133
14.304	95.76	95.77	1.46	0.98	1.53	120.9	0.870	0.000	0.870	22.9	24.6	5.0E-03	67.4	42.0	-9999.0	-9999.0	207.2	2.164
14.370	92.18	92.19	1.39	0.85	1.51	117.7	0.874	0.000	0.874	29.4	31.5	5.0E-04	66.3	42.0	-9999.0	-9999.0	202.3	2.194
14.436	88.60	88.61	1.29	0.90	1.46	120.9	0.878	0.000	0.878	21.2	22.6	5.0E-03	65.1	42.0	-9999.0	-9999.0	197.4	2.227
14.501	85.16	85.17	1.23	0.83	1.45	117.7	0.882	0.000	0.882	27.2	29.0	5.0E-04	63.9	42.0	-9999.0	-9999.0	192.7	2.263
14.567	81.32	81.33	1.17	1.13	1.44	117.7	0.886	0.000	0.886	26.0	27.6	5.0E-04	62.5	42.0	-9999.0	-9999.0	187.6	2.307
14.632	78.70	78.71	1.12	1.08	1.43	117.7	0.890	0.000	0.890	25.1	26.6	5.0E-04	61.5	42.0	-9999.0	-9999.0	184.2	2.340
14.698	76.01	76.03	1.06	1.00	1.40	117.7	0.894	0.000	0.894	24.3	25.7	5.0E-04	60.4	42.0	-9999.0	-9999.0	180.8	2.378
14.764	74.10	74.11	0.98	0.98	1.33	117.7	0.897	0.000	0.897	23.7	25.0	5.0E-04	59.6	42.0	-9999.0	-9999.0	178.4	2.407
14.829	72.64	72.64	0.92	0.71	1.27	120.9	0.901	0.000	0.901	17.4	18.3	5.0E-03	59.0	42.0	-9999.0	-9999.0	176.7	2.432
14.895	70.40	70.41	0.87	0.90	1.24	120.9	0.905	0.000	0.905	16.9	17.7	5.0E-03	58.0	40.0	-9999.0	-9999.0	173.9	2.470
14.960	67.33	67.34	0.85	0.83	1.27	117.7	0.909	0.000	0.909	21.5	22.5	5.0E-04	56.7	40.0	-9999.0	-9999.0	170.0	2.525
15.026	65.35	65.36	0.86	0.65	1.32	117.7	0.913	0.000	0.913	20.9	21.8	5.0E-04	55.8	40.0	-9999.0	-9999.0	167.6	2.565
15.092	62.86	62.87	0.72	0.61	1.15	117.7	0.917	0.000	0.917	20.1	21.0	5.0E-04	54.6	40.0	-9999.0	-9999.0	164.5	2.617
15.157	60.31	60.31	0.68	0.57	1.13	117.7	0.921	0.000	0.921	19.3	20.1	5.0E-04	53.3	40.0	-9999.0	-9999.0	161.4	2.675
15.223	58.26	58.27	0.66	0.51	1.14	117.7	0.925	0.000	0.925	18.6	19.3	5.0E-04	52.3	40.0	-9999.0	-9999.0	158.8	2.726
15.289	56.47	56.47	0.65	0.24	1.15	117.7	0.929	0.000	0.929	18.0	18.7	5.0E-04	51.3	40.0	-9999.0	-9999.0	156.6	2.773
15.354	56.67	56.68	0.65	0.73	1.15	117.7	0.932	0.000	0.932	18.1	18.7	5.0E-04	51.4	40.0	-9999.0	-9999.0	157.1	2.772
15.420	54.49	54.50	0.62	0.96	1.14	117.7	0.936	0.000	0.936	17.4	18.0	5.0E-04	50.2	40.0	-9999.0	-9999.0	154.3	2.832
15.485	54.17	54.18	0.60	0.81	1.11	117.7	0.940	0.000	0.940	17.3	17.8	5.0E-04	50.0	40.0	-9999.0	-9999.0	154.1	2.844
15.551	52.13	52.13	0.57	0.61	1.10	117.7	0.944	0.000	0.944	16.6	17.1	5.0E-04	48.8	40.0	-9999.0	-9999.0	151.4	2.905
15.617	50.66	50.67	0.56	0.98	1.11	117.7	0.948	0.000	0.948	16.2	16.6	5.0E-04	47.9	38.0	-9999.0	-9999.0	149.6	2.951
15.682	48.74	48.75	0.55	1.19	1.13	117.7	0.952	0.000	0.952	15.6	16.0	5.0E-04	46.8	38.0	-9999.0	-9999.0	146.9	3.014
15.748	45.93	45.94	0.52	0.85	1.13	117.7	0.956	0.000	0.956	14.7	15.0	5.0E-04	45.0	38.0	-9999.0	-9999.0	142.9	3.110
15.813	44.40	44.41	0.50	0.90	1.13	117.7	0.959	0.000	0.959	14.2	14.5	5.0E-04	44.0	38.0	-9999.0	-9999.0	140.7	3.168
15.879	43.18	43.19	0.45	0.94	1.04	117.7	0.963	0.000	0.963	13.8	14.1	5.0E-04	43.1	38.0	-9999.0	-9999.0	138.9	3.216
15.945	43.38	43.39	0.42	1.12	0.97	117.7	0.967	0.000	0.967	13.9	14.1	5.0E-04	43.2	38.0	-9999.0	-9999.0	139.4	3.213
16.010	42.86	42.88	0.40	1.04	0.94	117.7	0.971	0.000	0.971	13.7	13.9	5.0E-04	42.8	38.0	-9999.0	-9999.0	138.7	3.236
16.076	43.57	43.58	0.39	1.54	0.90	117.7	0.975	0.000	0.975	13.9	14.1	5.0E-04	43.2	38.0	-9999.0	-9999.0	140.1	3.214
16.142	44.15	44.16	0.39	1.13	0.89	117.7	0.979	0.000	0.979	14.1	14.3	5.0E-04	43.5	38.0	-9999.0	-9999.0	141.2	3.197
16.207	46.44	46.46	0.38	1.54	0.82	117.7	0.983	0.000	0.983	14.8	15.0	5.0E-04	44.9	38.0	-9999.0	-9999.0	145.0	3.121
16.273	49.25	49.27	0.37	1.45	0.75	120.9	0.987	0.000	0.987	11.8	11.9	5.0E-03	46.6	38.0	-9999.0	-9999.0	149.5	3.034
16.338	53.60	53.61	0.41	1.35	0.77	120.9	0.990	0.000	0.990	12.8	12.9	5.0E-03	48.9	40.0	-9999.0	-9999.0	156.0	2.909
16.404	58.77	58.79	0.43	1.98	0.73	120.9	0.994	0.000	0.994	14.1	14.1	5.0E-03	51.5	40.0	-9999.0	-9999.0	163.4	2.779
16.470	65.03	65.05	0.47	1.88	0.72	120.9	0.998	0.000	0.998	15.6	15.6	5.0E-03	54.4	40.0	-9999.0	-9999.0	172.1	2.646
16.535	69.31	69.33	0.51	1.62	0.74	120.9	1.002	0.000	1.002	16.6	16.6	5.0E-03	56.1	40.0	-9999.0	-9999.0	178.1	2.569
16.601	73.02	73.04	0.58	2.02	0.80	120.9	1.006	0.000	1.006	17.5	17.4	5.0E-03	57.6	40.0	-9999.0	-9999.0	183.3	2.509
16.666	76.08	76.11	0.63	2.02	0.83	120.9	1.010	0.000	1.010	18.2	18.1	5.0E-03	58.7	40.0	-9999.0	-9999.0	187.7	2.466
16.732	78.45	78.47	0.69	1.98	0.88	120.9	1.014	0.000	1.014	18.8	18.7	5.0E-03	59.5	40.0	-9999.0	-9999.0	191.1	2.435

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
16.798	80.17	80.20	0.72	2.17	0.90	120.9	1.018	0.000	1.018	19.2	19.0	5.0E-03	60.1	40.0	-9999.0	-9999.0	193.7	2.415
16.863	80.94	80.96	0.75	1.98	0.93	120.9	1.022	0.000	1.022	19.4	19.2	5.0E-03	60.3	42.0	-9999.0	-9999.0	195.0	2.408
16.929	82.15	82.17	0.75	2.37	0.91	120.9	1.026	0.000	1.026	19.7	19.4	5.0E-03	60.7	42.0	-9999.0	-9999.0	196.9	2.396
16.995	81.45	81.48	0.77	2.61	0.95	120.9	1.030	0.000	1.030	19.5	19.2	5.0E-03	60.4	42.0	-9999.0	-9999.0	196.1	2.407
17.060	82.09	82.11	0.76	2.39	0.93	120.9	1.034	0.000	1.034	19.7	19.3	5.0E-03	60.5	42.0	-9999.0	-9999.0	197.2	2.402
17.126	81.83	81.86	0.76	2.74	0.93	120.9	1.038	0.000	1.038	19.6	19.2	5.0E-03	60.4	40.0	-9999.0	-9999.0	197.1	2.408
17.191	82.79	82.82	0.77	2.61	0.93	120.9	1.042	0.000	1.042	19.8	19.4	5.0E-03	60.7	42.0	-9999.0	-9999.0	198.7	2.399
17.257	82.98	83.01	0.78	2.68	0.94	120.9	1.046	0.000	1.046	19.9	19.4	5.0E-03	60.7	42.0	-9999.0	-9999.0	199.2	2.399
17.323	84.06	84.09	0.77	2.57	0.92	120.9	1.050	0.000	1.050	20.1	19.6	5.0E-03	61.0	42.0	-9999.0	-9999.0	200.9	2.389
17.388	84.90	84.93	0.80	2.70	0.94	120.9	1.054	0.000	1.054	20.3	19.8	5.0E-03	61.2	42.0	-9999.0	-9999.0	202.3	2.382
17.454	84.71	84.74	0.83	2.98	0.98	120.9	1.058	0.000	1.058	20.3	19.7	5.0E-03	61.1	42.0	-9999.0	-9999.0	202.2	2.387
17.519	84.32	84.36	0.85	2.92	1.01	120.9	1.062	0.000	1.062	20.2	19.6	5.0E-03	60.9	42.0	-9999.0	-9999.0	201.9	2.394
17.585	83.62	83.66	0.86	3.20	1.03	120.9	1.066	0.000	1.066	20.0	19.4	5.0E-03	60.6	40.0	-9999.0	-9999.0	201.2	2.405
17.651	82.53	82.56	0.86	3.02	1.04	120.9	1.070	0.000	1.070	19.8	19.1	5.0E-03	60.2	40.0	-9999.0	-9999.0	199.9	2.421
17.716	81.64	81.67	0.85	3.27	1.04	120.9	1.074	0.000	1.074	19.6	18.9	5.0E-03	59.8	40.0	-9999.0	-9999.0	198.9	2.435
17.782	79.98	80.02	0.84	3.08	1.05	120.9	1.078	0.000	1.078	19.2	18.5	5.0E-03	59.2	40.0	-9999.0	-9999.0	196.8	2.460
17.848	79.47	79.50	0.81	2.84	1.02	120.9	1.082	0.000	1.082	19.0	18.3	5.0E-03	59.0	40.0	-9999.0	-9999.0	196.4	2.470
17.913	79.21	79.24	0.77	2.66	0.97	120.9	1.086	0.000	1.086	19.0	18.2	5.0E-03	58.8	40.0	-9999.0	-9999.0	196.2	2.476
17.979	77.68	77.71	0.73	2.47	0.94	120.9	1.090	0.000	1.090	18.6	17.8	5.0E-03	58.2	40.0	-9999.0	-9999.0	194.4	2.501
18.044	76.60	76.62	0.72	2.33	0.94	120.9	1.094	0.000	1.094	18.3	17.5	5.0E-03	57.7	40.0	-9999.0	-9999.0	193.1	2.520
18.110	75.31	75.34	0.72	2.78	0.96	120.9	1.098	0.000	1.098	18.0	17.2	5.0E-03	57.2	40.0	-9999.0	-9999.0	191.6	2.543
18.176	73.72	73.75	0.71	2.51	0.97	120.9	1.102	0.000	1.102	17.7	16.8	5.0E-03	56.5	40.0	-9999.0	-9999.0	189.6	2.572
18.241	71.86	71.89	0.70	2.11	0.98	120.9	1.106	0.000	1.106	17.2	16.4	5.0E-03	55.8	40.0	-9999.0	-9999.0	187.3	2.606
18.307	71.10	71.13	0.68	2.66	0.96	120.9	1.110	0.000	1.110	17.0	16.2	5.0E-03	55.4	40.0	-9999.0	-9999.0	186.5	2.622
18.372	70.01	70.04	0.66	2.86	0.94	120.9	1.113	0.000	1.113	16.8	15.9	5.0E-03	54.9	40.0	-9999.0	-9999.0	185.3	2.645
18.438	67.84	67.87	0.57	2.80	0.84	120.9	1.117	0.000	1.117	16.3	15.4	5.0E-03	54.0	40.0	-9999.0	-9999.0	182.5	2.689
18.504	66.88	66.91	0.59	2.96	0.88	120.9	1.121	0.000	1.121	16.0	15.1	5.0E-03	53.5	40.0	-9999.0	-9999.0	181.5	2.712
18.569	64.91	64.94	0.61	3.25	0.94	120.9	1.125	0.000	1.125	15.5	14.7	5.0E-03	52.6	40.0	-9999.0	-9999.0	179.0	2.756
18.635	62.86	62.90	0.62	3.16	0.99	120.9	1.129	0.000	1.129	15.1	14.2	5.0E-03	51.6	40.0	-9999.0	-9999.0	176.4	2.804
18.701	61.39	61.43	0.59	3.42	0.96	120.9	1.133	0.000	1.133	14.7	13.8	5.0E-03	50.9	40.0	-9999.0	-9999.0	174.5	2.841
18.766	56.67	56.71	0.56	3.72	0.99	117.7	1.137	0.000	1.137	18.1	17.0	5.0E-04	48.6	38.0	-9999.0	-9999.0	168.0	2.962
18.832	57.18	57.20	0.55	1.94	0.96	120.9	1.141	0.000	1.141	13.7	12.8	5.0E-03	48.8	38.0	-9999.0	-9999.0	168.9	2.953
18.897	55.71	55.73	0.52	2.09	0.94	120.9	1.145	0.000	1.145	13.3	12.5	5.0E-03	48.0	38.0	-9999.0	-9999.0	166.9	2.996
18.963	54.43	54.46	0.50	2.41	0.92	120.9	1.149	0.000	1.149	13.0	12.2	5.0E-03	47.2	38.0	-9999.0	-9999.0	165.3	3.035
19.029	53.02	53.04	0.49	2.35	0.93	117.7	1.153	0.000	1.153	16.9	15.8	5.0E-04	46.4	38.0	-9999.0	-9999.0	163.3	3.079
19.094	50.72	50.75	0.49	2.17	0.97	117.7	1.157	0.000	1.157	16.2	15.1	5.0E-04	45.1	38.0	-9999.0	-9999.0	160.0	3.152
19.160	49.51	49.54	0.48	3.00	0.97	117.7	1.161	0.000	1.161	15.8	14.7	5.0E-04	44.4	38.0	-9999.0	-9999.0	158.2	3.194
19.225	47.20	47.23	0.46	2.80	0.98	117.7	1.165	0.000	1.165	15.1	14.0	5.0E-04	43.0	38.0	-9999.0	-9999.0	154.6	3.274
19.291	45.10	45.13	0.46	3.29	1.02	117.7	1.168	0.000	1.168	14.4	13.3	5.0E-04	41.6	38.0	-9999.0	-9999.0	151.2	3.351
19.357	42.80	42.84	0.47	3.72	1.10	117.7	1.172	0.000	1.172	13.7	12.6	5.0E-04	40.1	38.0	-9999.0	-9999.0	147.3	3.439
19.422	40.69	40.73	0.46	3.76	1.13	117.7	1.176	0.000	1.176	13.0	12.0	5.0E-04	38.6	36.0	-9999.0	-9999.0	143.6	3.525
19.488	40.18	40.22	0.46	4.17	1.15	117.7	1.180	0.000	1.180	12.8	11.8	5.0E-04	38.2	36.0	-9999.0	-9999.0	142.8	3.549
19.554	36.92	36.96	0.48	4.03	1.30	117.7	1.184	0.000	1.184	11.8	10.8	5.0E-04	35.7	36.0	-9999.0	-9999.0	136.4	3.690
19.619	34.49	34.54	0.50	4.05	1.45	117.7	1.188	0.000	1.188	11.0	10.1	5.0E-04	33.7	36.0	-9999.0	-9999.0	131.3	3.802
19.685	33.03	33.08	0.50	4.17	1.52	114.6	1.192	0.000	1.192	12.7	11.6	5.0E-05	32.4	36.0	2.126	10.0	-9999.0	-9999.0
19.750	32.20	32.25	0.52	4.66	1.62	114.6	1.195	0.000	1.195	12.4	11.3	5.0E-05	31.7	34.0	2.070	10.0	-9999.0	-9999.0
19.816	30.72	30.78	0.51	4.72	1.66	114.6	1.199	0.000	1.199	11.8	10.8	5.0E-05	30.3	34.0	1.972	9.9	-9999.0	-9999.0
19.882	30.92	30.97	0.52	5.13	1.68	114.6	1.203	0.000	1.203	11.9	10.8	5.0E-05	30.4	34.0	1.985	9.9	-9999.0	-9999.0
19.947	31.05	31.10	0.52	5.13	1.68	114.6	1.207	0.000	1.207	11.9	10.8	5.0E-05	30.5	34.0	1.993	9.9	-9999.0	-9999.0
20.013	30.79	30.85	0.50	4.88	1.62	114.6	1.210	0.000	1.210	11.8	10.7	5.0E-05	30.2	34.0	1.976	9.8	-9999.0	-9999.0
20.078	29.58	29.63	0.45	4.90	1.52	114.6	1.214	0.000	1.214	11.4	10.3	5.0E-05	30.0	34.0	1.895	9.1	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
20.144	26.00	26.05	0.41	4.58	1.58	114.6	1.218	0.000	1.218	10.0	9.0	5.0E-05	30.0	34.0	1.656	7.3	-9999.0	-9999.0
20.210	22.35	22.40	0.36	4.44	1.61	114.6	1.222	0.000	1.222	8.6	7.8	5.0E-05	30.0	32.0	1.412	5.7	-9999.0	-9999.0
20.275	19.68	19.72	0.38	4.27	1.93	114.6	1.225	0.000	1.225	7.6	6.8	5.0E-05	30.0	32.0	1.233	4.6	-9999.0	-9999.0
20.341	16.48	16.52	0.42	4.03	2.55	114.6	1.229	0.000	1.229	7.9	7.1	5.0E-06	-9999.0	-9999.0	1.020	3.5	-9999.0	-9999.0
20.407	13.48	13.54	0.42	5.65	3.11	114.6	1.233	0.000	1.233	8.6	7.8	5.0E-07	-9999.0	-9999.0	0.821	2.5	-9999.0	-9999.0
20.472	12.01	12.09	0.36	7.83	2.98	114.6	1.237	0.000	1.237	7.7	6.9	5.0E-07	-9999.0	-9999.0	0.724	2.1	-9999.0	-9999.0
20.538	10.61	10.75	0.32	13.16	2.98	114.6	1.240	0.000	1.240	6.9	6.2	5.0E-07	-9999.0	-9999.0	0.634	1.8	-9999.0	-9999.0
20.603	8.62	8.83	0.29	19.07	3.29	114.6	1.244	0.000	1.244	5.6	5.1	5.0E-07	-9999.0	-9999.0	0.506	1.4	-9999.0	-9999.0
20.669	8.30	8.66	0.26	33.01	3.01	114.6	1.248	0.000	1.248	5.5	4.9	5.0E-07	-9999.0	-9999.0	0.494	1.3	-9999.0	-9999.0
20.735	9.90	10.39	0.21	45.29	2.03	114.6	1.252	0.000	1.252	5.0	4.4	5.0E-06	-9999.0	-9999.0	0.609	1.7	-9999.0	-9999.0
20.800	14.05	14.40	0.18	32.31	1.25	114.6	1.255	0.000	1.255	5.5	4.9	5.0E-05	30.0	30.0	0.877	2.7	-9999.0	-9999.0
20.866	17.31	17.61	0.18	27.14	1.02	114.6	1.259	0.000	1.259	6.7	6.0	5.0E-05	30.0	30.0	1.090	3.7	-9999.0	-9999.0
20.932	22.55	22.80	0.20	22.56	0.88	117.7	1.263	0.000	1.263	7.3	6.5	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
20.997	23.77	23.96	0.25	17.93	1.05	114.6	1.267	0.000	1.267	9.2	8.2	5.0E-05	30.0	32.0	1.513	6.0	-9999.0	-9999.0
21.063	22.94	23.10	0.32	15.51	1.39	114.6	1.271	0.000	1.271	8.9	7.9	5.0E-05	30.0	32.0	1.456	5.6	-9999.0	-9999.0
21.128	22.75	22.90	0.36	14.74	1.58	114.6	1.274	0.000	1.274	8.8	7.8	5.0E-05	30.0	32.0	1.442	5.5	-9999.0	-9999.0
21.194	22.75	22.90	0.37	14.26	1.62	114.6	1.278	0.000	1.278	8.8	7.8	5.0E-05	30.0	32.0	1.441	5.5	-9999.0	-9999.0
21.260	21.78	21.93	0.37	13.75	1.69	114.6	1.282	0.000	1.282	8.4	7.4	5.0E-05	30.0	32.0	1.377	5.1	-9999.0	-9999.0
21.325	21.59	21.73	0.38	13.14	1.75	114.6	1.286	0.000	1.286	8.3	7.3	5.0E-05	30.0	32.0	1.363	5.0	-9999.0	-9999.0
21.391	22.04	22.18	0.37	12.82	1.67	114.6	1.289	0.000	1.289	8.5	7.5	5.0E-05	30.0	32.0	1.393	5.1	-9999.0	-9999.0
21.456	23.32	23.45	0.36	12.76	1.54	114.6	1.293	0.000	1.293	9.0	7.9	5.0E-05	30.0	32.0	1.477	5.6	-9999.0	-9999.0
21.522	24.21	24.35	0.33	12.61	1.36	114.6	1.297	0.000	1.297	9.3	8.2	5.0E-05	30.0	32.0	1.537	5.9	-9999.0	-9999.0
21.588	23.38	23.51	0.29	12.20	1.24	114.6	1.301	0.000	1.301	9.0	7.9	5.0E-05	30.0	32.0	1.481	5.5	-9999.0	-9999.0
21.653	22.75	22.87	0.26	11.85	1.14	114.6	1.304	0.000	1.304	8.8	7.7	5.0E-05	30.0	32.0	1.438	5.3	-9999.0	-9999.0
21.719	21.40	21.53	0.26	11.75	1.21	114.6	1.308	0.000	1.308	8.2	7.2	5.0E-05	30.0	32.0	1.348	4.8	-9999.0	-9999.0
21.785	21.21	21.34	0.22	12.01	1.03	114.6	1.312	0.000	1.312	8.2	7.1	5.0E-05	30.0	32.0	1.335	4.7	-9999.0	-9999.0
21.850	24.02	24.16	0.20	13.14	0.83	117.7	1.316	0.000	1.316	7.7	6.7	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
21.916	23.32	23.46	0.21	13.18	0.90	117.7	1.320	0.000	1.320	7.5	6.5	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
21.981	22.42	22.56	0.21	12.90	0.93	114.6	1.323	0.000	1.323	8.6	7.5	5.0E-05	30.0	32.0	1.416	5.0	-9999.0	-9999.0
22.047	26.00	26.08	0.22	6.79	0.85	117.7	1.327	0.000	1.327	8.3	7.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
22.113	21.53	21.61	0.23	7.05	1.07	114.6	1.331	0.000	1.331	8.3	7.2	5.0E-05	30.0	32.0	1.352	4.7	-9999.0	-9999.0
22.178	18.91	18.98	0.24	7.17	1.27	114.6	1.335	0.000	1.335	7.3	6.3	5.0E-05	30.0	30.0	1.177	3.8	-9999.0	-9999.0
22.244	17.56	17.65	0.25	7.68	1.42	114.6	1.339	0.000	1.339	6.8	5.8	5.0E-05	30.0	30.0	1.087	3.3	-9999.0	-9999.0
22.309	17.63	17.73	0.26	9.46	1.47	114.6	1.342	0.000	1.342	6.8	5.9	5.0E-05	30.0	30.0	1.093	3.4	-9999.0	-9999.0
22.375	18.27	18.40	0.27	11.71	1.47	114.6	1.346	0.000	1.346	7.0	6.1	5.0E-05	30.0	30.0	1.137	3.5	-9999.0	-9999.0
22.441	17.82	17.95	0.28	11.67	1.56	114.6	1.350	0.000	1.350	6.9	5.9	5.0E-05	30.0	30.0	1.107	3.4	-9999.0	-9999.0
22.506	17.25	17.37	0.26	11.30	1.50	114.6	1.354	0.000	1.354	6.7	5.7	5.0E-05	30.0	30.0	1.068	3.2	-9999.0	-9999.0
22.572	15.46	15.57	0.25	10.65	1.61	114.6	1.357	0.000	1.357	6.0	5.1	5.0E-05	30.0	30.0	0.948	2.7	-9999.0	-9999.0
22.638	14.51	14.62	0.23	10.49	1.58	114.6	1.361	0.000	1.361	5.6	4.8	5.0E-05	30.0	30.0	0.884	2.4	-9999.0	-9999.0
22.703	16.04	16.16	0.21	10.92	1.30	114.6	1.365	0.000	1.365	6.2	5.3	5.0E-05	30.0	30.0	0.986	2.8	-9999.0	-9999.0
22.769	18.66	18.79	0.19	12.51	1.01	114.6	1.369	0.000	1.369	7.2	6.2	5.0E-05	30.0	30.0	1.161	3.6	-9999.0	-9999.0
22.834	19.23	19.37	0.16	13.10	0.83	114.6	1.372	0.000	1.372	7.4	6.3	5.0E-05	30.0	30.0	1.200	3.7	-9999.0	-9999.0
22.900	19.23	19.37	0.15	12.94	0.78	114.6	1.376	0.000	1.376	7.4	6.3	5.0E-05	30.0	30.0	1.199	3.7	-9999.0	-9999.0
22.966	17.25	17.39	0.13	12.55	0.75	114.6	1.380	0.000	1.380	6.7	5.7	5.0E-05	30.0	30.0	1.067	3.1	-9999.0	-9999.0
23.031	14.76	14.89	0.11	12.31	0.74	114.6	1.384	0.000	1.384	5.7	4.8	5.0E-05	30.0	30.0	0.900	2.5	-9999.0	-9999.0
23.097	12.65	12.78	0.09	12.35	0.71	114.6	1.387	0.000	1.387	4.9	4.2	5.0E-05	30.0	30.0	0.760	2.0	-9999.0	-9999.0
23.162	11.12	11.26	0.08	13.23	0.71	114.6	1.391	0.000	1.391	4.3	3.7	5.0E-05	30.0	30.0	0.658	1.6	-9999.0	-9999.0
23.228	10.61	10.76	0.06	14.47	0.56	114.6	1.395	0.000	1.395	4.1	3.5	5.0E-05	30.0	30.0	0.624	1.5	-9999.0	-9999.0
23.294	9.58	9.75	0.05	15.35	0.51	114.6	1.399	0.000	1.399	3.7	3.2	5.0E-05	30.0	30.0	0.557	1.3	-9999.0	-9999.0
23.359	8.05	8.22	0.04	15.76	0.49	111.4	1.402	0.000	1.402	3.9	3.3	1.0E-07	-9999.0	-9999.0	0.454	1.1	-9999.0	-9999.0
23.425	6.65	6.82	0.03	16.49	0.44	111.4	1.406	0.000	1.406	3.3	2.8	1.0E-07	-9999.0	-9999.0	0.361	0.9	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
23.491	6.39	6.58	0.03	18.37	0.46	111.4	1.410	0.000	1.410	3.2	2.7	1.0E-07	-9999.0	-9999.0	0.345	0.8	-9999.0	-9999.0
23.556	6.46	6.67	0.04	19.89	0.60	111.4	1.413	0.000	1.413	3.2	2.7	1.0E-07	-9999.0	-9999.0	0.350	0.9	-9999.0	-9999.0
23.622	9.52	9.75	0.06	21.07	0.62	114.6	1.417	0.000	1.417	3.7	3.1	5.0E-05	30.0	30.0	0.556	1.3	-9999.0	-9999.0
23.687	12.20	12.42	0.08	20.58	0.65	114.6	1.421	0.000	1.421	4.8	4.0	5.0E-05	30.0	30.0	0.733	1.8	-9999.0	-9999.0
23.753	13.67	13.88	0.12	18.90	0.87	114.6	1.425	0.000	1.425	5.3	4.5	5.0E-05	30.0	30.0	0.830	2.1	-9999.0	-9999.0
23.819	15.53	15.72	0.14	17.60	0.89	114.6	1.428	0.000	1.428	6.0	5.0	5.0E-05	30.0	30.0	0.953	2.5	-9999.0	-9999.0
23.884	16.23	16.40	0.18	16.02	1.10	114.6	1.432	0.000	1.432	6.3	5.3	5.0E-05	30.0	30.0	0.998	2.7	-9999.0	-9999.0
23.950	18.14	18.30	0.20	14.72	1.10	114.6	1.436	0.000	1.436	7.0	5.9	5.0E-05	30.0	30.0	1.124	3.2	-9999.0	-9999.0
24.015	19.42	19.56	0.22	13.08	1.13	114.6	1.440	0.000	1.440	7.5	6.2	5.0E-05	30.0	30.0	1.208	3.5	-9999.0	-9999.0
24.081	21.14	21.27	0.20	12.20	0.94	114.6	1.443	0.000	1.443	8.1	6.8	5.0E-05	30.0	32.0	1.322	4.0	-9999.0	-9999.0
24.147	19.68	19.80	0.19	11.20	0.96	114.6	1.447	0.000	1.447	7.6	6.3	5.0E-05	30.0	30.0	1.223	3.6	-9999.0	-9999.0
24.212	18.98	19.09	0.18	10.96	0.94	114.6	1.451	0.000	1.451	7.3	6.1	5.0E-05	30.0	30.0	1.176	3.3	-9999.0	-9999.0
24.278	16.42	16.54	0.16	10.92	0.97	114.6	1.455	0.000	1.455	6.3	5.3	5.0E-05	30.0	30.0	1.006	2.7	-9999.0	-9999.0
24.344	13.41	13.54	0.13	12.14	0.96	114.6	1.458	0.000	1.458	5.2	4.3	5.0E-05	30.0	30.0	0.806	2.0	-9999.0	-9999.0
24.409	11.05	11.20	0.13	14.32	1.16	114.6	1.462	0.000	1.462	4.3	3.5	5.0E-05	30.0	30.0	0.649	1.5	-9999.0	-9999.0
24.475	11.12	11.30	0.10	16.91	0.89	114.6	1.466	0.000	1.466	4.3	3.6	5.0E-05	30.0	30.0	0.656	1.5	-9999.0	-9999.0
24.540	11.37	11.57	0.09	18.99	0.78	114.6	1.470	0.000	1.470	4.4	3.7	5.0E-05	30.0	30.0	0.674	1.6	-9999.0	-9999.0
24.606	12.01	12.22	0.11	19.62	0.90	114.6	1.474	0.000	1.474	4.7	3.9	5.0E-05	30.0	30.0	0.717	1.7	-9999.0	-9999.0
24.672	13.79	14.01	0.10	20.01	0.72	114.6	1.477	0.000	1.477	5.4	4.4	5.0E-05	30.0	30.0	0.835	2.0	-9999.0	-9999.0
24.737	18.79	19.00	0.06	20.28	0.32	117.7	1.481	0.000	1.481	6.1	5.0	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
24.803	22.42	22.64	0.01	19.50	0.04	117.7	1.485	0.000	1.485	7.2	5.9	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
24.868	21.78	21.96	0.01	16.65	0.05	117.7	1.489	0.000	1.489	7.0	5.7	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
24.934	20.51	20.66	0.01	13.96	0.05	117.7	1.493	0.000	1.493	6.6	5.4	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
25.000	14.30	14.43	0.02	11.97	0.14	114.6	1.496	0.000	1.496	5.5	4.5	5.0E-05	30.0	30.0	0.862	2.1	-9999.0	-9999.0
25.065	9.83	9.95	0.02	11.10	0.20	111.4	1.500	0.000	1.500	4.8	3.9	1.0E-07	-9999.0	-9999.0	0.564	1.3	-9999.0	-9999.0
25.131	5.36	5.50	0.01	12.24	0.18	111.4	1.504	0.000	1.504	2.6	2.1	1.0E-07	-9999.0	-9999.0	0.266	0.7	-9999.0	-9999.0
25.197	5.94	6.14	0.02	17.66	0.33	111.4	1.508	0.000	1.508	2.9	2.4	1.0E-07	-9999.0	-9999.0	0.309	0.7	-9999.0	-9999.0
25.262	9.13	9.37	0.01	22.36	0.11	111.4	1.511	0.000	1.511	4.5	3.7	1.0E-07	-9999.0	-9999.0	0.524	1.2	-9999.0	-9999.0
25.328	12.01	12.20	0.01	17.80	0.08	114.6	1.515	0.000	1.515	4.7	3.8	5.0E-05	30.0	30.0	0.712	1.6	-9999.0	-9999.0
25.393	10.54	10.71	0.01	15.88	0.09	114.6	1.519	0.000	1.519	4.1	3.3	5.0E-05	30.0	30.0	0.613	1.4	-9999.0	-9999.0
25.459	8.62	8.80	0.01	16.17	0.11	111.4	1.522	0.000	1.522	4.2	3.4	1.0E-07	-9999.0	-9999.0	0.485	1.1	-9999.0	-9999.0
25.525	9.20	9.40	0.02	18.45	0.21	111.4	1.526	0.000	1.526	4.5	3.6	1.0E-07	-9999.0	-9999.0	0.525	1.1	-9999.0	-9999.0
25.590	7.79	8.01	0.02	20.13	0.25	111.4	1.530	0.000	1.530	3.8	3.1	1.0E-07	-9999.0	-9999.0	0.432	0.9	-9999.0	-9999.0
25.656	7.86	8.09	0.02	21.71	0.25	111.4	1.533	0.000	1.533	3.9	3.1	1.0E-07	-9999.0	-9999.0	0.437	1.0	-9999.0	-9999.0
25.721	7.86	8.10	0.02	22.61	0.25	111.4	1.537	0.000	1.537	3.9	3.1	1.0E-07	-9999.0	-9999.0	0.438	1.0	-9999.0	-9999.0
25.787	10.48	10.73	0.01	23.34	0.09	114.6	1.541	0.000	1.541	4.1	3.3	5.0E-05	30.0	30.0	0.612	1.3	-9999.0	-9999.0
25.853	14.11	14.36	0.01	22.40	0.07	114.6	1.544	0.000	1.544	5.5	4.4	5.0E-05	30.0	30.0	0.854	2.0	-9999.0	-9999.0
25.918	16.23	16.44	0.02	19.40	0.12	117.7	1.548	0.000	1.548	5.2	4.2	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
25.984	13.79	13.98	0.01	16.83	0.07	114.6	1.552	0.000	1.552	5.4	4.3	5.0E-05	30.0	30.0	0.828	1.9	-9999.0	-9999.0
26.050	12.78	12.96	0.01	16.29	0.08	114.6	1.556	0.002	1.554	5.0	4.0	5.0E-05	30.0	30.0	0.760	1.7	-9999.0	-9999.0
26.115	12.01	12.20	0.02	17.25	0.16	114.6	1.560	0.004	1.556	4.7	3.7	5.0E-05	30.0	30.0	0.709	1.6	-9999.0	-9999.0
26.181	11.63	11.83	0.01	19.12	0.08	114.6	1.563	0.006	1.558	4.5	3.6	5.0E-05	30.0	30.0	0.685	1.5	-9999.0	-9999.0
26.246	10.74	10.96	0.01	20.72	0.09	114.6	1.567	0.008	1.559	4.2	3.4	5.0E-05	30.0	30.0	0.626	1.3	-9999.0	-9999.0
26.312	9.71	9.94	0.01	21.40	0.10	111.4	1.571	0.010	1.561	4.8	3.8	1.0E-07	-9999.0	-9999.0	0.558	1.2	-9999.0	-9999.0
26.378	9.90	10.15	0.01	22.42	0.10	111.4	1.574	0.012	1.563	4.9	3.9	1.0E-07	-9999.0	-9999.0	0.571	1.2	-9999.0	-9999.0
26.443	8.43	8.67	0.01	22.26	0.12	111.4	1.578	0.014	1.564	4.2	3.3	1.0E-07	-9999.0	-9999.0	0.473	1.0	-9999.0	-9999.0
26.509	6.90	7.16	0.01	23.94	0.14	111.4	1.582	0.016	1.566	3.4	2.7	1.0E-07	-9999.0	-9999.0	0.372	0.8	-9999.0	-9999.0
26.574	7.28	7.56	0.02	26.59	0.27	111.4	1.585	0.018	1.567	3.6	2.9	1.0E-07	-9999.0	-9999.0	0.399	0.9	-9999.0	-9999.0
26.640	7.35	7.63	0.02	26.49	0.26	111.4	1.589	0.020	1.569	3.7	2.9	1.0E-07	-9999.0	-9999.0	0.403	0.9	-9999.0	-9999.0
26.706	6.39	6.65	0.03	24.81	0.45	111.4	1.593	0.022	1.571	3.2	2.5	1.0E-07	-9999.0	-9999.0	0.337	0.8	-9999.0	-9999.0
26.771	5.17	5.42	0.03	22.85	0.55	111.4	1.596	0.024	1.572	2.6	2.1	1.0E-07	-9999.0	-9999.0	0.255	0.6	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
26.837	4.28	4.53	0.04	23.09	0.89	111.4	1.600	0.026	1.574	2.2	1.7	1.0E-07	-9999.0	-9999.0	0.195	0.6	-9999.0	-9999.0
26.903	3.45	3.72	0.04	25.38	1.08	111.4	1.604	0.028	1.576	1.8	1.4	1.0E-07	-9999.0	-9999.0	0.141	0.5	-9999.0	-9999.0
26.968	3.01	3.31	0.04	28.29	1.21	111.4	1.607	0.030	1.577	1.6	1.3	1.0E-07	-9999.0	-9999.0	0.114	0.5	-9999.0	-9999.0
27.034	3.07	3.38	0.03	28.80	0.89	111.4	1.611	0.032	1.579	1.6	1.3	1.0E-07	-9999.0	-9999.0	0.118	0.5	-9999.0	-9999.0
27.099	2.37	2.68	0.02	28.68	0.75	111.4	1.615	0.034	1.580	1.3	1.0	1.0E-07	-9999.0	-9999.0	0.071	0.5	-9999.0	-9999.0
27.165	2.56	2.87	0.01	28.60	0.35	111.4	1.618	0.036	1.582	1.4	1.1	1.0E-07	-9999.0	-9999.0	0.083	0.5	-9999.0	-9999.0
27.231	2.81	3.12	0.01	28.82	0.32	111.4	1.622	0.038	1.584	1.5	1.2	1.0E-07	-9999.0	-9999.0	0.100	0.5	-9999.0	-9999.0
27.296	2.62	2.93	0.01	28.58	0.34	111.4	1.626	0.040	1.585	1.4	1.1	1.0E-07	-9999.0	-9999.0	0.087	0.5	-9999.0	-9999.0
27.362	2.88	3.18	0.01	28.43	0.31	111.4	1.629	0.043	1.587	1.5	1.2	1.0E-07	-9999.0	-9999.0	0.104	0.5	-9999.0	-9999.0
27.427	2.88	3.18	0.01	28.07	0.32	111.4	1.633	0.045	1.588	1.5	1.2	1.0E-07	-9999.0	-9999.0	0.103	0.5	-9999.0	-9999.0
27.493	2.24	2.53	0.01	27.65	0.40	111.4	1.637	0.047	1.590	1.2	1.0	1.0E-07	-9999.0	-9999.0	0.060	0.5	-9999.0	-9999.0
27.559	2.81	3.11	0.01	27.63	0.32	111.4	1.640	0.049	1.592	1.5	1.2	1.0E-07	-9999.0	-9999.0	0.098	0.5	-9999.0	-9999.0
27.624	2.81	3.11	0.01	27.75	0.32	111.4	1.644	0.051	1.593	1.5	1.2	1.0E-07	-9999.0	-9999.0	0.098	0.5	-9999.0	-9999.0
27.690	2.88	3.18	0.01	27.63	0.32	111.4	1.648	0.053	1.595	1.5	1.2	1.0E-07	-9999.0	-9999.0	0.102	0.5	-9999.0	-9999.0
27.756	2.43	2.72	0.01	27.53	0.37	111.4	1.651	0.055	1.596	1.3	1.0	1.0E-07	-9999.0	-9999.0	0.071	0.5	-9999.0	-9999.0
27.821	2.43	2.73	0.01	27.77	0.37	111.4	1.655	0.057	1.598	1.3	1.0	1.0E-07	-9999.0	-9999.0	0.071	0.5	-9999.0	-9999.0
27.887	2.81	3.11	0.01	28.52	0.32	111.4	1.659	0.059	1.600	1.5	1.2	1.0E-07	-9999.0	-9999.0	0.097	0.5	-9999.0	-9999.0
27.952	2.50	2.81	0.01	28.76	0.36	111.4	1.662	0.061	1.601	1.3	1.1	1.0E-07	-9999.0	-9999.0	0.076	0.5	-9999.0	-9999.0
28.018	3.83	4.15	0.02	29.47	0.48	111.4	1.666	0.063	1.603	2.0	1.6	1.0E-07	-9999.0	-9999.0	0.165	0.5	-9999.0	-9999.0
28.084	3.58	3.91	0.04	30.64	1.03	111.4	1.669	0.065	1.604	1.9	1.5	1.0E-07	-9999.0	-9999.0	0.149	0.5	-9999.0	-9999.0
28.149	4.92	5.25	0.07	30.62	1.34	111.4	1.673	0.067	1.606	2.5	2.0	1.0E-07	-9999.0	-9999.0	0.239	0.6	-9999.0	-9999.0
28.215	8.37	8.71	0.11	31.01	1.27	114.6	1.677	0.069	1.608	4.2	3.3	5.0E-06	-9999.0	-9999.0	0.469	1.0	-9999.0	-9999.0
28.280	12.39	12.64	0.16	23.22	1.27	114.6	1.681	0.071	1.609	4.8	3.8	5.0E-05	30.0	30.0	0.731	1.5	-9999.0	-9999.0
28.346	13.35	13.53	0.19	16.79	1.41	114.6	1.684	0.073	1.611	5.2	4.1	5.0E-05	30.0	30.0	0.790	1.7	-9999.0	-9999.0
28.412	14.37	14.52	0.22	13.55	1.52	114.6	1.688	0.075	1.613	5.6	4.4	5.0E-05	30.0	30.0	0.856	1.9	-9999.0	-9999.0
28.477	13.99	14.13	0.24	12.14	1.70	114.6	1.692	0.077	1.615	6.8	5.3	5.0E-06	-9999.0	-9999.0	0.829	1.8	-9999.0	-9999.0
28.543	12.90	13.02	0.25	11.10	1.92	114.6	1.696	0.079	1.616	6.2	4.9	5.0E-06	-9999.0	-9999.0	0.755	1.6	-9999.0	-9999.0
28.609	14.95	15.02	0.24	6.85	1.60	114.6	1.699	0.081	1.618	5.8	4.5	5.0E-05	30.0	30.0	0.888	2.0	-9999.0	-9999.0
28.674	14.89	14.96	0.23	6.93	1.54	114.6	1.703	0.083	1.620	5.7	4.5	5.0E-05	30.0	30.0	0.884	1.9	-9999.0	-9999.0
28.740	14.24	14.32	0.23	7.11	1.61	114.6	1.707	0.086	1.621	5.5	4.3	5.0E-05	30.0	30.0	0.841	1.8	-9999.0	-9999.0
28.805	14.76	14.84	0.23	7.80	1.55	114.6	1.711	0.088	1.623	5.7	4.5	5.0E-05	30.0	30.0	0.875	1.9	-9999.0	-9999.0
28.871	13.92	14.02	0.24	8.63	1.72	114.6	1.714	0.090	1.625	6.7	5.3	5.0E-06	-9999.0	-9999.0	0.820	1.8	-9999.0	-9999.0
28.937	13.54	13.65	0.25	10.01	1.84	114.6	1.718	0.092	1.626	6.5	5.1	5.0E-06	-9999.0	-9999.0	0.796	1.7	-9999.0	-9999.0
29.002	12.65	12.77	0.24	10.61	1.88	114.6	1.722	0.094	1.628	6.1	4.8	5.0E-06	-9999.0	-9999.0	0.736	1.5	-9999.0	-9999.0
29.068	12.27	12.39	0.23	11.32	1.86	114.6	1.726	0.096	1.630	5.9	4.6	5.0E-06	-9999.0	-9999.0	0.711	1.5	-9999.0	-9999.0
29.134	12.07	12.20	0.20	12.10	1.64	114.6	1.729	0.098	1.632	5.8	4.6	5.0E-06	-9999.0	-9999.0	0.698	1.4	-9999.0	-9999.0
29.199	11.82	11.96	0.20	12.92	1.68	114.6	1.733	0.100	1.633	5.7	4.5	5.0E-06	-9999.0	-9999.0	0.682	1.4	-9999.0	-9999.0
29.265	10.93	11.07	0.20	13.59	1.81	114.6	1.737	0.102	1.635	5.3	4.1	5.0E-06	-9999.0	-9999.0	0.622	1.3	-9999.0	-9999.0
29.330	9.26	9.41	0.21	13.73	2.24	114.6	1.741	0.104	1.637	4.5	3.5	5.0E-06	-9999.0	-9999.0	0.511	1.0	-9999.0	-9999.0
29.396	7.09	7.24	0.19	13.94	2.63	114.6	1.744	0.106	1.638	4.6	3.6	5.0E-07	-9999.0	-9999.0	0.366	0.8	-9999.0	-9999.0
29.462	6.20	6.36	0.19	14.86	3.00	111.4	1.748	0.108	1.640	6.1	4.8	5.0E-08	-9999.0	-9999.0	0.307	0.7	-9999.0	-9999.0
29.527	6.27	6.44	0.18	16.57	2.80	114.6	1.752	0.110	1.642	4.1	3.2	5.0E-07	-9999.0	-9999.0	0.313	0.7	-9999.0	-9999.0
29.593	6.06	6.28	0.18	19.93	2.87	111.4	1.756	0.112	1.643	6.0	4.7	5.0E-08	-9999.0	-9999.0	0.302	0.7	-9999.0	-9999.0
29.658	8.05	8.29	0.19	22.46	2.30	114.6	1.759	0.114	1.645	5.3	4.1	5.0E-07	-9999.0	-9999.0	0.436	0.9	-9999.0	-9999.0
29.724	9.71	9.94	0.19	21.09	1.92	114.6	1.763	0.116	1.647	4.8	3.7	5.0E-06	-9999.0	-9999.0	0.545	1.1	-9999.0	-9999.0
29.790	11.25	11.44	0.19	17.86	1.66	114.6	1.767	0.118	1.649	5.5	4.3	5.0E-06	-9999.0	-9999.0	0.645	1.3	-9999.0	-9999.0
29.855	10.54	10.70	0.19	14.92	1.78	114.6	1.771	0.120	1.650	5.1	4.0	5.0E-06	-9999.0	-9999.0	0.595	1.2	-9999.0	-9999.0
29.921	9.26	9.41	0.17	13.59	1.81	114.6	1.774	0.122	1.652	4.5	3.5	5.0E-06	-9999.0	-9999.0	0.509	1.0	-9999.0	-9999.0
29.987	8.75	8.89	0.16	13.16	1.80	114.6	1.778	0.124	1.654	4.3	3.3	5.0E-06	-9999.0	-9999.0	0.474	1.0	-9999.0	-9999.0
30.052	7.16	7.30	0.15	12.96	2.06	114.6	1.782	0.127	1.655	4.7	3.6	5.0E-07	-9999.0	-9999.0	0.368	0.8	-9999.0	-9999.0
30.118	6.52	6.67	0.13	14.28	1.95	114.6	1.786	0.129	1.657	4.3	3.3	5.0E-07	-9999.0	-9999.0	0.326	0.7	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
30.183	5.81	5.99	0.11	16.59	1.84	114.6	1.789	0.131	1.659	3.8	3.0	5.0E-07	-9999.0	-9999.0	0.280	0.7	-9999.0	-9999.0
30.249	4.85	5.05	0.09	18.45	1.79	114.6	1.793	0.133	1.660	3.2	2.5	5.0E-07	-9999.0	-9999.0	0.217	0.6	-9999.0	-9999.0
30.315	4.15	4.36	0.07	19.79	1.61	111.4	1.797	0.135	1.662	2.1	1.6	1.0E-07	-9999.0	-9999.0	0.171	0.5	-9999.0	-9999.0
30.380	4.34	4.57	0.06	21.15	1.32	111.4	1.801	0.137	1.664	2.2	1.7	1.0E-07	-9999.0	-9999.0	0.185	0.6	-9999.0	-9999.0
30.446	3.39	3.63	0.05	22.08	1.38	111.4	1.804	0.139	1.665	1.7	1.3	1.0E-07	-9999.0	-9999.0	0.122	0.5	-9999.0	-9999.0
30.511	3.39	3.63	0.04	22.77	1.10	111.4	1.808	0.141	1.667	1.7	1.3	1.0E-07	-9999.0	-9999.0	0.122	0.5	-9999.0	-9999.0
30.577	2.94	3.18	0.03	22.93	0.94	111.4	1.811	0.143	1.669	1.5	1.2	1.0E-07	-9999.0	-9999.0	0.092	0.5	-9999.0	-9999.0
30.643	3.13	3.38	0.02	23.38	0.59	111.4	1.815	0.145	1.670	1.6	1.3	1.0E-07	-9999.0	-9999.0	0.104	0.5	-9999.0	-9999.0
30.708	2.62	2.87	0.01	23.51	0.35	111.4	1.819	0.147	1.672	1.4	1.1	1.0E-07	-9999.0	-9999.0	0.070	0.5	-9999.0	-9999.0
30.774	2.56	2.81	0.01	23.59	0.36	111.4	1.822	0.149	1.673	1.3	1.0	1.0E-07	-9999.0	-9999.0	0.066	0.5	-9999.0	-9999.0
30.840	2.62	2.87	0.01	23.92	0.35	111.4	1.826	0.151	1.675	1.4	1.1	1.0E-07	-9999.0	-9999.0	0.070	0.5	-9999.0	-9999.0
30.905	2.75	3.01	0.01	24.00	0.33	111.4	1.830	0.153	1.677	1.4	1.1	1.0E-07	-9999.0	-9999.0	0.078	0.5	-9999.0	-9999.0
30.971	2.62	2.87	0.01	23.84	0.35	111.4	1.833	0.155	1.678	1.4	1.1	1.0E-07	-9999.0	-9999.0	0.069	0.5	-9999.0	-9999.0
31.036	2.50	2.75	0.01	23.84	0.36	111.4	1.837	0.157	1.680	1.3	1.0	1.0E-07	-9999.0	-9999.0	0.061	0.5	-9999.0	-9999.0
31.102	3.07	3.33	0.01	23.94	0.30	111.4	1.841	0.159	1.681	1.6	1.2	1.0E-07	-9999.0	-9999.0	0.099	0.5	-9999.0	-9999.0
31.168	3.26	3.51	0.01	23.78	0.29	111.4	1.844	0.161	1.683	1.7	1.3	1.0E-07	-9999.0	-9999.0	0.111	0.5	-9999.0	-9999.0
31.233	3.45	3.70	0.02	23.38	0.54	111.4	1.848	0.163	1.685	1.8	1.4	1.0E-07	-9999.0	-9999.0	0.124	0.5	-9999.0	-9999.0
31.299	3.96	4.21	0.04	23.36	0.95	111.4	1.852	0.165	1.686	2.0	1.6	1.0E-07	-9999.0	-9999.0	0.157	0.5	-9999.0	-9999.0
31.364	5.43	5.69	0.06	23.51	1.06	111.4	1.855	0.167	1.688	2.7	2.1	1.0E-07	-9999.0	-9999.0	0.255	0.6	-9999.0	-9999.0
31.430	6.39	6.63	0.08	22.61	1.21	111.4	1.859	0.170	1.689	3.2	2.4	1.0E-07	-9999.0	-9999.0	0.318	0.7	-9999.0	-9999.0
31.496	8.88	9.11	0.11	21.30	1.21	114.6	1.863	0.172	1.691	4.4	3.4	5.0E-06	-9999.0	-9999.0	0.483	1.0	-9999.0	-9999.0
31.561	9.26	9.45	0.16	17.70	1.70	114.6	1.866	0.174	1.693	4.5	3.5	5.0E-06	-9999.0	-9999.0	0.506	1.0	-9999.0	-9999.0
31.627	9.52	9.69	0.17	15.53	1.76	114.6	1.870	0.176	1.695	4.6	3.6	5.0E-06	-9999.0	-9999.0	0.521	1.0	-9999.0	-9999.0
31.693	9.07	9.23	0.17	14.60	1.85	114.6	1.874	0.178	1.696	4.4	3.4	5.0E-06	-9999.0	-9999.0	0.490	1.0	-9999.0	-9999.0
31.758	7.86	8.01	0.16	13.75	2.00	114.6	1.878	0.180	1.698	3.8	2.9	5.0E-06	-9999.0	-9999.0	0.409	0.8	-9999.0	-9999.0
31.824	7.16	7.30	0.16	13.65	2.20	114.6	1.881	0.182	1.700	4.7	3.6	5.0E-07	-9999.0	-9999.0	0.362	0.8	-9999.0	-9999.0
31.889	8.30	8.39	0.15	8.24	1.79	114.6	1.885	0.184	1.701	4.0	3.1	5.0E-06	-9999.0	-9999.0	0.434	0.9	-9999.0	-9999.0
31.955	6.97	7.07	0.15	9.12	2.13	114.6	1.889	0.186	1.703	4.5	3.5	5.0E-07	-9999.0	-9999.0	0.345	0.7	-9999.0	-9999.0
32.021	6.65	6.77	0.13	11.67	1.92	114.6	1.893	0.188	1.705	4.3	3.3	5.0E-07	-9999.0	-9999.0	0.325	0.7	-9999.0	-9999.0
32.086	5.81	5.98	0.15	14.96	2.52	114.6	1.897	0.190	1.706	3.8	2.9	5.0E-07	-9999.0	-9999.0	0.272	0.6	-9999.0	-9999.0
32.152	6.65	6.84	0.15	17.58	2.20	114.6	1.900	0.192	1.708	4.4	3.3	5.0E-07	-9999.0	-9999.0	0.329	0.7	-9999.0	-9999.0
32.217	7.09	7.29	0.16	18.52	2.20	114.6	1.904	0.194	1.710	4.7	3.6	5.0E-07	-9999.0	-9999.0	0.359	0.8	-9999.0	-9999.0
32.283	7.99	8.19	0.16	18.56	1.96	114.6	1.908	0.196	1.712	3.9	3.0	5.0E-06	-9999.0	-9999.0	0.419	0.8	-9999.0	-9999.0
32.349	7.41	7.60	0.17	18.09	2.24	114.6	1.912	0.198	1.713	4.9	3.7	5.0E-07	-9999.0	-9999.0	0.379	0.8	-9999.0	-9999.0
32.414	8.56	8.76	0.18	18.29	2.06	114.6	1.915	0.200	1.715	4.2	3.2	5.0E-06	-9999.0	-9999.0	0.456	0.9	-9999.0	-9999.0
32.480	8.81	9.00	0.18	17.84	2.00	114.6	1.919	0.202	1.717	4.3	3.3	5.0E-06	-9999.0	-9999.0	0.472	0.9	-9999.0	-9999.0
32.546	9.83	10.02	0.18	17.19	1.80	114.6	1.923	0.204	1.718	4.8	3.7	5.0E-06	-9999.0	-9999.0	0.540	1.0	-9999.0	-9999.0
32.611	9.58	9.76	0.18	16.10	1.85	114.6	1.927	0.206	1.720	4.7	3.6	5.0E-06	-9999.0	-9999.0	0.522	1.0	-9999.0	-9999.0
32.677	9.71	9.88	0.18	15.55	1.83	114.6	1.930	0.208	1.722	4.7	3.6	5.0E-06	-9999.0	-9999.0	0.530	1.0	-9999.0	-9999.0
32.742	9.45	9.61	0.17	14.99	1.77	114.6	1.934	0.211	1.724	4.6	3.5	5.0E-06	-9999.0	-9999.0	0.512	1.0	-9999.0	-9999.0
32.808	8.11	8.27	0.16	14.51	1.94	114.6	1.938	0.213	1.725	4.0	3.0	5.0E-06	-9999.0	-9999.0	0.422	0.8	-9999.0	-9999.0
32.874	6.90	7.05	0.15	14.38	2.13	114.6	1.942	0.215	1.727	4.5	3.4	5.0E-07	-9999.0	-9999.0	0.341	0.7	-9999.0	-9999.0
32.939	6.33	6.49	0.15	14.82	2.32	114.6	1.945	0.217	1.729	4.1	3.1	5.0E-07	-9999.0	-9999.0	0.303	0.7	-9999.0	-9999.0
33.005	5.87	6.05	0.13	16.37	2.15	114.6	1.949	0.219	1.730	3.9	2.9	5.0E-07	-9999.0	-9999.0	0.273	0.6	-9999.0	-9999.0
33.070	4.60	4.81	0.11	19.05	2.29	111.4	1.953	0.221	1.732	4.6	3.5	5.0E-08	-9999.0	-9999.0	0.190	0.6	-9999.0	-9999.0
33.136	4.09	4.32	0.09	21.73	2.09	111.4	1.957	0.223	1.734	4.1	3.1	5.0E-08	-9999.0	-9999.0	0.158	0.5	-9999.0	-9999.0
33.202	4.60	4.86	0.07	23.55	1.45	111.4	1.960	0.225	1.735	2.3	1.8	1.0E-07	-9999.0	-9999.0	0.193	0.6	-9999.0	-9999.0
33.267	4.85	5.11	0.06	24.12	1.18	111.4	1.964	0.227	1.737	2.4	1.9	1.0E-07	-9999.0	-9999.0	0.210	0.6	-9999.0	-9999.0
33.333	4.28	4.54	0.04	24.24	0.88	111.4	1.967	0.229	1.739	2.2	1.6	1.0E-07	-9999.0	-9999.0	0.172	0.5	-9999.0	-9999.0
33.399	3.71	3.97	0.03	24.18	0.76	111.4	1.971	0.231	1.740	1.9	1.4	1.0E-07	-9999.0	-9999.0	0.133	0.5	-9999.0	-9999.0
33.464	3.96	4.22	0.03	24.20	0.71	111.4	1.975	0.233	1.742	2.0	1.5	1.0E-07	-9999.0	-9999.0	0.150	0.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
33.530	3.77	4.03	0.03	24.30	0.75	111.4	1.978	0.235	1.743	1.9	1.5	1.0E-07	-9999.0	-9999.0	0.137	0.5	-9999.0	-9999.0
33.595	3.77	4.04	0.02	24.73	0.50	111.4	1.982	0.237	1.745	1.9	1.5	1.0E-07	-9999.0	-9999.0	0.137	0.5	-9999.0	-9999.0
33.661	3.01	3.28	0.02	25.00	0.61	111.4	1.986	0.239	1.747	1.6	1.2	1.0E-07	-9999.0	-9999.0	0.086	0.5	-9999.0	-9999.0
33.727	2.75	3.02	0.02	25.48	0.66	111.4	1.989	0.241	1.748	1.4	1.1	1.0E-07	-9999.0	-9999.0	0.069	0.5	-9999.0	-9999.0
33.792	2.88	3.16	0.02	25.92	0.64	111.4	1.993	0.243	1.750	1.5	1.1	1.0E-07	-9999.0	-9999.0	0.078	0.5	-9999.0	-9999.0
33.858	2.75	3.03	0.01	25.96	0.33	111.4	1.997	0.245	1.751	1.4	1.1	1.0E-07	-9999.0	-9999.0	0.069	0.5	-9999.0	-9999.0
33.923	2.75	3.03	0.01	25.92	0.33	111.4	2.000	0.247	1.753	1.4	1.1	1.0E-07	-9999.0	-9999.0	0.068	0.5	-9999.0	-9999.0
33.989	2.88	3.16	0.01	25.84	0.32	111.4	2.004	0.249	1.755	1.5	1.1	1.0E-07	-9999.0	-9999.0	0.077	0.5	-9999.0	-9999.0
34.055	3.01	3.28	0.01	25.68	0.31	111.4	2.008	0.251	1.756	1.6	1.2	1.0E-07	-9999.0	-9999.0	0.085	0.5	-9999.0	-9999.0
34.120	3.07	3.34	0.01	25.44	0.30	111.4	2.011	0.254	1.758	1.6	1.2	1.0E-07	-9999.0	-9999.0	0.089	0.5	-9999.0	-9999.0
34.186	2.50	2.77	0.02	25.42	0.72	111.4	2.015	0.256	1.759	1.3	1.0	1.0E-07	-9999.0	-9999.0	0.050	0.5	-9999.0	-9999.0
34.252	3.39	3.67	0.02	25.98	0.55	111.4	2.019	0.258	1.761	1.8	1.3	1.0E-07	-9999.0	-9999.0	0.110	0.5	-9999.0	-9999.0
34.317	3.96	4.24	0.03	26.27	0.71	111.4	2.022	0.260	1.763	2.0	1.5	1.0E-07	-9999.0	-9999.0	0.148	0.5	-9999.0	-9999.0
34.383	6.06	6.35	0.04	25.96	0.63	111.4	2.026	0.262	1.764	3.0	2.3	1.0E-07	-9999.0	-9999.0	0.288	0.6	-9999.0	-9999.0
34.448	6.00	6.27	0.07	24.49	1.12	111.4	2.030	0.264	1.766	3.0	2.3	1.0E-07	-9999.0	-9999.0	0.283	0.6	-9999.0	-9999.0
34.514	6.90	7.15	0.08	23.24	1.12	111.4	2.033	0.266	1.767	3.4	2.6	1.0E-07	-9999.0	-9999.0	0.341	0.7	-9999.0	-9999.0
34.580	6.58	6.81	0.11	21.59	1.62	114.6	2.037	0.268	1.769	3.3	2.5	5.0E-06	-9999.0	-9999.0	0.318	0.7	-9999.0	-9999.0
34.645	6.58	6.80	0.12	20.72	1.77	114.6	2.041	0.270	1.771	3.3	2.4	5.0E-06	-9999.0	-9999.0	0.317	0.7	-9999.0	-9999.0
34.711	5.04	5.26	0.12	20.58	2.28	114.6	2.044	0.272	1.773	3.4	2.5	5.0E-07	-9999.0	-9999.0	0.215	0.6	-9999.0	-9999.0
34.776	5.11	5.35	0.16	22.22	3.00	111.4	2.048	0.274	1.774	5.1	3.8	5.0E-08	-9999.0	-9999.0	0.220	0.6	-9999.0	-9999.0
34.842	4.79	5.04	0.15	23.42	2.98	111.4	2.052	0.276	1.776	4.8	3.6	5.0E-08	-9999.0	-9999.0	0.200	0.6	-9999.0	-9999.0
34.908	5.87	6.14	0.14	24.34	2.29	114.6	2.056	0.278	1.777	3.9	2.9	5.0E-07	-9999.0	-9999.0	0.272	0.6	-9999.0	-9999.0
34.973	6.39	6.64	0.14	23.59	2.11	114.6	2.059	0.280	1.779	4.2	3.2	5.0E-07	-9999.0	-9999.0	0.305	0.7	-9999.0	-9999.0
35.039	6.84	7.08	0.15	22.28	2.12	114.6	2.063	0.282	1.781	4.5	3.4	5.0E-07	-9999.0	-9999.0	0.334	0.7	-9999.0	-9999.0
35.105	8.88	8.99	0.15	10.12	1.67	114.6	2.067	0.284	1.783	4.3	3.2	5.0E-06	-9999.0	-9999.0	0.462	0.9	-9999.0	-9999.0
35.170	7.99	8.11	0.16	11.42	1.98	114.6	2.071	0.286	1.784	3.9	2.9	5.0E-06	-9999.0	-9999.0	0.403	0.8	-9999.0	-9999.0
35.236	6.39	6.53	0.14	13.06	2.15	114.6	2.074	0.288	1.786	4.2	3.1	5.0E-07	-9999.0	-9999.0	0.297	0.7	-9999.0	-9999.0
35.301	5.30	5.47	0.13	15.07	2.38	114.6	2.078	0.290	1.788	3.5	2.6	5.0E-07	-9999.0	-9999.0	0.226	0.6	-9999.0	-9999.0
35.367	5.17	5.35	0.13	16.87	2.43	114.6	2.082	0.292	1.789	3.4	2.6	5.0E-07	-9999.0	-9999.0	0.218	0.6	-9999.0	-9999.0
35.433	4.73	4.96	0.10	20.72	2.02	114.6	2.086	0.295	1.791	3.2	2.4	5.0E-07	-9999.0	-9999.0	0.191	0.5	-9999.0	-9999.0
35.498	4.34	4.59	0.09	23.51	1.96	114.6	2.089	0.297	1.793	2.9	2.2	5.0E-07	-9999.0	-9999.0	0.167	0.5	-9999.0	-9999.0
35.564	3.83	4.10	0.07	24.91	1.71	111.4	2.093	0.299	1.794	2.0	1.5	1.0E-07	-9999.0	-9999.0	0.134	0.5	-9999.0	-9999.0
35.629	3.71	3.99	0.06	26.00	1.51	111.4	2.097	0.301	1.796	1.9	1.4	1.0E-07	-9999.0	-9999.0	0.126	0.5	-9999.0	-9999.0
35.695	4.60	4.89	0.05	26.49	1.03	111.4	2.100	0.303	1.798	2.3	1.7	1.0E-07	-9999.0	-9999.0	0.186	0.5	-9999.0	-9999.0
35.761	5.24	5.52	0.05	25.94	0.91	111.4	2.104	0.305	1.799	2.6	2.0	1.0E-07	-9999.0	-9999.0	0.228	0.6	-9999.0	-9999.0
35.826	5.17	5.44	0.06	25.04	1.11	111.4	2.108	0.307	1.801	2.6	1.9	1.0E-07	-9999.0	-9999.0	0.222	0.6	-9999.0	-9999.0
35.892	4.47	4.73	0.06	24.22	1.27	111.4	2.111	0.309	1.803	2.3	1.7	1.0E-07	-9999.0	-9999.0	0.175	0.5	-9999.0	-9999.0
35.958	4.66	4.92	0.05	24.28	1.02	111.4	2.115	0.311	1.804	2.4	1.8	1.0E-07	-9999.0	-9999.0	0.187	0.5	-9999.0	-9999.0
36.023	4.53	4.80	0.06	24.63	1.25	111.4	2.119	0.313	1.806	2.3	1.7	1.0E-07	-9999.0	-9999.0	0.179	0.5	-9999.0	-9999.0
36.089	4.53	4.80	0.05	25.18	1.04	111.4	2.122	0.315	1.807	2.3	1.7	1.0E-07	-9999.0	-9999.0	0.179	0.5	-9999.0	-9999.0
36.154	4.47	4.75	0.05	25.63	1.06	111.4	2.126	0.317	1.809	2.3	1.7	1.0E-07	-9999.0	-9999.0	0.175	0.5	-9999.0	-9999.0
36.220	4.34	4.62	0.04	25.94	0.87	111.4	2.130	0.319	1.811	2.2	1.6	1.0E-07	-9999.0	-9999.0	0.166	0.5	-9999.0	-9999.0
36.286	3.77	4.05	0.04	26.02	0.99	111.4	2.133	0.321	1.812	1.9	1.4	1.0E-07	-9999.0	-9999.0	0.128	0.5	-9999.0	-9999.0
36.351	4.22	4.50	0.03	26.21	0.67	111.4	2.137	0.323	1.814	2.2	1.6	1.0E-07	-9999.0	-9999.0	0.158	0.5	-9999.0	-9999.0
36.417	3.90	4.18	0.03	26.15	0.72	111.4	2.141	0.325	1.815	2.0	1.5	1.0E-07	-9999.0	-9999.0	0.136	0.5	-9999.0	-9999.0
36.482	3.90	4.18	0.02	26.21	0.48	111.4	2.144	0.327	1.817	2.0	1.5	1.0E-07	-9999.0	-9999.0	0.136	0.5	-9999.0	-9999.0
36.548	3.58	3.86	0.02	26.27	0.52	111.4	2.148	0.329	1.819	1.8	1.4	1.0E-07	-9999.0	-9999.0	0.114	0.5	-9999.0	-9999.0
36.614	3.64	3.93	0.02	26.51	0.51	111.4	2.152	0.331	1.820	1.9	1.4	1.0E-07	-9999.0	-9999.0	0.118	0.5	-9999.0	-9999.0
36.679	3.51	3.80	0.02	26.72	0.53	111.4	2.155	0.333	1.822	1.8	1.3	1.0E-07	-9999.0	-9999.0	0.109	0.5	-9999.0	-9999.0
36.745	3.83	4.12	0.01	26.80	0.24	111.4	2.159	0.335	1.823	2.0	1.5	1.0E-07	-9999.0	-9999.0	0.131	0.5	-9999.0	-9999.0
36.811	3.83	4.12	0.02	26.65	0.49	111.4	2.163	0.338	1.825	2.0	1.5	1.0E-07	-9999.0	-9999.0	0.130	0.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
36.876	3.58	3.87	0.02	26.67	0.52	111.4	2.166	0.340	1.827	1.9	1.4	1.0E-07	-9999.0	-9999.0	0.113	0.5	-9999.0	-9999.0
36.942	3.58	3.87	0.01	26.80	0.26	111.4	2.170	0.342	1.828	1.9	1.4	1.0E-07	-9999.0	-9999.0	0.113	0.5	-9999.0	-9999.0
37.007	3.83	4.12	0.02	26.82	0.49	111.4	2.174	0.344	1.830	2.0	1.5	1.0E-07	-9999.0	-9999.0	0.130	0.5	-9999.0	-9999.0
37.073	3.64	3.93	0.01	26.61	0.26	111.4	2.177	0.346	1.831	1.9	1.4	1.0E-07	-9999.0	-9999.0	0.117	0.5	-9999.0	-9999.0
37.139	3.90	4.19	0.01	26.55	0.24	111.4	2.181	0.348	1.833	2.0	1.5	1.0E-07	-9999.0	-9999.0	0.134	0.5	-9999.0	-9999.0
37.204	4.53	4.82	0.01	26.67	0.21	111.4	2.184	0.350	1.835	2.3	1.7	1.0E-07	-9999.0	-9999.0	0.176	0.5	-9999.0	-9999.0
37.270	3.39	3.67	0.01	26.35	0.27	111.4	2.188	0.352	1.836	1.8	1.3	1.0E-07	-9999.0	-9999.0	0.099	0.5	-9999.0	-9999.0
37.336	4.47	4.76	0.01	26.82	0.21	111.4	2.192	0.354	1.838	2.3	1.7	1.0E-07	-9999.0	-9999.0	0.171	0.5	-9999.0	-9999.0
37.401	3.96	4.25	0.01	26.78	0.24	111.4	2.195	0.356	1.839	2.0	1.5	1.0E-07	-9999.0	-9999.0	0.137	0.5	-9999.0	-9999.0
37.467	3.39	3.68	0.01	26.63	0.27	111.4	2.199	0.358	1.841	1.8	1.3	1.0E-07	-9999.0	-9999.0	0.098	0.5	-9999.0	-9999.0
37.532	3.96	4.25	0.01	26.72	0.24	111.4	2.203	0.360	1.843	2.0	1.5	1.0E-07	-9999.0	-9999.0	0.136	0.5	-9999.0	-9999.0
37.598	3.32	3.61	0.01	26.69	0.28	111.4	2.206	0.362	1.844	1.7	1.3	1.0E-07	-9999.0	-9999.0	0.093	0.5	-9999.0	-9999.0
37.664	2.88	3.17	0.01	27.00	0.32	111.4	2.210	0.364	1.846	1.5	1.1	1.0E-07	-9999.0	-9999.0	0.064	0.5	-9999.0	-9999.0
37.729	3.39	3.69	0.01	27.75	0.27	111.4	2.214	0.366	1.847	1.8	1.3	1.0E-07	-9999.0	-9999.0	0.098	0.5	-9999.0	-9999.0
37.795	3.01	3.31	0.01	28.13	0.30	111.4	2.217	0.368	1.849	1.6	1.2	1.0E-07	-9999.0	-9999.0	0.073	0.5	-9999.0	-9999.0
37.860	3.83	4.14	0.01	28.66	0.24	111.4	2.221	0.370	1.851	2.0	1.5	1.0E-07	-9999.0	-9999.0	0.128	0.5	-9999.0	-9999.0
37.926	3.39	3.70	0.01	28.48	0.27	111.4	2.225	0.372	1.852	1.8	1.3	1.0E-07	-9999.0	-9999.0	0.098	0.5	-9999.0	-9999.0
37.992	3.32	3.63	0.01	28.41	0.28	111.4	2.228	0.374	1.854	1.7	1.3	1.0E-07	-9999.0	-9999.0	0.093	0.5	-9999.0	-9999.0
38.057	3.64	3.94	0.01	28.09	0.25	111.4	2.232	0.376	1.856	1.9	1.4	1.0E-07	-9999.0	-9999.0	0.114	0.5	-9999.0	-9999.0
38.123	2.94	3.24	0.01	27.69	0.31	111.4	2.236	0.379	1.857	1.5	1.1	1.0E-07	-9999.0	-9999.0	0.067	0.5	-9999.0	-9999.0
38.189	3.77	4.07	0.04	28.09	0.98	111.4	2.239	0.381	1.859	2.0	1.4	1.0E-07	-9999.0	-9999.0	0.122	0.5	-9999.0	-9999.0
38.254	2.24	2.54	0.04	28.19	1.58	111.4	2.243	0.383	1.860	1.2	0.9	1.0E-07	-9999.0	-9999.0	0.020	0.5	-9999.0	-9999.0
38.320	3.39	3.70	0.05	29.09	1.35	111.4	2.247	0.385	1.862	1.8	1.3	1.0E-07	-9999.0	-9999.0	0.097	0.5	-9999.0	-9999.0
38.385	3.58	3.89	0.05	29.13	1.29	111.4	2.250	0.387	1.864	1.9	1.4	1.0E-07	-9999.0	-9999.0	0.110	0.5	-9999.0	-9999.0
38.451	3.77	4.08	0.05	29.00	1.23	111.4	2.254	0.389	1.865	2.0	1.4	1.0E-07	-9999.0	-9999.0	0.122	0.5	-9999.0	-9999.0
38.517	5.81	5.96	0.04	13.10	0.67	111.4	2.258	0.391	1.867	2.9	2.1	1.0E-07	-9999.0	-9999.0	0.247	0.6	-9999.0	-9999.0
38.582	4.53	4.71	0.04	16.53	0.85	111.4	2.261	0.393	1.868	2.3	1.6	1.0E-07	-9999.0	-9999.0	0.163	0.5	-9999.0	-9999.0
38.648	4.73	4.96	0.04	21.07	0.81	111.4	2.265	0.395	1.870	2.4	1.7	1.0E-07	-9999.0	-9999.0	0.180	0.5	-9999.0	-9999.0
38.713	4.09	4.35	0.04	23.63	0.92	111.4	2.269	0.397	1.872	2.1	1.5	1.0E-07	-9999.0	-9999.0	0.138	0.5	-9999.0	-9999.0
38.779	3.39	3.66	0.03	25.48	0.82	111.4	2.272	0.399	1.873	1.8	1.3	1.0E-07	-9999.0	-9999.0	0.093	0.5	-9999.0	-9999.0
38.845	3.51	3.80	0.03	27.10	0.79	111.4	2.276	0.401	1.875	1.8	1.3	1.0E-07	-9999.0	-9999.0	0.102	0.5	-9999.0	-9999.0
38.910	3.39	3.70	0.03	28.45	0.81	111.4	2.279	0.403	1.876	1.8	1.3	1.0E-07	-9999.0	-9999.0	0.094	0.5	-9999.0	-9999.0
38.976	3.45	3.76	0.01	29.19	0.27	111.4	2.283	0.405	1.878	1.8	1.3	1.0E-07	-9999.0	-9999.0	0.099	0.5	-9999.0	-9999.0
39.042	3.71	4.03	0.01	29.39	0.25	111.4	2.287	0.407	1.880	1.9	1.4	1.0E-07	-9999.0	-9999.0	0.116	0.5	-9999.0	-9999.0
39.107	3.83	4.15	0.01	29.37	0.24	111.4	2.290	0.409	1.881	2.0	1.4	1.0E-07	-9999.0	-9999.0	0.124	0.5	-9999.0	-9999.0
39.173	3.71	4.03	0.01	29.39	0.25	111.4	2.294	0.411	1.883	1.9	1.4	1.0E-07	-9999.0	-9999.0	0.115	0.5	-9999.0	-9999.0
39.238	3.96	4.28	0.01	29.27	0.23	111.4	2.298	0.413	1.884	2.0	1.5	1.0E-07	-9999.0	-9999.0	0.132	0.5	-9999.0	-9999.0
39.304	2.94	3.26	0.01	29.57	0.31	111.4	2.301	0.415	1.886	1.6	1.1	1.0E-07	-9999.0	-9999.0	0.064	0.5	-9999.0	-9999.0
39.370	3.13	3.45	0.01	29.43	0.29	111.4	2.305	0.417	1.888	1.6	1.2	1.0E-07	-9999.0	-9999.0	0.076	0.5	-9999.0	-9999.0
39.435	3.20	3.51	0.01	29.33	0.29	111.4	2.309	0.419	1.889	1.7	1.2	1.0E-07	-9999.0	-9999.0	0.080	0.5	-9999.0	-9999.0
39.501	2.69	3.01	0.01	29.55	0.33	111.4	2.312	0.422	1.891	1.4	1.0	1.0E-07	-9999.0	-9999.0	0.046	0.5	-9999.0	-9999.0
39.566	2.81	3.13	0.01	30.02	0.32	111.4	2.316	0.424	1.892	1.5	1.1	1.0E-07	-9999.0	-9999.0	0.054	0.5	-9999.0	-9999.0
39.632	3.01	3.34	0.01	30.76	0.30	111.4	2.320	0.426	1.894	1.6	1.2	1.0E-07	-9999.0	-9999.0	0.068	0.5	-9999.0	-9999.0
39.698	2.04	2.38	0.01	31.25	0.42	111.4	2.323	0.428	1.896	1.1	0.8	1.0E-07	-9999.0	-9999.0	0.004	0.5	-9999.0	-9999.0
39.763	2.69	3.03	0.01	31.52	0.33	111.4	2.327	0.430	1.897	1.4	1.1	1.0E-07	-9999.0	-9999.0	0.047	0.5	-9999.0	-9999.0
39.829	3.26	3.60	0.01	31.62	0.28	111.4	2.331	0.432	1.899	1.7	1.3	1.0E-07	-9999.0	-9999.0	0.085	0.5	-9999.0	-9999.0
39.895	2.37	2.70	0.01	31.23	0.37	111.4	2.334	0.434	1.900	1.3	0.9	1.0E-07	-9999.0	-9999.0	0.025	0.5	-9999.0	-9999.0
39.960	3.32	3.66	0.01	31.60	0.27	111.4	2.338	0.436	1.902	1.8	1.3	1.0E-07	-9999.0	-9999.0	0.088	0.5	-9999.0	-9999.0
40.026	3.51	3.85	0.01	31.70	0.26	111.4	2.342	0.438	1.904	1.8	1.3	1.0E-07	-9999.0	-9999.0	0.101	0.5	-9999.0	-9999.0
40.091	3.45	3.79	0.01	31.88	0.26	111.4	2.345	0.440	1.905	1.8	1.3	1.0E-07	-9999.0	-9999.0	0.096	0.5	-9999.0	-9999.0
40.157	4.85	5.20	0.01	32.15	0.19	111.4	2.349	0.442	1.907	2.5	1.8	1.0E-07	-9999.0	-9999.0	0.190	0.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
40.223	4.98	5.33	0.01	32.29	0.19	111.4	2.353	0.444	1.909	2.6	1.8	1.0E-07	-9999.0	-9999.0	0.199	0.5	-9999.0	-9999.0
40.288	6.33	6.67	0.02	31.68	0.30	111.4	2.356	0.446	1.910	3.2	2.3	1.0E-07	-9999.0	-9999.0	0.287	0.6	-9999.0	-9999.0
40.354	6.65	6.97	0.01	30.34	0.14	111.4	2.360	0.448	1.912	3.3	2.4	1.0E-07	-9999.0	-9999.0	0.308	0.6	-9999.0	-9999.0
40.419	5.43	5.75	0.03	29.61	0.52	111.4	2.364	0.450	1.913	2.8	2.0	1.0E-07	-9999.0	-9999.0	0.226	0.6	-9999.0	-9999.0
40.485	5.55	5.89	0.02	30.91	0.34	111.4	2.367	0.452	1.915	2.8	2.0	1.0E-07	-9999.0	-9999.0	0.235	0.6	-9999.0	-9999.0
40.551	4.98	5.33	0.03	32.03	0.56	111.4	2.371	0.454	1.917	2.6	1.8	1.0E-07	-9999.0	-9999.0	0.197	0.5	-9999.0	-9999.0
40.616	6.00	6.37	0.03	33.97	0.47	111.4	2.375	0.456	1.918	3.1	2.2	1.0E-07	-9999.0	-9999.0	0.266	0.6	-9999.0	-9999.0
40.682	6.20	6.55	0.02	32.40	0.31	111.4	2.378	0.458	1.920	3.1	2.3	1.0E-07	-9999.0	-9999.0	0.278	0.6	-9999.0	-9999.0
40.748	6.65	6.97	0.02	29.92	0.29	111.4	2.382	0.460	1.921	3.3	2.4	1.0E-07	-9999.0	-9999.0	0.306	0.6	-9999.0	-9999.0
40.813	5.87	6.18	0.02	28.76	0.32	111.4	2.385	0.463	1.923	3.0	2.1	1.0E-07	-9999.0	-9999.0	0.253	0.6	-9999.0	-9999.0
40.879	5.36	5.68	0.02	29.31	0.35	111.4	2.389	0.465	1.925	2.7	2.0	1.0E-07	-9999.0	-9999.0	0.219	0.6	-9999.0	-9999.0
40.944	4.85	5.18	0.02	30.19	0.39	111.4	2.393	0.467	1.926	2.5	1.8	1.0E-07	-9999.0	-9999.0	0.186	0.5	-9999.0	-9999.0
41.010	4.22	4.56	0.02	31.70	0.44	111.4	2.396	0.469	1.928	2.2	1.6	1.0E-07	-9999.0	-9999.0	0.144	0.5	-9999.0	-9999.0
41.076	4.41	4.76	0.03	32.23	0.63	111.4	2.400	0.471	1.929	2.3	1.6	1.0E-07	-9999.0	-9999.0	0.157	0.5	-9999.0	-9999.0
41.141	4.02	4.37	0.04	32.44	0.92	111.4	2.404	0.473	1.931	2.1	1.5	1.0E-07	-9999.0	-9999.0	0.131	0.5	-9999.0	-9999.0
41.207	4.15	4.50	0.02	32.69	0.45	111.4	2.407	0.475	1.933	2.2	1.6	1.0E-07	-9999.0	-9999.0	0.140	0.5	-9999.0	-9999.0
41.272	4.15	4.51	0.03	33.01	0.67	111.4	2.411	0.477	1.934	2.2	1.6	1.0E-07	-9999.0	-9999.0	0.140	0.5	-9999.0	-9999.0
41.338	3.58	3.94	0.07	33.36	1.78	111.4	2.415	0.479	1.936	1.9	1.4	1.0E-07	-9999.0	-9999.0	0.102	0.5	-9999.0	-9999.0
41.404	4.60	4.97	0.09	33.97	1.82	114.6	2.418	0.481	1.937	3.2	2.3	5.0E-07	-9999.0	-9999.0	0.170	0.5	-9999.0	-9999.0
41.469	5.36	5.73	0.12	33.93	2.10	114.6	2.422	0.483	1.939	3.7	2.6	5.0E-07	-9999.0	-9999.0	0.220	0.6	-9999.0	-9999.0
41.535	5.87	6.22	0.11	32.03	1.77	114.6	2.426	0.485	1.941	4.0	2.9	5.0E-07	-9999.0	-9999.0	0.253	0.6	-9999.0	-9999.0
41.601	7.35	7.68	0.13	30.46	1.70	114.6	2.430	0.487	1.943	3.7	2.6	5.0E-06	-9999.0	-9999.0	0.350	0.7	-9999.0	-9999.0
41.666	11.63	11.78	0.16	13.82	1.36	114.6	2.433	0.489	1.944	5.6	4.0	5.0E-06	-9999.0	-9999.0	0.623	1.1	-9999.0	-9999.0
41.732	14.18	14.37	0.19	17.01	1.33	114.6	2.437	0.491	1.946	5.5	3.9	5.0E-05	30.0	30.0	0.795	1.4	-9999.0	-9999.0
41.797	15.53	15.72	0.20	17.36	1.28	114.6	2.441	0.493	1.948	6.0	4.3	5.0E-05	30.0	30.0	0.885	1.5	-9999.0	-9999.0
41.863	12.78	12.95	0.20	15.39	1.55	114.6	2.445	0.495	1.949	6.2	4.4	5.0E-06	-9999.0	-9999.0	0.700	1.2	-9999.0	-9999.0
41.929	12.20	12.35	0.20	13.55	1.62	114.6	2.448	0.497	1.951	5.9	4.2	5.0E-06	-9999.0	-9999.0	0.660	1.1	-9999.0	-9999.0
41.994	14.37	14.52	0.20	13.53	1.38	114.6	2.452	0.499	1.953	5.6	4.0	5.0E-05	30.0	30.0	0.805	1.4	-9999.0	-9999.0
42.060	16.29	16.46	0.20	15.37	1.22	114.6	2.456	0.501	1.955	6.3	4.5	5.0E-05	30.0	30.0	0.933	1.6	-9999.0	-9999.0
42.125	19.30	19.49	0.20	18.15	1.03	114.6	2.460	0.503	1.956	7.5	5.3	5.0E-05	30.0	30.0	1.136	2.1	-9999.0	-9999.0
42.191	21.40	21.59	0.21	17.50	0.97	114.6	2.464	0.506	1.958	8.3	5.9	5.0E-05	30.0	30.0	1.275	2.5	-9999.0	-9999.0
42.257	21.65	21.80	0.22	13.69	1.01	114.6	2.467	0.508	1.960	8.4	6.0	5.0E-05	30.0	30.0	1.289	2.5	-9999.0	-9999.0
42.322	22.35	22.48	0.23	11.93	1.03	114.6	2.471	0.510	1.961	8.6	6.2	5.0E-05	30.0	30.0	1.334	2.6	-9999.0	-9999.0
42.388	23.13	23.24	0.23	10.81	0.99	114.6	2.475	0.512	1.963	8.9	6.4	5.0E-05	30.0	30.0	1.385	2.7	-9999.0	-9999.0
42.454	25.61	25.73	0.23	10.96	0.90	117.7	2.479	0.514	1.965	8.2	5.9	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
42.519	28.24	28.36	0.23	11.42	0.81	117.7	2.482	0.516	1.967	9.1	6.5	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
42.585	29.26	29.39	0.22	11.69	0.75	117.7	2.486	0.518	1.969	9.4	6.7	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
42.650	31.31	31.44	0.23	12.35	0.73	117.7	2.490	0.520	1.970	10.0	7.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
42.716	31.56	31.68	0.22	11.81	0.70	117.7	2.494	0.522	1.972	10.1	7.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
42.782	31.69	31.81	0.21	11.16	0.66	117.7	2.498	0.524	1.974	10.2	7.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
42.847	31.69	31.80	0.19	10.73	0.60	117.7	2.502	0.526	1.976	10.2	7.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
42.913	32.52	32.64	0.16	10.75	0.49	117.7	2.506	0.528	1.978	10.4	7.4	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
42.978	33.28	33.40	0.12	10.85	0.36	117.7	2.510	0.530	1.979	10.7	7.6	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
43.044	31.75	31.86	0.12	10.73	0.38	117.7	2.513	0.532	1.981	10.2	7.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
43.110	30.34	30.46	0.12	10.69	0.39	117.7	2.517	0.534	1.983	9.7	6.9	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
43.175	28.87	28.99	0.12	10.83	0.41	117.7	2.521	0.536	1.985	9.3	6.6	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
43.241	28.30	28.42	0.14	10.88	0.49	117.7	2.525	0.538	1.987	9.1	6.4	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
43.307	27.34	27.45	0.13	10.83	0.47	117.7	2.529	0.540	1.988	8.8	6.2	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
43.372	27.09	27.21	0.15	11.14	0.55	117.7	2.533	0.542	1.990	8.7	6.2	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
43.438	27.92	28.05	0.18	11.95	0.64	117.7	2.537	0.544	1.992	9.0	6.3	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
43.503	28.24	28.37	0.19	12.49	0.67	117.7	2.540	0.547	1.994	9.1	6.4	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
43.569	28.87	29.01	0.21	13.04	0.73	117.7	2.544	0.549	1.996	9.3	6.6	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
43.635	30.15	30.29	0.25	12.80	0.83	117.7	2.548	0.551	1.998	9.7	6.8	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
43.700	30.47	30.61	0.26	12.22	0.85	117.7	2.552	0.553	1.999	9.8	6.9	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
43.766	31.31	31.44	0.29	11.97	0.92	117.7	2.556	0.555	2.001	10.0	7.1	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
43.831	32.39	32.52	0.29	12.28	0.89	117.7	2.560	0.557	2.003	10.4	7.3	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
43.897	32.20	32.33	0.29	12.37	0.90	117.7	2.564	0.559	2.005	10.3	7.3	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
43.963	32.58	32.72	0.31	12.82	0.95	117.7	2.567	0.561	2.007	10.4	7.4	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
44.028	31.11	31.24	0.31	12.72	0.99	117.7	2.571	0.563	2.008	10.0	7.0	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
44.094	31.05	31.19	0.31	13.49	1.00	117.7	2.575	0.565	2.010	10.0	7.0	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
44.160	30.79	30.94	0.31	13.84	1.00	117.7	2.579	0.567	2.012	9.9	7.0	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
44.225	30.99	31.15	0.31	15.05	1.00	117.7	2.583	0.569	2.014	9.9	7.0	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
44.291	28.87	29.05	0.32	16.87	1.10	117.7	2.587	0.571	2.016	9.3	6.5	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
44.356	27.98	28.18	0.28	18.70	1.00	117.7	2.591	0.573	2.018	9.0	6.3	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
44.422	26.76	26.98	0.26	19.99	0.97	117.7	2.595	0.575	2.019	8.6	6.1	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
44.488	25.04	25.28	0.23	22.42	0.91	117.7	2.598	0.577	2.021	8.1	5.7	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
44.553	24.79	25.08	0.21	27.02	0.84	117.7	2.602	0.579	2.023	8.0	5.6	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
44.619	24.59	24.91	0.22	29.51	0.89	117.7	2.606	0.581	2.025	8.0	5.6	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
44.684	26.25	26.57	0.21	29.39	0.79	117.7	2.610	0.583	2.027	8.5	6.0	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
44.750	26.00	26.28	0.23	25.50	0.88	117.7	2.614	0.585	2.028	8.4	5.9	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
44.816	24.85	25.11	0.20	24.45	0.80	117.7	2.618	0.587	2.030	8.0	5.6	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
44.881	24.34	24.60	0.19	24.55	0.77	117.7	2.622	0.590	2.032	7.9	5.5	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
44.947	27.09	27.24	0.22	14.66	0.81	117.7	2.625	0.592	2.034	8.7	6.1	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
45.013	28.24	28.45	0.25	19.42	0.88	117.7	2.629	0.594	2.036	9.1	6.4	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
45.078	27.92	28.14	0.26	20.87	0.93	117.7	2.633	0.596	2.037	9.0	6.3	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
45.144	27.60	27.82	0.29	20.54	1.04	117.7	2.637	0.598	2.039	8.9	6.2	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
45.209	24.40	24.60	0.31	19.03	1.26	114.6	2.641	0.600	2.041	9.4	6.6	5.0E-05	30.0	30.0	1.464	2.8	-9999.0	-9999.0
45.275	21.40	21.60	0.33	18.13	1.53	114.6	2.645	0.602	2.043	8.3	5.8	5.0E-05	30.0	30.0	1.264	2.3	-9999.0	-9999.0
45.341	19.30	19.49	0.28	18.23	1.44	114.6	2.648	0.604	2.044	7.5	5.2	5.0E-05	30.0	30.0	1.123	2.0	-9999.0	-9999.0
45.406	16.99	17.20	0.26	19.28	1.52	114.6	2.652	0.606	2.046	6.6	4.6	5.0E-05	30.0	30.0	0.970	1.6	-9999.0	-9999.0
45.472	15.27	15.50	0.25	21.40	1.62	114.6	2.656	0.608	2.048	5.9	4.1	5.0E-05	30.0	30.0	0.856	1.4	-9999.0	-9999.0
45.538	12.58	12.87	0.24	26.41	1.87	114.6	2.660	0.610	2.050	6.2	4.3	5.0E-06	-9999.0	-9999.0	0.680	1.1	-9999.0	-9999.0
45.603	11.25	11.59	0.21	31.66	1.82	114.6	2.663	0.612	2.051	5.5	3.9	5.0E-06	-9999.0	-9999.0	0.595	1.0	-9999.0	-9999.0
45.669	10.22	10.59	0.17	33.62	1.61	114.6	2.667	0.614	2.053	5.1	3.5	5.0E-06	-9999.0	-9999.0	0.528	0.9	-9999.0	-9999.0
45.734	9.96	10.33	0.15	33.87	1.46	114.6	2.671	0.616	2.055	4.9	3.5	5.0E-06	-9999.0	-9999.0	0.511	0.9	-9999.0	-9999.0
45.800	10.35	10.72	0.12	34.46	1.12	114.6	2.675	0.618	2.056	5.1	3.6	5.0E-06	-9999.0	-9999.0	0.536	0.9	-9999.0	-9999.0
45.866	10.42	10.79	0.12	35.08	1.11	114.6	2.678	0.620	2.058	5.2	3.6	5.0E-06	-9999.0	-9999.0	0.541	0.9	-9999.0	-9999.0
45.931	9.96	10.35	0.13	35.93	1.26	114.6	2.682	0.622	2.060	5.0	3.5	5.0E-06	-9999.0	-9999.0	0.511	0.9	-9999.0	-9999.0
45.997	11.82	12.23	0.15	37.69	1.23	114.6	2.686	0.624	2.062	4.7	3.3	5.0E-05	30.0	30.0	0.636	1.0	-9999.0	-9999.0
46.062	17.44	17.86	0.17	38.53	0.95	114.6	2.690	0.626	2.063	6.8	4.8	5.0E-05	30.0	30.0	1.011	1.7	-9999.0	-9999.0
46.128	26.70	27.06	0.21	32.81	0.78	117.7	2.694	0.628	2.065	8.6	6.0	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
46.194	31.24	31.50	0.24	24.14	0.76	117.7	2.697	0.631	2.067	10.1	7.0	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
46.259	31.75	31.95	0.29	18.68	0.91	117.7	2.701	0.633	2.069	10.2	7.1	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
46.325	30.60	30.78	0.35	16.49	1.14	117.7	2.705	0.635	2.071	9.8	6.8	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
46.391	29.26	29.43	0.35	15.88	1.19	117.7	2.709	0.637	2.072	9.4	6.5	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
46.456	28.49	28.66	0.35	15.43	1.22	117.7	2.713	0.639	2.074	9.1	6.4	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
46.522	26.90	27.06	0.34	15.07	1.26	114.6	2.717	0.641	2.076	10.4	7.2	5.0E-05	30.0	30.0	1.623	3.2	-9999.0	-9999.0
46.587	25.87	26.04	0.33	15.23	1.27	114.6	2.720	0.643	2.078	10.0	6.9	5.0E-05	30.0	30.0	1.554	3.0	-9999.0	-9999.0
46.653	26.63	26.81	0.31	16.63	1.16	117.7	2.724	0.645	2.079	8.6	5.9	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
46.719	28.81	29.02	0.34	19.38	1.17	117.7	2.728	0.647	2.081	9.3	6.4	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
46.784	31.69	31.89	0.34	19.26	1.07	117.7	2.732	0.649	2.083	10.2	7.1	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
46.850	33.41	33.59	0.35	16.49	1.04	117.7	2.736	0.651	2.085	10.7	7.4	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
46.915	34.68	34.85	0.36	15.01	1.04	117.7	2.740	0.653	2.087	11.1	7.7	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
46.981	35.00	35.16	0.34	14.28	0.97	117.7	2.744	0.655	2.088	11.2	7.8	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
47.047	35.71	35.86	0.34	13.88	0.95	117.7	2.747	0.657	2.090	11.4	7.9	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
47.112	35.78	35.92	0.34	13.65	0.95	117.7	2.751	0.659	2.092	11.5	7.9	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
47.178	35.14	35.28	0.32	13.41	0.91	117.7	2.755	0.661	2.094	11.3	7.8	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
47.244	35.14	35.28	0.30	13.45	0.85	117.7	2.759	0.663	2.096	11.3	7.8	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
47.309	32.45	32.59	0.30	13.12	0.92	117.7	2.763	0.665	2.098	10.4	7.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
47.375	29.64	29.78	0.32	13.06	1.08	117.7	2.767	0.667	2.099	9.5	6.6	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
47.440	25.74	25.88	0.35	12.90	1.36	114.6	2.771	0.669	2.101	9.9	6.8	5.0E-05	30.0	30.0	1.541	2.9	-9999.0	-9999.0
47.506	21.97	22.11	0.34	12.92	1.54	114.6	2.774	0.671	2.103	8.5	5.8	5.0E-05	30.0	30.0	1.289	2.3	-9999.0	-9999.0
47.572	18.72	18.85	0.34	12.84	1.81	114.6	2.778	0.674	2.105	7.2	5.0	5.0E-05	30.0	30.0	1.072	1.8	-9999.0	-9999.0
47.637	16.80	16.94	0.33	13.27	1.95	114.6	2.782	0.676	2.106	6.5	4.5	5.0E-05	30.0	30.0	0.944	1.5	-9999.0	-9999.0
47.703	15.53	15.68	0.31	13.79	1.98	114.6	2.786	0.678	2.108	7.5	5.2	5.0E-06	-9999.0	-9999.0	0.859	1.4	-9999.0	-9999.0
47.768	13.29	13.47	0.21	16.04	1.56	114.6	2.789	0.680	2.110	6.4	4.4	5.0E-06	-9999.0	-9999.0	0.712	1.1	-9999.0	-9999.0
47.834	11.50	11.78	0.18	26.49	1.53	114.6	2.793	0.682	2.111	5.6	3.9	5.0E-06	-9999.0	-9999.0	0.599	1.0	-9999.0	-9999.0
47.900	10.42	10.77	0.20	33.03	1.86	114.6	2.797	0.684	2.113	5.2	3.5	5.0E-06	-9999.0	-9999.0	0.532	0.9	-9999.0	-9999.0
47.965	9.39	9.75	0.16	33.24	1.64	114.6	2.801	0.686	2.115	4.7	3.2	5.0E-06	-9999.0	-9999.0	0.463	0.8	-9999.0	-9999.0
48.031	8.94	9.31	0.10	33.93	1.08	114.6	2.804	0.688	2.116	4.5	3.1	5.0E-06	-9999.0	-9999.0	0.434	0.7	-9999.0	-9999.0
48.097	12.01	12.21	0.08	18.96	0.66	114.6	2.808	0.690	2.118	4.7	3.2	5.0E-05	30.0	30.0	0.627	1.0	-9999.0	-9999.0
48.162	10.35	10.60	0.06	23.94	0.57	114.6	2.812	0.692	2.120	4.1	2.8	5.0E-05	30.0	30.0	0.519	0.8	-9999.0	-9999.0
48.228	9.58	9.89	0.05	28.74	0.51	114.6	2.816	0.694	2.122	3.8	2.6	5.0E-05	30.0	30.0	0.472	0.8	-9999.0	-9999.0
48.293	8.43	8.76	0.04	30.83	0.46	111.4	2.819	0.696	2.123	4.2	2.9	1.0E-07	-9999.0	-9999.0	0.396	0.7	-9999.0	-9999.0
48.359	7.92	8.27	0.02	32.11	0.24	111.4	2.823	0.698	2.125	4.0	2.7	1.0E-07	-9999.0	-9999.0	0.363	0.7	-9999.0	-9999.0
48.425	7.41	7.78	0.02	34.07	0.26	111.4	2.827	0.700	2.126	3.7	2.6	1.0E-07	-9999.0	-9999.0	0.330	0.6	-9999.0	-9999.0
48.490	6.39	6.77	0.02	35.73	0.30	111.4	2.830	0.702	2.128	3.2	2.2	1.0E-07	-9999.0	-9999.0	0.263	0.6	-9999.0	-9999.0
48.556	5.94	6.34	0.03	36.68	0.47	111.4	2.834	0.704	2.130	3.0	2.1	1.0E-07	-9999.0	-9999.0	0.234	0.6	-9999.0	-9999.0
48.621	5.49	5.90	0.02	37.55	0.34	111.4	2.838	0.706	2.131	2.8	1.9	1.0E-07	-9999.0	-9999.0	0.204	0.5	-9999.0	-9999.0
48.687	4.28	4.70	0.01	38.53	0.21	111.4	2.841	0.708	2.133	2.2	1.5	1.0E-07	-9999.0	-9999.0	0.124	0.5	-9999.0	-9999.0
48.753	4.98	5.41	0.01	39.51	0.19	111.4	2.845	0.710	2.135	2.6	1.8	1.0E-07	-9999.0	-9999.0	0.171	0.5	-9999.0	-9999.0
48.818	5.68	6.11	0.02	39.07	0.33	111.4	2.849	0.712	2.136	2.9	2.0	1.0E-07	-9999.0	-9999.0	0.217	0.5	-9999.0	-9999.0
48.884	5.62	6.04	0.02	38.53	0.33	111.4	2.852	0.715	2.138	2.9	2.0	1.0E-07	-9999.0	-9999.0	0.213	0.5	-9999.0	-9999.0
48.950	4.79	5.21	0.02	38.34	0.39	111.4	2.856	0.717	2.139	2.5	1.7	1.0E-07	-9999.0	-9999.0	0.157	0.5	-9999.0	-9999.0
49.015	4.41	4.82	0.02	38.08	0.42	111.4	2.860	0.719	2.141	2.3	1.6	1.0E-07	-9999.0	-9999.0	0.131	0.5	-9999.0	-9999.0
49.081	4.41	4.83	0.01	38.40	0.21	111.4	2.863	0.721	2.143	2.3	1.6	1.0E-07	-9999.0	-9999.0	0.131	0.5	-9999.0	-9999.0
49.146	4.15	4.57	0.02	38.67	0.44	111.4	2.867	0.723	2.144	2.2	1.5	1.0E-07	-9999.0	-9999.0	0.113	0.5	-9999.0	-9999.0
49.212	3.64	4.06	0.01	39.41	0.25	111.4	2.871	0.725	2.146	1.9	1.3	1.0E-07	-9999.0	-9999.0	0.080	0.5	-9999.0	-9999.0
49.278	4.22	4.67	0.02	41.22	0.43	111.4	2.874	0.727	2.147	2.2	1.5	1.0E-07	-9999.0	-9999.0	0.119	0.5	-9999.0	-9999.0
49.343	4.60	5.06	0.02	42.15	0.40	111.4	2.878	0.729	2.149	2.4	1.7	1.0E-07	-9999.0	-9999.0	0.145	0.5	-9999.0	-9999.0
49.409	5.36	5.81	0.02	41.42	0.35	111.4	2.881	0.731	2.151	2.8	1.9	1.0E-07	-9999.0	-9999.0	0.195	0.5	-9999.0	-9999.0
49.474	6.13	6.57	0.03	39.94	0.46	111.4	2.885	0.733	2.152	3.1	2.1	1.0E-07	-9999.0	-9999.0	0.245	0.6	-9999.0	-9999.0
49.540	6.65	7.07	0.02	39.19	0.28	111.4	2.889	0.735	2.154	3.4	2.3	1.0E-07	-9999.0	-9999.0	0.279	0.6	-9999.0	-9999.0
49.606	7.79	8.21	0.02	38.93	0.24	111.4	2.892	0.737	2.155	3.9	2.7	1.0E-07	-9999.0	-9999.0	0.354	0.7	-9999.0	-9999.0
49.671	7.99	8.40	0.01	37.59	0.12	111.4	2.896	0.739	2.157	4.0	2.7	1.0E-07	-9999.0	-9999.0	0.367	0.7	-9999.0	-9999.0
49.737	7.28	7.68	0.02	37.16	0.26	111.4	2.900	0.741	2.159	3.7	2.5	1.0E-07	-9999.0	-9999.0	0.319	0.6	-9999.0	-9999.0
49.803	7.35	7.75	0.01	36.86	0.13	111.4	2.903	0.743	2.160	3.7	2.5	1.0E-07	-9999.0	-9999.0	0.323	0.6	-9999.0	-9999.0
49.868	6.06	6.46	0.02	36.54	0.31	111.4	2.907	0.745	2.162	3.1	2.1	1.0E-07	-9999.0	-9999.0	0.237	0.6	-9999.0	-9999.0
49.934	5.17	5.58	0.01	37.57	0.18	111.4	2.911	0.747	2.163	2.7	1.8	1.0E-07	-9999.0	-9999.0	0.178	0.5	-9999.0	-9999.0
49.999	4.28	4.70	0.01	38.75	0.21	111.4	2.914	0.749	2.165	2.3	1.5	1.0E-07	-9999.0	-9999.0	0.119	0.5	-9999.0	-9999.0
50.065	4.34	4.77	0.01	40.04	0.21	111.4	2.918	0.751	2.167	2.3	1.6	1.0E-07	-9999.0	-9999.0	0.124	0.5	-9999.0	-9999.0
50.131	4.15	4.59	0.01	40.96	0.22	111.4	2.922	0.753	2.168	2.2	1.5	1.0E-07	-9999.0	-9999.0	0.111	0.5	-9999.0	-9999.0
50.196	4.15	4.60	0.01	41.64	0.22	111.4	2.925	0.755	2.170	2.2	1.5	1.0E-07	-9999.0	-9999.0	0.112	0.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
50.262	3.45	3.90	0.01	42.05	0.26	111.4	2.929	0.758	2.171	1.9	1.3	1.0E-07	-9999.0	-9999.0	0.065	0.5	-9999.0	-9999.0
50.327	2.94	3.39	0.01	42.11	0.30	111.4	2.933	0.760	2.173	1.6	1.1	1.0E-07	-9999.0	-9999.0	0.031	0.5	-9999.0	-9999.0
50.393	2.75	3.20	0.01	41.88	0.31	111.4	2.936	0.762	2.175	1.5	1.0	1.0E-07	-9999.0	-9999.0	0.018	0.5	-9999.0	-9999.0
50.459	3.51	3.96	0.01	42.03	0.25	111.4	2.940	0.764	2.176	1.9	1.3	1.0E-07	-9999.0	-9999.0	0.068	0.5	-9999.0	-9999.0
50.524	3.26	3.72	0.01	42.41	0.27	111.4	2.944	0.766	2.178	1.8	1.2	1.0E-07	-9999.0	-9999.0	0.052	0.5	-9999.0	-9999.0
50.590	2.75	3.20	0.01	42.27	0.31	111.4	2.947	0.768	2.179	1.5	1.0	1.0E-07	-9999.0	-9999.0	0.017	0.5	-9999.0	-9999.0
50.656	4.09	4.55	0.01	42.76	0.22	111.4	2.951	0.770	2.181	2.2	1.5	1.0E-07	-9999.0	-9999.0	0.107	0.5	-9999.0	-9999.0
50.721	4.85	5.30	0.01	41.60	0.19	111.4	2.955	0.772	2.183	2.5	1.7	1.0E-07	-9999.0	-9999.0	0.156	0.5	-9999.0	-9999.0
50.787	4.79	5.22	0.01	39.47	0.19	111.4	2.958	0.774	2.184	2.5	1.7	1.0E-07	-9999.0	-9999.0	0.151	0.5	-9999.0	-9999.0
50.852	5.24	5.66	0.02	38.59	0.35	111.4	2.962	0.776	2.186	2.7	1.8	1.0E-07	-9999.0	-9999.0	0.180	0.5	-9999.0	-9999.0
50.918	5.17	5.59	0.01	38.81	0.18	111.4	2.966	0.778	2.188	2.7	1.8	1.0E-07	-9999.0	-9999.0	0.175	0.5	-9999.0	-9999.0
50.984	4.79	5.22	0.02	39.27	0.38	111.4	2.969	0.780	2.189	2.5	1.7	1.0E-07	-9999.0	-9999.0	0.150	0.5	-9999.0	-9999.0
51.049	4.79	5.24	0.09	41.31	1.72	114.6	2.973	0.782	2.191	3.3	2.3	5.0E-07	-9999.0	-9999.0	0.151	0.5	-9999.0	-9999.0
51.115	5.04	5.50	0.09	42.76	1.64	111.4	2.977	0.784	2.192	2.6	1.8	1.0E-07	-9999.0	-9999.0	0.169	0.5	-9999.0	-9999.0
51.180	6.33	6.78	0.11	41.80	1.63	114.6	2.980	0.786	2.194	3.2	2.2	5.0E-06	-9999.0	-9999.0	0.253	0.6	-9999.0	-9999.0
51.246	7.16	7.55	0.13	36.26	1.73	114.6	2.984	0.788	2.196	3.6	2.4	5.0E-06	-9999.0	-9999.0	0.304	0.6	-9999.0	-9999.0
51.312	7.22	7.60	0.12	35.40	1.58	114.6	2.988	0.790	2.198	3.6	2.5	5.0E-06	-9999.0	-9999.0	0.307	0.6	-9999.0	-9999.0
51.377	10.09	10.29	0.13	18.25	1.27	114.6	2.992	0.792	2.199	4.9	3.3	5.0E-06	-9999.0	-9999.0	0.487	0.8	-9999.0	-9999.0
51.443	8.62	8.90	0.12	25.52	1.35	114.6	2.995	0.794	2.201	4.3	2.9	5.0E-06	-9999.0	-9999.0	0.393	0.7	-9999.0	-9999.0
51.509	7.16	7.50	0.13	31.54	1.74	114.6	2.999	0.796	2.203	3.6	2.4	5.0E-06	-9999.0	-9999.0	0.300	0.6	-9999.0	-9999.0
51.574	7.28	7.66	0.12	34.96	1.57	114.6	3.003	0.798	2.204	3.7	2.5	5.0E-06	-9999.0	-9999.0	0.310	0.6	-9999.0	-9999.0
51.640	5.36	5.76	0.10	36.75	1.74	114.6	3.007	0.801	2.206	3.7	2.5	5.0E-07	-9999.0	-9999.0	0.184	0.5	-9999.0	-9999.0
51.705	5.17	5.59	0.08	39.01	1.43	111.4	3.010	0.803	2.208	2.7	1.8	1.0E-07	-9999.0	-9999.0	0.172	0.5	-9999.0	-9999.0
51.771	4.79	5.24	0.08	41.42	1.53	111.4	3.014	0.805	2.209	2.5	1.7	1.0E-07	-9999.0	-9999.0	0.148	0.5	-9999.0	-9999.0
51.837	5.62	6.08	0.07	42.23	1.15	111.4	3.018	0.807	2.211	2.9	2.0	1.0E-07	-9999.0	-9999.0	0.204	0.5	-9999.0	-9999.0
51.902	5.55	6.00	0.06	41.02	1.00	111.4	3.021	0.809	2.213	2.9	1.9	1.0E-07	-9999.0	-9999.0	0.198	0.5	-9999.0	-9999.0
51.968	5.68	6.11	0.06	39.78	0.98	111.4	3.025	0.811	2.214	2.9	2.0	1.0E-07	-9999.0	-9999.0	0.206	0.5	-9999.0	-9999.0
52.033	5.11	5.54	0.06	39.55	1.09	111.4	3.029	0.813	2.216	2.7	1.8	1.0E-07	-9999.0	-9999.0	0.167	0.5	-9999.0	-9999.0
52.099	4.66	5.10	0.06	40.88	1.18	111.4	3.032	0.815	2.217	2.4	1.6	1.0E-07	-9999.0	-9999.0	0.138	0.5	-9999.0	-9999.0
52.165	4.79	5.24	0.06	41.37	1.15	111.4	3.036	0.817	2.219	2.5	1.7	1.0E-07	-9999.0	-9999.0	0.147	0.5	-9999.0	-9999.0
52.230	4.22	4.68	0.06	42.86	1.28	111.4	3.040	0.819	2.221	2.2	1.5	1.0E-07	-9999.0	-9999.0	0.110	0.5	-9999.0	-9999.0
52.296	4.79	5.27	0.05	44.03	0.95	111.4	3.043	0.821	2.222	2.5	1.7	1.0E-07	-9999.0	-9999.0	0.148	0.5	-9999.0	-9999.0
52.362	5.11	5.58	0.04	43.64	0.72	111.4	3.047	0.823	2.224	2.7	1.8	1.0E-07	-9999.0	-9999.0	0.169	0.5	-9999.0	-9999.0
52.427	4.92	5.39	0.03	43.60	0.56	111.4	3.051	0.825	2.225	2.6	1.7	1.0E-07	-9999.0	-9999.0	0.156	0.5	-9999.0	-9999.0
52.493	4.79	5.26	0.03	43.27	0.57	111.4	3.054	0.827	2.227	2.5	1.7	1.0E-07	-9999.0	-9999.0	0.147	0.5	-9999.0	-9999.0
52.558	4.92	5.39	0.03	43.27	0.56	111.4	3.058	0.829	2.229	2.6	1.7	1.0E-07	-9999.0	-9999.0	0.155	0.5	-9999.0	-9999.0
52.624	5.24	5.71	0.03	43.12	0.53	111.4	3.061	0.831	2.230	2.7	1.8	1.0E-07	-9999.0	-9999.0	0.176	0.5	-9999.0	-9999.0
52.690	5.75	6.22	0.03	43.08	0.48	111.4	3.065	0.833	2.232	3.0	2.0	1.0E-07	-9999.0	-9999.0	0.210	0.5	-9999.0	-9999.0
52.755	5.62	6.09	0.04	42.76	0.66	111.4	3.069	0.835	2.233	2.9	2.0	1.0E-07	-9999.0	-9999.0	0.201	0.5	-9999.0	-9999.0
52.821	6.52	6.97	0.05	42.19	0.72	111.4	3.072	0.837	2.235	3.3	2.2	1.0E-07	-9999.0	-9999.0	0.260	0.6	-9999.0	-9999.0
52.886	6.46	6.90	0.05	41.16	0.73	111.4	3.076	0.839	2.237	3.3	2.2	1.0E-07	-9999.0	-9999.0	0.255	0.6	-9999.0	-9999.0
52.952	6.20	6.64	0.06	40.82	0.91	111.4	3.080	0.842	2.238	3.2	2.1	1.0E-07	-9999.0	-9999.0	0.237	0.5	-9999.0	-9999.0
53.018	5.04	5.48	0.07	40.92	1.28	111.4	3.083	0.844	2.240	2.6	1.8	1.0E-07	-9999.0	-9999.0	0.160	0.5	-9999.0	-9999.0
53.083	4.47	4.92	0.07	41.37	1.43	111.4	3.087	0.846	2.241	2.4	1.6	1.0E-07	-9999.0	-9999.0	0.122	0.5	-9999.0	-9999.0
53.149	4.34	4.81	0.06	43.60	1.25	111.4	3.091	0.848	2.243	2.3	1.5	1.0E-07	-9999.0	-9999.0	0.115	0.5	-9999.0	-9999.0
53.215	3.83	4.33	0.05	46.73	1.16	111.4	3.094	0.850	2.245	2.1	1.4	1.0E-07	-9999.0	-9999.0	0.083	0.5	-9999.0	-9999.0
53.280	4.22	4.73	0.05	46.81	1.06	111.4	3.098	0.852	2.246	2.3	1.5	1.0E-07	-9999.0	-9999.0	0.109	0.5	-9999.0	-9999.0
53.346	5.49	5.99	0.04	46.07	0.67	111.4	3.102	0.854	2.248	2.9	1.9	1.0E-07	-9999.0	-9999.0	0.193	0.5	-9999.0	-9999.0
53.411	5.81	6.30	0.03	44.64	0.48	111.4	3.105	0.856	2.249	3.0	2.0	1.0E-07	-9999.0	-9999.0	0.213	0.5	-9999.0	-9999.0
53.477	5.55	6.02	0.04	43.53	0.67	111.4	3.109	0.858	2.251	2.9	1.9	1.0E-07	-9999.0	-9999.0	0.194	0.5	-9999.0	-9999.0
53.543	5.55	6.02	0.04	43.10	0.67	111.4	3.113	0.860	2.253	2.9	1.9	1.0E-07	-9999.0	-9999.0	0.194	0.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
53.608	6.33	6.79	0.05	43.17	0.74	111.4	3.116	0.862	2.254	3.3	2.2	1.0E-07	-9999.0	-9999.0	0.245	0.6	-9999.0	-9999.0
53.674	5.43	5.90	0.06	43.12	1.02	111.4	3.120	0.864	2.256	2.8	1.9	1.0E-07	-9999.0	-9999.0	0.185	0.5	-9999.0	-9999.0
53.740	6.27	6.74	0.06	43.66	0.89	111.4	3.124	0.866	2.258	3.2	2.1	1.0E-07	-9999.0	-9999.0	0.241	0.5	-9999.0	-9999.0
53.805	7.16	7.62	0.06	43.27	0.79	111.4	3.127	0.868	2.259	3.7	2.4	1.0E-07	-9999.0	-9999.0	0.300	0.6	-9999.0	-9999.0
53.871	6.46	6.91	0.07	42.37	1.01	111.4	3.131	0.870	2.261	3.3	2.2	1.0E-07	-9999.0	-9999.0	0.252	0.6	-9999.0	-9999.0
53.936	6.78	7.23	0.07	41.96	0.97	111.4	3.135	0.872	2.262	3.5	2.3	1.0E-07	-9999.0	-9999.0	0.273	0.6	-9999.0	-9999.0
54.002	7.09	7.54	0.08	42.01	1.06	111.4	3.138	0.874	2.264	3.6	2.4	1.0E-07	-9999.0	-9999.0	0.294	0.6	-9999.0	-9999.0
54.068	6.13	6.59	0.08	42.27	1.22	111.4	3.142	0.876	2.266	3.2	2.1	1.0E-07	-9999.0	-9999.0	0.230	0.5	-9999.0	-9999.0
54.133	5.81	6.28	0.08	43.27	1.28	111.4	3.146	0.878	2.267	3.0	2.0	1.0E-07	-9999.0	-9999.0	0.209	0.5	-9999.0	-9999.0
54.199	5.30	5.78	0.08	44.05	1.39	111.4	3.149	0.880	2.269	2.8	1.8	1.0E-07	-9999.0	-9999.0	0.175	0.5	-9999.0	-9999.0
54.264	4.73	5.22	0.07	44.95	1.35	111.4	3.153	0.882	2.270	2.5	1.7	1.0E-07	-9999.0	-9999.0	0.138	0.5	-9999.0	-9999.0
54.330	5.30	5.80	0.12	46.32	2.07	114.6	3.157	0.885	2.272	3.7	2.5	5.0E-07	-9999.0	-9999.0	0.176	0.5	-9999.0	-9999.0
54.396	5.49	5.99	0.10	46.01	1.67	114.6	3.160	0.887	2.274	3.8	2.5	5.0E-07	-9999.0	-9999.0	0.189	0.5	-9999.0	-9999.0
54.461	5.62	6.12	0.09	45.85	1.47	111.4	3.164	0.889	2.275	2.9	1.9	1.0E-07	-9999.0	-9999.0	0.197	0.5	-9999.0	-9999.0
54.527	5.04	5.54	0.09	45.68	1.63	111.4	3.168	0.891	2.277	2.7	1.8	1.0E-07	-9999.0	-9999.0	0.158	0.5	-9999.0	-9999.0
54.593	4.73	5.22	0.08	45.19	1.54	111.4	3.171	0.893	2.279	2.5	1.7	1.0E-07	-9999.0	-9999.0	0.137	0.5	-9999.0	-9999.0
54.658	8.05	8.33	0.08	25.55	0.96	114.6	3.175	0.895	2.280	4.0	2.6	5.0E-06	-9999.0	-9999.0	0.343	0.6	-9999.0	-9999.0
54.724	7.03	7.36	0.07	31.05	0.95	111.4	3.179	0.897	2.282	3.5	2.3	1.0E-07	-9999.0	-9999.0	0.279	0.6	-9999.0	-9999.0
54.789	6.33	6.72	0.07	36.38	1.04	111.4	3.182	0.899	2.284	3.2	2.1	1.0E-07	-9999.0	-9999.0	0.236	0.5	-9999.0	-9999.0
54.855	6.06	6.49	0.06	39.61	0.93	111.4	3.186	0.901	2.285	3.1	2.1	1.0E-07	-9999.0	-9999.0	0.220	0.5	-9999.0	-9999.0
54.921	5.94	6.39	0.05	41.64	0.78	111.4	3.190	0.903	2.287	3.1	2.0	1.0E-07	-9999.0	-9999.0	0.214	0.5	-9999.0	-9999.0
54.986	5.55	6.02	0.05	43.17	0.83	111.4	3.193	0.905	2.288	2.9	1.9	1.0E-07	-9999.0	-9999.0	0.188	0.5	-9999.0	-9999.0
55.052	5.11	5.59	0.06	44.05	1.08	111.4	3.197	0.907	2.290	2.7	1.8	1.0E-07	-9999.0	-9999.0	0.159	0.5	-9999.0	-9999.0
55.117	5.24	5.73	0.07	45.33	1.22	111.4	3.201	0.909	2.292	2.7	1.8	1.0E-07	-9999.0	-9999.0	0.169	0.5	-9999.0	-9999.0
55.183	4.79	5.30	0.08	46.77	1.51	111.4	3.204	0.911	2.293	2.5	1.7	1.0E-07	-9999.0	-9999.0	0.140	0.5	-9999.0	-9999.0
55.249	4.47	5.00	0.08	48.65	1.61	111.4	3.208	0.913	2.295	2.4	1.6	1.0E-07	-9999.0	-9999.0	0.119	0.5	-9999.0	-9999.0
55.314	6.39	6.97	0.08	53.88	1.15	111.4	3.212	0.915	2.296	3.3	2.2	1.0E-07	-9999.0	-9999.0	0.250	0.6	-9999.0	-9999.0
55.380	7.41	8.02	0.10	56.90	1.25	114.6	3.215	0.917	2.298	3.8	2.5	5.0E-06	-9999.0	-9999.0	0.320	0.6	-9999.0	-9999.0
55.446	7.60	8.27	0.11	62.14	1.33	114.6	3.219	0.919	2.300	4.0	2.6	5.0E-06	-9999.0	-9999.0	0.337	0.6	-9999.0	-9999.0
55.511	7.99	8.70	0.12	65.38	1.38	114.6	3.223	0.921	2.301	4.2	2.7	5.0E-06	-9999.0	-9999.0	0.365	0.6	-9999.0	-9999.0
55.577	7.60	8.31	0.12	65.73	1.45	114.6	3.227	0.923	2.303	4.0	2.6	5.0E-06	-9999.0	-9999.0	0.339	0.6	-9999.0	-9999.0
55.642	6.84	7.54	0.12	65.57	1.59	114.6	3.230	0.926	2.305	3.6	2.4	5.0E-06	-9999.0	-9999.0	0.288	0.6	-9999.0	-9999.0
55.708	7.60	8.31	0.12	66.27	1.45	114.6	3.234	0.928	2.307	4.0	2.6	5.0E-06	-9999.0	-9999.0	0.339	0.6	-9999.0	-9999.0
55.774	7.67	8.39	0.13	66.47	1.55	114.6	3.238	0.930	2.308	4.0	2.6	5.0E-06	-9999.0	-9999.0	0.343	0.6	-9999.0	-9999.0
55.839	8.05	8.78	0.14	67.31	1.60	114.6	3.242	0.932	2.310	4.2	2.8	5.0E-06	-9999.0	-9999.0	0.369	0.6	-9999.0	-9999.0
55.905	7.86	8.59	0.13	67.96	1.52	114.6	3.245	0.934	2.312	4.1	2.7	5.0E-06	-9999.0	-9999.0	0.357	0.6	-9999.0	-9999.0
55.970	8.18	8.91	0.13	67.45	1.46	114.6	3.249	0.936	2.313	4.3	2.8	5.0E-06	-9999.0	-9999.0	0.377	0.6	-9999.0	-9999.0
56.036	7.60	8.32	0.13	66.96	1.57	114.6	3.253	0.938	2.315	4.0	2.6	5.0E-06	-9999.0	-9999.0	0.338	0.6	-9999.0	-9999.0
56.102	7.48	8.20	0.14	67.10	1.71	114.6	3.257	0.940	2.317	3.9	2.6	5.0E-06	-9999.0	-9999.0	0.330	0.6	-9999.0	-9999.0
56.167	8.30	9.03	0.13	67.29	1.44	114.6	3.260	0.942	2.319	4.3	2.8	5.0E-06	-9999.0	-9999.0	0.384	0.7	-9999.0	-9999.0
56.233	7.16	7.88	0.13	66.86	1.65	114.6	3.264	0.944	2.320	3.8	2.5	5.0E-06	-9999.0	-9999.0	0.308	0.6	-9999.0	-9999.0
56.299	7.41	8.11	0.13	65.40	1.61	114.6	3.268	0.946	2.322	3.9	2.6	5.0E-06	-9999.0	-9999.0	0.323	0.6	-9999.0	-9999.0
56.364	7.09	7.81	0.13	66.59	1.67	114.6	3.272	0.948	2.324	3.7	2.5	5.0E-06	-9999.0	-9999.0	0.302	0.6	-9999.0	-9999.0
56.430	7.60	8.33	0.14	68.09	1.68	114.6	3.276	0.950	2.325	4.0	2.6	5.0E-06	-9999.0	-9999.0	0.337	0.6	-9999.0	-9999.0
56.495	7.79	8.54	0.13	69.35	1.53	114.6	3.279	0.952	2.327	4.1	2.7	5.0E-06	-9999.0	-9999.0	0.351	0.6	-9999.0	-9999.0
56.561	7.41	8.17	0.13	70.91	1.59	114.6	3.283	0.954	2.329	3.9	2.6	5.0E-06	-9999.0	-9999.0	0.326	0.6	-9999.0	-9999.0
56.627	7.54	8.29	0.13	69.78	1.57	114.6	3.287	0.956	2.331	4.0	2.6	5.0E-06	-9999.0	-9999.0	0.334	0.6	-9999.0	-9999.0
56.692	7.41	8.15	0.14	68.90	1.72	114.6	3.291	0.958	2.332	3.9	2.6	5.0E-06	-9999.0	-9999.0	0.324	0.6	-9999.0	-9999.0
56.758	7.54	8.30	0.15	70.58	1.81	114.6	3.294	0.960	2.334	4.0	2.6	5.0E-06	-9999.0	-9999.0	0.334	0.6	-9999.0	-9999.0
56.823	7.79	8.55	0.17	70.06	1.99	114.6	3.298	0.962	2.336	4.1	2.7	5.0E-06	-9999.0	-9999.0	0.350	0.6	-9999.0	-9999.0
56.889	7.86	8.61	0.20	69.62	2.33	114.6	3.302	0.964	2.337	4.1	2.7	5.0E-06	-9999.0	-9999.0	0.354	0.6	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
56.955	7.67	8.41	0.19	68.84	2.26	114.6	3.306	0.966	2.339	4.0	2.6	5.0E-06	-9999.0	-9999.0	0.340	0.6	-9999.0	-9999.0
57.020	7.73	8.48	0.31	69.60	3.66	111.4	3.309	0.969	2.341	8.1	5.3	5.0E-08	-9999.0	-9999.0	0.345	0.6	-9999.0	-9999.0
57.086	7.99	8.77	0.40	72.03	4.57	111.4	3.313	0.971	2.342	8.4	5.5	5.0E-08	-9999.0	-9999.0	0.364	0.6	-9999.0	-9999.0
57.152	13.03	13.84	0.43	74.54	3.12	114.6	3.317	0.973	2.344	8.8	5.8	5.0E-07	-9999.0	-9999.0	0.701	1.0	-9999.0	-9999.0
57.217	24.15	24.87	0.57	66.92	2.30	114.6	3.320	0.975	2.346	9.5	6.2	5.0E-05	30.0	30.0	1.437	2.3	-9999.0	-9999.0
57.283	33.35	33.68	0.50	30.64	1.49	117.7	3.324	0.977	2.347	10.8	7.0	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
57.348	31.50	31.63	0.56	12.39	1.77	114.6	3.328	0.979	2.349	12.1	7.9	5.0E-05	30.0	30.0	1.887	3.3	-9999.0	-9999.0
57.414	25.04	25.20	0.50	14.58	1.99	114.6	3.332	0.981	2.351	9.7	6.3	5.0E-05	30.0	30.0	1.458	2.3	-9999.0	-9999.0
57.480	21.46	21.65	0.44	17.66	2.04	114.6	3.336	0.983	2.353	8.3	5.4	5.0E-05	30.0	30.0	1.221	1.8	-9999.0	-9999.0
57.545	19.61	19.96	0.44	32.17	2.21	114.6	3.339	0.985	2.354	7.6	5.0	5.0E-05	30.0	30.0	1.108	1.6	-9999.0	-9999.0
57.611	16.16	16.72	0.47	51.59	2.82	114.6	3.343	0.987	2.356	8.0	5.2	5.0E-06	-9999.0	-9999.0	0.892	1.3	-9999.0	-9999.0
57.676	13.92	14.42	0.42	45.74	2.92	114.6	3.347	0.989	2.358	6.9	4.5	5.0E-06	-9999.0	-9999.0	0.738	1.0	-9999.0	-9999.0
57.742	11.05	11.40	0.30	32.46	2.64	114.6	3.351	0.991	2.360	5.5	3.6	5.0E-06	-9999.0	-9999.0	0.536	0.8	-9999.0	-9999.0
57.808	9.64	10.05	0.19	37.53	1.90	114.6	3.354	0.993	2.361	4.8	3.1	5.0E-06	-9999.0	-9999.0	0.446	0.7	-9999.0	-9999.0
57.873	8.62	9.08	0.14	42.25	1.55	114.6	3.358	0.995	2.363	4.3	2.8	5.0E-06	-9999.0	-9999.0	0.381	0.6	-9999.0	-9999.0
57.939	8.43	8.96	0.15	48.99	1.68	114.6	3.362	0.997	2.365	4.3	2.8	5.0E-06	-9999.0	-9999.0	0.373	0.6	-9999.0	-9999.0
58.005	8.62	9.24	0.15	56.99	1.63	114.6	3.366	0.999	2.366	4.4	2.9	5.0E-06	-9999.0	-9999.0	0.391	0.7	-9999.0	-9999.0
58.070	10.80	11.51	0.13	65.63	1.13	114.6	3.369	1.001	2.368	4.4	2.9	5.0E-05	30.0	30.0	0.542	0.8	-9999.0	-9999.0
58.136	13.73	14.32	0.10	54.28	0.70	114.6	3.373	1.003	2.370	5.5	3.6	5.0E-05	30.0	30.0	0.730	1.0	-9999.0	-9999.0
58.201	15.33	15.83	0.08	46.32	0.51	114.6	3.377	1.005	2.371	6.1	3.9	5.0E-05	30.0	30.0	0.830	1.2	-9999.0	-9999.0
58.267	13.48	13.97	0.08	45.29	0.57	114.6	3.381	1.007	2.373	5.4	3.5	5.0E-05	30.0	30.0	0.706	1.0	-9999.0	-9999.0
58.333	13.03	13.56	0.12	48.55	0.89	114.6	3.384	1.010	2.375	5.2	3.4	5.0E-05	30.0	30.0	0.678	1.0	-9999.0	-9999.0
58.398	11.25	11.81	0.13	52.04	1.10	114.6	3.388	1.012	2.377	4.5	2.9	5.0E-05	30.0	30.0	0.561	0.8	-9999.0	-9999.0
58.464	10.80	11.48	0.12	62.93	1.05	114.6	3.392	1.014	2.378	4.4	2.9	5.0E-05	30.0	30.0	0.539	0.8	-9999.0	-9999.0
58.529	10.99	11.70	0.20	65.81	1.71	114.6	3.396	1.016	2.380	5.6	3.6	5.0E-06	-9999.0	-9999.0	0.553	0.8	-9999.0	-9999.0
58.595	13.09	13.63	0.29	49.85	2.13	114.6	3.399	1.018	2.382	6.5	4.2	5.0E-06	-9999.0	-9999.0	0.682	1.0	-9999.0	-9999.0
58.661	10.67	11.28	0.33	57.17	2.93	114.6	3.403	1.020	2.383	7.2	4.7	5.0E-07	-9999.0	-9999.0	0.525	0.8	-9999.0	-9999.0
58.726	14.37	14.87	0.47	45.37	3.17	114.6	3.407	1.022	2.385	7.1	4.6	5.0E-06	-9999.0	-9999.0	0.764	1.1	-9999.0	-9999.0
58.792	19.61	19.88	0.36	24.77	1.82	114.6	3.411	1.024	2.387	7.6	4.9	5.0E-05	30.0	30.0	1.098	1.6	-9999.0	-9999.0
58.858	30.79	31.01	0.46	20.23	1.49	114.6	3.414	1.026	2.389	11.9	7.7	5.0E-05	30.0	30.0	1.840	3.1	-9999.0	-9999.0
58.923	38.71	38.80	0.42	7.62	1.09	117.7	3.418	1.028	2.390	12.4	8.0	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
58.989	44.27	44.33	0.44	5.77	0.99	117.7	3.422	1.030	2.392	14.2	9.2	5.0E-04	30.8	32.0	-9999.0	-9999.0	-9999.0	-9999.0
59.054	32.90	33.03	0.70	11.87	2.12	114.6	3.426	1.032	2.394	12.7	8.2	5.0E-05	30.0	30.0	1.973	3.4	-9999.0	-9999.0
59.120	23.64	23.75	0.93	9.99	3.93	114.6	3.430	1.034	2.396	15.2	9.8	5.0E-07	-9999.0	-9999.0	1.354	2.0	-9999.0	-9999.0
59.186	20.70	20.83	0.97	12.29	4.67	111.4	3.433	1.036	2.397	20.0	12.9	5.0E-08	-9999.0	-9999.0	1.160	1.7	-9999.0	-9999.0
59.251	14.05	14.25	0.78	17.82	5.49	111.4	3.437	1.038	2.399	13.6	8.8	5.0E-08	-9999.0	-9999.0	0.721	1.0	-9999.0	-9999.0
59.317	12.84	13.23	0.63	35.63	4.77	111.4	3.441	1.040	2.401	12.7	8.2	5.0E-08	-9999.0	-9999.0	0.652	0.9	-9999.0	-9999.0
59.382	28.30	28.88	0.54	53.65	1.87	114.6	3.444	1.042	2.402	11.1	7.1	5.0E-05	30.0	30.0	1.696	2.7	-9999.0	-9999.0
59.448	63.95	64.41	0.33	42.90	0.51	120.9	3.448	1.044	2.404	15.4	9.9	5.0E-03	41.5	34.0	-9999.0	-9999.0	236.1	3.666
59.514	82.28	82.52	0.31	22.18	0.38	120.9	3.452	1.046	2.406	19.8	12.7	5.0E-03	48.6	36.0	-9999.0	-9999.0	268.3	3.251
59.579	116.26	116.39	0.56	11.63	0.48	124.1	3.456	1.048	2.408	22.3	14.4	5.0E-02	58.4	38.0	-9999.0	-9999.0	321.7	2.764
59.645	154.66	154.78	0.74	11.89	0.48	124.1	3.460	1.050	2.410	29.6	19.1	5.0E-02	66.6	40.0	-9999.0	-9999.0	383.1	2.475
59.711	182.57	182.62	1.06	4.48	0.58	124.1	3.464	1.053	2.412	35.0	22.5	5.0E-02	71.3	40.0	-9999.0	-9999.0	427.6	2.342
59.776	164.18	164.31	1.43	11.87	0.87	124.1	3.469	1.055	2.414	31.5	20.3	5.0E-02	68.3	40.0	-9999.0	-9999.0	398.7	2.427
59.842	183.98	184.07	2.03	9.09	1.11	124.1	3.473	1.057	2.416	35.3	22.7	5.0E-02	71.5	40.0	-9999.0	-9999.0	430.1	2.337
59.907	180.79	180.95	2.58	15.17	1.42	120.9	3.477	1.059	2.418	43.3	27.9	5.0E-03	71.0	40.0	-9999.0	-9999.0	425.4	2.351
59.973	179.89	180.02	3.27	12.45	1.82	120.9	3.481	1.061	2.420	43.1	27.7	5.0E-03	70.8	40.0	-9999.0	-9999.0	424.1	2.356
60.039	184.24	184.30	4.12	5.83	2.24	117.7	3.485	1.063	2.422	58.8	37.8	5.0E-04	71.5	40.0	-9999.0	-9999.0	430.8	2.338
60.104	179.45	179.64	4.47	18.33	2.49	117.7	3.488	1.065	2.424	57.3	36.8	5.0E-04	70.8	40.0	-9999.0	-9999.0	423.7	2.359
60.170	178.04	178.21	4.70	15.70	2.64	117.7	3.492	1.067	2.425	56.9	36.5	5.0E-04	70.5	40.0	-9999.0	-9999.0	421.6	2.366
60.235	188.45	188.54	0.01	8.61	0.01	127.3	3.496	1.069	2.427	30.1	19.3	5.0E+00	72.1	40.0	-9999.0	-9999.0	437.7	2.321

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
60.301	192.67	192.73	0.01	5.43	0.01	127.3	3.500	1.071	2.429	30.8	19.7	5.0E+00	72.7	42.0	-9999.0	-9999.0	444.2	2.305
60.367	241.48	241.54	0.01	5.63	0.00	127.3	3.505	1.073	2.432	38.6	24.7	5.0E+00	79.2	42.0	-9999.0	-9999.0	511.8	2.119
60.432	299.80	299.83	0.01	3.40	0.00	127.3	3.509	1.075	2.434	47.9	30.7	5.0E+00	85.4	42.0	-9999.0	-9999.0	619.4	2.066
60.498	358.38	358.41	0.01	2.88	0.00	127.3	3.513	1.077	2.436	57.2	36.7	5.0E+00	90.5	44.0	-9999.0	-9999.0	-9999.0	-9999.0

Gregg In Situ, Inc. - CPT Interpretation

Interpretation Output - Release	1.20I
Run No:	04-0524-0703-3863
Job No:	04-073SC
Client:	MACTEC
Project:	TVA Bull Run Ash Disposal Facility
Site:	CPT-06
Location:	TVA Bull Run
Cone:	H. Bankayal
CPT Date:	04/21/05
CPT Time:	09:42
CPT File:	073CP06.COR
Northing (m):	0.000000
Easting (m):	0.000000
Elevation (m):	0.000000

Water Table (m):	3.35	(ft):	11.0
Unit Weight of Water (default):	62.40 pcf		
Averaging Increment (m):	0.0 (Every Data Point)		
Phi Method :	Robertson and Campanella, 1983		
Su Nkt used:	15.00	Su/P' (nc):	0.30
Dr Method :	Jamiolkowski - All Sands		
State Parameter M:	1.20		

Used Unit Weights Assigned to Soil Zones

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
0.066	7.73	7.73	0.20	0.33	2.59	114.6	0.004	0.000	0.004	4.9	9.9	5.0E-07	-9999.0	-9999.0	0.515	10.0	-9999.0	-9999.0
0.131	12.97	12.98	0.32	0.63	2.47	114.6	0.008	0.000	0.008	6.2	12.4	5.0E-06	-9999.0	-9999.0	0.865	10.0	-9999.0	-9999.0
0.197	20.57	20.57	0.32	0.08	1.56	114.6	0.011	0.000	0.011	7.9	15.8	5.0E-05	85.6	50.0	1.371	10.0	68.2	3.313
0.262	27.34	27.34	0.37	0.37	1.36	114.6	0.015	0.000	0.015	10.5	20.9	5.0E-05	89.6	50.0	1.822	10.0	78.5	2.872
0.328	35.33	35.38	0.40	4.92	1.13	117.7	0.019	0.000	0.019	11.3	22.6	5.0E-04	93.8	50.0	-9999.0	-9999.0	89.2	2.522
0.394	42.48	42.54	0.48	5.23	1.13	117.7	0.023	0.000	0.023	13.6	27.2	5.0E-04	95.0	50.0	-9999.0	-9999.0	98.7	2.321
0.459	45.80	45.88	0.58	7.33	1.27	117.7	0.027	0.000	0.027	14.6	29.3	5.0E-04	95.0	50.0	-9999.0	-9999.0	103.3	2.252
0.525	51.56	51.54	0.60	-1.62	1.17	117.7	0.030	0.000	0.030	16.5	32.9	5.0E-04	95.0	50.0	-9999.0	-9999.0	111.3	2.160
0.591	52.51	52.52	0.65	0.85	1.24	117.7	0.034	0.000	0.034	16.8	33.5	5.0E-04	95.0	50.0	-9999.0	-9999.0	112.7	2.147
0.656	53.34	53.33	0.65	-0.53	1.22	117.7	0.038	0.000	0.038	17.0	34.1	5.0E-04	95.0	50.0	-9999.0	-9999.0	113.9	2.136
0.722	52.07	52.18	0.63	10.61	1.21	117.7	0.042	0.000	0.042	16.7	33.3	5.0E-04	93.4	50.0	-9999.0	-9999.0	112.2	2.151
0.787	49.19	49.25	0.64	5.71	1.30	117.7	0.046	0.000	0.046	15.7	31.4	5.0E-04	90.5	50.0	-9999.0	-9999.0	108.1	2.194
0.853	47.47	47.50	0.65	3.64	1.37	117.7	0.050	0.000	0.050	15.2	30.3	5.0E-04	88.3	50.0	-9999.0	-9999.0	105.6	2.223
0.919	44.27	44.30	0.71	2.74	1.61	117.7	0.054	0.000	0.054	14.1	28.3	5.0E-04	85.2	50.0	-9999.0	-9999.0	101.1	2.283
0.984	42.16	42.19	0.76	2.68	1.81	117.7	0.057	0.000	0.057	13.5	26.9	5.0E-04	82.9	50.0	-9999.0	-9999.0	98.3	2.329
1.050	39.93	39.97	0.82	3.78	2.06	114.6	0.061	0.000	0.061	15.3	30.6	5.0E-05	80.4	50.0	2.660	10.0	95.3	2.384
1.115	38.07	38.10	0.87	2.41	2.29	114.6	0.065	0.000	0.065	14.6	29.2	5.0E-05	78.2	50.0	2.536	10.0	92.8	2.436
1.181	35.90	35.92	0.88	1.96	2.46	114.6	0.069	0.000	0.069	13.8	27.5	5.0E-05	75.7	48.0	2.390	10.0	89.9	2.504
1.247	36.16	36.20	0.92	3.80	2.55	114.6	0.073	0.000	0.073	13.9	27.7	5.0E-05	75.1	48.0	2.408	10.0	90.3	2.495
1.312	35.14	35.16	0.89	2.66	2.54	114.6	0.076	0.000	0.076	13.5	26.9	5.0E-05	73.6	48.0	2.339	10.0	89.0	2.530
1.378	35.39	35.40	0.86	1.52	2.44	114.6	0.080	0.000	0.080	13.6	27.1	5.0E-05	73.1	48.0	2.355	10.0	89.3	2.522
1.444	35.08	35.07	0.84	-0.14	2.40	114.6	0.084	0.000	0.084	13.4	26.9	5.0E-05	72.1	48.0	2.333	10.0	88.8	2.533
1.509	31.18	31.19	0.79	1.33	2.54	114.6	0.088	0.000	0.088	11.9	23.9	5.0E-05	68.2	48.0	2.073	10.0	83.7	2.685
1.575	30.60	30.64	0.72	2.94	2.36	114.6	0.091	0.000	0.091	11.7	23.5	5.0E-05	67.0	48.0	2.036	10.0	83.0	2.709
1.640	30.47	30.53	0.69	5.43	2.27	114.6	0.095	0.000	0.095	11.7	23.4	5.0E-05	66.4	46.0	2.029	10.0	82.9	2.714
1.706	29.13	29.20	0.65	6.26	2.23	114.6	0.099	0.000	0.099	11.2	22.4	5.0E-05	64.5	46.0	1.940	10.0	81.1	2.777
1.772	28.43	28.44	0.60	1.13	2.11	114.6	0.103	0.000	0.103	10.9	21.8	5.0E-05	63.2	46.0	1.889	10.0	80.0	2.814
1.837	27.28	27.30	0.62	2.47	2.28	114.6	0.106	0.000	0.106	10.5	20.9	5.0E-05	61.6	46.0	1.813	10.0	78.5	2.874
1.903	27.79	27.81	0.64	2.47	2.31	114.6	0.110	0.000	0.110	10.7	21.3	5.0E-05	61.6	46.0	1.847	10.0	79.2	2.847
1.968	27.03	27.05	0.64	1.88	2.37	114.6	0.114	0.000	0.114	10.4	20.7	5.0E-05	60.3	46.0	1.795	10.0	78.1	2.888
2.034	26.32	26.35	0.65	2.02	2.47	114.6	0.118	0.000	0.118	10.1	20.2	5.0E-05	59.1	46.0	1.749	10.0	77.1	2.927
2.100	25.42	25.44	0.69	1.70	2.72	114.6	0.121	0.000	0.121	12.2	24.4	5.0E-06	-9999.0	-9999.0	1.688	10.0	-9999.0	-9999.0
2.165	24.85	24.89	0.74	3.58	2.98	114.6	0.125	0.000	0.125	11.9	23.8	5.0E-06	-9999.0	-9999.0	1.651	10.0	-9999.0	-9999.0
2.231	23.89	23.92	0.77	2.86	3.23	114.6	0.129	0.000	0.129	11.5	22.9	5.0E-06	-9999.0	-9999.0	1.586	10.0	-9999.0	-9999.0
2.297	21.97	21.99	0.78	1.62	3.56	114.6	0.133	0.000	0.133	10.5	21.1	5.0E-06	-9999.0	-9999.0	1.457	10.0	-9999.0	-9999.0
2.362	20.25	20.28	0.82	2.63	4.05	114.6	0.136	0.000	0.136	12.9	25.9	5.0E-07	-9999.0	-9999.0	1.343	10.0	-9999.0	-9999.0
2.428	20.63	20.67	0.85	3.52	4.12	114.6	0.140	0.000	0.140	13.2	26.4	5.0E-07	-9999.0	-9999.0	1.369	10.0	-9999.0	-9999.0
2.493	21.21	21.29	0.88	7.23	4.14	114.6	0.144	0.000	0.144	13.6	27.2	5.0E-07	-9999.0	-9999.0	1.410	10.0	-9999.0	-9999.0
2.559	20.70	20.78	0.88	7.44	4.25	114.6	0.148	0.000	0.148	13.3	26.5	5.0E-07	-9999.0	-9999.0	1.376	10.0	-9999.0	-9999.0
2.625	18.20	18.25	0.85	4.37	4.67	111.4	0.151	0.000	0.151	17.5	35.0	5.0E-08	-9999.0	-9999.0	1.207	10.0	-9999.0	-9999.0
2.690	17.50	17.53	0.81	3.00	4.63	111.4	0.155	0.000	0.155	16.8	33.6	5.0E-08	-9999.0	-9999.0	1.159	10.0	-9999.0	-9999.0
2.756	16.61	16.63	0.78	1.64	4.70	111.4	0.159	0.000	0.159	15.9	31.8	5.0E-08	-9999.0	-9999.0	1.098	10.0	-9999.0	-9999.0
2.821	15.27	15.27	0.76	0.53	4.99	111.4	0.162	0.000	0.162	14.6	29.3	5.0E-08	-9999.0	-9999.0	1.007	10.0	-9999.0	-9999.0
2.887	14.44	14.46	0.68	2.74	4.71	111.4	0.166	0.000	0.166	13.9	27.7	5.0E-08	-9999.0	-9999.0	0.953	10.0	-9999.0	-9999.0
2.953	13.48	13.49	0.65	0.57	4.83	111.4	0.170	0.000	0.170	12.9	25.8	5.0E-08	-9999.0	-9999.0	0.888	10.0	-9999.0	-9999.0
3.018	11.18	11.18	0.60	0.31	5.38	111.4	0.173	0.000	0.173	10.7	21.4	5.0E-08	-9999.0	-9999.0	0.734	10.0	-9999.0	-9999.0
3.084	10.28	10.29	0.52	0.39	5.07	111.4	0.177	0.000	0.177	9.9	19.7	5.0E-08	-9999.0	-9999.0	0.674	10.0	-9999.0	-9999.0
3.150	8.37	8.37	0.46	-0.04	5.51	111.4	0.181	0.000	0.181	8.0	16.0	5.0E-08	-9999.0	-9999.0	0.546	10.0	-9999.0	-9999.0
3.215	8.30	8.32	0.41	1.72	4.94	111.4	0.184	0.000	0.184	8.0	15.9	5.0E-08	-9999.0	-9999.0	0.542	10.0	-9999.0	-9999.0
3.281	8.94	8.97	0.35	2.21	3.91	111.4	0.188	0.000	0.188	8.6	17.2	5.0E-08	-9999.0	-9999.0	0.585	10.0	-9999.0	-9999.0
3.346	8.56	8.58	0.33	1.70	3.86	111.4	0.192	0.000	0.192	8.2	16.4	5.0E-08	-9999.0	-9999.0	0.559	10.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
3.412	9.13	9.14	0.18	1.00	1.97	114.6	0.195	0.000	0.195	4.4	8.8	5.0E-06	-9999.0	-9999.0	0.597	10.0	-9999.0	-9999.0
3.478	10.48	10.52	0.19	3.83	1.81	114.6	0.199	0.000	0.199	5.0	10.1	5.0E-06	-9999.0	-9999.0	0.688	10.0	-9999.0	-9999.0
3.543	11.37	11.42	0.20	4.86	1.76	114.6	0.203	0.000	0.203	5.5	10.9	5.0E-06	-9999.0	-9999.0	0.748	10.0	-9999.0	-9999.0
3.609	12.27	12.29	0.20	1.76	1.63	114.6	0.207	0.000	0.207	5.9	11.8	5.0E-06	-9999.0	-9999.0	0.805	10.0	-9999.0	-9999.0
3.674	12.01	12.00	0.24	-0.83	2.00	114.6	0.210	0.000	0.210	5.7	11.5	5.0E-06	-9999.0	-9999.0	0.786	10.0	-9999.0	-9999.0
3.740	14.70	14.76	0.33	6.22	2.24	114.6	0.214	0.000	0.214	7.1	14.1	5.0E-06	-9999.0	-9999.0	0.970	10.0	-9999.0	-9999.0
3.806	15.65	15.75	0.42	8.99	2.67	114.6	0.218	0.000	0.218	7.5	15.1	5.0E-06	-9999.0	-9999.0	1.035	10.0	-9999.0	-9999.0
3.871	17.63	17.74	0.58	10.33	3.28	114.6	0.222	0.000	0.222	8.5	17.0	5.0E-06	-9999.0	-9999.0	1.168	10.0	-9999.0	-9999.0
3.937	19.49	19.59	0.65	9.64	3.33	114.6	0.225	0.000	0.225	9.4	18.8	5.0E-06	-9999.0	-9999.0	1.291	10.0	-9999.0	-9999.0
4.003	21.21	21.31	0.75	9.42	3.53	114.6	0.229	0.000	0.229	10.2	20.4	5.0E-06	-9999.0	-9999.0	1.406	10.0	-9999.0	-9999.0
4.068	25.49	25.60	0.88	10.47	3.45	114.6	0.233	0.000	0.233	12.3	24.5	5.0E-06	-9999.0	-9999.0	1.691	10.0	-9999.0	-9999.0
4.134	34.94	35.14	1.03	18.39	2.94	114.6	0.237	0.000	0.237	13.5	26.9	5.0E-05	57.3	44.0	2.327	10.0	88.9	2.531
4.199	39.48	39.68	1.17	19.36	2.96	114.6	0.240	0.000	0.240	15.2	30.4	5.0E-05	60.6	44.0	2.630	10.0	94.9	2.392
4.265	37.69	37.80	1.27	9.97	3.37	114.6	0.244	0.000	0.244	18.1	36.2	5.0E-06	-9999.0	-9999.0	2.504	10.0	-9999.0	-9999.0
4.331	35.71	35.78	1.28	7.25	3.59	114.6	0.248	0.000	0.248	17.1	34.3	5.0E-06	-9999.0	-9999.0	2.369	10.0	-9999.0	-9999.0
4.396	33.60	33.73	1.38	12.26	4.10	114.6	0.252	0.000	0.252	21.5	42.9	5.0E-07	-9999.0	-9999.0	2.232	10.0	-9999.0	-9999.0
4.462	33.86	33.98	1.50	11.34	4.42	114.6	0.256	0.000	0.256	21.7	42.9	5.0E-07	-9999.0	-9999.0	2.249	10.0	-9999.0	-9999.0
4.528	33.47	33.61	1.52	12.82	4.53	114.6	0.259	0.000	0.259	21.5	42.1	5.0E-07	-9999.0	-9999.0	2.223	10.0	-9999.0	-9999.0
4.593	33.79	33.98	1.55	16.99	4.57	114.6	0.263	0.000	0.263	21.7	42.3	5.0E-07	-9999.0	-9999.0	2.248	10.0	-9999.0	-9999.0
4.659	37.88	38.12	1.68	21.99	4.42	114.6	0.267	0.000	0.267	24.3	47.1	5.0E-07	-9999.0	-9999.0	2.524	10.0	-9999.0	-9999.0
4.724	42.92	43.19	1.73	24.37	4.02	114.6	0.271	0.000	0.271	20.7	39.8	5.0E-06	-9999.0	-9999.0	2.861	10.0	-9999.0	-9999.0
4.790	44.27	44.44	1.71	16.37	3.86	114.6	0.274	0.000	0.274	21.3	40.6	5.0E-06	-9999.0	-9999.0	2.945	10.0	-9999.0	-9999.0
4.856	43.64	43.84	1.78	18.80	4.07	114.6	0.278	0.000	0.278	21.0	39.8	5.0E-06	-9999.0	-9999.0	2.904	10.0	-9999.0	-9999.0
4.921	42.22	42.38	1.89	14.90	4.47	114.6	0.282	0.000	0.282	27.1	51.0	5.0E-07	-9999.0	-9999.0	2.807	10.0	-9999.0	-9999.0
4.987	41.27	41.48	1.92	19.18	4.64	114.6	0.286	0.000	0.286	26.5	49.6	5.0E-07	-9999.0	-9999.0	2.746	10.0	-9999.0	-9999.0
5.052	38.45	38.62	1.86	15.23	4.83	114.6	0.289	0.000	0.289	24.7	45.8	5.0E-07	-9999.0	-9999.0	2.555	10.0	-9999.0	-9999.0
5.118	36.41	36.53	1.72	11.38	4.72	114.6	0.293	0.000	0.293	23.3	43.1	5.0E-07	-9999.0	-9999.0	2.416	10.0	-9999.0	-9999.0
5.184	34.36	34.47	1.60	9.87	4.65	114.6	0.297	0.000	0.297	22.0	40.4	5.0E-07	-9999.0	-9999.0	2.278	10.0	-9999.0	-9999.0
5.249	33.28	33.40	1.19	11.34	3.57	114.6	0.301	0.000	0.301	16.0	29.2	5.0E-06	-9999.0	-9999.0	2.207	10.0	-9999.0	-9999.0
5.315	32.77	32.99	1.22	20.85	3.71	114.6	0.304	0.000	0.304	15.8	28.6	5.0E-06	-9999.0	-9999.0	2.179	10.0	-9999.0	-9999.0
5.381	35.14	35.50	1.32	33.54	3.73	114.6	0.308	0.000	0.308	17.0	30.6	5.0E-06	-9999.0	-9999.0	2.346	10.0	-9999.0	-9999.0
5.446	35.00	35.28	1.44	25.65	4.09	114.6	0.312	0.000	0.312	16.9	30.3	5.0E-06	-9999.0	-9999.0	2.331	10.0	-9999.0	-9999.0
5.512	33.47	33.71	1.52	21.95	4.52	114.6	0.316	0.000	0.316	21.5	38.3	5.0E-07	-9999.0	-9999.0	2.226	10.0	-9999.0	-9999.0
5.577	33.60	33.58	1.59	-1.56	4.75	114.6	0.319	0.000	0.319	21.4	37.9	5.0E-07	-9999.0	-9999.0	2.218	10.0	-9999.0	-9999.0
5.643	29.45	29.43	1.57	-1.96	5.35	111.4	0.323	0.000	0.323	28.2	49.6	5.0E-08	-9999.0	-9999.0	1.940	10.0	-9999.0	-9999.0
5.709	26.63	26.63	1.48	-0.53	5.57	111.4	0.327	0.000	0.327	25.5	44.6	5.0E-08	-9999.0	-9999.0	1.753	10.0	-9999.0	-9999.0
5.774	25.49	25.54	1.40	4.09	5.50	111.4	0.330	0.000	0.330	24.5	42.5	5.0E-08	-9999.0	-9999.0	1.680	10.0	-9999.0	-9999.0
5.840	26.06	26.16	1.31	8.55	5.02	111.4	0.334	0.000	0.334	25.0	43.3	5.0E-08	-9999.0	-9999.0	1.721	10.0	-9999.0	-9999.0
5.905	26.44	26.65	1.23	18.88	4.63	111.4	0.338	0.000	0.338	25.5	43.9	5.0E-08	-9999.0	-9999.0	1.754	10.0	-9999.0	-9999.0
5.971	26.63	26.86	1.14	20.82	4.25	114.6	0.341	0.000	0.341	17.1	29.3	5.0E-07	-9999.0	-9999.0	1.768	10.0	-9999.0	-9999.0
6.037	25.68	25.97	1.07	26.57	4.13	114.6	0.345	0.000	0.345	16.6	28.2	5.0E-07	-9999.0	-9999.0	1.708	10.0	-9999.0	-9999.0
6.102	25.49	25.75	1.07	23.51	4.17	114.6	0.349	0.000	0.349	16.4	27.8	5.0E-07	-9999.0	-9999.0	1.693	10.0	-9999.0	-9999.0
6.168	26.51	26.81	1.20	27.63	4.49	114.6	0.353	0.000	0.353	17.1	28.8	5.0E-07	-9999.0	-9999.0	1.764	10.0	-9999.0	-9999.0
6.234	31.50	32.07	1.36	53.02	4.25	114.6	0.356	0.000	0.356	20.5	34.3	5.0E-07	-9999.0	-9999.0	2.114	10.0	-9999.0	-9999.0
6.299	37.88	38.51	1.45	57.80	3.77	114.6	0.360	0.000	0.360	18.4	30.7	5.0E-06	-9999.0	-9999.0	2.543	10.0	-9999.0	-9999.0
6.365	42.86	43.22	1.54	32.75	3.57	114.6	0.364	0.000	0.364	20.7	34.3	5.0E-06	-9999.0	-9999.0	2.857	10.0	-9999.0	-9999.0
6.430	45.55	45.79	1.58	22.48	3.46	114.6	0.368	0.000	0.368	21.9	36.2	5.0E-06	-9999.0	-9999.0	3.028	10.0	-9999.0	-9999.0
6.496	48.11	48.27	1.68	14.74	3.49	114.6	0.372	0.000	0.372	23.1	37.9	5.0E-06	-9999.0	-9999.0	3.193	10.0	-9999.0	-9999.0
6.562	48.55	48.80	1.83	23.44	3.76	114.6	0.375	0.000	0.375	23.4	38.1	5.0E-06	-9999.0	-9999.0	3.228	10.0	-9999.0	-9999.0
6.627	47.14	47.32	1.99	16.08	4.22	114.6	0.379	0.000	0.379	22.7	36.8	5.0E-06	-9999.0	-9999.0	3.129	10.0	-9999.0	-9999.0
6.693	46.76	47.07	1.97	27.95	4.20	114.6	0.383	0.000	0.383	22.5	36.4	5.0E-06	-9999.0	-9999.0	3.112	10.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
6.758	47.20	47.96	2.07	69.82	4.31	114.6	0.387	0.000	0.387	23.0	36.9	5.0E-06	-9999.0	-9999.0	3.171	10.0	-9999.0	-9999.0
6.824	54.11	54.97	2.23	79.74	4.05	114.6	0.390	0.000	0.390	26.3	42.1	5.0E-06	-9999.0	-9999.0	3.639	10.0	-9999.0	-9999.0
6.890	57.94	58.96	2.46	94.45	4.17	114.6	0.394	0.000	0.394	28.2	45.0	5.0E-06	-9999.0	-9999.0	3.904	10.0	-9999.0	-9999.0
6.955	64.40	65.50	2.65	102.36	4.04	114.6	0.398	0.000	0.398	31.4	49.7	5.0E-06	-9999.0	-9999.0	4.340	10.0	-9999.0	-9999.0
7.021	69.12	69.56	2.91	40.69	4.18	114.6	0.402	0.000	0.402	33.3	52.6	5.0E-06	-9999.0	-9999.0	4.610	10.0	-9999.0	-9999.0
7.087	68.42	68.64	3.11	20.82	4.53	114.6	0.405	0.000	0.405	32.9	51.6	5.0E-06	-9999.0	-9999.0	4.549	10.0	-9999.0	-9999.0
7.152	66.44	66.51	3.22	6.44	4.84	130.5	0.409	0.000	0.409	63.7	99.6	1.0E-15	67.8	44.0	-9999.0	-9999.0	142.2	2.139
7.218	62.28	62.30	3.32	2.04	5.33	130.5	0.414	0.000	0.414	59.7	92.8	1.0E-15	65.7	44.0	-9999.0	-9999.0	136.5	2.190
7.283	61.33	61.43	3.26	9.24	5.30	130.5	0.418	0.000	0.418	58.8	91.0	1.0E-15	65.2	44.0	-9999.0	-9999.0	135.5	2.205
7.349	59.60	59.81	3.18	18.84	5.31	130.5	0.422	0.000	0.422	57.3	88.2	1.0E-15	64.3	44.0	-9999.0	-9999.0	133.4	2.231
7.415	59.60	59.85	3.07	22.69	5.13	130.5	0.427	0.000	0.427	57.3	87.8	1.0E-15	64.2	44.0	-9999.0	-9999.0	133.8	2.235
7.480	58.96	59.31	2.99	32.11	5.04	130.5	0.431	0.000	0.431	56.8	86.5	1.0E-15	63.8	44.0	-9999.0	-9999.0	133.3	2.247
7.546	59.86	60.15	2.98	27.00	4.95	130.5	0.435	0.000	0.435	57.6	87.3	1.0E-15	64.0	44.0	-9999.0	-9999.0	134.7	2.239
7.611	67.07	67.58	2.99	46.75	4.42	114.6	0.439	0.000	0.439	32.4	48.8	5.0E-06	-9999.0	-9999.0	4.476	10.0	-9999.0	-9999.0
7.677	76.01	76.47	3.03	42.27	3.96	114.6	0.443	0.000	0.443	36.6	55.0	5.0E-06	-9999.0	-9999.0	5.069	10.0	-9999.0	-9999.0
7.743	83.49	83.81	3.12	29.70	3.72	114.6	0.447	0.000	0.447	40.1	60.1	5.0E-06	-9999.0	-9999.0	5.558	10.0	-9999.0	-9999.0
7.808	86.11	86.12	3.27	0.83	3.79	114.6	0.450	0.000	0.450	41.2	61.5	5.0E-06	-9999.0	-9999.0	5.711	10.0	-9999.0	-9999.0
7.874	79.72	79.70	3.41	-2.27	4.28	114.6	0.454	0.000	0.454	38.2	56.6	5.0E-06	-9999.0	-9999.0	5.283	10.0	-9999.0	-9999.0
7.940	70.21	70.17	3.44	-3.68	4.90	130.5	0.458	0.000	0.458	67.2	99.3	1.0E-15	67.7	44.0	-9999.0	-9999.0	150.2	2.140
8.005	65.10	65.08	3.42	-1.35	5.25	130.5	0.462	0.000	0.462	62.3	91.7	1.0E-15	65.4	44.0	-9999.0	-9999.0	143.2	2.200
8.071	57.05	57.00	3.26	-4.54	5.72	111.4	0.466	0.000	0.466	54.6	79.9	5.0E-08	-9999.0	-9999.0	3.769	10.0	-9999.0	-9999.0
8.136	53.21	53.25	3.04	3.36	5.70	111.4	0.470	0.000	0.470	51.0	74.4	5.0E-08	-9999.0	-9999.0	3.518	10.0	-9999.0	-9999.0
8.202	47.41	47.48	2.88	6.48	6.06	111.4	0.474	0.000	0.474	45.5	66.1	5.0E-08	-9999.0	-9999.0	3.133	10.0	-9999.0	-9999.0
8.268	42.35	42.50	2.76	13.84	6.49	111.4	0.477	0.000	0.477	40.7	58.9	5.0E-08	-9999.0	-9999.0	2.802	10.0	-9999.0	-9999.0
8.333	38.90	38.96	2.55	4.92	6.54	111.4	0.481	0.000	0.481	37.3	53.8	5.0E-08	-9999.0	-9999.0	2.565	10.0	-9999.0	-9999.0
8.399	36.48	36.52	2.35	3.76	6.42	111.4	0.485	0.000	0.485	35.0	50.2	5.0E-08	-9999.0	-9999.0	2.402	10.0	-9999.0	-9999.0
8.464	34.24	34.28	1.61	3.72	4.71	114.6	0.488	0.000	0.488	21.9	31.3	5.0E-07	-9999.0	-9999.0	2.253	10.0	-9999.0	-9999.0
8.530	32.07	32.15	1.73	7.87	5.39	111.4	0.492	0.000	0.492	30.8	43.9	5.0E-08	-9999.0	-9999.0	2.111	10.0	-9999.0	-9999.0
8.596	32.20	32.30	1.71	9.52	5.31	111.4	0.496	0.000	0.496	30.9	43.9	5.0E-08	-9999.0	-9999.0	2.120	10.0	-9999.0	-9999.0
8.661	34.87	35.08	1.82	19.44	5.20	111.4	0.499	0.000	0.499	33.6	47.6	5.0E-08	-9999.0	-9999.0	2.306	10.0	-9999.0	-9999.0
8.727	37.05	37.34	1.90	26.53	5.10	111.4	0.503	0.000	0.503	35.8	50.4	5.0E-08	-9999.0	-9999.0	2.456	10.0	-9999.0	-9999.0
8.793	39.03	39.13	1.98	8.55	5.07	111.4	0.507	0.000	0.507	37.5	52.6	5.0E-08	-9999.0	-9999.0	2.575	10.0	-9999.0	-9999.0
8.858	41.01	41.00	2.01	-0.61	4.91	114.6	0.510	0.000	0.510	26.2	36.6	5.0E-07	-9999.0	-9999.0	2.700	10.0	-9999.0	-9999.0
8.924	41.01	41.08	2.03	6.77	4.95	114.6	0.514	0.000	0.514	26.2	36.6	5.0E-07	-9999.0	-9999.0	2.705	10.0	-9999.0	-9999.0
8.989	39.74	39.85	2.04	10.43	5.13	111.4	0.518	0.000	0.518	38.2	53.0	5.0E-08	-9999.0	-9999.0	2.622	10.0	-9999.0	-9999.0
9.055	39.74	39.99	2.10	23.07	5.24	111.4	0.522	0.000	0.522	38.3	53.0	5.0E-08	-9999.0	-9999.0	2.631	10.0	-9999.0	-9999.0
9.121	39.93	40.44	2.04	47.32	5.06	111.4	0.525	0.000	0.525	38.7	53.4	5.0E-08	-9999.0	-9999.0	2.661	10.0	-9999.0	-9999.0
9.186	42.10	42.67	1.91	52.56	4.49	114.6	0.529	0.000	0.529	27.2	37.5	5.0E-07	-9999.0	-9999.0	2.809	10.0	-9999.0	-9999.0
9.252	41.71	42.19	1.83	44.42	4.35	114.6	0.533	0.000	0.533	26.9	36.9	5.0E-07	-9999.0	-9999.0	2.777	10.0	-9999.0	-9999.0
9.317	43.24	43.70	1.81	41.80	4.15	114.6	0.536	0.000	0.536	20.9	28.6	5.0E-06	-9999.0	-9999.0	2.877	10.0	-9999.0	-9999.0
9.383	40.31	40.91	1.77	56.11	4.34	114.6	0.540	0.000	0.540	26.1	35.5	5.0E-07	-9999.0	-9999.0	2.692	10.0	-9999.0	-9999.0
9.449	39.03	39.53	1.79	45.47	4.54	114.6	0.544	0.000	0.544	25.2	34.2	5.0E-07	-9999.0	-9999.0	2.599	10.0	-9999.0	-9999.0
9.514	38.01	38.35	1.85	31.31	4.84	114.6	0.548	0.000	0.548	24.5	33.1	5.0E-07	-9999.0	-9999.0	2.520	10.0	-9999.0	-9999.0
9.580	36.61	36.87	1.81	24.14	4.92	111.4	0.551	0.000	0.551	35.3	47.6	5.0E-08	-9999.0	-9999.0	2.421	10.0	-9999.0	-9999.0
9.646	35.52	35.76	1.79	22.46	5.02	111.4	0.555	0.000	0.555	34.2	46.0	5.0E-08	-9999.0	-9999.0	2.347	10.0	-9999.0	-9999.0
9.711	34.43	34.70	1.76	24.55	5.08	111.4	0.559	0.000	0.559	33.2	44.5	5.0E-08	-9999.0	-9999.0	2.276	10.0	-9999.0	-9999.0
9.777	36.67	37.09	1.75	39.15	4.73	114.6	0.562	0.000	0.562	23.7	31.6	5.0E-07	-9999.0	-9999.0	2.435	10.0	-9999.0	-9999.0
9.842	43.12	43.63	1.87	46.38	4.30	114.6	0.566	0.000	0.566	27.9	37.0	5.0E-07	-9999.0	-9999.0	2.871	10.0	-9999.0	-9999.0
9.908	50.53	51.31	1.99	71.52	3.89	114.6	0.570	0.000	0.570	24.6	32.5	5.0E-06	-9999.0	-9999.0	3.382	10.0	-9999.0	-9999.0
9.974	51.10	51.77	2.07	61.81	3.99	114.6	0.574	0.000	0.574	24.8	32.7	5.0E-06	-9999.0	-9999.0	3.413	10.0	-9999.0	-9999.0
10.039	45.10	45.10	2.07	-0.08	4.58	114.6	0.577	0.000	0.577	28.8	37.9	5.0E-07	-9999.0	-9999.0	2.968	10.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
10.105	39.23	39.17	2.07	-4.84	5.27	111.4	0.581	0.000	0.581	37.5	49.2	5.0E-08	-9999.0	-9999.0	2.573	10.0	-9999.0	-9999.0
10.170	33.92	33.93	2.04	1.02	6.03	111.4	0.585	0.000	0.585	32.5	42.5	5.0E-08	-9999.0	-9999.0	2.223	10.0	-9999.0	-9999.0
10.236	30.53	30.63	1.99	9.28	6.51	111.4	0.588	0.000	0.588	29.3	38.2	5.0E-08	-9999.0	-9999.0	2.003	10.0	-9999.0	-9999.0
10.302	28.24	28.43	1.78	18.11	6.28	111.4	0.592	0.000	0.592	27.2	35.4	5.0E-08	-9999.0	-9999.0	1.856	10.0	-9999.0	-9999.0
10.367	26.63	26.88	1.55	22.77	5.78	111.4	0.596	0.000	0.596	25.7	33.4	5.0E-08	-9999.0	-9999.0	1.752	10.0	-9999.0	-9999.0
10.433	26.06	26.28	1.37	19.71	5.23	111.4	0.599	0.000	0.599	25.2	32.5	5.0E-08	-9999.0	-9999.0	1.712	10.0	-9999.0	-9999.0
10.499	25.74	25.87	1.25	12.08	4.84	111.4	0.603	0.000	0.603	24.8	31.9	5.0E-08	-9999.0	-9999.0	1.685	10.0	-9999.0	-9999.0
10.564	24.59	24.72	1.15	12.29	4.66	111.4	0.607	0.000	0.607	23.7	30.4	5.0E-08	-9999.0	-9999.0	1.608	10.0	-9999.0	-9999.0
10.630	23.32	23.43	1.10	10.75	4.71	111.4	0.610	0.000	0.610	22.4	28.7	5.0E-08	-9999.0	-9999.0	1.521	10.0	-9999.0	-9999.0
10.695	20.57	20.67	1.03	9.48	4.99	111.4	0.614	0.000	0.614	19.8	25.3	5.0E-08	-9999.0	-9999.0	1.337	10.0	-9999.0	-9999.0
10.761	19.55	19.61	0.97	5.89	4.96	111.4	0.618	0.000	0.618	18.8	23.9	5.0E-08	-9999.0	-9999.0	1.266	10.0	-9999.0	-9999.0
10.827	17.76	17.80	0.92	3.76	5.18	111.4	0.621	0.000	0.621	17.1	21.6	5.0E-08	-9999.0	-9999.0	1.145	10.0	-9999.0	-9999.0
10.892	16.10	16.19	0.81	8.55	5.01	111.4	0.625	0.000	0.625	15.5	19.6	5.0E-08	-9999.0	-9999.0	1.038	10.0	-9999.0	-9999.0
10.958	16.10	16.24	0.75	12.70	4.63	111.4	0.629	0.000	0.629	15.5	19.6	5.0E-08	-9999.0	-9999.0	1.041	10.0	-9999.0	-9999.0
11.023	16.29	16.42	0.70	12.47	4.27	111.4	0.632	0.001	0.632	15.7	19.8	5.0E-08	-9999.0	-9999.0	1.053	10.0	-9999.0	-9999.0
11.089	17.12	17.29	0.64	16.02	3.71	114.6	0.636	0.003	0.633	11.0	13.9	5.0E-07	-9999.0	-9999.0	1.111	10.0	-9999.0	-9999.0
11.155	18.98	19.12	0.62	13.02	3.25	114.6	0.640	0.005	0.635	9.2	11.5	5.0E-06	-9999.0	-9999.0	1.232	10.0	-9999.0	-9999.0
11.220	18.07	18.26	0.62	17.31	3.40	114.6	0.644	0.007	0.637	8.7	11.0	5.0E-06	-9999.0	-9999.0	1.174	10.0	-9999.0	-9999.0
11.286	19.36	19.54	0.64	17.36	3.28	114.6	0.647	0.009	0.638	9.4	11.7	5.0E-06	-9999.0	-9999.0	1.260	10.0	-9999.0	-9999.0
11.352	18.39	18.55	0.65	14.32	3.51	114.6	0.651	0.011	0.640	11.8	14.8	5.0E-07	-9999.0	-9999.0	1.193	10.0	-9999.0	-9999.0
11.417	17.88	18.08	0.71	18.09	3.94	114.6	0.655	0.013	0.642	11.5	14.4	5.0E-07	-9999.0	-9999.0	1.162	10.0	-9999.0	-9999.0
11.483	19.23	19.43	0.76	18.52	3.92	114.6	0.659	0.015	0.644	12.4	15.5	5.0E-07	-9999.0	-9999.0	1.251	10.0	-9999.0	-9999.0
11.548	20.57	20.81	0.84	22.26	4.05	114.6	0.662	0.017	0.645	13.3	16.5	5.0E-07	-9999.0	-9999.0	1.343	10.0	-9999.0	-9999.0
11.614	21.84	22.11	0.89	24.28	4.04	114.6	0.666	0.019	0.647	14.1	17.5	5.0E-07	-9999.0	-9999.0	1.429	10.0	-9999.0	-9999.0
11.680	22.23	22.43	0.98	17.76	4.38	114.6	0.670	0.021	0.649	14.3	17.8	5.0E-07	-9999.0	-9999.0	1.450	10.0	-9999.0	-9999.0
11.745	23.19	23.30	0.86	10.96	3.70	114.6	0.674	0.023	0.650	11.2	13.8	5.0E-06	-9999.0	-9999.0	1.509	10.0	-9999.0	-9999.0
11.811	21.97	22.07	0.90	8.67	4.09	114.6	0.677	0.025	0.652	14.1	17.4	5.0E-07	-9999.0	-9999.0	1.426	10.0	-9999.0	-9999.0
11.876	20.06	20.10	0.85	4.03	4.24	114.6	0.681	0.027	0.654	12.8	15.9	5.0E-07	-9999.0	-9999.0	1.295	10.0	-9999.0	-9999.0
11.942	17.44	17.46	0.80	1.78	4.59	111.4	0.685	0.029	0.655	16.7	20.7	5.0E-08	-9999.0	-9999.0	1.118	10.0	-9999.0	-9999.0
12.008	16.86	16.89	0.75	2.76	4.45	111.4	0.688	0.031	0.657	16.2	20.0	5.0E-08	-9999.0	-9999.0	1.080	9.9	-9999.0	-9999.0
12.073	14.51	14.62	0.70	10.92	4.80	111.4	0.692	0.034	0.659	14.0	17.3	5.0E-08	-9999.0	-9999.0	0.929	7.7	-9999.0	-9999.0
12.139	13.67	13.78	0.63	10.10	4.58	111.4	0.696	0.036	0.660	13.2	16.2	5.0E-08	-9999.0	-9999.0	0.872	7.0	-9999.0	-9999.0
12.205	13.29	13.51	0.60	19.73	4.45	111.4	0.699	0.038	0.662	12.9	15.9	5.0E-08	-9999.0	-9999.0	0.854	6.7	-9999.0	-9999.0
12.270	15.53	15.79	0.61	24.73	3.87	114.6	0.703	0.040	0.664	10.1	12.4	5.0E-07	-9999.0	-9999.0	1.006	8.7	-9999.0	-9999.0
12.336	22.55	22.89	0.71	31.44	3.11	114.6	0.707	0.042	0.665	11.0	13.4	5.0E-06	-9999.0	-9999.0	1.479	10.0	-9999.0	-9999.0
12.401	28.94	29.12	0.76	16.33	2.62	114.6	0.711	0.044	0.667	11.2	13.7	5.0E-05	37.1	38.0	1.894	10.0	102.1	3.507
12.467	31.75	31.79	0.82	4.11	2.59	114.6	0.714	0.046	0.669	12.2	14.9	5.0E-05	39.6	38.0	2.072	10.0	107.1	3.369
12.533	29.96	30.01	0.73	4.03	2.44	114.6	0.718	0.048	0.670	11.5	14.0	5.0E-05	37.9	38.0	1.953	10.0	103.9	3.463
12.598	25.81	25.87	0.64	5.53	2.48	114.6	0.722	0.050	0.672	9.9	12.1	5.0E-05	33.6	38.0	1.677	10.0	95.7	3.698
12.664	23.13	23.19	0.70	6.22	3.03	114.6	0.726	0.052	0.674	11.1	13.5	5.0E-06	-9999.0	-9999.0	1.498	10.0	-9999.0	-9999.0
12.730	19.81	19.90	0.74	8.77	3.73	114.6	0.729	0.054	0.675	12.7	15.5	5.0E-07	-9999.0	-9999.0	1.278	10.0	-9999.0	-9999.0
12.795	22.04	22.30	0.72	23.32	3.24	114.6	0.733	0.056	0.677	10.7	13.0	5.0E-06	-9999.0	-9999.0	1.437	10.0	-9999.0	-9999.0
12.861	37.24	37.74	0.82	46.18	2.18	114.6	0.737	0.058	0.679	14.5	17.5	5.0E-05	44.3	40.0	2.467	10.0	117.3	3.109
12.926	74.87	75.18	0.90	28.48	1.20	120.9	0.741	0.060	0.681	18.0	21.8	5.0E-03	64.0	42.0	-9999.0	-9999.0	168.4	2.240
12.992	122.02	122.14	1.08	11.34	0.89	124.1	0.745	0.062	0.683	23.4	28.3	5.0E-02	77.9	44.0	-9999.0	-9999.0	235.6	1.929
13.058	169.09	169.20	1.30	10.51	0.77	124.1	0.749	0.064	0.685	32.4	39.2	5.0E-02	87.2	46.0	-9999.0	-9999.0	-9999.0	-9999.0
13.123	202.69	202.79	1.54	8.85	0.76	124.1	0.753	0.066	0.687	38.8	46.9	5.0E-02	92.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0
13.189	228.18	228.36	1.83	16.35	0.80	124.1	0.757	0.068	0.689	43.7	52.7	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
13.254	245.17	245.37	2.10	17.93	0.85	124.1	0.761	0.070	0.691	47.0	56.6	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
13.320	254.12	254.33	2.47	19.40	0.97	124.1	0.765	0.072	0.693	48.7	58.5	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
13.386	264.53	264.74	2.83	19.07	1.07	124.1	0.769	0.074	0.695	50.7	60.8	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
13.451	269.13	269.33	3.17	18.01	1.18	124.1	0.773	0.077	0.697	51.6	61.8	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
13.517	270.35	270.55	3.50	18.82	1.29	124.1	0.777	0.079	0.699	51.8	62.0	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
13.583	270.92	271.10	3.76	16.89	1.39	124.1	0.782	0.081	0.701	51.9	62.0	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
13.648	268.94	269.16	4.00	20.48	1.49	120.9	0.786	0.083	0.703	64.4	76.9	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
13.714	260.63	260.85	3.97	20.15	1.52	120.9	0.790	0.085	0.705	62.5	74.4	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
13.779	250.86	250.99	4.01	12.51	1.60	120.9	0.793	0.087	0.707	60.1	71.5	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
13.845	241.86	242.03	3.99	16.21	1.65	120.9	0.797	0.089	0.709	57.9	68.8	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
13.911	234.51	234.70	3.88	17.44	1.65	120.9	0.801	0.091	0.711	56.2	66.7	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
13.976	227.48	227.63	3.72	14.16	1.63	120.9	0.805	0.093	0.712	54.5	64.6	5.0E-03	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.042	221.73	221.91	3.63	16.75	1.64	120.9	0.809	0.095	0.714	53.1	62.9	5.0E-03	94.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.107	215.85	216.00	3.41	13.90	1.58	120.9	0.813	0.097	0.716	51.7	61.1	5.0E-03	93.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.173	211.38	211.54	3.27	14.34	1.54	120.9	0.817	0.099	0.718	50.6	59.8	5.0E-03	92.9	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.239	207.17	207.30	3.08	12.06	1.48	120.9	0.821	0.101	0.720	49.6	58.5	5.0E-03	92.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.304	202.95	203.13	2.89	16.75	1.42	120.9	0.825	0.103	0.722	48.6	57.2	5.0E-03	91.6	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.370	197.71	197.85	2.82	12.57	1.42	120.9	0.829	0.105	0.724	47.4	55.7	5.0E-03	90.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.436	195.35	195.47	2.67	10.79	1.36	120.9	0.833	0.107	0.726	46.8	54.9	5.0E-03	90.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.501	192.48	192.57	2.58	8.46	1.34	120.9	0.837	0.109	0.728	46.1	54.0	5.0E-03	90.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.567	190.94	191.09	2.44	13.84	1.27	124.1	0.841	0.111	0.730	36.6	42.8	5.0E-02	89.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.632	188.20	188.31	2.36	10.41	1.25	124.1	0.845	0.113	0.732	36.1	42.2	5.0E-02	89.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.698	183.34	183.47	2.29	11.69	1.25	124.1	0.849	0.115	0.734	35.1	41.0	5.0E-02	88.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.764	179.58	179.68	2.21	9.20	1.23	124.1	0.853	0.118	0.736	34.4	40.1	5.0E-02	87.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.829	177.33	177.45	2.13	11.47	1.20	124.1	0.857	0.120	0.738	34.0	39.6	5.0E-02	87.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.895	173.76	173.86	2.04	9.40	1.18	124.1	0.862	0.122	0.740	33.3	38.7	5.0E-02	86.8	46.0	-9999.0	-9999.0	350.1	2.014
14.960	171.59	171.71	1.75	11.47	1.02	124.1	0.866	0.124	0.742	32.9	38.2	5.0E-02	86.4	46.0	-9999.0	-9999.0	340.9	1.985
15.026	168.27	168.37	1.64	9.73	0.98	124.1	0.870	0.126	0.744	32.2	37.4	5.0E-02	85.8	46.0	-9999.0	-9999.0	328.3	1.950
15.092	164.69	164.80	1.56	9.95	0.95	124.1	0.874	0.128	0.746	31.6	36.5	5.0E-02	85.2	46.0	-9999.0	-9999.0	316.7	1.922
15.157	162.26	162.37	1.49	9.87	0.92	124.1	0.878	0.130	0.748	31.1	36.0	5.0E-02	84.7	46.0	-9999.0	-9999.0	309.6	1.907
15.223	159.83	159.89	1.44	5.47	0.90	124.1	0.882	0.132	0.750	30.6	35.4	5.0E-02	84.2	46.0	-9999.0	-9999.0	303.0	1.895
15.289	156.45	156.51	1.37	5.23	0.88	124.1	0.886	0.134	0.752	30.0	34.6	5.0E-02	83.6	46.0	-9999.0	-9999.0	295.0	1.885
15.354	155.94	155.99	1.32	4.44	0.85	124.1	0.890	0.136	0.754	29.9	34.4	5.0E-02	83.4	46.0	-9999.0	-9999.0	293.7	1.883
15.420	154.85	154.91	1.33	6.13	0.86	124.1	0.894	0.138	0.756	29.7	34.1	5.0E-02	83.2	46.0	-9999.0	-9999.0	291.4	1.881
15.485	152.17	152.22	1.31	5.07	0.86	124.1	0.898	0.140	0.758	29.2	33.5	5.0E-02	82.7	46.0	-9999.0	-9999.0	285.9	1.878
15.551	149.48	149.58	1.32	9.42	0.88	124.1	0.902	0.142	0.760	28.7	32.9	5.0E-02	82.1	44.0	-9999.0	-9999.0	281.0	1.878
15.617	145.39	145.51	1.33	11.16	0.92	124.1	0.906	0.144	0.762	27.9	31.9	5.0E-02	81.3	44.0	-9999.0	-9999.0	273.9	1.882
15.682	139.65	139.74	1.38	8.42	0.99	124.1	0.910	0.146	0.764	26.8	30.6	5.0E-02	80.1	44.0	-9999.0	-9999.0	264.7	1.894
15.748	135.62	135.69	1.43	6.40	1.06	120.9	0.914	0.148	0.766	32.5	37.1	5.0E-03	79.2	44.0	-9999.0	-9999.0	258.7	1.907
15.813	131.41	131.46	1.36	4.88	1.04	120.9	0.918	0.150	0.768	31.5	35.9	5.0E-03	78.3	44.0	-9999.0	-9999.0	252.7	1.922
15.879	127.95	128.02	1.31	6.62	1.03	120.9	0.922	0.152	0.770	30.7	34.9	5.0E-03	77.5	44.0	-9999.0	-9999.0	247.8	1.936
15.945	127.57	127.63	1.25	5.37	0.98	120.9	0.926	0.154	0.772	30.6	34.8	5.0E-03	77.4	44.0	-9999.0	-9999.0	247.4	1.938
16.010	126.23	126.30	1.20	6.58	0.95	120.9	0.930	0.156	0.774	30.2	34.4	5.0E-03	77.0	44.0	-9999.0	-9999.0	245.6	1.944
16.076	127.13	127.24	1.13	10.63	0.89	124.1	0.934	0.158	0.776	24.4	27.7	5.0E-02	77.2	44.0	-9999.0	-9999.0	247.0	1.941
16.142	121.05	121.27	1.05	20.15	0.87	124.1	0.938	0.161	0.778	23.2	26.3	5.0E-02	75.8	44.0	-9999.0	-9999.0	238.6	1.968
16.207	116.71	116.76	0.98	4.56	0.84	124.1	0.942	0.163	0.780	22.4	25.3	5.0E-02	74.7	44.0	-9999.0	-9999.0	232.3	1.990
16.273	115.63	115.70	0.91	6.83	0.79	124.1	0.947	0.165	0.782	22.2	25.1	5.0E-02	74.4	44.0	-9999.0	-9999.0	230.9	1.996
16.338	113.07	113.18	0.82	9.97	0.73	124.1	0.951	0.167	0.784	21.7	24.5	5.0E-02	73.7	44.0	-9999.0	-9999.0	227.4	2.009
16.404	114.16	114.22	0.75	5.43	0.66	124.1	0.955	0.169	0.786	21.9	24.7	5.0E-02	73.9	44.0	-9999.0	-9999.0	229.0	2.005
16.470	115.82	115.90	0.71	6.93	0.61	124.1	0.959	0.171	0.788	22.2	25.0	5.0E-02	74.3	44.0	-9999.0	-9999.0	231.5	1.998
16.535	118.50	118.56	0.69	6.11	0.58	124.1	0.963	0.173	0.790	22.7	25.6	5.0E-02	74.9	44.0	-9999.0	-9999.0	235.4	1.986
16.601	122.78	122.87	0.69	8.85	0.56	124.1	0.967	0.175	0.792	23.5	26.4	5.0E-02	75.9	44.0	-9999.0	-9999.0	241.7	1.967
16.666	125.85	125.96	0.73	10.71	0.58	124.1	0.971	0.177	0.794	24.1	27.1	5.0E-02	76.6	44.0	-9999.0	-9999.0	246.2	1.954
16.732	128.85	128.92	0.80	6.38	0.62	124.1	0.975	0.179	0.796	24.7	27.7	5.0E-02	77.2	44.0	-9999.0	-9999.0	250.5	1.943

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
16.798	127.57	127.66	0.85	7.96	0.67	124.1	0.979	0.181	0.798	24.5	27.4	5.0E-02	76.9	44.0	-9999.0	-9999.0	248.8	1.949
16.863	125.33	125.43	0.93	8.46	0.74	124.1	0.983	0.183	0.800	24.0	26.9	5.0E-02	76.3	44.0	-9999.0	-9999.0	245.8	1.960
16.929	121.83	121.92	0.86	8.75	0.71	124.1	0.987	0.185	0.802	23.4	26.1	5.0E-02	75.5	44.0	-9999.0	-9999.0	240.9	1.976
16.995	119.20	119.28	0.88	7.29	0.74	124.1	0.991	0.187	0.804	22.8	25.5	5.0E-02	74.8	44.0	-9999.0	-9999.0	237.3	1.990
17.060	115.50	115.58	0.84	7.03	0.73	124.1	0.995	0.189	0.806	22.1	24.7	5.0E-02	73.9	44.0	-9999.0	-9999.0	232.2	2.009
17.126	113.26	113.35	0.79	7.52	0.70	124.1	0.999	0.191	0.808	21.7	24.2	5.0E-02	73.3	44.0	-9999.0	-9999.0	229.1	2.021
17.191	110.77	110.85	0.76	7.15	0.69	124.1	1.004	0.193	0.810	21.2	23.6	5.0E-02	72.6	44.0	-9999.0	-9999.0	225.6	2.035
17.257	109.10	109.19	0.75	7.60	0.69	124.1	1.008	0.195	0.812	20.9	23.2	5.0E-02	72.2	44.0	-9999.0	-9999.0	223.3	2.046
17.323	106.87	106.94	0.71	6.50	0.67	124.1	1.012	0.197	0.814	20.5	22.7	5.0E-02	71.5	44.0	-9999.0	-9999.0	220.2	2.059
17.388	105.28	105.35	0.68	7.29	0.65	124.1	1.016	0.199	0.816	20.2	22.3	5.0E-02	71.1	44.0	-9999.0	-9999.0	218.0	2.069
17.454	103.30	103.36	0.63	5.35	0.61	124.1	1.020	0.202	0.818	19.8	21.9	5.0E-02	70.5	44.0	-9999.0	-9999.0	215.2	2.083
17.519	101.45	101.53	0.60	8.00	0.59	124.1	1.024	0.204	0.820	19.4	21.5	5.0E-02	69.9	42.0	-9999.0	-9999.0	212.7	2.095
17.585	98.76	98.83	0.54	6.24	0.55	124.1	1.028	0.206	0.822	18.9	20.9	5.0E-02	69.1	42.0	-9999.0	-9999.0	208.9	2.114
17.651	98.51	98.58	0.52	7.03	0.53	124.1	1.032	0.208	0.824	18.9	20.8	5.0E-02	69.0	42.0	-9999.0	-9999.0	208.7	2.117
17.716	96.65	96.71	0.50	5.23	0.52	124.1	1.036	0.210	0.826	18.5	20.4	5.0E-02	68.4	42.0	-9999.0	-9999.0	206.1	2.131
17.782	94.55	94.63	0.49	7.89	0.52	124.1	1.040	0.212	0.828	18.1	19.9	5.0E-02	67.8	42.0	-9999.0	-9999.0	203.2	2.147
17.848	93.33	93.41	0.45	7.29	0.48	124.1	1.044	0.214	0.830	17.9	19.6	5.0E-02	67.4	42.0	-9999.0	-9999.0	201.5	2.157
17.913	92.30	92.38	0.43	6.64	0.47	124.1	1.048	0.216	0.832	17.7	19.4	5.0E-02	67.0	42.0	-9999.0	-9999.0	200.1	2.167
17.979	92.37	92.45	0.45	7.31	0.49	124.1	1.052	0.218	0.834	17.7	19.4	5.0E-02	67.0	42.0	-9999.0	-9999.0	200.4	2.167
18.044	90.46	90.55	0.47	8.50	0.52	120.9	1.056	0.220	0.836	21.7	23.7	5.0E-03	66.4	42.0	-9999.0	-9999.0	197.7	2.184
18.110	88.60	88.68	0.52	6.95	0.59	120.9	1.060	0.222	0.838	21.2	23.2	5.0E-03	65.7	42.0	-9999.0	-9999.0	195.2	2.201
18.176	87.32	87.41	0.49	7.89	0.56	120.9	1.064	0.224	0.840	20.9	22.8	5.0E-03	65.3	42.0	-9999.0	-9999.0	193.5	2.214
18.241	84.90	84.97	0.53	6.48	0.63	120.9	1.068	0.226	0.842	20.3	22.2	5.0E-03	64.4	42.0	-9999.0	-9999.0	190.1	2.238
18.307	81.90	81.95	0.46	4.68	0.56	120.9	1.072	0.228	0.844	19.6	21.4	5.0E-03	63.4	42.0	-9999.0	-9999.0	186.0	2.270
18.372	82.22	82.27	0.46	4.23	0.56	120.9	1.076	0.230	0.846	19.7	21.4	5.0E-03	63.5	42.0	-9999.0	-9999.0	186.6	2.268
18.438	80.29	80.34	0.47	3.76	0.59	120.9	1.080	0.232	0.848	19.2	20.9	5.0E-03	62.7	42.0	-9999.0	-9999.0	184.0	2.290
18.504	78.51	78.57	0.45	5.05	0.57	120.9	1.084	0.234	0.850	18.8	20.4	5.0E-03	62.1	42.0	-9999.0	-9999.0	181.7	2.312
18.569	76.53	76.59	0.44	5.59	0.58	120.9	1.088	0.236	0.852	18.3	19.9	5.0E-03	61.3	42.0	-9999.0	-9999.0	179.1	2.338
18.635	70.84	70.89	0.41	4.39	0.58	120.9	1.092	0.238	0.854	17.0	18.4	5.0E-03	59.1	42.0	-9999.0	-9999.0	171.5	2.419
18.701	67.90	67.95	0.38	3.76	0.56	120.9	1.096	0.240	0.856	16.3	17.6	5.0E-03	57.8	42.0	-9999.0	-9999.0	167.7	2.468
18.766	65.73	65.78	0.33	4.58	0.50	120.9	1.100	0.242	0.858	15.7	17.0	5.0E-03	56.9	40.0	-9999.0	-9999.0	164.9	2.507
18.832	63.05	63.11	0.32	4.84	0.51	120.9	1.104	0.245	0.860	15.1	16.3	5.0E-03	55.6	40.0	-9999.0	-9999.0	161.5	2.560
18.897	59.93	59.97	0.28	4.37	0.47	120.9	1.108	0.247	0.861	14.4	15.5	5.0E-03	54.1	40.0	-9999.0	-9999.0	157.5	2.626
18.963	57.18	57.23	0.25	5.13	0.44	120.9	1.112	0.249	0.863	13.7	14.7	5.0E-03	52.8	40.0	-9999.0	-9999.0	154.0	2.690
19.029	54.68	54.73	0.22	3.95	0.40	120.9	1.116	0.251	0.865	13.1	14.1	5.0E-03	51.5	40.0	-9999.0	-9999.0	150.7	2.754
19.094	52.58	52.61	0.19	3.14	0.36	120.9	1.120	0.253	0.867	12.6	13.5	5.0E-03	50.3	40.0	-9999.0	-9999.0	147.9	2.812
19.160	51.42	51.51	0.17	7.48	0.33	120.9	1.124	0.255	0.869	12.3	13.2	5.0E-03	49.6	40.0	-9999.0	-9999.0	146.5	2.845
19.225	49.13	49.17	0.17	3.35	0.35	120.9	1.128	0.257	0.871	11.8	12.6	5.0E-03	48.3	40.0	-9999.0	-9999.0	143.3	2.916
19.291	48.11	48.18	0.16	7.03	0.33	120.9	1.132	0.259	0.873	11.5	12.3	5.0E-03	47.7	40.0	-9999.0	-9999.0	142.0	2.948
19.357	46.12	46.17	0.12	4.66	0.26	120.9	1.136	0.261	0.875	11.1	11.8	5.0E-03	46.4	38.0	-9999.0	-9999.0	139.2	3.015
19.422	44.65	44.70	0.11	4.94	0.25	120.9	1.140	0.263	0.877	10.7	11.4	5.0E-03	45.5	38.0	-9999.0	-9999.0	137.1	3.067
19.488	43.12	43.18	0.10	4.80	0.23	120.9	1.144	0.265	0.879	10.3	11.0	5.0E-03	44.4	38.0	-9999.0	-9999.0	134.9	3.124
19.554	43.57	43.63	0.09	6.32	0.21	120.9	1.148	0.267	0.881	10.4	11.1	5.0E-03	44.7	38.0	-9999.0	-9999.0	135.7	3.109
19.619	43.51	43.56	0.08	4.86	0.18	120.9	1.152	0.269	0.883	10.4	11.1	5.0E-03	44.6	38.0	-9999.0	-9999.0	135.6	3.114
19.685	43.51	43.55	0.08	4.56	0.18	120.9	1.156	0.271	0.884	10.4	11.1	5.0E-03	44.6	38.0	-9999.0	-9999.0	135.7	3.116
19.750	44.72	44.77	0.08	5.07	0.18	120.9	1.160	0.273	0.886	10.7	11.4	5.0E-03	45.4	38.0	-9999.0	-9999.0	137.7	3.075
19.816	46.06	46.12	0.08	5.83	0.17	120.9	1.164	0.275	0.888	11.0	11.7	5.0E-03	46.2	38.0	-9999.0	-9999.0	139.8	3.031
19.882	47.08	47.14	0.05	5.35	0.11	120.9	1.168	0.277	0.890	11.3	12.0	5.0E-03	46.8	38.0	-9999.0	-9999.0	141.4	3.000
19.947	47.33	47.40	0.05	6.28	0.11	120.9	1.171	0.279	0.892	11.3	12.0	5.0E-03	46.9	38.0	-9999.0	-9999.0	141.9	2.994
20.013	47.60	47.66	0.06	6.09	0.13	120.9	1.175	0.281	0.894	11.4	12.1	5.0E-03	47.0	38.0	-9999.0	-9999.0	142.4	2.988
20.078	46.18	46.26	0.06	7.05	0.13	120.9	1.179	0.283	0.896	11.1	11.7	5.0E-03	46.1	38.0	-9999.0	-9999.0	140.4	3.035

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
20.144	44.46	44.54	0.08	7.25	0.18	120.9	1.183	0.286	0.898	10.7	11.3	5.0E-03	45.0	38.0	-9999.0	-9999.0	137.9	3.097
20.210	42.22	42.28	0.07	5.17	0.17	120.9	1.187	0.288	0.900	10.1	10.7	5.0E-03	43.5	38.0	-9999.0	-9999.0	134.5	3.180
20.275	38.90	38.96	0.09	5.43	0.23	120.9	1.191	0.290	0.902	9.3	9.8	5.0E-03	41.1	38.0	-9999.0	-9999.0	129.1	3.313
20.341	36.29	36.35	0.11	5.77	0.30	117.7	1.195	0.292	0.904	11.6	12.2	5.0E-04	39.1	38.0	-9999.0	-9999.0	124.5	3.426
20.407	33.54	33.62	0.09	7.36	0.27	117.7	1.199	0.294	0.905	10.7	11.3	5.0E-04	36.8	38.0	-9999.0	-9999.0	119.5	3.553
20.472	31.50	31.56	0.07	5.99	0.22	117.7	1.203	0.296	0.907	10.1	10.6	5.0E-04	35.0	36.0	-9999.0	-9999.0	115.4	3.656
20.538	31.31	31.36	0.05	5.45	0.16	117.7	1.207	0.298	0.909	10.0	10.5	5.0E-04	34.8	36.0	-9999.0	-9999.0	115.0	3.667
20.603	35.20	35.27	0.04	6.46	0.11	120.9	1.211	0.300	0.911	8.4	8.8	5.0E-03	38.1	38.0	-9999.0	-9999.0	122.8	3.483
20.669	39.23	39.30	0.06	7.07	0.15	120.9	1.215	0.302	0.913	9.4	9.8	5.0E-03	41.2	38.0	-9999.0	-9999.0	130.1	3.311
20.735	41.20	41.27	0.08	6.34	0.19	120.9	1.219	0.304	0.915	9.9	10.3	5.0E-03	42.6	38.0	-9999.0	-9999.0	133.5	3.236
20.800	41.84	41.91	0.06	6.68	0.14	120.9	1.223	0.306	0.917	10.0	10.5	5.0E-03	43.0	38.0	-9999.0	-9999.0	134.7	3.213
20.866	42.10	42.17	0.07	6.40	0.17	120.9	1.227	0.308	0.919	10.1	10.5	5.0E-03	43.1	38.0	-9999.0	-9999.0	135.2	3.205
20.932	42.92	43.01	0.06	7.74	0.14	120.9	1.231	0.310	0.920	10.3	10.7	5.0E-03	43.7	38.0	-9999.0	-9999.0	136.6	3.176
20.997	44.02	44.09	0.08	6.68	0.18	120.9	1.235	0.312	0.922	10.6	11.0	5.0E-03	44.3	38.0	-9999.0	-9999.0	138.4	3.139
21.063	46.12	46.19	0.08	6.62	0.17	120.9	1.239	0.314	0.924	11.1	11.5	5.0E-03	45.6	38.0	-9999.0	-9999.0	141.7	3.068
21.128	47.20	47.28	0.09	7.31	0.19	120.9	1.242	0.316	0.926	11.3	11.8	5.0E-03	46.3	38.0	-9999.0	-9999.0	143.5	3.034
21.194	46.25	46.32	0.09	6.11	0.19	120.9	1.246	0.318	0.928	11.1	11.5	5.0E-03	45.7	38.0	-9999.0	-9999.0	142.1	3.068
21.260	44.34	44.40	0.12	5.37	0.27	120.9	1.250	0.320	0.930	10.6	11.0	5.0E-03	44.4	38.0	-9999.0	-9999.0	139.3	3.137
21.325	41.78	41.87	0.17	8.16	0.41	120.9	1.254	0.322	0.932	10.0	10.4	5.0E-03	42.7	38.0	-9999.0	-9999.0	135.3	3.232
21.391	39.99	40.07	0.14	8.10	0.35	120.9	1.258	0.324	0.934	9.6	9.9	5.0E-03	41.4	38.0	-9999.0	-9999.0	132.4	3.304
21.456	37.43	37.51	0.09	7.15	0.24	120.9	1.262	0.326	0.936	9.0	9.3	5.0E-03	39.5	38.0	-9999.0	-9999.0	128.0	3.412
21.522	35.97	36.05	0.07	7.70	0.19	120.9	1.266	0.329	0.938	8.6	8.9	5.0E-03	38.3	38.0	-9999.0	-9999.0	125.4	3.478
21.588	36.73	36.80	0.06	6.97	0.16	120.9	1.270	0.331	0.940	8.8	9.1	5.0E-03	38.9	38.0	-9999.0	-9999.0	126.9	3.447
21.653	39.29	39.36	0.07	6.93	0.18	120.9	1.274	0.333	0.942	9.4	9.7	5.0E-03	40.8	38.0	-9999.0	-9999.0	131.5	3.341
21.719	43.95	44.03	0.07	8.08	0.16	120.9	1.278	0.335	0.944	10.5	10.9	5.0E-03	44.0	38.0	-9999.0	-9999.0	139.3	3.164
21.785	48.17	48.25	0.09	8.10	0.19	120.9	1.282	0.337	0.945	11.6	11.9	5.0E-03	46.6	38.0	-9999.0	-9999.0	145.9	3.023
21.850	50.66	50.75	0.12	7.74	0.24	120.9	1.286	0.339	0.947	12.1	12.5	5.0E-03	48.0	38.0	-9999.0	-9999.0	149.6	2.949
21.916	49.06	49.15	0.12	8.16	0.24	120.9	1.290	0.341	0.949	11.8	12.1	5.0E-03	47.0	38.0	-9999.0	-9999.0	147.4	2.999
21.981	50.59	50.68	0.13	7.83	0.26	120.9	1.294	0.343	0.951	12.1	12.4	5.0E-03	47.9	38.0	-9999.0	-9999.0	149.7	2.955
22.047	50.91	51.00	0.13	7.91	0.26	120.9	1.298	0.345	0.953	12.2	12.5	5.0E-03	48.0	38.0	-9999.0	-9999.0	150.3	2.947
22.113	51.81	51.88	0.17	6.77	0.33	120.9	1.302	0.347	0.955	12.4	12.7	5.0E-03	48.5	40.0	-9999.0	-9999.0	151.7	2.923
22.178	52.83	52.92	0.20	8.67	0.38	120.9	1.306	0.349	0.957	12.7	13.0	5.0E-03	49.0	40.0	-9999.0	-9999.0	153.2	2.896
22.244	53.79	53.87	0.19	7.29	0.35	120.9	1.310	0.351	0.959	12.9	13.2	5.0E-03	49.5	40.0	-9999.0	-9999.0	154.7	2.871
22.309	56.47	56.55	0.22	7.38	0.39	120.9	1.314	0.353	0.961	13.5	13.8	5.0E-03	50.9	40.0	-9999.0	-9999.0	158.5	2.803
22.375	58.26	58.33	0.33	6.70	0.57	120.9	1.318	0.355	0.963	14.0	14.2	5.0E-03	51.8	40.0	-9999.0	-9999.0	161.0	2.761
22.441	58.13	58.21	0.64	7.03	1.10	117.7	1.322	0.357	0.965	18.6	18.9	5.0E-04	51.7	40.0	-9999.0	-9999.0	161.0	2.766
22.506	58.70	58.78	1.13	7.09	1.93	117.7	1.326	0.359	0.966	18.8	19.1	5.0E-04	51.9	40.0	-9999.0	-9999.0	161.9	2.754
22.572	59.15	59.24	1.67	7.72	2.83	114.6	1.329	0.361	0.968	22.7	23.1	5.0E-05	52.1	40.0	3.860	10.0	162.6	2.744
22.638	61.20	61.30	1.87	9.20	3.06	114.6	1.333	0.363	0.970	23.5	23.8	5.0E-05	53.1	40.0	3.998	10.0	165.5	2.699
22.703	65.73	65.85	2.03	11.20	3.09	114.6	1.337	0.365	0.972	25.2	25.6	5.0E-05	55.1	40.0	4.301	10.0	171.7	2.607
22.769	75.89	76.04	1.97	13.59	2.60	114.6	1.341	0.367	0.973	29.1	29.5	5.0E-05	59.2	40.0	4.980	10.0	185.4	2.439
22.834	91.99	92.14	2.26	13.39	2.45	117.7	1.345	0.370	0.975	29.4	29.8	5.0E-04	64.7	42.0	-9999.0	-9999.0	208.0	2.257
22.900	121.18	121.35	1.61	15.49	1.33	120.9	1.348	0.372	0.977	29.1	29.4	5.0E-03	72.5	42.0	-9999.0	-9999.0	250.6	2.065
22.966	141.81	141.92	1.56	9.42	1.10	120.9	1.352	0.374	0.979	34.0	34.3	5.0E-03	77.0	44.0	-9999.0	-9999.0	280.0	1.973
23.031	221.35	221.49	1.28	13.45	0.58	124.1	1.356	0.376	0.981	42.4	42.8	5.0E-02	89.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0
23.097	253.61	253.72	1.23	10.18	0.49	127.3	1.361	0.378	0.983	40.5	40.9	5.0E+00	93.6	46.0	-9999.0	-9999.0	-9999.0	-9999.0
23.162	242.81	242.94	1.63	12.41	0.67	124.1	1.365	0.380	0.985	46.5	46.9	5.0E-02	92.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0
23.228	284.72	284.83	1.94	9.79	0.68	124.1	1.369	0.382	0.987	54.6	54.9	5.0E-02	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
23.294	258.60	258.72	1.58	11.65	0.61	124.1	1.373	0.384	0.989	49.6	49.8	5.0E-02	94.1	46.0	-9999.0	-9999.0	-9999.0	-9999.0
23.359	182.25	182.32	1.28	5.99	0.70	124.1	1.377	0.386	0.991	34.9	35.1	5.0E-02	84.0	44.0	-9999.0	-9999.0	348.2	1.910
23.425	109.43	109.52	1.17	8.77	1.07	120.9	1.381	0.388	0.993	26.2	26.3	5.0E-03	69.4	42.0	-9999.0	-9999.0	234.3	2.139

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
23.491	55.06	55.16	1.01	8.75	1.84	117.7	1.385	0.390	0.995	17.6	17.7	5.0E-04	49.7	40.0	-9999.0	-9999.0	158.4	2.872
23.556	35.71	35.79	0.99	7.42	2.77	114.6	1.389	0.392	0.997	13.7	13.7	5.0E-05	37.2	38.0	2.293	10.0	127.2	3.554
23.622	35.14	35.22	1.04	7.40	2.96	114.6	1.392	0.394	0.998	13.5	13.5	5.0E-05	36.8	36.0	2.255	10.0	126.1	3.581
23.687	28.24	28.33	1.14	8.59	4.03	114.6	1.396	0.396	1.000	18.1	18.1	5.0E-07	-9999.0	-9999.0	1.796	10.0	-9999.0	-9999.0
23.753	23.00	23.12	1.00	11.28	4.34	114.6	1.400	0.398	1.002	14.8	14.7	5.0E-07	-9999.0	-9999.0	1.448	8.0	-9999.0	-9999.0
23.819	18.85	18.95	0.69	9.64	3.65	114.6	1.404	0.400	1.003	12.1	12.1	5.0E-07	-9999.0	-9999.0	1.170	5.8	-9999.0	-9999.0
23.884	16.35	16.44	0.64	7.96	3.90	114.6	1.407	0.402	1.005	10.5	10.5	5.0E-07	-9999.0	-9999.0	1.002	4.5	-9999.0	-9999.0
23.950	14.95	15.05	0.56	9.62	3.73	114.6	1.411	0.404	1.007	9.6	9.6	5.0E-07	-9999.0	-9999.0	0.909	3.9	-9999.0	-9999.0
24.015	13.22	13.36	0.46	12.86	3.45	114.6	1.415	0.406	1.009	8.5	8.5	5.0E-07	-9999.0	-9999.0	0.796	3.2	-9999.0	-9999.0
24.081	10.15	10.36	0.40	18.84	3.87	111.4	1.419	0.408	1.010	9.9	9.9	5.0E-08	-9999.0	-9999.0	0.596	2.2	-9999.0	-9999.0
24.147	8.50	8.71	0.38	19.77	4.37	111.4	1.422	0.410	1.012	8.3	8.3	5.0E-08	-9999.0	-9999.0	0.486	1.7	-9999.0	-9999.0
24.212	7.73	8.02	0.37	26.59	4.63	111.4	1.426	0.413	1.013	7.7	7.6	5.0E-08	-9999.0	-9999.0	0.439	1.5	-9999.0	-9999.0
24.278	7.48	7.68	0.37	18.52	4.83	111.4	1.430	0.415	1.015	7.4	7.3	5.0E-08	-9999.0	-9999.0	0.417	1.4	-9999.0	-9999.0
24.344	6.97	7.15	0.34	17.36	4.76	111.4	1.433	0.417	1.017	6.9	6.8	5.0E-08	-9999.0	-9999.0	0.381	1.2	-9999.0	-9999.0
24.409	6.71	6.86	0.31	14.45	4.53	111.4	1.437	0.419	1.018	6.6	6.5	5.0E-08	-9999.0	-9999.0	0.362	1.2	-9999.0	-9999.0
24.475	6.52	6.65	0.31	12.39	4.67	111.4	1.441	0.421	1.020	6.4	6.3	5.0E-08	-9999.0	-9999.0	0.347	1.1	-9999.0	-9999.0
24.540	6.84	6.98	0.33	12.86	4.74	111.4	1.444	0.423	1.022	6.7	6.6	5.0E-08	-9999.0	-9999.0	0.369	1.2	-9999.0	-9999.0
24.606	6.33	6.51	0.37	17.50	5.69	111.4	1.448	0.425	1.023	6.2	6.2	5.0E-08	-9999.0	-9999.0	0.338	1.1	-9999.0	-9999.0
24.672	7.48	7.69	0.39	19.93	5.08	111.4	1.452	0.427	1.025	7.4	7.3	5.0E-08	-9999.0	-9999.0	0.416	1.4	-9999.0	-9999.0
24.737	8.43	8.59	0.41	15.21	4.78	111.4	1.455	0.429	1.026	8.2	8.1	5.0E-08	-9999.0	-9999.0	0.476	1.6	-9999.0	-9999.0
24.803	9.45	9.54	0.47	8.34	4.94	111.4	1.459	0.431	1.028	9.1	9.0	5.0E-08	-9999.0	-9999.0	0.539	1.8	-9999.0	-9999.0
24.868	9.13	9.20	0.45	6.24	4.90	111.4	1.463	0.433	1.030	8.8	8.7	5.0E-08	-9999.0	-9999.0	0.516	1.7	-9999.0	-9999.0
24.934	8.11	8.13	0.47	1.88	5.80	111.4	1.466	0.435	1.031	7.8	7.7	5.0E-08	-9999.0	-9999.0	0.444	1.5	-9999.0	-9999.0
25.000	7.28	7.30	0.46	1.66	6.32	111.4	1.470	0.437	1.033	7.0	6.9	5.0E-08	-9999.0	-9999.0	0.388	1.3	-9999.0	-9999.0
25.065	5.36	5.43	0.42	6.44	7.75	111.4	1.474	0.439	1.034	5.2	5.1	5.0E-08	-9999.0	-9999.0	0.264	0.9	-9999.0	-9999.0
25.131	5.62	5.75	0.41	11.36	7.15	111.4	1.477	0.441	1.036	5.5	5.4	5.0E-08	-9999.0	-9999.0	0.285	0.9	-9999.0	-9999.0
25.197	5.24	5.37	0.34	11.87	6.35	111.4	1.481	0.443	1.038	5.1	5.1	5.0E-08	-9999.0	-9999.0	0.259	0.9	-9999.0	-9999.0
25.262	4.85	5.02	0.28	15.74	5.59	111.4	1.484	0.445	1.039	4.8	4.7	5.0E-08	-9999.0	-9999.0	0.236	0.8	-9999.0	-9999.0
25.328	5.55	5.74	0.24	16.81	4.19	111.4	1.488	0.447	1.041	5.5	5.4	5.0E-08	-9999.0	-9999.0	0.283	0.9	-9999.0	-9999.0
25.393	5.17	5.37	0.24	18.56	4.48	111.4	1.492	0.449	1.042	5.1	5.0	5.0E-08	-9999.0	-9999.0	0.259	0.9	-9999.0	-9999.0
25.459	6.13	6.34	0.22	19.40	3.48	111.4	1.495	0.451	1.044	6.1	5.9	5.0E-08	-9999.0	-9999.0	0.323	1.0	-9999.0	-9999.0
25.525	6.06	6.23	0.22	15.19	3.54	111.4	1.499	0.454	1.046	6.0	5.8	5.0E-08	-9999.0	-9999.0	0.315	1.0	-9999.0	-9999.0
25.590	5.24	5.36	0.22	10.83	4.11	111.4	1.503	0.456	1.047	5.1	5.0	5.0E-08	-9999.0	-9999.0	0.257	0.8	-9999.0	-9999.0
25.656	4.98	5.13	0.21	14.06	4.10	111.4	1.506	0.458	1.049	4.9	4.8	5.0E-08	-9999.0	-9999.0	0.242	0.8	-9999.0	-9999.0
25.721	5.24	5.48	0.21	21.97	3.84	111.4	1.510	0.460	1.050	5.2	5.1	5.0E-08	-9999.0	-9999.0	0.265	0.9	-9999.0	-9999.0
25.787	4.73	4.96	0.19	20.99	3.84	111.4	1.514	0.462	1.052	4.7	4.6	5.0E-08	-9999.0	-9999.0	0.230	0.8	-9999.0	-9999.0
25.853	5.36	5.58	0.18	19.93	3.23	111.4	1.517	0.464	1.054	5.3	5.2	5.0E-08	-9999.0	-9999.0	0.271	0.9	-9999.0	-9999.0
25.918	5.17	5.40	0.18	21.40	3.34	111.4	1.521	0.466	1.055	5.2	5.0	5.0E-08	-9999.0	-9999.0	0.259	0.8	-9999.0	-9999.0
25.984	5.49	5.75	0.21	23.32	3.66	111.4	1.525	0.468	1.057	5.5	5.4	5.0E-08	-9999.0	-9999.0	0.281	0.9	-9999.0	-9999.0
26.050	7.54	7.81	0.23	25.38	2.95	114.6	1.528	0.470	1.059	5.0	4.8	5.0E-07	-9999.0	-9999.0	0.419	1.3	-9999.0	-9999.0
26.115	9.39	9.60	0.28	18.96	2.92	114.6	1.532	0.472	1.060	6.1	6.0	5.0E-07	-9999.0	-9999.0	0.538	1.8	-9999.0	-9999.0
26.181	10.22	10.38	0.35	14.22	3.38	114.6	1.536	0.474	1.062	6.6	6.4	5.0E-07	-9999.0	-9999.0	0.589	2.0	-9999.0	-9999.0
26.246	11.25	11.37	0.40	11.59	3.53	114.6	1.540	0.476	1.064	7.3	7.0	5.0E-07	-9999.0	-9999.0	0.656	2.3	-9999.0	-9999.0
26.312	9.64	9.69	0.43	4.25	4.45	111.4	1.543	0.478	1.065	9.3	9.0	5.0E-08	-9999.0	-9999.0	0.543	1.8	-9999.0	-9999.0
26.378	8.88	8.95	0.43	6.44	4.82	111.4	1.547	0.480	1.067	8.6	8.3	5.0E-08	-9999.0	-9999.0	0.494	1.6	-9999.0	-9999.0
26.443	8.11	8.17	0.39	5.93	4.78	111.4	1.551	0.482	1.069	7.8	7.6	5.0E-08	-9999.0	-9999.0	0.442	1.4	-9999.0	-9999.0
26.509	7.28	7.37	0.36	8.83	4.89	111.4	1.554	0.484	1.070	7.1	6.8	5.0E-08	-9999.0	-9999.0	0.388	1.2	-9999.0	-9999.0
26.574	6.71	6.91	0.31	19.26	4.49	111.4	1.558	0.486	1.072	6.6	6.4	5.0E-08	-9999.0	-9999.0	0.357	1.1	-9999.0	-9999.0
26.640	7.03	7.23	0.29	18.39	4.02	111.4	1.562	0.488	1.073	6.9	6.7	5.0E-08	-9999.0	-9999.0	0.378	1.2	-9999.0	-9999.0
26.706	6.90	7.12	0.28	20.70	3.94	111.4	1.565	0.490	1.075	6.8	6.6	5.0E-08	-9999.0	-9999.0	0.370	1.1	-9999.0	-9999.0
26.771	6.46	6.69	0.27	22.02	4.04	111.4	1.569	0.492	1.077	6.4	6.2	5.0E-08	-9999.0	-9999.0	0.342	1.1	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
26.837	7.54	7.76	0.27	20.52	3.49	111.4	1.573	0.494	1.078	7.4	7.2	5.0E-08	-9999.0	-9999.0	0.412	1.3	-9999.0	-9999.0
26.903	8.05	8.29	0.29	22.54	3.51	111.4	1.576	0.497	1.080	7.9	7.6	5.0E-08	-9999.0	-9999.0	0.448	1.4	-9999.0	-9999.0
26.968	8.50	8.75	0.28	22.85	3.21	114.6	1.580	0.499	1.081	5.6	5.4	5.0E-07	-9999.0	-9999.0	0.478	1.5	-9999.0	-9999.0
27.034	7.73	7.85	0.27	11.61	3.45	111.4	1.584	0.501	1.083	7.5	7.2	5.0E-08	-9999.0	-9999.0	0.418	1.3	-9999.0	-9999.0
27.099	8.37	8.55	0.29	16.25	3.40	111.4	1.587	0.503	1.085	8.2	7.9	5.0E-08	-9999.0	-9999.0	0.464	1.4	-9999.0	-9999.0
27.165	7.79	7.98	0.32	17.42	4.02	111.4	1.591	0.505	1.086	7.6	7.3	5.0E-08	-9999.0	-9999.0	0.426	1.3	-9999.0	-9999.0
27.231	6.84	7.18	0.33	31.39	4.61	111.4	1.595	0.507	1.088	6.9	6.6	5.0E-08	-9999.0	-9999.0	0.372	1.1	-9999.0	-9999.0
27.296	6.90	7.21	0.31	29.13	4.31	111.4	1.598	0.509	1.089	6.9	6.6	5.0E-08	-9999.0	-9999.0	0.374	1.1	-9999.0	-9999.0
27.362	6.46	6.75	0.29	26.94	4.31	111.4	1.602	0.511	1.091	6.5	6.2	5.0E-08	-9999.0	-9999.0	0.343	1.0	-9999.0	-9999.0
27.427	7.22	7.45	0.25	21.17	3.37	111.4	1.606	0.513	1.093	7.1	6.8	5.0E-08	-9999.0	-9999.0	0.389	1.2	-9999.0	-9999.0
27.493	7.16	7.39	0.24	21.17	3.26	111.4	1.609	0.515	1.094	7.1	6.8	5.0E-08	-9999.0	-9999.0	0.385	1.2	-9999.0	-9999.0
27.559	6.90	7.17	0.25	25.50	3.49	111.4	1.613	0.517	1.096	6.9	6.6	5.0E-08	-9999.0	-9999.0	0.371	1.1	-9999.0	-9999.0
27.624	6.52	6.79	0.24	25.38	3.54	111.4	1.617	0.519	1.098	6.5	6.2	5.0E-08	-9999.0	-9999.0	0.345	1.0	-9999.0	-9999.0
27.690	6.52	6.80	0.22	26.02	3.24	111.4	1.620	0.521	1.099	6.5	6.2	5.0E-08	-9999.0	-9999.0	0.345	1.0	-9999.0	-9999.0
27.756	6.00	6.29	0.22	25.96	3.51	111.4	1.624	0.523	1.101	6.0	5.7	5.0E-08	-9999.0	-9999.0	0.311	0.9	-9999.0	-9999.0
27.821	6.20	6.48	0.23	26.33	3.56	111.4	1.628	0.525	1.102	6.2	5.9	5.0E-08	-9999.0	-9999.0	0.323	1.0	-9999.0	-9999.0
27.887	6.00	6.31	0.26	28.50	4.13	111.4	1.631	0.527	1.104	6.0	5.8	5.0E-08	-9999.0	-9999.0	0.312	0.9	-9999.0	-9999.0
27.952	8.69	9.01	0.29	29.63	3.23	114.6	1.635	0.529	1.106	5.8	5.5	5.0E-07	-9999.0	-9999.0	0.492	1.5	-9999.0	-9999.0
28.018	12.20	12.51	0.30	28.27	2.40	114.6	1.639	0.531	1.107	6.0	5.7	5.0E-06	-9999.0	-9999.0	0.724	2.5	-9999.0	-9999.0
28.084	15.08	15.31	0.30	21.87	1.96	114.6	1.642	0.533	1.109	7.3	7.0	5.0E-06	-9999.0	-9999.0	0.911	3.4	-9999.0	-9999.0
28.149	15.40	15.60	0.31	18.94	1.99	114.6	1.646	0.535	1.111	7.5	7.1	5.0E-06	-9999.0	-9999.0	0.930	3.5	-9999.0	-9999.0
28.215	13.29	13.46	0.20	15.74	1.49	114.6	1.650	0.537	1.112	5.2	4.9	5.0E-05	30.0	30.0	0.787	2.8	-9999.0	-9999.0
28.280	11.25	11.39	0.18	13.25	1.58	114.6	1.654	0.540	1.114	5.5	5.2	5.0E-06	-9999.0	-9999.0	0.649	2.1	-9999.0	-9999.0
28.346	9.71	9.86	0.17	13.88	1.73	114.6	1.657	0.542	1.116	4.7	4.5	5.0E-06	-9999.0	-9999.0	0.547	1.7	-9999.0	-9999.0
28.412	7.73	7.88	0.15	13.71	1.91	114.6	1.661	0.544	1.118	3.8	3.6	5.0E-06	-9999.0	-9999.0	0.414	1.2	-9999.0	-9999.0
28.477	6.97	7.17	0.15	18.92	2.10	114.6	1.665	0.546	1.119	4.6	4.3	5.0E-07	-9999.0	-9999.0	0.367	1.1	-9999.0	-9999.0
28.543	5.81	6.09	0.14	25.88	2.30	114.6	1.669	0.548	1.121	3.9	3.7	5.0E-07	-9999.0	-9999.0	0.295	0.9	-9999.0	-9999.0
28.609	6.33	6.62	0.12	26.92	1.82	114.6	1.672	0.550	1.123	4.2	4.0	5.0E-07	-9999.0	-9999.0	0.330	1.0	-9999.0	-9999.0
28.674	6.58	6.88	0.12	28.03	1.75	114.6	1.676	0.552	1.124	3.3	3.1	5.0E-06	-9999.0	-9999.0	0.347	1.0	-9999.0	-9999.0
28.740	6.06	6.34	0.12	25.46	1.90	114.6	1.680	0.554	1.126	4.0	3.8	5.0E-07	-9999.0	-9999.0	0.311	0.9	-9999.0	-9999.0
28.805	6.97	7.22	0.12	23.44	1.67	114.6	1.684	0.556	1.128	3.5	3.3	5.0E-06	-9999.0	-9999.0	0.369	1.1	-9999.0	-9999.0
28.871	5.94	6.18	0.12	22.20	1.95	114.6	1.688	0.558	1.130	3.9	3.7	5.0E-07	-9999.0	-9999.0	0.300	0.9	-9999.0	-9999.0
28.937	6.65	6.91	0.12	24.26	1.74	114.6	1.691	0.560	1.131	3.3	3.1	5.0E-06	-9999.0	-9999.0	0.348	1.0	-9999.0	-9999.0
29.002	6.20	6.47	0.12	25.02	1.86	114.6	1.695	0.562	1.133	4.1	3.9	5.0E-07	-9999.0	-9999.0	0.318	0.9	-9999.0	-9999.0
29.068	6.00	6.28	0.13	25.08	2.08	114.6	1.699	0.564	1.135	4.0	3.8	5.0E-07	-9999.0	-9999.0	0.305	0.9	-9999.0	-9999.0
29.134	6.27	6.52	0.14	23.13	2.15	114.6	1.703	0.566	1.136	4.2	3.9	5.0E-07	-9999.0	-9999.0	0.321	0.9	-9999.0	-9999.0
29.199	6.06	6.26	0.15	17.62	2.40	114.6	1.706	0.568	1.138	4.0	3.7	5.0E-07	-9999.0	-9999.0	0.303	0.9	-9999.0	-9999.0
29.265	5.75	6.07	0.15	29.04	2.48	114.6	1.710	0.570	1.140	3.9	3.6	5.0E-07	-9999.0	-9999.0	0.291	0.9	-9999.0	-9999.0
29.330	6.33	6.67	0.20	31.76	3.01	111.4	1.714	0.572	1.141	6.4	6.0	5.0E-08	-9999.0	-9999.0	0.330	1.0	-9999.0	-9999.0
29.396	7.86	8.08	0.28	20.15	3.48	111.4	1.717	0.574	1.143	7.7	7.2	5.0E-08	-9999.0	-9999.0	0.424	1.2	-9999.0	-9999.0
29.462	8.75	8.99	0.30	22.32	3.34	114.6	1.721	0.576	1.145	5.7	5.4	5.0E-07	-9999.0	-9999.0	0.485	1.4	-9999.0	-9999.0
29.527	9.71	9.96	0.31	22.58	3.12	114.6	1.725	0.578	1.146	6.4	5.9	5.0E-07	-9999.0	-9999.0	0.549	1.6	-9999.0	-9999.0
29.593	9.26	9.50	0.34	21.83	3.59	111.4	1.729	0.581	1.148	9.1	8.5	5.0E-08	-9999.0	-9999.0	0.518	1.5	-9999.0	-9999.0
29.658	10.42	10.67	0.39	23.80	3.66	111.4	1.732	0.583	1.150	10.2	9.5	5.0E-08	-9999.0	-9999.0	0.596	1.8	-9999.0	-9999.0
29.724	12.65	12.99	0.44	31.35	3.40	114.6	1.736	0.585	1.151	8.3	7.7	5.0E-07	-9999.0	-9999.0	0.750	2.5	-9999.0	-9999.0
29.790	13.29	13.66	0.51	33.99	3.74	114.6	1.740	0.587	1.153	8.7	8.1	5.0E-07	-9999.0	-9999.0	0.795	2.7	-9999.0	-9999.0
29.855	12.33	12.62	0.50	26.82	3.97	111.4	1.743	0.589	1.155	12.1	11.2	5.0E-08	-9999.0	-9999.0	0.725	2.3	-9999.0	-9999.0
29.921	11.50	11.65	0.47	13.94	4.04	111.4	1.747	0.591	1.156	11.2	10.4	5.0E-08	-9999.0	-9999.0	0.660	2.1	-9999.0	-9999.0
29.987	10.61	10.72	0.46	10.57	4.30	111.4	1.751	0.593	1.158	10.3	9.5	5.0E-08	-9999.0	-9999.0	0.598	1.8	-9999.0	-9999.0
30.052	8.37	8.46	0.52	8.75	6.16	111.4	1.754	0.595	1.160	8.1	7.5	5.0E-08	-9999.0	-9999.0	0.447	1.3	-9999.0	-9999.0
30.118	8.18	8.28	0.57	9.46	6.90	111.4	1.758	0.597	1.161	7.9	7.4	5.0E-08	-9999.0	-9999.0	0.435	1.2	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
30.183	7.54	7.66	0.58	11.08	7.59	111.4	1.762	0.599	1.163	7.3	6.8	5.0E-08	-9999.0	-9999.0	0.393	1.1	-9999.0	-9999.0
30.249	9.20	9.32	0.55	10.98	5.92	111.4	1.765	0.601	1.164	8.9	8.3	5.0E-08	-9999.0	-9999.0	0.504	1.5	-9999.0	-9999.0
30.315	10.35	10.46	0.47	10.57	4.50	111.4	1.769	0.603	1.166	10.0	9.3	5.0E-08	-9999.0	-9999.0	0.579	1.7	-9999.0	-9999.0
30.380	10.22	10.36	0.43	12.26	4.16	111.4	1.773	0.605	1.168	9.9	9.2	5.0E-08	-9999.0	-9999.0	0.572	1.7	-9999.0	-9999.0
30.446	11.31	11.45	0.45	12.76	3.94	111.4	1.776	0.607	1.169	11.0	10.1	5.0E-08	-9999.0	-9999.0	0.645	2.0	-9999.0	-9999.0
30.511	10.09	10.26	0.41	15.29	4.01	111.4	1.780	0.609	1.171	9.8	9.1	5.0E-08	-9999.0	-9999.0	0.565	1.7	-9999.0	-9999.0
30.577	9.64	9.82	0.39	16.71	3.98	111.4	1.784	0.611	1.172	9.4	8.7	5.0E-08	-9999.0	-9999.0	0.536	1.6	-9999.0	-9999.0
30.643	9.58	9.73	0.37	13.98	3.81	111.4	1.787	0.613	1.174	9.3	8.6	5.0E-08	-9999.0	-9999.0	0.530	1.5	-9999.0	-9999.0
30.708	8.62	8.71	0.41	8.53	4.72	111.4	1.791	0.615	1.176	8.3	7.7	5.0E-08	-9999.0	-9999.0	0.461	1.3	-9999.0	-9999.0
30.774	7.48	7.58	0.41	9.75	5.42	111.4	1.795	0.617	1.177	7.3	6.7	5.0E-08	-9999.0	-9999.0	0.386	1.1	-9999.0	-9999.0
30.840	7.22	7.34	0.37	11.65	5.05	111.4	1.798	0.619	1.179	7.0	6.5	5.0E-08	-9999.0	-9999.0	0.370	1.0	-9999.0	-9999.0
30.905	7.28	7.45	0.34	15.98	4.57	111.4	1.802	0.621	1.180	7.1	6.6	5.0E-08	-9999.0	-9999.0	0.377	1.1	-9999.0	-9999.0
30.971	7.09	7.24	0.32	14.32	4.43	111.4	1.806	0.624	1.182	6.9	6.4	5.0E-08	-9999.0	-9999.0	0.362	1.0	-9999.0	-9999.0
31.036	7.48	7.68	0.34	18.29	4.44	111.4	1.809	0.626	1.184	7.4	6.8	5.0E-08	-9999.0	-9999.0	0.391	1.1	-9999.0	-9999.0
31.102	7.73	7.92	0.35	18.07	4.43	111.4	1.813	0.628	1.185	7.6	7.0	5.0E-08	-9999.0	-9999.0	0.407	1.1	-9999.0	-9999.0
31.168	7.79	7.99	0.33	18.21	4.14	111.4	1.817	0.630	1.187	7.6	7.0	5.0E-08	-9999.0	-9999.0	0.411	1.1	-9999.0	-9999.0
31.233	7.99	8.16	0.32	16.10	3.93	111.4	1.820	0.632	1.188	7.8	7.2	5.0E-08	-9999.0	-9999.0	0.423	1.2	-9999.0	-9999.0
31.299	6.78	6.94	0.30	15.23	4.33	111.4	1.824	0.634	1.190	6.6	6.1	5.0E-08	-9999.0	-9999.0	0.341	1.0	-9999.0	-9999.0
31.364	6.84	7.01	0.30	15.88	4.29	111.4	1.828	0.636	1.192	6.7	6.1	5.0E-08	-9999.0	-9999.0	0.345	1.0	-9999.0	-9999.0
31.430	6.84	7.01	0.24	16.41	3.43	111.4	1.831	0.638	1.193	6.7	6.1	5.0E-08	-9999.0	-9999.0	0.346	1.0	-9999.0	-9999.0
31.496	6.39	6.58	0.25	18.17	3.81	111.4	1.835	0.640	1.195	6.3	5.8	5.0E-08	-9999.0	-9999.0	0.316	0.9	-9999.0	-9999.0
31.561	6.52	6.73	0.22	19.46	3.28	111.4	1.838	0.642	1.196	6.4	5.9	5.0E-08	-9999.0	-9999.0	0.326	0.9	-9999.0	-9999.0
31.627	6.20	6.38	0.20	16.87	3.14	111.4	1.842	0.644	1.198	6.1	5.6	5.0E-08	-9999.0	-9999.0	0.302	0.9	-9999.0	-9999.0
31.693	5.62	5.83	0.19	19.12	3.27	111.4	1.846	0.646	1.200	5.6	5.1	5.0E-08	-9999.0	-9999.0	0.266	0.8	-9999.0	-9999.0
31.758	5.55	5.80	0.18	22.48	3.11	111.4	1.849	0.648	1.201	5.6	5.1	5.0E-08	-9999.0	-9999.0	0.263	0.8	-9999.0	-9999.0
31.824	5.87	6.13	0.21	23.65	3.43	111.4	1.853	0.650	1.203	5.9	5.4	5.0E-08	-9999.0	-9999.0	0.285	0.8	-9999.0	-9999.0
31.889	5.11	5.37	0.21	23.67	3.92	111.4	1.857	0.652	1.205	5.1	4.7	5.0E-08	-9999.0	-9999.0	0.234	0.7	-9999.0	-9999.0
31.955	4.66	4.90	0.20	22.20	4.09	111.4	1.860	0.654	1.206	4.7	4.3	5.0E-08	-9999.0	-9999.0	0.203	0.7	-9999.0	-9999.0
32.021	5.49	5.70	0.17	19.05	2.99	111.4	1.864	0.656	1.208	5.5	5.0	5.0E-08	-9999.0	-9999.0	0.256	0.8	-9999.0	-9999.0
32.086	5.68	5.88	0.17	17.80	2.90	111.4	1.868	0.658	1.209	5.6	5.1	5.0E-08	-9999.0	-9999.0	0.267	0.8	-9999.0	-9999.0
32.152	4.98	5.16	0.17	16.77	3.30	111.4	1.871	0.660	1.211	4.9	4.5	5.0E-08	-9999.0	-9999.0	0.219	0.7	-9999.0	-9999.0
32.217	5.43	5.65	0.16	19.75	2.84	111.4	1.875	0.662	1.213	5.4	4.9	5.0E-08	-9999.0	-9999.0	0.251	0.7	-9999.0	-9999.0
32.283	6.20	6.42	0.15	21.15	2.34	114.6	1.879	0.665	1.214	4.1	3.7	5.0E-07	-9999.0	-9999.0	0.303	0.9	-9999.0	-9999.0
32.349	6.39	6.62	0.18	21.65	2.73	114.6	1.882	0.667	1.216	4.2	3.8	5.0E-07	-9999.0	-9999.0	0.316	0.9	-9999.0	-9999.0
32.414	6.58	6.86	0.24	25.88	3.51	111.4	1.886	0.669	1.218	6.6	6.0	5.0E-08	-9999.0	-9999.0	0.331	0.9	-9999.0	-9999.0
32.480	10.80	11.13	0.33	30.99	2.97	114.6	1.890	0.671	1.219	7.1	6.4	5.0E-07	-9999.0	-9999.0	0.616	1.8	-9999.0	-9999.0
32.546	15.08	15.42	0.42	31.66	2.73	114.6	1.894	0.673	1.221	7.4	6.7	5.0E-06	-9999.0	-9999.0	0.902	2.9	-9999.0	-9999.0
32.611	14.82	15.02	0.49	18.92	3.27	114.6	1.897	0.675	1.223	9.6	8.7	5.0E-07	-9999.0	-9999.0	0.875	2.8	-9999.0	-9999.0
32.677	12.90	12.97	0.54	6.77	4.17	111.4	1.901	0.677	1.224	12.4	11.2	5.0E-08	-9999.0	-9999.0	0.738	2.2	-9999.0	-9999.0
32.742	11.12	11.15	0.57	2.70	5.13	111.4	1.905	0.679	1.226	10.7	9.6	5.0E-08	-9999.0	-9999.0	0.616	1.8	-9999.0	-9999.0
32.808	11.31	11.37	0.59	5.99	5.20	111.4	1.908	0.681	1.228	10.9	9.8	5.0E-08	-9999.0	-9999.0	0.631	1.8	-9999.0	-9999.0
32.874	10.99	11.08	0.56	8.32	5.07	111.4	1.912	0.683	1.229	10.6	9.6	5.0E-08	-9999.0	-9999.0	0.611	1.7	-9999.0	-9999.0
32.939	9.64	9.76	0.47	10.98	4.83	111.4	1.916	0.685	1.231	9.3	8.4	5.0E-08	-9999.0	-9999.0	0.523	1.4	-9999.0	-9999.0
33.005	9.26	9.40	0.39	12.49	4.16	111.4	1.919	0.687	1.232	9.0	8.1	5.0E-08	-9999.0	-9999.0	0.499	1.4	-9999.0	-9999.0
33.070	7.79	7.92	0.33	12.59	4.17	111.4	1.923	0.689	1.234	7.6	6.8	5.0E-08	-9999.0	-9999.0	0.400	1.1	-9999.0	-9999.0
33.136	7.35	7.48	0.33	12.37	4.42	111.4	1.927	0.691	1.236	7.2	6.4	5.0E-08	-9999.0	-9999.0	0.370	1.0	-9999.0	-9999.0
33.202	7.09	7.22	0.40	12.53	5.55	111.4	1.930	0.693	1.237	6.9	6.2	5.0E-08	-9999.0	-9999.0	0.353	1.0	-9999.0	-9999.0
33.267	6.78	6.92	0.46	12.98	6.67	111.4	1.934	0.695	1.239	6.6	6.0	5.0E-08	-9999.0	-9999.0	0.332	0.9	-9999.0	-9999.0
33.333	6.78	6.92	0.48	13.53	6.95	111.4	1.938	0.697	1.240	6.6	6.0	5.0E-08	-9999.0	-9999.0	0.332	0.9	-9999.0	-9999.0
33.399	8.43	8.59	0.50	14.96	5.83	111.4	1.941	0.699	1.242	8.2	7.4	5.0E-08	-9999.0	-9999.0	0.443	1.2	-9999.0	-9999.0
33.464	10.86	11.03	0.54	15.98	4.91	111.4	1.945	0.701	1.244	10.6	9.5	5.0E-08	-9999.0	-9999.0	0.606	1.7	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
33.530	11.12	11.32	0.56	19.16	4.96	111.4	1.949	0.703	1.245	10.8	9.7	5.0E-08	-9999.0	-9999.0	0.625	1.7	-9999.0	-9999.0
33.595	11.05	11.30	0.55	23.03	4.88	111.4	1.952	0.705	1.247	10.8	9.7	5.0E-08	-9999.0	-9999.0	0.623	1.7	-9999.0	-9999.0
33.661	10.67	10.92	0.53	23.69	4.86	111.4	1.956	0.708	1.248	10.5	9.4	5.0E-08	-9999.0	-9999.0	0.598	1.7	-9999.0	-9999.0
33.727	10.35	10.57	0.54	21.15	5.12	111.4	1.960	0.710	1.250	10.1	9.1	5.0E-08	-9999.0	-9999.0	0.574	1.6	-9999.0	-9999.0
33.792	9.71	9.93	0.55	19.64	5.55	111.4	1.963	0.712	1.252	9.5	8.5	5.0E-08	-9999.0	-9999.0	0.531	1.4	-9999.0	-9999.0
33.858	8.50	8.70	0.58	18.01	6.69	111.4	1.967	0.714	1.253	8.3	7.4	5.0E-08	-9999.0	-9999.0	0.449	1.2	-9999.0	-9999.0
33.923	8.18	8.35	0.52	15.76	6.24	111.4	1.971	0.716	1.255	8.0	7.1	5.0E-08	-9999.0	-9999.0	0.425	1.1	-9999.0	-9999.0
33.989	7.16	7.31	0.46	13.94	6.31	111.4	1.974	0.718	1.256	7.0	6.2	5.0E-08	-9999.0	-9999.0	0.356	0.9	-9999.0	-9999.0
34.055	7.35	7.51	0.41	14.92	5.47	111.4	1.978	0.720	1.258	7.2	6.4	5.0E-08	-9999.0	-9999.0	0.369	1.0	-9999.0	-9999.0
34.120	6.78	6.95	0.37	16.14	5.34	111.4	1.982	0.722	1.260	6.7	5.9	5.0E-08	-9999.0	-9999.0	0.331	0.9	-9999.0	-9999.0
34.186	6.90	7.09	0.32	17.72	4.53	111.4	1.985	0.724	1.261	6.8	6.0	5.0E-08	-9999.0	-9999.0	0.340	0.9	-9999.0	-9999.0
34.252	5.62	5.81	0.27	17.54	4.66	111.4	1.989	0.726	1.263	5.6	5.0	5.0E-08	-9999.0	-9999.0	0.255	0.7	-9999.0	-9999.0
34.317	5.68	5.88	0.23	18.23	3.92	111.4	1.992	0.728	1.264	5.6	5.0	5.0E-08	-9999.0	-9999.0	0.259	0.7	-9999.0	-9999.0
34.383	5.68	5.89	0.20	18.68	3.41	111.4	1.996	0.730	1.266	5.6	5.0	5.0E-08	-9999.0	-9999.0	0.259	0.7	-9999.0	-9999.0
34.448	5.62	5.83	0.19	19.34	3.27	111.4	2.000	0.732	1.268	5.6	5.0	5.0E-08	-9999.0	-9999.0	0.256	0.7	-9999.0	-9999.0
34.514	5.17	5.38	0.18	18.84	3.36	111.4	2.003	0.734	1.269	5.1	4.6	5.0E-08	-9999.0	-9999.0	0.225	0.7	-9999.0	-9999.0
34.580	5.49	5.71	0.16	20.46	2.81	111.4	2.007	0.736	1.271	5.5	4.9	5.0E-08	-9999.0	-9999.0	0.247	0.7	-9999.0	-9999.0
34.645	5.04	5.26	0.18	20.38	3.43	111.4	2.011	0.738	1.272	5.0	4.5	5.0E-08	-9999.0	-9999.0	0.217	0.7	-9999.0	-9999.0
34.711	4.92	5.15	0.13	21.05	2.53	111.4	2.014	0.740	1.274	4.9	4.4	5.0E-08	-9999.0	-9999.0	0.209	0.7	-9999.0	-9999.0
34.776	5.68	5.92	0.16	21.63	2.71	111.4	2.018	0.742	1.276	5.7	5.0	5.0E-08	-9999.0	-9999.0	0.260	0.7	-9999.0	-9999.0
34.842	6.39	6.61	0.20	21.20	3.03	111.4	2.022	0.744	1.277	6.3	5.6	5.0E-08	-9999.0	-9999.0	0.306	0.8	-9999.0	-9999.0
34.908	6.06	6.28	0.23	19.91	3.67	111.4	2.025	0.746	1.279	6.0	5.3	5.0E-08	-9999.0	-9999.0	0.284	0.8	-9999.0	-9999.0
34.973	6.13	6.37	0.24	21.51	3.78	111.4	2.029	0.749	1.281	6.1	5.4	5.0E-08	-9999.0	-9999.0	0.289	0.8	-9999.0	-9999.0
35.039	5.62	5.89	0.27	24.47	4.60	111.4	2.033	0.751	1.282	5.6	5.0	5.0E-08	-9999.0	-9999.0	0.257	0.7	-9999.0	-9999.0
35.105	5.81	6.07	0.24	23.44	3.97	111.4	2.036	0.753	1.284	5.8	5.1	5.0E-08	-9999.0	-9999.0	0.269	0.8	-9999.0	-9999.0
35.170	6.27	6.55	0.20	25.96	3.06	111.4	2.040	0.755	1.285	6.3	5.5	5.0E-08	-9999.0	-9999.0	0.300	0.8	-9999.0	-9999.0
35.236	6.33	6.62	0.19	27.06	2.88	114.6	2.044	0.757	1.287	4.2	3.7	5.0E-07	-9999.0	-9999.0	0.305	0.8	-9999.0	-9999.0
35.301	6.00	6.30	0.18	27.51	2.86	111.4	2.047	0.759	1.289	6.0	5.3	5.0E-08	-9999.0	-9999.0	0.284	0.8	-9999.0	-9999.0
35.367	7.16	7.46	0.17	28.11	2.28	114.6	2.051	0.761	1.290	4.8	4.2	5.0E-07	-9999.0	-9999.0	0.361	0.9	-9999.0	-9999.0
35.433	7.16	7.46	0.18	28.03	2.42	114.6	2.055	0.763	1.292	4.8	4.2	5.0E-07	-9999.0	-9999.0	0.360	0.9	-9999.0	-9999.0
35.498	6.52	6.83	0.17	28.92	2.50	114.6	2.059	0.765	1.294	4.4	3.8	5.0E-07	-9999.0	-9999.0	0.318	0.8	-9999.0	-9999.0
35.564	7.22	7.55	0.16	30.66	2.12	114.6	2.062	0.767	1.295	4.8	4.2	5.0E-07	-9999.0	-9999.0	0.366	0.9	-9999.0	-9999.0
35.629	7.54	7.87	0.16	30.60	2.04	114.6	2.066	0.769	1.297	3.8	3.3	5.0E-06	-9999.0	-9999.0	0.387	1.0	-9999.0	-9999.0
35.695	7.60	7.94	0.18	31.90	2.27	114.6	2.070	0.771	1.299	5.1	4.5	5.0E-07	-9999.0	-9999.0	0.392	1.0	-9999.0	-9999.0
35.761	8.18	8.54	0.17	33.44	2.00	114.6	2.074	0.773	1.301	4.1	3.6	5.0E-06	-9999.0	-9999.0	0.431	1.1	-9999.0	-9999.0
35.826	7.67	8.03	0.19	33.20	2.37	114.6	2.077	0.775	1.302	5.1	4.5	5.0E-07	-9999.0	-9999.0	0.397	1.0	-9999.0	-9999.0
35.892	8.43	8.80	0.20	34.19	2.28	114.6	2.081	0.777	1.304	4.2	3.7	5.0E-06	-9999.0	-9999.0	0.448	1.1	-9999.0	-9999.0
35.958	7.54	7.90	0.22	33.58	2.79	114.6	2.085	0.779	1.306	5.0	4.4	5.0E-07	-9999.0	-9999.0	0.388	1.0	-9999.0	-9999.0
36.023	8.05	8.44	0.20	36.36	2.37	114.6	2.089	0.781	1.307	5.4	4.7	5.0E-07	-9999.0	-9999.0	0.424	1.1	-9999.0	-9999.0
36.089	8.75	9.14	0.22	35.73	2.41	114.6	2.092	0.783	1.309	4.4	3.8	5.0E-06	-9999.0	-9999.0	0.470	1.2	-9999.0	-9999.0
36.154	9.13	9.53	0.25	37.02	2.63	114.6	2.096	0.785	1.311	6.1	5.3	5.0E-07	-9999.0	-9999.0	0.496	1.3	-9999.0	-9999.0
36.220	9.13	9.54	0.23	37.83	2.42	114.6	2.100	0.787	1.313	4.6	4.0	5.0E-06	-9999.0	-9999.0	0.496	1.3	-9999.0	-9999.0
36.286	9.77	10.19	0.25	38.26	2.46	114.6	2.104	0.789	1.314	4.9	4.3	5.0E-06	-9999.0	-9999.0	0.539	1.4	-9999.0	-9999.0
36.351	11.37	11.78	0.33	38.44	2.81	114.6	2.108	0.792	1.316	5.6	4.9	5.0E-06	-9999.0	-9999.0	0.645	1.7	-9999.0	-9999.0
36.417	13.03	13.52	0.41	45.45	3.04	114.6	2.111	0.794	1.318	6.5	5.6	5.0E-06	-9999.0	-9999.0	0.761	2.1	-9999.0	-9999.0
36.482	14.44	14.92	0.47	45.13	3.16	114.6	2.115	0.796	1.319	7.1	6.2	5.0E-06	-9999.0	-9999.0	0.854	2.4	-9999.0	-9999.0
36.548	15.40	15.74	0.54	31.42	3.44	114.6	2.119	0.798	1.321	10.0	8.7	5.0E-07	-9999.0	-9999.0	0.908	2.6	-9999.0	-9999.0
36.614	14.95	15.23	0.56	26.31	3.69	114.6	2.123	0.800	1.323	9.7	8.5	5.0E-07	-9999.0	-9999.0	0.874	2.5	-9999.0	-9999.0
36.679	15.46	15.78	0.57	29.49	3.62	114.6	2.126	0.802	1.325	10.1	8.8	5.0E-07	-9999.0	-9999.0	0.910	2.6	-9999.0	-9999.0
36.745	15.14	15.49	0.60	32.97	3.88	114.6	2.130	0.804	1.326	9.9	8.6	5.0E-07	-9999.0	-9999.0	0.891	2.6	-9999.0	-9999.0
36.811	15.27	15.64	0.61	34.65	3.91	114.6	2.134	0.806	1.328	10.0	8.7	5.0E-07	-9999.0	-9999.0	0.901	2.6	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
36.876	15.14	15.55	0.54	37.92	3.48	114.6	2.138	0.808	1.330	9.9	8.6	5.0E-07	-9999.0	-9999.0	0.894	2.6	-9999.0	-9999.0
36.942	14.82	15.23	0.47	38.51	3.09	114.6	2.141	0.810	1.331	7.3	6.3	5.0E-06	-9999.0	-9999.0	0.873	2.5	-9999.0	-9999.0
37.007	15.53	15.95	0.47	38.79	2.95	114.6	2.145	0.812	1.333	7.6	6.6	5.0E-06	-9999.0	-9999.0	0.920	2.7	-9999.0	-9999.0
37.073	16.04	16.47	0.52	40.06	3.16	114.6	2.149	0.814	1.335	7.9	6.8	5.0E-06	-9999.0	-9999.0	0.955	2.8	-9999.0	-9999.0
37.139	15.78	16.21	0.58	39.92	3.59	114.6	2.153	0.816	1.336	10.3	9.0	5.0E-07	-9999.0	-9999.0	0.937	2.7	-9999.0	-9999.0
37.204	15.84	16.24	0.63	36.90	3.89	114.6	2.156	0.818	1.338	10.4	9.0	5.0E-07	-9999.0	-9999.0	0.939	2.7	-9999.0	-9999.0
37.270	14.95	15.20	0.66	23.82	4.35	111.4	2.160	0.820	1.340	14.6	12.6	5.0E-08	-9999.0	-9999.0	0.870	2.4	-9999.0	-9999.0
37.336	14.24	14.48	0.64	22.20	4.43	111.4	2.164	0.822	1.341	13.9	12.0	5.0E-08	-9999.0	-9999.0	0.821	2.3	-9999.0	-9999.0
37.401	13.79	14.11	0.65	29.37	4.62	111.4	2.167	0.824	1.343	13.5	11.7	5.0E-08	-9999.0	-9999.0	0.796	2.2	-9999.0	-9999.0
37.467	13.16	13.57	0.64	37.53	4.73	111.4	2.171	0.826	1.345	13.0	11.2	5.0E-08	-9999.0	-9999.0	0.760	2.0	-9999.0	-9999.0
37.532	12.71	13.15	0.60	41.00	4.57	111.4	2.175	0.828	1.346	12.6	10.9	5.0E-08	-9999.0	-9999.0	0.732	1.9	-9999.0	-9999.0
37.598	12.52	12.92	0.51	37.00	3.96	111.4	2.178	0.830	1.348	12.4	10.7	5.0E-08	-9999.0	-9999.0	0.716	1.9	-9999.0	-9999.0
37.664	12.20	12.59	0.44	36.34	3.50	114.6	2.182	0.833	1.350	8.0	6.9	5.0E-07	-9999.0	-9999.0	0.694	1.8	-9999.0	-9999.0
37.729	12.52	12.97	0.41	41.50	3.17	114.6	2.186	0.835	1.351	8.3	7.1	5.0E-07	-9999.0	-9999.0	0.719	1.9	-9999.0	-9999.0
37.795	13.41	13.91	0.41	45.95	2.95	114.6	2.190	0.837	1.353	6.7	5.7	5.0E-06	-9999.0	-9999.0	0.781	2.1	-9999.0	-9999.0
37.860	13.09	13.59	0.38	46.30	2.80	114.6	2.193	0.839	1.355	6.5	5.6	5.0E-06	-9999.0	-9999.0	0.760	2.0	-9999.0	-9999.0
37.926	12.52	12.93	0.37	38.24	2.87	114.6	2.197	0.841	1.356	6.2	5.3	5.0E-06	-9999.0	-9999.0	0.716	1.9	-9999.0	-9999.0
37.992	11.95	12.28	0.36	30.72	2.94	114.6	2.201	0.843	1.358	7.8	6.7	5.0E-07	-9999.0	-9999.0	0.672	1.7	-9999.0	-9999.0
38.057	12.52	12.89	0.38	34.65	2.95	114.6	2.205	0.845	1.360	6.2	5.3	5.0E-06	-9999.0	-9999.0	0.713	1.8	-9999.0	-9999.0
38.123	12.07	12.52	0.40	41.28	3.20	114.6	2.208	0.847	1.362	8.0	6.8	5.0E-07	-9999.0	-9999.0	0.687	1.8	-9999.0	-9999.0
38.189	11.76	12.19	0.39	40.39	3.21	114.6	2.212	0.849	1.363	7.8	6.7	5.0E-07	-9999.0	-9999.0	0.666	1.7	-9999.0	-9999.0
38.254	12.20	12.68	0.37	44.13	2.93	114.6	2.216	0.851	1.365	6.1	5.2	5.0E-06	-9999.0	-9999.0	0.697	1.8	-9999.0	-9999.0
38.320	12.65	13.11	0.35	42.68	2.68	114.6	2.220	0.853	1.367	6.3	5.4	5.0E-06	-9999.0	-9999.0	0.726	1.9	-9999.0	-9999.0
38.385	13.48	13.84	0.36	33.34	2.61	114.6	2.223	0.855	1.368	6.6	5.7	5.0E-06	-9999.0	-9999.0	0.775	2.0	-9999.0	-9999.0
38.451	14.11	14.48	0.36	33.70	2.49	114.6	2.227	0.857	1.370	6.9	5.9	5.0E-06	-9999.0	-9999.0	0.817	2.2	-9999.0	-9999.0
38.517	14.37	14.74	0.37	34.05	2.52	114.6	2.231	0.859	1.372	7.1	6.0	5.0E-06	-9999.0	-9999.0	0.834	2.2	-9999.0	-9999.0
38.582	13.41	13.76	0.39	31.76	2.84	114.6	2.235	0.861	1.373	6.6	5.6	5.0E-06	-9999.0	-9999.0	0.768	2.0	-9999.0	-9999.0
38.648	12.46	12.80	0.46	31.17	3.60	114.6	2.238	0.863	1.375	8.2	7.0	5.0E-07	-9999.0	-9999.0	0.704	1.8	-9999.0	-9999.0
38.713	14.11	14.54	0.57	39.74	3.93	114.6	2.242	0.865	1.377	9.3	7.9	5.0E-07	-9999.0	-9999.0	0.820	2.2	-9999.0	-9999.0
38.779	16.04	16.47	0.67	40.04	4.08	114.6	2.246	0.867	1.379	10.5	9.0	5.0E-07	-9999.0	-9999.0	0.948	2.6	-9999.0	-9999.0
38.845	16.55	16.91	0.70	33.66	4.15	114.6	2.250	0.869	1.380	10.8	9.2	5.0E-07	-9999.0	-9999.0	0.978	2.8	-9999.0	-9999.0
38.910	16.29	16.56	0.70	24.89	4.24	111.4	2.253	0.871	1.382	15.9	13.5	5.0E-08	-9999.0	-9999.0	0.954	2.7	-9999.0	-9999.0
38.976	15.53	15.78	0.76	22.95	4.83	111.4	2.257	0.873	1.384	15.1	12.8	5.0E-08	-9999.0	-9999.0	0.901	2.5	-9999.0	-9999.0
39.042	14.44	14.68	0.81	22.81	5.53	111.4	2.261	0.876	1.385	14.1	11.9	5.0E-08	-9999.0	-9999.0	0.828	2.2	-9999.0	-9999.0
39.107	14.70	14.99	0.80	27.02	5.35	111.4	2.264	0.878	1.387	14.4	12.2	5.0E-08	-9999.0	-9999.0	0.848	2.3	-9999.0	-9999.0
39.173	14.63	14.91	0.77	26.25	5.18	111.4	2.268	0.880	1.388	14.3	12.1	5.0E-08	-9999.0	-9999.0	0.843	2.2	-9999.0	-9999.0
39.238	13.29	13.58	0.73	26.55	5.39	111.4	2.272	0.882	1.390	13.0	11.0	5.0E-08	-9999.0	-9999.0	0.754	1.9	-9999.0	-9999.0
39.304	12.90	13.22	0.69	29.29	5.23	111.4	2.275	0.884	1.392	12.7	10.7	5.0E-08	-9999.0	-9999.0	0.729	1.8	-9999.0	-9999.0
39.370	12.14	12.49	0.67	32.03	5.38	111.4	2.279	0.886	1.393	12.0	10.1	5.0E-08	-9999.0	-9999.0	0.680	1.7	-9999.0	-9999.0
39.435	14.05	14.42	0.66	33.58	4.59	111.4	2.283	0.888	1.395	13.8	11.7	5.0E-08	-9999.0	-9999.0	0.809	2.1	-9999.0	-9999.0
39.501	13.22	13.58	0.60	33.32	4.43	111.4	2.286	0.890	1.396	13.0	11.0	5.0E-08	-9999.0	-9999.0	0.753	1.9	-9999.0	-9999.0
39.566	13.86	14.25	0.56	35.83	3.94	114.6	2.290	0.892	1.398	9.1	7.7	5.0E-07	-9999.0	-9999.0	0.797	2.1	-9999.0	-9999.0
39.632	14.51	14.84	0.60	30.95	4.05	111.4	2.294	0.894	1.400	14.2	12.0	5.0E-08	-9999.0	-9999.0	0.836	2.2	-9999.0	-9999.0
39.698	14.57	14.88	0.64	29.13	4.31	111.4	2.297	0.896	1.401	14.3	12.0	5.0E-08	-9999.0	-9999.0	0.839	2.2	-9999.0	-9999.0
39.763	14.76	15.08	0.69	30.17	4.59	111.4	2.301	0.898	1.403	14.4	12.2	5.0E-08	-9999.0	-9999.0	0.852	2.2	-9999.0	-9999.0
39.829	13.92	14.23	0.74	28.35	5.21	111.4	2.305	0.900	1.405	13.6	11.5	5.0E-08	-9999.0	-9999.0	0.795	2.0	-9999.0	-9999.0
39.895	13.09	13.33	0.72	21.67	5.42	111.4	2.308	0.902	1.406	12.8	10.8	5.0E-08	-9999.0	-9999.0	0.735	1.8	-9999.0	-9999.0
39.960	12.01	12.23	0.66	20.82	5.41	111.4	2.312	0.904	1.408	11.7	9.9	5.0E-08	-9999.0	-9999.0	0.661	1.6	-9999.0	-9999.0
40.026	12.01	12.27	0.63	24.34	5.15	111.4	2.316	0.906	1.409	11.8	9.9	5.0E-08	-9999.0	-9999.0	0.664	1.6	-9999.0	-9999.0
40.091	10.80	11.23	0.58	40.53	5.18	111.4	2.319	0.908	1.411	10.8	9.1	5.0E-08	-9999.0	-9999.0	0.594	1.4	-9999.0	-9999.0
40.157	10.99	11.48	0.52	45.72	4.54	111.4	2.323	0.910	1.413	11.0	9.3	5.0E-08	-9999.0	-9999.0	0.611	1.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
40.223	12.01	12.52	0.49	47.50	3.92	111.4	2.327	0.912	1.414	12.0	10.1	5.0E-08	-9999.0	-9999.0	0.680	1.7	-9999.0	-9999.0
40.288	12.20	12.69	0.46	45.21	3.63	114.6	2.330	0.914	1.416	8.1	6.8	5.0E-07	-9999.0	-9999.0	0.691	1.7	-9999.0	-9999.0
40.354	11.76	12.25	0.43	45.91	3.52	114.6	2.334	0.917	1.418	7.8	6.6	5.0E-07	-9999.0	-9999.0	0.661	1.6	-9999.0	-9999.0
40.419	11.63	12.07	0.41	40.90	3.41	114.6	2.338	0.919	1.419	7.7	6.5	5.0E-07	-9999.0	-9999.0	0.649	1.6	-9999.0	-9999.0
40.485	12.84	13.28	0.43	41.06	3.24	114.6	2.342	0.921	1.421	8.5	7.1	5.0E-07	-9999.0	-9999.0	0.730	1.8	-9999.0	-9999.0
40.551	12.71	13.13	0.46	38.57	3.51	114.6	2.345	0.923	1.423	8.4	7.0	5.0E-07	-9999.0	-9999.0	0.719	1.8	-9999.0	-9999.0
40.616	12.27	12.71	0.45	40.69	3.55	114.6	2.349	0.925	1.424	8.1	6.8	5.0E-07	-9999.0	-9999.0	0.691	1.7	-9999.0	-9999.0
40.682	12.46	12.89	0.45	39.37	3.50	114.6	2.353	0.927	1.426	8.2	6.9	5.0E-07	-9999.0	-9999.0	0.702	1.7	-9999.0	-9999.0
40.748	12.27	12.69	0.45	39.19	3.55	114.6	2.357	0.929	1.428	8.1	6.8	5.0E-07	-9999.0	-9999.0	0.689	1.7	-9999.0	-9999.0
40.813	12.52	12.97	0.45	41.62	3.48	114.6	2.360	0.931	1.430	8.3	6.9	5.0E-07	-9999.0	-9999.0	0.707	1.7	-9999.0	-9999.0
40.879	13.09	13.56	0.46	43.72	3.40	114.6	2.364	0.933	1.431	8.7	7.2	5.0E-07	-9999.0	-9999.0	0.747	1.8	-9999.0	-9999.0
40.944	12.84	13.25	0.45	38.04	3.40	114.6	2.368	0.935	1.433	8.5	7.1	5.0E-07	-9999.0	-9999.0	0.726	1.8	-9999.0	-9999.0
41.010	12.97	13.40	0.47	39.49	3.52	114.6	2.372	0.937	1.435	8.6	7.1	5.0E-07	-9999.0	-9999.0	0.735	1.8	-9999.0	-9999.0
41.076	13.03	13.43	0.51	36.66	3.81	114.6	2.375	0.939	1.436	8.6	7.2	5.0E-07	-9999.0	-9999.0	0.737	1.8	-9999.0	-9999.0
41.141	13.29	13.74	0.51	41.31	3.72	114.6	2.379	0.941	1.438	8.8	7.3	5.0E-07	-9999.0	-9999.0	0.757	1.9	-9999.0	-9999.0
41.207	13.54	14.03	0.51	44.64	3.65	114.6	2.383	0.943	1.440	9.0	7.5	5.0E-07	-9999.0	-9999.0	0.776	1.9	-9999.0	-9999.0
41.272	14.30	14.70	0.48	36.92	3.27	114.6	2.387	0.945	1.442	9.4	7.8	5.0E-07	-9999.0	-9999.0	0.821	2.1	-9999.0	-9999.0
41.338	13.92	14.28	0.47	33.26	3.30	114.6	2.390	0.947	1.443	9.1	7.6	5.0E-07	-9999.0	-9999.0	0.793	2.0	-9999.0	-9999.0
41.404	13.79	14.21	0.48	38.97	3.39	114.6	2.394	0.949	1.445	9.1	7.6	5.0E-07	-9999.0	-9999.0	0.788	1.9	-9999.0	-9999.0
41.469	13.92	14.37	0.45	40.98	3.14	114.6	2.398	0.951	1.447	6.9	5.7	5.0E-06	-9999.0	-9999.0	0.798	2.0	-9999.0	-9999.0
41.535	13.86	14.27	0.45	37.61	3.16	114.6	2.402	0.953	1.448	9.1	7.6	5.0E-07	-9999.0	-9999.0	0.791	1.9	-9999.0	-9999.0
41.601	13.86	14.22	0.44	32.67	3.10	114.6	2.406	0.955	1.450	6.8	5.7	5.0E-06	-9999.0	-9999.0	0.787	1.9	-9999.0	-9999.0
41.666	13.09	13.48	0.45	35.61	3.35	114.6	2.409	0.957	1.452	8.6	7.1	5.0E-07	-9999.0	-9999.0	0.738	1.8	-9999.0	-9999.0
41.732	14.44	14.85	0.50	38.40	3.38	114.6	2.413	0.960	1.454	9.5	7.9	5.0E-07	-9999.0	-9999.0	0.829	2.1	-9999.0	-9999.0
41.797	14.89	15.29	0.57	37.39	3.74	114.6	2.417	0.962	1.455	9.8	8.1	5.0E-07	-9999.0	-9999.0	0.858	2.1	-9999.0	-9999.0
41.863	16.10	16.50	0.61	37.06	3.71	114.6	2.421	0.964	1.457	10.5	8.7	5.0E-07	-9999.0	-9999.0	0.939	2.4	-9999.0	-9999.0
41.929	16.04	16.41	0.61	34.40	3.73	114.6	2.424	0.966	1.459	10.5	8.7	5.0E-07	-9999.0	-9999.0	0.932	2.4	-9999.0	-9999.0
41.994	16.04	16.35	0.56	28.39	3.43	114.6	2.428	0.968	1.460	10.4	8.6	5.0E-07	-9999.0	-9999.0	0.928	2.4	-9999.0	-9999.0
42.060	15.78	16.07	0.53	27.37	3.31	114.6	2.432	0.970	1.462	10.3	8.5	5.0E-07	-9999.0	-9999.0	0.909	2.3	-9999.0	-9999.0
42.125	14.76	15.07	0.54	29.15	3.59	114.6	2.436	0.972	1.464	9.6	8.0	5.0E-07	-9999.0	-9999.0	0.842	2.1	-9999.0	-9999.0
42.191	13.92	14.28	0.54	33.28	3.79	114.6	2.439	0.974	1.465	9.1	7.5	5.0E-07	-9999.0	-9999.0	0.790	1.9	-9999.0	-9999.0
42.257	14.11	14.51	0.52	36.60	3.59	114.6	2.443	0.976	1.467	9.3	7.6	5.0E-07	-9999.0	-9999.0	0.804	2.0	-9999.0	-9999.0
42.322	13.92	14.32	0.50	37.08	3.50	114.6	2.447	0.978	1.469	9.1	7.5	5.0E-07	-9999.0	-9999.0	0.792	1.9	-9999.0	-9999.0
42.388	13.92	14.37	0.56	40.90	3.91	114.6	2.451	0.980	1.471	9.2	7.6	5.0E-07	-9999.0	-9999.0	0.794	1.9	-9999.0	-9999.0
42.454	16.55	17.04	0.60	45.05	3.53	114.6	2.454	0.982	1.472	10.9	9.0	5.0E-07	-9999.0	-9999.0	0.972	2.5	-9999.0	-9999.0
42.519	22.04	22.53	0.69	45.03	3.07	114.6	2.458	0.984	1.474	10.8	8.9	5.0E-06	-9999.0	-9999.0	1.338	3.9	-9999.0	-9999.0
42.585	27.54	27.97	0.78	40.12	2.80	114.6	2.462	0.986	1.476	13.4	11.0	5.0E-06	-9999.0	-9999.0	1.701	5.7	-9999.0	-9999.0
42.650	27.73	27.94	0.89	19.62	3.19	114.6	2.466	0.988	1.477	13.4	11.0	5.0E-06	-9999.0	-9999.0	1.698	5.6	-9999.0	-9999.0
42.716	24.91	25.04	0.92	12.22	3.68	114.6	2.469	0.990	1.479	12.0	9.9	5.0E-06	-9999.0	-9999.0	1.505	4.7	-9999.0	-9999.0
42.782	20.82	20.95	0.91	11.59	4.36	114.6	2.473	0.992	1.481	13.4	11.0	5.0E-07	-9999.0	-9999.0	1.232	3.5	-9999.0	-9999.0
42.847	18.79	18.93	0.89	13.49	4.71	111.4	2.477	0.994	1.483	18.1	14.9	5.0E-08	-9999.0	-9999.0	1.097	2.9	-9999.0	-9999.0
42.913	16.42	16.60	0.82	16.43	4.95	111.4	2.481	0.996	1.484	15.9	13.0	5.0E-08	-9999.0	-9999.0	0.941	2.4	-9999.0	-9999.0
42.978	15.46	15.69	0.70	21.61	4.47	111.4	2.484	0.998	1.486	15.0	12.3	5.0E-08	-9999.0	-9999.0	0.880	2.2	-9999.0	-9999.0
43.044	14.37	14.63	0.60	23.98	4.11	111.4	2.488	1.001	1.487	14.0	11.5	5.0E-08	-9999.0	-9999.0	0.810	1.9	-9999.0	-9999.0
43.110	14.82	15.10	0.50	25.84	3.32	114.6	2.492	1.003	1.489	9.6	7.9	5.0E-07	-9999.0	-9999.0	0.840	2.0	-9999.0	-9999.0
43.175	13.54	13.82	0.42	25.98	3.05	114.6	2.495	1.005	1.491	6.6	5.4	5.0E-06	-9999.0	-9999.0	0.755	1.8	-9999.0	-9999.0
43.241	14.05	14.35	0.37	27.02	2.59	114.6	2.499	1.007	1.492	6.9	5.6	5.0E-06	-9999.0	-9999.0	0.790	1.9	-9999.0	-9999.0
43.307	13.79	14.10	0.35	28.21	2.49	114.6	2.503	1.009	1.494	6.8	5.5	5.0E-06	-9999.0	-9999.0	0.773	1.8	-9999.0	-9999.0
43.372	12.78	13.08	0.33	28.05	2.53	114.6	2.507	1.011	1.496	6.3	5.1	5.0E-06	-9999.0	-9999.0	0.705	1.6	-9999.0	-9999.0
43.438	12.14	12.46	0.32	29.88	2.57	114.6	2.510	1.013	1.498	6.0	4.9	5.0E-06	-9999.0	-9999.0	0.663	1.5	-9999.0	-9999.0
43.503	13.16	13.51	0.30	31.82	2.23	114.6	2.514	1.015	1.499	6.5	5.3	5.0E-06	-9999.0	-9999.0	0.733	1.7	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
43.569	12.39	12.74	0.28	32.79	2.20	114.6	2.518	1.017	1.501	6.1	5.0	5.0E-06	-9999.0	-9999.0	0.682	1.5	-9999.0	-9999.0
43.635	12.78	13.15	0.28	33.74	2.14	114.6	2.522	1.019	1.503	6.3	5.1	5.0E-06	-9999.0	-9999.0	0.708	1.6	-9999.0	-9999.0
43.700	14.24	14.62	0.28	34.44	1.92	114.6	2.525	1.021	1.504	7.0	5.7	5.0E-06	-9999.0	-9999.0	0.806	1.9	-9999.0	-9999.0
43.766	13.48	13.82	0.28	31.58	2.03	114.6	2.529	1.023	1.506	6.6	5.4	5.0E-06	-9999.0	-9999.0	0.753	1.7	-9999.0	-9999.0
43.831	12.27	12.63	0.29	33.72	2.30	114.6	2.533	1.025	1.508	6.0	4.9	5.0E-06	-9999.0	-9999.0	0.673	1.5	-9999.0	-9999.0
43.897	12.07	12.46	0.31	36.36	2.49	114.6	2.537	1.027	1.510	6.0	4.9	5.0E-06	-9999.0	-9999.0	0.662	1.5	-9999.0	-9999.0
43.963	12.58	12.98	0.43	36.73	3.32	114.6	2.540	1.029	1.511	8.3	6.7	5.0E-07	-9999.0	-9999.0	0.696	1.6	-9999.0	-9999.0
44.028	13.22	13.61	0.50	35.83	3.68	114.6	2.544	1.031	1.513	8.7	7.1	5.0E-07	-9999.0	-9999.0	0.738	1.7	-9999.0	-9999.0
44.094	14.37	14.77	0.50	36.26	3.39	114.6	2.548	1.033	1.515	9.4	7.7	5.0E-07	-9999.0	-9999.0	0.815	1.9	-9999.0	-9999.0
44.160	15.02	15.38	0.49	33.48	3.19	114.6	2.552	1.035	1.516	7.4	6.0	5.0E-06	-9999.0	-9999.0	0.855	2.0	-9999.0	-9999.0
44.225	13.79	14.11	0.52	28.94	3.70	114.6	2.555	1.037	1.518	9.0	7.3	5.0E-07	-9999.0	-9999.0	0.770	1.8	-9999.0	-9999.0
44.291	13.73	14.10	0.50	33.66	3.56	114.6	2.559	1.039	1.520	9.0	7.3	5.0E-07	-9999.0	-9999.0	0.769	1.8	-9999.0	-9999.0
44.356	14.05	14.53	0.49	43.87	3.38	114.6	2.563	1.041	1.522	9.3	7.5	5.0E-07	-9999.0	-9999.0	0.798	1.8	-9999.0	-9999.0
44.422	13.92	14.38	0.47	42.39	3.28	114.6	2.567	1.044	1.523	9.2	7.4	5.0E-07	-9999.0	-9999.0	0.788	1.8	-9999.0	-9999.0
44.488	13.67	14.08	0.40	38.02	2.85	114.6	2.571	1.046	1.525	6.7	5.5	5.0E-06	-9999.0	-9999.0	0.768	1.8	-9999.0	-9999.0
44.553	13.92	14.35	0.42	39.25	2.93	114.6	2.574	1.048	1.527	6.9	5.6	5.0E-06	-9999.0	-9999.0	0.785	1.8	-9999.0	-9999.0
44.619	14.18	14.60	0.42	38.75	2.88	114.6	2.578	1.050	1.528	7.0	5.7	5.0E-06	-9999.0	-9999.0	0.802	1.8	-9999.0	-9999.0
44.684	14.44	14.85	0.41	38.69	2.77	114.6	2.582	1.052	1.530	7.1	5.8	5.0E-06	-9999.0	-9999.0	0.818	1.9	-9999.0	-9999.0
44.750	14.11	14.47	0.36	33.22	2.49	114.6	2.586	1.054	1.532	6.9	5.6	5.0E-06	-9999.0	-9999.0	0.793	1.8	-9999.0	-9999.0
44.816	12.33	12.66	0.35	30.44	2.77	114.6	2.589	1.056	1.533	6.1	4.9	5.0E-06	-9999.0	-9999.0	0.671	1.5	-9999.0	-9999.0
44.881	13.79	14.15	0.38	33.13	2.69	114.6	2.593	1.058	1.535	6.8	5.5	5.0E-06	-9999.0	-9999.0	0.771	1.7	-9999.0	-9999.0
44.947	13.03	13.40	0.41	33.91	3.07	114.6	2.597	1.060	1.537	8.6	6.9	5.0E-07	-9999.0	-9999.0	0.720	1.6	-9999.0	-9999.0
45.013	13.29	13.69	0.45	36.75	3.30	114.6	2.601	1.062	1.539	8.7	7.0	5.0E-07	-9999.0	-9999.0	0.739	1.7	-9999.0	-9999.0
45.078	15.21	15.65	0.49	40.73	3.14	114.6	2.604	1.064	1.540	7.5	6.0	5.0E-06	-9999.0	-9999.0	0.870	2.0	-9999.0	-9999.0
45.144	17.69	18.16	0.53	42.96	2.93	114.6	2.608	1.066	1.542	8.7	7.0	5.0E-06	-9999.0	-9999.0	1.037	2.6	-9999.0	-9999.0
45.209	19.10	19.56	0.62	43.37	3.18	114.6	2.612	1.068	1.544	9.4	7.5	5.0E-06	-9999.0	-9999.0	1.130	2.9	-9999.0	-9999.0
45.275	21.53	22.01	0.78	43.89	3.55	114.6	2.616	1.070	1.545	10.5	8.5	5.0E-06	-9999.0	-9999.0	1.293	3.5	-9999.0	-9999.0
45.341	27.22	27.73	0.93	47.50	3.36	114.6	2.619	1.072	1.547	13.3	10.7	5.0E-06	-9999.0	-9999.0	1.674	5.1	-9999.0	-9999.0
45.406	34.17	34.67	1.08	45.97	3.12	114.6	2.623	1.074	1.549	16.6	13.3	5.0E-06	-9999.0	-9999.0	2.136	7.5	-9999.0	-9999.0
45.472	37.94	38.21	1.20	25.26	3.15	114.6	2.627	1.076	1.551	18.3	14.7	5.0E-06	-9999.0	-9999.0	2.373	8.8	-9999.0	-9999.0
45.538	38.45	38.60	1.27	13.71	3.30	114.6	2.631	1.078	1.552	18.5	14.8	5.0E-06	-9999.0	-9999.0	2.398	8.9	-9999.0	-9999.0
45.603	35.27	35.39	1.30	11.91	3.68	114.6	2.634	1.080	1.554	16.9	13.6	5.0E-06	-9999.0	-9999.0	2.184	7.7	-9999.0	-9999.0
45.669	30.47	30.61	1.26	12.57	4.13	114.6	2.638	1.082	1.556	19.5	15.7	5.0E-07	-9999.0	-9999.0	1.865	6.0	-9999.0	-9999.0
45.734	26.25	26.41	1.18	14.26	4.48	114.6	2.642	1.085	1.557	16.9	13.5	5.0E-07	-9999.0	-9999.0	1.584	4.7	-9999.0	-9999.0
45.800	23.38	23.56	1.06	17.34	4.51	114.6	2.646	1.087	1.559	15.0	12.0	5.0E-07	-9999.0	-9999.0	1.395	3.9	-9999.0	-9999.0
45.866	20.82	21.06	0.91	22.44	4.33	114.6	2.649	1.089	1.561	13.4	10.8	5.0E-07	-9999.0	-9999.0	1.228	3.2	-9999.0	-9999.0
45.931	20.44	20.75	0.81	28.27	3.91	114.6	2.653	1.091	1.563	13.2	10.6	5.0E-07	-9999.0	-9999.0	1.206	3.1	-9999.0	-9999.0
45.997	19.17	19.49	0.68	30.28	3.50	114.6	2.657	1.093	1.564	9.3	7.5	5.0E-06	-9999.0	-9999.0	1.122	2.8	-9999.0	-9999.0
46.062	19.17	19.51	0.67	31.88	3.44	114.6	2.661	1.095	1.566	9.3	7.5	5.0E-06	-9999.0	-9999.0	1.123	2.8	-9999.0	-9999.0
46.128	19.17	19.52	0.68	32.37	3.49	114.6	2.664	1.097	1.568	9.3	7.5	5.0E-06	-9999.0	-9999.0	1.123	2.8	-9999.0	-9999.0
46.194	18.14	18.47	0.63	29.90	3.42	114.6	2.668	1.099	1.569	8.8	7.1	5.0E-06	-9999.0	-9999.0	1.053	2.6	-9999.0	-9999.0
46.259	19.17	19.52	0.61	32.33	3.13	114.6	2.672	1.101	1.571	9.3	7.5	5.0E-06	-9999.0	-9999.0	1.123	2.8	-9999.0	-9999.0
46.325	17.88	18.19	0.63	28.45	3.47	114.6	2.676	1.103	1.573	11.6	9.3	5.0E-07	-9999.0	-9999.0	1.034	2.5	-9999.0	-9999.0
46.391	17.25	17.60	0.61	31.80	3.48	114.6	2.680	1.105	1.575	11.2	9.0	5.0E-07	-9999.0	-9999.0	0.994	2.4	-9999.0	-9999.0
46.456	17.18	17.56	0.59	35.34	3.37	114.6	2.683	1.107	1.576	8.4	6.7	5.0E-06	-9999.0	-9999.0	0.992	2.3	-9999.0	-9999.0
46.522	17.44	17.82	0.55	35.26	3.09	114.6	2.687	1.109	1.578	8.5	6.8	5.0E-06	-9999.0	-9999.0	1.009	2.4	-9999.0	-9999.0
46.587	16.80	17.17	0.53	33.85	3.09	114.6	2.691	1.111	1.580	8.2	6.5	5.0E-06	-9999.0	-9999.0	0.965	2.3	-9999.0	-9999.0
46.653	17.05	17.42	0.49	34.50	2.82	114.6	2.695	1.113	1.581	8.3	6.6	5.0E-06	-9999.0	-9999.0	0.982	2.3	-9999.0	-9999.0
46.719	15.84	16.21	0.47	34.56	2.91	114.6	2.698	1.115	1.583	7.8	6.2	5.0E-06	-9999.0	-9999.0	0.901	2.1	-9999.0	-9999.0
46.784	15.78	16.15	0.44	34.44	2.73	114.6	2.702	1.117	1.585	7.7	6.1	5.0E-06	-9999.0	-9999.0	0.897	2.0	-9999.0	-9999.0
46.850	15.72	16.08	0.42	33.81	2.62	114.6	2.706	1.119	1.586	7.7	6.1	5.0E-06	-9999.0	-9999.0	0.892	2.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
46.915	15.21	15.60	0.40	36.40	2.57	114.6	2.710	1.121	1.588	7.5	5.9	5.0E-06	-9999.0	-9999.0	0.859	1.9	-9999.0	-9999.0
46.981	14.82	15.23	0.41	38.51	2.70	114.6	2.713	1.123	1.590	7.3	5.8	5.0E-06	-9999.0	-9999.0	0.835	1.8	-9999.0	-9999.0
47.047	14.89	15.33	0.38	41.12	2.48	114.6	2.717	1.125	1.592	7.3	5.8	5.0E-06	-9999.0	-9999.0	0.841	1.9	-9999.0	-9999.0
47.112	14.30	14.74	0.43	40.41	2.92	114.6	2.721	1.128	1.593	7.1	5.6	5.0E-06	-9999.0	-9999.0	0.801	1.8	-9999.0	-9999.0
47.178	15.40	15.84	0.94	41.10	5.95	111.4	2.725	1.130	1.595	15.2	12.0	5.0E-08	-9999.0	-9999.0	0.874	2.0	-9999.0	-9999.0
47.244	15.02	15.46	0.01	41.02	0.06	117.7	2.728	1.132	1.597	4.9	3.9	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
47.309	14.76	15.21	0.01	42.21	0.07	114.6	2.732	1.134	1.598	5.8	4.6	5.0E-05	30.0	30.0	0.832	1.8	-9999.0	-9999.0
47.375	14.30	14.77	0.01	43.25	0.07	114.6	2.736	1.136	1.600	5.7	4.5	5.0E-05	30.0	30.0	0.802	1.7	-9999.0	-9999.0
47.440	15.02	15.51	0.01	45.49	0.06	117.7	2.740	1.138	1.602	5.0	3.9	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
47.506	160.47	161.02	0.01	50.57	0.01	124.1	2.744	1.140	1.604	30.8	24.4	5.0E-02	73.5	42.0	-9999.0	-9999.0	345.7	2.147

Gregg In Situ, Inc. - CPT Interpretation

Interpretation Output - Release	1.20I
Run No:	04-0524-0703-3935
Job No:	04-073SC
Client:	MACTEC
Project:	TVA Bull Run Ash Disposal Facility
Site:	CPT-07
Location:	TVA Bull Run
Cone:	H. Bankayal
CPT Date:	04/20/05
CPT Time:	13:56
CPT File:	073CP07.COR
Northing (m):	0.000000
Easting (m):	0.000000
Elevation (m):	0.000000

Water Table (m):	1.68	(ft):	5.5
Unit Weight of Water (default):	62.40 pcf		
Averaging Increment (m):	0.0 (Every Data Point)		
Phi Method :	Robertson and Campanella, 1983		
Su Nkt used:	15.00	Su/P' (nc):	0.30
Dr Method :	Jamiolkowski - All Sands		
State Parameter M:	1.20		

Used Unit Weights Assigned to Soil Zones

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
0.066	4.66	4.66	0.01	-0.39	0.22	111.4	0.004	0.000	0.004	2.2	4.5	1.0E-07	-9999.0	-9999.0	0.310	10.0	-9999.0	-9999.0
0.131	7.79	7.79	0.02	-0.02	0.26	111.4	0.007	0.000	0.007	3.7	7.5	1.0E-07	-9999.0	-9999.0	0.519	10.0	-9999.0	-9999.0
0.197	11.76	11.76	0.03	-0.31	0.26	114.6	0.011	0.000	0.011	4.5	9.0	5.0E-05	69.9	50.0	0.783	10.0	-9999.0	-9999.0
0.262	16.61	16.62	0.04	0.51	0.24	117.7	0.015	0.000	0.015	5.3	10.6	5.0E-04	75.6	50.0	-9999.0	-9999.0	60.7	3.652
0.328	18.14	18.15	0.04	0.98	0.22	117.7	0.019	0.000	0.019	5.8	11.6	5.0E-04	74.8	50.0	-9999.0	-9999.0	63.8	3.512
0.394	20.00	20.01	0.08	0.73	0.40	117.7	0.023	0.000	0.023	6.4	12.8	5.0E-04	74.9	50.0	-9999.0	-9999.0	67.2	3.357
0.459	22.42	22.42	0.10	-0.85	0.45	117.7	0.026	0.000	0.026	7.2	14.3	5.0E-04	75.9	50.0	-9999.0	-9999.0	71.2	3.177
0.525	23.58	23.58	0.11	0.65	0.47	117.7	0.030	0.000	0.030	7.5	15.1	5.0E-04	75.4	50.0	-9999.0	-9999.0	73.0	3.097
0.591	24.85	24.85	0.11	-0.28	0.44	117.7	0.034	0.000	0.034	7.9	15.9	5.0E-04	75.1	50.0	-9999.0	-9999.0	75.0	3.017
0.656	25.42	25.42	0.13	-0.35	0.51	117.7	0.038	0.000	0.038	8.1	16.2	5.0E-04	74.3	50.0	-9999.0	-9999.0	75.8	2.982
0.722	25.74	25.74	0.14	-0.39	0.55	117.7	0.042	0.000	0.042	8.2	16.4	5.0E-04	73.2	50.0	-9999.0	-9999.0	76.3	2.963
0.787	26.32	26.31	0.16	-0.85	0.61	117.7	0.046	0.000	0.046	8.4	16.8	5.0E-04	72.6	50.0	-9999.0	-9999.0	77.1	2.929
0.853	26.00	26.00	0.16	-0.61	0.62	117.7	0.050	0.000	0.050	8.3	16.6	5.0E-04	71.1	48.0	-9999.0	-9999.0	76.6	2.948
0.919	26.90	26.89	0.17	-0.53	0.63	117.7	0.053	0.000	0.053	8.6	17.2	5.0E-04	71.0	48.0	-9999.0	-9999.0	77.9	2.897
0.984	27.28	27.28	0.16	0.33	0.59	117.7	0.057	0.000	0.057	8.7	17.4	5.0E-04	70.4	48.0	-9999.0	-9999.0	78.4	2.876
1.050	27.28	27.27	0.16	-0.92	0.59	117.7	0.061	0.000	0.061	8.7	17.4	5.0E-04	69.4	48.0	-9999.0	-9999.0	78.4	2.876
1.115	28.62	28.61	0.15	-0.57	0.53	117.7	0.065	0.000	0.065	9.1	18.3	5.0E-04	70.0	48.0	-9999.0	-9999.0	80.3	2.806
1.181	30.21	30.21	0.14	-0.49	0.46	117.7	0.069	0.000	0.069	9.6	19.3	5.0E-04	70.7	48.0	-9999.0	-9999.0	82.4	2.729
1.247	30.60	30.61	0.13	0.24	0.43	117.7	0.073	0.000	0.073	9.8	19.5	5.0E-04	70.3	48.0	-9999.0	-9999.0	83.0	2.711
1.312	32.96	32.96	0.14	-0.45	0.43	117.7	0.077	0.000	0.077	10.5	21.0	5.0E-04	71.7	48.0	-9999.0	-9999.0	86.1	2.612
1.378	36.22	36.22	0.17	-0.08	0.47	117.7	0.081	0.000	0.081	11.6	23.1	5.0E-04	73.7	48.0	-9999.0	-9999.0	90.3	2.494
1.444	37.94	37.95	0.16	0.49	0.42	117.7	0.084	0.000	0.084	12.1	24.2	5.0E-04	74.3	48.0	-9999.0	-9999.0	92.6	2.440
1.509	41.33	41.33	0.16	-0.12	0.39	120.9	0.088	0.000	0.088	9.9	19.8	5.0E-03	76.1	48.0	-9999.0	-9999.0	97.1	2.350
1.575	44.21	44.20	0.17	-1.02	0.39	120.9	0.092	0.000	0.092	10.6	21.2	5.0E-03	77.4	48.0	-9999.0	-9999.0	101.0	2.285
1.640	48.04	48.06	0.20	2.61	0.42	120.9	0.096	0.000	0.096	11.5	23.0	5.0E-03	79.2	48.0	-9999.0	-9999.0	106.4	2.213
1.706	52.19	52.18	0.23	-0.73	0.44	120.9	0.100	0.000	0.100	12.5	25.0	5.0E-03	81.0	48.0	-9999.0	-9999.0	112.2	2.151
1.772	55.57	55.56	0.25	-1.17	0.45	120.9	0.104	0.000	0.104	13.3	26.6	5.0E-03	82.2	48.0	-9999.0	-9999.0	117.1	2.108
1.837	59.28	59.28	0.30	-0.63	0.51	120.9	0.108	0.000	0.108	14.2	28.4	5.0E-03	83.5	50.0	-9999.0	-9999.0	122.5	2.067
1.903	62.28	62.28	0.31	0.00	0.50	120.9	0.112	0.000	0.112	14.9	29.8	5.0E-03	84.4	50.0	-9999.0	-9999.0	126.9	2.037
1.968	65.80	65.79	0.32	-0.53	0.49	120.9	0.116	0.000	0.116	15.8	31.5	5.0E-03	85.5	50.0	-9999.0	-9999.0	131.9	2.005
2.034	69.76	69.79	0.37	3.29	0.53	120.9	0.120	0.000	0.120	16.7	33.4	5.0E-03	86.7	50.0	-9999.0	-9999.0	137.6	1.971
2.100	72.05	72.06	0.30	0.53	0.42	120.9	0.124	0.000	0.124	17.3	34.5	5.0E-03	87.2	50.0	-9999.0	-9999.0	140.8	1.954
2.165	75.12	75.11	0.34	-1.31	0.45	120.9	0.128	0.000	0.128	18.0	36.0	5.0E-03	87.9	50.0	-9999.0	-9999.0	145.1	1.932
2.231	77.36	77.35	0.45	-0.57	0.58	120.9	0.132	0.000	0.132	18.5	37.0	5.0E-03	88.3	50.0	-9999.0	-9999.0	148.3	1.917
2.297	81.39	81.38	0.50	-0.63	0.62	120.9	0.136	0.000	0.136	19.5	39.0	5.0E-03	89.4	50.0	-9999.0	-9999.0	154.3	1.896
2.362	83.24	83.28	0.54	3.91	0.65	120.9	0.140	0.000	0.140	19.9	39.9	5.0E-03	89.6	50.0	-9999.0	-9999.0	157.2	1.888
2.428	73.08	73.07	0.59	-0.33	0.81	120.9	0.144	0.000	0.144	17.5	35.0	5.0E-03	85.5	48.0	-9999.0	-9999.0	142.2	1.946
2.493	73.40	73.38	0.60	-1.35	0.82	120.9	0.148	0.000	0.148	17.6	35.1	5.0E-03	85.2	48.0	-9999.0	-9999.0	142.7	1.944
2.559	70.78	70.77	0.66	-0.83	0.93	120.9	0.152	0.000	0.152	16.9	33.9	5.0E-03	83.8	48.0	-9999.0	-9999.0	139.0	1.964
2.625	67.71	67.72	0.68	0.47	1.01	120.9	0.156	0.000	0.156	16.2	32.4	5.0E-03	82.1	48.0	-9999.0	-9999.0	134.6	1.988
2.690	63.49	63.49	0.73	-0.20	1.15	117.7	0.160	0.000	0.160	20.3	40.5	5.0E-04	79.9	48.0	-9999.0	-9999.0	128.6	2.026
2.756	58.58	58.57	0.88	-1.00	1.51	117.7	0.164	0.000	0.164	18.7	37.4	5.0E-04	77.3	48.0	-9999.0	-9999.0	121.5	2.074
2.821	54.81	54.80	0.92	-1.64	1.68	117.7	0.167	0.000	0.167	17.5	35.0	5.0E-04	75.0	48.0	-9999.0	-9999.0	116.0	2.117
2.887	49.51	49.52	0.97	0.67	1.96	117.7	0.171	0.000	0.171	15.8	31.6	5.0E-04	71.8	46.0	-9999.0	-9999.0	108.4	2.190
2.953	46.44	46.44	1.16	-0.18	2.50	114.6	0.175	0.000	0.175	17.8	35.6	5.0E-05	69.6	46.0	3.084	10.0	104.1	2.242
3.018	47.47	47.46	1.06	-0.83	2.24	114.6	0.179	0.000	0.179	18.2	36.4	5.0E-05	70.0	46.0	3.152	10.0	105.5	2.224
3.084	54.04	54.05	1.02	0.47	1.89	117.7	0.183	0.000	0.183	17.3	34.5	5.0E-04	73.4	46.0	-9999.0	-9999.0	114.9	2.127
3.150	65.93	65.96	0.97	3.20	1.47	117.7	0.186	0.000	0.186	21.1	42.1	5.0E-04	78.8	48.0	-9999.0	-9999.0	132.1	2.003
3.215	75.12	75.21	0.93	7.74	1.24	120.9	0.190	0.000	0.190	18.0	36.0	5.0E-03	82.3	48.0	-9999.0	-9999.0	145.2	1.931
3.281	65.03	65.02	0.92	-0.57	1.42	117.7	0.194	0.000	0.194	20.8	41.5	5.0E-04	77.8	48.0	-9999.0	-9999.0	130.8	2.012
3.346	67.14	67.13	0.89	-0.81	1.33	117.7	0.198	0.000	0.198	21.4	42.9	5.0E-04	78.4	48.0	-9999.0	-9999.0	133.8	1.993

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
3.412	69.19	69.18	0.83	-0.43	1.20	120.9	0.202	0.000	0.202	16.6	33.1	5.0E-03	79.0	48.0	-9999.0	-9999.0	136.7	1.976
3.478	70.27	70.27	0.72	0.12	1.03	120.9	0.206	0.000	0.206	16.8	33.6	5.0E-03	79.2	48.0	-9999.0	-9999.0	138.3	1.968
3.543	69.89	69.89	0.53	-0.04	0.76	120.9	0.210	0.000	0.210	16.7	33.5	5.0E-03	78.8	48.0	-9999.0	-9999.0	137.7	1.971
3.609	69.89	69.87	0.54	-1.35	0.77	120.9	0.214	0.000	0.214	16.7	33.5	5.0E-03	78.5	48.0	-9999.0	-9999.0	137.7	1.971
3.674	66.31	66.30	0.59	-1.19	0.89	120.9	0.218	0.000	0.218	15.9	31.7	5.0E-03	76.7	46.0	-9999.0	-9999.0	132.6	2.000
3.740	62.41	62.41	0.62	-0.08	1.00	120.9	0.222	0.000	0.222	14.9	29.9	5.0E-03	74.7	46.0	-9999.0	-9999.0	127.0	2.036
3.806	60.75	60.75	0.65	0.00	1.07	120.9	0.226	0.000	0.226	14.5	29.1	5.0E-03	73.7	46.0	-9999.0	-9999.0	124.6	2.052
3.871	60.31	60.31	0.67	0.10	1.11	117.7	0.230	0.000	0.230	19.3	38.5	5.0E-04	73.2	46.0	-9999.0	-9999.0	124.0	2.056
3.937	58.51	58.51	0.71	-0.20	1.22	117.7	0.234	0.000	0.234	18.7	37.4	5.0E-04	72.1	46.0	-9999.0	-9999.0	121.4	2.075
4.003	57.11	57.12	0.81	1.43	1.42	117.7	0.238	0.000	0.238	18.2	36.5	5.0E-04	71.2	46.0	-9999.0	-9999.0	119.4	2.090
4.068	56.22	56.24	0.90	2.39	1.60	117.7	0.241	0.000	0.241	18.0	35.9	5.0E-04	70.5	46.0	-9999.0	-9999.0	118.1	2.100
4.134	60.82	60.85	1.05	2.70	1.73	117.7	0.245	0.000	0.245	19.4	38.8	5.0E-04	72.6	46.0	-9999.0	-9999.0	124.8	2.051
4.199	65.73	65.75	1.21	1.92	1.84	117.7	0.249	0.000	0.249	21.0	42.0	5.0E-04	74.6	46.0	-9999.0	-9999.0	131.8	2.005
4.265	67.97	68.01	1.36	3.54	2.00	117.7	0.253	0.000	0.253	21.7	43.2	5.0E-04	75.3	46.0	-9999.0	-9999.0	135.1	1.986
4.331	64.40	64.45	1.49	4.52	2.32	114.6	0.257	0.000	0.257	24.7	48.7	5.0E-05	73.5	46.0	4.279	10.0	130.0	2.017
4.396	61.45	61.48	1.62	3.06	2.64	114.6	0.261	0.000	0.261	23.6	46.1	5.0E-05	72.0	46.0	4.081	10.0	125.7	2.045
4.462	56.86	56.87	1.70	0.94	3.00	114.6	0.264	0.000	0.264	21.8	42.4	5.0E-05	69.5	46.0	3.774	10.0	119.2	2.097
4.528	52.00	52.00	1.72	0.49	3.32	114.6	0.268	0.000	0.268	19.9	38.5	5.0E-05	66.8	44.0	3.449	10.0	112.5	2.163
4.593	47.27	47.27	1.61	-0.81	3.41	114.6	0.272	0.000	0.272	22.6	43.4	5.0E-06	-9999.0	-9999.0	3.133	10.0	-9999.0	-9999.0
4.659	41.33	41.31	1.41	-1.88	3.42	114.6	0.276	0.000	0.276	19.8	37.7	5.0E-06	-9999.0	-9999.0	2.736	10.0	-9999.0	-9999.0
4.724	36.86	36.83	1.22	-2.39	3.32	114.6	0.279	0.000	0.279	17.6	33.4	5.0E-06	-9999.0	-9999.0	2.437	10.0	-9999.0	-9999.0
4.790	33.54	33.51	1.06	-3.31	3.17	114.6	0.283	0.000	0.283	16.0	30.2	5.0E-06	-9999.0	-9999.0	2.215	10.0	-9999.0	-9999.0
4.856	31.82	31.78	0.87	-3.02	2.74	114.6	0.287	0.000	0.287	12.2	22.7	5.0E-05	51.7	42.0	2.100	10.0	86.6	2.724
4.921	33.66	33.64	0.67	-2.39	2.00	114.6	0.291	0.000	0.291	12.9	23.9	5.0E-05	53.1	42.0	2.223	10.0	89.3	2.655
4.987	35.59	35.56	0.54	-2.17	1.52	117.7	0.294	0.000	0.294	11.4	20.9	5.0E-04	54.5	42.0	-9999.0	-9999.0	92.1	2.591
5.052	36.92	36.89	0.48	-2.35	1.30	117.7	0.298	0.000	0.298	11.8	21.6	5.0E-04	55.4	42.0	-9999.0	-9999.0	94.2	2.553
5.118	38.20	38.18	0.46	-2.19	1.21	117.7	0.302	0.000	0.302	12.2	22.2	5.0E-04	56.2	44.0	-9999.0	-9999.0	96.2	2.519
5.184	39.15	39.12	0.44	-2.88	1.13	117.7	0.306	0.000	0.306	12.5	22.6	5.0E-04	56.7	44.0	-9999.0	-9999.0	97.7	2.497
5.249	42.29	42.26	0.43	-2.59	1.02	117.7	0.310	0.000	0.310	13.5	24.2	5.0E-04	58.8	44.0	-9999.0	-9999.0	102.1	2.416
5.315	44.40	44.37	0.25	-2.55	0.56	120.9	0.314	0.000	0.314	10.6	19.0	5.0E-03	60.0	44.0	-9999.0	-9999.0	105.2	2.371
5.381	44.59	44.56	0.28	-2.96	0.63	120.9	0.318	0.000	0.318	10.7	18.9	5.0E-03	59.9	44.0	-9999.0	-9999.0	105.7	2.373
5.446	45.04	45.00	0.33	-3.33	0.74	117.7	0.322	0.000	0.322	14.4	25.3	5.0E-04	60.0	44.0	-9999.0	-9999.0	106.6	2.369
5.512	46.12	46.09	0.37	-2.68	0.80	117.7	0.326	0.000	0.325	14.7	25.8	5.0E-04	60.6	44.0	-9999.0	-9999.0	108.3	2.351
5.577	46.44	46.41	0.39	-2.86	0.84	117.7	0.329	0.002	0.327	14.8	25.9	5.0E-04	60.7	44.0	-9999.0	-9999.0	108.9	2.346
5.643	37.88	37.86	0.42	-1.66	1.11	117.7	0.333	0.004	0.329	12.1	21.1	5.0E-04	54.8	42.0	-9999.0	-9999.0	97.7	2.582
5.709	37.88	37.86	0.42	-2.02	1.11	117.7	0.337	0.007	0.331	12.1	21.0	5.0E-04	54.7	42.0	-9999.0	-9999.0	97.9	2.585
5.774	36.35	36.32	0.41	-2.57	1.13	117.7	0.341	0.009	0.332	11.6	20.1	5.0E-04	53.4	42.0	-9999.0	-9999.0	96.0	2.643
5.840	33.98	33.95	0.40	-3.04	1.18	117.7	0.345	0.011	0.334	10.8	18.7	5.0E-04	51.4	42.0	-9999.0	-9999.0	93.0	2.738
5.905	30.85	30.82	0.38	-3.35	1.24	117.7	0.349	0.013	0.336	9.8	17.0	5.0E-04	48.5	42.0	-9999.0	-9999.0	88.8	2.882
5.971	29.26	29.22	0.34	-3.62	1.17	117.7	0.353	0.015	0.338	9.3	16.0	5.0E-04	46.9	42.0	-9999.0	-9999.0	86.7	2.966
6.037	27.34	27.30	0.29	-3.66	1.06	117.7	0.356	0.017	0.340	8.7	15.0	5.0E-04	44.9	42.0	-9999.0	-9999.0	83.9	3.075
6.102	27.92	27.88	0.25	-3.08	0.90	117.7	0.360	0.019	0.342	8.9	15.2	5.0E-04	45.4	42.0	-9999.0	-9999.0	84.9	3.046
6.168	27.34	27.30	0.22	-2.96	0.81	117.7	0.364	0.021	0.343	8.7	14.9	5.0E-04	44.8	42.0	-9999.0	-9999.0	84.2	3.083
6.234	24.79	24.76	0.19	-3.25	0.77	117.7	0.368	0.023	0.345	7.9	13.5	5.0E-04	41.9	40.0	-9999.0	-9999.0	80.2	3.241
6.299	21.40	21.37	0.16	-3.33	0.75	117.7	0.372	0.025	0.347	6.8	11.6	5.0E-04	37.6	40.0	-9999.0	-9999.0	74.3	3.479
6.365	18.59	18.55	0.15	-3.42	0.81	114.6	0.376	0.027	0.349	7.1	12.0	5.0E-05	33.5	38.0	1.211	10.0	68.7	3.706
6.430	17.69	17.66	0.15	-2.90	0.85	114.6	0.380	0.029	0.350	6.8	11.4	5.0E-05	32.0	38.0	1.152	10.0	-9999.0	-9999.0
6.496	19.10	19.07	0.14	-2.13	0.74	114.6	0.383	0.031	0.352	7.3	12.3	5.0E-05	34.1	40.0	1.246	10.0	70.0	3.670
6.562	18.66	18.63	0.15	-2.13	0.81	114.6	0.387	0.033	0.354	7.1	12.0	5.0E-05	33.4	38.0	1.216	10.0	69.1	3.710
6.627	17.82	17.80	0.17	-1.80	0.96	114.6	0.391	0.035	0.356	6.8	11.4	5.0E-05	32.0	38.0	1.161	10.0	-9999.0	-9999.0
6.693	17.31	17.30	0.19	-1.29	1.10	114.6	0.395	0.037	0.357	6.6	11.1	5.0E-05	31.1	38.0	1.127	10.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
6.758	19.04	19.03	0.21	-0.12	1.11	114.6	0.398	0.039	0.359	7.3	12.2	5.0E-05	33.8	38.0	1.242	10.0	70.2	3.688
6.824	22.35	22.36	0.23	0.16	1.03	114.6	0.402	0.041	0.361	8.6	14.3	5.0E-05	38.3	40.0	1.464	10.0	76.9	3.438
6.890	25.61	25.61	0.23	0.00	0.90	117.7	0.406	0.043	0.362	8.2	13.6	5.0E-04	42.2	40.0	-9999.0	-9999.0	82.6	3.226
6.955	27.98	27.97	0.16	-0.59	0.57	117.7	0.410	0.045	0.364	8.9	14.8	5.0E-04	44.6	40.0	-9999.0	-9999.0	86.5	3.091
7.021	28.81	28.80	0.13	-0.79	0.45	117.7	0.414	0.047	0.366	9.2	15.2	5.0E-04	45.4	40.0	-9999.0	-9999.0	87.8	3.050
7.087	28.24	28.23	0.13	-1.19	0.46	117.7	0.417	0.050	0.368	9.0	14.9	5.0E-04	44.7	40.0	-9999.0	-9999.0	87.1	3.085
7.152	25.55	25.53	0.13	-1.86	0.51	117.7	0.421	0.052	0.370	8.2	13.4	5.0E-04	41.8	40.0	-9999.0	-9999.0	82.9	3.246
7.218	20.76	20.73	0.12	-2.78	0.58	117.7	0.425	0.054	0.372	6.6	10.9	5.0E-04	35.7	40.0	-9999.0	-9999.0	74.2	3.581
7.283	16.48	16.45	0.12	-2.88	0.73	114.6	0.429	0.056	0.373	6.3	10.3	5.0E-05	30.0	38.0	1.068	10.0	-9999.0	-9999.0
7.349	14.37	14.35	0.13	-2.68	0.91	114.6	0.433	0.058	0.375	5.5	9.0	5.0E-05	30.0	38.0	0.928	10.0	-9999.0	-9999.0
7.415	14.51	14.48	0.13	-1.90	0.90	114.6	0.437	0.060	0.377	5.5	9.0	5.0E-05	30.0	38.0	0.937	10.0	-9999.0	-9999.0
7.480	13.73	13.72	0.12	-1.52	0.88	114.6	0.440	0.062	0.378	5.3	8.5	5.0E-05	30.0	38.0	0.885	10.0	-9999.0	-9999.0
7.546	14.44	14.42	0.12	-0.94	0.83	114.6	0.444	0.064	0.380	5.5	9.0	5.0E-05	30.0	38.0	0.932	10.0	-9999.0	-9999.0
7.611	13.92	13.92	0.12	-0.67	0.86	114.6	0.448	0.066	0.382	5.3	8.6	5.0E-05	30.0	38.0	0.898	10.0	-9999.0	-9999.0
7.677	14.30	14.30	0.12	-0.16	0.84	114.6	0.452	0.068	0.384	5.5	8.8	5.0E-05	30.0	38.0	0.923	10.0	-9999.0	-9999.0
7.743	15.02	15.04	0.12	1.76	0.80	114.6	0.455	0.070	0.385	5.8	9.3	5.0E-05	30.0	38.0	0.972	10.0	-9999.0	-9999.0
7.808	15.46	15.48	0.11	2.31	0.71	114.6	0.459	0.072	0.387	5.9	9.5	5.0E-05	30.0	38.0	1.002	10.0	-9999.0	-9999.0
7.874	16.67	16.70	0.13	2.96	0.78	114.6	0.463	0.074	0.389	6.4	10.3	5.0E-05	30.0	38.0	1.083	10.0	-9999.0	-9999.0
7.940	18.14	18.17	0.14	2.84	0.77	114.6	0.467	0.076	0.390	7.0	11.1	5.0E-05	31.3	38.0	1.181	10.0	-9999.0	-9999.0
8.005	20.25	20.28	0.15	2.61	0.74	117.7	0.470	0.078	0.392	6.5	10.3	5.0E-04	34.3	38.0	-9999.0	-9999.0	74.2	3.659
8.071	22.42	22.45	0.18	2.43	0.80	117.7	0.474	0.080	0.394	7.2	11.4	5.0E-04	37.2	40.0	-9999.0	-9999.0	78.6	3.502
8.136	25.87	25.90	0.21	2.23	0.81	117.7	0.478	0.082	0.396	8.3	13.1	5.0E-04	41.2	40.0	-9999.0	-9999.0	84.9	3.278
8.202	31.18	31.20	0.24	2.00	0.77	117.7	0.482	0.084	0.398	10.0	15.8	5.0E-04	46.5	40.0	-9999.0	-9999.0	93.3	2.990
8.268	35.08	35.08	0.31	0.87	0.89	117.7	0.486	0.086	0.399	11.2	17.7	5.0E-04	49.8	42.0	-9999.0	-9999.0	98.9	2.819
8.333	37.94	37.94	0.38	-0.57	1.00	117.7	0.490	0.088	0.401	12.1	19.1	5.0E-04	52.0	42.0	-9999.0	-9999.0	102.8	2.711
8.399	41.20	41.18	0.49	-1.50	1.19	117.7	0.494	0.091	0.403	13.1	20.7	5.0E-04	54.2	42.0	-9999.0	-9999.0	107.3	2.604
8.464	43.51	43.48	0.61	-2.15	1.41	117.7	0.497	0.093	0.405	13.9	21.8	5.0E-04	55.7	42.0	-9999.0	-9999.0	110.4	2.539
8.530	45.10	45.07	0.28	-2.70	0.62	120.9	0.501	0.095	0.407	10.8	16.9	5.0E-03	56.7	42.0	-9999.0	-9999.0	112.6	2.498
8.596	46.95	46.92	0.33	-2.88	0.70	120.9	0.505	0.097	0.409	11.2	17.6	5.0E-03	57.8	42.0	-9999.0	-9999.0	115.1	2.454
8.661	50.27	50.24	0.39	-3.14	0.78	120.9	0.509	0.099	0.411	12.0	18.8	5.0E-03	59.7	42.0	-9999.0	-9999.0	119.7	2.382
8.727	53.60	53.57	0.45	-3.16	0.84	120.9	0.513	0.101	0.413	12.8	20.0	5.0E-03	61.5	44.0	-9999.0	-9999.0	124.3	2.320
8.793	54.74	54.71	0.50	-3.27	0.92	120.9	0.517	0.103	0.414	13.1	20.3	5.0E-03	62.0	44.0	-9999.0	-9999.0	125.9	2.302
8.858	43.05	43.03	0.51	-2.68	1.19	117.7	0.521	0.105	0.416	13.7	21.3	5.0E-04	55.0	42.0	-9999.0	-9999.0	110.5	2.569
8.924	44.21	44.17	0.48	-3.31	1.09	117.7	0.525	0.107	0.418	14.1	21.8	5.0E-04	55.7	42.0	-9999.0	-9999.0	112.1	2.539
8.989	42.73	42.70	0.29	-3.52	0.68	117.7	0.529	0.109	0.420	13.6	21.0	5.0E-04	54.7	42.0	-9999.0	-9999.0	110.3	2.584
9.055	39.42	39.37	0.24	-3.80	0.61	117.7	0.533	0.111	0.422	12.6	19.4	5.0E-04	52.3	42.0	-9999.0	-9999.0	106.1	2.694
9.121	35.08	35.03	0.24	-3.97	0.69	117.7	0.537	0.113	0.424	11.2	17.2	5.0E-04	48.9	42.0	-9999.0	-9999.0	100.3	2.864
9.186	29.38	29.34	0.23	-4.21	0.79	117.7	0.540	0.115	0.425	9.4	14.4	5.0E-04	43.8	40.0	-9999.0	-9999.0	92.1	3.138
9.252	24.15	24.10	0.19	-4.48	0.79	117.7	0.544	0.117	0.427	7.7	11.8	5.0E-04	38.1	40.0	-9999.0	-9999.0	83.2	3.453
9.317	19.10	19.05	0.17	-4.23	0.89	114.6	0.548	0.119	0.429	7.3	11.1	5.0E-05	31.3	38.0	1.233	10.0	-9999.0	-9999.0
9.383	18.98	18.94	0.17	-2.94	0.90	114.6	0.552	0.121	0.431	7.3	11.1	5.0E-05	31.0	38.0	1.226	10.0	-9999.0	-9999.0
9.449	19.81	19.79	0.22	-1.29	1.11	114.6	0.556	0.123	0.432	7.6	11.5	5.0E-05	32.2	38.0	1.283	10.0	-9999.0	-9999.0
9.514	20.00	19.99	0.27	-0.71	1.35	114.6	0.559	0.125	0.434	7.7	11.6	5.0E-05	32.5	38.0	1.295	10.0	-9999.0	-9999.0
9.580	19.42	19.41	0.29	-0.33	1.50	114.6	0.563	0.127	0.436	7.4	11.3	5.0E-05	31.6	38.0	1.257	10.0	-9999.0	-9999.0
9.646	21.33	21.34	0.32	0.79	1.50	114.6	0.567	0.129	0.438	8.2	12.4	5.0E-05	34.2	38.0	1.385	10.0	78.2	3.664
9.711	27.60	27.62	0.29	1.84	1.05	117.7	0.571	0.131	0.439	8.8	13.3	5.0E-04	41.6	40.0	-9999.0	-9999.0	90.0	3.259
9.777	33.66	33.68	0.22	1.33	0.65	117.7	0.575	0.134	0.441	10.8	16.2	5.0E-04	47.2	40.0	-9999.0	-9999.0	99.4	2.953
9.842	30.15	30.15	0.09	-0.61	0.30	117.7	0.578	0.136	0.443	9.6	14.5	5.0E-04	44.0	40.0	-9999.0	-9999.0	94.3	3.127
9.908	20.12	20.08	0.04	-3.22	0.20	117.7	0.582	0.138	0.445	6.4	9.6	5.0E-04	32.3	38.0	-9999.0	-9999.0	-9999.0	-9999.0
9.974	14.30	14.25	0.01	-4.70	0.07	114.6	0.586	0.140	0.446	5.5	8.2	5.0E-05	30.0	36.0	0.911	10.0	-9999.0	-9999.0
10.039	9.96	9.92	0.01	-4.07	0.10	111.4	0.590	0.142	0.448	4.8	7.1	1.0E-07	-9999.0	-9999.0	0.622	7.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
10.105	5.81	5.77	0.01	-4.48	0.17	111.4	0.594	0.144	0.450	2.8	4.1	1.0E-07	-9999.0	-9999.0	0.345	3.1	-9999.0	-9999.0
10.170	2.11	2.07	0.01	-3.60	0.49	111.4	0.597	0.146	0.451	1.0	1.5	1.0E-07	-9999.0	-9999.0	0.098	0.8	-9999.0	-9999.0
10.236	1.00	0.99	0.01	-1.50	1.02	82.7	0.600	0.148	0.452	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
10.302	1.00	1.03	0.01	2.49	0.97	82.7	0.603	0.150	0.453	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
10.367	1.00	1.08	0.01	6.77	0.93	79.6	0.606	0.152	0.454	1.0	1.5	1.0E-15	-9999.0	-9999.0	0.031	0.5	-9999.0	-9999.0
10.433	1.00	1.11	0.01	9.97	0.90	79.6	0.608	0.154	0.454	1.1	1.6	1.0E-15	-9999.0	-9999.0	0.033	0.5	-9999.0	-9999.0
10.499	1.00	1.13	0.01	11.47	0.89	111.4	0.611	0.156	0.455	0.5	0.8	1.0E-07	-9999.0	-9999.0	0.034	0.5	-9999.0	-9999.0
10.564	1.00	1.15	0.01	13.69	0.87	111.4	0.615	0.158	0.457	0.6	0.8	1.0E-07	-9999.0	-9999.0	0.036	0.5	-9999.0	-9999.0
10.630	1.00	1.16	0.01	14.66	0.86	111.4	0.619	0.160	0.459	0.6	0.8	1.0E-07	-9999.0	-9999.0	0.036	0.5	-9999.0	-9999.0
10.695	1.00	1.18	0.01	16.27	0.85	111.4	0.622	0.162	0.460	0.6	0.8	1.0E-07	-9999.0	-9999.0	0.037	0.5	-9999.0	-9999.0
10.761	3.13	3.31	0.04	16.91	1.21	111.4	0.626	0.164	0.462	1.6	2.3	1.0E-07	-9999.0	-9999.0	0.179	1.3	-9999.0	-9999.0
10.827	7.28	7.41	0.07	12.61	0.95	111.4	0.630	0.166	0.463	3.6	5.2	1.0E-07	-9999.0	-9999.0	0.452	4.4	-9999.0	-9999.0
10.892	10.61	10.71	0.10	9.91	0.94	114.6	0.633	0.168	0.465	4.1	6.0	5.0E-05	30.0	34.0	0.672	8.0	-9999.0	-9999.0
10.958	14.24	14.33	0.11	7.48	0.77	114.6	0.637	0.170	0.467	5.5	8.0	5.0E-05	30.0	36.0	0.913	10.0	-9999.0	-9999.0
11.023	17.25	17.31	0.13	5.05	0.75	114.6	0.641	0.172	0.469	6.6	9.7	5.0E-05	30.0	38.0	1.111	10.0	-9999.0	-9999.0
11.089	20.57	20.62	0.14	4.44	0.68	117.7	0.645	0.175	0.470	6.6	9.6	5.0E-04	32.2	38.0	-9999.0	-9999.0	-9999.0	-9999.0
11.155	21.27	21.31	0.14	3.70	0.66	117.7	0.649	0.177	0.472	6.8	9.9	5.0E-04	33.1	38.0	-9999.0	-9999.0	79.4	3.725
11.220	21.08	21.12	0.13	3.33	0.62	117.7	0.653	0.179	0.474	6.7	9.8	5.0E-04	32.8	38.0	-9999.0	-9999.0	79.0	3.743
11.286	19.10	19.13	0.12	2.80	0.63	117.7	0.656	0.181	0.476	6.1	8.9	5.0E-04	30.0	38.0	-9999.0	-9999.0	-9999.0	-9999.0
11.352	17.69	17.72	0.09	2.94	0.51	114.6	0.660	0.183	0.477	6.8	9.8	5.0E-05	30.0	38.0	1.138	10.0	-9999.0	-9999.0
11.417	15.84	15.87	0.08	2.94	0.51	114.6	0.664	0.185	0.479	6.1	8.8	5.0E-05	30.0	36.0	1.014	10.0	-9999.0	-9999.0
11.483	14.95	14.98	0.07	3.06	0.47	114.6	0.668	0.187	0.481	5.7	8.3	5.0E-05	30.0	36.0	0.954	10.0	-9999.0	-9999.0
11.548	13.86	13.89	0.07	2.88	0.51	114.6	0.671	0.189	0.483	5.3	7.7	5.0E-05	30.0	36.0	0.882	10.0	-9999.0	-9999.0
11.614	13.79	13.82	0.06	2.78	0.44	114.6	0.675	0.191	0.484	5.3	7.6	5.0E-05	30.0	36.0	0.877	10.0	-9999.0	-9999.0
11.680	13.35	13.38	0.06	2.31	0.45	114.6	0.679	0.193	0.486	5.1	7.4	5.0E-05	30.0	36.0	0.847	10.0	-9999.0	-9999.0
11.745	13.03	13.07	0.05	3.29	0.38	114.6	0.683	0.195	0.488	5.0	7.2	5.0E-05	30.0	34.0	0.826	10.0	-9999.0	-9999.0
11.811	12.27	12.30	0.04	2.37	0.33	114.6	0.687	0.197	0.489	4.7	6.7	5.0E-05	30.0	34.0	0.774	9.3	-9999.0	-9999.0
11.876	12.14	12.18	0.05	3.35	0.41	114.6	0.690	0.199	0.491	4.7	6.7	5.0E-05	30.0	34.0	0.766	9.1	-9999.0	-9999.0
11.942	11.18	11.21	0.06	3.22	0.54	114.6	0.694	0.201	0.493	4.3	6.1	5.0E-05	30.0	34.0	0.701	7.8	-9999.0	-9999.0
12.008	9.58	9.61	0.09	2.94	0.94	114.6	0.698	0.203	0.495	4.6	6.5	5.0E-06	-9999.0	-9999.0	0.594	6.0	-9999.0	-9999.0
12.073	7.03	7.06	0.10	2.76	1.42	114.6	0.702	0.205	0.496	3.4	4.8	5.0E-06	-9999.0	-9999.0	0.424	3.6	-9999.0	-9999.0
12.139	6.84	6.86	0.11	2.15	1.61	114.6	0.705	0.207	0.498	3.3	4.7	5.0E-06	-9999.0	-9999.0	0.410	3.4	-9999.0	-9999.0
12.205	7.41	7.45	0.10	3.48	1.35	114.6	0.709	0.209	0.500	3.6	5.0	5.0E-06	-9999.0	-9999.0	0.449	3.9	-9999.0	-9999.0
12.270	6.52	6.57	0.10	4.58	1.53	114.6	0.713	0.211	0.501	3.1	4.4	5.0E-06	-9999.0	-9999.0	0.390	3.1	-9999.0	-9999.0
12.336	7.22	7.27	0.11	4.56	1.52	114.6	0.717	0.213	0.503	3.5	4.9	5.0E-06	-9999.0	-9999.0	0.437	3.7	-9999.0	-9999.0
12.401	7.09	7.14	0.11	5.35	1.54	114.6	0.720	0.215	0.505	3.4	4.8	5.0E-06	-9999.0	-9999.0	0.428	3.6	-9999.0	-9999.0
12.467	8.75	8.86	0.13	9.75	1.47	114.6	0.724	0.218	0.507	4.2	6.0	5.0E-06	-9999.0	-9999.0	0.542	5.0	-9999.0	-9999.0
12.533	13.99	14.10	0.15	10.22	1.07	114.6	0.728	0.220	0.508	5.4	7.6	5.0E-05	30.0	36.0	0.892	10.0	-9999.0	-9999.0
12.598	18.52	18.61	0.16	7.52	0.86	114.6	0.732	0.222	0.510	7.1	10.0	5.0E-05	30.0	38.0	1.192	10.0	-9999.0	-9999.0
12.664	18.79	18.84	0.17	4.64	0.90	114.6	0.735	0.224	0.512	7.2	10.1	5.0E-05	30.0	38.0	1.207	10.0	-9999.0	-9999.0
12.730	17.12	17.16	0.18	3.35	1.05	114.6	0.739	0.226	0.513	6.6	9.2	5.0E-05	30.0	36.0	1.095	10.0	-9999.0	-9999.0
12.795	15.78	15.82	0.19	3.83	1.20	114.6	0.743	0.228	0.515	6.1	8.4	5.0E-05	30.0	36.0	1.005	10.0	-9999.0	-9999.0
12.861	14.44	14.48	0.18	4.35	1.25	114.6	0.747	0.230	0.517	5.5	7.7	5.0E-05	30.0	36.0	0.916	10.0	-9999.0	-9999.0
12.926	12.27	12.32	0.16	4.56	1.30	114.6	0.750	0.232	0.519	4.7	6.6	5.0E-05	30.0	34.0	0.771	8.4	-9999.0	-9999.0
12.992	11.18	11.23	0.14	4.88	1.25	114.6	0.754	0.234	0.520	5.4	7.5	5.0E-06	-9999.0	-9999.0	0.698	7.2	-9999.0	-9999.0
13.058	9.26	9.32	0.12	5.05	1.29	114.6	0.758	0.236	0.522	4.5	6.2	5.0E-06	-9999.0	-9999.0	0.571	5.2	-9999.0	-9999.0
13.123	8.50	8.56	0.11	5.25	1.29	114.6	0.762	0.238	0.524	4.1	5.7	5.0E-06	-9999.0	-9999.0	0.520	4.5	-9999.0	-9999.0
13.189	6.39	6.45	0.09	5.73	1.40	111.4	0.765	0.240	0.525	3.1	4.3	1.0E-07	-9999.0	-9999.0	0.379	2.8	-9999.0	-9999.0
13.254	4.22	4.28	0.05	5.81	1.17	111.4	0.769	0.242	0.527	2.1	2.8	1.0E-07	-9999.0	-9999.0	0.234	1.5	-9999.0	-9999.0
13.320	3.39	3.47	0.03	7.91	0.87	111.4	0.773	0.244	0.529	1.7	2.3	1.0E-07	-9999.0	-9999.0	0.180	1.1	-9999.0	-9999.0
13.386	2.37	2.47	0.03	9.24	1.22	111.4	0.776	0.246	0.530	1.2	1.6	1.0E-07	-9999.0	-9999.0	0.113	0.8	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
13.451	2.69	2.78	0.03	9.07	1.08	111.4	0.780	0.248	0.532	1.3	1.8	1.0E-07	-9999.0	-9999.0	0.134	0.9	-9999.0	-9999.0
13.517	2.56	2.65	0.03	8.53	1.14	111.4	0.784	0.250	0.533	1.3	1.7	1.0E-07	-9999.0	-9999.0	0.124	0.8	-9999.0	-9999.0
13.583	2.18	2.26	0.03	8.24	1.33	111.4	0.787	0.252	0.535	1.1	1.5	1.0E-07	-9999.0	-9999.0	0.098	0.7	-9999.0	-9999.0
13.648	2.30	2.39	0.03	9.20	1.26	111.4	0.791	0.254	0.537	1.1	1.6	1.0E-07	-9999.0	-9999.0	0.107	0.7	-9999.0	-9999.0
13.714	2.11	2.21	0.03	10.01	1.36	111.4	0.795	0.256	0.538	1.1	1.4	1.0E-07	-9999.0	-9999.0	0.095	0.7	-9999.0	-9999.0
13.779	1.85	1.97	0.04	10.47	2.04	111.4	0.798	0.259	0.540	0.9	1.3	1.0E-07	-9999.0	-9999.0	0.078	0.6	-9999.0	-9999.0
13.845	2.11	2.21	0.03	9.60	1.36	111.4	0.802	0.261	0.541	1.1	1.4	1.0E-07	-9999.0	-9999.0	0.094	0.7	-9999.0	-9999.0
13.911	2.11	2.20	0.02	8.34	0.91	111.4	0.806	0.263	0.543	1.1	1.4	1.0E-07	-9999.0	-9999.0	0.093	0.7	-9999.0	-9999.0
13.976	2.18	2.26	0.03	8.20	1.33	111.4	0.809	0.265	0.545	1.1	1.5	1.0E-07	-9999.0	-9999.0	0.097	0.7	-9999.0	-9999.0
14.042	1.78	1.87	0.04	8.38	2.14	111.4	0.813	0.267	0.546	0.9	1.2	1.0E-07	-9999.0	-9999.0	0.071	0.6	-9999.0	-9999.0
14.107	1.34	1.44	0.04	9.40	2.78	111.4	0.817	0.269	0.548	1.4	1.9	5.0E-08	-9999.0	-9999.0	0.042	0.5	-9999.0	-9999.0
14.173	1.21	1.32	0.03	10.03	2.28	111.4	0.820	0.271	0.549	0.6	0.9	1.0E-07	-9999.0	-9999.0	0.033	0.5	-9999.0	-9999.0
14.239	1.66	1.77	0.03	10.18	1.70	111.4	0.824	0.273	0.551	0.8	1.1	1.0E-07	-9999.0	-9999.0	0.063	0.6	-9999.0	-9999.0
14.304	2.81	2.92	0.03	10.12	1.03	111.4	0.828	0.275	0.553	1.4	1.9	1.0E-07	-9999.0	-9999.0	0.139	0.9	-9999.0	-9999.0
14.370	4.79	4.89	0.04	8.99	0.82	111.4	0.831	0.277	0.554	2.3	3.1	1.0E-07	-9999.0	-9999.0	0.271	1.7	-9999.0	-9999.0
14.436	5.30	5.38	0.04	7.13	0.75	111.4	0.835	0.279	0.556	2.6	3.5	1.0E-07	-9999.0	-9999.0	0.303	1.9	-9999.0	-9999.0
14.501	4.79	4.86	0.05	6.24	1.03	111.4	0.838	0.281	0.557	2.3	3.1	1.0E-07	-9999.0	-9999.0	0.268	1.7	-9999.0	-9999.0
14.567	4.53	4.60	0.06	6.58	1.31	111.4	0.842	0.283	0.559	2.2	2.9	1.0E-07	-9999.0	-9999.0	0.251	1.5	-9999.0	-9999.0
14.632	3.39	3.46	0.06	6.62	1.74	111.4	0.846	0.285	0.561	1.7	2.2	1.0E-07	-9999.0	-9999.0	0.174	1.0	-9999.0	-9999.0
14.698	3.13	3.20	0.07	6.81	2.19	111.4	0.849	0.287	0.562	3.1	4.1	5.0E-08	-9999.0	-9999.0	0.157	0.9	-9999.0	-9999.0
14.764	2.62	2.69	0.07	6.72	2.61	111.4	0.853	0.289	0.564	2.6	3.4	5.0E-08	-9999.0	-9999.0	0.122	0.8	-9999.0	-9999.0
14.829	1.98	2.06	0.06	6.95	2.92	111.4	0.857	0.291	0.565	2.0	2.6	5.0E-08	-9999.0	-9999.0	0.080	0.6	-9999.0	-9999.0
14.895	2.50	2.58	0.07	7.64	2.72	111.4	0.860	0.293	0.567	2.5	3.3	5.0E-08	-9999.0	-9999.0	0.115	0.7	-9999.0	-9999.0
14.960	1.27	1.36	0.06	7.89	4.43	79.6	0.864	0.295	0.568	1.3	1.7	1.0E-15	-9999.0	-9999.0	0.033	0.5	-9999.0	-9999.0
15.026	1.72	1.81	0.07	8.16	3.87	111.4	0.867	0.297	0.569	1.7	2.3	5.0E-08	-9999.0	-9999.0	0.063	0.6	-9999.0	-9999.0
15.092	1.00	1.09	0.07	8.24	6.43	79.6	0.870	0.299	0.570	1.0	1.4	1.0E-15	-9999.0	-9999.0	0.015	0.5	-9999.0	-9999.0
15.157	1.00	1.10	0.05	8.73	4.57	79.6	0.872	0.302	0.571	1.1	1.4	1.0E-15	-9999.0	-9999.0	0.015	0.5	-9999.0	-9999.0
15.223	1.00	1.11	0.06	10.14	5.41	79.6	0.875	0.304	0.571	1.1	1.4	1.0E-15	-9999.0	-9999.0	0.016	0.5	-9999.0	-9999.0
15.289	1.00	1.13	0.07	11.93	6.20	79.6	0.878	0.306	0.572	1.1	1.4	1.0E-15	-9999.0	-9999.0	0.017	0.5	-9999.0	-9999.0
15.354	2.88	3.02	0.07	13.16	2.32	111.4	0.881	0.308	0.573	2.9	3.8	5.0E-08	-9999.0	-9999.0	0.143	0.9	-9999.0	-9999.0
15.420	6.52	6.65	0.09	12.26	1.36	111.4	0.884	0.310	0.575	3.2	4.2	1.0E-07	-9999.0	-9999.0	0.384	2.5	-9999.0	-9999.0
15.485	8.05	8.11	0.10	5.27	1.24	114.6	0.888	0.312	0.576	3.9	5.1	5.0E-06	-9999.0	-9999.0	0.481	3.5	-9999.0	-9999.0
15.551	8.75	8.83	0.12	7.50	1.36	114.6	0.892	0.314	0.578	4.2	5.6	5.0E-06	-9999.0	-9999.0	0.529	4.0	-9999.0	-9999.0
15.617	9.45	9.55	0.14	8.69	1.47	114.6	0.896	0.316	0.580	4.6	6.0	5.0E-06	-9999.0	-9999.0	0.577	4.5	-9999.0	-9999.0
15.682	9.96	10.06	0.14	9.07	1.39	114.6	0.899	0.318	0.582	4.8	6.3	5.0E-06	-9999.0	-9999.0	0.611	4.9	-9999.0	-9999.0
15.748	11.12	11.22	0.15	9.30	1.34	114.6	0.903	0.320	0.583	5.4	7.0	5.0E-06	-9999.0	-9999.0	0.688	5.9	-9999.0	-9999.0
15.813	11.25	11.35	0.16	9.38	1.41	114.6	0.907	0.322	0.585	5.4	7.1	5.0E-06	-9999.0	-9999.0	0.696	5.9	-9999.0	-9999.0
15.879	11.88	11.98	0.16	9.50	1.34	114.6	0.911	0.324	0.587	5.7	7.5	5.0E-06	-9999.0	-9999.0	0.738	6.5	-9999.0	-9999.0
15.945	12.58	12.68	0.16	9.54	1.26	114.6	0.914	0.326	0.588	4.9	6.3	5.0E-05	30.0	34.0	0.785	7.1	-9999.0	-9999.0
16.010	11.63	11.73	0.16	9.48	1.37	114.6	0.918	0.328	0.590	5.6	7.3	5.0E-06	-9999.0	-9999.0	0.721	6.2	-9999.0	-9999.0
16.076	11.37	11.48	0.16	9.95	1.40	114.6	0.922	0.330	0.592	5.5	7.1	5.0E-06	-9999.0	-9999.0	0.704	5.9	-9999.0	-9999.0
16.142	11.37	11.48	0.15	10.03	1.31	114.6	0.926	0.332	0.593	5.5	7.1	5.0E-06	-9999.0	-9999.0	0.703	5.9	-9999.0	-9999.0
16.207	10.09	10.21	0.14	10.24	1.38	114.6	0.929	0.334	0.595	4.9	6.3	5.0E-06	-9999.0	-9999.0	0.618	4.8	-9999.0	-9999.0
16.273	9.26	9.38	0.14	10.65	1.50	114.6	0.933	0.336	0.597	4.5	5.8	5.0E-06	-9999.0	-9999.0	0.563	4.2	-9999.0	-9999.0
16.338	8.43	8.56	0.12	11.69	1.41	114.6	0.937	0.338	0.599	4.1	5.3	5.0E-06	-9999.0	-9999.0	0.508	3.6	-9999.0	-9999.0
16.404	6.90	7.02	0.10	11.87	1.43	114.6	0.941	0.340	0.600	3.4	4.3	5.0E-06	-9999.0	-9999.0	0.406	2.6	-9999.0	-9999.0
16.470	5.49	5.62	0.09	11.85	1.60	111.4	0.944	0.343	0.602	2.7	3.5	1.0E-07	-9999.0	-9999.0	0.312	1.8	-9999.0	-9999.0
16.535	4.02	4.15	0.08	12.33	1.93	111.4	0.948	0.345	0.604	2.0	2.6	1.0E-07	-9999.0	-9999.0	0.214	1.2	-9999.0	-9999.0
16.601	3.20	3.34	0.07	13.49	2.10	111.4	0.952	0.347	0.605	1.6	2.1	1.0E-07	-9999.0	-9999.0	0.159	0.9	-9999.0	-9999.0
16.666	3.20	3.36	0.05	14.80	1.49	111.4	0.955	0.349	0.607	1.6	2.1	1.0E-07	-9999.0	-9999.0	0.160	0.9	-9999.0	-9999.0
16.732	2.30	2.47	0.03	15.78	1.22	111.4	0.959	0.351	0.608	1.2	1.5	1.0E-07	-9999.0	-9999.0	0.100	0.7	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
16.798	2.24	2.41	0.04	16.55	1.66	111.4	0.963	0.353	0.610	1.2	1.5	1.0E-07	-9999.0	-9999.0	0.097	0.6	-9999.0	-9999.0
16.863	3.07	3.24	0.01	15.90	0.31	111.4	0.966	0.355	0.612	1.6	2.0	1.0E-07	-9999.0	-9999.0	0.152	0.8	-9999.0	-9999.0
16.929	2.75	2.91	0.01	15.11	0.34	111.4	0.970	0.357	0.613	1.4	1.8	1.0E-07	-9999.0	-9999.0	0.129	0.8	-9999.0	-9999.0
16.995	2.50	2.65	0.01	14.26	0.38	111.4	0.974	0.359	0.615	1.3	1.6	1.0E-07	-9999.0	-9999.0	0.112	0.7	-9999.0	-9999.0
17.060	1.27	1.42	0.01	13.65	0.71	111.4	0.977	0.361	0.616	0.7	0.9	1.0E-07	-9999.0	-9999.0	0.030	0.5	-9999.0	-9999.0
17.126	1.21	1.37	0.01	14.47	0.73	111.4	0.981	0.363	0.618	0.7	0.8	1.0E-07	-9999.0	-9999.0	0.026	0.5	-9999.0	-9999.0
17.191	1.34	1.52	0.01	15.98	0.66	111.4	0.985	0.365	0.620	0.7	0.9	1.0E-07	-9999.0	-9999.0	0.035	0.5	-9999.0	-9999.0
17.257	1.00	1.18	0.01	16.14	0.85	111.4	0.988	0.367	0.621	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.013	0.5	-9999.0	-9999.0
17.323	1.00	1.18	0.01	16.00	0.85	111.4	0.992	0.369	0.623	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.012	0.5	-9999.0	-9999.0
17.388	1.00	1.18	0.01	16.17	0.85	111.4	0.996	0.371	0.624	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.012	0.5	-9999.0	-9999.0
17.454	1.00	1.18	0.01	16.21	0.85	111.4	0.999	0.373	0.626	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.012	0.5	-9999.0	-9999.0
17.519	1.00	1.18	0.01	16.39	0.85	111.4	1.003	0.375	0.628	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.012	0.5	-9999.0	-9999.0
17.585	1.00	1.19	0.01	17.23	0.84	111.4	1.007	0.377	0.629	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.012	0.5	-9999.0	-9999.0
17.651	1.00	1.20	0.01	18.39	0.83	111.4	1.010	0.379	0.631	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.013	0.5	-9999.0	-9999.0
17.716	1.00	1.21	0.01	19.03	0.83	111.4	1.014	0.381	0.632	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.013	0.5	-9999.0	-9999.0
17.782	1.21	1.40	0.01	17.21	0.72	111.4	1.018	0.383	0.634	0.7	0.8	1.0E-07	-9999.0	-9999.0	0.025	0.5	-9999.0	-9999.0
17.848	1.08	1.24	0.01	14.43	0.81	111.4	1.021	0.386	0.636	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.014	0.5	-9999.0	-9999.0
17.913	1.21	1.35	0.01	12.94	0.74	111.4	1.025	0.388	0.637	0.6	0.8	1.0E-07	-9999.0	-9999.0	0.022	0.5	-9999.0	-9999.0
17.979	1.00	1.15	0.03	13.20	2.63	79.6	1.028	0.390	0.638	1.1	1.4	1.0E-15	-9999.0	-9999.0	0.008	0.5	-9999.0	-9999.0
18.044	1.02	1.19	0.05	15.25	4.22	79.6	1.031	0.392	0.639	1.1	1.4	1.0E-15	-9999.0	-9999.0	0.010	0.5	-9999.0	-9999.0
18.110	2.43	2.60	0.07	16.35	2.70	111.4	1.034	0.394	0.640	2.5	3.1	5.0E-08	-9999.0	-9999.0	0.105	0.6	-9999.0	-9999.0
18.176	3.96	4.11	0.07	13.51	1.71	111.4	1.037	0.396	0.642	2.0	2.5	1.0E-07	-9999.0	-9999.0	0.205	1.1	-9999.0	-9999.0
18.241	4.92	5.04	0.08	10.59	1.59	111.4	1.041	0.398	0.643	2.4	3.0	1.0E-07	-9999.0	-9999.0	0.266	1.4	-9999.0	-9999.0
18.307	4.92	5.02	0.08	8.89	1.60	111.4	1.045	0.400	0.645	2.4	3.0	1.0E-07	-9999.0	-9999.0	0.265	1.4	-9999.0	-9999.0
18.372	4.73	4.82	0.09	8.34	1.87	114.6	1.048	0.402	0.647	3.1	3.8	5.0E-07	-9999.0	-9999.0	0.252	1.3	-9999.0	-9999.0
18.438	4.79	4.88	0.09	8.42	1.85	114.6	1.052	0.404	0.648	3.1	3.9	5.0E-07	-9999.0	-9999.0	0.255	1.3	-9999.0	-9999.0
18.504	3.96	4.05	0.10	8.42	2.47	111.4	1.056	0.406	0.650	3.9	4.8	5.0E-08	-9999.0	-9999.0	0.200	1.0	-9999.0	-9999.0
18.569	2.94	3.02	0.09	8.06	2.98	111.4	1.060	0.408	0.651	2.9	3.6	5.0E-08	-9999.0	-9999.0	0.131	0.7	-9999.0	-9999.0
18.635	1.53	1.62	0.08	8.18	4.94	79.6	1.063	0.410	0.653	1.6	1.9	1.0E-15	-9999.0	-9999.0	0.037	0.5	-9999.0	-9999.0
18.701	1.15	1.23	0.07	7.05	5.71	79.6	1.065	0.412	0.653	1.2	1.5	1.0E-15	-9999.0	-9999.0	0.011	0.5	-9999.0	-9999.0
18.766	1.00	1.09	0.07	8.42	6.42	79.6	1.068	0.414	0.654	1.0	1.3	1.0E-15	-9999.0	-9999.0	0.002	0.5	-9999.0	-9999.0
18.832	1.00	1.11	0.05	10.31	4.50	79.6	1.071	0.416	0.654	1.1	1.3	1.0E-15	-9999.0	-9999.0	0.003	0.5	-9999.0	-9999.0
18.897	1.00	1.14	0.03	12.78	2.64	79.6	1.073	0.418	0.655	1.1	1.3	1.0E-15	-9999.0	-9999.0	0.004	0.5	-9999.0	-9999.0
18.963	1.00	1.17	0.02	15.92	1.71	79.6	1.076	0.420	0.655	1.1	1.4	1.0E-15	-9999.0	-9999.0	0.007	0.5	-9999.0	-9999.0
19.029	1.00	1.18	0.01	16.73	0.85	111.4	1.079	0.422	0.656	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.007	0.5	-9999.0	-9999.0
19.094	1.00	1.19	0.01	17.01	0.85	111.4	1.083	0.424	0.658	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.007	0.5	-9999.0	-9999.0
19.160	1.00	1.17	0.01	15.94	0.85	111.4	1.086	0.427	0.660	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.006	0.5	-9999.0	-9999.0
19.225	1.00	1.16	0.01	14.90	0.86	111.4	1.090	0.429	0.661	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.005	0.5	-9999.0	-9999.0
19.291	1.00	1.16	0.01	14.43	0.87	111.4	1.093	0.431	0.663	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.004	0.5	-9999.0	-9999.0
19.357	1.00	1.17	0.01	15.31	0.86	111.4	1.097	0.433	0.664	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.005	0.5	-9999.0	-9999.0
19.422	1.00	1.18	0.01	16.21	0.85	111.4	1.101	0.435	0.666	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.005	0.5	-9999.0	-9999.0
19.488	1.00	1.18	0.01	16.57	0.85	111.4	1.104	0.437	0.668	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.005	0.5	-9999.0	-9999.0
19.554	1.00	1.18	0.01	16.47	0.85	111.4	1.108	0.439	0.669	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.005	0.5	-9999.0	-9999.0
19.619	1.00	1.19	0.01	16.95	0.85	111.4	1.112	0.441	0.671	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.005	0.5	-9999.0	-9999.0
19.685	1.00	1.19	0.01	17.76	0.84	111.4	1.115	0.443	0.673	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.005	0.5	-9999.0	-9999.0
19.750	1.00	1.21	0.01	18.90	0.83	111.4	1.119	0.445	0.674	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.006	0.5	-9999.0	-9999.0
19.816	1.00	1.20	0.01	18.11	0.84	111.4	1.123	0.447	0.676	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.005	0.5	-9999.0	-9999.0
19.882	1.00	1.19	0.01	17.78	0.84	111.4	1.126	0.449	0.677	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.005	0.5	-9999.0	-9999.0
19.947	1.00	1.20	0.01	18.19	0.84	111.4	1.130	0.451	0.679	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.005	0.5	-9999.0	-9999.0
20.013	1.00	1.21	0.01	19.16	0.83	111.4	1.134	0.453	0.681	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.005	0.5	-9999.0	-9999.0
20.078	1.00	1.21	0.01	19.28	0.83	111.4	1.137	0.455	0.682	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.005	0.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
20.144	1.00	1.21	0.01	19.16	0.83	111.4	1.141	0.457	0.684	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.005	0.5	-9999.0	-9999.0
20.210	1.00	1.21	0.01	19.01	0.83	111.4	1.145	0.459	0.685	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.004	0.5	-9999.0	-9999.0
20.275	1.00	1.21	0.01	19.14	0.83	111.4	1.148	0.461	0.687	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.004	0.5	-9999.0	-9999.0
20.341	1.00	1.21	0.01	19.64	0.83	111.4	1.152	0.463	0.689	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.004	0.5	-9999.0	-9999.0
20.407	1.00	1.22	0.01	19.83	0.82	111.4	1.156	0.465	0.690	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.004	0.5	-9999.0	-9999.0
20.472	1.00	1.21	0.01	19.16	0.83	111.4	1.159	0.467	0.692	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.003	0.5	-9999.0	-9999.0
20.538	1.00	1.20	0.01	18.45	0.83	111.4	1.163	0.470	0.693	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.003	0.5	-9999.0	-9999.0
20.603	1.00	1.20	0.01	18.21	0.84	111.4	1.167	0.472	0.695	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.002	0.5	-9999.0	-9999.0
20.669	1.00	1.20	0.01	18.74	0.83	111.4	1.170	0.474	0.697	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.002	0.5	-9999.0	-9999.0
20.735	1.00	1.21	0.01	18.80	0.83	111.4	1.174	0.476	0.698	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.002	0.5	-9999.0	-9999.0
20.800	1.00	1.21	0.01	18.99	0.83	111.4	1.178	0.478	0.700	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.002	0.5	-9999.0	-9999.0
20.866	1.00	1.22	0.01	19.89	0.82	111.4	1.181	0.480	0.701	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.002	0.5	-9999.0	-9999.0
20.932	1.00	1.22	0.01	20.17	0.82	111.4	1.185	0.482	0.703	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.002	0.5	-9999.0	-9999.0
20.997	1.00	1.21	0.01	19.44	0.83	111.4	1.189	0.484	0.705	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.002	0.5	-9999.0	-9999.0
21.063	1.00	1.20	0.01	18.72	0.83	111.4	1.192	0.486	0.706	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.001	0.5	-9999.0	-9999.0
21.128	1.00	1.20	0.01	18.49	0.83	111.4	1.196	0.488	0.708	0.6	0.7	1.0E-07	-9999.0	-9999.0	0.000	0.5	-9999.0	-9999.0
21.194	1.00	1.20	0.01	18.13	0.84	111.4	1.199	0.490	0.709	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
21.260	1.00	1.19	0.01	17.72	0.84	111.4	1.203	0.492	0.711	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
21.325	1.00	1.19	0.01	17.54	0.84	111.4	1.207	0.494	0.713	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
21.391	1.00	1.19	0.01	17.78	0.84	111.4	1.210	0.496	0.714	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
21.456	1.00	1.20	0.01	18.23	0.84	111.4	1.214	0.498	0.716	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
21.522	1.00	1.21	0.01	18.78	0.83	111.4	1.218	0.500	0.717	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
21.588	1.00	1.21	0.01	19.26	0.83	111.4	1.221	0.502	0.719	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
21.653	1.00	1.21	0.01	19.34	0.83	111.4	1.225	0.504	0.721	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
21.719	1.00	1.21	0.01	19.18	0.83	111.4	1.229	0.506	0.722	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
21.785	1.00	1.21	0.01	19.42	0.83	111.4	1.232	0.508	0.724	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
21.850	1.00	1.21	0.01	19.56	0.83	111.4	1.236	0.510	0.726	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
21.916	1.00	1.12	0.01	11.20	0.89	111.4	1.240	0.513	0.727	0.5	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
21.981	1.00	1.15	0.01	13.90	0.87	111.4	1.243	0.515	0.729	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
22.047	1.00	1.16	0.01	14.72	0.86	111.4	1.247	0.517	0.730	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
22.113	1.00	1.16	0.01	14.80	0.86	111.4	1.251	0.519	0.732	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
22.178	1.00	1.17	0.01	15.47	0.86	111.4	1.254	0.521	0.734	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
22.244	1.00	1.18	0.01	16.43	0.85	111.4	1.258	0.523	0.735	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
22.309	1.00	1.19	0.01	17.34	0.84	111.4	1.262	0.525	0.737	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
22.375	1.00	1.19	0.01	17.50	0.84	111.4	1.265	0.527	0.738	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
22.441	1.00	1.20	0.01	17.86	0.84	111.4	1.269	0.529	0.740	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
22.506	1.00	1.19	0.01	17.76	0.84	111.4	1.273	0.531	0.742	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
22.572	1.00	1.20	0.01	18.19	0.84	111.4	1.276	0.533	0.743	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
22.638	1.00	1.20	0.01	18.45	0.83	111.4	1.280	0.535	0.745	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
22.703	1.00	1.21	0.01	18.90	0.83	111.4	1.284	0.537	0.746	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
22.769	1.00	1.21	0.01	18.94	0.83	111.4	1.287	0.539	0.748	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
22.834	1.00	1.22	0.01	19.69	0.82	111.4	1.291	0.541	0.750	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
22.900	1.00	1.22	0.01	20.40	0.82	111.4	1.294	0.543	0.751	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
22.966	1.00	1.23	0.01	20.93	0.82	111.4	1.298	0.545	0.753	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
23.031	1.00	1.24	0.01	21.55	0.81	111.4	1.302	0.547	0.754	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
23.097	1.00	1.23	0.01	20.78	0.82	111.4	1.305	0.549	0.756	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
23.162	1.00	1.23	0.01	20.72	0.82	111.4	1.309	0.551	0.758	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
23.228	1.00	1.23	0.01	20.68	0.82	111.4	1.313	0.554	0.759	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
23.294	1.00	1.24	0.01	21.81	0.81	111.4	1.316	0.556	0.761	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
23.359	1.00	1.26	0.01	23.78	0.80	111.4	1.320	0.558	0.762	0.6	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
23.425	1.00	1.26	0.04	24.30	3.17	79.6	1.323	0.560	0.764	1.2	1.4	1.0E-15	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
23.491	1.00	1.25	0.04	22.71	3.21	79.6	1.326	0.562	0.764	1.2	1.4	1.0E-15	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
23.556	1.40	1.64	0.06	21.65	3.67	111.4	1.329	0.564	0.765	1.6	1.8	5.0E-08	-9999.0	-9999.0	0.021	0.5	-9999.0	-9999.0
23.622	2.04	2.24	0.08	18.39	3.57	111.4	1.333	0.566	0.767	2.1	2.5	5.0E-08	-9999.0	-9999.0	0.061	0.5	-9999.0	-9999.0
23.687	1.27	1.49	0.12	20.03	8.08	82.7	1.336	0.568	0.768	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
23.753	1.72	1.99	0.15	24.28	7.57	79.6	1.338	0.570	0.769	1.9	2.2	1.0E-15	-9999.0	-9999.0	0.043	0.5	-9999.0	-9999.0
23.819	3.01	3.27	0.18	24.34	5.52	111.4	1.342	0.572	0.770	3.1	3.6	5.0E-08	-9999.0	-9999.0	0.129	0.7	-9999.0	-9999.0
23.884	4.66	4.94	0.24	25.94	4.87	111.4	1.345	0.574	0.771	4.7	5.4	5.0E-08	-9999.0	-9999.0	0.240	1.0	-9999.0	-9999.0
23.950	6.20	6.47	0.27	25.78	4.18	111.4	1.349	0.576	0.773	6.2	7.1	5.0E-08	-9999.0	-9999.0	0.342	1.5	-9999.0	-9999.0
24.015	6.71	6.92	0.31	20.21	4.49	111.4	1.353	0.578	0.774	6.6	7.5	5.0E-08	-9999.0	-9999.0	0.371	1.7	-9999.0	-9999.0
24.081	6.52	6.69	0.32	16.41	4.79	111.4	1.356	0.580	0.776	6.4	7.3	5.0E-08	-9999.0	-9999.0	0.356	1.6	-9999.0	-9999.0
24.147	5.68	5.81	0.35	11.69	6.04	111.4	1.360	0.582	0.778	5.6	6.3	5.0E-08	-9999.0	-9999.0	0.297	1.3	-9999.0	-9999.0
24.212	5.81	5.94	0.41	11.36	6.92	111.4	1.364	0.584	0.779	5.7	6.4	5.0E-08	-9999.0	-9999.0	0.305	1.3	-9999.0	-9999.0
24.278	6.20	6.37	0.40	16.08	6.30	111.4	1.367	0.586	0.781	6.1	6.9	5.0E-08	-9999.0	-9999.0	0.333	1.4	-9999.0	-9999.0
24.344	6.27	6.45	0.40	17.44	6.21	111.4	1.371	0.588	0.782	6.2	7.0	5.0E-08	-9999.0	-9999.0	0.339	1.5	-9999.0	-9999.0
24.409	6.46	6.68	0.40	20.66	6.00	111.4	1.374	0.590	0.784	6.4	7.2	5.0E-08	-9999.0	-9999.0	0.354	1.5	-9999.0	-9999.0
24.475	7.35	7.59	0.40	22.65	5.28	111.4	1.378	0.592	0.786	7.3	8.2	5.0E-08	-9999.0	-9999.0	0.414	1.9	-9999.0	-9999.0
24.540	7.67	7.97	0.42	27.45	5.29	111.4	1.382	0.594	0.787	7.6	8.6	5.0E-08	-9999.0	-9999.0	0.439	2.0	-9999.0	-9999.0
24.606	8.43	8.68	0.44	23.20	5.08	111.4	1.385	0.597	0.789	8.3	9.4	5.0E-08	-9999.0	-9999.0	0.486	2.3	-9999.0	-9999.0
24.672	8.56	8.73	0.49	15.66	5.63	111.4	1.389	0.599	0.791	8.4	9.4	5.0E-08	-9999.0	-9999.0	0.489	2.3	-9999.0	-9999.0
24.737	7.60	7.76	0.51	15.05	6.59	111.4	1.393	0.601	0.792	7.4	8.4	5.0E-08	-9999.0	-9999.0	0.425	1.9	-9999.0	-9999.0
24.803	6.97	7.11	0.53	13.16	7.47	111.4	1.396	0.603	0.794	6.8	7.6	5.0E-08	-9999.0	-9999.0	0.381	1.7	-9999.0	-9999.0
24.868	6.84	6.97	0.55	12.80	7.90	111.4	1.400	0.605	0.795	6.7	7.5	5.0E-08	-9999.0	-9999.0	0.372	1.6	-9999.0	-9999.0
24.934	7.54	7.68	0.54	12.88	7.05	111.4	1.404	0.607	0.797	7.4	8.2	5.0E-08	-9999.0	-9999.0	0.418	1.8	-9999.0	-9999.0
25.000	8.11	8.28	0.54	15.78	6.54	111.4	1.407	0.609	0.799	7.9	8.9	5.0E-08	-9999.0	-9999.0	0.458	2.1	-9999.0	-9999.0
25.065	7.73	7.91	0.51	16.65	6.46	111.4	1.411	0.611	0.800	7.6	8.5	5.0E-08	-9999.0	-9999.0	0.433	1.9	-9999.0	-9999.0
25.131	8.50	8.66	0.49	14.49	5.67	111.4	1.415	0.613	0.802	8.3	9.3	5.0E-08	-9999.0	-9999.0	0.483	2.2	-9999.0	-9999.0
25.197	8.18	8.29	0.48	9.93	5.81	111.4	1.418	0.615	0.803	7.9	8.9	5.0E-08	-9999.0	-9999.0	0.458	2.1	-9999.0	-9999.0
25.262	7.03	7.17	0.48	13.23	6.71	111.4	1.422	0.617	0.805	6.9	7.7	5.0E-08	-9999.0	-9999.0	0.383	1.6	-9999.0	-9999.0
25.328	7.16	7.33	0.49	16.43	6.70	111.4	1.426	0.619	0.807	7.0	7.8	5.0E-08	-9999.0	-9999.0	0.394	1.7	-9999.0	-9999.0
25.393	7.09	7.26	0.49	15.72	6.77	111.4	1.429	0.621	0.808	6.9	7.7	5.0E-08	-9999.0	-9999.0	0.389	1.7	-9999.0	-9999.0
25.459	6.58	6.74	0.46	15.37	6.84	111.4	1.433	0.623	0.810	6.5	7.2	5.0E-08	-9999.0	-9999.0	0.354	1.5	-9999.0	-9999.0
25.525	6.52	6.67	0.45	14.16	6.76	111.4	1.437	0.625	0.811	6.4	7.1	5.0E-08	-9999.0	-9999.0	0.349	1.5	-9999.0	-9999.0
25.590	6.71	6.85	0.43	13.10	6.29	111.4	1.440	0.627	0.813	6.6	7.3	5.0E-08	-9999.0	-9999.0	0.361	1.5	-9999.0	-9999.0
25.656	6.84	6.99	0.43	14.47	6.16	111.4	1.444	0.629	0.815	6.7	7.4	5.0E-08	-9999.0	-9999.0	0.370	1.5	-9999.0	-9999.0
25.721	6.52	6.68	0.47	15.23	7.05	111.4	1.448	0.631	0.816	6.4	7.1	5.0E-08	-9999.0	-9999.0	0.349	1.4	-9999.0	-9999.0
25.787	7.28	7.44	0.51	14.66	6.88	111.4	1.451	0.633	0.818	7.1	7.9	5.0E-08	-9999.0	-9999.0	0.399	1.7	-9999.0	-9999.0
25.853	6.84	6.98	0.51	13.08	7.33	111.4	1.455	0.635	0.819	6.7	7.4	5.0E-08	-9999.0	-9999.0	0.368	1.5	-9999.0	-9999.0
25.918	6.58	6.70	0.48	11.93	7.18	111.4	1.459	0.638	0.821	6.4	7.1	5.0E-08	-9999.0	-9999.0	0.350	1.4	-9999.0	-9999.0
25.984	6.20	6.31	0.45	10.57	7.15	111.4	1.462	0.640	0.823	6.0	6.7	5.0E-08	-9999.0	-9999.0	0.323	1.3	-9999.0	-9999.0
26.050	6.97	7.12	0.47	13.73	6.62	111.4	1.466	0.642	0.824	6.8	7.5	5.0E-08	-9999.0	-9999.0	0.377	1.6	-9999.0	-9999.0
26.115	7.22	7.41	0.48	17.90	6.49	111.4	1.470	0.644	0.826	7.1	7.8	5.0E-08	-9999.0	-9999.0	0.396	1.7	-9999.0	-9999.0
26.181	6.65	6.87	0.45	20.64	6.57	111.4	1.473	0.646	0.827	6.6	7.2	5.0E-08	-9999.0	-9999.0	0.360	1.5	-9999.0	-9999.0
26.246	6.52	6.72	0.44	19.03	6.56	111.4	1.477	0.648	0.829	6.4	7.1	5.0E-08	-9999.0	-9999.0	0.350	1.4	-9999.0	-9999.0
26.312	6.90	7.07	0.45	16.08	6.38	111.4	1.480	0.650	0.831	6.8	7.4	5.0E-08	-9999.0	-9999.0	0.373	1.5	-9999.0	-9999.0
26.378	7.03	7.20	0.45	15.62	6.27	111.4	1.484	0.652	0.832	6.9	7.6	5.0E-08	-9999.0	-9999.0	0.381	1.6	-9999.0	-9999.0
26.443	7.35	7.54	0.49	17.60	6.52	111.4	1.488	0.654	0.834	7.2	7.9	5.0E-08	-9999.0	-9999.0	0.403	1.7	-9999.0	-9999.0
26.509	7.79	7.93	0.53	13.45	6.70	111.4	1.491	0.656	0.835	7.6	8.3	5.0E-08	-9999.0	-9999.0	0.430	1.8	-9999.0	-9999.0
26.574	7.22	7.35	0.54	11.85	7.37	111.4	1.495	0.658	0.837	7.0	7.7	5.0E-08	-9999.0	-9999.0	0.390	1.6	-9999.0	-9999.0
26.640	7.41	7.52	0.55	10.77	7.33	111.4	1.499	0.660	0.839	7.2	7.9	5.0E-08	-9999.0	-9999.0	0.402	1.7	-9999.0	-9999.0
26.706	7.09	7.16	0.56	6.34	7.84	111.4	1.502	0.662	0.840	6.9	7.5	5.0E-08	-9999.0	-9999.0	0.377	1.5	-9999.0	-9999.0
26.771	6.90	6.96	0.55	6.05	7.92	111.4	1.506	0.664	0.842	6.7	7.3	5.0E-08	-9999.0	-9999.0	0.364	1.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
26.837	6.65	6.72	0.51	7.03	7.61	111.4	1.510	0.666	0.844	6.4	7.0	5.0E-08	-9999.0	-9999.0	0.347	1.4	-9999.0	-9999.0
26.903	6.97	7.05	0.49	7.87	6.97	111.4	1.513	0.668	0.845	6.8	7.3	5.0E-08	-9999.0	-9999.0	0.369	1.5	-9999.0	-9999.0
26.968	6.90	6.99	0.44	8.18	6.31	111.4	1.517	0.670	0.847	6.7	7.3	5.0E-08	-9999.0	-9999.0	0.365	1.5	-9999.0	-9999.0
27.034	6.27	6.35	0.42	7.74	6.63	111.4	1.521	0.672	0.848	6.1	6.6	5.0E-08	-9999.0	-9999.0	0.322	1.3	-9999.0	-9999.0
27.099	6.71	6.80	0.43	8.77	6.34	111.4	1.524	0.674	0.850	6.5	7.1	5.0E-08	-9999.0	-9999.0	0.352	1.4	-9999.0	-9999.0
27.165	6.20	6.29	0.43	9.16	6.85	111.4	1.528	0.676	0.852	6.0	6.5	5.0E-08	-9999.0	-9999.0	0.318	1.2	-9999.0	-9999.0
27.231	6.39	6.48	0.44	8.40	6.81	111.4	1.532	0.678	0.853	6.2	6.7	5.0E-08	-9999.0	-9999.0	0.330	1.3	-9999.0	-9999.0
27.296	5.62	5.71	0.44	7.58	7.73	111.4	1.535	0.681	0.855	5.5	5.9	5.0E-08	-9999.0	-9999.0	0.278	1.1	-9999.0	-9999.0
27.362	5.62	5.69	0.46	5.69	8.11	82.7	1.538	0.683	0.856	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
27.427	6.58	6.64	0.46	6.24	6.94	111.4	1.542	0.685	0.857	6.4	6.9	5.0E-08	-9999.0	-9999.0	0.340	1.3	-9999.0	-9999.0
27.493	6.20	6.30	0.49	10.06	7.79	111.4	1.545	0.687	0.859	6.0	6.5	5.0E-08	-9999.0	-9999.0	0.317	1.2	-9999.0	-9999.0
27.559	6.33	6.43	0.50	10.01	7.79	111.4	1.549	0.689	0.860	6.2	6.6	5.0E-08	-9999.0	-9999.0	0.326	1.3	-9999.0	-9999.0
27.624	7.22	7.32	0.55	9.38	7.53	111.4	1.553	0.691	0.862	7.0	7.6	5.0E-08	-9999.0	-9999.0	0.384	1.5	-9999.0	-9999.0
27.690	7.48	7.51	0.61	3.06	8.14	82.7	1.556	0.693	0.863	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
27.756	9.39	9.39	0.65	-0.49	6.94	111.4	1.559	0.695	0.864	9.0	9.7	5.0E-08	-9999.0	-9999.0	0.522	2.2	-9999.0	-9999.0
27.821	10.42	10.40	0.73	-0.96	7.03	111.4	1.563	0.697	0.866	10.0	10.7	5.0E-08	-9999.0	-9999.0	0.589	2.6	-9999.0	-9999.0
27.887	10.42	10.39	0.82	-1.96	7.91	111.4	1.566	0.699	0.867	10.0	10.7	5.0E-08	-9999.0	-9999.0	0.589	2.6	-9999.0	-9999.0
27.952	10.03	10.00	0.87	-2.82	8.72	82.7	1.569	0.701	0.868	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
28.018	9.64	9.61	0.88	-3.46	9.18	82.7	1.572	0.703	0.869	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
28.084	10.28	10.24	0.88	-4.13	8.61	82.7	1.575	0.705	0.870	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
28.149	9.20	9.16	0.67	-4.31	7.34	111.4	1.578	0.707	0.871	8.8	9.4	5.0E-08	-9999.0	-9999.0	0.505	2.1	-9999.0	-9999.0
28.215	9.52	9.48	0.65	-3.64	6.87	111.4	1.582	0.709	0.873	9.1	9.7	5.0E-08	-9999.0	-9999.0	0.527	2.2	-9999.0	-9999.0
28.280	9.90	9.87	0.66	-3.36	6.70	111.4	1.585	0.711	0.874	9.4	10.1	5.0E-08	-9999.0	-9999.0	0.552	2.4	-9999.0	-9999.0
28.346	9.20	9.16	0.65	-3.58	7.11	111.4	1.589	0.713	0.876	8.8	9.4	5.0E-08	-9999.0	-9999.0	0.505	2.1	-9999.0	-9999.0
28.412	9.52	9.50	0.65	-1.94	6.86	111.4	1.593	0.715	0.877	9.1	9.7	5.0E-08	-9999.0	-9999.0	0.527	2.2	-9999.0	-9999.0
28.477	8.05	8.07	0.67	2.19	8.32	82.7	1.596	0.717	0.878	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
28.543	7.54	7.56	0.68	1.94	9.02	82.7	1.599	0.719	0.879	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
28.609	7.79	7.81	0.68	2.31	8.72	82.7	1.601	0.722	0.880	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
28.674	6.71	6.70	0.67	-0.47	10.02	82.7	1.604	0.724	0.880	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
28.740	6.27	6.25	0.68	-1.00	10.90	82.7	1.607	0.726	0.881	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
28.805	6.78	6.73	0.68	-4.27	10.13	82.7	1.609	0.728	0.882	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
28.871	7.28	7.25	0.68	-2.47	9.40	82.7	1.612	0.730	0.882	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
28.937	7.03	7.01	0.68	-1.68	9.73	82.7	1.615	0.732	0.883	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.002	7.03	6.99	0.67	-3.00	9.60	82.7	1.618	0.734	0.884	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.068	7.03	7.02	0.68	-0.63	9.71	82.7	1.620	0.736	0.884	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.134	7.67	7.67	0.69	0.47	9.01	82.7	1.623	0.738	0.885	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.199	8.50	8.48	0.69	-2.37	8.16	82.7	1.626	0.740	0.886	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.265	10.42	10.41	0.66	-0.87	6.36	111.4	1.629	0.742	0.887	10.0	10.6	5.0E-08	-9999.0	-9999.0	0.585	2.5	-9999.0	-9999.0
29.330	9.90	9.88	0.67	-2.35	6.80	111.4	1.633	0.744	0.889	9.5	10.0	5.0E-08	-9999.0	-9999.0	0.550	2.3	-9999.0	-9999.0
29.396	10.09	10.11	0.72	1.06	7.14	111.4	1.636	0.746	0.890	9.7	10.3	5.0E-08	-9999.0	-9999.0	0.565	2.4	-9999.0	-9999.0
29.462	10.15	10.17	0.74	1.25	7.30	111.4	1.640	0.748	0.892	9.7	10.3	5.0E-08	-9999.0	-9999.0	0.569	2.4	-9999.0	-9999.0
29.527	10.28	10.30	0.74	1.64	7.20	111.4	1.644	0.750	0.893	9.9	10.4	5.0E-08	-9999.0	-9999.0	0.577	2.4	-9999.0	-9999.0
29.593	10.74	10.73	0.75	-0.71	7.01	111.4	1.647	0.752	0.895	10.3	10.9	5.0E-08	-9999.0	-9999.0	0.605	2.6	-9999.0	-9999.0
29.658	10.42	10.44	0.76	1.88	7.30	111.4	1.651	0.754	0.897	10.0	10.6	5.0E-08	-9999.0	-9999.0	0.586	2.5	-9999.0	-9999.0
29.724	10.54	10.58	0.76	4.35	7.20	111.4	1.655	0.756	0.898	10.1	10.7	5.0E-08	-9999.0	-9999.0	0.595	2.5	-9999.0	-9999.0
29.790	10.54	10.60	0.73	6.07	6.90	111.4	1.658	0.758	0.900	10.2	10.7	5.0E-08	-9999.0	-9999.0	0.596	2.5	-9999.0	-9999.0
29.855	10.74	10.80	0.71	6.07	6.59	111.4	1.662	0.760	0.901	10.3	10.9	5.0E-08	-9999.0	-9999.0	0.609	2.6	-9999.0	-9999.0
29.921	10.80	10.89	0.69	9.12	6.35	111.4	1.665	0.762	0.903	10.4	11.0	5.0E-08	-9999.0	-9999.0	0.615	2.6	-9999.0	-9999.0
29.987	11.05	11.19	0.69	13.45	6.18	111.4	1.669	0.765	0.905	10.7	11.3	5.0E-08	-9999.0	-9999.0	0.635	2.7	-9999.0	-9999.0
30.052	11.63	11.76	0.71	12.33	6.05	111.4	1.673	0.767	0.906	11.3	11.8	5.0E-08	-9999.0	-9999.0	0.673	2.9	-9999.0	-9999.0
30.118	11.12	11.22	0.72	9.54	6.43	111.4	1.676	0.769	0.908	10.7	11.3	5.0E-08	-9999.0	-9999.0	0.636	2.7	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
30.183	10.93	11.05	0.72	11.30	6.53	111.4	1.680	0.771	0.909	10.6	11.1	5.0E-08	-9999.0	-9999.0	0.625	2.6	-9999.0	-9999.0
30.249	10.80	10.93	0.78	12.12	7.16	111.4	1.684	0.773	0.911	10.5	11.0	5.0E-08	-9999.0	-9999.0	0.616	2.6	-9999.0	-9999.0
30.315	11.50	11.64	0.83	13.25	7.15	111.4	1.687	0.775	0.913	11.1	11.7	5.0E-08	-9999.0	-9999.0	0.664	2.9	-9999.0	-9999.0
30.380	12.71	12.88	0.88	15.60	6.85	111.4	1.691	0.777	0.914	12.3	12.9	5.0E-08	-9999.0	-9999.0	0.746	3.4	-9999.0	-9999.0
30.446	15.14	15.30	0.88	15.47	5.76	111.4	1.695	0.779	0.916	14.7	15.3	5.0E-08	-9999.0	-9999.0	0.907	4.5	-9999.0	-9999.0
30.511	17.50	17.63	0.92	12.26	5.23	111.4	1.698	0.781	0.917	16.9	17.6	5.0E-08	-9999.0	-9999.0	1.062	5.7	-9999.0	-9999.0
30.577	16.29	16.39	1.05	9.42	6.42	111.4	1.702	0.783	0.919	15.7	16.4	5.0E-08	-9999.0	-9999.0	0.979	5.0	-9999.0	-9999.0
30.643	16.99	17.05	1.16	5.53	6.82	111.4	1.706	0.785	0.921	16.3	17.0	5.0E-08	-9999.0	-9999.0	1.023	5.3	-9999.0	-9999.0
30.708	18.20	18.31	1.27	9.81	6.95	111.4	1.709	0.787	0.922	17.5	18.3	5.0E-08	-9999.0	-9999.0	1.107	6.0	-9999.0	-9999.0
30.774	19.49	19.61	1.37	11.61	7.00	111.4	1.713	0.789	0.924	18.8	19.5	5.0E-08	-9999.0	-9999.0	1.193	6.7	-9999.0	-9999.0
30.840	20.44	20.50	1.42	5.45	6.94	111.4	1.717	0.791	0.925	19.6	20.4	5.0E-08	-9999.0	-9999.0	1.252	7.2	-9999.0	-9999.0
30.905	22.10	22.11	1.50	0.87	6.80	111.4	1.720	0.793	0.927	21.2	22.0	5.0E-08	-9999.0	-9999.0	1.360	8.2	-9999.0	-9999.0
30.971	25.04	25.02	1.55	-1.74	6.21	111.4	1.724	0.795	0.929	24.0	24.9	5.0E-08	-9999.0	-9999.0	1.553	10.0	-9999.0	-9999.0
31.036	24.59	24.55	1.59	-4.03	6.49	111.4	1.728	0.797	0.930	23.5	24.4	5.0E-08	-9999.0	-9999.0	1.521	9.8	-9999.0	-9999.0
31.102	24.28	24.29	1.64	0.90	6.77	111.4	1.731	0.799	0.932	23.3	24.1	5.0E-08	-9999.0	-9999.0	1.504	9.6	-9999.0	-9999.0
31.168	23.51	23.56	1.69	5.25	7.19	111.4	1.735	0.801	0.934	22.6	23.4	5.0E-08	-9999.0	-9999.0	1.455	9.1	-9999.0	-9999.0
31.233	22.81	22.83	1.73	1.90	7.60	111.4	1.739	0.803	0.935	21.9	22.6	5.0E-08	-9999.0	-9999.0	1.406	8.6	-9999.0	-9999.0
31.299	20.57	20.54	1.74	-3.08	8.49	82.7	1.742	0.806	0.936	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
31.364	21.33	21.31	1.71	-1.58	8.04	82.7	1.744	0.808	0.937	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
31.430	22.68	22.74	1.55	5.65	6.83	111.4	1.748	0.810	0.938	21.8	22.5	5.0E-08	-9999.0	-9999.0	1.399	8.5	-9999.0	-9999.0
31.496	23.19	23.28	1.57	8.97	6.76	111.4	1.751	0.812	0.940	22.3	23.0	5.0E-08	-9999.0	-9999.0	1.435	8.8	-9999.0	-9999.0
31.561	24.21	24.24	1.60	3.08	6.62	111.4	1.755	0.814	0.941	23.2	23.9	5.0E-08	-9999.0	-9999.0	1.499	9.4	-9999.0	-9999.0
31.627	23.32	23.38	1.64	5.53	7.03	111.4	1.759	0.816	0.943	22.4	23.1	5.0E-08	-9999.0	-9999.0	1.441	8.8	-9999.0	-9999.0
31.693	24.02	24.06	1.70	4.03	7.08	111.4	1.762	0.818	0.944	23.0	23.7	5.0E-08	-9999.0	-9999.0	1.487	9.2	-9999.0	-9999.0
31.758	24.98	25.05	1.73	6.36	6.92	111.4	1.766	0.820	0.946	24.0	24.7	5.0E-08	-9999.0	-9999.0	1.552	9.8	-9999.0	-9999.0
31.824	25.10	25.13	1.68	3.10	6.70	111.4	1.770	0.822	0.948	24.1	24.7	5.0E-08	-9999.0	-9999.0	1.558	9.9	-9999.0	-9999.0
31.889	24.66	24.71	1.67	4.74	6.77	111.4	1.773	0.824	0.949	23.7	24.3	5.0E-08	-9999.0	-9999.0	1.529	9.5	-9999.0	-9999.0
31.955	24.59	24.67	1.66	7.01	6.75	111.4	1.777	0.826	0.951	23.6	24.2	5.0E-08	-9999.0	-9999.0	1.526	9.5	-9999.0	-9999.0
32.021	24.98	25.10	1.62	10.71	6.47	111.4	1.781	0.828	0.953	24.0	24.6	5.0E-08	-9999.0	-9999.0	1.554	9.7	-9999.0	-9999.0
32.086	24.98	25.14	1.61	14.78	6.42	111.4	1.784	0.830	0.954	24.1	24.7	5.0E-08	-9999.0	-9999.0	1.557	9.7	-9999.0	-9999.0
32.152	25.68	25.81	1.65	11.85	6.41	111.4	1.788	0.832	0.956	24.7	25.3	5.0E-08	-9999.0	-9999.0	1.601	10.0	-9999.0	-9999.0
32.217	26.70	26.84	1.66	12.96	6.20	111.4	1.792	0.834	0.957	25.7	26.3	5.0E-08	-9999.0	-9999.0	1.670	10.0	-9999.0	-9999.0
32.283	27.66	27.75	1.64	8.97	5.92	111.4	1.795	0.836	0.959	26.6	27.1	5.0E-08	-9999.0	-9999.0	1.731	10.0	-9999.0	-9999.0
32.349	28.36	28.39	1.63	3.14	5.75	111.4	1.799	0.838	0.961	27.2	27.7	5.0E-08	-9999.0	-9999.0	1.773	10.0	-9999.0	-9999.0
32.414	28.81	28.83	1.66	1.68	5.77	111.4	1.802	0.840	0.962	27.6	28.1	5.0E-08	-9999.0	-9999.0	1.802	10.0	-9999.0	-9999.0
32.480	29.51	29.64	1.71	11.57	5.78	111.4	1.806	0.842	0.964	28.4	28.9	5.0E-08	-9999.0	-9999.0	1.855	10.0	-9999.0	-9999.0
32.546	29.89	30.08	1.75	17.05	5.83	111.4	1.810	0.844	0.965	28.8	29.3	5.0E-08	-9999.0	-9999.0	1.884	10.0	-9999.0	-9999.0
32.611	29.38	29.59	1.79	18.99	6.06	111.4	1.813	0.846	0.967	28.3	28.8	5.0E-08	-9999.0	-9999.0	1.852	10.0	-9999.0	-9999.0
32.677	28.87	29.02	1.78	13.57	6.15	111.4	1.817	0.849	0.969	27.8	28.2	5.0E-08	-9999.0	-9999.0	1.813	10.0	-9999.0	-9999.0
32.742	28.62	28.82	1.81	18.86	6.29	111.4	1.821	0.851	0.970	27.6	28.0	5.0E-08	-9999.0	-9999.0	1.800	10.0	-9999.0	-9999.0
32.808	28.75	28.95	1.81	18.39	6.27	111.4	1.824	0.853	0.972	27.7	28.1	5.0E-08	-9999.0	-9999.0	1.808	10.0	-9999.0	-9999.0
32.874	30.92	31.07	1.83	14.72	5.90	111.4	1.828	0.855	0.973	29.8	30.2	5.0E-08	-9999.0	-9999.0	1.950	10.0	-9999.0	-9999.0
32.939	30.15	30.35	1.87	18.58	6.18	111.4	1.832	0.857	0.975	29.1	29.4	5.0E-08	-9999.0	-9999.0	1.901	10.0	-9999.0	-9999.0
33.005	30.21	30.39	1.95	16.02	6.43	111.4	1.835	0.859	0.977	29.1	29.4	5.0E-08	-9999.0	-9999.0	1.903	10.0	-9999.0	-9999.0
33.070	30.72	30.89	2.00	15.35	6.49	111.4	1.839	0.861	0.978	29.6	29.9	5.0E-08	-9999.0	-9999.0	1.937	10.0	-9999.0	-9999.0
33.136	30.66	30.84	2.07	16.02	6.70	111.4	1.843	0.863	0.980	29.5	29.8	5.0E-08	-9999.0	-9999.0	1.933	10.0	-9999.0	-9999.0
33.202	32.26	32.45	2.05	17.38	6.33	111.4	1.846	0.865	0.981	31.1	31.4	5.0E-08	-9999.0	-9999.0	2.040	10.0	-9999.0	-9999.0
33.267	31.94	32.13	2.09	17.36	6.49	111.4	1.850	0.867	0.983	30.8	31.0	5.0E-08	-9999.0	-9999.0	2.018	10.0	-9999.0	-9999.0
333	32.52	32.70	2.03	16.65	6.22	111.4	1.854	0.869	0.985	31.3	31.6	5.0E-08	-9999.0	-9999.0	2.056	10.0	-9999.0	-9999.0
399	31.37	31.54	1.98	15.66	6.29	111.4	1.857	0.871	0.986	30.2	30.4	5.0E-08	-9999.0	-9999.0	1.979	10.0	-9999.0	-9999.0
464	30.53	30.74	1.90	19.40	6.20	111.4	1.861	0.873	0.988	29.4	29.6	5.0E-08	-9999.0	-9999.0	1.926	10.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
33.530	29.45	29.70	1.83	23.44	6.18	111.4	1.865	0.875	0.989	28.4	28.6	5.0E-08	-9999.0	-9999.0	1.856	10.0	-9999.0	-9999.0
33.595	27.41	27.73	1.77	30.38	6.40	111.4	1.868	0.877	0.991	26.6	26.7	5.0E-08	-9999.0	-9999.0	1.724	10.0	-9999.0	-9999.0
33.661	26.25	26.62	1.67	33.52	6.29	111.4	1.872	0.879	0.993	25.5	25.6	5.0E-08	-9999.0	-9999.0	1.650	10.0	-9999.0	-9999.0
33.727	26.00	26.50	1.66	45.66	6.28	111.4	1.876	0.881	0.994	25.4	25.5	5.0E-08	-9999.0	-9999.0	1.641	9.9	-9999.0	-9999.0
33.792	26.90	27.34	1.65	41.46	6.05	111.4	1.879	0.883	0.996	26.2	26.2	5.0E-08	-9999.0	-9999.0	1.698	10.0	-9999.0	-9999.0
33.858	27.09	27.54	1.66	41.92	6.04	111.4	1.883	0.885	0.997	26.4	26.4	5.0E-08	-9999.0	-9999.0	1.710	10.0	-9999.0	-9999.0
33.923	28.30	28.68	1.64	35.55	5.73	111.4	1.887	0.887	0.999	27.5	27.5	5.0E-08	-9999.0	-9999.0	1.786	10.0	-9999.0	-9999.0
33.989	27.66	28.03	1.62	34.67	5.79	111.4	1.890	0.890	1.001	26.8	26.8	5.0E-08	-9999.0	-9999.0	1.743	10.0	-9999.0	-9999.0
34.055	28.49	28.87	1.58	35.42	5.49	111.4	1.894	0.892	1.002	27.6	27.6	5.0E-08	-9999.0	-9999.0	1.799	10.0	-9999.0	-9999.0
34.120	27.60	27.98	1.58	35.44	5.66	111.4	1.898	0.894	1.004	26.8	26.7	5.0E-08	-9999.0	-9999.0	1.739	10.0	-9999.0	-9999.0
34.186	27.60	28.03	1.55	40.37	5.54	111.4	1.901	0.896	1.006	26.8	26.8	5.0E-08	-9999.0	-9999.0	1.742	10.0	-9999.0	-9999.0
34.252	26.51	27.03	1.50	48.06	5.56	111.4	1.905	0.898	1.007	25.9	25.8	5.0E-08	-9999.0	-9999.0	1.675	10.0	-9999.0	-9999.0
34.317	26.38	26.95	1.47	52.18	5.47	111.4	1.908	0.900	1.009	25.8	25.7	5.0E-08	-9999.0	-9999.0	1.669	10.0	-9999.0	-9999.0
34.383	25.23	25.78	1.38	50.96	5.37	111.4	1.912	0.902	1.010	24.7	24.6	5.0E-08	-9999.0	-9999.0	1.591	9.2	-9999.0	-9999.0
34.448	25.61	26.21	1.33	55.45	5.09	111.4	1.916	0.904	1.012	25.1	25.0	5.0E-08	-9999.0	-9999.0	1.620	9.5	-9999.0	-9999.0
34.514	25.68	26.23	1.36	50.82	5.20	111.4	1.919	0.906	1.014	25.1	25.0	5.0E-08	-9999.0	-9999.0	1.621	9.4	-9999.0	-9999.0
34.580	25.68	26.13	1.38	41.40	5.29	111.4	1.923	0.908	1.015	25.0	24.8	5.0E-08	-9999.0	-9999.0	1.614	9.3	-9999.0	-9999.0
34.645	26.51	27.05	1.37	49.28	5.08	111.4	1.927	0.910	1.017	25.9	25.7	5.0E-08	-9999.0	-9999.0	1.675	9.9	-9999.0	-9999.0
34.711	26.76	27.26	1.38	45.85	5.07	111.4	1.930	0.912	1.018	26.1	25.9	5.0E-08	-9999.0	-9999.0	1.689	10.0	-9999.0	-9999.0
34.776	26.38	26.82	1.22	40.39	4.56	114.6	1.934	0.914	1.020	17.1	17.0	5.0E-07	-9999.0	-9999.0	1.659	9.7	-9999.0	-9999.0
34.842	24.98	25.54	1.24	51.59	4.87	111.4	1.938	0.916	1.022	24.5	24.2	5.0E-08	-9999.0	-9999.0	1.573	8.9	-9999.0	-9999.0
34.908	25.81	26.49	1.26	62.38	4.77	111.4	1.941	0.918	1.023	25.4	25.1	5.0E-08	-9999.0	-9999.0	1.636	9.4	-9999.0	-9999.0
34.973	25.30	26.06	1.30	70.04	5.00	111.4	1.945	0.920	1.025	25.0	24.7	5.0E-08	-9999.0	-9999.0	1.608	9.2	-9999.0	-9999.0
35.039	25.23	25.95	1.29	66.53	4.98	111.4	1.949	0.922	1.026	24.9	24.5	5.0E-08	-9999.0	-9999.0	1.600	9.1	-9999.0	-9999.0
35.105	24.21	25.02	1.30	74.86	5.21	111.4	1.952	0.924	1.028	24.0	23.6	5.0E-08	-9999.0	-9999.0	1.538	8.5	-9999.0	-9999.0
35.170	25.10	25.83	1.30	67.84	5.04	111.4	1.956	0.926	1.030	24.7	24.4	5.0E-08	-9999.0	-9999.0	1.592	8.9	-9999.0	-9999.0
35.236	24.02	24.69	1.29	61.77	5.24	111.4	1.960	0.928	1.031	23.6	23.3	5.0E-08	-9999.0	-9999.0	1.515	8.3	-9999.0	-9999.0
35.301	23.07	23.71	1.28	59.67	5.41	111.4	1.963	0.930	1.033	22.7	22.3	5.0E-08	-9999.0	-9999.0	1.450	7.7	-9999.0	-9999.0
35.367	23.38	24.02	1.35	59.22	5.63	111.4	1.967	0.933	1.035	23.0	22.6	5.0E-08	-9999.0	-9999.0	1.470	7.8	-9999.0	-9999.0
35.433	24.15	24.76	1.36	56.33	5.51	111.4	1.971	0.935	1.036	23.7	23.3	5.0E-08	-9999.0	-9999.0	1.519	8.2	-9999.0	-9999.0
35.498	25.49	26.14	1.28	60.20	4.91	111.4	1.974	0.937	1.038	25.0	24.6	5.0E-08	-9999.0	-9999.0	1.611	9.0	-9999.0	-9999.0
35.564	26.57	27.12	1.30	50.84	4.80	111.4	1.978	0.939	1.039	26.0	25.5	5.0E-08	-9999.0	-9999.0	1.676	9.6	-9999.0	-9999.0
35.629	26.38	26.89	1.37	46.48	5.11	111.4	1.982	0.941	1.041	25.7	25.2	5.0E-08	-9999.0	-9999.0	1.660	9.4	-9999.0	-9999.0
35.695	24.34	24.88	1.42	49.71	5.72	111.4	1.985	0.943	1.043	23.8	23.3	5.0E-08	-9999.0	-9999.0	1.526	8.2	-9999.0	-9999.0
35.761	24.40	24.98	1.46	54.22	5.86	111.4	1.989	0.945	1.044	23.9	23.4	5.0E-08	-9999.0	-9999.0	1.533	8.2	-9999.0	-9999.0
35.826	24.28	24.73	1.44	41.72	5.84	111.4	1.993	0.947	1.046	23.7	23.2	5.0E-08	-9999.0	-9999.0	1.516	8.1	-9999.0	-9999.0
35.892	24.28	24.76	1.38	44.19	5.59	111.4	1.996	0.949	1.047	23.7	23.2	5.0E-08	-9999.0	-9999.0	1.517	8.1	-9999.0	-9999.0
35.958	23.96	24.35	1.34	36.54	5.52	111.4	2.000	0.951	1.049	23.3	22.8	5.0E-08	-9999.0	-9999.0	1.490	7.8	-9999.0	-9999.0
36.023	21.72	22.17	1.34	41.48	6.06	111.4	2.004	0.953	1.051	21.2	20.7	5.0E-08	-9999.0	-9999.0	1.344	6.6	-9999.0	-9999.0
36.089	21.53	22.08	1.30	51.02	5.90	111.4	2.007	0.955	1.052	21.1	20.6	5.0E-08	-9999.0	-9999.0	1.338	6.6	-9999.0	-9999.0
36.154	20.57	21.19	1.27	57.74	6.01	111.4	2.011	0.957	1.054	20.3	19.8	5.0E-08	-9999.0	-9999.0	1.279	6.1	-9999.0	-9999.0
36.220	21.33	21.93	1.22	55.13	5.58	111.4	2.015	0.959	1.055	21.0	20.4	5.0E-08	-9999.0	-9999.0	1.328	6.5	-9999.0	-9999.0
36.286	20.63	21.26	1.14	58.72	5.37	111.4	2.018	0.961	1.057	20.4	19.8	5.0E-08	-9999.0	-9999.0	1.283	6.1	-9999.0	-9999.0
36.351	19.81	20.45	1.07	59.71	5.24	111.4	2.022	0.963	1.059	19.6	19.0	5.0E-08	-9999.0	-9999.0	1.229	5.7	-9999.0	-9999.0
36.417	20.57	21.20	1.05	58.44	4.96	111.4	2.026	0.965	1.060	20.3	19.7	5.0E-08	-9999.0	-9999.0	1.278	6.1	-9999.0	-9999.0
36.482	20.89	21.63	1.07	68.80	4.96	111.4	2.029	0.967	1.062	20.7	20.1	5.0E-08	-9999.0	-9999.0	1.307	6.3	-9999.0	-9999.0
36.548	19.81	20.56	1.11	69.88	5.41	111.4	2.033	0.969	1.063	19.7	19.1	5.0E-08	-9999.0	-9999.0	1.235	5.7	-9999.0	-9999.0
36.614	19.55	20.17	1.16	57.70	5.76	111.4	2.036	0.971	1.065	19.3	18.7	5.0E-08	-9999.0	-9999.0	1.209	5.5	-9999.0	-9999.0
36.679	19.49	20.02	1.19	49.06	5.96	111.4	2.040	0.974	1.067	19.2	18.6	5.0E-08	-9999.0	-9999.0	1.198	5.4	-9999.0	-9999.0
36.745	19.61	19.99	1.18	35.30	5.92	111.4	2.044	0.976	1.068	19.1	18.5	5.0E-08	-9999.0	-9999.0	1.196	5.4	-9999.0	-9999.0
36.811	18.85	19.19	1.22	32.21	6.37	111.4	2.047	0.978	1.070	18.4	17.8	5.0E-08	-9999.0	-9999.0	1.143	5.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
36.876	17.18	17.48	1.20	27.81	6.88	111.4	2.051	0.980	1.071	16.7	16.2	5.0E-08	-9999.0	-9999.0	1.029	4.3	-9999.0	-9999.0
36.942	16.48	16.89	1.09	37.79	6.47	111.4	2.055	0.982	1.073	16.2	15.6	5.0E-08	-9999.0	-9999.0	0.989	4.0	-9999.0	-9999.0
37.007	16.74	17.04	1.01	28.01	5.94	111.4	2.058	0.984	1.075	16.3	15.7	5.0E-08	-9999.0	-9999.0	0.999	4.1	-9999.0	-9999.0
37.073	15.78	16.15	1.02	34.54	6.33	111.4	2.062	0.986	1.076	15.5	14.9	5.0E-08	-9999.0	-9999.0	0.939	3.7	-9999.0	-9999.0
37.139	15.59	16.05	1.04	42.53	6.50	111.4	2.066	0.988	1.078	15.4	14.8	5.0E-08	-9999.0	-9999.0	0.932	3.7	-9999.0	-9999.0
37.204	17.31	17.91	1.10	54.99	6.16	111.4	2.069	0.990	1.079	17.1	16.5	5.0E-08	-9999.0	-9999.0	1.056	4.4	-9999.0	-9999.0
37.270	17.69	18.21	1.09	47.72	6.00	111.4	2.073	0.992	1.081	17.4	16.8	5.0E-08	-9999.0	-9999.0	1.076	4.5	-9999.0	-9999.0
37.336	17.05	17.35	1.06	27.22	6.13	111.4	2.077	0.994	1.083	16.6	16.0	5.0E-08	-9999.0	-9999.0	1.018	4.2	-9999.0	-9999.0
37.401	17.25	17.62	1.00	33.89	5.69	111.4	2.080	0.996	1.084	16.9	16.2	5.0E-08	-9999.0	-9999.0	1.036	4.3	-9999.0	-9999.0
37.467	16.16	16.53	0.89	33.93	5.40	111.4	2.084	0.998	1.086	15.8	15.2	5.0E-08	-9999.0	-9999.0	0.963	3.8	-9999.0	-9999.0
37.532	14.70	15.20	0.82	47.03	5.41	111.4	2.088	1.000	1.088	14.6	14.0	5.0E-08	-9999.0	-9999.0	0.874	3.3	-9999.0	-9999.0
37.598	14.30	14.90	0.73	54.67	4.91	111.4	2.091	1.002	1.089	14.3	13.7	5.0E-08	-9999.0	-9999.0	0.854	3.2	-9999.0	-9999.0
37.664	12.84	13.49	0.66	60.15	4.90	111.4	2.095	1.004	1.091	12.9	12.4	5.0E-08	-9999.0	-9999.0	0.760	2.7	-9999.0	-9999.0
37.729	12.14	12.85	0.56	65.92	4.37	111.4	2.099	1.006	1.092	12.3	11.8	5.0E-08	-9999.0	-9999.0	0.717	2.5	-9999.0	-9999.0
37.795	12.39	13.12	0.48	67.67	3.67	114.6	2.102	1.008	1.094	8.4	8.0	5.0E-07	-9999.0	-9999.0	0.735	2.6	-9999.0	-9999.0
37.860	12.27	13.06	0.44	73.05	3.38	114.6	2.106	1.010	1.096	8.3	8.0	5.0E-07	-9999.0	-9999.0	0.730	2.5	-9999.0	-9999.0
37.926	11.76	12.56	0.46	74.60	3.67	114.6	2.110	1.012	1.097	8.0	7.7	5.0E-07	-9999.0	-9999.0	0.697	2.4	-9999.0	-9999.0
37.992	11.95	12.75	0.34	74.52	2.67	114.6	2.114	1.014	1.099	6.1	5.8	5.0E-06	-9999.0	-9999.0	0.709	2.4	-9999.0	-9999.0
38.057	12.33	13.12	0.35	73.24	2.67	114.6	2.117	1.017	1.101	6.3	6.0	5.0E-06	-9999.0	-9999.0	0.734	2.5	-9999.0	-9999.0
38.123	12.33	13.13	0.34	74.15	2.60	114.6	2.121	1.019	1.103	6.3	6.0	5.0E-06	-9999.0	-9999.0	0.734	2.5	-9999.0	-9999.0
38.189	12.01	12.87	0.39	79.56	3.04	114.6	2.125	1.021	1.104	8.2	7.8	5.0E-07	-9999.0	-9999.0	0.716	2.4	-9999.0	-9999.0
38.254	13.92	14.84	0.50	84.70	3.38	114.6	2.129	1.023	1.106	9.5	9.0	5.0E-07	-9999.0	-9999.0	0.847	3.1	-9999.0	-9999.0
38.320	14.37	15.20	0.54	76.79	3.56	114.6	2.132	1.025	1.108	9.7	9.2	5.0E-07	-9999.0	-9999.0	0.871	3.2	-9999.0	-9999.0
38.385	13.73	14.43	0.54	64.94	3.75	114.6	2.136	1.027	1.109	9.2	8.8	5.0E-07	-9999.0	-9999.0	0.820	2.9	-9999.0	-9999.0
38.451	13.16	13.66	0.52	46.18	3.82	114.6	2.140	1.029	1.111	8.7	8.3	5.0E-07	-9999.0	-9999.0	0.768	2.7	-9999.0	-9999.0
38.517	11.31	11.83	0.47	48.42	3.98	111.4	2.144	1.031	1.113	11.3	10.7	5.0E-08	-9999.0	-9999.0	0.646	2.1	-9999.0	-9999.0
38.582	10.35	11.01	0.39	61.25	3.55	114.6	2.147	1.033	1.114	7.0	6.7	5.0E-07	-9999.0	-9999.0	0.591	1.9	-9999.0	-9999.0
38.648	10.67	11.44	0.39	71.31	3.42	114.6	2.151	1.035	1.116	7.3	6.9	5.0E-07	-9999.0	-9999.0	0.619	2.0	-9999.0	-9999.0
38.713	10.67	11.54	0.36	81.30	3.13	114.6	2.155	1.037	1.118	7.4	7.0	5.0E-07	-9999.0	-9999.0	0.626	2.0	-9999.0	-9999.0
38.779	10.54	11.52	0.34	91.28	2.96	114.6	2.159	1.039	1.120	7.4	7.0	5.0E-07	-9999.0	-9999.0	0.624	2.0	-9999.0	-9999.0
38.845	10.61	11.52	0.29	84.70	2.52	114.6	2.162	1.041	1.121	5.5	5.2	5.0E-06	-9999.0	-9999.0	0.624	2.0	-9999.0	-9999.0
38.910	10.48	11.27	0.25	73.64	2.22	114.6	2.166	1.043	1.123	5.4	5.1	5.0E-06	-9999.0	-9999.0	0.607	1.9	-9999.0	-9999.0
38.976	10.61	11.41	0.25	74.28	2.20	114.6	2.170	1.045	1.125	5.5	5.2	5.0E-06	-9999.0	-9999.0	0.616	2.0	-9999.0	-9999.0
39.042	9.96	10.85	0.25	81.95	2.31	114.6	2.174	1.047	1.126	5.2	4.9	5.0E-06	-9999.0	-9999.0	0.578	1.8	-9999.0	-9999.0
39.107	10.54	11.50	0.27	89.12	2.35	114.6	2.177	1.049	1.128	5.5	5.2	5.0E-06	-9999.0	-9999.0	0.621	2.0	-9999.0	-9999.0
39.173	13.16	14.10	0.24	86.61	1.71	114.6	2.181	1.051	1.130	6.8	6.4	5.0E-06	-9999.0	-9999.0	0.794	2.7	-9999.0	-9999.0
39.238	13.48	14.29	0.24	74.88	1.68	114.6	2.185	1.053	1.132	6.8	6.4	5.0E-06	-9999.0	-9999.0	0.807	2.8	-9999.0	-9999.0
39.304	13.73	14.51	0.21	72.17	1.45	114.6	2.189	1.055	1.133	5.6	5.2	5.0E-05	30.0	30.0	0.822	2.8	-9999.0	-9999.0
39.370	13.48	14.32	0.18	77.84	1.26	114.6	2.192	1.058	1.135	5.5	5.2	5.0E-05	30.0	30.0	0.809	2.8	-9999.0	-9999.0
39.435	13.92	14.78	0.18	79.53	1.22	114.6	2.196	1.060	1.137	5.7	5.3	5.0E-05	30.0	30.0	0.839	2.9	-9999.0	-9999.0
39.501	13.09	13.93	0.20	77.43	1.44	114.6	2.200	1.062	1.138	5.3	5.0	5.0E-05	30.0	30.0	0.782	2.6	-9999.0	-9999.0
39.566	12.20	13.00	0.18	74.34	1.39	114.6	2.204	1.064	1.140	5.0	4.7	5.0E-05	30.0	30.0	0.720	2.4	-9999.0	-9999.0
39.632	10.03	10.79	0.16	69.62	1.49	114.6	2.207	1.066	1.142	5.2	4.8	5.0E-06	-9999.0	-9999.0	0.572	1.7	-9999.0	-9999.0
39.698	9.01	9.77	0.17	69.78	1.75	114.6	2.211	1.068	1.143	4.7	4.4	5.0E-06	-9999.0	-9999.0	0.504	1.5	-9999.0	-9999.0
39.763	7.41	8.19	0.12	72.41	1.47	114.6	2.215	1.070	1.145	3.9	3.7	5.0E-06	-9999.0	-9999.0	0.398	1.2	-9999.0	-9999.0
39.829	7.09	7.93	0.11	78.36	1.39	114.6	2.219	1.072	1.147	3.8	3.5	5.0E-06	-9999.0	-9999.0	0.381	1.1	-9999.0	-9999.0
39.895	6.20	7.12	0.17	85.21	2.39	114.6	2.223	1.074	1.149	4.5	4.2	5.0E-07	-9999.0	-9999.0	0.326	1.0	-9999.0	-9999.0
39.960	7.67	8.68	0.22	93.19	2.54	114.6	2.226	1.076	1.150	5.5	5.2	5.0E-07	-9999.0	-9999.0	0.430	1.2	-9999.0	-9999.0
40.026	11.76	12.77	0.19	93.23	1.49	114.6	2.230	1.078	1.152	6.1	5.7	5.0E-06	-9999.0	-9999.0	0.702	2.2	-9999.0	-9999.0
40.091	15.65	16.61	0.24	88.67	1.45	114.6	2.234	1.080	1.154	6.4	5.9	5.0E-05	30.0	32.0	0.958	3.5	-9999.0	-9999.0
40.157	16.86	17.49	0.39	58.25	2.24	114.6	2.238	1.082	1.155	8.4	7.8	5.0E-06	-9999.0	-9999.0	1.017	3.8	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
40.223	16.74	17.34	0.45	55.70	2.60	114.6	2.241	1.084	1.157	8.3	7.7	5.0E-06	-9999.0	-9999.0	1.007	3.7	-9999.0	-9999.0
40.288	16.55	17.24	0.41	64.14	2.38	114.6	2.245	1.086	1.159	8.3	7.7	5.0E-06	-9999.0	-9999.0	1.000	3.7	-9999.0	-9999.0
40.354	15.33	15.76	0.35	40.47	2.23	114.6	2.249	1.088	1.161	7.5	7.0	5.0E-06	-9999.0	-9999.0	0.901	3.1	-9999.0	-9999.0
40.419	13.60	13.88	0.35	25.42	2.53	114.6	2.253	1.090	1.162	6.6	6.2	5.0E-06	-9999.0	-9999.0	0.775	2.5	-9999.0	-9999.0
40.485	12.20	12.56	0.35	33.13	2.79	114.6	2.256	1.092	1.164	6.0	5.6	5.0E-06	-9999.0	-9999.0	0.687	2.2	-9999.0	-9999.0
40.551	10.48	10.90	0.71	39.25	6.53	111.4	2.260	1.094	1.166	10.4	9.7	5.0E-08	-9999.0	-9999.0	0.576	1.7	-9999.0	-9999.0
40.616	9.13	9.68	0.76	50.61	7.87	111.4	2.264	1.096	1.167	9.3	8.6	5.0E-08	-9999.0	-9999.0	0.494	1.4	-9999.0	-9999.0
40.682	16.48	17.17	0.87	63.76	5.08	111.4	2.267	1.098	1.169	16.4	15.2	5.0E-08	-9999.0	-9999.0	0.993	3.6	-9999.0	-9999.0
40.748	47.27	48.21	0.94	86.97	1.95	117.7	2.271	1.101	1.171	15.4	14.2	5.0E-04	43.5	38.0	-9999.0	-9999.0	156.5	3.246
40.813	100.10	100.77	0.51	61.57	0.51	124.1	2.275	1.103	1.173	19.3	17.8	5.0E-02	64.6	42.0	-9999.0	-9999.0	231.5	2.297
40.879	128.08	128.05	0.72	-2.82	0.56	124.1	2.279	1.105	1.175	24.5	22.6	5.0E-02	71.4	42.0	-9999.0	-9999.0	271.9	2.123
40.944	129.88	129.79	0.91	-7.83	0.70	124.1	2.283	1.107	1.177	24.9	22.9	5.0E-02	71.8	42.0	-9999.0	-9999.0	274.6	2.116
41.010	126.11	126.08	1.10	-2.00	0.87	124.1	2.287	1.109	1.179	24.1	22.2	5.0E-02	70.9	42.0	-9999.0	-9999.0	269.2	2.135
41.076	123.99	124.01	1.30	1.64	1.05	120.9	2.291	1.111	1.181	29.7	27.3	5.0E-03	70.4	42.0	-9999.0	-9999.0	266.3	2.147
41.141	117.41	117.40	1.50	-1.12	1.28	120.9	2.295	1.113	1.182	28.1	25.9	5.0E-03	68.9	42.0	-9999.0	-9999.0	256.6	2.186
41.207	120.48	120.45	1.60	-3.44	1.33	120.9	2.299	1.115	1.184	28.8	26.5	5.0E-03	69.6	42.0	-9999.0	-9999.0	261.2	2.169
41.272	123.42	123.38	1.74	-3.35	1.41	120.9	2.303	1.117	1.186	29.5	27.1	5.0E-03	70.2	42.0	-9999.0	-9999.0	265.7	2.153
41.338	123.87	123.82	1.92	-4.66	1.55	120.9	2.307	1.119	1.188	29.6	27.2	5.0E-03	70.3	42.0	-9999.0	-9999.0	266.4	2.152
41.404	130.45	130.42	1.16	-2.09	0.89	124.1	2.311	1.121	1.190	25.0	22.9	5.0E-02	71.8	42.0	-9999.0	-9999.0	276.3	2.119
41.469	145.20	145.15	1.50	-4.98	1.04	124.1	2.315	1.123	1.192	27.8	25.5	5.0E-02	74.8	42.0	-9999.0	-9999.0	297.7	2.051
41.535	149.48	149.45	2.76	-3.27	1.84	120.9	2.319	1.125	1.194	35.8	32.7	5.0E-03	75.6	42.0	-9999.0	-9999.0	303.9	2.034
41.601	152.80	152.77	2.30	-3.10	1.50	120.9	2.323	1.127	1.196	36.6	33.4	5.0E-03	76.2	44.0	-9999.0	-9999.0	308.7	2.021
41.666	166.79	166.75	2.01	-3.80	1.21	120.9	2.327	1.129	1.198	39.9	36.5	5.0E-03	78.7	44.0	-9999.0	-9999.0	328.4	1.969
41.732	181.93	181.89	3.25	-3.56	1.79	120.9	2.331	1.131	1.200	43.5	39.8	5.0E-03	81.2	44.0	-9999.0	-9999.0	351.1	1.930
41.797	199.56	199.51	2.72	-4.94	1.36	120.9	2.335	1.133	1.202	47.8	43.6	5.0E-03	83.8	44.0	-9999.0	-9999.0	384.4	1.926
41.863	255.14	255.13	2.84	-1.19	1.11	124.1	2.339	1.135	1.204	48.9	44.5	5.0E-02	90.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0
41.929	301.77	301.84	2.93	6.60	0.97	124.1	2.343	1.137	1.206	57.8	52.7	5.0E-02	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
41.994	285.87	285.95	3.29	6.85	1.15	124.1	2.347	1.139	1.208	54.8	49.8	5.0E-02	94.1	46.0	-9999.0	-9999.0	-9999.0	-9999.0
42.060	285.42	285.50	3.25	7.09	1.14	124.1	2.351	1.142	1.210	54.7	49.7	5.0E-02	94.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
42.125	291.56	291.69	3.24	12.72	1.11	124.1	2.356	1.144	1.212	55.9	50.8	5.0E-02	94.6	46.0	-9999.0	-9999.0	-9999.0	-9999.0
42.191	295.39	295.50	0.01	10.77	0.00	127.3	2.360	1.146	1.214	47.2	42.8	5.0E+00	94.9	46.0	-9999.0	-9999.0	-9999.0	-9999.0
42.257	316.92	316.93	0.01	0.65	0.00	127.3	2.364	1.148	1.216	50.6	45.9	5.0E+00	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
42.322	380.86	380.82	0.01	-4.03	0.00	127.3	2.368	1.150	1.218	60.8	55.1	5.0E+00	95.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
42.388	422.96	423.03	0.01	6.58	0.00	127.3	2.372	1.152	1.220	67.5	61.1	5.0E+00	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
42.454	425.45	425.54	0.01	7.68	0.00	127.3	2.376	1.154	1.223	67.9	61.4	5.0E+00	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0

Gregg In Situ, Inc. - CPT Interpretation

Interpretation Output - Release	1.20I
Run No:	04-0524-0703-3979
Job No:	04-073SC
Client:	MACTEC
Project:	TVA Bull Run Ash Disposal Facility
Site:	CPT-08
Location:	TVA Bull Run
Cone:	H. Bankayal
CPT Date:	04/20/05
CPT Time:	14:33
CPT File:	073CP08.COR
Northing (m):	0.000000
Easting (m):	0.000000
Elevation (m):	0.000000

Water Table (m):	5.49	(ft):	18.0
Unit Weight of Water (default):	62.40 pcf		
Averaging Increment (m):	0.0 (Every Data Point)		
Phi Method :	Robertson and Campanella, 1983		
Su Nkt used:	15.00	Su/P' (nc):	0.30
Dr Method :	Jamiolkowski - All Sands		
State Parameter M:	1.20		

Used Unit Weights Assigned to Soil Zones

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
0.066	5.68	5.68	0.02	0.08	0.35	111.4	0.004	0.000	0.004	2.7	5.4	1.0E-07	-9999.0	-9999.0	0.379	10.0	-9999.0	-9999.0
0.131	11.95	11.97	0.07	1.90	0.59	114.6	0.007	0.000	0.007	4.6	9.2	5.0E-05	76.2	50.0	0.797	10.0	-9999.0	-9999.0
0.197	16.86	16.88	0.11	1.88	0.65	114.6	0.011	0.000	0.011	6.5	12.9	5.0E-05	80.1	50.0	1.125	10.0	61.2	3.627
0.262	27.28	27.29	0.15	1.58	0.55	117.7	0.015	0.000	0.015	8.7	17.4	5.0E-04	89.7	50.0	-9999.0	-9999.0	78.5	2.875
0.328	39.55	39.57	0.19	2.09	0.48	117.7	0.019	0.000	0.019	12.6	25.3	5.0E-04	95.0	50.0	-9999.0	-9999.0	94.8	2.395
0.394	45.87	45.89	0.26	1.52	0.57	120.9	0.023	0.000	0.023	11.0	22.0	5.0E-03	95.0	50.0	-9999.0	-9999.0	103.3	2.252
0.459	47.98	48.02	0.36	3.72	0.75	120.9	0.027	0.000	0.027	11.5	23.0	5.0E-03	95.0	50.0	-9999.0	-9999.0	106.3	2.214
0.525	50.02	50.05	0.43	3.08	0.86	117.7	0.031	0.000	0.031	16.0	32.0	5.0E-04	95.0	50.0	-9999.0	-9999.0	109.2	2.182
0.591	56.35	56.36	0.45	1.50	0.80	120.9	0.035	0.000	0.035	13.5	27.0	5.0E-03	95.0	50.0	-9999.0	-9999.0	118.3	2.099
0.656	70.84	70.87	0.47	2.23	0.66	120.9	0.038	0.000	0.038	17.0	33.9	5.0E-03	95.0	50.0	-9999.0	-9999.0	139.1	1.963
0.722	75.19	75.20	0.56	0.39	0.75	120.9	0.042	0.000	0.042	18.0	36.0	5.0E-03	95.0	50.0	-9999.0	-9999.0	145.2	1.931
0.787	78.57	78.63	0.57	5.07	0.73	120.9	0.046	0.000	0.046	18.8	37.6	5.0E-03	95.0	50.0	-9999.0	-9999.0	150.2	1.910
0.853	81.58	81.62	0.61	3.60	0.75	120.9	0.050	0.000	0.050	19.5	39.1	5.0E-03	95.0	50.0	-9999.0	-9999.0	154.6	1.895
0.919	85.28	85.29	0.66	0.81	0.78	120.9	0.054	0.000	0.054	20.4	40.8	5.0E-03	95.0	50.0	-9999.0	-9999.0	160.5	1.882
0.984	87.39	87.52	0.73	11.69	0.84	120.9	0.058	0.000	0.058	21.0	41.9	5.0E-03	95.0	50.0	-9999.0	-9999.0	164.4	1.878
1.050	89.56	89.59	0.81	3.48	0.91	120.9	0.062	0.000	0.062	21.5	42.9	5.0E-03	95.0	50.0	-9999.0	-9999.0	168.3	1.879
1.115	88.80	88.83	0.96	3.10	1.08	120.9	0.066	0.000	0.066	21.3	42.5	5.0E-03	95.0	50.0	-9999.0	-9999.0	166.8	1.878
1.181	89.44	89.44	1.04	0.51	1.17	120.9	0.070	0.000	0.070	21.4	42.8	5.0E-03	95.0	50.0	-9999.0	-9999.0	168.0	1.878
1.247	90.07	90.13	1.13	5.53	1.26	120.9	0.074	0.000	0.074	21.6	43.2	5.0E-03	95.0	50.0	-9999.0	-9999.0	169.4	1.879
1.312	91.09	91.18	1.17	8.44	1.29	120.9	0.078	0.000	0.078	21.8	43.7	5.0E-03	95.0	50.0	-9999.0	-9999.0	171.6	1.881
1.378	89.69	89.98	1.23	27.47	1.37	120.9	0.082	0.000	0.082	21.5	43.1	5.0E-03	95.0	50.0	-9999.0	-9999.0	169.1	1.879
1.444	90.33	90.39	1.25	6.03	1.39	120.9	0.086	0.000	0.086	21.6	43.3	5.0E-03	95.0	50.0	-9999.0	-9999.0	169.9	1.880
1.509	89.37	89.43	1.28	5.55	1.43	120.9	0.090	0.000	0.090	21.4	42.8	5.0E-03	95.0	50.0	-9999.0	-9999.0	168.0	1.878
1.575	89.95	90.00	1.24	4.35	1.38	120.9	0.094	0.000	0.094	21.5	43.1	5.0E-03	95.0	50.0	-9999.0	-9999.0	169.1	1.879
1.640	88.34	88.38	1.14	2.98	1.29	120.9	0.098	0.000	0.098	21.2	42.3	5.0E-03	95.0	50.0	-9999.0	-9999.0	166.0	1.878
1.706	86.75	86.77	1.08	1.76	1.25	120.9	0.102	0.000	0.102	20.8	41.5	5.0E-03	95.0	50.0	-9999.0	-9999.0	163.1	1.879
1.772	84.65	84.68	1.00	3.27	1.18	120.9	0.106	0.000	0.106	20.3	40.5	5.0E-03	94.1	50.0	-9999.0	-9999.0	159.5	1.884
1.837	83.11	83.12	0.98	1.02	1.18	120.9	0.110	0.000	0.110	19.9	39.8	5.0E-03	93.0	50.0	-9999.0	-9999.0	157.0	1.889
1.903	79.53	79.61	0.98	6.77	1.23	120.9	0.114	0.000	0.114	19.1	38.1	5.0E-03	91.3	50.0	-9999.0	-9999.0	151.6	1.905
1.968	78.57	78.60	0.92	2.57	1.17	120.9	0.118	0.000	0.118	18.8	37.6	5.0E-03	90.4	50.0	-9999.0	-9999.0	150.1	1.910
2.034	76.47	76.50	0.97	2.82	1.27	120.9	0.122	0.000	0.122	18.3	36.6	5.0E-03	89.1	50.0	-9999.0	-9999.0	147.1	1.923
2.100	74.87	74.91	0.96	3.27	1.28	120.9	0.126	0.000	0.126	17.9	35.9	5.0E-03	88.1	50.0	-9999.0	-9999.0	144.8	1.933
2.165	75.38	75.41	0.94	2.96	1.25	120.9	0.130	0.000	0.130	18.1	36.1	5.0E-03	87.8	50.0	-9999.0	-9999.0	145.5	1.930
2.231	74.29	74.35	0.95	5.61	1.28	120.9	0.134	0.000	0.134	17.8	35.6	5.0E-03	87.0	50.0	-9999.0	-9999.0	144.0	1.937
2.297	72.45	72.50	0.95	5.13	1.31	117.7	0.138	0.000	0.138	23.1	46.3	5.0E-04	85.9	48.0	-9999.0	-9999.0	141.4	1.951
2.362	68.61	68.62	0.92	1.41	1.34	117.7	0.141	0.000	0.141	21.9	43.8	5.0E-04	83.9	48.0	-9999.0	-9999.0	135.9	1.981
2.428	66.24	66.27	0.43	3.14	0.65	120.9	0.145	0.000	0.145	15.9	31.7	5.0E-03	82.5	48.0	-9999.0	-9999.0	132.6	2.001
2.493	65.29	65.32	0.46	2.70	0.71	120.9	0.149	0.000	0.149	15.6	31.3	5.0E-03	81.7	48.0	-9999.0	-9999.0	131.2	2.009
2.559	65.80	65.97	0.49	15.98	0.74	120.9	0.153	0.000	0.153	15.8	31.6	5.0E-03	81.6	48.0	-9999.0	-9999.0	132.2	2.003
2.625	64.91	64.93	0.55	2.35	0.85	120.9	0.157	0.000	0.157	15.5	31.1	5.0E-03	80.8	48.0	-9999.0	-9999.0	130.7	2.012
2.690	65.22	65.27	0.66	4.64	1.01	120.9	0.161	0.000	0.161	15.6	31.3	5.0E-03	80.6	48.0	-9999.0	-9999.0	131.2	2.009
2.756	57.43	57.46	0.72	2.90	1.26	117.7	0.165	0.000	0.165	18.3	36.7	5.0E-04	76.6	48.0	-9999.0	-9999.0	119.9	2.086
2.821	62.41	62.41	0.69	0.26	1.11	117.7	0.169	0.000	0.169	19.9	39.8	5.0E-04	78.6	48.0	-9999.0	-9999.0	127.1	2.036
2.887	66.50	66.49	0.68	-0.94	1.03	120.9	0.173	0.000	0.173	15.9	31.8	5.0E-03	80.1	48.0	-9999.0	-9999.0	132.9	1.999
2.953	66.12	66.13	0.68	0.63	1.03	120.9	0.177	0.000	0.177	15.8	31.7	5.0E-03	79.6	48.0	-9999.0	-9999.0	132.4	2.002
3.018	63.49	63.50	0.68	0.39	1.07	120.9	0.181	0.000	0.181	15.2	30.4	5.0E-03	78.1	48.0	-9999.0	-9999.0	128.6	2.025
3.084	63.30	63.32	0.65	1.41	1.03	120.9	0.185	0.000	0.185	15.2	30.3	5.0E-03	77.7	48.0	-9999.0	-9999.0	128.4	2.027
3.150	62.86	62.87	0.62	0.37	0.99	120.9	0.189	0.000	0.189	15.1	30.1	5.0E-03	77.2	48.0	-9999.0	-9999.0	127.7	2.031
3.215	62.92	62.97	0.53	4.76	0.84	120.9	0.193	0.000	0.193	15.1	30.2	5.0E-03	77.0	48.0	-9999.0	-9999.0	127.9	2.030
3.281	64.40	64.38	0.61	-1.76	0.95	120.9	0.197	0.000	0.197	15.4	30.8	5.0E-03	77.3	48.0	-9999.0	-9999.0	129.9	2.017
3.346	64.97	64.99	0.55	1.94	0.85	120.9	0.201	0.000	0.201	15.6	31.1	5.0E-03	77.3	48.0	-9999.0	-9999.0	130.8	2.012

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
3.412	64.52	64.51	0.55	-0.53	0.85	120.9	0.205	0.000	0.205	15.4	30.9	5.0E-03	76.8	46.0	-9999.0	-9999.0	130.1	2.016
3.478	67.33	67.34	0.57	0.35	0.85	120.9	0.209	0.000	0.209	16.1	32.2	5.0E-03	77.8	46.0	-9999.0	-9999.0	134.1	1.992
3.543	68.55	68.56	0.58	0.94	0.85	120.9	0.213	0.000	0.213	16.4	32.8	5.0E-03	78.0	46.0	-9999.0	-9999.0	135.8	1.981
3.609	66.50	66.50	0.56	0.31	0.84	120.9	0.217	0.000	0.217	15.9	31.8	5.0E-03	76.9	46.0	-9999.0	-9999.0	132.9	1.999
3.674	66.69	66.68	0.57	-0.69	0.86	120.9	0.221	0.000	0.221	16.0	31.9	5.0E-03	76.7	46.0	-9999.0	-9999.0	133.2	1.997
3.740	66.82	66.82	0.60	-0.39	0.90	120.9	0.225	0.000	0.225	16.0	32.0	5.0E-03	76.5	46.0	-9999.0	-9999.0	133.4	1.996
3.806	63.56	63.55	0.60	-0.96	0.95	120.9	0.229	0.000	0.229	15.2	30.4	5.0E-03	74.8	46.0	-9999.0	-9999.0	128.7	2.025
3.871	60.31	60.33	0.57	2.00	0.95	120.9	0.232	0.000	0.232	14.4	28.9	5.0E-03	73.1	46.0	-9999.0	-9999.0	124.0	2.056
3.937	56.47	56.45	0.60	-1.88	1.07	117.7	0.236	0.000	0.236	18.0	36.0	5.0E-04	70.9	46.0	-9999.0	-9999.0	118.4	2.098
4.003	54.17	54.17	0.60	0.04	1.11	117.7	0.240	0.000	0.240	17.3	34.6	5.0E-04	69.5	46.0	-9999.0	-9999.0	115.1	2.125
4.068	52.07	52.05	0.58	-1.37	1.12	117.7	0.244	0.000	0.244	16.6	33.2	5.0E-04	68.1	46.0	-9999.0	-9999.0	112.1	2.153
4.134	48.81	48.79	0.59	-1.45	1.21	117.7	0.248	0.000	0.248	15.6	31.2	5.0E-04	66.1	44.0	-9999.0	-9999.0	107.4	2.201
4.199	46.76	46.75	0.59	-1.23	1.27	117.7	0.252	0.000	0.252	14.9	29.7	5.0E-04	64.6	44.0	-9999.0	-9999.0	104.5	2.236
4.265	44.85	44.84	0.58	-0.69	1.30	117.7	0.256	0.000	0.256	14.3	28.3	5.0E-04	63.2	44.0	-9999.0	-9999.0	101.9	2.272
4.331	45.87	45.87	0.54	0.33	1.18	117.7	0.260	0.000	0.260	14.6	28.7	5.0E-04	63.6	44.0	-9999.0	-9999.0	103.3	2.252
4.396	46.57	46.58	0.49	0.73	1.05	117.7	0.263	0.000	0.263	14.9	29.0	5.0E-04	63.9	44.0	-9999.0	-9999.0	104.5	2.243
4.462	47.72	47.73	0.51	1.58	1.07	117.7	0.267	0.000	0.267	15.2	29.5	5.0E-04	64.4	44.0	-9999.0	-9999.0	106.4	2.229
4.528	47.20	47.22	0.47	1.48	1.00	117.7	0.271	0.000	0.271	15.1	28.9	5.0E-04	63.9	44.0	-9999.0	-9999.0	106.0	2.244
4.593	47.91	47.90	0.44	-0.47	0.92	117.7	0.275	0.000	0.275	15.3	29.2	5.0E-04	64.1	44.0	-9999.0	-9999.0	107.2	2.238
4.659	49.76	49.76	0.41	0.35	0.83	117.7	0.279	0.000	0.279	15.9	30.1	5.0E-04	65.0	44.0	-9999.0	-9999.0	110.1	2.212
4.724	47.53	47.53	0.34	0.41	0.72	120.9	0.283	0.000	0.283	11.4	21.4	5.0E-03	63.4	44.0	-9999.0	-9999.0	107.2	2.256
4.790	46.76	46.75	0.32	-0.96	0.69	120.9	0.287	0.000	0.287	11.2	20.9	5.0E-03	62.8	44.0	-9999.0	-9999.0	106.5	2.277
4.856	46.63	46.62	0.32	-0.77	0.69	120.9	0.291	0.000	0.291	11.2	20.7	5.0E-03	62.5	44.0	-9999.0	-9999.0	106.6	2.286
4.921	47.85	47.87	0.35	2.43	0.73	120.9	0.295	0.000	0.295	11.5	21.1	5.0E-03	63.1	44.0	-9999.0	-9999.0	108.6	2.268
4.987	48.04	48.01	0.32	-2.78	0.67	120.9	0.299	0.000	0.299	11.5	21.0	5.0E-03	62.9	44.0	-9999.0	-9999.0	109.0	2.272
5.052	47.27	47.27	0.27	-0.71	0.57	120.9	0.303	0.000	0.303	11.3	20.6	5.0E-03	62.3	44.0	-9999.0	-9999.0	108.3	2.292
5.118	46.50	46.50	0.28	-0.53	0.60	120.9	0.307	0.000	0.307	11.1	20.1	5.0E-03	61.6	44.0	-9999.0	-9999.0	107.6	2.313
5.184	44.97	44.96	0.29	-0.45	0.65	120.9	0.311	0.000	0.311	10.8	19.3	5.0E-03	60.5	44.0	-9999.0	-9999.0	105.8	2.352
5.249	43.89	43.89	0.31	0.67	0.71	117.7	0.315	0.000	0.315	14.0	25.0	5.0E-04	59.6	44.0	-9999.0	-9999.0	104.6	2.384
5.315	42.67	42.67	0.33	-0.14	0.78	117.7	0.318	0.000	0.318	13.6	24.1	5.0E-04	58.6	44.0	-9999.0	-9999.0	103.3	2.420
5.381	41.14	41.14	0.35	-0.18	0.85	117.7	0.322	0.000	0.322	13.1	23.1	5.0E-04	57.4	44.0	-9999.0	-9999.0	101.5	2.468
5.446	40.63	40.63	0.39	0.20	0.96	117.7	0.326	0.000	0.326	13.0	22.7	5.0E-04	56.9	42.0	-9999.0	-9999.0	101.2	2.490
5.512	41.01	41.00	0.46	-0.45	1.12	117.7	0.330	0.000	0.330	13.1	22.8	5.0E-04	57.0	42.0	-9999.0	-9999.0	101.9	2.486
5.577	43.18	43.20	0.50	1.04	1.16	117.7	0.334	0.000	0.334	13.8	23.9	5.0E-04	58.3	44.0	-9999.0	-9999.0	105.1	2.433
5.643	45.04	45.06	0.54	1.90	1.20	117.7	0.338	0.000	0.338	14.4	24.8	5.0E-04	59.4	44.0	-9999.0	-9999.0	107.8	2.393
5.709	44.34	44.36	0.57	1.74	1.29	117.7	0.342	0.000	0.342	14.2	24.2	5.0E-04	58.8	44.0	-9999.0	-9999.0	107.2	2.417
5.774	39.42	39.43	0.62	1.00	1.58	117.7	0.345	0.000	0.345	12.6	21.4	5.0E-04	55.2	42.0	-9999.0	-9999.0	101.0	2.561
5.840	33.79	33.80	0.66	0.87	1.96	114.6	0.349	0.000	0.349	12.9	21.9	5.0E-05	50.6	42.0	2.230	10.0	93.8	2.776
5.905	30.47	30.48	0.67	0.77	2.20	114.6	0.353	0.000	0.353	11.7	19.7	5.0E-05	47.5	42.0	2.009	10.0	89.5	2.935
5.971	29.64	29.65	0.64	1.13	2.16	114.6	0.357	0.000	0.357	11.4	19.0	5.0E-05	46.6	42.0	1.953	10.0	88.5	2.985
6.037	28.56	28.57	0.61	1.00	2.14	114.6	0.361	0.000	0.361	10.9	18.2	5.0E-05	45.4	42.0	1.881	10.0	87.1	3.050
6.102	28.62	28.64	0.57	1.45	2.00	114.6	0.364	0.000	0.364	11.0	18.2	5.0E-05	45.3	40.0	1.885	10.0	87.5	3.055
6.168	29.07	29.09	0.55	1.52	1.90	114.6	0.368	0.000	0.368	11.1	18.4	5.0E-05	45.6	42.0	1.915	10.0	88.4	3.038
6.234	32.77	32.79	0.53	1.96	1.62	114.6	0.372	0.000	0.372	12.6	20.6	5.0E-05	48.9	42.0	2.161	10.0	93.9	2.865
6.299	40.95	40.98	0.55	2.84	1.35	117.7	0.376	0.000	0.376	13.1	21.3	5.0E-04	55.1	42.0	-9999.0	-9999.0	105.1	2.566
6.365	51.88	51.91	0.56	3.02	1.08	117.7	0.379	0.000	0.379	16.6	26.9	5.0E-04	61.7	44.0	-9999.0	-9999.0	119.9	2.310
6.430	57.11	57.14	0.53	3.14	0.93	120.9	0.383	0.000	0.383	13.7	22.1	5.0E-03	64.4	44.0	-9999.0	-9999.0	127.4	2.229
6.496	56.22	56.24	0.53	2.45	0.94	120.9	0.387	0.000	0.387	13.5	21.6	5.0E-03	63.8	44.0	-9999.0	-9999.0	126.4	2.247
6.562	51.16	51.19	0.58	2.07	1.14	117.7	0.391	0.000	0.391	16.3	26.1	5.0E-04	60.9	44.0	-9999.0	-9999.0	119.7	2.338
6.627	45.04	45.05	0.65	0.81	1.45	117.7	0.395	0.000	0.395	14.4	22.9	5.0E-04	57.1	42.0	-9999.0	-9999.0	111.8	2.481
6.693	38.45	38.45	0.69	-0.28	1.80	114.6	0.399	0.000	0.399	14.7	23.3	5.0E-05	52.4	42.0	2.537	10.0	103.4	2.689

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
6.758	33.92	33.91	0.72	-0.87	2.13	114.6	0.403	0.000	0.403	13.0	20.5	5.0E-05	48.7	42.0	2.234	10.0	97.5	2.874
6.824	31.82	31.82	0.72	-0.12	2.27	114.6	0.406	0.000	0.406	12.2	19.1	5.0E-05	46.7	40.0	2.094	10.0	94.7	2.977
6.890	31.94	31.95	0.71	0.90	2.23	114.6	0.410	0.000	0.410	12.2	19.1	5.0E-05	46.7	40.0	2.102	10.0	95.1	2.978
6.955	32.64	32.65	0.69	1.43	2.12	114.6	0.414	0.000	0.414	12.5	19.4	5.0E-05	47.2	40.0	2.149	10.0	96.4	2.951
7.021	34.36	34.38	0.64	1.13	1.87	114.6	0.418	0.000	0.418	13.2	20.4	5.0E-05	48.6	42.0	2.264	10.0	99.0	2.881
7.087	35.84	35.85	0.57	0.92	1.59	117.7	0.422	0.000	0.422	11.4	17.6	5.0E-04	49.6	42.0	-9999.0	-9999.0	101.3	2.826
7.152	40.44	40.45	0.56	1.23	1.39	117.7	0.425	0.000	0.425	12.9	19.8	5.0E-04	53.0	42.0	-9999.0	-9999.0	107.7	2.663
7.218	46.95	46.97	0.59	1.13	1.26	117.7	0.429	0.000	0.429	15.0	22.9	5.0E-04	57.1	42.0	-9999.0	-9999.0	116.5	2.481
7.283	54.93	54.95	0.65	1.39	1.19	117.7	0.433	0.000	0.433	17.5	26.7	5.0E-04	61.5	44.0	-9999.0	-9999.0	127.4	2.319
7.349	61.07	61.09	0.74	1.72	1.21	117.7	0.437	0.000	0.437	19.5	29.5	5.0E-04	64.4	44.0	-9999.0	-9999.0	136.1	2.228
7.415	63.95	63.98	0.75	3.06	1.18	117.7	0.441	0.000	0.441	20.4	30.8	5.0E-04	65.6	44.0	-9999.0	-9999.0	140.4	2.194
7.480	62.09	62.13	0.76	3.25	1.23	117.7	0.445	0.000	0.445	19.8	29.7	5.0E-04	64.6	44.0	-9999.0	-9999.0	138.0	2.221
7.546	58.19	58.22	0.79	2.57	1.36	117.7	0.449	0.000	0.449	18.6	27.8	5.0E-04	62.6	44.0	-9999.0	-9999.0	132.8	2.281
7.611	54.43	54.43	0.88	0.26	1.62	117.7	0.452	0.000	0.452	17.4	25.8	5.0E-04	60.6	42.0	-9999.0	-9999.0	127.9	2.349
7.677	56.47	56.47	0.96	-0.04	1.70	117.7	0.456	0.000	0.456	18.0	26.7	5.0E-04	61.5	42.0	-9999.0	-9999.0	130.9	2.317
7.743	70.14	70.16	1.07	2.15	1.53	117.7	0.460	0.000	0.460	22.4	33.0	5.0E-04	67.6	44.0	-9999.0	-9999.0	150.3	2.142
7.808	77.62	77.64	1.22	2.25	1.58	117.7	0.464	0.000	0.464	24.8	36.4	5.0E-04	70.4	44.0	-9999.0	-9999.0	161.3	2.078
7.874	80.62	80.63	1.39	1.41	1.73	117.7	0.468	0.000	0.468	25.7	37.6	5.0E-04	71.4	44.0	-9999.0	-9999.0	165.9	2.057
7.940	84.19	84.21	1.63	1.58	1.94	117.7	0.472	0.000	0.472	26.9	39.1	5.0E-04	72.5	44.0	-9999.0	-9999.0	171.2	2.033
8.005	84.97	84.98	1.84	1.12	2.17	117.7	0.476	0.000	0.476	27.1	39.3	5.0E-04	72.6	44.0	-9999.0	-9999.0	172.5	2.031
8.071	85.79	85.80	1.99	0.67	2.33	117.7	0.479	0.000	0.479	27.4	39.6	5.0E-04	72.8	44.0	-9999.0	-9999.0	173.9	2.027
8.136	87.52	87.54	2.10	2.04	2.39	117.7	0.483	0.000	0.483	27.9	40.2	5.0E-04	73.3	44.0	-9999.0	-9999.0	176.6	2.018
8.202	88.47	88.51	2.18	3.02	2.46	117.7	0.487	0.000	0.487	28.3	40.5	5.0E-04	73.5	44.0	-9999.0	-9999.0	178.2	2.014
8.268	86.11	86.14	2.22	2.57	2.57	114.6	0.491	0.000	0.491	33.0	47.1	5.0E-05	72.6	44.0	5.710	10.0	175.0	2.032
8.333	82.66	82.67	2.21	1.00	2.67	114.6	0.495	0.000	0.495	31.7	45.0	5.0E-05	71.3	44.0	5.478	10.0	170.2	2.059
8.399	79.21	79.22	2.12	0.61	2.67	114.6	0.499	0.000	0.499	30.3	43.0	5.0E-05	70.0	44.0	5.248	10.0	165.4	2.088
8.464	75.25	75.25	2.02	-0.14	2.69	114.6	0.502	0.000	0.502	28.8	40.7	5.0E-05	68.4	44.0	4.983	10.0	159.8	2.124
8.530	72.32	72.32	1.98	0.00	2.74	114.6	0.506	0.000	0.506	27.7	38.9	5.0E-05	67.1	44.0	4.787	10.0	155.8	2.154
8.596	68.87	68.87	1.92	-0.10	2.79	114.6	0.510	0.000	0.510	26.4	36.9	5.0E-05	65.6	44.0	4.557	10.0	151.1	2.194
8.661	66.63	66.63	1.86	-0.12	2.80	114.6	0.514	0.000	0.514	25.5	35.6	5.0E-05	64.6	44.0	4.408	10.0	148.1	2.223
8.727	62.22	62.22	1.75	-0.39	2.82	114.6	0.517	0.000	0.517	23.8	33.1	5.0E-05	62.5	42.0	4.113	10.0	142.2	2.285
8.793	58.00	58.00	1.60	-0.43	2.77	114.6	0.521	0.000	0.521	22.2	30.8	5.0E-05	60.4	42.0	3.832	10.0	136.7	2.357
8.858	52.26	52.24	0.81	-1.13	1.55	117.7	0.525	0.000	0.525	16.7	23.0	5.0E-04	57.3	42.0	-9999.0	-9999.0	129.3	2.474
8.924	46.82	46.81	0.71	-1.37	1.52	117.7	0.529	0.000	0.529	14.9	20.6	5.0E-04	54.0	42.0	-9999.0	-9999.0	122.4	2.614
8.989	42.67	42.65	0.59	-1.86	1.39	117.7	0.533	0.000	0.533	13.6	18.7	5.0E-04	51.3	42.0	-9999.0	-9999.0	117.1	2.745
9.055	42.03	42.01	0.50	-1.80	1.19	117.7	0.537	0.000	0.537	13.4	18.3	5.0E-04	50.7	40.0	-9999.0	-9999.0	116.4	2.772
9.121	42.10	42.09	0.40	-1.19	0.95	117.7	0.540	0.000	0.540	13.4	18.3	5.0E-04	50.7	40.0	-9999.0	-9999.0	116.8	2.774
9.186	31.62	31.63	0.34	1.56	1.08	117.7	0.544	0.000	0.544	10.1	13.7	5.0E-04	42.4	40.0	-9999.0	-9999.0	101.6	3.213
9.252	33.35	33.37	0.32	2.02	0.96	117.7	0.548	0.000	0.548	10.7	14.4	5.0E-04	43.8	40.0	-9999.0	-9999.0	104.6	3.134
9.317	29.51	29.53	0.28	1.33	0.95	117.7	0.552	0.000	0.552	9.4	12.7	5.0E-04	40.2	38.0	-9999.0	-9999.0	98.4	3.334
9.383	25.68	25.69	0.25	0.55	0.98	117.7	0.556	0.000	0.556	8.2	11.0	5.0E-04	36.1	38.0	-9999.0	-9999.0	91.5	3.561
9.449	21.40	21.40	0.22	-0.08	1.03	114.6	0.560	0.000	0.560	8.2	11.0	5.0E-05	30.8	38.0	1.389	10.0	-9999.0	-9999.0
9.514	18.01	18.02	0.18	0.51	1.00	114.6	0.563	0.000	0.563	6.9	9.2	5.0E-05	30.0	36.0	1.164	10.0	-9999.0	-9999.0
9.580	15.08	15.09	0.17	1.54	1.13	114.6	0.567	0.000	0.567	5.8	7.7	5.0E-05	30.0	34.0	0.968	10.0	-9999.0	-9999.0
9.646	11.69	11.72	0.16	3.16	1.37	114.6	0.571	0.000	0.571	5.6	7.4	5.0E-06	-9999.0	-9999.0	0.743	6.8	-9999.0	-9999.0
9.711	10.09	10.16	0.16	6.42	1.58	114.6	0.575	0.000	0.575	4.9	6.4	5.0E-06	-9999.0	-9999.0	0.639	5.4	-9999.0	-9999.0
9.777	8.88	8.99	0.15	9.71	1.67	114.6	0.578	0.000	0.578	4.3	5.7	5.0E-06	-9999.0	-9999.0	0.561	4.3	-9999.0	-9999.0
9.842	8.56	8.70	0.15	12.88	1.73	114.6	0.582	0.000	0.582	4.2	5.5	5.0E-06	-9999.0	-9999.0	0.541	4.1	-9999.0	-9999.0
9.908	10.61	10.75	0.16	13.43	1.49	114.6	0.586	0.000	0.586	5.1	6.7	5.0E-06	-9999.0	-9999.0	0.678	5.7	-9999.0	-9999.0
9.974	12.65	12.77	0.19	10.67	1.49	114.6	0.590	0.000	0.590	6.1	8.0	5.0E-06	-9999.0	-9999.0	0.812	7.4	-9999.0	-9999.0
10.039	13.60	13.68	0.19	6.77	1.39	114.6	0.593	0.000	0.593	5.2	6.8	5.0E-05	30.0	34.0	0.872	8.3	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
10.105	12.58	12.63	0.18	4.66	1.43	114.6	0.597	0.000	0.597	6.0	7.8	5.0E-06	-9999.0	-9999.0	0.802	7.2	-9999.0	-9999.0
10.170	12.39	12.43	0.17	3.87	1.37	114.6	0.601	0.000	0.601	4.8	6.1	5.0E-05	30.0	32.0	0.789	6.9	-9999.0	-9999.0
10.236	11.37	11.41	0.17	3.66	1.49	114.6	0.605	0.000	0.605	5.5	7.0	5.0E-06	-9999.0	-9999.0	0.720	5.9	-9999.0	-9999.0
10.302	11.37	11.40	0.17	3.35	1.49	114.6	0.609	0.000	0.609	5.5	7.0	5.0E-06	-9999.0	-9999.0	0.720	5.9	-9999.0	-9999.0
10.367	11.56	11.60	0.17	3.42	1.47	114.6	0.612	0.000	0.612	5.6	7.1	5.0E-06	-9999.0	-9999.0	0.732	6.0	-9999.0	-9999.0
10.433	12.71	12.75	0.19	3.56	1.49	114.6	0.616	0.000	0.616	6.1	7.8	5.0E-06	-9999.0	-9999.0	0.809	6.9	-9999.0	-9999.0
10.499	15.14	15.18	0.22	4.17	1.45	114.6	0.620	0.000	0.620	5.8	7.4	5.0E-05	30.0	34.0	0.971	9.1	-9999.0	-9999.0
10.564	20.19	20.25	0.25	5.61	1.24	114.6	0.624	0.000	0.624	7.8	9.8	5.0E-05	30.0	36.0	1.308	10.0	-9999.0	-9999.0
10.630	25.49	25.55	0.27	5.25	1.06	117.7	0.627	0.000	0.627	8.2	10.3	5.0E-04	34.2	38.0	-9999.0	-9999.0	93.6	3.664
10.695	27.15	27.20	0.29	5.19	1.07	117.7	0.631	0.000	0.631	8.7	10.9	5.0E-04	35.9	38.0	-9999.0	-9999.0	97.1	3.571
10.761	29.45	29.50	0.31	4.13	1.05	117.7	0.635	0.000	0.635	9.4	11.8	5.0E-04	38.2	38.0	-9999.0	-9999.0	101.7	3.447
10.827	30.21	30.25	0.33	3.78	1.09	117.7	0.639	0.000	0.639	9.7	12.1	5.0E-04	38.8	38.0	-9999.0	-9999.0	103.2	3.412
10.892	28.75	28.79	0.32	3.29	1.11	117.7	0.643	0.000	0.643	9.2	11.5	5.0E-04	37.3	38.0	-9999.0	-9999.0	100.6	3.496
10.958	26.06	26.09	0.28	2.43	1.08	117.7	0.647	0.000	0.647	8.3	10.4	5.0E-04	34.4	38.0	-9999.0	-9999.0	95.4	3.655
11.023	24.79	24.82	0.22	2.35	0.89	117.7	0.651	0.000	0.651	7.9	9.8	5.0E-04	32.9	38.0	-9999.0	-9999.0	92.8	3.738
11.089	23.07	23.09	0.16	2.55	0.69	117.7	0.654	0.000	0.654	7.4	9.1	5.0E-04	30.7	36.0	-9999.0	-9999.0	-9999.0	-9999.0
11.155	22.61	22.65	0.15	3.20	0.66	117.7	0.658	0.000	0.658	7.2	8.9	5.0E-04	30.1	36.0	-9999.0	-9999.0	-9999.0	-9999.0
11.220	19.74	19.77	0.14	2.61	0.71	114.6	0.662	0.000	0.662	7.6	9.3	5.0E-05	30.0	36.0	1.274	10.0	-9999.0	-9999.0
11.286	15.72	15.74	0.15	2.27	0.96	114.6	0.666	0.000	0.666	6.0	7.4	5.0E-05	30.0	34.0	1.005	8.6	-9999.0	-9999.0
11.352	13.48	13.52	0.17	3.64	1.26	114.6	0.670	0.000	0.670	5.2	6.3	5.0E-05	30.0	32.0	0.857	6.6	-9999.0	-9999.0
11.417	13.09	13.19	0.22	8.95	1.67	114.6	0.673	0.000	0.673	6.3	7.7	5.0E-06	-9999.0	-9999.0	0.834	6.3	-9999.0	-9999.0
11.483	18.01	18.18	0.29	15.53	1.60	114.6	0.677	0.000	0.677	7.0	8.5	5.0E-05	30.0	34.0	1.167	10.0	-9999.0	-9999.0
11.548	26.12	26.29	0.36	15.35	1.37	114.6	0.681	0.000	0.681	10.1	12.2	5.0E-05	33.9	38.0	1.707	10.0	96.8	3.684
11.614	34.68	34.82	0.44	12.53	1.27	117.7	0.685	0.000	0.685	11.1	13.4	5.0E-04	41.8	38.0	-9999.0	-9999.0	112.9	3.243
11.680	39.42	39.52	0.52	9.73	1.32	117.7	0.689	0.000	0.689	12.6	15.2	5.0E-04	45.4	40.0	-9999.0	-9999.0	120.5	3.049
11.745	41.84	41.92	0.59	7.17	1.41	117.7	0.692	0.000	0.692	13.4	16.1	5.0E-04	47.0	40.0	-9999.0	-9999.0	124.2	2.963
11.811	43.89	43.96	0.60	6.54	1.37	117.7	0.696	0.000	0.696	14.0	16.8	5.0E-04	48.3	40.0	-9999.0	-9999.0	127.3	2.895
11.876	42.48	42.54	0.58	5.49	1.37	117.7	0.700	0.000	0.700	13.6	16.2	5.0E-04	47.3	40.0	-9999.0	-9999.0	125.4	2.949
11.942	41.20	41.25	0.51	4.60	1.24	117.7	0.704	0.000	0.704	13.2	15.7	5.0E-04	46.3	40.0	-9999.0	-9999.0	123.7	3.000
12.008	38.90	38.93	0.37	2.76	0.95	117.7	0.708	0.000	0.708	12.4	14.8	5.0E-04	44.6	40.0	-9999.0	-9999.0	120.4	3.093
12.073	34.17	34.21	0.30	3.54	0.88	117.7	0.712	0.000	0.712	10.9	12.9	5.0E-04	40.8	38.0	-9999.0	-9999.0	113.0	3.302
12.139	24.40	24.42	0.28	1.78	1.15	114.6	0.716	0.000	0.716	9.4	11.1	5.0E-05	31.0	36.0	1.580	10.0	-9999.0	-9999.0
12.205	18.98	18.99	0.21	0.94	1.11	114.6	0.719	0.000	0.719	7.3	8.6	5.0E-05	30.0	34.0	1.218	10.0	-9999.0	-9999.0
12.270	13.22	13.21	0.16	-1.06	1.21	114.6	0.723	0.000	0.723	5.1	6.0	5.0E-05	30.0	32.0	0.833	5.6	-9999.0	-9999.0
12.336	7.60	7.58	0.11	-1.58	1.45	114.6	0.727	0.000	0.727	3.6	4.3	5.0E-06	-9999.0	-9999.0	0.457	2.3	-9999.0	-9999.0
12.401	5.11	5.12	0.07	0.51	1.37	111.4	0.731	0.000	0.731	2.5	2.9	1.0E-07	-9999.0	-9999.0	0.292	1.3	-9999.0	-9999.0
12.467	4.85	4.92	0.06	6.22	1.22	111.4	0.734	0.000	0.734	2.4	2.7	1.0E-07	-9999.0	-9999.0	0.279	1.3	-9999.0	-9999.0
12.533	3.45	3.55	0.05	9.22	1.41	111.4	0.738	0.000	0.738	1.7	2.0	1.0E-07	-9999.0	-9999.0	0.187	0.9	-9999.0	-9999.0
12.598	2.94	3.07	0.04	12.45	1.31	111.4	0.741	0.000	0.741	1.5	1.7	1.0E-07	-9999.0	-9999.0	0.155	0.8	-9999.0	-9999.0
12.664	2.43	2.58	0.03	14.68	1.16	111.4	0.745	0.000	0.745	1.2	1.4	1.0E-07	-9999.0	-9999.0	0.123	0.7	-9999.0	-9999.0
12.730	2.18	2.35	0.01	16.06	0.43	111.4	0.749	0.000	0.749	1.1	1.3	1.0E-07	-9999.0	-9999.0	0.107	0.6	-9999.0	-9999.0
12.795	1.85	2.03	0.01	16.39	0.49	111.4	0.752	0.000	0.752	1.0	1.1	1.0E-07	-9999.0	-9999.0	0.085	0.6	-9999.0	-9999.0
12.861	2.24	2.42	0.01	17.07	0.41	111.4	0.756	0.000	0.756	1.2	1.3	1.0E-07	-9999.0	-9999.0	0.111	0.6	-9999.0	-9999.0
12.926	1.66	1.85	0.01	17.19	0.54	111.4	0.760	0.000	0.760	0.9	1.0	1.0E-07	-9999.0	-9999.0	0.073	0.5	-9999.0	-9999.0
12.992	2.11	2.28	0.01	16.37	0.44	111.4	0.763	0.000	0.763	1.1	1.3	1.0E-07	-9999.0	-9999.0	0.101	0.6	-9999.0	-9999.0
13.058	2.37	2.55	0.01	17.29	0.39	111.4	0.767	0.000	0.767	1.2	1.4	1.0E-07	-9999.0	-9999.0	0.119	0.6	-9999.0	-9999.0
13.123	3.13	3.32	0.01	17.70	0.30	111.4	0.771	0.000	0.771	1.6	1.8	1.0E-07	-9999.0	-9999.0	0.170	0.8	-9999.0	-9999.0
13.189	2.88	3.07	0.01	17.42	0.33	111.4	0.774	0.000	0.774	1.5	1.7	1.0E-07	-9999.0	-9999.0	0.153	0.7	-9999.0	-9999.0
13.254	2.81	2.99	0.01	17.03	0.34	111.4	0.778	0.000	0.778	1.4	1.6	1.0E-07	-9999.0	-9999.0	0.148	0.7	-9999.0	-9999.0
13.320	2.37	2.58	0.02	19.56	0.78	111.4	0.782	0.000	0.782	1.2	1.4	1.0E-07	-9999.0	-9999.0	0.120	0.6	-9999.0	-9999.0
13.386	4.02	4.26	0.05	22.42	1.18	111.4	0.785	0.000	0.785	2.0	2.3	1.0E-07	-9999.0	-9999.0	0.232	1.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
13.451	8.24	8.46	0.08	20.46	0.95	114.6	0.789	0.000	0.789	4.1	4.6	5.0E-06	-9999.0	-9999.0	0.511	2.4	-9999.0	-9999.0
13.517	14.37	14.50	0.10	11.75	0.69	114.6	0.793	0.000	0.793	5.6	6.2	5.0E-05	30.0	32.0	0.914	5.7	-9999.0	-9999.0
13.583	17.50	17.57	0.13	6.68	0.74	114.6	0.797	0.000	0.797	6.7	7.5	5.0E-05	30.0	34.0	1.119	7.7	-9999.0	-9999.0
13.648	18.07	18.13	0.15	4.90	0.83	114.6	0.800	0.000	0.800	6.9	7.8	5.0E-05	30.0	34.0	1.155	8.0	-9999.0	-9999.0
13.714	17.37	17.41	0.18	3.66	1.04	114.6	0.804	0.000	0.804	6.7	7.4	5.0E-05	30.0	34.0	1.107	7.5	-9999.0	-9999.0
13.779	17.12	17.17	0.18	4.19	1.05	114.6	0.808	0.000	0.808	6.6	7.3	5.0E-05	30.0	34.0	1.091	7.2	-9999.0	-9999.0
13.845	16.29	16.33	0.16	4.15	0.98	114.6	0.812	0.000	0.812	6.3	6.9	5.0E-05	30.0	32.0	1.035	6.6	-9999.0	-9999.0
13.911	16.29	16.34	0.14	4.37	0.86	114.6	0.815	0.000	0.815	6.3	6.9	5.0E-05	30.0	32.0	1.035	6.6	-9999.0	-9999.0
13.976	15.78	15.82	0.14	4.17	0.89	114.6	0.819	0.000	0.819	6.1	6.7	5.0E-05	30.0	32.0	1.000	6.2	-9999.0	-9999.0
14.042	16.86	16.91	0.12	4.46	0.71	114.6	0.823	0.000	0.823	6.5	7.1	5.0E-05	30.0	32.0	1.072	6.8	-9999.0	-9999.0
14.107	16.29	16.33	0.09	4.09	0.55	114.6	0.827	0.000	0.827	6.3	6.9	5.0E-05	30.0	32.0	1.034	6.4	-9999.0	-9999.0
14.173	16.10	16.14	0.08	4.11	0.50	114.6	0.830	0.000	0.830	6.2	6.8	5.0E-05	30.0	32.0	1.021	6.2	-9999.0	-9999.0
14.239	15.53	15.57	0.07	3.80	0.45	114.6	0.834	0.000	0.834	6.0	6.5	5.0E-05	30.0	32.0	0.982	5.8	-9999.0	-9999.0
14.304	15.78	15.82	0.06	4.03	0.38	114.6	0.838	0.000	0.838	6.1	6.6	5.0E-05	30.0	32.0	0.999	6.0	-9999.0	-9999.0
14.370	14.57	14.61	0.05	4.03	0.34	114.6	0.842	0.000	0.842	5.6	6.1	5.0E-05	30.0	32.0	0.918	5.2	-9999.0	-9999.0
14.436	12.97	13.01	0.04	3.80	0.31	114.6	0.845	0.000	0.845	5.0	5.4	5.0E-05	30.0	32.0	0.811	4.3	-9999.0	-9999.0
14.501	12.39	12.43	0.05	4.09	0.40	114.6	0.849	0.000	0.849	4.8	5.2	5.0E-05	30.0	32.0	0.772	4.0	-9999.0	-9999.0
14.567	11.44	11.48	0.04	4.15	0.35	114.6	0.853	0.000	0.853	4.4	4.8	5.0E-05	30.0	30.0	0.709	3.5	-9999.0	-9999.0
14.632	11.82	11.87	0.04	4.42	0.34	114.6	0.857	0.000	0.857	4.5	4.9	5.0E-05	30.0	30.0	0.734	3.6	-9999.0	-9999.0
14.698	11.12	11.17	0.04	4.46	0.36	114.6	0.860	0.000	0.860	4.3	4.6	5.0E-05	30.0	30.0	0.687	3.3	-9999.0	-9999.0
14.764	10.80	10.85	0.04	4.68	0.37	114.6	0.864	0.000	0.864	4.2	4.5	5.0E-05	30.0	30.0	0.666	3.1	-9999.0	-9999.0
14.829	10.86	10.91	0.04	4.54	0.37	114.6	0.868	0.000	0.868	4.2	4.5	5.0E-05	30.0	30.0	0.669	3.1	-9999.0	-9999.0
14.895	9.96	10.01	0.04	4.17	0.40	114.6	0.872	0.000	0.872	3.8	4.1	5.0E-05	30.0	30.0	0.609	2.7	-9999.0	-9999.0
14.960	9.77	9.82	0.04	4.23	0.41	114.6	0.876	0.000	0.876	3.8	4.0	5.0E-05	30.0	30.0	0.596	2.6	-9999.0	-9999.0
15.026	8.50	8.54	0.04	3.89	0.47	111.4	0.879	0.000	0.879	4.1	4.4	1.0E-07	-9999.0	-9999.0	0.511	2.1	-9999.0	-9999.0
15.092	9.32	9.37	0.03	3.95	0.32	111.4	0.883	0.000	0.883	4.5	4.8	1.0E-07	-9999.0	-9999.0	0.565	2.4	-9999.0	-9999.0
15.157	9.39	9.44	0.02	4.31	0.21	111.4	0.887	0.000	0.887	4.5	4.8	1.0E-07	-9999.0	-9999.0	0.570	2.4	-9999.0	-9999.0
15.223	9.26	9.31	0.02	4.31	0.22	111.4	0.890	0.000	0.890	4.5	4.7	1.0E-07	-9999.0	-9999.0	0.561	2.3	-9999.0	-9999.0
15.289	10.03	10.09	0.02	4.82	0.20	114.6	0.894	0.000	0.894	3.9	4.1	5.0E-05	30.0	30.0	0.613	2.6	-9999.0	-9999.0
15.354	9.32	9.37	0.02	4.70	0.21	111.4	0.898	0.000	0.898	4.5	4.7	1.0E-07	-9999.0	-9999.0	0.565	2.3	-9999.0	-9999.0
15.420	10.42	10.47	0.02	4.94	0.19	114.6	0.901	0.000	0.901	4.0	4.2	5.0E-05	30.0	30.0	0.638	2.8	-9999.0	-9999.0
15.485	10.54	10.58	0.02	4.56	0.19	114.6	0.905	0.000	0.905	4.1	4.3	5.0E-05	30.0	30.0	0.645	2.8	-9999.0	-9999.0
15.551	11.31	11.36	0.02	4.84	0.18	114.6	0.909	0.000	0.909	4.4	4.6	5.0E-05	30.0	30.0	0.697	3.1	-9999.0	-9999.0
15.617	11.05	11.10	0.03	4.80	0.27	114.6	0.913	0.000	0.913	4.3	4.5	5.0E-05	30.0	30.0	0.679	3.0	-9999.0	-9999.0
15.682	11.76	11.81	0.04	4.78	0.34	114.6	0.916	0.000	0.916	4.5	4.7	5.0E-05	30.0	30.0	0.726	3.2	-9999.0	-9999.0
15.748	10.22	10.27	0.05	4.29	0.49	114.6	0.920	0.000	0.920	3.9	4.1	5.0E-05	30.0	30.0	0.623	2.6	-9999.0	-9999.0
15.813	10.03	10.09	0.06	5.05	0.60	114.6	0.924	0.000	0.924	3.9	4.0	5.0E-05	30.0	30.0	0.611	2.5	-9999.0	-9999.0
15.879	9.26	9.32	0.07	4.98	0.75	114.6	0.928	0.000	0.928	4.5	4.6	5.0E-06	-9999.0	-9999.0	0.559	2.2	-9999.0	-9999.0
15.945	9.26	9.32	0.08	5.21	0.86	114.6	0.931	0.000	0.931	4.5	4.6	5.0E-06	-9999.0	-9999.0	0.559	2.2	-9999.0	-9999.0
16.010	9.96	10.03	0.09	5.69	0.90	114.6	0.935	0.000	0.935	3.8	4.0	5.0E-05	30.0	30.0	0.606	2.4	-9999.0	-9999.0
16.076	11.18	11.24	0.10	5.79	0.89	114.6	0.939	0.000	0.939	4.3	4.4	5.0E-05	30.0	30.0	0.687	2.9	-9999.0	-9999.0
16.142	11.76	11.82	0.10	6.01	0.85	114.6	0.943	0.000	0.943	4.5	4.7	5.0E-05	30.0	30.0	0.725	3.1	-9999.0	-9999.0
16.207	12.58	12.64	0.11	5.75	0.87	114.6	0.946	0.000	0.946	4.8	5.0	5.0E-05	30.0	30.0	0.780	3.4	-9999.0	-9999.0
16.273	14.24	14.31	0.12	6.46	0.84	114.6	0.950	0.000	0.950	5.5	5.6	5.0E-05	30.0	32.0	0.891	4.1	-9999.0	-9999.0
16.338	15.14	15.20	0.13	6.01	0.86	114.6	0.954	0.000	0.954	5.8	6.0	5.0E-05	30.0	32.0	0.950	4.5	-9999.0	-9999.0
16.404	15.40	15.46	0.13	5.99	0.84	114.6	0.958	0.000	0.958	5.9	6.1	5.0E-05	30.0	32.0	0.967	4.6	-9999.0	-9999.0
16.470	15.27	15.33	0.13	5.47	0.85	114.6	0.961	0.000	0.961	5.9	6.0	5.0E-05	30.0	32.0	0.958	4.5	-9999.0	-9999.0
16.535	13.60	13.66	0.15	5.17	1.10	114.6	0.965	0.000	0.965	5.2	5.3	5.0E-05	30.0	30.0	0.846	3.7	-9999.0	-9999.0
16.601	12.71	12.77	0.17	5.47	1.33	114.6	0.969	0.000	0.969	4.9	5.0	5.0E-05	30.0	30.0	0.787	3.3	-9999.0	-9999.0
16.666	12.01	12.07	0.16	5.81	1.33	114.6	0.973	0.000	0.973	4.6	4.7	5.0E-05	30.0	30.0	0.740	3.0	-9999.0	-9999.0
16.732	11.18	11.24	0.16	6.07	1.43	114.6	0.976	0.000	0.976	5.4	5.4	5.0E-06	-9999.0	-9999.0	0.684	2.7	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
16.798	12.33	12.41	0.18	7.05	1.45	114.6	0.980	0.000	0.980	5.9	6.0	5.0E-06	-9999.0	-9999.0	0.762	3.1	-9999.0	-9999.0
16.863	14.11	14.19	0.20	7.40	1.41	114.6	0.984	0.000	0.984	5.4	5.5	5.0E-05	30.0	32.0	0.881	3.9	-9999.0	-9999.0
16.929	16.99	17.08	0.22	8.61	1.29	114.6	0.988	0.000	0.988	6.5	6.6	5.0E-05	30.0	32.0	1.073	5.2	-9999.0	-9999.0
16.995	19.42	19.53	0.23	10.20	1.18	114.6	0.992	0.000	0.992	7.5	7.5	5.0E-05	30.0	32.0	1.236	6.4	-9999.0	-9999.0
17.060	22.23	22.33	0.26	8.93	1.17	114.6	0.995	0.000	0.995	8.6	8.6	5.0E-05	30.0	34.0	1.422	7.9	-9999.0	-9999.0
17.126	24.85	24.94	0.28	8.10	1.13	114.6	0.999	0.000	0.999	9.6	9.6	5.0E-05	30.0	34.0	1.596	9.4	-9999.0	-9999.0
17.191	24.40	24.47	0.29	6.99	1.19	114.6	1.003	0.000	1.003	9.4	9.4	5.0E-05	30.0	34.0	1.565	9.1	-9999.0	-9999.0
17.257	23.26	23.33	0.30	6.93	1.29	114.6	1.007	0.000	1.007	8.9	8.9	5.0E-05	30.0	34.0	1.488	8.3	-9999.0	-9999.0
17.323	21.65	21.73	0.30	7.19	1.38	114.6	1.010	0.000	1.010	8.3	8.3	5.0E-05	30.0	34.0	1.381	7.4	-9999.0	-9999.0
17.388	20.38	20.46	0.31	7.15	1.52	114.6	1.014	0.000	1.014	7.8	7.8	5.0E-05	30.0	32.0	1.296	6.6	-9999.0	-9999.0
17.454	19.23	19.30	0.31	6.93	1.61	114.6	1.018	0.000	1.018	7.4	7.3	5.0E-05	30.0	32.0	1.219	6.0	-9999.0	-9999.0
17.519	18.14	18.22	0.31	7.46	1.71	114.6	1.022	0.000	1.022	7.0	6.9	5.0E-05	30.0	32.0	1.147	5.4	-9999.0	-9999.0
17.585	16.74	16.82	0.30	7.38	1.79	114.6	1.025	0.000	1.025	6.4	6.4	5.0E-05	30.0	32.0	1.053	4.7	-9999.0	-9999.0
17.651	15.27	15.36	0.30	8.53	1.96	114.6	1.029	0.000	1.029	7.4	7.3	5.0E-06	-9999.0	-9999.0	0.955	4.1	-9999.0	-9999.0
17.716	15.08	15.17	0.29	8.83	1.92	114.6	1.033	0.000	1.033	7.3	7.1	5.0E-06	-9999.0	-9999.0	0.943	4.0	-9999.0	-9999.0
17.782	14.57	14.66	0.29	8.48	1.98	114.6	1.037	0.000	1.037	7.0	6.9	5.0E-06	-9999.0	-9999.0	0.908	3.7	-9999.0	-9999.0
17.848	15.14	15.23	0.27	8.30	1.78	114.6	1.040	0.000	1.040	5.8	5.7	5.0E-05	30.0	32.0	0.946	3.9	-9999.0	-9999.0
17.913	15.53	15.61	0.26	7.44	1.67	114.6	1.044	0.000	1.044	6.0	5.9	5.0E-05	30.0	32.0	0.971	4.1	-9999.0	-9999.0
17.979	16.04	16.11	0.24	6.97	1.49	114.6	1.048	0.000	1.048	6.2	6.0	5.0E-05	30.0	32.0	1.004	4.3	-9999.0	-9999.0
18.044	14.57	14.64	0.23	6.52	1.58	114.6	1.052	0.001	1.050	5.6	5.5	5.0E-05	30.0	30.0	0.906	3.7	-9999.0	-9999.0
18.110	13.92	14.00	0.22	6.95	1.58	114.6	1.055	0.003	1.052	5.4	5.2	5.0E-05	30.0	30.0	0.863	3.4	-9999.0	-9999.0
18.176	13.41	13.49	0.22	7.07	1.63	114.6	1.059	0.005	1.054	6.5	6.3	5.0E-06	-9999.0	-9999.0	0.829	3.2	-9999.0	-9999.0
18.241	12.33	12.40	0.22	6.95	1.78	114.6	1.063	0.008	1.055	5.9	5.8	5.0E-06	-9999.0	-9999.0	0.756	2.8	-9999.0	-9999.0
18.307	11.95	12.02	0.21	7.03	1.75	114.6	1.067	0.010	1.057	5.8	5.6	5.0E-06	-9999.0	-9999.0	0.731	2.7	-9999.0	-9999.0
18.372	11.18	11.26	0.20	7.25	1.78	114.6	1.070	0.012	1.059	5.4	5.2	5.0E-06	-9999.0	-9999.0	0.679	2.4	-9999.0	-9999.0
18.438	10.93	11.01	0.20	7.85	1.82	114.6	1.074	0.014	1.061	5.3	5.1	5.0E-06	-9999.0	-9999.0	0.662	2.3	-9999.0	-9999.0
18.504	11.05	11.13	0.21	8.08	1.89	114.6	1.078	0.016	1.062	5.3	5.2	5.0E-06	-9999.0	-9999.0	0.670	2.4	-9999.0	-9999.0
18.569	10.74	10.82	0.19	7.83	1.76	114.6	1.082	0.018	1.064	5.2	5.0	5.0E-06	-9999.0	-9999.0	0.649	2.2	-9999.0	-9999.0
18.635	10.35	10.43	0.20	7.42	1.92	114.6	1.085	0.020	1.066	5.0	4.8	5.0E-06	-9999.0	-9999.0	0.623	2.1	-9999.0	-9999.0
18.701	9.52	9.60	0.19	7.13	1.98	114.6	1.089	0.022	1.067	4.6	4.4	5.0E-06	-9999.0	-9999.0	0.567	1.9	-9999.0	-9999.0
18.766	9.13	9.21	0.17	7.56	1.85	114.6	1.093	0.024	1.069	4.4	4.3	5.0E-06	-9999.0	-9999.0	0.541	1.8	-9999.0	-9999.0
18.832	9.32	9.40	0.16	7.48	1.71	114.6	1.097	0.026	1.071	4.5	4.4	5.0E-06	-9999.0	-9999.0	0.554	1.8	-9999.0	-9999.0
18.897	8.69	8.77	0.15	7.62	1.71	114.6	1.101	0.028	1.073	4.2	4.1	5.0E-06	-9999.0	-9999.0	0.512	1.6	-9999.0	-9999.0
18.963	8.11	8.19	0.15	7.40	1.84	114.6	1.104	0.030	1.074	3.9	3.8	5.0E-06	-9999.0	-9999.0	0.472	1.5	-9999.0	-9999.0
19.029	9.07	9.16	0.14	7.70	1.53	114.6	1.108	0.032	1.076	4.4	4.2	5.0E-06	-9999.0	-9999.0	0.536	1.7	-9999.0	-9999.0
19.094	8.62	8.69	0.13	6.81	1.50	114.6	1.112	0.034	1.078	4.2	4.0	5.0E-06	-9999.0	-9999.0	0.506	1.6	-9999.0	-9999.0
19.160	9.07	9.14	0.12	6.74	1.32	114.6	1.116	0.036	1.079	4.4	4.2	5.0E-06	-9999.0	-9999.0	0.535	1.7	-9999.0	-9999.0
19.225	9.32	9.40	0.12	7.03	1.28	114.6	1.119	0.038	1.081	4.5	4.3	5.0E-06	-9999.0	-9999.0	0.552	1.8	-9999.0	-9999.0
19.291	9.20	9.28	0.12	6.95	1.30	114.6	1.123	0.040	1.083	4.4	4.3	5.0E-06	-9999.0	-9999.0	0.544	1.7	-9999.0	-9999.0
19.357	8.50	8.57	0.11	6.87	1.29	114.6	1.127	0.042	1.084	4.1	3.9	5.0E-06	-9999.0	-9999.0	0.497	1.6	-9999.0	-9999.0
19.422	8.11	8.19	0.13	7.29	1.59	114.6	1.131	0.044	1.086	3.9	3.8	5.0E-06	-9999.0	-9999.0	0.471	1.5	-9999.0	-9999.0
19.488	8.05	8.13	0.13	7.42	1.60	114.6	1.134	0.046	1.088	3.9	3.7	5.0E-06	-9999.0	-9999.0	0.466	1.4	-9999.0	-9999.0
19.554	7.92	8.00	0.14	7.46	1.75	114.6	1.138	0.049	1.090	3.8	3.7	5.0E-06	-9999.0	-9999.0	0.457	1.4	-9999.0	-9999.0
19.619	8.43	8.51	0.13	7.66	1.53	114.6	1.142	0.051	1.091	4.1	3.9	5.0E-06	-9999.0	-9999.0	0.491	1.5	-9999.0	-9999.0
19.685	8.62	8.70	0.13	7.76	1.50	114.6	1.146	0.053	1.093	4.2	4.0	5.0E-06	-9999.0	-9999.0	0.504	1.6	-9999.0	-9999.0
19.750	10.22	10.31	0.14	8.12	1.36	114.6	1.149	0.055	1.095	4.9	4.7	5.0E-06	-9999.0	-9999.0	0.611	2.0	-9999.0	-9999.0
19.816	11.18	11.26	0.14	7.87	1.25	114.6	1.153	0.057	1.096	5.4	5.2	5.0E-06	-9999.0	-9999.0	0.674	2.3	-9999.0	-9999.0
19.882	11.88	11.96	0.14	7.68	1.17	114.6	1.157	0.059	1.098	4.6	4.4	5.0E-05	30.0	30.0	0.720	2.5	-9999.0	-9999.0
19.947	12.27	12.35	0.15	7.44	1.22	114.6	1.161	0.061	1.100	4.7	4.5	5.0E-05	30.0	30.0	0.746	2.6	-9999.0	-9999.0
20.013	11.56	11.64	0.14	7.36	1.21	114.6	1.164	0.063	1.102	4.5	4.2	5.0E-05	30.0	30.0	0.698	2.4	-9999.0	-9999.0
20.078	11.56	11.64	0.14	7.50	1.21	114.6	1.168	0.065	1.103	4.5	4.2	5.0E-05	30.0	30.0	0.698	2.4	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
20.144	10.61	10.68	0.14	7.25	1.31	114.6	1.172	0.067	1.105	5.1	4.9	5.0E-06	-9999.0	-9999.0	0.634	2.1	-9999.0	-9999.0
20.210	9.26	9.34	0.13	7.15	1.40	114.6	1.176	0.069	1.107	4.5	4.3	5.0E-06	-9999.0	-9999.0	0.544	1.7	-9999.0	-9999.0
20.275	9.20	9.28	0.13	7.19	1.40	114.6	1.179	0.071	1.108	4.4	4.2	5.0E-06	-9999.0	-9999.0	0.540	1.7	-9999.0	-9999.0
20.341	8.56	8.64	0.12	7.13	1.39	114.6	1.183	0.073	1.110	4.1	3.9	5.0E-06	-9999.0	-9999.0	0.497	1.5	-9999.0	-9999.0
20.407	8.11	8.19	0.12	7.38	1.47	114.6	1.187	0.075	1.112	3.9	3.7	5.0E-06	-9999.0	-9999.0	0.467	1.4	-9999.0	-9999.0
20.472	7.79	7.87	0.12	7.56	1.53	114.6	1.191	0.077	1.114	3.8	3.6	5.0E-06	-9999.0	-9999.0	0.445	1.3	-9999.0	-9999.0
20.538	7.41	7.50	0.11	8.12	1.47	114.6	1.195	0.079	1.115	3.6	3.4	5.0E-06	-9999.0	-9999.0	0.420	1.3	-9999.0	-9999.0
20.603	7.16	7.25	0.12	8.71	1.66	114.6	1.198	0.081	1.117	3.5	3.3	5.0E-06	-9999.0	-9999.0	0.404	1.2	-9999.0	-9999.0
20.669	7.16	7.25	0.12	8.81	1.66	114.6	1.202	0.083	1.119	3.5	3.3	5.0E-06	-9999.0	-9999.0	0.403	1.2	-9999.0	-9999.0
20.735	6.84	6.93	0.12	8.79	1.74	114.6	1.206	0.085	1.120	3.3	3.1	5.0E-06	-9999.0	-9999.0	0.382	1.1	-9999.0	-9999.0
20.800	7.41	7.51	0.11	9.09	1.47	114.6	1.210	0.087	1.122	3.6	3.4	5.0E-06	-9999.0	-9999.0	0.420	1.2	-9999.0	-9999.0
20.866	6.71	6.80	0.12	9.03	1.77	114.6	1.213	0.089	1.124	3.3	3.1	5.0E-06	-9999.0	-9999.0	0.373	1.1	-9999.0	-9999.0
20.932	6.39	6.48	0.10	8.67	1.55	114.6	1.217	0.092	1.126	3.1	2.9	5.0E-06	-9999.0	-9999.0	0.351	1.0	-9999.0	-9999.0
20.997	5.94	6.04	0.11	8.44	1.83	114.6	1.221	0.094	1.127	3.9	3.6	5.0E-07	-9999.0	-9999.0	0.321	1.0	-9999.0	-9999.0
21.063	6.00	6.10	0.11	9.03	1.81	114.6	1.225	0.096	1.129	3.9	3.7	5.0E-07	-9999.0	-9999.0	0.325	1.0	-9999.0	-9999.0
21.128	5.30	5.41	0.11	10.18	2.04	114.6	1.228	0.098	1.131	3.5	3.3	5.0E-07	-9999.0	-9999.0	0.279	0.8	-9999.0	-9999.0
21.194	5.43	5.56	0.10	11.55	1.80	114.6	1.232	0.100	1.132	3.5	3.3	5.0E-07	-9999.0	-9999.0	0.288	0.9	-9999.0	-9999.0
21.260	4.98	5.10	0.11	11.32	2.16	114.6	1.236	0.102	1.134	3.3	3.1	5.0E-07	-9999.0	-9999.0	0.258	0.8	-9999.0	-9999.0
21.325	5.62	5.75	0.12	11.24	2.09	114.6	1.240	0.104	1.136	3.7	3.4	5.0E-07	-9999.0	-9999.0	0.300	0.9	-9999.0	-9999.0
21.391	5.24	5.36	0.11	10.92	2.06	114.6	1.243	0.106	1.138	3.4	3.2	5.0E-07	-9999.0	-9999.0	0.274	0.8	-9999.0	-9999.0
21.456	5.55	5.67	0.11	11.08	1.94	114.6	1.247	0.108	1.139	3.6	3.4	5.0E-07	-9999.0	-9999.0	0.295	0.9	-9999.0	-9999.0
21.522	5.43	5.55	0.11	10.63	1.99	114.6	1.251	0.110	1.141	3.5	3.3	5.0E-07	-9999.0	-9999.0	0.286	0.9	-9999.0	-9999.0
21.588	6.13	6.25	0.11	10.45	1.76	114.6	1.255	0.112	1.143	4.0	3.7	5.0E-07	-9999.0	-9999.0	0.333	1.0	-9999.0	-9999.0
21.653	7.22	7.33	0.11	10.45	1.50	114.6	1.258	0.114	1.144	3.5	3.3	5.0E-06	-9999.0	-9999.0	0.405	1.2	-9999.0	-9999.0
21.719	6.71	6.81	0.10	9.81	1.47	114.6	1.262	0.116	1.146	3.3	3.0	5.0E-06	-9999.0	-9999.0	0.370	1.1	-9999.0	-9999.0
21.785	7.54	7.64	0.10	9.38	1.31	114.6	1.266	0.118	1.148	3.7	3.4	5.0E-06	-9999.0	-9999.0	0.425	1.2	-9999.0	-9999.0
21.850	7.35	7.45	0.10	9.28	1.35	114.6	1.270	0.120	1.149	3.6	3.3	5.0E-06	-9999.0	-9999.0	0.412	1.2	-9999.0	-9999.0
21.916	7.60	7.70	0.10	9.42	1.30	114.6	1.273	0.122	1.151	3.7	3.4	5.0E-06	-9999.0	-9999.0	0.428	1.2	-9999.0	-9999.0
21.981	7.54	7.64	0.10	9.12	1.31	114.6	1.277	0.124	1.153	3.7	3.4	5.0E-06	-9999.0	-9999.0	0.424	1.2	-9999.0	-9999.0
22.047	6.46	6.55	0.11	8.91	1.68	114.6	1.281	0.126	1.155	3.1	2.9	5.0E-06	-9999.0	-9999.0	0.351	1.0	-9999.0	-9999.0
22.113	6.00	6.11	0.11	9.38	1.81	114.6	1.285	0.128	1.156	3.9	3.6	5.0E-07	-9999.0	-9999.0	0.321	0.9	-9999.0	-9999.0
22.178	5.94	6.05	0.11	9.36	1.82	114.6	1.288	0.130	1.158	3.9	3.6	5.0E-07	-9999.0	-9999.0	0.317	0.9	-9999.0	-9999.0
22.244	4.98	5.08	0.11	9.01	2.17	114.6	1.292	0.133	1.160	3.2	3.0	5.0E-07	-9999.0	-9999.0	0.252	0.8	-9999.0	-9999.0
22.309	5.62	5.73	0.11	9.60	1.93	114.6	1.296	0.135	1.161	3.7	3.4	5.0E-07	-9999.0	-9999.0	0.295	0.9	-9999.0	-9999.0
22.375	6.06	6.16	0.11	9.01	1.79	114.6	1.300	0.137	1.163	3.9	3.6	5.0E-07	-9999.0	-9999.0	0.324	0.9	-9999.0	-9999.0
22.441	5.30	5.42	0.11	10.73	2.03	114.6	1.304	0.139	1.165	3.5	3.2	5.0E-07	-9999.0	-9999.0	0.274	0.8	-9999.0	-9999.0
22.506	6.00	6.13	0.10	11.79	1.63	114.6	1.307	0.141	1.167	3.9	3.6	5.0E-07	-9999.0	-9999.0	0.322	0.9	-9999.0	-9999.0
22.572	5.55	5.67	0.10	11.16	1.77	114.6	1.311	0.143	1.168	3.6	3.4	5.0E-07	-9999.0	-9999.0	0.291	0.9	-9999.0	-9999.0
22.638	4.92	5.04	0.09	11.08	1.79	114.6	1.315	0.145	1.170	3.2	3.0	5.0E-07	-9999.0	-9999.0	0.248	0.8	-9999.0	-9999.0
22.703	4.79	4.91	0.10	10.94	2.04	114.6	1.319	0.147	1.172	3.1	2.9	5.0E-07	-9999.0	-9999.0	0.239	0.7	-9999.0	-9999.0
22.769	4.22	4.34	0.10	11.53	2.31	111.4	1.322	0.149	1.173	4.2	3.8	5.0E-08	-9999.0	-9999.0	0.202	0.7	-9999.0	-9999.0
22.834	3.58	3.70	0.09	11.57	2.44	111.4	1.326	0.151	1.175	3.5	3.3	5.0E-08	-9999.0	-9999.0	0.159	0.6	-9999.0	-9999.0
22.900	2.69	2.82	0.08	12.22	2.85	111.4	1.330	0.153	1.177	2.7	2.5	5.0E-08	-9999.0	-9999.0	0.099	0.5	-9999.0	-9999.0
22.966	2.11	2.25	0.06	13.45	2.67	111.4	1.333	0.155	1.178	2.2	2.0	5.0E-08	-9999.0	-9999.0	0.061	0.5	-9999.0	-9999.0
23.031	2.37	2.53	0.06	15.41	2.38	111.4	1.337	0.157	1.180	2.4	2.2	5.0E-08	-9999.0	-9999.0	0.080	0.5	-9999.0	-9999.0
23.097	2.18	2.36	0.04	16.91	1.70	111.4	1.341	0.159	1.181	1.1	1.0	1.0E-07	-9999.0	-9999.0	0.068	0.5	-9999.0	-9999.0
23.162	2.37	2.56	0.03	17.66	1.18	111.4	1.344	0.161	1.183	1.2	1.1	1.0E-07	-9999.0	-9999.0	0.081	0.5	-9999.0	-9999.0
23.228	2.88	3.07	0.03	18.05	0.98	111.4	1.348	0.163	1.185	1.5	1.4	1.0E-07	-9999.0	-9999.0	0.115	0.5	-9999.0	-9999.0
23.294	2.81	2.99	0.03	17.21	1.00	111.4	1.352	0.165	1.186	1.4	1.3	1.0E-07	-9999.0	-9999.0	0.109	0.5	-9999.0	-9999.0
23.359	3.20	3.37	0.04	16.31	1.19	111.4	1.355	0.167	1.188	1.6	1.5	1.0E-07	-9999.0	-9999.0	0.135	0.6	-9999.0	-9999.0
23.425	3.45	3.61	0.05	15.25	1.39	111.4	1.359	0.169	1.189	1.7	1.6	1.0E-07	-9999.0	-9999.0	0.150	0.6	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
23.491	3.77	3.93	0.05	14.72	1.28	111.4	1.362	0.171	1.191	1.9	1.7	1.0E-07	-9999.0	-9999.0	0.171	0.6	-9999.0	-9999.0
23.556	4.09	4.25	0.06	14.54	1.42	111.4	1.366	0.173	1.193	2.0	1.9	1.0E-07	-9999.0	-9999.0	0.192	0.6	-9999.0	-9999.0
23.622	3.51	3.67	0.07	14.66	1.91	111.4	1.370	0.176	1.194	1.8	1.6	1.0E-07	-9999.0	-9999.0	0.153	0.6	-9999.0	-9999.0
23.687	3.26	3.42	0.07	15.41	2.05	111.4	1.373	0.178	1.196	1.6	1.5	1.0E-07	-9999.0	-9999.0	0.137	0.6	-9999.0	-9999.0
23.753	3.96	4.13	0.07	15.39	1.70	111.4	1.377	0.180	1.197	2.0	1.8	1.0E-07	-9999.0	-9999.0	0.183	0.6	-9999.0	-9999.0
23.819	3.20	3.37	0.06	15.64	1.79	111.4	1.381	0.182	1.199	1.6	1.5	1.0E-07	-9999.0	-9999.0	0.132	0.6	-9999.0	-9999.0
23.884	2.50	2.67	0.05	16.00	1.88	111.4	1.384	0.184	1.201	1.3	1.2	1.0E-07	-9999.0	-9999.0	0.086	0.5	-9999.0	-9999.0
23.950	3.01	3.19	0.05	16.77	1.57	111.4	1.388	0.186	1.202	1.5	1.4	1.0E-07	-9999.0	-9999.0	0.120	0.5	-9999.0	-9999.0
24.015	2.43	2.61	0.04	16.69	1.54	111.4	1.392	0.188	1.204	1.2	1.1	1.0E-07	-9999.0	-9999.0	0.081	0.5	-9999.0	-9999.0
24.081	3.07	3.25	0.04	16.69	1.23	111.4	1.395	0.190	1.205	1.6	1.4	1.0E-07	-9999.0	-9999.0	0.123	0.5	-9999.0	-9999.0
24.147	2.50	2.68	0.03	17.07	1.12	111.4	1.399	0.192	1.207	1.3	1.2	1.0E-07	-9999.0	-9999.0	0.085	0.5	-9999.0	-9999.0
24.212	2.62	2.81	0.03	17.52	1.07	111.4	1.403	0.194	1.209	1.3	1.2	1.0E-07	-9999.0	-9999.0	0.094	0.5	-9999.0	-9999.0
24.278	2.50	2.69	0.02	17.62	0.75	111.4	1.406	0.196	1.210	1.3	1.2	1.0E-07	-9999.0	-9999.0	0.085	0.5	-9999.0	-9999.0
24.344	2.24	2.43	0.02	17.82	0.83	111.4	1.410	0.198	1.212	1.2	1.1	1.0E-07	-9999.0	-9999.0	0.068	0.5	-9999.0	-9999.0
24.409	2.43	2.62	0.02	18.15	0.76	111.4	1.414	0.200	1.214	1.3	1.1	1.0E-07	-9999.0	-9999.0	0.081	0.5	-9999.0	-9999.0
24.475	1.72	1.92	0.01	18.21	0.52	111.4	1.417	0.202	1.215	0.9	0.8	1.0E-07	-9999.0	-9999.0	0.034	0.5	-9999.0	-9999.0
24.540	2.50	2.69	0.01	18.35	0.37	111.4	1.421	0.204	1.217	1.3	1.2	1.0E-07	-9999.0	-9999.0	0.085	0.5	-9999.0	-9999.0
24.606	1.85	2.05	0.01	18.05	0.49	111.4	1.425	0.206	1.218	1.0	0.9	1.0E-07	-9999.0	-9999.0	0.042	0.5	-9999.0	-9999.0
24.672	2.11	2.30	0.01	18.27	0.44	111.4	1.428	0.208	1.220	1.1	1.0	1.0E-07	-9999.0	-9999.0	0.058	0.5	-9999.0	-9999.0
24.737	1.91	2.12	0.01	18.68	0.47	111.4	1.432	0.210	1.222	1.0	0.9	1.0E-07	-9999.0	-9999.0	0.046	0.5	-9999.0	-9999.0
24.803	1.53	1.74	0.01	19.05	0.58	111.4	1.436	0.212	1.223	0.8	0.8	1.0E-07	-9999.0	-9999.0	0.020	0.5	-9999.0	-9999.0
24.868	1.91	2.12	0.01	19.10	0.47	111.4	1.439	0.214	1.225	1.0	0.9	1.0E-07	-9999.0	-9999.0	0.045	0.5	-9999.0	-9999.0
24.934	1.34	1.55	0.01	18.88	0.65	111.4	1.443	0.217	1.226	0.7	0.7	1.0E-07	-9999.0	-9999.0	0.007	0.5	-9999.0	-9999.0
25.000	1.85	2.06	0.01	19.07	0.49	111.4	1.447	0.219	1.228	1.0	0.9	1.0E-07	-9999.0	-9999.0	0.041	0.5	-9999.0	-9999.0
25.065	1.08	1.29	0.01	18.97	0.78	111.4	1.450	0.221	1.230	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
25.131	1.00	1.21	0.01	19.60	0.83	111.4	1.454	0.223	1.231	0.6	0.5	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
25.197	1.21	1.43	0.01	20.01	0.70	111.4	1.457	0.225	1.233	0.7	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
25.262	1.40	1.62	0.01	20.36	0.62	111.4	1.461	0.227	1.234	0.8	0.7	1.0E-07	-9999.0	-9999.0	0.011	0.5	-9999.0	-9999.0
25.328	1.00	1.22	0.01	20.52	0.82	111.4	1.465	0.229	1.236	0.6	0.5	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
25.393	1.21	1.44	0.01	20.76	0.70	111.4	1.468	0.231	1.238	0.7	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
25.459	1.00	1.23	0.01	20.70	0.82	111.4	1.472	0.233	1.239	0.6	0.5	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
25.525	1.00	1.22	0.01	20.44	0.82	111.4	1.476	0.235	1.241	0.6	0.5	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
25.590	1.08	1.31	0.01	20.97	0.77	111.4	1.479	0.237	1.242	0.6	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
25.656	1.34	1.58	0.01	21.73	0.64	111.4	1.483	0.239	1.244	0.8	0.7	1.0E-07	-9999.0	-9999.0	0.006	0.5	-9999.0	-9999.0
25.721	1.78	1.96	0.01	16.69	0.51	111.4	1.487	0.241	1.246	0.9	0.8	1.0E-07	-9999.0	-9999.0	0.032	0.5	-9999.0	-9999.0
25.787	1.91	2.11	0.01	18.27	0.47	111.4	1.490	0.243	1.247	1.0	0.9	1.0E-07	-9999.0	-9999.0	0.041	0.5	-9999.0	-9999.0
25.853	1.78	1.99	0.01	18.60	0.50	111.4	1.494	0.245	1.249	1.0	0.9	1.0E-07	-9999.0	-9999.0	0.033	0.5	-9999.0	-9999.0
25.918	1.00	1.22	0.01	19.75	0.82	111.4	1.498	0.247	1.250	0.6	0.5	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
25.984	1.15	1.38	0.01	20.95	0.73	111.4	1.501	0.249	1.252	0.7	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
26.050	1.00	1.23	0.01	21.15	0.81	111.4	1.505	0.251	1.254	0.6	0.5	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
26.115	1.00	1.23	0.01	21.30	0.81	111.4	1.509	0.253	1.255	0.6	0.5	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
26.181	1.34	1.58	0.01	21.65	0.64	111.4	1.512	0.255	1.257	0.8	0.7	1.0E-07	-9999.0	-9999.0	0.004	0.5	-9999.0	-9999.0
26.246	1.27	1.51	0.01	21.77	0.66	111.4	1.516	0.257	1.258	0.7	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
26.312	1.00	1.23	0.01	21.40	0.81	111.4	1.520	0.260	1.260	0.6	0.5	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
26.378	1.21	1.45	0.01	21.49	0.69	111.4	1.523	0.262	1.262	0.7	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
26.443	1.00	1.24	0.01	21.79	0.81	111.4	1.527	0.264	1.263	0.6	0.5	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
26.509	1.47	1.72	0.01	22.46	0.58	111.4	1.531	0.266	1.265	0.8	0.7	1.0E-07	-9999.0	-9999.0	0.012	0.5	-9999.0	-9999.0
26.574	1.00	1.24	0.01	21.75	0.81	111.4	1.534	0.268	1.267	0.6	0.5	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
26.640	1.00	1.23	0.01	21.47	0.81	111.4	1.538	0.270	1.268	0.6	0.5	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
26.706	1.21	1.45	0.01	21.55	0.69	111.4	1.542	0.272	1.270	0.7	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
26.771	1.15	1.39	0.01	21.61	0.72	111.4	1.545	0.274	1.271	0.7	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
26.837	1.34	1.58	0.01	22.10	0.63	111.4	1.549	0.276	1.273	0.8	0.7	1.0E-07	-9999.0	-9999.0	0.002	0.5	-9999.0	-9999.0
26.903	1.85	2.10	0.01	22.77	0.48	111.4	1.553	0.278	1.275	1.0	0.9	1.0E-07	-9999.0	-9999.0	0.037	0.5	-9999.0	-9999.0
26.968	2.04	2.30	0.01	23.15	0.44	111.4	1.556	0.280	1.276	1.1	1.0	1.0E-07	-9999.0	-9999.0	0.049	0.5	-9999.0	-9999.0
27.034	2.50	2.72	0.01	20.76	0.37	111.4	1.560	0.282	1.278	1.3	1.2	1.0E-07	-9999.0	-9999.0	0.077	0.5	-9999.0	-9999.0
27.099	3.13	3.32	0.01	17.86	0.30	111.4	1.563	0.284	1.279	1.6	1.4	1.0E-07	-9999.0	-9999.0	0.117	0.5	-9999.0	-9999.0
27.165	2.50	2.69	0.01	17.50	0.37	111.4	1.567	0.286	1.281	1.3	1.1	1.0E-07	-9999.0	-9999.0	0.075	0.5	-9999.0	-9999.0
27.231	2.88	3.08	0.01	19.14	0.33	111.4	1.571	0.288	1.283	1.5	1.3	1.0E-07	-9999.0	-9999.0	0.101	0.5	-9999.0	-9999.0
27.296	1.85	2.07	0.02	19.93	0.97	111.4	1.574	0.290	1.284	1.0	0.9	1.0E-07	-9999.0	-9999.0	0.033	0.5	-9999.0	-9999.0
27.362	2.11	2.33	0.01	20.91	0.43	111.4	1.578	0.292	1.286	1.1	1.0	1.0E-07	-9999.0	-9999.0	0.050	0.5	-9999.0	-9999.0
27.427	1.47	1.71	0.01	21.81	0.59	111.4	1.582	0.294	1.287	0.8	0.7	1.0E-07	-9999.0	-9999.0	0.008	0.5	-9999.0	-9999.0
27.493	1.59	1.85	0.01	23.63	0.54	111.4	1.585	0.296	1.289	0.9	0.8	1.0E-07	-9999.0	-9999.0	0.018	0.5	-9999.0	-9999.0
27.559	1.15	1.41	0.01	23.98	0.71	111.4	1.589	0.298	1.291	0.7	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
27.624	1.91	2.16	0.01	22.65	0.46	111.4	1.593	0.300	1.292	1.0	0.9	1.0E-07	-9999.0	-9999.0	0.038	0.5	-9999.0	-9999.0
27.690	2.37	2.60	0.01	21.69	0.39	111.4	1.596	0.303	1.294	1.2	1.1	1.0E-07	-9999.0	-9999.0	0.067	0.5	-9999.0	-9999.0
27.756	3.07	3.30	0.01	21.22	0.30	111.4	1.600	0.305	1.295	1.6	1.4	1.0E-07	-9999.0	-9999.0	0.113	0.5	-9999.0	-9999.0
27.821	2.69	2.91	0.01	20.42	0.34	111.4	1.604	0.307	1.297	1.4	1.2	1.0E-07	-9999.0	-9999.0	0.087	0.5	-9999.0	-9999.0
27.887	1.78	2.01	0.01	20.60	0.50	111.4	1.607	0.309	1.299	1.0	0.8	1.0E-07	-9999.0	-9999.0	0.027	0.5	-9999.0	-9999.0
27.952	1.98	2.22	0.01	21.69	0.45	111.4	1.611	0.311	1.300	1.1	0.9	1.0E-07	-9999.0	-9999.0	0.041	0.5	-9999.0	-9999.0
28.018	2.11	2.36	0.02	23.49	0.85	111.4	1.615	0.313	1.302	1.1	1.0	1.0E-07	-9999.0	-9999.0	0.050	0.5	-9999.0	-9999.0
28.084	3.01	3.25	0.02	22.73	0.62	111.4	1.618	0.315	1.303	1.6	1.4	1.0E-07	-9999.0	-9999.0	0.109	0.5	-9999.0	-9999.0
28.149	4.79	5.01	0.02	20.58	0.40	111.4	1.622	0.317	1.305	2.4	2.1	1.0E-07	-9999.0	-9999.0	0.226	0.7	-9999.0	-9999.0
28.215	5.43	5.64	0.03	18.78	0.53	111.4	1.626	0.319	1.307	2.7	2.4	1.0E-07	-9999.0	-9999.0	0.267	0.7	-9999.0	-9999.0
28.280	5.11	5.32	0.04	19.40	0.75	111.4	1.629	0.321	1.308	2.5	2.2	1.0E-07	-9999.0	-9999.0	0.246	0.7	-9999.0	-9999.0
28.346	5.55	5.76	0.05	18.99	0.87	111.4	1.633	0.323	1.310	2.8	2.4	1.0E-07	-9999.0	-9999.0	0.275	0.8	-9999.0	-9999.0
28.412	4.60	4.80	0.06	18.58	1.25	111.4	1.637	0.325	1.311	2.3	2.0	1.0E-07	-9999.0	-9999.0	0.211	0.6	-9999.0	-9999.0
28.477	4.02	4.22	0.07	18.43	1.66	111.4	1.640	0.327	1.313	2.0	1.8	1.0E-07	-9999.0	-9999.0	0.172	0.6	-9999.0	-9999.0
28.543	3.90	4.11	0.05	19.26	1.22	111.4	1.644	0.329	1.315	2.0	1.7	1.0E-07	-9999.0	-9999.0	0.164	0.6	-9999.0	-9999.0
28.609	3.32	3.54	0.10	20.64	2.83	111.4	1.648	0.331	1.316	3.4	3.0	5.0E-08	-9999.0	-9999.0	0.126	0.5	-9999.0	-9999.0
28.674	2.50	2.74	0.09	22.46	3.29	111.4	1.651	0.333	1.318	2.6	2.3	5.0E-08	-9999.0	-9999.0	0.073	0.5	-9999.0	-9999.0
28.740	3.51	3.75	0.10	22.63	2.67	111.4	1.655	0.335	1.320	3.6	3.1	5.0E-08	-9999.0	-9999.0	0.140	0.5	-9999.0	-9999.0
28.805	3.83	4.06	0.09	21.20	2.22	111.4	1.659	0.337	1.321	3.9	3.4	5.0E-08	-9999.0	-9999.0	0.160	0.6	-9999.0	-9999.0
28.871	3.90	4.12	0.10	20.05	2.44	111.4	1.662	0.339	1.323	3.9	3.4	5.0E-08	-9999.0	-9999.0	0.164	0.6	-9999.0	-9999.0
28.937	5.49	5.65	0.10	14.43	1.77	114.6	1.666	0.341	1.324	3.6	3.1	5.0E-07	-9999.0	-9999.0	0.266	0.7	-9999.0	-9999.0
29.002	5.94	6.11	0.10	15.74	1.64	114.6	1.670	0.344	1.326	3.9	3.4	5.0E-07	-9999.0	-9999.0	0.296	0.8	-9999.0	-9999.0
29.068	6.06	6.25	0.11	16.75	1.77	114.6	1.673	0.346	1.328	4.0	3.5	5.0E-07	-9999.0	-9999.0	0.305	0.8	-9999.0	-9999.0
29.134	5.68	5.87	0.10	16.95	1.71	114.6	1.677	0.348	1.330	3.7	3.2	5.0E-07	-9999.0	-9999.0	0.279	0.8	-9999.0	-9999.0
29.199	5.94	6.13	0.09	16.91	1.47	111.4	1.681	0.350	1.331	2.9	2.5	1.0E-07	-9999.0	-9999.0	0.296	0.8	-9999.0	-9999.0
29.265	5.04	5.23	0.08	17.25	1.53	111.4	1.685	0.352	1.333	2.5	2.2	1.0E-07	-9999.0	-9999.0	0.236	0.7	-9999.0	-9999.0
29.330	4.02	4.22	0.09	18.45	2.14	111.4	1.688	0.354	1.334	4.0	3.5	5.0E-08	-9999.0	-9999.0	0.169	0.6	-9999.0	-9999.0
29.396	4.09	4.32	0.08	21.40	1.86	111.4	1.692	0.356	1.336	2.1	1.8	1.0E-07	-9999.0	-9999.0	0.175	0.6	-9999.0	-9999.0
29.462	3.20	3.44	0.07	22.14	2.04	111.4	1.695	0.358	1.338	1.6	1.4	1.0E-07	-9999.0	-9999.0	0.116	0.5	-9999.0	-9999.0
29.527	3.20	3.44	0.05	22.36	1.46	111.4	1.699	0.360	1.339	1.6	1.4	1.0E-07	-9999.0	-9999.0	0.116	0.5	-9999.0	-9999.0
29.593	2.69	2.93	0.05	22.20	1.71	111.4	1.703	0.362	1.341	1.4	1.2	1.0E-07	-9999.0	-9999.0	0.082	0.5	-9999.0	-9999.0
29.658	2.94	3.18	0.04	22.75	1.26	111.4	1.706	0.364	1.342	1.5	1.3	1.0E-07	-9999.0	-9999.0	0.098	0.5	-9999.0	-9999.0
29.724	2.30	2.55	0.04	23.24	1.57	111.4	1.710	0.366	1.344	1.2	1.1	1.0E-07	-9999.0	-9999.0	0.056	0.5	-9999.0	-9999.0
29.790	1.72	1.98	0.03	23.88	1.52	111.4	1.714	0.368	1.346	0.9	0.8	1.0E-07	-9999.0	-9999.0	0.018	0.5	-9999.0	-9999.0
29.855	1.15	1.42	0.02	24.63	1.41	111.4	1.717	0.370	1.347	0.7	0.6	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
29.921	1.53	1.81	0.02	25.38	1.11	111.4	1.721	0.372	1.349	0.9	0.7	1.0E-07	-9999.0	-9999.0	0.006	0.5	-9999.0	-9999.0
29.987	1.02	1.30	0.01	25.34	0.77	111.4	1.725	0.374	1.350	0.6	0.5	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.052	1.78	2.05	0.01	24.85	0.49	111.4	1.728	0.376	1.352	1.0	0.8	1.0E-07	-9999.0	-9999.0	0.022	0.5	-9999.0	-9999.0
30.118	1.53	1.80	0.01	24.59	0.56	111.4	1.732	0.378	1.354	0.9	0.7	1.0E-07	-9999.0	-9999.0	0.004	0.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
30.183	1.00	1.27	0.01	24.63	0.79	111.4	1.736	0.380	1.355	0.6	0.5	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.249	1.59	1.86	0.01	24.85	0.54	111.4	1.739	0.382	1.357	0.9	0.8	1.0E-07	-9999.0	-9999.0	0.008	0.5	-9999.0	-9999.0
30.315	1.02	1.29	0.01	24.81	0.78	111.4	1.743	0.384	1.358	0.6	0.5	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.380	1.34	1.61	0.01	25.14	0.62	111.4	1.747	0.387	1.360	0.8	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.446	1.00	1.28	0.01	25.63	0.78	111.4	1.750	0.389	1.362	0.6	0.5	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.511	1.34	1.62	0.01	25.38	0.62	111.4	1.754	0.391	1.363	0.8	0.7	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.577	1.00	1.26	0.02	24.28	1.59	111.4	1.758	0.393	1.365	0.6	0.5	1.0E-07	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
30.643	1.85	2.11	0.02	23.88	0.95	111.4	1.761	0.395	1.367	1.0	0.9	1.0E-07	-9999.0	-9999.0	0.023	0.5	-9999.0	-9999.0
30.708	2.37	2.63	0.03	24.83	1.14	111.4	1.765	0.397	1.368	1.3	1.1	1.0E-07	-9999.0	-9999.0	0.058	0.5	-9999.0	-9999.0
30.774	6.13	6.40	0.06	24.85	0.94	111.4	1.769	0.399	1.370	3.1	2.6	1.0E-07	-9999.0	-9999.0	0.309	0.8	-9999.0	-9999.0
30.840	8.24	8.45	0.07	19.71	0.83	111.4	1.772	0.401	1.371	4.0	3.5	1.0E-07	-9999.0	-9999.0	0.445	1.1	-9999.0	-9999.0
30.905	9.71	9.86	0.10	13.75	1.02	114.6	1.776	0.403	1.373	4.7	4.0	5.0E-06	-9999.0	-9999.0	0.539	1.3	-9999.0	-9999.0
30.971	9.90	10.05	0.11	13.92	1.10	114.6	1.780	0.405	1.375	4.8	4.1	5.0E-06	-9999.0	-9999.0	0.552	1.3	-9999.0	-9999.0
31.036	9.83	9.99	0.11	14.30	1.10	114.6	1.783	0.407	1.376	4.8	4.1	5.0E-06	-9999.0	-9999.0	0.547	1.3	-9999.0	-9999.0
31.102	11.05	11.20	0.12	14.52	1.07	114.6	1.787	0.409	1.378	4.3	3.7	5.0E-05	30.0	30.0	0.628	1.6	-9999.0	-9999.0
31.168	11.25	11.40	0.13	14.28	1.14	114.6	1.791	0.411	1.380	4.4	3.7	5.0E-05	30.0	30.0	0.641	1.6	-9999.0	-9999.0
31.233	12.33	12.49	0.13	14.80	1.04	114.6	1.795	0.413	1.382	4.8	4.1	5.0E-05	30.0	30.0	0.713	1.8	-9999.0	-9999.0
31.299	11.76	11.92	0.14	14.80	1.18	114.6	1.798	0.415	1.383	4.6	3.9	5.0E-05	30.0	30.0	0.675	1.7	-9999.0	-9999.0
31.364	10.93	11.09	0.15	14.90	1.36	114.6	1.802	0.417	1.385	5.3	4.5	5.0E-06	-9999.0	-9999.0	0.619	1.5	-9999.0	-9999.0
31.430	11.05	11.21	0.15	15.39	1.34	114.6	1.806	0.419	1.387	5.4	4.6	5.0E-06	-9999.0	-9999.0	0.627	1.5	-9999.0	-9999.0
31.496	10.48	10.64	0.15	15.55	1.41	114.6	1.810	0.421	1.388	5.1	4.3	5.0E-06	-9999.0	-9999.0	0.589	1.4	-9999.0	-9999.0
31.561	9.52	9.70	0.14	16.53	1.45	114.6	1.814	0.423	1.390	4.6	3.9	5.0E-06	-9999.0	-9999.0	0.526	1.3	-9999.0	-9999.0
31.627	8.43	8.62	0.14	17.97	1.63	114.6	1.817	0.425	1.392	4.1	3.5	5.0E-06	-9999.0	-9999.0	0.454	1.1	-9999.0	-9999.0
31.693	7.35	7.57	0.13	20.19	1.72	114.6	1.821	0.428	1.394	3.6	3.1	5.0E-06	-9999.0	-9999.0	0.383	0.9	-9999.0	-9999.0
31.758	7.03	7.26	0.12	21.93	1.66	114.6	1.825	0.430	1.395	3.5	2.9	5.0E-06	-9999.0	-9999.0	0.363	0.9	-9999.0	-9999.0
31.824	6.78	7.02	0.14	22.73	2.00	114.6	1.829	0.432	1.397	4.5	3.8	5.0E-07	-9999.0	-9999.0	0.346	0.8	-9999.0	-9999.0
31.889	6.27	6.52	0.14	23.47	2.15	114.6	1.832	0.434	1.399	4.2	3.5	5.0E-07	-9999.0	-9999.0	0.312	0.8	-9999.0	-9999.0
31.955	7.22	7.48	0.12	24.65	1.61	114.6	1.836	0.436	1.400	3.6	3.0	5.0E-06	-9999.0	-9999.0	0.377	0.9	-9999.0	-9999.0
32.021	7.67	7.94	0.12	25.34	1.51	114.6	1.840	0.438	1.402	3.8	3.2	5.0E-06	-9999.0	-9999.0	0.407	1.0	-9999.0	-9999.0
32.086	7.79	8.05	0.11	24.49	1.37	114.6	1.844	0.440	1.404	3.9	3.3	5.0E-06	-9999.0	-9999.0	0.414	1.0	-9999.0	-9999.0
32.152	8.94	9.14	0.09	17.95	0.99	114.6	1.847	0.442	1.405	4.4	3.7	5.0E-06	-9999.0	-9999.0	0.486	1.1	-9999.0	-9999.0
32.217	8.50	8.72	0.07	20.32	0.80	114.6	1.851	0.444	1.407	4.2	3.5	5.0E-06	-9999.0	-9999.0	0.458	1.1	-9999.0	-9999.0
32.283	7.16	7.39	0.06	21.26	0.81	111.4	1.855	0.446	1.409	3.5	3.0	1.0E-07	-9999.0	-9999.0	0.369	0.9	-9999.0	-9999.0
32.349	6.00	6.25	0.06	23.07	0.96	111.4	1.858	0.448	1.410	3.0	2.5	1.0E-07	-9999.0	-9999.0	0.293	0.7	-9999.0	-9999.0
32.414	5.36	5.63	0.06	25.16	1.07	111.4	1.862	0.450	1.412	2.7	2.3	1.0E-07	-9999.0	-9999.0	0.252	0.7	-9999.0	-9999.0
32.480	3.83	4.12	0.06	26.92	1.46	111.4	1.866	0.452	1.414	2.0	1.7	1.0E-07	-9999.0	-9999.0	0.150	0.5	-9999.0	-9999.0
32.546	2.94	3.26	0.06	29.43	1.85	111.4	1.869	0.454	1.415	1.6	1.3	1.0E-07	-9999.0	-9999.0	0.092	0.5	-9999.0	-9999.0
32.611	2.62	2.98	0.06	33.91	2.02	111.4	1.873	0.456	1.417	1.4	1.2	1.0E-07	-9999.0	-9999.0	0.074	0.5	-9999.0	-9999.0
32.677	3.51	3.93	0.07	39.07	1.79	111.4	1.877	0.458	1.418	1.9	1.6	1.0E-07	-9999.0	-9999.0	0.137	0.5	-9999.0	-9999.0
32.742	3.39	3.82	0.07	40.10	1.84	111.4	1.880	0.460	1.420	1.8	1.5	1.0E-07	-9999.0	-9999.0	0.129	0.5	-9999.0	-9999.0
32.808	3.77	4.20	0.10	40.33	2.38	111.4	1.884	0.462	1.422	4.0	3.4	5.0E-08	-9999.0	-9999.0	0.155	0.6	-9999.0	-9999.0
32.874	4.28	4.74	0.11	42.41	2.33	111.4	1.888	0.464	1.423	4.5	3.8	5.0E-08	-9999.0	-9999.0	0.190	0.6	-9999.0	-9999.0
32.939	5.11	5.58	0.12	43.60	2.15	114.6	1.891	0.466	1.425	3.6	3.0	5.0E-07	-9999.0	-9999.0	0.246	0.7	-9999.0	-9999.0
33.005	6.78	7.19	0.16	38.34	2.23	114.6	1.895	0.468	1.427	4.6	3.8	5.0E-07	-9999.0	-9999.0	0.353	0.8	-9999.0	-9999.0
33.070	6.84	7.22	0.19	35.42	2.64	114.6	1.899	0.471	1.428	4.6	3.9	5.0E-07	-9999.0	-9999.0	0.355	0.9	-9999.0	-9999.0
33.136	8.37	8.75	0.24	35.04	2.75	114.6	1.903	0.473	1.430	5.6	4.7	5.0E-07	-9999.0	-9999.0	0.456	1.1	-9999.0	-9999.0
33.202	8.18	8.51	0.27	30.36	3.18	114.6	1.906	0.475	1.432	5.4	4.5	5.0E-07	-9999.0	-9999.0	0.440	1.0	-9999.0	-9999.0
33.267	8.05	8.35	0.31	27.55	3.72	111.4	1.910	0.477	1.433	8.0	6.7	5.0E-08	-9999.0	-9999.0	0.429	1.0	-9999.0	-9999.0
33.333	8.81	9.09	0.32	26.04	3.53	111.4	1.914	0.479	1.435	8.7	7.3	5.0E-08	-9999.0	-9999.0	0.479	1.1	-9999.0	-9999.0
33.399	8.30	8.63	0.36	30.83	4.18	111.4	1.917	0.481	1.437	8.3	6.9	5.0E-08	-9999.0	-9999.0	0.448	1.0	-9999.0	-9999.0
33.464	9.77	10.16	0.39	36.16	3.85	111.4	1.921	0.483	1.438	9.7	8.1	5.0E-08	-9999.0	-9999.0	0.550	1.3	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
33.530	10.03	10.40	0.38	34.15	3.66	111.4	1.925	0.485	1.440	10.0	8.3	5.0E-08	-9999.0	-9999.0	0.565	1.3	-9999.0	-9999.0
33.595	10.80	11.11	0.39	29.49	3.52	114.6	1.928	0.487	1.442	7.1	5.9	5.0E-07	-9999.0	-9999.0	0.612	1.4	-9999.0	-9999.0
33.661	10.61	10.90	0.40	27.57	3.68	111.4	1.932	0.489	1.443	10.4	8.7	5.0E-08	-9999.0	-9999.0	0.598	1.4	-9999.0	-9999.0
33.727	11.69	11.99	0.42	28.35	3.51	114.6	1.936	0.491	1.445	7.7	6.4	5.0E-07	-9999.0	-9999.0	0.671	1.6	-9999.0	-9999.0
33.792	11.50	11.79	0.45	27.41	3.82	111.4	1.940	0.493	1.447	11.3	9.4	5.0E-08	-9999.0	-9999.0	0.657	1.5	-9999.0	-9999.0
33.858	11.63	11.86	0.45	21.67	3.80	111.4	1.943	0.495	1.448	11.4	9.4	5.0E-08	-9999.0	-9999.0	0.661	1.6	-9999.0	-9999.0
33.923	10.28	10.54	0.43	23.80	4.09	111.4	1.947	0.497	1.450	10.1	8.4	5.0E-08	-9999.0	-9999.0	0.573	1.3	-9999.0	-9999.0
33.989	9.45	9.69	0.41	21.59	4.24	111.4	1.951	0.499	1.451	9.3	7.7	5.0E-08	-9999.0	-9999.0	0.516	1.2	-9999.0	-9999.0
34.055	9.01	9.26	0.39	22.83	4.22	111.4	1.954	0.501	1.453	8.9	7.4	5.0E-08	-9999.0	-9999.0	0.487	1.1	-9999.0	-9999.0
34.120	8.50	8.82	0.38	29.23	4.32	111.4	1.958	0.503	1.455	8.4	7.0	5.0E-08	-9999.0	-9999.0	0.457	1.0	-9999.0	-9999.0
34.186	8.18	8.51	0.38	30.19	4.48	111.4	1.962	0.505	1.456	8.1	6.8	5.0E-08	-9999.0	-9999.0	0.436	1.0	-9999.0	-9999.0
34.252	7.35	7.65	0.37	28.05	4.85	111.4	1.965	0.507	1.458	7.3	6.1	5.0E-08	-9999.0	-9999.0	0.379	0.9	-9999.0	-9999.0
34.317	6.78	7.03	0.34	23.84	4.85	111.4	1.969	0.509	1.459	6.7	5.6	5.0E-08	-9999.0	-9999.0	0.338	0.8	-9999.0	-9999.0
34.383	6.58	6.81	0.32	21.38	4.71	111.4	1.972	0.512	1.461	6.5	5.4	5.0E-08	-9999.0	-9999.0	0.322	0.8	-9999.0	-9999.0
34.448	6.00	6.25	0.29	22.30	4.65	111.4	1.976	0.514	1.463	6.0	4.9	5.0E-08	-9999.0	-9999.0	0.285	0.7	-9999.0	-9999.0
34.514	5.04	5.33	0.28	26.63	5.27	111.4	1.980	0.516	1.464	5.1	4.2	5.0E-08	-9999.0	-9999.0	0.223	0.6	-9999.0	-9999.0
34.580	4.92	5.26	0.26	30.99	4.96	111.4	1.983	0.518	1.466	5.0	4.2	5.0E-08	-9999.0	-9999.0	0.218	0.6	-9999.0	-9999.0
34.645	5.55	5.92	0.21	34.01	3.56	111.4	1.987	0.520	1.467	5.7	4.7	5.0E-08	-9999.0	-9999.0	0.262	0.7	-9999.0	-9999.0
34.711	5.24	5.63	0.17	36.22	3.02	111.4	1.991	0.522	1.469	5.4	4.5	5.0E-08	-9999.0	-9999.0	0.243	0.7	-9999.0	-9999.0
34.776	4.92	5.29	0.14	33.62	2.66	111.4	1.994	0.524	1.471	5.1	4.2	5.0E-08	-9999.0	-9999.0	0.219	0.6	-9999.0	-9999.0
34.842	5.04	5.40	0.14	32.99	2.60	111.4	1.998	0.526	1.472	5.2	4.3	5.0E-08	-9999.0	-9999.0	0.227	0.6	-9999.0	-9999.0
34.908	5.49	5.86	0.13	33.60	2.23	114.6	2.002	0.528	1.474	3.7	3.1	5.0E-07	-9999.0	-9999.0	0.257	0.7	-9999.0	-9999.0
34.973	4.98	5.37	0.14	35.59	2.62	111.4	2.005	0.530	1.476	5.1	4.2	5.0E-08	-9999.0	-9999.0	0.224	0.6	-9999.0	-9999.0
35.039	5.04	5.44	0.13	37.12	2.39	114.6	2.009	0.532	1.477	3.5	2.9	5.0E-07	-9999.0	-9999.0	0.229	0.6	-9999.0	-9999.0
35.105	4.92	5.35	0.13	39.41	2.44	114.6	2.013	0.534	1.479	3.4	2.8	5.0E-07	-9999.0	-9999.0	0.222	0.6	-9999.0	-9999.0
35.170	4.98	5.41	0.16	39.84	2.96	111.4	2.017	0.536	1.481	5.2	4.3	5.0E-08	-9999.0	-9999.0	0.226	0.6	-9999.0	-9999.0
35.236	5.49	5.90	0.14	38.06	2.38	114.6	2.020	0.538	1.482	3.8	3.1	5.0E-07	-9999.0	-9999.0	0.259	0.7	-9999.0	-9999.0
35.301	5.36	5.75	0.15	35.87	2.61	114.6	2.024	0.540	1.484	3.7	3.0	5.0E-07	-9999.0	-9999.0	0.248	0.7	-9999.0	-9999.0
35.367	5.11	5.48	0.17	34.21	3.11	111.4	2.028	0.542	1.486	5.2	4.3	5.0E-08	-9999.0	-9999.0	0.230	0.6	-9999.0	-9999.0
35.433	5.17	5.55	0.18	34.61	3.25	111.4	2.031	0.544	1.487	5.3	4.4	5.0E-08	-9999.0	-9999.0	0.234	0.6	-9999.0	-9999.0
35.498	5.87	6.25	0.18	35.06	2.89	111.4	2.035	0.546	1.489	6.0	4.9	5.0E-08	-9999.0	-9999.0	0.281	0.7	-9999.0	-9999.0
35.564	6.46	6.84	0.20	35.59	2.93	114.6	2.039	0.548	1.490	4.4	3.6	5.0E-07	-9999.0	-9999.0	0.320	0.8	-9999.0	-9999.0
35.629	5.62	6.01	0.21	35.30	3.51	111.4	2.043	0.550	1.492	5.8	4.7	5.0E-08	-9999.0	-9999.0	0.264	0.7	-9999.0	-9999.0
35.695	5.94	6.34	0.21	36.34	3.32	111.4	2.046	0.552	1.494	6.1	5.0	5.0E-08	-9999.0	-9999.0	0.286	0.7	-9999.0	-9999.0
35.761	6.20	6.58	0.23	35.42	3.51	111.4	2.050	0.555	1.495	6.3	5.2	5.0E-08	-9999.0	-9999.0	0.302	0.7	-9999.0	-9999.0
35.826	6.13	6.49	0.23	32.97	3.55	111.4	2.054	0.557	1.497	6.2	5.1	5.0E-08	-9999.0	-9999.0	0.296	0.7	-9999.0	-9999.0
35.892	6.33	6.68	0.25	32.87	3.75	111.4	2.057	0.559	1.499	6.4	5.2	5.0E-08	-9999.0	-9999.0	0.308	0.7	-9999.0	-9999.0
35.958	6.33	6.67	0.26	32.01	3.91	111.4	2.061	0.561	1.500	6.4	5.2	5.0E-08	-9999.0	-9999.0	0.307	0.7	-9999.0	-9999.0
36.023	5.94	6.29	0.28	31.94	4.46	111.4	2.064	0.563	1.502	6.0	4.9	5.0E-08	-9999.0	-9999.0	0.282	0.7	-9999.0	-9999.0
36.089	6.58	6.92	0.28	32.09	4.05	111.4	2.068	0.565	1.503	6.6	5.4	5.0E-08	-9999.0	-9999.0	0.324	0.8	-9999.0	-9999.0
36.154	6.46	6.79	0.28	31.39	4.13	111.4	2.072	0.567	1.505	6.5	5.3	5.0E-08	-9999.0	-9999.0	0.315	0.8	-9999.0	-9999.0
36.220	7.35	7.68	0.31	30.99	4.04	111.4	2.075	0.569	1.507	7.4	6.0	5.0E-08	-9999.0	-9999.0	0.374	0.9	-9999.0	-9999.0
36.286	7.54	7.86	0.33	29.51	4.21	111.4	2.079	0.571	1.508	7.5	6.1	5.0E-08	-9999.0	-9999.0	0.385	0.9	-9999.0	-9999.0
36.351	7.54	7.81	0.34	25.00	4.36	111.4	2.083	0.573	1.510	7.5	6.1	5.0E-08	-9999.0	-9999.0	0.382	0.9	-9999.0	-9999.0
36.417	7.41	7.61	0.37	18.62	4.87	111.4	2.086	0.575	1.511	7.3	5.9	5.0E-08	-9999.0	-9999.0	0.368	0.8	-9999.0	-9999.0
36.482	6.78	6.96	0.38	16.97	5.47	111.4	2.090	0.577	1.513	6.7	5.4	5.0E-08	-9999.0	-9999.0	0.325	0.8	-9999.0	-9999.0
36.548	6.78	6.95	0.38	16.35	5.48	111.4	2.094	0.579	1.515	6.7	5.4	5.0E-08	-9999.0	-9999.0	0.324	0.8	-9999.0	-9999.0
36.614	5.87	6.06	0.38	17.19	6.29	111.4	2.097	0.581	1.516	5.8	4.7	5.0E-08	-9999.0	-9999.0	0.264	0.7	-9999.0	-9999.0
36.679	5.55	5.76	0.35	18.82	6.09	111.4	2.101	0.583	1.518	5.5	4.5	5.0E-08	-9999.0	-9999.0	0.244	0.6	-9999.0	-9999.0
36.745	5.81	6.06	0.36	22.93	5.95	111.4	2.105	0.585	1.519	5.8	4.7	5.0E-08	-9999.0	-9999.0	0.264	0.7	-9999.0	-9999.0
36.811	6.97	7.30	0.37	30.56	5.08	111.4	2.108	0.587	1.521	7.0	5.7	5.0E-08	-9999.0	-9999.0	0.346	0.8	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
36.876	8.18	8.59	0.40	38.08	4.67	111.4	2.112	0.589	1.523	8.2	6.7	5.0E-08	-9999.0	-9999.0	0.432	1.0	-9999.0	-9999.0
36.942	10.61	10.97	0.42	33.83	3.84	111.4	2.116	0.591	1.524	10.5	8.5	5.0E-08	-9999.0	-9999.0	0.590	1.3	-9999.0	-9999.0
37.007	11.05	11.27	0.46	20.66	4.09	111.4	2.119	0.593	1.526	10.8	8.7	5.0E-08	-9999.0	-9999.0	0.610	1.3	-9999.0	-9999.0
37.073	10.67	10.84	0.52	16.47	4.81	111.4	2.123	0.596	1.527	10.4	8.4	5.0E-08	-9999.0	-9999.0	0.581	1.3	-9999.0	-9999.0
37.139	10.74	10.92	0.58	17.19	5.32	111.4	2.127	0.598	1.529	10.5	8.5	5.0E-08	-9999.0	-9999.0	0.586	1.3	-9999.0	-9999.0
37.204	11.25	11.44	0.60	17.80	5.26	111.4	2.130	0.600	1.531	11.0	8.9	5.0E-08	-9999.0	-9999.0	0.621	1.4	-9999.0	-9999.0
37.270	11.12	11.27	0.64	14.45	5.69	111.4	2.134	0.602	1.532	10.8	8.7	5.0E-08	-9999.0	-9999.0	0.609	1.3	-9999.0	-9999.0
37.336	11.76	11.86	0.63	9.50	5.32	111.4	2.138	0.604	1.534	11.4	9.2	5.0E-08	-9999.0	-9999.0	0.648	1.4	-9999.0	-9999.0
37.401	11.05	11.14	0.62	8.99	5.58	111.4	2.141	0.606	1.535	10.7	8.6	5.0E-08	-9999.0	-9999.0	0.600	1.3	-9999.0	-9999.0
37.467	10.61	10.70	0.64	8.69	6.00	111.4	2.145	0.608	1.537	10.2	8.3	5.0E-08	-9999.0	-9999.0	0.570	1.2	-9999.0	-9999.0
37.532	9.13	9.15	0.63	1.84	6.90	111.4	2.149	0.610	1.539	8.8	7.1	5.0E-08	-9999.0	-9999.0	0.467	1.0	-9999.0	-9999.0
37.598	8.50	8.51	0.61	0.63	7.19	111.4	2.152	0.612	1.540	8.1	6.6	5.0E-08	-9999.0	-9999.0	0.424	0.9	-9999.0	-9999.0
37.664	6.90	6.90	0.56	0.51	8.13	82.7	2.155	0.614	1.541	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
37.729	6.27	6.28	0.49	1.78	7.82	111.4	2.159	0.616	1.543	6.0	4.8	5.0E-08	-9999.0	-9999.0	0.275	0.7	-9999.0	-9999.0
37.795	6.39	6.41	0.43	2.70	6.72	111.4	2.162	0.618	1.544	6.1	4.9	5.0E-08	-9999.0	-9999.0	0.283	0.7	-9999.0	-9999.0
37.860	5.17	5.21	0.37	3.10	7.12	111.4	2.166	0.620	1.546	5.0	4.0	5.0E-08	-9999.0	-9999.0	0.203	0.6	-9999.0	-9999.0
37.926	4.98	5.03	0.32	4.72	6.37	111.4	2.170	0.622	1.547	4.8	3.9	5.0E-08	-9999.0	-9999.0	0.191	0.6	-9999.0	-9999.0
37.992	4.60	4.66	0.28	5.87	6.02	111.4	2.173	0.624	1.549	4.5	3.6	5.0E-08	-9999.0	-9999.0	0.166	0.5	-9999.0	-9999.0
38.057	4.28	4.35	0.26	6.58	5.99	111.4	2.177	0.626	1.551	4.2	3.3	5.0E-08	-9999.0	-9999.0	0.145	0.5	-9999.0	-9999.0
38.123	5.17	5.26	0.22	8.16	4.19	111.4	2.180	0.628	1.552	5.0	4.0	5.0E-08	-9999.0	-9999.0	0.205	0.6	-9999.0	-9999.0
38.189	4.28	4.37	0.21	8.63	4.81	111.4	2.184	0.630	1.554	4.2	3.4	5.0E-08	-9999.0	-9999.0	0.146	0.5	-9999.0	-9999.0
38.254	3.58	3.68	0.21	8.95	5.73	111.4	2.188	0.632	1.555	3.5	2.8	5.0E-08	-9999.0	-9999.0	0.099	0.5	-9999.0	-9999.0
38.320	3.39	3.49	0.20	9.46	5.74	111.4	2.191	0.634	1.557	3.3	2.7	5.0E-08	-9999.0	-9999.0	0.087	0.5	-9999.0	-9999.0
38.385	3.90	4.01	0.22	10.20	5.50	111.4	2.195	0.636	1.559	3.8	3.1	5.0E-08	-9999.0	-9999.0	0.121	0.5	-9999.0	-9999.0
38.451	3.51	3.62	0.23	10.55	6.36	111.4	2.199	0.639	1.560	3.5	2.8	5.0E-08	-9999.0	-9999.0	0.095	0.5	-9999.0	-9999.0
38.517	3.39	3.51	0.25	11.61	7.13	79.6	2.202	0.641	1.561	3.4	2.7	1.0E-15	-9999.0	-9999.0	0.087	0.5	-9999.0	-9999.0
38.582	3.77	3.90	0.25	12.06	6.43	111.4	2.205	0.643	1.562	3.7	3.0	5.0E-08	-9999.0	-9999.0	0.113	0.5	-9999.0	-9999.0
38.648	3.58	3.71	0.25	12.24	6.75	111.4	2.209	0.645	1.564	3.6	2.8	5.0E-08	-9999.0	-9999.0	0.100	0.5	-9999.0	-9999.0
38.713	3.71	3.91	0.26	18.25	6.67	111.4	2.212	0.647	1.566	3.7	3.0	5.0E-08	-9999.0	-9999.0	0.113	0.5	-9999.0	-9999.0
38.779	4.47	4.71	0.27	22.22	5.75	111.4	2.216	0.649	1.567	4.5	3.6	5.0E-08	-9999.0	-9999.0	0.166	0.5	-9999.0	-9999.0
38.845	4.79	5.08	0.30	26.35	5.92	111.4	2.220	0.651	1.569	4.9	3.9	5.0E-08	-9999.0	-9999.0	0.190	0.6	-9999.0	-9999.0
38.910	5.30	5.62	0.34	29.33	6.06	111.4	2.223	0.653	1.570	5.4	4.3	5.0E-08	-9999.0	-9999.0	0.226	0.6	-9999.0	-9999.0
38.976	5.24	5.55	0.36	28.58	6.50	111.4	2.227	0.655	1.572	5.3	4.2	5.0E-08	-9999.0	-9999.0	0.222	0.6	-9999.0	-9999.0
39.042	6.65	6.93	0.39	26.69	5.64	111.4	2.231	0.657	1.574	6.6	5.3	5.0E-08	-9999.0	-9999.0	0.314	0.7	-9999.0	-9999.0
39.107	6.46	6.68	0.40	20.52	6.00	111.4	2.234	0.659	1.575	6.4	5.1	5.0E-08	-9999.0	-9999.0	0.296	0.7	-9999.0	-9999.0
39.173	6.58	6.80	0.40	20.50	5.90	111.4	2.238	0.661	1.577	6.5	5.2	5.0E-08	-9999.0	-9999.0	0.304	0.7	-9999.0	-9999.0
39.238	8.11	8.36	0.44	23.03	5.28	111.4	2.242	0.663	1.578	8.0	6.4	5.0E-08	-9999.0	-9999.0	0.408	0.9	-9999.0	-9999.0
39.304	9.39	9.68	0.50	26.37	5.18	111.4	2.245	0.665	1.580	9.3	7.4	5.0E-08	-9999.0	-9999.0	0.495	1.0	-9999.0	-9999.0
39.370	11.05	11.33	0.55	25.94	4.87	111.4	2.249	0.667	1.582	10.8	8.6	5.0E-08	-9999.0	-9999.0	0.605	1.3	-9999.0	-9999.0
39.435	12.39	12.62	0.59	21.55	4.69	111.4	2.253	0.669	1.583	12.1	9.6	5.0E-08	-9999.0	-9999.0	0.691	1.5	-9999.0	-9999.0
39.501	13.92	14.05	0.70	11.83	4.99	111.4	2.256	0.671	1.585	13.5	10.7	5.0E-08	-9999.0	-9999.0	0.786	1.7	-9999.0	-9999.0
39.566	15.02	15.07	0.82	5.29	5.45	111.4	2.260	0.673	1.586	14.4	11.5	5.0E-08	-9999.0	-9999.0	0.854	1.9	-9999.0	-9999.0
39.632	15.65	15.71	0.94	5.59	6.00	111.4	2.264	0.675	1.588	15.0	11.9	5.0E-08	-9999.0	-9999.0	0.896	2.0	-9999.0	-9999.0
39.698	16.04	16.10	0.99	5.47	6.16	111.4	2.267	0.677	1.590	15.4	12.2	5.0E-08	-9999.0	-9999.0	0.922	2.1	-9999.0	-9999.0
39.763	17.05	17.05	1.02	-0.28	6.00	111.4	2.271	0.680	1.591	16.3	12.9	5.0E-08	-9999.0	-9999.0	0.985	2.3	-9999.0	-9999.0
39.829	16.29	16.32	1.00	3.14	6.14	111.4	2.274	0.682	1.593	15.6	12.4	5.0E-08	-9999.0	-9999.0	0.937	2.1	-9999.0	-9999.0
39.895	16.74	16.79	0.97	4.66	5.79	111.4	2.278	0.684	1.595	16.1	12.7	5.0E-08	-9999.0	-9999.0	0.968	2.2	-9999.0	-9999.0
39.960	15.40	15.49	0.96	8.87	6.21	111.4	2.282	0.686	1.596	14.8	11.7	5.0E-08	-9999.0	-9999.0	0.881	2.0	-9999.0	-9999.0
40.026	14.76	14.85	0.92	9.18	6.21	111.4	2.285	0.688	1.598	14.2	11.3	5.0E-08	-9999.0	-9999.0	0.838	1.8	-9999.0	-9999.0
40.091	14.11	14.24	0.89	12.03	6.26	111.4	2.289	0.690	1.599	13.6	10.8	5.0E-08	-9999.0	-9999.0	0.797	1.7	-9999.0	-9999.0
40.157	14.51	14.66	0.89	14.38	6.09	111.4	2.293	0.692	1.601	14.0	11.1	5.0E-08	-9999.0	-9999.0	0.825	1.8	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
40.223	14.95	15.07	0.93	11.42	6.19	111.4	2.296	0.694	1.603	14.4	11.4	5.0E-08	-9999.0	-9999.0	0.852	1.9	-9999.0	-9999.0
40.288	14.76	14.84	0.97	7.58	6.55	111.4	2.300	0.696	1.604	14.2	11.2	5.0E-08	-9999.0	-9999.0	0.836	1.8	-9999.0	-9999.0
40.354	15.08	15.13	1.02	5.05	6.76	111.4	2.304	0.698	1.606	14.5	11.4	5.0E-08	-9999.0	-9999.0	0.855	1.9	-9999.0	-9999.0
40.419	15.02	15.02	1.08	0.75	7.21	111.4	2.307	0.700	1.607	14.4	11.4	5.0E-08	-9999.0	-9999.0	0.848	1.9	-9999.0	-9999.0
40.485	15.33	15.35	1.11	1.78	7.25	111.4	2.311	0.702	1.609	14.7	11.6	5.0E-08	-9999.0	-9999.0	0.869	1.9	-9999.0	-9999.0
40.551	14.89	14.91	1.12	2.51	7.53	111.4	2.315	0.704	1.611	14.3	11.3	5.0E-08	-9999.0	-9999.0	0.840	1.8	-9999.0	-9999.0
40.616	15.14	15.15	1.10	1.50	7.28	111.4	2.318	0.706	1.612	14.5	11.4	5.0E-08	-9999.0	-9999.0	0.856	1.9	-9999.0	-9999.0
40.682	15.08	15.09	1.10	1.29	7.31	111.4	2.322	0.708	1.614	14.5	11.4	5.0E-08	-9999.0	-9999.0	0.851	1.9	-9999.0	-9999.0
40.748	15.72	15.76	0.95	3.80	6.04	111.4	2.326	0.710	1.615	15.1	11.9	5.0E-08	-9999.0	-9999.0	0.896	2.0	-9999.0	-9999.0
40.813	14.57	14.58	0.94	1.08	6.46	111.4	2.329	0.712	1.617	14.0	11.0	5.0E-08	-9999.0	-9999.0	0.817	1.8	-9999.0	-9999.0
40.879	14.11	14.13	0.92	1.35	6.53	111.4	2.333	0.714	1.619	13.5	10.6	5.0E-08	-9999.0	-9999.0	0.786	1.7	-9999.0	-9999.0
40.944	13.99	13.99	0.90	-0.57	6.45	111.4	2.337	0.716	1.620	13.4	10.5	5.0E-08	-9999.0	-9999.0	0.777	1.7	-9999.0	-9999.0
41.010	13.03	13.02	0.91	-1.02	7.01	111.4	2.340	0.718	1.622	12.5	9.8	5.0E-08	-9999.0	-9999.0	0.712	1.5	-9999.0	-9999.0
41.076	9.20	9.16	0.91	-3.52	9.95	82.7	2.343	0.720	1.623	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
41.141	9.26	9.23	0.90	-3.35	9.78	82.7	2.346	0.723	1.624	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
41.207	8.69	8.66	0.86	-2.70	9.95	82.7	2.349	0.725	1.624	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
41.272	8.50	8.47	0.83	-3.18	9.83	82.7	2.352	0.727	1.625	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
41.338	8.43	8.39	0.78	-3.97	9.32	82.7	2.354	0.729	1.626	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
41.404	8.05	8.02	0.74	-2.84	9.25	82.7	2.357	0.731	1.626	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
41.469	8.88	8.88	0.72	-0.08	8.13	82.7	2.360	0.733	1.627	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
41.535	9.20	9.22	0.71	2.09	7.72	111.4	2.363	0.735	1.628	8.8	6.9	5.0E-08	-9999.0	-9999.0	0.457	0.9	-9999.0	-9999.0
41.601	10.86	10.91	0.68	5.03	6.25	111.4	2.367	0.737	1.630	10.4	8.2	5.0E-08	-9999.0	-9999.0	0.570	1.2	-9999.0	-9999.0
41.666	11.44	11.51	0.68	6.56	5.92	111.4	2.370	0.739	1.631	11.0	8.6	5.0E-08	-9999.0	-9999.0	0.609	1.2	-9999.0	-9999.0
41.732	11.18	11.26	0.71	7.66	6.32	111.4	2.374	0.741	1.633	10.8	8.4	5.0E-08	-9999.0	-9999.0	0.592	1.2	-9999.0	-9999.0
41.797	11.95	12.01	0.73	5.95	6.09	111.4	2.378	0.743	1.635	11.5	9.0	5.0E-08	-9999.0	-9999.0	0.642	1.3	-9999.0	-9999.0
41.863	11.56	11.61	0.74	5.03	6.39	111.4	2.381	0.745	1.636	11.1	8.7	5.0E-08	-9999.0	-9999.0	0.615	1.3	-9999.0	-9999.0
41.929	11.18	11.27	0.75	8.48	6.67	111.4	2.385	0.747	1.638	10.8	8.4	5.0E-08	-9999.0	-9999.0	0.592	1.2	-9999.0	-9999.0
41.994	9.58	9.63	0.72	4.56	7.49	111.4	2.389	0.749	1.639	9.2	7.2	5.0E-08	-9999.0	-9999.0	0.483	1.0	-9999.0	-9999.0
42.060	9.45	9.54	0.68	7.74	7.15	111.4	2.392	0.751	1.641	9.1	7.1	5.0E-08	-9999.0	-9999.0	0.476	1.0	-9999.0	-9999.0
42.125	8.18	8.31	0.63	11.71	7.60	111.4	2.396	0.753	1.643	8.0	6.2	5.0E-08	-9999.0	-9999.0	0.394	0.8	-9999.0	-9999.0
42.191	7.35	7.52	0.57	15.92	7.60	111.4	2.399	0.755	1.644	7.2	5.6	5.0E-08	-9999.0	-9999.0	0.341	0.7	-9999.0	-9999.0
42.257	7.41	7.62	0.52	19.66	6.84	111.4	2.403	0.757	1.646	7.3	5.7	5.0E-08	-9999.0	-9999.0	0.348	0.8	-9999.0	-9999.0
42.322	7.09	7.35	0.50	24.53	6.82	111.4	2.407	0.759	1.647	7.0	5.5	5.0E-08	-9999.0	-9999.0	0.330	0.7	-9999.0	-9999.0
42.388	7.35	7.66	0.48	29.27	6.28	111.4	2.410	0.761	1.649	7.3	5.7	5.0E-08	-9999.0	-9999.0	0.350	0.8	-9999.0	-9999.0
42.454	6.71	7.05	0.46	32.03	6.54	111.4	2.414	0.764	1.651	6.8	5.3	5.0E-08	-9999.0	-9999.0	0.309	0.7	-9999.0	-9999.0
42.519	7.73	8.10	0.44	34.01	5.45	111.4	2.418	0.766	1.652	7.8	6.0	5.0E-08	-9999.0	-9999.0	0.379	0.8	-9999.0	-9999.0
42.585	7.16	7.59	0.42	39.68	5.55	111.4	2.421	0.768	1.654	7.3	5.6	5.0E-08	-9999.0	-9999.0	0.344	0.7	-9999.0	-9999.0
42.650	7.09	7.55	0.43	43.10	5.71	111.4	2.425	0.770	1.655	7.2	5.6	5.0E-08	-9999.0	-9999.0	0.342	0.7	-9999.0	-9999.0
42.716	8.30	8.68	0.43	34.94	4.97	111.4	2.429	0.772	1.657	8.3	6.5	5.0E-08	-9999.0	-9999.0	0.417	0.9	-9999.0	-9999.0
42.782	8.24	8.60	0.40	33.66	4.66	111.4	2.432	0.774	1.659	8.2	6.4	5.0E-08	-9999.0	-9999.0	0.411	0.9	-9999.0	-9999.0
42.847	8.05	8.38	0.37	30.58	4.43	111.4	2.436	0.776	1.660	8.0	6.2	5.0E-08	-9999.0	-9999.0	0.396	0.8	-9999.0	-9999.0
42.913	7.73	8.06	0.33	30.54	4.10	111.4	2.440	0.778	1.662	7.7	6.0	5.0E-08	-9999.0	-9999.0	0.375	0.8	-9999.0	-9999.0
42.978	7.73	8.08	0.29	32.25	3.60	111.4	2.443	0.780	1.663	7.7	6.0	5.0E-08	-9999.0	-9999.0	0.376	0.8	-9999.0	-9999.0
43.044	7.67	8.07	0.28	36.83	3.48	111.4	2.447	0.782	1.665	7.7	6.0	5.0E-08	-9999.0	-9999.0	0.375	0.8	-9999.0	-9999.0
43.110	8.81	9.27	0.31	42.11	3.35	114.6	2.451	0.784	1.667	5.9	4.6	5.0E-07	-9999.0	-9999.0	0.454	0.9	-9999.0	-9999.0
43.175	8.43	8.87	0.36	40.71	4.07	111.4	2.454	0.786	1.668	8.5	6.6	5.0E-08	-9999.0	-9999.0	0.428	0.9	-9999.0	-9999.0
43.241	8.56	8.98	0.37	38.53	4.13	111.4	2.458	0.788	1.670	8.6	6.7	5.0E-08	-9999.0	-9999.0	0.435	0.9	-9999.0	-9999.0
43.307	7.67	7.99	0.36	30.19	4.51	111.4	2.462	0.790	1.672	7.7	5.9	5.0E-08	-9999.0	-9999.0	0.369	0.8	-9999.0	-9999.0
43.372	6.90	7.20	0.36	28.19	5.01	111.4	2.465	0.792	1.673	6.9	5.3	5.0E-08	-9999.0	-9999.0	0.316	0.7	-9999.0	-9999.0
43.438	5.81	6.21	0.34	36.48	5.49	111.4	2.469	0.794	1.675	5.9	4.6	5.0E-08	-9999.0	-9999.0	0.249	0.6	-9999.0	-9999.0
43.503	6.39	6.87	0.29	44.80	4.23	111.4	2.473	0.796	1.676	6.6	5.1	5.0E-08	-9999.0	-9999.0	0.293	0.7	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
43.569	6.65	7.22	0.26	52.72	3.61	111.4	2.476	0.798	1.678	6.9	5.3	5.0E-08	-9999.0	-9999.0	0.316	0.7	-9999.0	-9999.0
43.635	6.39	7.00	0.21	56.55	3.01	111.4	2.480	0.800	1.680	6.7	5.2	5.0E-08	-9999.0	-9999.0	0.301	0.7	-9999.0	-9999.0
43.700	7.41	8.07	0.19	61.36	2.36	114.6	2.484	0.802	1.681	5.2	4.0	5.0E-07	-9999.0	-9999.0	0.372	0.8	-9999.0	-9999.0
43.766	7.67	8.34	0.21	62.59	2.52	114.6	2.487	0.804	1.683	5.3	4.1	5.0E-07	-9999.0	-9999.0	0.390	0.8	-9999.0	-9999.0
43.831	7.86	8.52	0.21	61.53	2.47	114.6	2.491	0.807	1.685	5.4	4.2	5.0E-07	-9999.0	-9999.0	0.402	0.8	-9999.0	-9999.0
43.897	8.75	9.42	0.22	61.77	2.34	114.6	2.495	0.809	1.686	4.5	3.5	5.0E-06	-9999.0	-9999.0	0.462	0.9	-9999.0	-9999.0
43.963	9.20	9.84	0.23	58.98	2.34	114.6	2.499	0.811	1.688	4.7	3.6	5.0E-06	-9999.0	-9999.0	0.489	1.0	-9999.0	-9999.0
44.028	8.37	8.97	0.24	55.64	2.68	114.6	2.502	0.813	1.690	5.7	4.4	5.0E-07	-9999.0	-9999.0	0.431	0.9	-9999.0	-9999.0
44.094	9.39	9.98	0.26	54.00	2.61	114.6	2.506	0.815	1.692	6.4	4.9	5.0E-07	-9999.0	-9999.0	0.498	1.0	-9999.0	-9999.0
44.160	9.13	9.60	0.29	43.62	3.03	114.6	2.510	0.817	1.693	6.1	4.7	5.0E-07	-9999.0	-9999.0	0.473	0.9	-9999.0	-9999.0
44.225	9.20	9.66	0.32	42.13	3.32	114.6	2.514	0.819	1.695	6.2	4.7	5.0E-07	-9999.0	-9999.0	0.476	0.9	-9999.0	-9999.0
44.291	9.26	9.70	0.83	40.04	8.58	82.7	2.517	0.821	1.696	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
44.356	9.77	10.18	0.01	37.47	0.10	111.4	2.520	0.823	1.697	4.9	3.7	1.0E-07	-9999.0	-9999.0	0.511	1.0	-9999.0	-9999.0
44.422	8.81	9.18	0.01	34.46	0.11	111.4	2.524	0.825	1.699	4.4	3.4	1.0E-07	-9999.0	-9999.0	0.444	0.9	-9999.0	-9999.0
44.488	8.75	9.19	0.01	40.71	0.11	111.4	2.527	0.827	1.700	4.4	3.4	1.0E-07	-9999.0	-9999.0	0.444	0.9	-9999.0	-9999.0
44.553	26.06	26.64	0.01	53.10	0.04	117.7	2.531	0.829	1.702	8.5	6.5	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
44.619	250.93	251.24	0.01	28.66	0.00	127.3	2.535	0.831	1.704	40.1	30.7	5.0E+00	85.4	44.0	-9999.0	-9999.0	504.3	2.007

Gregg In Situ, Inc. - CPT Interpretation

Interpretation Output - Release	1.20I
Run No:	04-0524-0703-4028
Job No:	04-073SC
Client:	MACTEC
Project:	TVA Bull Run Ash Disposal Facility
Site:	CPT-09
Location:	TVA Bull Run
Cone:	H. Bankayal
CPT Date:	04/21/05
CPT Time:	10:28
CPT File:	073CP09.COR
Northing (m):	0.000000
Easting (m):	0.000000
Elevation (m):	0.000000

Water Table (m):	3.35	(ft):	11.0
Unit Weight of Water (default):	62.40 pcf		
Averaging Increment (m):	0.0 (Every Data Point)		
Phi Method :	Robertson and Campanella, 1983		
Su Nkt used:	15.00	Su/P' (nc):	0.30
Dr Method :	Jamiolkowski - All Sands		
State Parameter M:	1.20		

Used Unit Weights Assigned to Soil Zones

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
0.066	28.68	28.71	0.41	2.47	1.43	114.6	0.004	0.000	0.004	11.0	22.0	5.0E-05	95.0	50.0	1.913	10.0	80.4	2.801
0.131	93.27	93.28	0.38	1.19	0.41	124.1	0.008	0.000	0.008	17.9	35.7	5.0E-02	95.0	50.0	-9999.0	-9999.0	176.2	1.889
0.197	149.16	149.17	0.37	0.94	0.25	124.1	0.012	0.000	0.012	28.6	57.1	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.262	244.22	244.23	0.53	0.94	0.22	127.3	0.016	0.000	0.016	39.0	78.0	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.328	269.51	269.53	0.55	1.10	0.20	127.3	0.020	0.000	0.020	43.0	86.0	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.394	273.98	274.02	1.06	2.92	0.39	127.3	0.024	0.000	0.024	43.7	87.5	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.459	246.39	246.42	1.16	3.12	0.47	127.3	0.028	0.000	0.028	39.3	78.7	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.525	217.84	217.85	1.39	1.27	0.64	124.1	0.033	0.000	0.033	41.7	83.5	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.591	187.94	187.94	1.67	0.12	0.89	124.1	0.037	0.000	0.037	36.0	72.0	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.656	175.87	175.87	0.78	0.39	0.44	124.1	0.041	0.000	0.041	33.7	67.4	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.722	155.36	155.36	1.52	0.75	0.98	124.1	0.045	0.000	0.045	29.8	59.5	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.787	140.54	140.55	2.15	0.45	1.53	120.9	0.049	0.000	0.049	33.6	67.3	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.853	126.04	126.06	2.73	1.86	2.16	117.7	0.053	0.000	0.053	40.2	80.5	5.0E-04	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.919	122.02	122.05	3.18	2.94	2.60	117.7	0.057	0.000	0.057	39.0	77.9	5.0E-04	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.984	55.00	55.16	3.41	14.58	6.18	111.4	0.060	0.000	0.060	52.8	105.7	5.0E-08	-9999.0	-9999.0	3.673	10.0	-9999.0	-9999.0
1.050	122.66	122.71	3.69	4.74	3.01	114.6	0.064	0.000	0.064	47.0	94.0	5.0E-05	95.0	50.0	8.176	10.0	-9999.0	-9999.0
1.115	123.10	123.13	3.90	2.76	3.17	114.6	0.068	0.000	0.068	47.2	94.3	5.0E-05	95.0	50.0	8.204	10.0	-9999.0	-9999.0
1.181	122.21	122.22	4.16	1.41	3.40	114.6	0.072	0.000	0.072	46.8	93.6	5.0E-05	95.0	50.0	8.143	10.0	-9999.0	-9999.0
1.247	119.33	119.34	4.37	1.00	3.66	114.6	0.075	0.000	0.075	45.7	91.4	5.0E-05	95.0	50.0	7.951	10.0	-9999.0	-9999.0
1.312	114.10	114.10	4.39	0.02	3.85	114.6	0.079	0.000	0.079	43.7	87.4	5.0E-05	95.0	50.0	7.601	10.0	-9999.0	-9999.0
1.378	109.88	109.88	4.34	0.31	3.95	114.6	0.083	0.000	0.083	52.6	105.2	5.0E-06	-9999.0	-9999.0	7.320	10.0	-9999.0	-9999.0
1.444	102.28	102.29	4.37	0.94	4.27	130.5	0.087	0.000	0.087	98.0	195.9	1.0E-15	95.0	50.0	-9999.0	-9999.0	203.9	1.993
1.509	98.19	98.20	4.42	1.33	4.50	130.5	0.091	0.000	0.091	94.0	188.1	1.0E-15	95.0	50.0	-9999.0	-9999.0	189.5	1.930
1.575	95.63	95.64	4.43	0.51	4.63	130.5	0.095	0.000	0.095	91.6	183.2	1.0E-15	95.0	50.0	-9999.0	-9999.0	182.1	1.904
1.640	94.48	94.49	4.38	1.02	4.64	130.5	0.100	0.000	0.100	90.5	181.0	1.0E-15	95.0	50.0	-9999.0	-9999.0	179.2	1.896
1.706	91.35	91.34	4.32	-0.67	4.73	130.5	0.104	0.000	0.104	87.5	175.0	1.0E-15	95.0	50.0	-9999.0	-9999.0	171.9	1.882
1.772	85.28	85.27	4.21	-1.04	4.94	130.5	0.108	0.000	0.108	81.7	163.3	1.0E-15	94.0	50.0	-9999.0	-9999.0	160.5	1.882
1.837	82.02	82.01	4.09	-0.47	4.99	130.5	0.113	0.000	0.113	78.5	157.1	1.0E-15	92.3	50.0	-9999.0	-9999.0	155.2	1.893
1.903	76.41	76.40	3.98	-0.33	5.21	130.5	0.117	0.000	0.117	73.2	146.3	1.0E-15	89.7	50.0	-9999.0	-9999.0	147.0	1.923
1.968	71.10	71.10	3.91	-0.67	5.50	130.5	0.121	0.000	0.121	68.1	136.2	1.0E-15	87.1	50.0	-9999.0	-9999.0	139.4	1.961
2.034	71.54	71.55	3.85	0.31	5.38	130.5	0.125	0.000	0.125	68.5	137.0	1.0E-15	86.8	50.0	-9999.0	-9999.0	140.1	1.958
2.100	81.07	81.08	3.89	1.43	4.80	130.5	0.130	0.000	0.130	77.7	155.3	1.0E-15	89.9	50.0	-9999.0	-9999.0	153.8	1.897
2.165	86.43	86.47	3.98	3.42	4.60	130.5	0.134	0.000	0.134	82.8	165.6	1.0E-15	91.3	50.0	-9999.0	-9999.0	162.5	1.880
2.231	87.52	87.61	4.00	8.55	4.57	130.5	0.138	0.000	0.138	83.9	167.8	1.0E-15	91.2	50.0	-9999.0	-9999.0	164.6	1.878
2.297	86.88	86.95	4.08	6.11	4.69	130.5	0.142	0.000	0.142	83.3	166.5	1.0E-15	90.6	50.0	-9999.0	-9999.0	163.4	1.879
2.362	86.81	86.85	4.25	3.48	4.89	130.5	0.147	0.000	0.147	83.2	166.3	1.0E-15	90.1	50.0	-9999.0	-9999.0	163.2	1.879
2.428	86.69	86.72	4.31	2.80	4.97	130.5	0.151	0.000	0.151	83.0	166.1	1.0E-15	89.7	50.0	-9999.0	-9999.0	163.0	1.879
2.493	82.98	83.03	4.30	4.39	5.18	130.5	0.155	0.000	0.155	79.5	159.0	1.0E-15	88.0	48.0	-9999.0	-9999.0	156.8	1.889
2.559	83.94	84.02	4.24	7.50	5.05	130.5	0.160	0.000	0.160	80.5	160.9	1.0E-15	88.0	48.0	-9999.0	-9999.0	158.4	1.885
2.625	84.38	84.45	4.27	6.13	5.06	130.5	0.164	0.000	0.164	80.9	161.8	1.0E-15	87.7	48.0	-9999.0	-9999.0	159.1	1.884
2.690	83.36	83.42	4.25	5.65	5.09	130.5	0.168	0.000	0.168	79.9	159.8	1.0E-15	87.0	48.0	-9999.0	-9999.0	157.5	1.887
2.756	82.15	82.24	4.23	8.36	5.14	130.5	0.172	0.000	0.172	78.8	157.5	1.0E-15	86.2	48.0	-9999.0	-9999.0	155.6	1.892
2.821	78.32	78.39	4.32	6.62	5.51	130.5	0.177	0.000	0.177	75.1	150.1	1.0E-15	84.5	48.0	-9999.0	-9999.0	149.8	1.911
2.887	74.49	74.50	4.21	1.15	5.65	130.5	0.181	0.000	0.181	71.3	142.7	1.0E-15	82.7	48.0	-9999.0	-9999.0	144.3	1.936
2.953	75.31	75.31	4.19	-0.45	5.56	130.5	0.185	0.000	0.185	72.1	144.2	1.0E-15	82.7	48.0	-9999.0	-9999.0	145.4	1.931
3.018	76.85	76.88	4.23	3.54	5.50	130.5	0.190	0.000	0.190	73.6	147.3	1.0E-15	83.0	48.0	-9999.0	-9999.0	147.6	1.920
3.084	76.21	76.28	4.18	5.73	5.48	130.5	0.194	0.000	0.194	73.0	146.1	1.0E-15	82.4	48.0	-9999.0	-9999.0	146.8	1.924
3.150	71.99	72.08	3.97	8.20	5.51	130.5	0.198	0.000	0.198	69.0	138.1	1.0E-15	80.5	48.0	-9999.0	-9999.0	140.8	1.954
3.215	67.20	67.23	3.84	2.94	5.71	130.5	0.202	0.000	0.202	64.4	128.8	1.0E-15	78.2	48.0	-9999.0	-9999.0	134.0	1.992
3.281	62.54	62.57	3.69	2.37	5.90	130.5	0.207	0.000	0.207	59.9	119.8	1.0E-15	75.8	46.0	-9999.0	-9999.0	127.3	2.034
3.346	57.49	57.50	3.51	1.37	6.10	111.4	0.211	0.000	0.211	55.1	110.1	5.0E-08	-9999.0	-9999.0	3.820	10.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
3.412	55.06	55.06	3.33	-0.16	6.04	111.4	0.214	0.000	0.214	52.7	105.5	5.0E-08	-9999.0	-9999.0	3.657	10.0	-9999.0	-9999.0
3.478	52.45	52.45	3.20	-0.14	6.10	111.4	0.218	0.000	0.218	50.2	100.5	5.0E-08	-9999.0	-9999.0	3.482	10.0	-9999.0	-9999.0
3.543	48.42	48.41	3.01	-0.57	6.21	111.4	0.222	0.000	0.222	46.4	92.7	5.0E-08	-9999.0	-9999.0	3.213	10.0	-9999.0	-9999.0
3.609	47.08	47.09	2.74	0.18	5.81	111.4	0.225	0.000	0.225	45.1	90.2	5.0E-08	-9999.0	-9999.0	3.124	10.0	-9999.0	-9999.0
3.674	46.95	46.95	2.58	0.08	5.49	111.4	0.229	0.000	0.229	45.0	89.9	5.0E-08	-9999.0	-9999.0	3.115	10.0	-9999.0	-9999.0
3.740	47.60	47.61	2.44	1.43	5.12	111.4	0.233	0.000	0.233	45.6	91.2	5.0E-08	-9999.0	-9999.0	3.159	10.0	-9999.0	-9999.0
3.806	45.29	45.30	2.33	0.98	5.13	111.4	0.236	0.000	0.236	43.4	86.8	5.0E-08	-9999.0	-9999.0	3.004	10.0	-9999.0	-9999.0
3.871	41.33	41.36	2.17	2.82	5.24	111.4	0.240	0.000	0.240	39.6	79.2	5.0E-08	-9999.0	-9999.0	2.741	10.0	-9999.0	-9999.0
3.937	36.16	36.17	2.08	1.45	5.74	111.4	0.244	0.000	0.244	34.6	69.3	5.0E-08	-9999.0	-9999.0	2.395	10.0	-9999.0	-9999.0
4.003	30.53	30.54	1.96	0.35	6.43	111.4	0.247	0.000	0.247	29.2	58.5	5.0E-08	-9999.0	-9999.0	2.019	10.0	-9999.0	-9999.0
4.068	28.62	28.60	1.84	-1.66	6.45	111.4	0.251	0.000	0.251	27.4	54.7	5.0E-08	-9999.0	-9999.0	1.890	10.0	-9999.0	-9999.0
4.134	26.57	26.55	1.73	-2.35	6.53	111.4	0.255	0.000	0.255	25.4	50.4	5.0E-08	-9999.0	-9999.0	1.753	10.0	-9999.0	-9999.0
4.199	24.34	24.31	1.65	-2.49	6.80	111.4	0.258	0.000	0.258	23.3	45.8	5.0E-08	-9999.0	-9999.0	1.604	10.0	-9999.0	-9999.0
4.265	22.94	22.92	1.57	-1.74	6.87	111.4	0.262	0.000	0.262	21.9	42.9	5.0E-08	-9999.0	-9999.0	1.510	10.0	-9999.0	-9999.0
4.331	22.81	22.79	1.45	-1.64	6.38	111.4	0.265	0.000	0.265	21.8	42.4	5.0E-08	-9999.0	-9999.0	1.501	10.0	-9999.0	-9999.0
4.396	23.32	23.31	1.47	-0.90	6.32	111.4	0.269	0.000	0.269	22.3	43.0	5.0E-08	-9999.0	-9999.0	1.536	10.0	-9999.0	-9999.0
4.462	29.13	29.13	1.52	0.39	5.23	111.4	0.273	0.000	0.273	27.9	53.4	5.0E-08	-9999.0	-9999.0	1.924	10.0	-9999.0	-9999.0
4.528	34.87	34.89	1.53	1.56	4.40	114.6	0.277	0.000	0.277	22.3	42.4	5.0E-07	-9999.0	-9999.0	2.308	10.0	-9999.0	-9999.0
4.593	42.03	42.06	1.62	2.92	3.86	114.6	0.280	0.000	0.280	20.1	38.0	5.0E-06	-9999.0	-9999.0	2.786	10.0	-9999.0	-9999.0
4.659	42.03	42.07	1.72	3.16	4.10	114.6	0.284	0.000	0.284	20.1	37.8	5.0E-06	-9999.0	-9999.0	2.785	10.0	-9999.0	-9999.0
4.724	37.56	37.58	1.84	1.86	4.91	111.4	0.288	0.000	0.288	36.0	67.1	5.0E-08	-9999.0	-9999.0	2.486	10.0	-9999.0	-9999.0
4.790	33.22	33.22	1.91	0.33	5.76	111.4	0.291	0.000	0.291	31.8	58.9	5.0E-08	-9999.0	-9999.0	2.196	10.0	-9999.0	-9999.0
4.856	29.38	29.37	1.87	-1.02	6.38	111.4	0.295	0.000	0.295	28.1	51.8	5.0E-08	-9999.0	-9999.0	1.938	10.0	-9999.0	-9999.0
4.921	26.19	26.18	1.48	-1.37	5.67	111.4	0.299	0.000	0.299	25.1	45.9	5.0E-08	-9999.0	-9999.0	1.725	10.0	-9999.0	-9999.0
4.987	24.34	24.33	1.38	-0.57	5.69	111.4	0.302	0.000	0.302	23.3	42.4	5.0E-08	-9999.0	-9999.0	1.602	10.0	-9999.0	-9999.0
5.052	24.34	24.34	1.30	-0.06	5.35	111.4	0.306	0.000	0.306	23.3	42.1	5.0E-08	-9999.0	-9999.0	1.602	10.0	-9999.0	-9999.0
5.118	26.44	26.45	1.27	0.83	4.81	111.4	0.310	0.000	0.310	25.3	45.5	5.0E-08	-9999.0	-9999.0	1.743	10.0	-9999.0	-9999.0
5.184	29.32	29.33	1.20	1.02	4.10	114.6	0.313	0.000	0.313	18.7	33.5	5.0E-07	-9999.0	-9999.0	1.935	10.0	-9999.0	-9999.0
5.249	30.85	30.87	1.14	1.08	3.70	114.6	0.317	0.000	0.317	14.8	26.2	5.0E-06	-9999.0	-9999.0	2.037	10.0	-9999.0	-9999.0
5.315	28.81	28.80	1.13	-1.04	3.93	114.6	0.321	0.000	0.321	18.4	32.5	5.0E-07	-9999.0	-9999.0	1.899	10.0	-9999.0	-9999.0
5.381	24.40	24.38	1.16	-1.37	4.77	111.4	0.325	0.000	0.325	23.4	41.0	5.0E-08	-9999.0	-9999.0	1.604	10.0	-9999.0	-9999.0
5.446	21.08	21.06	1.19	-2.09	5.66	111.4	0.328	0.000	0.328	20.2	35.2	5.0E-08	-9999.0	-9999.0	1.382	10.0	-9999.0	-9999.0
5.512	18.79	18.76	1.19	-2.37	6.36	111.4	0.332	0.000	0.332	18.0	31.2	5.0E-08	-9999.0	-9999.0	1.229	10.0	-9999.0	-9999.0
5.577	17.69	17.66	1.14	-2.61	6.47	111.4	0.336	0.000	0.336	16.9	29.2	5.0E-08	-9999.0	-9999.0	1.155	10.0	-9999.0	-9999.0
5.643	17.50	17.48	1.08	-2.00	6.19	111.4	0.339	0.000	0.339	16.7	28.7	5.0E-08	-9999.0	-9999.0	1.143	10.0	-9999.0	-9999.0
5.709	16.23	16.20	1.05	-2.27	6.50	111.4	0.343	0.000	0.343	15.5	26.5	5.0E-08	-9999.0	-9999.0	1.057	10.0	-9999.0	-9999.0
5.774	17.05	17.03	1.06	-1.92	6.24	111.4	0.347	0.000	0.347	16.3	27.7	5.0E-08	-9999.0	-9999.0	1.112	10.0	-9999.0	-9999.0
5.840	18.46	18.47	1.02	0.06	5.54	111.4	0.350	0.000	0.350	17.7	29.9	5.0E-08	-9999.0	-9999.0	1.208	10.0	-9999.0	-9999.0
5.905	21.33	21.34	1.01	0.81	4.74	111.4	0.354	0.000	0.354	20.4	34.4	5.0E-08	-9999.0	-9999.0	1.399	10.0	-9999.0	-9999.0
5.971	25.42	25.44	1.03	1.35	4.06	114.6	0.358	0.000	0.358	16.2	27.2	5.0E-07	-9999.0	-9999.0	1.672	10.0	-9999.0	-9999.0
6.037	26.96	26.97	1.14	1.68	4.24	114.6	0.361	0.000	0.361	17.2	28.7	5.0E-07	-9999.0	-9999.0	1.774	10.0	-9999.0	-9999.0
6.102	28.68	28.69	1.29	0.77	4.51	114.6	0.365	0.000	0.365	18.3	30.3	5.0E-07	-9999.0	-9999.0	1.888	10.0	-9999.0	-9999.0
6.168	32.33	32.35	1.47	2.15	4.55	114.6	0.369	0.000	0.369	20.7	34.0	5.0E-07	-9999.0	-9999.0	2.132	10.0	-9999.0	-9999.0
6.234	39.48	39.53	1.67	4.60	4.24	114.6	0.373	0.000	0.373	25.2	41.3	5.0E-07	-9999.0	-9999.0	2.610	10.0	-9999.0	-9999.0
6.299	48.74	48.82	1.84	7.38	3.78	114.6	0.376	0.000	0.376	23.4	38.1	5.0E-06	-9999.0	-9999.0	3.229	10.0	-9999.0	-9999.0
6.365	56.79	56.92	2.04	11.97	3.59	114.6	0.380	0.000	0.380	27.3	44.2	5.0E-06	-9999.0	-9999.0	3.769	10.0	-9999.0	-9999.0
6.430	59.28	59.45	2.27	15.31	3.81	114.6	0.384	0.000	0.384	28.5	46.0	5.0E-06	-9999.0	-9999.0	3.938	10.0	-9999.0	-9999.0
6.496	55.96	56.18	2.52	20.34	4.48	114.6	0.388	0.000	0.388	35.9	57.6	5.0E-07	-9999.0	-9999.0	3.719	10.0	-9999.0	-9999.0
6.562	54.43	54.67	2.71	21.79	4.95	114.6	0.391	0.000	0.391	34.9	55.8	5.0E-07	-9999.0	-9999.0	3.618	10.0	-9999.0	-9999.0
6.627	53.60	53.79	2.92	17.15	5.42	111.4	0.395	0.000	0.395	51.5	82.0	5.0E-08	-9999.0	-9999.0	3.559	10.0	-9999.0	-9999.0
6.693	53.28	53.47	3.07	17.82	5.74	111.4	0.399	0.000	0.399	51.2	81.1	5.0E-08	-9999.0	-9999.0	3.538	10.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
6.758	51.62	51.76	3.05	13.02	5.89	111.4	0.402	0.000	0.402	49.6	78.1	5.0E-08	-9999.0	-9999.0	3.424	10.0	-9999.0	-9999.0
6.824	49.25	49.47	2.97	20.28	6.00	111.4	0.406	0.000	0.406	47.4	74.4	5.0E-08	-9999.0	-9999.0	3.271	10.0	-9999.0	-9999.0
6.890	51.29	51.46	2.95	15.55	5.73	111.4	0.410	0.000	0.410	49.3	77.0	5.0E-08	-9999.0	-9999.0	3.404	10.0	-9999.0	-9999.0
6.955	54.30	54.51	2.92	18.92	5.35	111.4	0.413	0.000	0.413	52.2	81.2	5.0E-08	-9999.0	-9999.0	3.606	10.0	-9999.0	-9999.0
7.021	56.22	56.64	2.91	39.21	5.13	114.6	0.417	0.000	0.417	36.2	56.0	5.0E-07	-9999.0	-9999.0	3.748	10.0	-9999.0	-9999.0
7.087	56.35	56.68	2.90	30.97	5.11	114.6	0.421	0.000	0.421	36.2	55.8	5.0E-07	-9999.0	-9999.0	3.751	10.0	-9999.0	-9999.0
7.152	53.28	53.41	2.81	12.43	5.25	111.4	0.425	0.000	0.425	51.2	78.5	5.0E-08	-9999.0	-9999.0	3.533	10.0	-9999.0	-9999.0
7.218	47.47	47.55	2.72	7.78	5.71	111.4	0.428	0.000	0.428	45.5	69.6	5.0E-08	-9999.0	-9999.0	3.141	10.0	-9999.0	-9999.0
7.283	45.23	45.32	2.70	8.55	5.95	111.4	0.432	0.000	0.432	43.4	66.1	5.0E-08	-9999.0	-9999.0	2.993	10.0	-9999.0	-9999.0
7.349	40.89	40.92	2.64	3.06	6.44	111.4	0.435	0.000	0.435	39.2	59.4	5.0E-08	-9999.0	-9999.0	2.699	10.0	-9999.0	-9999.0
7.415	39.36	39.39	2.48	2.80	6.29	111.4	0.439	0.000	0.439	37.7	56.9	5.0E-08	-9999.0	-9999.0	2.596	10.0	-9999.0	-9999.0
7.480	38.90	38.99	2.35	7.78	6.02	111.4	0.443	0.000	0.443	37.3	56.1	5.0E-08	-9999.0	-9999.0	2.570	10.0	-9999.0	-9999.0
7.546	36.86	36.91	2.26	4.39	6.11	111.4	0.446	0.000	0.446	35.3	52.9	5.0E-08	-9999.0	-9999.0	2.431	10.0	-9999.0	-9999.0
7.611	35.52	35.55	2.14	3.14	6.01	111.4	0.450	0.000	0.450	34.0	50.8	5.0E-08	-9999.0	-9999.0	2.340	10.0	-9999.0	-9999.0
7.677	35.59	35.64	2.08	5.09	5.82	111.4	0.454	0.000	0.454	34.1	50.7	5.0E-08	-9999.0	-9999.0	2.346	10.0	-9999.0	-9999.0
7.743	35.33	35.37	2.09	3.85	5.90	111.4	0.457	0.000	0.457	33.9	50.1	5.0E-08	-9999.0	-9999.0	2.327	10.0	-9999.0	-9999.0
7.808	33.98	34.01	2.03	2.43	5.98	111.4	0.461	0.000	0.461	32.6	48.0	5.0E-08	-9999.0	-9999.0	2.237	10.0	-9999.0	-9999.0
7.874	30.99	31.02	1.97	3.42	6.37	111.4	0.465	0.000	0.465	29.7	43.6	5.0E-08	-9999.0	-9999.0	2.037	10.0	-9999.0	-9999.0
7.940	30.72	30.77	1.89	4.13	6.16	111.4	0.468	0.000	0.468	29.5	43.1	5.0E-08	-9999.0	-9999.0	2.020	10.0	-9999.0	-9999.0
8.005	30.53	30.56	1.82	2.39	5.97	111.4	0.472	0.000	0.472	29.3	42.6	5.0E-08	-9999.0	-9999.0	2.006	10.0	-9999.0	-9999.0
8.071	29.07	29.10	1.70	2.88	5.86	111.4	0.476	0.000	0.476	27.9	40.4	5.0E-08	-9999.0	-9999.0	1.908	10.0	-9999.0	-9999.0
8.136	27.54	27.57	1.63	3.48	5.93	111.4	0.479	0.000	0.479	26.4	38.1	5.0E-08	-9999.0	-9999.0	1.806	10.0	-9999.0	-9999.0
8.202	28.68	28.74	1.56	5.93	5.44	111.4	0.483	0.000	0.483	27.5	39.6	5.0E-08	-9999.0	-9999.0	1.884	10.0	-9999.0	-9999.0
8.268	29.96	30.05	1.55	8.14	5.17	111.4	0.487	0.000	0.487	28.8	41.3	5.0E-08	-9999.0	-9999.0	1.971	10.0	-9999.0	-9999.0
8.333	29.96	30.08	1.51	10.45	5.03	111.4	0.490	0.000	0.490	28.8	41.1	5.0E-08	-9999.0	-9999.0	1.972	10.0	-9999.0	-9999.0
8.399	30.72	30.83	1.51	9.87	4.91	111.4	0.494	0.000	0.494	29.5	42.0	5.0E-08	-9999.0	-9999.0	2.022	10.0	-9999.0	-9999.0
8.464	33.66	33.72	1.55	5.55	4.61	114.6	0.498	0.000	0.498	21.5	30.5	5.0E-07	-9999.0	-9999.0	2.215	10.0	-9999.0	-9999.0
8.530	34.87	34.92	1.60	3.80	4.59	114.6	0.501	0.000	0.501	22.3	31.5	5.0E-07	-9999.0	-9999.0	2.294	10.0	-9999.0	-9999.0
8.596	35.39	35.44	1.50	4.88	4.24	114.6	0.505	0.000	0.505	22.6	31.8	5.0E-07	-9999.0	-9999.0	2.329	10.0	-9999.0	-9999.0
8.661	31.75	31.75	1.54	-0.14	4.86	111.4	0.509	0.000	0.509	30.4	42.6	5.0E-08	-9999.0	-9999.0	2.082	10.0	-9999.0	-9999.0
8.727	28.24	28.23	1.54	-0.81	5.47	111.4	0.513	0.000	0.513	27.0	37.8	5.0E-08	-9999.0	-9999.0	1.848	10.0	-9999.0	-9999.0
8.793	25.68	25.68	1.51	-0.51	5.90	111.4	0.516	0.000	0.516	24.6	34.2	5.0E-08	-9999.0	-9999.0	1.677	10.0	-9999.0	-9999.0
8.858	24.72	24.73	1.45	0.81	5.88	111.4	0.520	0.000	0.520	23.7	32.8	5.0E-08	-9999.0	-9999.0	1.614	10.0	-9999.0	-9999.0
8.924	27.41	27.44	1.42	3.46	5.19	111.4	0.524	0.000	0.524	26.3	36.3	5.0E-08	-9999.0	-9999.0	1.795	10.0	-9999.0	-9999.0
8.989	28.75	28.81	1.42	5.19	4.94	111.4	0.527	0.000	0.527	27.6	38.0	5.0E-08	-9999.0	-9999.0	1.885	10.0	-9999.0	-9999.0
9.055	29.51	29.55	1.46	3.72	4.95	111.4	0.531	0.000	0.531	28.3	38.8	5.0E-08	-9999.0	-9999.0	1.935	10.0	-9999.0	-9999.0
9.121	31.18	31.24	1.51	5.59	4.85	111.4	0.534	0.000	0.534	29.9	40.9	5.0E-08	-9999.0	-9999.0	2.047	10.0	-9999.0	-9999.0
9.186	32.52	32.59	1.53	6.62	4.71	114.6	0.538	0.000	0.538	20.8	28.4	5.0E-07	-9999.0	-9999.0	2.137	10.0	-9999.0	-9999.0
9.252	35.08	35.17	1.61	8.71	4.59	114.6	0.542	0.000	0.542	22.5	30.5	5.0E-07	-9999.0	-9999.0	2.308	10.0	-9999.0	-9999.0
9.317	36.99	37.06	1.62	6.72	4.38	114.6	0.546	0.000	0.546	23.7	32.0	5.0E-07	-9999.0	-9999.0	2.434	10.0	-9999.0	-9999.0
9.383	36.73	36.81	1.64	7.76	4.47	114.6	0.549	0.000	0.549	23.5	31.7	5.0E-07	-9999.0	-9999.0	2.418	10.0	-9999.0	-9999.0
9.449	36.35	36.42	1.65	6.93	4.54	114.6	0.553	0.000	0.553	23.3	31.3	5.0E-07	-9999.0	-9999.0	2.391	10.0	-9999.0	-9999.0
9.514	32.77	32.81	1.62	3.99	4.95	111.4	0.557	0.000	0.557	31.4	42.1	5.0E-08	-9999.0	-9999.0	2.150	10.0	-9999.0	-9999.0
9.580	30.34	30.41	1.58	6.15	5.21	111.4	0.561	0.000	0.561	29.1	38.9	5.0E-08	-9999.0	-9999.0	1.990	10.0	-9999.0	-9999.0
9.646	29.45	29.54	1.53	8.04	5.19	111.4	0.564	0.000	0.564	28.3	37.7	5.0E-08	-9999.0	-9999.0	1.932	10.0	-9999.0	-9999.0
9.711	28.49	28.58	1.47	8.53	5.16	111.4	0.568	0.000	0.568	27.4	36.3	5.0E-08	-9999.0	-9999.0	1.868	10.0	-9999.0	-9999.0
9.777	27.85	27.92	1.36	6.36	4.88	111.4	0.572	0.000	0.572	26.7	35.4	5.0E-08	-9999.0	-9999.0	1.823	10.0	-9999.0	-9999.0
9.842	26.70	26.79	1.34	7.70	5.01	111.4	0.575	0.000	0.575	25.7	33.8	5.0E-08	-9999.0	-9999.0	1.748	10.0	-9999.0	-9999.0
9.908	26.44	26.55	1.37	9.48	5.17	111.4	0.579	0.000	0.579	25.4	33.4	5.0E-08	-9999.0	-9999.0	1.731	10.0	-9999.0	-9999.0
9.974	27.41	27.53	1.38	11.57	5.02	111.4	0.583	0.000	0.583	26.4	34.5	5.0E-08	-9999.0	-9999.0	1.797	10.0	-9999.0	-9999.0
10.039	27.28	27.39	1.40	10.31	5.12	111.4	0.586	0.000	0.586	26.2	34.3	5.0E-08	-9999.0	-9999.0	1.787	10.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
10.105	29.32	29.43	1.49	10.35	5.07	111.4	0.590	0.000	0.590	28.2	36.7	5.0E-08	-9999.0	-9999.0	1.923	10.0	-9999.0	-9999.0
10.170	33.22	33.39	1.57	15.49	4.71	114.6	0.594	0.000	0.594	21.3	27.7	5.0E-07	-9999.0	-9999.0	2.186	10.0	-9999.0	-9999.0
10.236	36.10	36.34	1.66	22.44	4.58	114.6	0.597	0.000	0.597	23.2	30.0	5.0E-07	-9999.0	-9999.0	2.383	10.0	-9999.0	-9999.0
10.302	36.99	37.15	1.86	15.13	5.02	111.4	0.601	0.000	0.601	35.6	45.9	5.0E-08	-9999.0	-9999.0	2.437	10.0	-9999.0	-9999.0
10.367	40.44	40.57	2.05	12.45	5.06	111.4	0.605	0.000	0.605	38.9	50.0	5.0E-08	-9999.0	-9999.0	2.665	10.0	-9999.0	-9999.0
10.433	57.24	57.57	2.14	30.38	3.71	114.6	0.608	0.000	0.608	27.6	35.3	5.0E-06	-9999.0	-9999.0	3.797	10.0	-9999.0	-9999.0
10.499	70.27	70.52	2.19	22.79	3.10	114.6	0.612	0.000	0.612	27.0	34.5	5.0E-05	63.7	42.0	4.660	10.0	158.6	2.249
10.564	73.59	73.64	2.22	5.01	3.01	114.6	0.616	0.000	0.616	28.2	36.0	5.0E-05	64.8	42.0	4.868	10.0	163.1	2.215
10.630	70.65	70.68	2.25	2.45	3.18	114.6	0.620	0.000	0.620	27.1	34.4	5.0E-05	63.6	42.0	4.671	10.0	159.2	2.252
10.695	63.95	63.93	2.31	-1.21	3.61	114.6	0.623	0.000	0.623	30.6	38.8	5.0E-06	-9999.0	-9999.0	4.221	10.0	-9999.0	-9999.0
10.761	53.60	53.58	2.29	-1.52	4.27	114.6	0.627	0.000	0.627	25.7	32.4	5.0E-06	-9999.0	-9999.0	3.530	10.0	-9999.0	-9999.0
10.827	43.76	43.73	2.05	-2.72	4.70	114.6	0.631	0.000	0.631	27.9	35.2	5.0E-07	-9999.0	-9999.0	2.873	10.0	-9999.0	-9999.0
10.892	36.22	36.19	1.78	-2.96	4.93	111.4	0.635	0.000	0.635	34.7	43.5	5.0E-08	-9999.0	-9999.0	2.370	10.0	-9999.0	-9999.0
10.958	31.05	31.02	1.64	-2.07	5.30	111.4	0.638	0.000	0.638	29.7	37.2	5.0E-08	-9999.0	-9999.0	2.026	10.0	-9999.0	-9999.0
11.023	28.11	28.09	1.49	-2.07	5.32	111.4	0.642	0.001	0.641	26.9	33.6	5.0E-08	-9999.0	-9999.0	1.830	10.0	-9999.0	-9999.0
11.089	26.57	26.57	1.40	-0.53	5.28	111.4	0.646	0.003	0.643	25.4	31.7	5.0E-08	-9999.0	-9999.0	1.728	10.0	-9999.0	-9999.0
11.155	25.68	25.68	1.34	0.04	5.23	111.4	0.649	0.005	0.644	24.6	30.6	5.0E-08	-9999.0	-9999.0	1.669	10.0	-9999.0	-9999.0
11.220	25.93	25.95	1.25	1.33	4.83	111.4	0.653	0.007	0.646	24.8	30.9	5.0E-08	-9999.0	-9999.0	1.686	10.0	-9999.0	-9999.0
11.286	25.93	25.97	1.20	3.22	4.63	111.4	0.657	0.009	0.648	24.9	30.9	5.0E-08	-9999.0	-9999.0	1.687	10.0	-9999.0	-9999.0
11.352	23.26	23.27	1.13	1.41	4.87	111.4	0.660	0.011	0.649	22.3	27.7	5.0E-08	-9999.0	-9999.0	1.507	10.0	-9999.0	-9999.0
11.417	21.59	21.60	1.12	1.12	5.20	111.4	0.664	0.013	0.651	20.7	25.6	5.0E-08	-9999.0	-9999.0	1.396	10.0	-9999.0	-9999.0
11.483	20.57	20.59	1.09	1.88	5.31	111.4	0.668	0.015	0.652	19.7	24.4	5.0E-08	-9999.0	-9999.0	1.328	10.0	-9999.0	-9999.0
11.548	18.46	18.48	1.02	1.50	5.53	111.4	0.671	0.017	0.654	17.7	21.9	5.0E-08	-9999.0	-9999.0	1.187	10.0	-9999.0	-9999.0
11.614	17.31	17.33	0.95	1.84	5.49	111.4	0.675	0.019	0.656	16.6	20.5	5.0E-08	-9999.0	-9999.0	1.110	10.0	-9999.0	-9999.0
11.680	15.78	15.80	0.88	1.84	5.58	111.4	0.678	0.021	0.657	15.1	18.7	5.0E-08	-9999.0	-9999.0	1.008	8.8	-9999.0	-9999.0
11.745	15.65	15.68	0.82	2.55	5.24	111.4	0.682	0.023	0.659	15.0	18.5	5.0E-08	-9999.0	-9999.0	1.000	8.7	-9999.0	-9999.0
11.811	14.95	14.98	0.76	3.06	5.09	111.4	0.686	0.025	0.660	14.3	17.7	5.0E-08	-9999.0	-9999.0	0.953	8.0	-9999.0	-9999.0
11.876	14.51	14.53	0.70	2.61	4.83	111.4	0.689	0.027	0.662	13.9	17.1	5.0E-08	-9999.0	-9999.0	0.923	7.6	-9999.0	-9999.0
11.942	15.14	15.18	0.72	3.99	4.75	111.4	0.693	0.029	0.664	14.5	17.8	5.0E-08	-9999.0	-9999.0	0.966	8.1	-9999.0	-9999.0
12.008	15.33	15.37	0.74	3.87	4.83	111.4	0.697	0.031	0.665	14.7	18.0	5.0E-08	-9999.0	-9999.0	0.978	8.3	-9999.0	-9999.0
12.073	16.29	16.34	0.75	4.78	4.60	111.4	0.700	0.034	0.667	15.6	19.2	5.0E-08	-9999.0	-9999.0	1.043	9.1	-9999.0	-9999.0
12.139	18.14	18.20	0.81	5.45	4.46	111.4	0.704	0.036	0.668	17.4	21.3	5.0E-08	-9999.0	-9999.0	1.167	10.0	-9999.0	-9999.0
12.205	25.81	25.89	0.87	7.13	3.37	114.6	0.708	0.038	0.670	12.4	15.1	5.0E-06	-9999.0	-9999.0	1.679	10.0	-9999.0	-9999.0
12.270	27.54	27.58	0.94	3.70	3.42	114.6	0.712	0.040	0.672	13.2	16.1	5.0E-06	-9999.0	-9999.0	1.791	10.0	-9999.0	-9999.0
12.336	28.11	28.11	0.98	-0.10	3.50	114.6	0.715	0.042	0.674	13.5	16.4	5.0E-06	-9999.0	-9999.0	1.826	10.0	-9999.0	-9999.0
12.401	24.66	24.66	0.99	-0.16	4.02	114.6	0.719	0.044	0.675	15.7	19.2	5.0E-07	-9999.0	-9999.0	1.596	10.0	-9999.0	-9999.0
12.467	24.47	24.47	0.99	0.08	4.06	114.6	0.723	0.046	0.677	15.6	19.0	5.0E-07	-9999.0	-9999.0	1.583	10.0	-9999.0	-9999.0
12.533	24.98	24.99	0.96	0.65	3.85	114.6	0.727	0.048	0.679	16.0	19.4	5.0E-07	-9999.0	-9999.0	1.617	10.0	-9999.0	-9999.0
12.598	22.48	22.49	0.91	0.90	4.06	114.6	0.730	0.050	0.680	14.4	17.4	5.0E-07	-9999.0	-9999.0	1.451	10.0	-9999.0	-9999.0
12.664	20.44	20.45	0.83	1.12	4.07	114.6	0.734	0.052	0.682	13.1	15.8	5.0E-07	-9999.0	-9999.0	1.315	10.0	-9999.0	-9999.0
12.730	17.18	17.18	0.80	-0.43	4.67	111.4	0.738	0.054	0.684	16.4	19.9	5.0E-08	-9999.0	-9999.0	1.096	9.5	-9999.0	-9999.0
12.795	14.95	14.96	0.75	0.87	5.03	111.4	0.741	0.056	0.685	14.3	17.3	5.0E-08	-9999.0	-9999.0	0.948	7.5	-9999.0	-9999.0
12.861	14.76	14.78	0.79	2.63	5.36	111.4	0.745	0.058	0.687	14.2	17.1	5.0E-08	-9999.0	-9999.0	0.936	7.3	-9999.0	-9999.0
12.926	15.72	15.76	0.91	4.07	5.79	111.4	0.749	0.060	0.689	15.1	18.2	5.0E-08	-9999.0	-9999.0	1.001	8.1	-9999.0	-9999.0
12.992	20.06	20.20	0.86	12.90	4.27	114.6	0.752	0.062	0.690	12.9	15.5	5.0E-07	-9999.0	-9999.0	1.296	10.0	-9999.0	-9999.0
13.058	37.37	37.61	0.83	22.04	2.21	114.6	0.756	0.064	0.692	14.4	17.3	5.0E-05	43.9	40.0	2.457	10.0	117.7	3.130
13.123	63.11	63.26	0.87	14.00	1.38	117.7	0.760	0.066	0.694	20.2	24.2	5.0E-04	58.8	42.0	-9999.0	-9999.0	152.8	2.416
13.189	95.31	95.42	0.93	9.64	0.98	120.9	0.764	0.068	0.696	22.8	27.4	5.0E-03	70.5	44.0	-9999.0	-9999.0	198.0	2.075
13.254	122.40	122.48	1.06	7.44	0.87	124.1	0.768	0.070	0.698	23.5	28.1	5.0E-02	77.6	44.0	-9999.0	-9999.0	236.8	1.933
13.320	139.39	139.48	1.18	8.59	0.85	124.1	0.772	0.072	0.700	26.7	31.9	5.0E-02	81.3	46.0	-9999.0	-9999.0	262.5	1.882
13.386	149.29	149.38	1.28	8.57	0.86	124.1	0.776	0.074	0.702	28.6	34.2	5.0E-02	83.2	46.0	-9999.0	-9999.0	281.0	1.881

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
13.451	154.46	154.56	1.31	9.28	0.85	124.1	0.780	0.077	0.704	29.6	35.3	5.0E-02	84.2	46.0	-9999.0	-9999.0	292.7	1.894
13.517	156.89	156.99	1.45	9.38	0.93	124.1	0.784	0.079	0.706	30.1	35.8	5.0E-02	84.6	46.0	-9999.0	-9999.0	298.8	1.903
13.583	155.68	155.76	1.60	7.29	1.03	124.1	0.788	0.081	0.708	29.8	35.5	5.0E-02	84.3	46.0	-9999.0	-9999.0	295.4	1.897
13.648	152.23	152.31	1.73	7.21	1.14	120.9	0.792	0.083	0.710	36.5	43.3	5.0E-03	83.6	46.0	-9999.0	-9999.0	287.1	1.885
13.714	149.23	149.35	1.83	10.57	1.23	120.9	0.796	0.085	0.712	35.8	42.4	5.0E-03	83.0	46.0	-9999.0	-9999.0	280.7	1.880
13.779	146.09	146.19	1.91	8.87	1.31	120.9	0.800	0.087	0.713	35.0	41.4	5.0E-03	82.4	46.0	-9999.0	-9999.0	274.5	1.878
13.845	140.35	140.44	1.97	8.36	1.41	120.9	0.804	0.089	0.715	33.6	39.8	5.0E-03	81.2	44.0	-9999.0	-9999.0	264.5	1.883
13.911	134.54	134.64	2.01	9.26	1.50	120.9	0.808	0.091	0.717	32.2	38.1	5.0E-03	79.9	44.0	-9999.0	-9999.0	255.3	1.896
13.976	130.13	130.21	1.98	7.44	1.52	120.9	0.812	0.093	0.719	31.2	36.8	5.0E-03	78.9	44.0	-9999.0	-9999.0	248.8	1.911
14.042	125.27	125.37	1.95	8.91	1.56	120.9	0.816	0.095	0.721	30.0	35.3	5.0E-03	77.8	44.0	-9999.0	-9999.0	241.9	1.930
14.107	120.48	120.57	1.86	8.16	1.55	120.9	0.820	0.097	0.723	28.9	34.0	5.0E-03	76.7	44.0	-9999.0	-9999.0	235.2	1.951
14.173	117.03	117.12	1.75	7.98	1.50	120.9	0.824	0.099	0.725	28.0	32.9	5.0E-03	75.8	44.0	-9999.0	-9999.0	230.4	1.968
14.239	116.07	116.16	1.64	8.02	1.42	120.9	0.828	0.101	0.727	27.8	32.6	5.0E-03	75.5	44.0	-9999.0	-9999.0	229.2	1.973
14.304	114.99	115.07	1.63	7.13	1.42	120.9	0.832	0.103	0.729	27.5	32.3	5.0E-03	75.2	44.0	-9999.0	-9999.0	227.7	1.979
14.370	113.84	113.92	1.57	7.40	1.38	120.9	0.836	0.105	0.731	27.3	31.9	5.0E-03	74.9	44.0	-9999.0	-9999.0	226.2	1.985
14.436	113.71	113.78	1.48	7.19	1.30	120.9	0.840	0.107	0.733	27.2	31.8	5.0E-03	74.8	44.0	-9999.0	-9999.0	226.1	1.987
14.501	115.69	115.76	1.43	6.60	1.24	120.9	0.844	0.109	0.735	27.7	32.3	5.0E-03	75.3	44.0	-9999.0	-9999.0	228.9	1.978
14.567	117.22	117.28	1.38	5.01	1.18	120.9	0.848	0.111	0.737	28.1	32.7	5.0E-03	75.6	44.0	-9999.0	-9999.0	231.2	1.971
14.632	118.69	118.75	1.34	5.63	1.13	120.9	0.852	0.113	0.738	28.4	33.1	5.0E-03	75.9	44.0	-9999.0	-9999.0	233.3	1.965
14.698	119.14	119.20	1.27	5.77	1.07	120.9	0.856	0.115	0.740	28.5	33.2	5.0E-03	76.0	44.0	-9999.0	-9999.0	234.1	1.964
14.764	116.64	116.73	1.27	8.30	1.09	120.9	0.860	0.118	0.742	27.9	32.4	5.0E-03	75.4	44.0	-9999.0	-9999.0	230.7	1.976
14.829	113.52	113.58	1.19	5.55	1.05	120.9	0.864	0.120	0.744	27.2	31.5	5.0E-03	74.5	44.0	-9999.0	-9999.0	226.3	1.992
14.895	110.52	110.56	1.17	4.27	1.06	120.9	0.868	0.122	0.746	26.5	30.6	5.0E-03	73.7	44.0	-9999.0	-9999.0	222.0	2.008
14.960	108.02	108.06	1.15	3.52	1.07	120.9	0.872	0.124	0.748	25.9	29.9	5.0E-03	73.0	44.0	-9999.0	-9999.0	218.5	2.022
15.026	103.81	103.86	1.08	4.44	1.04	120.9	0.876	0.126	0.750	24.9	28.7	5.0E-03	71.9	44.0	-9999.0	-9999.0	212.6	2.047
15.092	102.53	102.58	0.94	5.03	0.92	120.9	0.880	0.128	0.752	24.6	28.3	5.0E-03	71.5	44.0	-9999.0	-9999.0	210.8	2.055
15.157	100.67	100.73	1.00	5.51	1.00	120.9	0.884	0.130	0.754	24.1	27.8	5.0E-03	70.9	44.0	-9999.0	-9999.0	208.2	2.067
15.223	99.59	99.65	1.03	5.27	1.04	120.9	0.888	0.132	0.756	23.9	27.4	5.0E-03	70.6	44.0	-9999.0	-9999.0	206.7	2.074
15.289	97.74	97.82	1.04	7.83	1.07	120.9	0.892	0.134	0.758	23.4	26.9	5.0E-03	70.0	44.0	-9999.0	-9999.0	204.1	2.087
15.354	95.18	95.28	1.02	8.91	1.07	120.9	0.896	0.136	0.760	22.8	26.2	5.0E-03	69.2	42.0	-9999.0	-9999.0	200.5	2.105
15.420	85.35	85.37	1.02	1.88	1.20	120.9	0.899	0.138	0.761	20.4	23.4	5.0E-03	66.0	42.0	-9999.0	-9999.0	186.3	2.183
15.485	83.24	83.28	1.00	3.74	1.20	120.9	0.903	0.140	0.763	19.9	22.8	5.0E-03	65.3	42.0	-9999.0	-9999.0	183.5	2.203
15.551	81.20	81.24	0.95	4.27	1.17	120.9	0.907	0.142	0.765	19.5	22.2	5.0E-03	64.5	42.0	-9999.0	-9999.0	180.7	2.224
15.617	78.70	78.76	0.92	5.91	1.17	120.9	0.911	0.144	0.767	18.9	21.5	5.0E-03	63.6	42.0	-9999.0	-9999.0	177.3	2.251
15.682	77.43	77.48	0.88	5.25	1.14	120.9	0.915	0.146	0.769	18.6	21.2	5.0E-03	63.1	42.0	-9999.0	-9999.0	175.6	2.266
15.748	75.50	75.57	0.83	6.11	1.10	120.9	0.919	0.148	0.771	18.1	20.6	5.0E-03	62.4	42.0	-9999.0	-9999.0	173.1	2.290
15.813	75.25	75.32	0.81	6.13	1.08	120.9	0.923	0.150	0.773	18.0	20.5	5.0E-03	62.2	42.0	-9999.0	-9999.0	172.8	2.294
15.879	74.36	74.42	0.75	5.29	1.01	120.9	0.927	0.152	0.775	17.8	20.2	5.0E-03	61.8	42.0	-9999.0	-9999.0	171.7	2.307
15.945	73.53	73.62	0.71	8.08	0.97	120.9	0.931	0.154	0.777	17.6	20.0	5.0E-03	61.5	42.0	-9999.0	-9999.0	170.7	2.318
16.010	72.25	72.30	0.68	5.03	0.94	120.9	0.935	0.156	0.779	17.3	19.6	5.0E-03	60.9	42.0	-9999.0	-9999.0	169.0	2.337
16.076	71.10	71.17	0.67	5.83	0.94	120.9	0.939	0.158	0.781	17.0	19.3	5.0E-03	60.5	42.0	-9999.0	-9999.0	167.5	2.354
16.142	70.33	70.40	0.67	6.38	0.95	120.9	0.943	0.161	0.783	16.9	19.1	5.0E-03	60.1	42.0	-9999.0	-9999.0	166.6	2.366
16.207	69.82	69.86	0.63	4.05	0.90	120.9	0.947	0.163	0.785	16.7	18.9	5.0E-03	59.9	42.0	-9999.0	-9999.0	166.0	2.376
16.273	69.31	69.37	0.61	5.71	0.88	120.9	0.951	0.165	0.786	16.6	18.7	5.0E-03	59.6	42.0	-9999.0	-9999.0	165.4	2.385
16.338	69.70	69.77	0.61	6.56	0.88	120.9	0.955	0.167	0.788	16.7	18.8	5.0E-03	59.7	42.0	-9999.0	-9999.0	166.1	2.380
16.404	69.70	69.77	0.60	6.99	0.86	120.9	0.959	0.169	0.790	16.7	18.8	5.0E-03	59.7	42.0	-9999.0	-9999.0	166.2	2.382
16.470	68.99	69.06	0.55	6.62	0.80	120.9	0.963	0.171	0.792	16.5	18.6	5.0E-03	59.4	42.0	-9999.0	-9999.0	165.4	2.395
16.535	68.48	68.55	0.51	6.58	0.75	120.9	0.967	0.173	0.794	16.4	18.4	5.0E-03	59.1	42.0	-9999.0	-9999.0	164.8	2.404
16.601	67.01	67.08	0.48	6.54	0.72	120.9	0.971	0.175	0.796	16.1	18.0	5.0E-03	58.5	42.0	-9999.0	-9999.0	163.0	2.429
16.666	65.99	66.05	0.44	5.49	0.67	120.9	0.975	0.177	0.798	15.8	17.7	5.0E-03	58.0	42.0	-9999.0	-9999.0	161.7	2.449
16.732	64.84	64.89	0.40	4.68	0.62	120.9	0.979	0.179	0.800	15.5	17.4	5.0E-03	57.5	42.0	-9999.0	-9999.0	160.3	2.471

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
16.798	63.49	63.54	0.36	4.56	0.57	120.9	0.983	0.181	0.802	15.2	17.0	5.0E-03	56.8	42.0	-9999.0	-9999.0	158.7	2.497
16.863	64.46	64.50	0.29	3.80	0.45	120.9	0.987	0.183	0.804	15.4	17.2	5.0E-03	57.2	42.0	-9999.0	-9999.0	160.0	2.481
16.929	63.30	63.34	0.23	3.64	0.36	120.9	0.991	0.185	0.806	15.2	16.9	5.0E-03	56.7	40.0	-9999.0	-9999.0	158.6	2.504
16.995	62.41	62.45	0.21	3.70	0.34	120.9	0.995	0.187	0.808	15.0	16.6	5.0E-03	56.2	40.0	-9999.0	-9999.0	157.6	2.523
17.060	61.84	61.88	0.18	3.60	0.29	120.9	0.999	0.189	0.809	14.8	16.5	5.0E-03	55.9	40.0	-9999.0	-9999.0	156.9	2.536
17.126	61.96	62.01	0.15	4.23	0.24	120.9	1.003	0.191	0.811	14.8	16.5	5.0E-03	56.0	40.0	-9999.0	-9999.0	157.2	2.536
17.191	60.63	60.68	0.12	5.31	0.20	120.9	1.007	0.193	0.813	14.5	16.1	5.0E-03	55.3	40.0	-9999.0	-9999.0	155.6	2.564
17.257	59.15	59.21	0.15	5.57	0.25	120.9	1.011	0.195	0.815	14.2	15.7	5.0E-03	54.6	40.0	-9999.0	-9999.0	153.8	2.597
17.323	57.69	57.74	0.16	4.42	0.28	120.9	1.015	0.197	0.817	13.8	15.3	5.0E-03	53.8	40.0	-9999.0	-9999.0	151.9	2.632
17.388	56.28	56.34	0.18	5.79	0.32	120.9	1.019	0.199	0.819	13.5	14.9	5.0E-03	53.1	40.0	-9999.0	-9999.0	150.2	2.666
17.454	54.55	54.60	0.13	4.48	0.24	120.9	1.022	0.202	0.821	13.1	14.4	5.0E-03	52.1	40.0	-9999.0	-9999.0	148.0	2.711
17.519	52.45	52.50	0.10	4.56	0.19	120.9	1.026	0.204	0.823	12.6	13.9	5.0E-03	51.0	40.0	-9999.0	-9999.0	145.3	2.768
17.585	52.64	52.69	0.12	5.17	0.23	120.9	1.030	0.206	0.825	12.6	13.9	5.0E-03	51.1	40.0	-9999.0	-9999.0	145.7	2.765
17.651	53.02	53.08	0.12	5.65	0.23	120.9	1.034	0.208	0.827	12.7	14.0	5.0E-03	51.2	40.0	-9999.0	-9999.0	146.3	2.756
17.716	52.58	52.65	0.12	6.87	0.23	120.9	1.038	0.210	0.829	12.6	13.8	5.0E-03	51.0	40.0	-9999.0	-9999.0	145.8	2.770
17.782	52.58	52.63	0.11	4.46	0.21	120.9	1.042	0.212	0.831	12.6	13.8	5.0E-03	50.9	40.0	-9999.0	-9999.0	145.9	2.773
17.848	50.91	50.96	0.11	4.64	0.22	120.9	1.046	0.214	0.832	12.2	13.4	5.0E-03	50.0	40.0	-9999.0	-9999.0	143.7	2.821
17.913	53.47	53.54	0.13	6.07	0.24	120.9	1.050	0.216	0.834	12.8	14.0	5.0E-03	51.3	40.0	-9999.0	-9999.0	147.4	2.752
17.979	54.49	54.54	0.10	4.82	0.18	120.9	1.054	0.218	0.836	13.1	14.3	5.0E-03	51.8	40.0	-9999.0	-9999.0	148.8	2.728
18.044	54.87	54.92	0.13	4.64	0.24	120.9	1.058	0.220	0.838	13.1	14.4	5.0E-03	52.0	40.0	-9999.0	-9999.0	149.4	2.721
18.110	54.87	54.93	0.13	5.21	0.24	120.9	1.062	0.222	0.840	13.2	14.3	5.0E-03	52.0	40.0	-9999.0	-9999.0	149.6	2.723
18.176	53.28	53.35	0.11	6.46	0.21	120.9	1.066	0.224	0.842	12.8	13.9	5.0E-03	51.1	40.0	-9999.0	-9999.0	147.5	2.766
18.241	53.47	53.55	0.24	7.33	0.45	120.9	1.070	0.226	0.844	12.8	14.0	5.0E-03	51.2	40.0	-9999.0	-9999.0	147.9	2.762
18.307	52.51	52.56	0.19	4.44	0.36	120.9	1.074	0.228	0.846	12.6	13.7	5.0E-03	50.6	40.0	-9999.0	-9999.0	146.7	2.791
18.372	52.51	52.57	0.11	6.13	0.21	120.9	1.078	0.230	0.848	12.6	13.7	5.0E-03	50.6	40.0	-9999.0	-9999.0	146.8	2.792
18.438	51.81	51.86	0.12	4.80	0.23	120.9	1.082	0.232	0.850	12.4	13.5	5.0E-03	50.2	40.0	-9999.0	-9999.0	145.9	2.814
18.504	51.88	51.98	0.12	9.50	0.23	120.9	1.086	0.234	0.852	12.4	13.5	5.0E-03	50.2	40.0	-9999.0	-9999.0	146.2	2.813
18.569	48.23	48.29	0.12	5.89	0.25	120.9	1.090	0.236	0.854	11.6	12.5	5.0E-03	48.1	40.0	-9999.0	-9999.0	141.2	2.923
18.635	42.61	42.69	0.10	6.79	0.23	120.9	1.094	0.238	0.856	10.2	11.1	5.0E-03	44.5	38.0	-9999.0	-9999.0	133.0	3.115
18.701	40.50	40.56	0.10	5.83	0.25	120.9	1.098	0.240	0.857	9.7	10.5	5.0E-03	43.0	38.0	-9999.0	-9999.0	129.7	3.198
18.766	38.13	38.21	0.08	7.46	0.21	120.9	1.102	0.242	0.859	9.1	9.9	5.0E-03	41.3	38.0	-9999.0	-9999.0	125.9	3.295
18.832	37.05	37.11	0.07	5.33	0.19	120.9	1.106	0.245	0.861	8.9	9.6	5.0E-03	40.4	38.0	-9999.0	-9999.0	124.1	3.344
18.897	35.14	35.21	0.05	7.13	0.14	120.9	1.110	0.247	0.863	8.4	9.1	5.0E-03	38.8	38.0	-9999.0	-9999.0	120.8	3.430
18.963	34.43	34.52	0.06	8.34	0.17	120.9	1.114	0.249	0.865	8.3	8.9	5.0E-03	38.2	38.0	-9999.0	-9999.0	119.6	3.464
19.029	32.84	32.92	0.04	7.36	0.12	117.7	1.118	0.251	0.867	10.5	11.3	5.0E-04	36.9	38.0	-9999.0	-9999.0	116.6	3.542
19.094	31.88	31.95	0.04	7.09	0.13	117.7	1.122	0.253	0.869	10.2	10.9	5.0E-04	36.0	38.0	-9999.0	-9999.0	114.8	3.591
19.160	30.28	30.36	0.04	6.95	0.13	117.7	1.125	0.255	0.871	9.7	10.4	5.0E-04	34.5	36.0	-9999.0	-9999.0	111.6	3.675
19.225	28.75	28.83	0.04	7.09	0.14	117.7	1.129	0.257	0.872	9.2	9.9	5.0E-04	33.0	36.0	-9999.0	-9999.0	108.3	3.758
19.291	28.75	28.82	0.03	6.79	0.10	117.7	1.133	0.259	0.874	9.2	9.8	5.0E-04	32.9	36.0	-9999.0	-9999.0	108.4	3.760
19.357	25.93	26.00	0.04	6.66	0.15	117.7	1.137	0.261	0.876	8.3	8.9	5.0E-04	30.0	36.0	-9999.0	-9999.0	-9999.0	-9999.0
19.422	24.85	24.93	0.04	6.95	0.16	117.7	1.141	0.263	0.878	8.0	8.5	5.0E-04	30.0	36.0	-9999.0	-9999.0	-9999.0	-9999.0
19.488	24.53	24.61	0.04	7.29	0.16	117.7	1.145	0.265	0.880	7.9	8.4	5.0E-04	30.0	36.0	-9999.0	-9999.0	-9999.0	-9999.0
19.554	24.34	24.42	0.03	7.05	0.12	117.7	1.149	0.267	0.881	7.8	8.3	5.0E-04	30.0	36.0	-9999.0	-9999.0	-9999.0	-9999.0
19.619	23.26	23.33	0.03	6.91	0.13	117.7	1.152	0.269	0.883	7.4	7.9	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
19.685	22.61	22.69	0.02	7.15	0.09	117.7	1.156	0.271	0.885	7.2	7.7	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
19.750	21.46	21.54	0.02	6.79	0.09	117.7	1.160	0.273	0.887	6.9	7.3	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
19.816	20.44	20.52	0.02	7.07	0.10	117.7	1.164	0.275	0.889	6.5	6.9	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
19.882	20.19	20.27	0.03	7.07	0.15	117.7	1.168	0.277	0.891	6.5	6.9	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
19.947	19.74	19.82	0.02	7.40	0.10	117.7	1.172	0.279	0.892	6.3	6.7	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
20.013	19.49	19.57	0.02	7.58	0.10	117.7	1.176	0.281	0.894	6.2	6.6	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
20.078	19.55	19.63	0.02	7.60	0.10	117.7	1.179	0.283	0.896	6.3	6.6	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
20.144	20.38	20.46	0.02	7.33	0.10	117.7	1.183	0.286	0.898	6.5	6.9	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
20.210	22.42	22.50	0.02	7.46	0.09	117.7	1.187	0.288	0.900	7.2	7.6	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
20.275	23.51	23.59	0.02	7.74	0.08	117.7	1.191	0.290	0.901	7.5	7.9	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
20.341	24.72	24.80	0.03	7.54	0.12	117.7	1.195	0.292	0.903	7.9	8.3	5.0E-04	30.0	36.0	-9999.0	-9999.0	-9999.0	-9999.0
20.407	26.06	26.15	0.03	7.81	0.12	117.7	1.199	0.294	0.905	8.3	8.8	5.0E-04	30.0	36.0	-9999.0	-9999.0	-9999.0	-9999.0
20.472	26.90	26.98	0.03	8.02	0.11	117.7	1.203	0.296	0.907	8.6	9.0	5.0E-04	30.5	36.0	-9999.0	-9999.0	-9999.0	-9999.0
20.538	28.24	28.32	0.04	7.70	0.14	117.7	1.207	0.298	0.909	9.0	9.5	5.0E-04	31.9	36.0	-9999.0	-9999.0	-9999.0	-9999.0
20.603	29.83	29.92	0.05	7.66	0.17	117.7	1.210	0.300	0.911	9.5	10.0	5.0E-04	33.4	36.0	-9999.0	-9999.0	112.0	3.744
20.669	30.53	30.62	0.04	7.64	0.13	117.7	1.214	0.302	0.912	9.8	10.2	5.0E-04	34.0	36.0	-9999.0	-9999.0	113.6	3.709
20.735	31.18	31.26	0.04	7.66	0.13	117.7	1.218	0.304	0.914	10.0	10.4	5.0E-04	34.6	36.0	-9999.0	-9999.0	115.0	3.679
20.800	31.43	31.51	0.02	8.16	0.06	117.7	1.222	0.306	0.916	10.1	10.5	5.0E-04	34.8	36.0	-9999.0	-9999.0	115.6	3.668
20.866	31.43	31.50	0.03	7.29	0.10	117.7	1.226	0.308	0.918	10.1	10.5	5.0E-04	34.8	36.0	-9999.0	-9999.0	115.6	3.670
20.932	31.43	31.50	0.04	6.85	0.13	117.7	1.230	0.310	0.920	10.1	10.5	5.0E-04	34.7	36.0	-9999.0	-9999.0	115.7	3.673
20.997	30.66	30.76	0.06	8.48	0.20	117.7	1.234	0.312	0.921	9.8	10.2	5.0E-04	34.0	36.0	-9999.0	-9999.0	114.2	3.712
21.063	29.96	30.05	0.06	7.64	0.20	117.7	1.237	0.314	0.923	9.6	10.0	5.0E-04	33.3	36.0	-9999.0	-9999.0	112.7	3.751
21.128	27.09	27.17	0.06	7.62	0.22	117.7	1.241	0.316	0.925	8.7	9.0	5.0E-04	30.4	36.0	-9999.0	-9999.0	-9999.0	-9999.0
21.194	24.21	24.29	0.09	7.33	0.37	117.7	1.245	0.318	0.927	7.8	8.1	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
21.260	20.63	20.71	0.15	7.83	0.73	117.7	1.249	0.320	0.929	6.6	6.9	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
21.325	16.23	16.31	0.15	7.56	0.92	114.6	1.253	0.322	0.930	6.2	6.5	5.0E-05	30.0	32.0	1.004	5.1	-9999.0	-9999.0
21.391	13.09	13.18	0.11	7.78	0.84	114.6	1.257	0.324	0.932	5.0	5.2	5.0E-05	30.0	30.0	0.795	3.6	-9999.0	-9999.0
21.456	10.35	10.43	0.21	8.00	2.02	114.6	1.260	0.326	0.934	5.0	5.2	5.0E-06	-9999.0	-9999.0	0.611	2.5	-9999.0	-9999.0
21.522	9.77	9.86	0.23	8.02	2.34	114.6	1.264	0.329	0.936	4.7	4.9	5.0E-06	-9999.0	-9999.0	0.573	2.3	-9999.0	-9999.0
21.588	12.01	12.11	0.25	9.07	2.07	114.6	1.268	0.331	0.937	5.8	6.0	5.0E-06	-9999.0	-9999.0	0.723	3.1	-9999.0	-9999.0
21.653	15.33	15.42	0.23	8.50	1.50	114.6	1.272	0.333	0.939	5.9	6.1	5.0E-05	30.0	32.0	0.943	4.6	-9999.0	-9999.0
21.719	12.84	12.95	0.22	9.68	1.70	114.6	1.275	0.335	0.941	6.2	6.4	5.0E-06	-9999.0	-9999.0	0.778	3.4	-9999.0	-9999.0
21.785	13.09	13.16	0.23	6.07	1.75	114.6	1.279	0.337	0.942	6.3	6.5	5.0E-06	-9999.0	-9999.0	0.792	3.5	-9999.0	-9999.0
21.850	9.71	9.82	0.23	9.46	2.35	114.6	1.283	0.339	0.944	4.7	4.8	5.0E-06	-9999.0	-9999.0	0.569	2.2	-9999.0	-9999.0
21.916	6.78	7.07	0.25	26.78	3.55	111.4	1.287	0.341	0.946	6.8	7.0	5.0E-08	-9999.0	-9999.0	0.385	1.4	-9999.0	-9999.0
21.981	6.71	7.02	0.27	29.17	3.85	111.4	1.290	0.343	0.947	6.7	6.9	5.0E-08	-9999.0	-9999.0	0.382	1.4	-9999.0	-9999.0
22.047	7.73	8.04	0.29	28.78	3.62	111.4	1.294	0.345	0.949	7.7	7.9	5.0E-08	-9999.0	-9999.0	0.450	1.6	-9999.0	-9999.0
22.113	7.92	8.18	0.29	24.18	3.55	111.4	1.298	0.347	0.951	7.8	8.0	5.0E-08	-9999.0	-9999.0	0.459	1.7	-9999.0	-9999.0
22.178	7.67	7.88	0.32	19.36	4.07	111.4	1.301	0.349	0.952	7.5	7.7	5.0E-08	-9999.0	-9999.0	0.438	1.6	-9999.0	-9999.0
22.244	7.22	7.40	0.35	17.29	4.74	111.4	1.305	0.351	0.954	7.1	7.3	5.0E-08	-9999.0	-9999.0	0.407	1.4	-9999.0	-9999.0
22.309	7.03	7.26	0.37	21.55	5.11	111.4	1.309	0.353	0.955	7.0	7.1	5.0E-08	-9999.0	-9999.0	0.397	1.4	-9999.0	-9999.0
22.375	7.28	7.52	0.40	22.71	5.33	111.4	1.312	0.355	0.957	7.2	7.4	5.0E-08	-9999.0	-9999.0	0.414	1.5	-9999.0	-9999.0
22.441	7.22	7.48	0.40	24.45	5.36	111.4	1.316	0.357	0.959	7.2	7.3	5.0E-08	-9999.0	-9999.0	0.411	1.4	-9999.0	-9999.0
22.506	7.73	8.01	0.39	25.90	4.88	111.4	1.320	0.359	0.960	7.7	7.8	5.0E-08	-9999.0	-9999.0	0.446	1.6	-9999.0	-9999.0
22.572	9.01	9.34	0.40	30.30	4.29	111.4	1.323	0.361	0.962	8.9	9.1	5.0E-08	-9999.0	-9999.0	0.534	2.0	-9999.0	-9999.0
22.638	10.22	10.60	0.40	35.02	3.78	111.4	1.327	0.363	0.963	10.2	10.3	5.0E-08	-9999.0	-9999.0	0.618	2.4	-9999.0	-9999.0
22.703	11.56	11.92	0.37	33.60	3.11	114.6	1.331	0.365	0.965	7.6	7.7	5.0E-07	-9999.0	-9999.0	0.706	2.9	-9999.0	-9999.0
22.769	11.05	11.28	0.33	21.38	2.93	114.6	1.334	0.367	0.967	7.2	7.3	5.0E-07	-9999.0	-9999.0	0.663	2.6	-9999.0	-9999.0
22.834	10.15	10.34	0.30	16.93	2.91	114.6	1.338	0.370	0.969	6.6	6.7	5.0E-07	-9999.0	-9999.0	0.600	2.3	-9999.0	-9999.0
22.900	9.39	9.62	0.30	20.78	3.13	114.6	1.342	0.372	0.970	6.1	6.2	5.0E-07	-9999.0	-9999.0	0.552	2.0	-9999.0	-9999.0
22.966	9.77	10.08	0.31	28.29	3.08	114.6	1.346	0.374	0.972	6.4	6.5	5.0E-07	-9999.0	-9999.0	0.582	2.2	-9999.0	-9999.0
23.031	10.61	10.98	0.34	34.44	3.10	114.6	1.349	0.376	0.974	7.0	7.1	5.0E-07	-9999.0	-9999.0	0.642	2.5	-9999.0	-9999.0
23.097	12.58	12.99	0.39	38.16	3.01	114.6	1.353	0.378	0.975	6.2	6.3	5.0E-06	-9999.0	-9999.0	0.776	3.3	-9999.0	-9999.0
23.162	14.95	15.39	0.44	41.06	2.87	114.6	1.357	0.380	0.977	7.4	7.5	5.0E-06	-9999.0	-9999.0	0.936	4.3	-9999.0	-9999.0
23.228	17.37	17.81	0.51	40.71	2.87	114.6	1.361	0.382	0.979	8.5	8.6	5.0E-06	-9999.0	-9999.0	1.097	5.4	-9999.0	-9999.0
23.294	17.37	17.66	0.59	26.35	3.35	114.6	1.364	0.384	0.981	8.5	8.5	5.0E-06	-9999.0	-9999.0	1.086	5.3	-9999.0	-9999.0
23.359	16.48	16.73	0.68	23.03	4.07	114.6	1.368	0.386	0.982	10.7	10.8	5.0E-07	-9999.0	-9999.0	1.024	4.8	-9999.0	-9999.0
23.425	16.16	16.43	0.75	25.20	4.58	111.4	1.372	0.388	0.984	15.7	15.9	5.0E-08	-9999.0	-9999.0	1.004	4.7	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
23.491	15.27	15.53	0.82	24.16	5.29	111.4	1.375	0.390	0.985	14.9	15.0	5.0E-08	-9999.0	-9999.0	0.944	4.3	-9999.0	-9999.0
23.556	15.53	15.79	0.84	24.61	5.33	111.4	1.379	0.392	0.987	15.1	15.2	5.0E-08	-9999.0	-9999.0	0.961	4.4	-9999.0	-9999.0
23.622	15.27	15.59	0.79	30.17	5.08	111.4	1.383	0.394	0.989	14.9	15.0	5.0E-08	-9999.0	-9999.0	0.947	4.3	-9999.0	-9999.0
23.687	14.44	14.81	0.78	34.40	5.28	111.4	1.386	0.396	0.990	14.2	14.3	5.0E-08	-9999.0	-9999.0	0.895	3.9	-9999.0	-9999.0
23.753	14.82	15.22	0.76	37.61	5.00	111.4	1.390	0.398	0.992	14.6	14.6	5.0E-08	-9999.0	-9999.0	0.922	4.1	-9999.0	-9999.0
23.819	13.73	14.19	0.77	42.47	5.44	111.4	1.394	0.400	0.994	13.6	13.6	5.0E-08	-9999.0	-9999.0	0.853	3.6	-9999.0	-9999.0
23.884	14.11	14.56	0.73	41.46	5.03	111.4	1.397	0.402	0.995	13.9	14.0	5.0E-08	-9999.0	-9999.0	0.878	3.8	-9999.0	-9999.0
23.950	14.37	14.84	0.69	43.29	4.66	111.4	1.401	0.404	0.997	14.2	14.2	5.0E-08	-9999.0	-9999.0	0.896	3.9	-9999.0	-9999.0
24.015	15.08	15.55	0.69	44.09	4.45	111.4	1.405	0.406	0.998	14.9	14.9	5.0E-08	-9999.0	-9999.0	0.943	4.2	-9999.0	-9999.0
24.081	16.35	16.81	0.73	42.29	4.35	111.4	1.408	0.408	1.000	16.1	16.1	5.0E-08	-9999.0	-9999.0	1.027	4.7	-9999.0	-9999.0
24.147	19.17	19.67	0.77	46.26	3.92	114.6	1.412	0.410	1.002	12.6	12.5	5.0E-07	-9999.0	-9999.0	1.217	6.1	-9999.0	-9999.0
24.212	20.44	20.88	0.82	40.79	3.94	114.6	1.416	0.413	1.003	13.3	13.3	5.0E-07	-9999.0	-9999.0	1.298	6.8	-9999.0	-9999.0
24.278	21.78	21.98	0.78	18.03	3.56	114.6	1.420	0.415	1.005	10.5	10.5	5.0E-06	-9999.0	-9999.0	1.371	7.3	-9999.0	-9999.0
24.344	21.40	21.59	0.75	17.50	3.48	114.6	1.423	0.417	1.007	10.3	10.3	5.0E-06	-9999.0	-9999.0	1.345	7.1	-9999.0	-9999.0
24.409	20.76	20.97	0.79	19.38	3.78	114.6	1.427	0.419	1.008	13.4	13.3	5.0E-07	-9999.0	-9999.0	1.303	6.7	-9999.0	-9999.0
24.475	19.93	20.29	0.82	33.60	4.05	114.6	1.431	0.421	1.010	13.0	12.9	5.0E-07	-9999.0	-9999.0	1.257	6.4	-9999.0	-9999.0
24.540	18.98	19.37	0.76	36.22	3.93	114.6	1.435	0.423	1.012	12.4	12.3	5.0E-07	-9999.0	-9999.0	1.196	5.9	-9999.0	-9999.0
24.606	17.63	17.92	0.67	26.21	3.75	114.6	1.438	0.425	1.014	11.4	11.4	5.0E-07	-9999.0	-9999.0	1.099	5.1	-9999.0	-9999.0
24.672	17.82	18.10	0.65	25.90	3.60	114.6	1.442	0.427	1.015	11.6	11.5	5.0E-07	-9999.0	-9999.0	1.111	5.2	-9999.0	-9999.0
24.737	18.79	19.11	0.76	30.06	3.99	114.6	1.446	0.429	1.017	12.2	12.1	5.0E-07	-9999.0	-9999.0	1.178	5.7	-9999.0	-9999.0
24.803	18.46	18.88	0.85	38.20	4.51	111.4	1.450	0.431	1.019	18.1	17.9	5.0E-08	-9999.0	-9999.0	1.162	5.6	-9999.0	-9999.0
24.868	18.46	18.82	0.97	33.28	5.17	111.4	1.453	0.433	1.020	18.0	17.8	5.0E-08	-9999.0	-9999.0	1.158	5.5	-9999.0	-9999.0
24.934	18.01	18.26	1.00	23.13	5.49	111.4	1.457	0.435	1.022	17.5	17.3	5.0E-08	-9999.0	-9999.0	1.120	5.2	-9999.0	-9999.0
25.000	17.88	18.09	1.04	19.26	5.76	111.4	1.461	0.437	1.023	17.3	17.1	5.0E-08	-9999.0	-9999.0	1.109	5.1	-9999.0	-9999.0
25.065	18.52	18.79	1.09	24.32	5.82	111.4	1.464	0.439	1.025	18.0	17.8	5.0E-08	-9999.0	-9999.0	1.155	5.5	-9999.0	-9999.0
25.131	18.79	19.15	1.16	33.95	6.07	111.4	1.468	0.441	1.027	18.3	18.1	5.0E-08	-9999.0	-9999.0	1.179	5.6	-9999.0	-9999.0
25.197	21.33	21.74	1.17	38.04	5.39	111.4	1.472	0.443	1.028	20.8	20.5	5.0E-08	-9999.0	-9999.0	1.351	6.9	-9999.0	-9999.0
25.262	22.04	22.60	1.14	51.47	5.06	111.4	1.475	0.445	1.030	21.6	21.3	5.0E-08	-9999.0	-9999.0	1.408	7.4	-9999.0	-9999.0
25.328	22.10	22.56	1.11	42.43	4.93	111.4	1.479	0.447	1.031	21.6	21.3	5.0E-08	-9999.0	-9999.0	1.406	7.3	-9999.0	-9999.0
25.393	22.81	23.15	1.11	32.35	4.81	111.4	1.483	0.449	1.033	22.2	21.8	5.0E-08	-9999.0	-9999.0	1.445	7.6	-9999.0	-9999.0
25.459	24.66	25.06	1.14	37.45	4.56	114.6	1.486	0.451	1.035	16.0	15.7	5.0E-07	-9999.0	-9999.0	1.572	8.7	-9999.0	-9999.0
25.525	25.04	25.39	1.20	32.59	4.74	111.4	1.490	0.454	1.036	24.3	23.9	5.0E-08	-9999.0	-9999.0	1.594	8.9	-9999.0	-9999.0
25.590	23.45	23.71	1.23	24.20	5.20	111.4	1.494	0.456	1.038	22.7	22.3	5.0E-08	-9999.0	-9999.0	1.481	7.9	-9999.0	-9999.0
25.656	21.72	21.94	1.27	20.50	5.80	111.4	1.497	0.458	1.040	21.0	20.6	5.0E-08	-9999.0	-9999.0	1.363	6.9	-9999.0	-9999.0
25.721	24.21	24.43	1.32	20.23	5.42	111.4	1.501	0.460	1.041	23.4	22.9	5.0E-08	-9999.0	-9999.0	1.528	8.2	-9999.0	-9999.0
25.787	20.25	20.44	1.28	18.11	6.28	111.4	1.505	0.462	1.043	19.6	19.2	5.0E-08	-9999.0	-9999.0	1.263	6.1	-9999.0	-9999.0
25.853	19.55	19.81	1.29	24.57	6.53	111.4	1.508	0.464	1.044	19.0	18.6	5.0E-08	-9999.0	-9999.0	1.220	5.8	-9999.0	-9999.0
25.918	20.19	20.53	1.25	31.72	6.10	111.4	1.512	0.466	1.046	19.7	19.2	5.0E-08	-9999.0	-9999.0	1.268	6.1	-9999.0	-9999.0
25.984	19.30	19.75	1.12	41.96	5.68	111.4	1.515	0.468	1.048	18.9	18.5	5.0E-08	-9999.0	-9999.0	1.216	5.7	-9999.0	-9999.0
26.050	19.36	19.93	0.98	53.45	4.93	111.4	1.519	0.470	1.049	19.1	18.6	5.0E-08	-9999.0	-9999.0	1.228	5.8	-9999.0	-9999.0
26.115	19.93	20.45	0.92	47.97	4.51	111.4	1.523	0.472	1.051	19.6	19.1	5.0E-08	-9999.0	-9999.0	1.262	6.0	-9999.0	-9999.0
26.181	19.74	20.19	0.96	41.86	4.77	111.4	1.526	0.474	1.052	19.3	18.8	5.0E-08	-9999.0	-9999.0	1.244	5.9	-9999.0	-9999.0
26.246	18.66	19.18	0.99	48.95	5.17	111.4	1.530	0.476	1.054	18.4	17.9	5.0E-08	-9999.0	-9999.0	1.177	5.4	-9999.0	-9999.0
26.312	18.91	19.35	0.98	40.77	5.08	111.4	1.534	0.478	1.056	18.5	18.0	5.0E-08	-9999.0	-9999.0	1.188	5.4	-9999.0	-9999.0
26.378	19.55	19.85	1.02	27.95	5.15	111.4	1.537	0.480	1.057	19.0	18.5	5.0E-08	-9999.0	-9999.0	1.221	5.7	-9999.0	-9999.0
26.443	20.00	20.26	1.03	24.59	5.10	111.4	1.541	0.482	1.059	19.4	18.9	5.0E-08	-9999.0	-9999.0	1.248	5.9	-9999.0	-9999.0
26.509	20.89	21.22	1.11	30.17	5.24	111.4	1.545	0.484	1.061	20.3	19.7	5.0E-08	-9999.0	-9999.0	1.311	6.3	-9999.0	-9999.0
26.574	21.21	21.46	1.16	23.11	5.42	111.4	1.548	0.486	1.062	20.6	19.9	5.0E-08	-9999.0	-9999.0	1.328	6.4	-9999.0	-9999.0
26.640	21.53	21.69	1.13	14.92	5.22	111.4	1.552	0.488	1.064	20.8	20.1	5.0E-08	-9999.0	-9999.0	1.343	6.5	-9999.0	-9999.0
26.706	21.78	21.91	1.11	11.53	5.08	111.4	1.556	0.490	1.065	21.0	20.3	5.0E-08	-9999.0	-9999.0	1.357	6.6	-9999.0	-9999.0
26.771	22.16	22.31	1.17	13.53	5.26	111.4	1.559	0.492	1.067	21.4	20.7	5.0E-08	-9999.0	-9999.0	1.383	6.8	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
26.837	23.07	23.31	1.21	22.50	5.20	111.4	1.563	0.494	1.069	22.3	21.6	5.0E-08	-9999.0	-9999.0	1.450	7.3	-9999.0	-9999.0
26.903	24.66	24.93	1.15	25.10	4.62	111.4	1.567	0.497	1.070	23.9	23.1	5.0E-08	-9999.0	-9999.0	1.558	8.1	-9999.0	-9999.0
26.968	25.87	26.14	1.15	24.87	4.41	114.6	1.570	0.499	1.072	16.7	16.1	5.0E-07	-9999.0	-9999.0	1.638	8.8	-9999.0	-9999.0
27.034	26.19	26.43	1.14	22.20	4.32	114.6	1.574	0.501	1.074	16.9	16.3	5.0E-07	-9999.0	-9999.0	1.657	8.9	-9999.0	-9999.0
27.099	26.12	26.39	1.11	24.85	4.22	114.6	1.578	0.503	1.075	16.8	16.3	5.0E-07	-9999.0	-9999.0	1.654	8.9	-9999.0	-9999.0
27.165	25.81	26.06	1.17	22.61	4.50	114.6	1.582	0.505	1.077	16.6	16.0	5.0E-07	-9999.0	-9999.0	1.632	8.7	-9999.0	-9999.0
27.231	25.30	25.48	1.18	16.29	4.64	111.4	1.585	0.507	1.079	24.4	23.5	5.0E-08	-9999.0	-9999.0	1.593	8.3	-9999.0	-9999.0
27.296	24.08	24.25	1.13	15.76	4.67	111.4	1.589	0.509	1.080	23.2	22.3	5.0E-08	-9999.0	-9999.0	1.511	7.6	-9999.0	-9999.0
27.362	23.77	23.95	1.09	16.57	4.56	111.4	1.593	0.511	1.082	22.9	22.1	5.0E-08	-9999.0	-9999.0	1.490	7.5	-9999.0	-9999.0
27.427	22.42	22.57	1.05	13.59	4.66	111.4	1.596	0.513	1.083	21.6	20.8	5.0E-08	-9999.0	-9999.0	1.398	6.7	-9999.0	-9999.0
27.493	22.10	22.27	1.02	15.43	4.59	111.4	1.600	0.515	1.085	21.3	20.5	5.0E-08	-9999.0	-9999.0	1.378	6.6	-9999.0	-9999.0
27.559	21.27	21.45	1.04	16.35	4.86	111.4	1.604	0.517	1.087	20.5	19.7	5.0E-08	-9999.0	-9999.0	1.323	6.2	-9999.0	-9999.0
27.624	19.74	19.90	1.08	15.01	5.44	111.4	1.607	0.519	1.088	19.1	18.3	5.0E-08	-9999.0	-9999.0	1.220	5.4	-9999.0	-9999.0
27.690	17.44	17.62	1.10	16.02	6.26	111.4	1.611	0.521	1.090	16.9	16.2	5.0E-08	-9999.0	-9999.0	1.067	4.4	-9999.0	-9999.0
27.756	16.42	16.61	0.95	17.86	5.73	111.4	1.615	0.523	1.091	15.9	15.2	5.0E-08	-9999.0	-9999.0	1.000	4.0	-9999.0	-9999.0
27.821	16.42	16.65	0.87	21.55	5.24	111.4	1.618	0.525	1.093	15.9	15.3	5.0E-08	-9999.0	-9999.0	1.002	4.0	-9999.0	-9999.0
27.887	17.56	17.93	0.84	34.36	4.70	111.4	1.622	0.527	1.095	17.2	16.4	5.0E-08	-9999.0	-9999.0	1.087	4.5	-9999.0	-9999.0
27.952	20.82	21.35	0.91	49.26	4.27	114.6	1.626	0.529	1.096	13.6	13.0	5.0E-07	-9999.0	-9999.0	1.315	6.0	-9999.0	-9999.0
28.018	24.34	24.99	1.02	60.54	4.09	114.6	1.629	0.531	1.098	16.0	15.2	5.0E-07	-9999.0	-9999.0	1.558	7.8	-9999.0	-9999.0
28.084	26.70	27.16	1.11	42.17	4.10	114.6	1.633	0.533	1.100	17.3	16.5	5.0E-07	-9999.0	-9999.0	1.702	9.0	-9999.0	-9999.0
28.149	26.96	27.30	1.11	32.01	4.08	114.6	1.637	0.535	1.101	17.4	16.6	5.0E-07	-9999.0	-9999.0	1.711	9.0	-9999.0	-9999.0
28.215	26.84	27.04	1.16	19.18	4.30	114.6	1.641	0.537	1.103	17.3	16.4	5.0E-07	-9999.0	-9999.0	1.693	8.8	-9999.0	-9999.0
28.280	26.70	26.92	1.20	19.81	4.47	114.6	1.644	0.540	1.105	17.2	16.4	5.0E-07	-9999.0	-9999.0	1.685	8.8	-9999.0	-9999.0
28.346	26.84	27.20	1.24	33.64	4.57	114.6	1.648	0.542	1.107	17.4	16.5	5.0E-07	-9999.0	-9999.0	1.703	8.9	-9999.0	-9999.0
28.412	27.92	28.37	1.25	41.46	4.42	114.6	1.652	0.544	1.108	18.1	17.2	5.0E-07	-9999.0	-9999.0	1.781	9.5	-9999.0	-9999.0
28.477	27.22	27.61	1.24	36.77	4.50	114.6	1.656	0.546	1.110	17.6	16.7	5.0E-07	-9999.0	-9999.0	1.731	9.1	-9999.0	-9999.0
28.543	26.51	26.83	1.21	28.94	4.52	114.6	1.659	0.548	1.112	17.1	16.2	5.0E-07	-9999.0	-9999.0	1.678	8.6	-9999.0	-9999.0
28.609	26.19	26.39	1.26	18.17	4.79	111.4	1.663	0.550	1.113	25.3	24.0	5.0E-08	-9999.0	-9999.0	1.648	8.4	-9999.0	-9999.0
28.674	25.10	25.25	1.33	13.84	5.28	111.4	1.667	0.552	1.115	24.2	22.9	5.0E-08	-9999.0	-9999.0	1.572	7.7	-9999.0	-9999.0
28.740	23.51	23.70	1.21	18.09	5.12	111.4	1.670	0.554	1.117	22.7	21.5	5.0E-08	-9999.0	-9999.0	1.469	6.9	-9999.0	-9999.0
28.805	23.64	23.91	1.29	25.46	5.41	111.4	1.674	0.556	1.118	22.9	21.7	5.0E-08	-9999.0	-9999.0	1.483	7.0	-9999.0	-9999.0
28.871	24.79	25.19	1.34	37.20	5.33	111.4	1.678	0.558	1.120	24.1	22.8	5.0E-08	-9999.0	-9999.0	1.568	7.6	-9999.0	-9999.0
28.937	28.62	29.28	1.35	60.97	4.62	114.6	1.681	0.560	1.121	18.7	17.7	5.0E-07	-9999.0	-9999.0	1.840	9.8	-9999.0	-9999.0
29.002	32.13	32.86	1.34	67.92	4.09	114.6	1.685	0.562	1.123	21.0	19.8	5.0E-07	-9999.0	-9999.0	2.078	10.0	-9999.0	-9999.0
29.068	34.43	34.84	1.44	37.49	4.14	114.6	1.689	0.564	1.125	22.2	21.0	5.0E-07	-9999.0	-9999.0	2.210	10.0	-9999.0	-9999.0
29.134	37.12	37.48	1.57	33.70	4.20	114.6	1.693	0.566	1.127	23.9	22.5	5.0E-07	-9999.0	-9999.0	2.386	10.0	-9999.0	-9999.0
29.199	37.43	37.67	1.73	22.34	4.60	114.6	1.697	0.568	1.128	24.1	22.6	5.0E-07	-9999.0	-9999.0	2.398	10.0	-9999.0	-9999.0
29.265	37.37	37.52	1.82	13.57	4.86	114.6	1.700	0.570	1.130	24.0	22.5	5.0E-07	-9999.0	-9999.0	2.388	10.0	-9999.0	-9999.0
29.330	36.16	36.22	1.91	6.22	5.29	111.4	1.704	0.572	1.132	34.7	32.6	5.0E-08	-9999.0	-9999.0	2.301	10.0	-9999.0	-9999.0
29.396	35.08	35.18	1.90	9.95	5.41	111.4	1.708	0.574	1.133	33.7	31.7	5.0E-08	-9999.0	-9999.0	2.232	10.0	-9999.0	-9999.0
29.462	32.77	32.98	1.79	19.71	5.44	111.4	1.711	0.576	1.135	31.6	29.7	5.0E-08	-9999.0	-9999.0	2.085	10.0	-9999.0	-9999.0
29.527	31.69	31.94	1.67	23.86	5.24	111.4	1.715	0.578	1.136	30.6	28.7	5.0E-08	-9999.0	-9999.0	2.015	10.0	-9999.0	-9999.0
29.593	29.38	29.60	1.57	20.23	5.32	111.4	1.719	0.581	1.138	28.3	26.6	5.0E-08	-9999.0	-9999.0	1.859	9.8	-9999.0	-9999.0
29.658	28.36	28.67	1.52	28.90	5.31	111.4	1.722	0.583	1.140	27.5	25.7	5.0E-08	-9999.0	-9999.0	1.797	9.2	-9999.0	-9999.0
29.724	25.42	25.71	1.47	26.96	5.73	111.4	1.726	0.585	1.141	24.6	23.1	5.0E-08	-9999.0	-9999.0	1.599	7.7	-9999.0	-9999.0
29.790	23.51	23.76	1.36	23.26	5.74	111.4	1.730	0.587	1.143	22.8	21.3	5.0E-08	-9999.0	-9999.0	1.469	6.7	-9999.0	-9999.0
29.855	22.35	22.60	1.22	22.65	5.41	111.4	1.733	0.589	1.144	21.6	20.2	5.0E-08	-9999.0	-9999.0	1.391	6.1	-9999.0	-9999.0
29.921	22.16	22.45	1.23	26.72	5.49	111.4	1.737	0.591	1.146	21.5	20.1	5.0E-08	-9999.0	-9999.0	1.381	6.1	-9999.0	-9999.0
29.987	21.84	22.24	1.20	36.46	5.41	111.4	1.741	0.593	1.148	21.3	19.9	5.0E-08	-9999.0	-9999.0	1.366	5.9	-9999.0	-9999.0
30.052	21.84	22.31	1.10	43.17	4.94	111.4	1.744	0.595	1.149	21.4	19.9	5.0E-08	-9999.0	-9999.0	1.371	6.0	-9999.0	-9999.0
30.118	20.82	21.23	1.05	38.20	4.96	111.4	1.748	0.597	1.151	20.3	19.0	5.0E-08	-9999.0	-9999.0	1.299	5.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
30.183	20.57	20.87	0.97	27.61	4.66	111.4	1.751	0.599	1.153	20.0	18.6	5.0E-08	-9999.0	-9999.0	1.274	5.3	-9999.0	-9999.0
30.249	19.93	20.33	1.04	37.37	5.13	111.4	1.755	0.601	1.154	19.5	18.1	5.0E-08	-9999.0	-9999.0	1.238	5.1	-9999.0	-9999.0
30.315	19.81	20.25	1.00	40.94	4.95	111.4	1.759	0.603	1.156	19.4	18.0	5.0E-08	-9999.0	-9999.0	1.233	5.0	-9999.0	-9999.0
30.380	20.57	20.99	0.98	39.19	4.68	111.4	1.762	0.605	1.157	20.1	18.7	5.0E-08	-9999.0	-9999.0	1.282	5.3	-9999.0	-9999.0
30.446	25.17	25.56	1.04	35.91	4.08	114.6	1.766	0.607	1.159	16.3	15.2	5.0E-07	-9999.0	-9999.0	1.586	7.4	-9999.0	-9999.0
30.511	26.00	26.19	1.17	17.54	4.48	114.6	1.770	0.609	1.161	16.7	15.5	5.0E-07	-9999.0	-9999.0	1.628	7.7	-9999.0	-9999.0
30.577	24.47	24.85	1.25	35.50	5.04	111.4	1.774	0.611	1.162	23.8	22.1	5.0E-08	-9999.0	-9999.0	1.539	7.0	-9999.0	-9999.0
30.643	24.53	24.83	1.22	27.90	4.93	111.4	1.777	0.613	1.164	23.8	22.0	5.0E-08	-9999.0	-9999.0	1.537	7.0	-9999.0	-9999.0
30.708	23.07	23.30	1.15	21.91	4.95	111.4	1.781	0.615	1.166	22.3	20.7	5.0E-08	-9999.0	-9999.0	1.435	6.3	-9999.0	-9999.0
30.774	22.48	22.76	1.12	25.86	4.93	111.4	1.785	0.617	1.167	21.8	20.2	5.0E-08	-9999.0	-9999.0	1.399	6.0	-9999.0	-9999.0
30.840	21.97	22.43	1.06	41.86	4.74	111.4	1.788	0.619	1.169	21.5	19.9	5.0E-08	-9999.0	-9999.0	1.376	5.8	-9999.0	-9999.0
30.905	21.33	21.94	1.04	55.96	4.75	111.4	1.792	0.621	1.170	21.0	19.4	5.0E-08	-9999.0	-9999.0	1.343	5.6	-9999.0	-9999.0
30.971	20.57	21.23	0.99	60.68	4.68	111.4	1.796	0.624	1.172	20.3	18.8	5.0E-08	-9999.0	-9999.0	1.295	5.3	-9999.0	-9999.0
31.036	20.51	21.06	0.94	51.24	4.47	111.4	1.799	0.626	1.174	20.2	18.6	5.0E-08	-9999.0	-9999.0	1.284	5.2	-9999.0	-9999.0
31.102	20.82	21.31	0.92	44.86	4.33	114.6	1.803	0.628	1.175	13.6	12.5	5.0E-07	-9999.0	-9999.0	1.300	5.3	-9999.0	-9999.0
31.168	20.06	20.54	0.91	44.60	4.44	111.4	1.807	0.630	1.177	19.7	18.1	5.0E-08	-9999.0	-9999.0	1.249	5.0	-9999.0	-9999.0
31.233	19.74	20.22	0.92	44.17	4.56	111.4	1.810	0.632	1.179	19.4	17.8	5.0E-08	-9999.0	-9999.0	1.227	4.8	-9999.0	-9999.0
31.299	19.36	19.83	0.92	43.37	4.65	111.4	1.814	0.634	1.180	19.0	17.5	5.0E-08	-9999.0	-9999.0	1.201	4.7	-9999.0	-9999.0
31.364	18.39	18.84	0.92	41.26	4.90	111.4	1.818	0.636	1.182	18.0	16.6	5.0E-08	-9999.0	-9999.0	1.135	4.3	-9999.0	-9999.0
31.430	17.50	17.96	0.81	42.05	4.52	111.4	1.821	0.638	1.183	17.2	15.8	5.0E-08	-9999.0	-9999.0	1.076	3.9	-9999.0	-9999.0
31.496	16.86	17.30	0.85	40.20	4.93	111.4	1.825	0.640	1.185	16.6	15.2	5.0E-08	-9999.0	-9999.0	1.031	3.7	-9999.0	-9999.0
31.561	16.16	16.58	0.85	39.15	5.14	111.4	1.829	0.642	1.187	15.9	14.6	5.0E-08	-9999.0	-9999.0	0.984	3.5	-9999.0	-9999.0
31.627	15.84	16.24	0.79	37.37	4.88	111.4	1.832	0.644	1.188	15.6	14.3	5.0E-08	-9999.0	-9999.0	0.961	3.3	-9999.0	-9999.0
31.693	15.14	15.53	0.75	36.66	4.84	111.4	1.836	0.646	1.190	14.9	13.6	5.0E-08	-9999.0	-9999.0	0.913	3.1	-9999.0	-9999.0
31.758	14.57	14.96	0.66	36.60	4.42	111.4	1.840	0.648	1.191	14.3	13.1	5.0E-08	-9999.0	-9999.0	0.875	2.9	-9999.0	-9999.0
31.824	14.76	15.18	0.61	39.53	4.03	114.6	1.843	0.650	1.193	9.7	8.9	5.0E-07	-9999.0	-9999.0	0.889	3.0	-9999.0	-9999.0
31.889	15.02	15.48	0.56	43.27	3.63	114.6	1.847	0.652	1.195	9.9	9.0	5.0E-07	-9999.0	-9999.0	0.909	3.1	-9999.0	-9999.0
31.955	15.14	15.59	0.51	41.88	3.28	114.6	1.851	0.654	1.196	10.0	9.1	5.0E-07	-9999.0	-9999.0	0.916	3.1	-9999.0	-9999.0
32.021	14.70	15.15	0.46	42.13	3.04	114.6	1.854	0.656	1.198	7.3	6.6	5.0E-06	-9999.0	-9999.0	0.886	2.9	-9999.0	-9999.0
32.086	14.44	14.87	0.46	40.71	3.10	114.6	1.858	0.658	1.200	7.1	6.5	5.0E-06	-9999.0	-9999.0	0.868	2.8	-9999.0	-9999.0
32.152	15.84	16.35	0.48	47.44	2.94	114.6	1.862	0.660	1.202	7.8	7.1	5.0E-06	-9999.0	-9999.0	0.966	3.3	-9999.0	-9999.0
32.217	16.74	17.30	0.51	51.81	2.96	114.6	1.866	0.662	1.203	8.3	7.6	5.0E-06	-9999.0	-9999.0	1.029	3.6	-9999.0	-9999.0
32.283	18.01	18.60	0.58	53.92	3.13	114.6	1.870	0.665	1.205	8.9	8.1	5.0E-06	-9999.0	-9999.0	1.115	4.1	-9999.0	-9999.0
32.349	19.42	20.04	0.64	57.34	3.20	114.6	1.873	0.667	1.207	9.6	8.7	5.0E-06	-9999.0	-9999.0	1.211	4.6	-9999.0	-9999.0
32.414	20.76	21.34	0.64	53.82	3.01	114.6	1.877	0.669	1.208	10.2	9.3	5.0E-06	-9999.0	-9999.0	1.298	5.1	-9999.0	-9999.0
32.480	21.27	21.81	0.67	49.75	3.08	114.6	1.881	0.671	1.210	10.4	9.5	5.0E-06	-9999.0	-9999.0	1.329	5.2	-9999.0	-9999.0
32.546	21.46	21.91	0.70	41.28	3.20	114.6	1.885	0.673	1.212	10.5	9.5	5.0E-06	-9999.0	-9999.0	1.335	5.3	-9999.0	-9999.0
32.611	21.46	22.00	0.74	49.38	3.37	114.6	1.888	0.675	1.214	10.5	9.6	5.0E-06	-9999.0	-9999.0	1.340	5.3	-9999.0	-9999.0
32.677	21.14	21.72	0.77	53.31	3.55	114.6	1.892	0.677	1.215	10.4	9.4	5.0E-06	-9999.0	-9999.0	1.322	5.2	-9999.0	-9999.0
32.742	21.14	21.63	0.76	44.78	3.52	114.6	1.896	0.679	1.217	10.4	9.4	5.0E-06	-9999.0	-9999.0	1.315	5.1	-9999.0	-9999.0
32.808	19.68	20.15	0.70	44.01	3.48	114.6	1.900	0.681	1.219	9.7	8.7	5.0E-06	-9999.0	-9999.0	1.217	4.5	-9999.0	-9999.0
32.874	18.52	18.97	0.68	40.98	3.59	114.6	1.903	0.683	1.220	12.1	11.0	5.0E-07	-9999.0	-9999.0	1.138	4.1	-9999.0	-9999.0
32.939	18.01	18.43	0.72	38.57	3.92	114.6	1.907	0.685	1.222	11.8	10.6	5.0E-07	-9999.0	-9999.0	1.102	3.9	-9999.0	-9999.0
33.005	18.07	18.52	0.76	41.31	4.11	114.6	1.911	0.687	1.224	11.8	10.7	5.0E-07	-9999.0	-9999.0	1.107	3.9	-9999.0	-9999.0
33.070	18.01	18.42	0.69	37.94	3.75	114.6	1.915	0.689	1.226	11.8	10.6	5.0E-07	-9999.0	-9999.0	1.101	3.9	-9999.0	-9999.0
33.136	17.76	18.10	0.68	30.72	3.77	114.6	1.918	0.691	1.227	11.6	10.4	5.0E-07	-9999.0	-9999.0	1.078	3.8	-9999.0	-9999.0
33.202	17.56	17.91	0.66	32.37	3.69	114.6	1.922	0.693	1.229	11.4	10.3	5.0E-07	-9999.0	-9999.0	1.066	3.7	-9999.0	-9999.0
33.267	17.69	18.17	0.65	44.34	3.59	114.6	1.926	0.695	1.231	11.6	10.5	5.0E-07	-9999.0	-9999.0	1.083	3.8	-9999.0	-9999.0
33.333	17.44	18.03	0.63	54.04	3.50	114.6	1.930	0.697	1.232	11.5	10.4	5.0E-07	-9999.0	-9999.0	1.073	3.7	-9999.0	-9999.0
33.399	17.44	17.95	0.58	46.58	3.24	114.6	1.933	0.699	1.234	8.6	7.7	5.0E-06	-9999.0	-9999.0	1.067	3.7	-9999.0	-9999.0
33.464	17.44	17.97	0.55	48.45	3.07	114.6	1.937	0.701	1.236	8.6	7.7	5.0E-06	-9999.0	-9999.0	1.069	3.7	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
33.530	16.67	17.17	0.54	46.36	3.15	114.6	1.941	0.703	1.238	8.2	7.4	5.0E-06	-9999.0	-9999.0	1.015	3.4	-9999.0	-9999.0
33.595	16.04	16.55	0.53	47.23	3.21	114.6	1.945	0.705	1.239	7.9	7.1	5.0E-06	-9999.0	-9999.0	0.974	3.2	-9999.0	-9999.0
33.661	15.40	15.90	0.50	46.73	3.15	114.6	1.948	0.708	1.241	7.6	6.8	5.0E-06	-9999.0	-9999.0	0.930	3.0	-9999.0	-9999.0
33.727	14.95	15.38	0.47	40.59	3.06	114.6	1.952	0.710	1.243	7.4	6.6	5.0E-06	-9999.0	-9999.0	0.896	2.8	-9999.0	-9999.0
33.792	13.67	14.11	0.45	40.14	3.20	114.6	1.956	0.712	1.244	9.0	8.1	5.0E-07	-9999.0	-9999.0	0.810	2.5	-9999.0	-9999.0
33.858	13.03	13.48	0.46	41.20	3.42	114.6	1.960	0.714	1.246	8.6	7.7	5.0E-07	-9999.0	-9999.0	0.768	2.3	-9999.0	-9999.0
33.923	12.46	12.90	0.44	40.90	3.42	114.6	1.964	0.716	1.248	8.2	7.4	5.0E-07	-9999.0	-9999.0	0.729	2.1	-9999.0	-9999.0
33.989	11.05	11.50	0.40	42.09	3.49	114.6	1.967	0.718	1.249	7.3	6.6	5.0E-07	-9999.0	-9999.0	0.636	1.8	-9999.0	-9999.0
34.055	10.80	11.24	0.36	41.35	3.21	114.6	1.971	0.720	1.251	7.2	6.4	5.0E-07	-9999.0	-9999.0	0.618	1.7	-9999.0	-9999.0
34.120	10.61	11.06	0.33	42.33	2.99	114.6	1.975	0.722	1.253	7.1	6.3	5.0E-07	-9999.0	-9999.0	0.606	1.7	-9999.0	-9999.0
34.186	10.61	11.12	0.32	47.66	2.88	114.6	1.979	0.724	1.255	7.1	6.3	5.0E-07	-9999.0	-9999.0	0.609	1.7	-9999.0	-9999.0
34.252	10.93	11.47	0.32	50.01	2.80	114.6	1.982	0.726	1.256	5.5	4.9	5.0E-06	-9999.0	-9999.0	0.632	1.8	-9999.0	-9999.0
34.317	10.22	10.78	0.31	51.36	2.88	114.6	1.986	0.728	1.258	6.9	6.1	5.0E-07	-9999.0	-9999.0	0.586	1.6	-9999.0	-9999.0
34.383	10.15	10.66	0.32	47.17	3.01	114.6	1.990	0.730	1.260	6.8	6.1	5.0E-07	-9999.0	-9999.0	0.578	1.6	-9999.0	-9999.0
34.448	10.54	11.01	0.32	43.66	2.91	114.6	1.994	0.732	1.261	7.0	6.3	5.0E-07	-9999.0	-9999.0	0.601	1.6	-9999.0	-9999.0
34.514	10.67	11.13	0.33	43.21	2.97	114.6	1.997	0.734	1.263	7.1	6.3	5.0E-07	-9999.0	-9999.0	0.609	1.7	-9999.0	-9999.0
34.580	9.90	10.37	0.35	43.19	3.38	114.6	2.001	0.736	1.265	6.6	5.9	5.0E-07	-9999.0	-9999.0	0.558	1.5	-9999.0	-9999.0
34.645	9.83	10.30	0.35	43.19	3.41	114.6	2.005	0.738	1.267	6.6	5.8	5.0E-07	-9999.0	-9999.0	0.553	1.5	-9999.0	-9999.0
34.711	10.22	10.71	0.32	44.76	3.00	114.6	2.009	0.740	1.268	6.8	6.1	5.0E-07	-9999.0	-9999.0	0.580	1.6	-9999.0	-9999.0
34.776	9.45	9.93	0.32	44.23	3.23	114.6	2.012	0.742	1.270	6.3	5.6	5.0E-07	-9999.0	-9999.0	0.528	1.4	-9999.0	-9999.0
34.842	9.45	9.93	0.30	44.07	3.03	114.6	2.016	0.744	1.272	6.3	5.6	5.0E-07	-9999.0	-9999.0	0.528	1.4	-9999.0	-9999.0
34.908	9.83	10.36	0.28	48.36	2.71	114.6	2.020	0.746	1.273	6.6	5.9	5.0E-07	-9999.0	-9999.0	0.556	1.5	-9999.0	-9999.0
34.973	9.45	10.00	0.28	50.33	2.81	114.6	2.024	0.749	1.275	6.4	5.7	5.0E-07	-9999.0	-9999.0	0.532	1.4	-9999.0	-9999.0
35.039	8.62	9.18	0.27	51.34	2.95	114.6	2.027	0.751	1.277	5.9	5.2	5.0E-07	-9999.0	-9999.0	0.477	1.2	-9999.0	-9999.0
35.105	9.83	10.43	0.28	55.37	2.69	114.6	2.031	0.753	1.279	6.7	5.9	5.0E-07	-9999.0	-9999.0	0.560	1.5	-9999.0	-9999.0
35.170	10.35	10.89	0.31	50.57	2.85	114.6	2.035	0.755	1.280	7.0	6.1	5.0E-07	-9999.0	-9999.0	0.590	1.6	-9999.0	-9999.0
35.236	10.35	10.86	0.35	47.48	3.23	114.6	2.039	0.757	1.282	6.9	6.1	5.0E-07	-9999.0	-9999.0	0.588	1.6	-9999.0	-9999.0
35.301	10.99	11.52	0.39	49.63	3.39	114.6	2.042	0.759	1.284	7.4	6.5	5.0E-07	-9999.0	-9999.0	0.632	1.7	-9999.0	-9999.0
35.367	11.63	12.05	0.42	39.47	3.49	114.6	2.046	0.761	1.285	7.7	6.8	5.0E-07	-9999.0	-9999.0	0.667	1.8	-9999.0	-9999.0
35.433	11.37	11.74	0.45	34.42	3.84	111.4	2.050	0.763	1.287	11.2	9.9	5.0E-08	-9999.0	-9999.0	0.646	1.7	-9999.0	-9999.0
35.498	12.07	12.45	0.46	35.40	3.70	114.6	2.054	0.765	1.289	7.9	7.0	5.0E-07	-9999.0	-9999.0	0.693	1.9	-9999.0	-9999.0
35.564	12.14	12.51	0.50	34.54	4.01	111.4	2.057	0.767	1.290	12.0	10.5	5.0E-08	-9999.0	-9999.0	0.697	1.9	-9999.0	-9999.0
35.629	12.46	12.88	0.55	38.79	4.28	111.4	2.061	0.769	1.292	12.3	10.9	5.0E-08	-9999.0	-9999.0	0.721	2.0	-9999.0	-9999.0
35.695	12.71	13.15	0.58	40.67	4.42	111.4	2.065	0.771	1.294	12.6	11.1	5.0E-08	-9999.0	-9999.0	0.739	2.1	-9999.0	-9999.0
35.761	13.92	14.34	0.61	38.38	4.26	111.4	2.068	0.773	1.295	13.7	12.1	5.0E-08	-9999.0	-9999.0	0.818	2.4	-9999.0	-9999.0
35.826	14.63	15.00	0.64	34.83	4.28	111.4	2.072	0.775	1.297	14.4	12.6	5.0E-08	-9999.0	-9999.0	0.862	2.5	-9999.0	-9999.0
35.892	14.95	15.29	0.66	32.05	4.33	111.4	2.076	0.777	1.298	14.6	12.9	5.0E-08	-9999.0	-9999.0	0.881	2.6	-9999.0	-9999.0
35.958	15.97	16.32	0.67	32.69	4.11	114.6	2.079	0.779	1.300	10.4	9.1	5.0E-07	-9999.0	-9999.0	0.950	2.9	-9999.0	-9999.0
36.023	15.59	15.90	0.70	28.76	4.41	111.4	2.083	0.781	1.302	15.2	13.3	5.0E-08	-9999.0	-9999.0	0.921	2.8	-9999.0	-9999.0
36.089	15.46	15.82	0.71	33.56	4.50	111.4	2.087	0.783	1.303	15.2	13.3	5.0E-08	-9999.0	-9999.0	0.916	2.7	-9999.0	-9999.0
36.154	15.33	15.71	0.69	35.08	4.40	111.4	2.090	0.785	1.305	15.0	13.2	5.0E-08	-9999.0	-9999.0	0.908	2.7	-9999.0	-9999.0
36.220	15.02	15.35	0.67	31.01	4.38	111.4	2.094	0.787	1.307	14.7	12.9	5.0E-08	-9999.0	-9999.0	0.884	2.6	-9999.0	-9999.0
36.286	14.24	14.61	0.64	33.85	4.39	111.4	2.098	0.789	1.308	14.0	12.2	5.0E-08	-9999.0	-9999.0	0.834	2.4	-9999.0	-9999.0
36.351	13.92	14.35	0.61	39.13	4.26	111.4	2.101	0.792	1.310	13.7	12.0	5.0E-08	-9999.0	-9999.0	0.816	2.3	-9999.0	-9999.0
36.417	13.73	14.14	0.61	37.90	4.32	111.4	2.105	0.794	1.311	13.5	11.8	5.0E-08	-9999.0	-9999.0	0.803	2.3	-9999.0	-9999.0
36.482	13.16	13.56	0.59	37.20	4.36	111.4	2.109	0.796	1.313	13.0	11.3	5.0E-08	-9999.0	-9999.0	0.764	2.1	-9999.0	-9999.0
36.548	12.78	13.19	0.57	37.77	4.33	111.4	2.112	0.798	1.315	12.6	11.0	5.0E-08	-9999.0	-9999.0	0.738	2.0	-9999.0	-9999.0
36.614	12.84	13.19	0.57	32.25	4.33	111.4	2.116	0.800	1.316	12.6	11.0	5.0E-08	-9999.0	-9999.0	0.738	2.0	-9999.0	-9999.0
36.679	12.65	13.00	0.55	32.09	4.24	111.4	2.120	0.802	1.318	12.4	10.8	5.0E-08	-9999.0	-9999.0	0.725	2.0	-9999.0	-9999.0
36.745	12.97	13.35	0.56	34.60	4.21	111.4	2.123	0.804	1.319	12.8	11.1	5.0E-08	-9999.0	-9999.0	0.748	2.0	-9999.0	-9999.0
36.811	13.54	13.91	0.56	33.58	4.04	111.4	2.127	0.806	1.321	13.3	11.6	5.0E-08	-9999.0	-9999.0	0.785	2.2	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
36.876	12.65	12.98	0.53	30.17	4.09	111.4	2.131	0.808	1.323	12.4	10.8	5.0E-08	-9999.0	-9999.0	0.723	1.9	-9999.0	-9999.0
36.942	11.37	11.64	0.52	25.36	4.48	111.4	2.134	0.810	1.324	11.1	9.7	5.0E-08	-9999.0	-9999.0	0.634	1.6	-9999.0	-9999.0
37.007	10.15	10.43	0.53	25.38	5.09	111.4	2.138	0.812	1.326	10.0	8.7	5.0E-08	-9999.0	-9999.0	0.553	1.4	-9999.0	-9999.0
37.073	10.09	10.38	0.55	26.00	5.31	111.4	2.141	0.814	1.327	9.9	8.6	5.0E-08	-9999.0	-9999.0	0.549	1.4	-9999.0	-9999.0
37.139	9.45	9.72	0.58	24.89	5.98	111.4	2.145	0.816	1.329	9.3	8.1	5.0E-08	-9999.0	-9999.0	0.505	1.3	-9999.0	-9999.0
37.204	9.32	9.58	0.59	23.69	6.17	111.4	2.149	0.818	1.331	9.2	8.0	5.0E-08	-9999.0	-9999.0	0.495	1.2	-9999.0	-9999.0
37.270	9.52	9.80	0.58	25.70	5.93	111.4	2.152	0.820	1.332	9.4	8.1	5.0E-08	-9999.0	-9999.0	0.510	1.3	-9999.0	-9999.0
37.336	9.20	9.51	0.56	28.88	5.90	111.4	2.156	0.822	1.334	9.1	7.9	5.0E-08	-9999.0	-9999.0	0.491	1.2	-9999.0	-9999.0
37.401	9.32	9.64	0.54	29.61	5.61	111.4	2.160	0.824	1.335	9.2	8.0	5.0E-08	-9999.0	-9999.0	0.499	1.2	-9999.0	-9999.0
37.467	9.83	10.22	0.50	35.48	4.91	111.4	2.163	0.826	1.337	9.8	8.5	5.0E-08	-9999.0	-9999.0	0.537	1.3	-9999.0	-9999.0
37.532	9.96	10.34	0.48	34.65	4.65	111.4	2.167	0.828	1.339	9.9	8.6	5.0E-08	-9999.0	-9999.0	0.545	1.4	-9999.0	-9999.0
37.598	10.03	10.42	0.47	36.07	4.52	111.4	2.171	0.830	1.340	10.0	8.6	5.0E-08	-9999.0	-9999.0	0.550	1.4	-9999.0	-9999.0
37.664	9.71	10.10	0.46	36.07	4.56	111.4	2.174	0.833	1.342	9.7	8.4	5.0E-08	-9999.0	-9999.0	0.529	1.3	-9999.0	-9999.0
37.729	9.58	9.94	0.43	33.38	4.33	111.4	2.178	0.835	1.343	9.5	8.2	5.0E-08	-9999.0	-9999.0	0.518	1.3	-9999.0	-9999.0
37.795	9.26	9.58	0.42	29.53	4.39	111.4	2.182	0.837	1.345	9.2	7.9	5.0E-08	-9999.0	-9999.0	0.493	1.2	-9999.0	-9999.0
37.860	8.43	8.78	0.39	32.25	4.45	111.4	2.185	0.839	1.347	8.4	7.2	5.0E-08	-9999.0	-9999.0	0.440	1.1	-9999.0	-9999.0
37.926	8.30	8.67	0.33	34.17	3.82	111.4	2.189	0.841	1.348	8.3	7.2	5.0E-08	-9999.0	-9999.0	0.432	1.1	-9999.0	-9999.0
37.992	7.92	8.31	0.35	35.89	4.22	111.4	2.193	0.843	1.350	8.0	6.8	5.0E-08	-9999.0	-9999.0	0.408	1.0	-9999.0	-9999.0
38.057	7.92	8.33	0.34	37.65	4.09	111.4	2.196	0.845	1.352	8.0	6.9	5.0E-08	-9999.0	-9999.0	0.409	1.0	-9999.0	-9999.0
38.123	8.56	8.99	0.32	39.70	3.57	111.4	2.200	0.847	1.353	8.6	7.4	5.0E-08	-9999.0	-9999.0	0.453	1.1	-9999.0	-9999.0
38.189	7.79	8.21	0.31	38.57	3.79	111.4	2.204	0.849	1.355	7.9	6.8	5.0E-08	-9999.0	-9999.0	0.400	1.0	-9999.0	-9999.0
38.254	7.48	7.84	0.30	33.28	3.84	111.4	2.207	0.851	1.356	7.5	6.4	5.0E-08	-9999.0	-9999.0	0.375	0.9	-9999.0	-9999.0
38.320	7.79	8.19	0.29	36.98	3.55	111.4	2.211	0.853	1.358	7.8	6.7	5.0E-08	-9999.0	-9999.0	0.399	1.0	-9999.0	-9999.0
38.385	7.60	8.03	0.31	40.16	3.87	111.4	2.215	0.855	1.360	7.7	6.6	5.0E-08	-9999.0	-9999.0	0.388	1.0	-9999.0	-9999.0
38.451	7.92	8.33	0.31	37.90	3.73	111.4	2.218	0.857	1.361	8.0	6.8	5.0E-08	-9999.0	-9999.0	0.407	1.0	-9999.0	-9999.0
38.517	7.60	8.02	0.31	39.45	3.87	111.4	2.222	0.859	1.363	7.7	6.6	5.0E-08	-9999.0	-9999.0	0.387	1.0	-9999.0	-9999.0
38.582	7.86	8.22	0.30	33.54	3.66	111.4	2.226	0.861	1.364	7.9	6.7	5.0E-08	-9999.0	-9999.0	0.400	1.0	-9999.0	-9999.0
38.648	8.30	8.60	0.31	27.65	3.61	111.4	2.229	0.863	1.366	8.2	7.0	5.0E-08	-9999.0	-9999.0	0.425	1.0	-9999.0	-9999.0
38.713	8.75	9.04	0.30	26.53	3.33	114.6	2.233	0.865	1.368	5.8	4.9	5.0E-07	-9999.0	-9999.0	0.454	1.1	-9999.0	-9999.0
38.779	8.05	8.27	0.31	20.11	3.76	111.4	2.237	0.867	1.369	7.9	6.8	5.0E-08	-9999.0	-9999.0	0.402	1.0	-9999.0	-9999.0
38.845	8.37	8.55	0.30	16.91	3.52	111.4	2.240	0.869	1.371	8.2	7.0	5.0E-08	-9999.0	-9999.0	0.421	1.0	-9999.0	-9999.0
38.910	8.05	8.26	0.30	19.38	3.64	111.4	2.244	0.871	1.372	7.9	6.8	5.0E-08	-9999.0	-9999.0	0.401	1.0	-9999.0	-9999.0
38.976	7.92	8.12	0.29	18.23	3.58	111.4	2.248	0.873	1.374	7.8	6.6	5.0E-08	-9999.0	-9999.0	0.391	1.0	-9999.0	-9999.0
39.042	8.24	8.41	0.28	15.66	3.34	111.4	2.251	0.876	1.376	8.1	6.9	5.0E-08	-9999.0	-9999.0	0.411	1.0	-9999.0	-9999.0
39.107	7.86	8.05	0.29	17.76	3.61	111.4	2.255	0.878	1.377	7.7	6.6	5.0E-08	-9999.0	-9999.0	0.386	0.9	-9999.0	-9999.0
39.173	7.16	7.40	0.29	22.44	3.93	111.4	2.259	0.880	1.379	7.1	6.0	5.0E-08	-9999.0	-9999.0	0.343	0.9	-9999.0	-9999.0
39.238	7.54	7.79	0.28	22.93	3.60	111.4	2.262	0.882	1.381	7.5	6.3	5.0E-08	-9999.0	-9999.0	0.368	0.9	-9999.0	-9999.0
39.304	7.60	7.86	0.28	23.90	3.57	111.4	2.266	0.884	1.382	7.5	6.4	5.0E-08	-9999.0	-9999.0	0.373	0.9	-9999.0	-9999.0
39.370	7.99	8.29	0.37	27.69	4.47	111.4	2.270	0.886	1.384	7.9	6.7	5.0E-08	-9999.0	-9999.0	0.401	1.0	-9999.0	-9999.0
39.435	9.71	10.06	0.47	31.70	4.69	111.4	2.273	0.888	1.385	9.6	8.2	5.0E-08	-9999.0	-9999.0	0.519	1.2	-9999.0	-9999.0
39.501	11.18	11.55	0.50	34.15	4.34	111.4	2.277	0.890	1.387	11.1	9.4	5.0E-08	-9999.0	-9999.0	0.618	1.5	-9999.0	-9999.0
39.566	13.22	13.59	0.56	33.95	4.13	111.4	2.280	0.892	1.389	13.0	11.0	5.0E-08	-9999.0	-9999.0	0.754	1.9	-9999.0	-9999.0
39.632	14.76	14.96	0.62	18.62	4.16	111.4	2.284	0.894	1.390	14.3	12.1	5.0E-08	-9999.0	-9999.0	0.845	2.2	-9999.0	-9999.0
39.698	16.29	16.43	0.69	12.57	4.21	111.4	2.288	0.896	1.392	15.7	13.3	5.0E-08	-9999.0	-9999.0	0.943	2.6	-9999.0	-9999.0
39.763	16.80	16.92	0.71	11.24	4.21	111.4	2.291	0.898	1.393	16.2	13.7	5.0E-08	-9999.0	-9999.0	0.975	2.7	-9999.0	-9999.0
39.829	14.37	14.45	0.69	6.68	4.79	111.4	2.295	0.900	1.395	13.8	11.7	5.0E-08	-9999.0	-9999.0	0.810	2.1	-9999.0	-9999.0
39.895	12.27	12.34	0.64	6.40	5.20	111.4	2.299	0.902	1.397	11.8	10.0	5.0E-08	-9999.0	-9999.0	0.669	1.7	-9999.0	-9999.0
39.960	10.67	10.73	0.59	5.61	5.51	111.4	2.302	0.904	1.398	10.3	8.7	5.0E-08	-9999.0	-9999.0	0.562	1.3	-9999.0	-9999.0
40.026	8.81	8.88	0.54	6.38	6.10	111.4	2.306	0.906	1.400	8.5	7.2	5.0E-08	-9999.0	-9999.0	0.438	1.0	-9999.0	-9999.0
40.091	7.54	7.64	0.45	9.42	5.90	111.4	2.310	0.908	1.401	7.3	6.2	5.0E-08	-9999.0	-9999.0	0.355	0.9	-9999.0	-9999.0
40.157	7.28	7.41	0.39	12.14	5.28	111.4	2.313	0.910	1.403	7.1	6.0	5.0E-08	-9999.0	-9999.0	0.340	0.8	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
40.223	7.16	7.31	0.33	14.51	4.52	111.4	2.317	0.912	1.405	7.0	5.9	5.0E-08	-9999.0	-9999.0	0.333	0.8	-9999.0	-9999.0
40.288	7.09	7.27	0.33	16.49	4.55	111.4	2.321	0.914	1.406	7.0	5.9	5.0E-08	-9999.0	-9999.0	0.330	0.8	-9999.0	-9999.0
40.354	7.28	7.48	0.36	18.92	4.82	111.4	2.324	0.917	1.408	7.2	6.0	5.0E-08	-9999.0	-9999.0	0.344	0.8	-9999.0	-9999.0
40.419	7.48	7.71	0.39	21.79	5.07	111.4	2.328	0.919	1.409	7.4	6.2	5.0E-08	-9999.0	-9999.0	0.359	0.9	-9999.0	-9999.0
40.485	8.43	8.70	0.42	24.67	4.84	111.4	2.332	0.921	1.411	8.3	7.0	5.0E-08	-9999.0	-9999.0	0.424	1.0	-9999.0	-9999.0
40.551	9.32	9.62	0.45	27.83	4.69	111.4	2.335	0.923	1.413	9.2	7.8	5.0E-08	-9999.0	-9999.0	0.486	1.1	-9999.0	-9999.0
40.616	10.03	10.38	0.47	32.42	4.54	111.4	2.339	0.925	1.414	9.9	8.4	5.0E-08	-9999.0	-9999.0	0.536	1.3	-9999.0	-9999.0
40.682	10.67	11.08	0.47	38.34	4.25	111.4	2.343	0.927	1.416	10.6	8.9	5.0E-08	-9999.0	-9999.0	0.582	1.4	-9999.0	-9999.0
40.748	10.86	11.29	0.47	39.78	4.17	111.4	2.346	0.929	1.417	10.8	9.1	5.0E-08	-9999.0	-9999.0	0.596	1.4	-9999.0	-9999.0
40.813	10.61	11.08	0.49	43.68	4.43	111.4	2.350	0.931	1.419	10.6	8.9	5.0E-08	-9999.0	-9999.0	0.582	1.4	-9999.0	-9999.0
40.879	9.96	10.45	0.50	45.23	4.80	111.4	2.354	0.933	1.421	10.0	8.4	5.0E-08	-9999.0	-9999.0	0.540	1.3	-9999.0	-9999.0
40.944	10.28	10.76	0.49	44.23	4.56	111.4	2.357	0.935	1.422	10.3	8.6	5.0E-08	-9999.0	-9999.0	0.560	1.3	-9999.0	-9999.0
41.010	10.35	10.86	0.48	47.44	4.43	111.4	2.361	0.937	1.424	10.4	8.7	5.0E-08	-9999.0	-9999.0	0.566	1.3	-9999.0	-9999.0
41.076	9.77	10.32	0.47	50.73	4.56	111.4	2.365	0.939	1.425	9.9	8.3	5.0E-08	-9999.0	-9999.0	0.530	1.2	-9999.0	-9999.0
41.141	9.77	10.34	0.46	52.02	4.46	111.4	2.368	0.941	1.427	9.9	8.3	5.0E-08	-9999.0	-9999.0	0.531	1.2	-9999.0	-9999.0
41.207	9.52	10.09	0.43	52.53	4.27	111.4	2.372	0.943	1.429	9.7	8.1	5.0E-08	-9999.0	-9999.0	0.515	1.2	-9999.0	-9999.0
41.272	9.39	9.97	0.37	53.41	3.72	111.4	2.375	0.945	1.430	9.5	8.0	5.0E-08	-9999.0	-9999.0	0.506	1.2	-9999.0	-9999.0
41.338	9.64	10.23	0.35	54.16	3.43	114.6	2.379	0.947	1.432	6.5	5.5	5.0E-07	-9999.0	-9999.0	0.523	1.2	-9999.0	-9999.0
41.404	9.77	10.41	0.31	58.58	2.99	114.6	2.383	0.949	1.434	6.6	5.5	5.0E-07	-9999.0	-9999.0	0.535	1.2	-9999.0	-9999.0
41.469	10.42	11.09	0.29	62.30	2.62	114.6	2.387	0.951	1.435	5.3	4.4	5.0E-06	-9999.0	-9999.0	0.580	1.4	-9999.0	-9999.0
41.535	10.15	10.81	0.29	60.97	2.69	114.6	2.390	0.953	1.437	5.2	4.3	5.0E-06	-9999.0	-9999.0	0.562	1.3	-9999.0	-9999.0
41.601	9.90	10.40	0.30	46.01	2.89	114.6	2.394	0.955	1.439	6.6	5.5	5.0E-07	-9999.0	-9999.0	0.534	1.2	-9999.0	-9999.0
41.666	9.13	9.65	0.25	48.38	2.60	114.6	2.398	0.957	1.441	6.2	5.1	5.0E-07	-9999.0	-9999.0	0.484	1.1	-9999.0	-9999.0
41.732	8.50	8.98	0.26	44.72	2.90	114.6	2.402	0.960	1.442	5.7	4.8	5.0E-07	-9999.0	-9999.0	0.439	1.0	-9999.0	-9999.0
41.797	8.30	8.83	0.33	48.67	3.75	111.4	2.405	0.962	1.444	8.5	7.0	5.0E-08	-9999.0	-9999.0	0.428	1.0	-9999.0	-9999.0
41.863	8.69	9.30	0.45	56.72	4.85	111.4	2.409	0.964	1.445	8.9	7.4	5.0E-08	-9999.0	-9999.0	0.460	1.1	-9999.0	-9999.0
41.929	12.14	12.82	0.40	63.14	3.13	114.6	2.413	0.966	1.447	8.2	6.8	5.0E-07	-9999.0	-9999.0	0.694	1.7	-9999.0	-9999.0
41.994	18.46	19.00	0.38	49.77	2.00	114.6	2.417	0.968	1.449	7.3	6.0	5.0E-05	30.0	30.0	1.106	3.1	-9999.0	-9999.0
42.060	27.47	27.62	0.38	14.22	1.38	114.6	2.420	0.970	1.451	10.6	8.8	5.0E-05	30.0	32.0	1.680	5.7	-9999.0	-9999.0
42.125	35.65	35.67	0.35	2.04	0.98	117.7	2.424	0.972	1.452	11.4	9.4	5.0E-04	31.8	34.0	-9999.0	-9999.0	-9999.0	-9999.0
42.191	41.52	41.55	0.46	2.43	1.11	117.7	2.428	0.974	1.454	13.3	11.0	5.0E-04	36.1	36.0	-9999.0	-9999.0	155.3	3.738
42.257	45.29	45.33	0.45	3.38	1.00	117.7	2.432	0.976	1.456	14.5	12.0	5.0E-04	38.6	36.0	-9999.0	-9999.0	163.0	3.597
42.322	47.33	47.37	0.46	3.08	0.97	117.7	2.436	0.978	1.458	15.1	12.5	5.0E-04	39.8	36.0	-9999.0	-9999.0	167.0	3.525
42.388	48.23	48.26	0.31	3.10	0.64	120.9	2.440	0.980	1.460	11.6	9.6	5.0E-03	40.4	36.0	-9999.0	-9999.0	168.7	3.496
42.454	48.04	48.08	0.31	4.25	0.65	120.9	2.444	0.982	1.462	11.5	9.5	5.0E-03	40.2	36.0	-9999.0	-9999.0	168.5	3.504
42.519	49.44	49.50	0.35	5.43	0.71	120.9	2.448	0.984	1.463	11.9	9.8	5.0E-03	41.0	36.0	-9999.0	-9999.0	171.1	3.457
42.585	52.00	52.07	0.47	6.70	0.90	117.7	2.452	0.986	1.465	16.6	13.7	5.0E-04	42.5	36.0	-9999.0	-9999.0	175.8	3.376
42.650	53.41	53.47	0.63	5.87	1.18	117.7	2.455	0.988	1.467	17.1	14.1	5.0E-04	43.2	38.0	-9999.0	-9999.0	178.3	3.333
42.716	47.53	47.59	0.64	5.93	1.35	117.7	2.459	0.990	1.469	15.2	12.5	5.0E-04	39.9	36.0	-9999.0	-9999.0	167.8	3.527
42.782	49.76	49.81	0.71	4.50	1.43	117.7	2.463	0.992	1.471	15.9	13.1	5.0E-04	41.1	36.0	-9999.0	-9999.0	172.0	3.453
42.847	48.30	48.34	0.80	3.54	1.66	117.7	2.467	0.994	1.473	15.4	12.7	5.0E-04	40.3	36.0	-9999.0	-9999.0	169.4	3.504
42.913	42.61	42.71	0.80	8.71	1.88	114.6	2.471	0.996	1.474	16.4	13.5	5.0E-05	36.7	36.0	2.682	10.0	158.4	3.710
42.978	38.96	39.06	0.74	8.50	1.90	114.6	2.475	0.998	1.476	15.0	12.3	5.0E-05	34.1	34.0	2.439	9.9	150.7	3.858
43.044	38.64	38.71	0.79	6.34	2.05	114.6	2.478	1.001	1.478	14.8	12.2	5.0E-05	33.9	34.0	2.416	9.8	149.9	3.873
43.110	38.58	38.68	1.20	9.24	3.11	114.6	2.482	1.003	1.480	18.5	15.2	5.0E-06	-9999.0	-9999.0	2.413	9.7	-9999.0	-9999.0
43.175	40.44	40.53	0.01	8.95	0.02	120.9	2.486	1.005	1.481	9.7	8.0	5.0E-03	35.1	34.0	-9999.0	-9999.0	154.1	3.801
43.241	42.86	42.94	0.01	6.91	0.02	120.9	2.490	1.007	1.483	10.3	8.4	5.0E-03	36.8	36.0	-9999.0	-9999.0	159.2	3.708
43.307	54.93	54.99	0.01	4.84	0.02	120.9	2.494	1.009	1.485	13.2	10.8	5.0E-03	43.8	38.0	-9999.0	-9999.0	181.6	3.302
43.372	111.79	111.80	0.01	0.90	0.01	124.1	2.498	1.011	1.487	21.4	17.6	5.0E-02	64.2	40.0	-9999.0	-9999.0	265.1	2.371
43.438	265.94	266.07	0.01	12.37	0.00	127.3	2.502	1.013	1.489	42.5	34.8	5.0E+00	89.0	44.0	-9999.0	-9999.0	-9999.0	-9999.0

Gregg In Situ, Inc. - CPT Interpretation

Interpretation Output - Release	1.20I
Run No:	04-0524-0703-4160
Job No:	04-073SC
Client:	MACTEC
Project:	TVA Bull Run Ash Disposal Facility
Site:	CPT-10
Location:	TVA Bull Run
Cone:	H. Bankayal
CPT Date:	04/21/05
CPT Time:	08:01
CPT File:	073CP10.COR
Northing (m):	0.000000
Easting (m):	0.000000
Elevation (m):	0.000000

Water Table (m):	10.67	(ft):	35.0
Unit Weight of Water (default):	62.40 pcf		
Averaging Increment (m):	0.0 (Every Data Point)		
Phi Method :	Robertson and Campanella, 1983		
Su Nkt used:	15.00	Su/P' (nc):	0.30
Dr Method :	Jamiolkowski - All Sands		
State Parameter M:	1.20		

Used Unit Weights Assigned to Soil Zones

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
0.066	1.15	1.15	0.02	0.20	1.74	79.6	0.003	0.000	0.003	1.1	2.2	1.0E-15	-9999.0	-9999.0	0.077	10.0	-9999.0	-9999.0
0.131	17.50	17.51	0.06	0.41	0.34	117.7	0.006	0.000	0.006	5.6	11.2	5.0E-04	90.4	50.0	-9999.0	-9999.0	62.5	3.569
0.197	22.23	22.24	0.13	0.39	0.59	117.7	0.010	0.000	0.010	7.1	14.2	5.0E-04	90.0	50.0	-9999.0	-9999.0	70.9	3.190
0.262	28.75	28.76	0.07	1.27	0.24	117.7	0.014	0.000	0.014	9.2	18.4	5.0E-04	92.6	50.0	-9999.0	-9999.0	80.5	2.798
0.328	40.44	40.45	0.08	0.65	0.20	120.9	0.017	0.000	0.017	9.7	19.4	5.0E-03	95.0	50.0	-9999.0	-9999.0	95.9	2.372
0.394	50.08	50.10	0.14	1.82	0.28	120.9	0.021	0.000	0.021	12.0	24.0	5.0E-03	95.0	50.0	-9999.0	-9999.0	109.3	2.181
0.459	82.47	82.50	0.18	2.39	0.22	124.1	0.025	0.000	0.025	15.8	31.6	5.0E-02	95.0	50.0	-9999.0	-9999.0	156.0	1.891
0.525	112.75	112.77	0.26	1.70	0.23	124.1	0.030	0.000	0.030	21.6	43.2	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.591	130.45	130.47	0.73	2.37	0.56	124.1	0.034	0.000	0.034	25.0	50.0	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.656	173.50	173.52	0.66	1.82	0.38	124.1	0.038	0.000	0.038	33.2	66.5	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.722	227.80	227.80	0.72	-0.43	0.32	127.3	0.042	0.000	0.042	36.4	72.7	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.787	295.46	295.51	0.88	5.19	0.30	127.3	0.046	0.000	0.046	47.2	94.3	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.853	338.38	338.42	1.09	3.27	0.32	127.3	0.050	0.000	0.050	54.0	108.0	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.919	330.97	331.09	1.29	11.24	0.39	127.3	0.054	0.000	0.054	52.8	105.7	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
0.984	303.95	303.96	1.51	1.10	0.50	127.3	0.059	0.000	0.059	48.5	97.0	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.050	289.19	289.26	1.61	6.38	0.56	127.3	0.063	0.000	0.063	46.2	92.3	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.115	271.82	271.83	1.62	0.81	0.60	124.1	0.067	0.000	0.067	52.1	104.1	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.181	268.62	268.63	1.69	1.06	0.63	124.1	0.071	0.000	0.071	51.5	102.9	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.247	270.67	270.68	1.73	0.87	0.64	124.1	0.075	0.000	0.075	51.8	103.7	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.312	283.44	283.50	1.92	5.69	0.68	124.1	0.079	0.000	0.079	54.3	108.6	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.378	302.03	302.04	2.19	0.81	0.72	124.1	0.083	0.000	0.083	57.9	115.7	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.444	309.06	309.10	2.35	3.50	0.76	124.1	0.087	0.000	0.087	59.2	118.4	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.509	308.04	308.19	2.51	14.10	0.81	124.1	0.091	0.000	0.091	59.0	118.1	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.575	304.97	304.97	2.76	-0.20	0.90	124.1	0.095	0.000	0.095	58.4	116.8	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.640	296.03	296.14	3.02	10.03	1.02	124.1	0.099	0.000	0.099	56.7	113.4	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.706	283.00	283.04	3.19	4.01	1.13	124.1	0.103	0.000	0.103	54.2	108.4	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.772	266.84	266.99	3.24	14.34	1.21	124.1	0.108	0.000	0.108	51.1	102.3	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.837	249.59	249.63	3.36	4.07	1.35	124.1	0.112	0.000	0.112	47.8	95.6	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.903	233.94	234.11	3.47	15.51	1.48	120.9	0.116	0.000	0.116	56.0	112.1	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
1.968	223.71	223.72	3.50	0.79	1.56	120.9	0.120	0.000	0.120	53.6	107.1	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.034	214.90	214.94	3.44	3.78	1.60	120.9	0.124	0.000	0.124	51.5	102.9	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.100	213.69	213.73	3.15	3.76	1.47	120.9	0.128	0.000	0.128	51.2	102.3	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.165	214.51	214.51	3.02	-0.47	1.41	120.9	0.132	0.000	0.132	51.4	102.7	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.231	214.77	214.83	2.97	5.03	1.38	120.9	0.135	0.000	0.135	51.4	102.9	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.297	211.70	211.67	2.89	-2.76	1.36	120.9	0.139	0.000	0.139	50.7	101.4	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.362	206.85	206.85	2.23	-0.31	1.08	124.1	0.143	0.000	0.143	39.6	79.2	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.428	199.75	199.78	2.22	2.07	1.11	124.1	0.148	0.000	0.148	38.3	76.5	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.493	188.45	188.48	2.16	3.06	1.14	124.1	0.152	0.000	0.152	36.1	72.2	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.559	177.72	177.76	2.12	3.35	1.19	124.1	0.156	0.000	0.156	34.0	68.1	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.625	170.88	170.91	2.00	2.49	1.17	124.1	0.160	0.000	0.160	32.7	65.5	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.690	163.29	163.30	1.94	0.96	1.19	120.9	0.164	0.000	0.164	39.1	78.2	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.756	163.79	163.78	1.86	-0.24	1.14	124.1	0.168	0.000	0.168	31.4	62.7	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.821	158.23	158.24	1.63	0.22	1.03	124.1	0.172	0.000	0.172	30.3	60.6	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.887	156.64	156.63	1.43	-1.00	0.92	124.1	0.176	0.000	0.176	30.0	60.0	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
2.953	155.87	155.87	1.51	-0.04	0.97	124.1	0.180	0.000	0.180	29.9	59.7	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.018	156.45	156.44	1.46	-0.59	0.94	124.1	0.184	0.000	0.184	30.0	59.9	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.084	152.55	152.58	1.26	2.66	0.83	124.1	0.188	0.000	0.188	29.2	58.4	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.150	149.80	149.80	1.05	0.14	0.70	124.1	0.192	0.000	0.192	28.7	57.4	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.215	149.67	149.67	1.10	-0.26	0.74	124.1	0.196	0.000	0.196	28.7	57.3	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.281	146.36	146.44	1.14	8.28	0.78	124.1	0.200	0.000	0.200	28.0	56.1	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.346	138.82	138.79	1.07	-2.02	0.77	124.1	0.204	0.000	0.204	26.6	53.2	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
3.412	138.88	138.87	0.85	-0.43	0.61	124.1	0.209	0.000	0.209	26.6	53.2	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.478	137.28	137.32	0.65	2.96	0.47	124.1	0.213	0.000	0.213	26.3	52.6	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.543	138.50	138.48	0.61	-1.08	0.44	124.1	0.217	0.000	0.217	26.5	53.0	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.609	137.53	137.57	0.46	3.25	0.34	124.1	0.221	0.000	0.221	26.3	52.7	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.674	138.88	138.91	0.55	3.00	0.40	124.1	0.225	0.000	0.225	26.6	53.2	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.740	138.24	138.23	0.66	-0.24	0.48	124.1	0.229	0.000	0.229	26.5	53.0	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.806	133.44	133.44	0.72	-0.16	0.54	124.1	0.233	0.000	0.233	25.6	51.1	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.871	136.96	136.96	0.62	-0.33	0.45	124.1	0.237	0.000	0.237	26.2	52.5	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
3.937	141.43	141.41	0.61	-1.84	0.43	124.1	0.241	0.000	0.241	27.1	54.2	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.003	142.00	142.00	0.91	-0.73	0.64	124.1	0.245	0.000	0.245	27.2	54.4	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.068	152.36	152.44	1.35	7.54	0.89	124.1	0.249	0.000	0.249	29.2	58.4	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.134	164.69	164.68	1.31	-0.81	0.80	124.1	0.253	0.000	0.253	31.5	62.7	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.199	180.59	180.61	1.44	2.07	0.80	124.1	0.257	0.000	0.257	34.6	68.2	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.265	207.04	207.07	1.68	2.37	0.81	124.1	0.261	0.000	0.261	39.7	77.6	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.331	272.64	272.69	1.54	4.82	0.57	127.3	0.266	0.000	0.266	43.5	84.5	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.396	321.90	321.97	1.50	5.95	0.47	127.3	0.270	0.000	0.270	51.4	99.0	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.462	331.03	331.12	1.89	8.42	0.57	127.3	0.274	0.000	0.274	52.9	101.0	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.528	318.26	318.31	2.18	4.54	0.68	127.3	0.278	0.000	0.278	50.8	96.3	5.0E+00	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.593	300.63	300.72	2.44	8.34	0.81	124.1	0.282	0.000	0.282	57.6	108.4	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.659	278.46	278.62	2.72	15.53	0.98	124.1	0.286	0.000	0.286	53.4	99.7	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.724	256.04	256.07	2.85	2.84	1.11	124.1	0.290	0.000	0.290	49.0	91.0	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.790	235.02	235.13	2.85	10.03	1.21	124.1	0.294	0.000	0.294	45.0	83.0	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.856	213.05	213.13	2.84	7.66	1.33	124.1	0.299	0.000	0.299	40.8	74.7	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.921	196.57	196.61	2.82	3.66	1.43	120.9	0.303	0.000	0.303	47.1	85.6	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
4.987	185.00	185.03	2.66	3.16	1.44	120.9	0.307	0.000	0.307	44.3	80.0	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
5.052	173.57	173.57	2.44	0.20	1.40	120.9	0.310	0.000	0.310	41.6	74.6	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
5.118	161.24	161.26	2.25	2.09	1.39	120.9	0.314	0.000	0.314	38.6	68.9	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.184	153.44	153.45	2.01	0.28	1.31	120.9	0.318	0.000	0.318	36.7	65.1	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.249	151.66	151.66	1.45	0.63	0.96	124.1	0.322	0.000	0.322	29.0	51.2	5.0E-02	94.8	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.315	155.68	155.69	1.43	1.56	0.92	124.1	0.327	0.000	0.327	29.8	52.2	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.381	164.62	164.63	1.44	0.90	0.88	124.1	0.331	0.000	0.331	31.5	54.8	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.446	172.29	172.31	1.63	2.19	0.95	124.1	0.335	0.000	0.335	33.0	57.1	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.512	179.96	179.98	1.82	1.84	1.01	124.1	0.339	0.000	0.339	34.5	59.2	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.577	179.64	179.65	2.00	1.31	1.12	124.1	0.343	0.000	0.343	34.4	58.8	5.0E-02	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
5.643	187.94	187.94	2.27	0.59	1.21	124.1	0.347	0.000	0.347	36.0	61.1	5.0E-02	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
5.709	194.33	194.35	2.57	1.88	1.32	120.9	0.351	0.000	0.351	46.5	78.6	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
5.774	200.59	200.60	2.87	1.41	1.43	120.9	0.355	0.000	0.355	48.0	80.6	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
5.840	203.91	203.93	3.17	1.10	1.55	120.9	0.359	0.000	0.359	48.8	81.5	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
5.905	206.72	206.73	3.44	0.67	1.66	120.9	0.363	0.000	0.363	49.5	82.2	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
5.971	205.38	205.39	3.69	1.50	1.80	120.9	0.367	0.000	0.367	49.2	81.2	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
6.037	204.62	204.63	3.83	1.64	1.87	120.9	0.371	0.000	0.371	49.0	80.5	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
6.102	203.71	203.73	3.97	1.52	1.95	120.9	0.375	0.000	0.375	48.8	79.7	5.0E-03	95.0	50.0	-9999.0	-9999.0	-9999.0	-9999.0
6.168	202.18	202.20	4.03	1.56	1.99	120.9	0.379	0.000	0.379	48.4	78.7	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
6.234	199.31	199.35	3.98	2.92	2.00	120.9	0.383	0.000	0.383	47.7	77.2	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
6.299	194.33	194.35	3.98	1.66	2.05	120.9	0.387	0.000	0.387	46.5	74.8	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
6.365	189.66	189.67	3.96	0.51	2.09	117.7	0.391	0.000	0.391	60.5	96.9	5.0E-04	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
6.430	183.08	183.11	3.90	2.63	2.13	117.7	0.394	0.000	0.394	58.5	93.1	5.0E-04	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
6.496	177.97	177.98	3.77	0.43	2.12	117.7	0.398	0.000	0.398	56.8	90.0	5.0E-04	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
6.562	173.95	173.96	3.60	0.87	2.07	117.7	0.402	0.000	0.402	55.5	87.6	5.0E-04	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
6.627	168.90	168.91	3.41	0.98	2.02	117.7	0.406	0.000	0.406	53.9	84.6	5.0E-04	94.6	48.0	-9999.0	-9999.0	-9999.0	-9999.0
6.693	162.26	162.27	3.23	0.65	1.99	117.7	0.410	0.000	0.410	51.8	80.9	5.0E-04	93.3	48.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
6.758	152.36	152.36	3.13	0.47	2.05	117.7	0.414	0.000	0.414	48.6	75.6	5.0E-04	91.4	48.0	-9999.0	-9999.0	-9999.0	-9999.0
6.824	145.58	145.58	2.99	0.06	2.05	117.7	0.418	0.000	0.418	46.5	71.9	5.0E-04	89.9	48.0	-9999.0	-9999.0	-9999.0	-9999.0
6.890	141.05	141.06	2.77	0.35	1.96	117.7	0.421	0.000	0.421	45.0	69.4	5.0E-04	88.9	48.0	-9999.0	-9999.0	-9999.0	-9999.0
6.955	137.21	137.21	2.50	-0.51	1.82	120.9	0.425	0.000	0.425	32.8	50.4	5.0E-03	88.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
7.021	135.56	135.56	2.31	0.12	1.70	120.9	0.429	0.000	0.429	32.5	49.5	5.0E-03	87.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0
7.087	134.79	134.79	2.15	0.06	1.59	120.9	0.433	0.000	0.433	32.3	49.0	5.0E-03	87.2	46.0	-9999.0	-9999.0	-9999.0	-9999.0
7.152	134.41	134.41	2.01	0.53	1.50	120.9	0.437	0.000	0.437	32.2	48.7	5.0E-03	87.0	46.0	-9999.0	-9999.0	272.4	2.027
7.218	134.79	134.79	1.88	0.57	1.40	120.9	0.441	0.000	0.441	32.3	48.6	5.0E-03	86.9	46.0	-9999.0	-9999.0	272.6	2.023
7.283	135.30	135.30	1.78	0.47	1.32	120.9	0.445	0.000	0.445	32.4	48.6	5.0E-03	86.9	46.0	-9999.0	-9999.0	273.4	2.021
7.349	134.67	134.67	1.76	0.24	1.31	120.9	0.449	0.000	0.449	32.2	48.1	5.0E-03	86.7	46.0	-9999.0	-9999.0	269.5	2.001
7.415	137.02	137.03	1.70	0.61	1.24	120.9	0.453	0.000	0.453	32.8	48.7	5.0E-03	87.0	46.0	-9999.0	-9999.0	278.2	2.030
7.480	140.54	140.55	1.66	0.63	1.18	120.9	0.457	0.000	0.457	33.6	49.8	5.0E-03	87.6	46.0	-9999.0	-9999.0	-9999.0	-9999.0
7.546	143.93	143.94	1.73	0.61	1.20	120.9	0.461	0.000	0.461	34.5	50.8	5.0E-03	88.2	46.0	-9999.0	-9999.0	-9999.0	-9999.0
7.611	150.18	150.19	1.78	0.73	1.19	120.9	0.465	0.000	0.465	36.0	52.7	5.0E-03	89.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0
7.677	159.52	159.52	1.86	0.65	1.17	120.9	0.469	0.000	0.469	38.2	55.8	5.0E-03	90.9	48.0	-9999.0	-9999.0	-9999.0	-9999.0
7.743	166.66	166.68	1.95	1.37	1.17	124.1	0.473	0.000	0.473	31.9	46.4	5.0E-02	92.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
7.808	169.80	169.81	2.04	0.85	1.20	124.1	0.477	0.000	0.477	32.5	47.1	5.0E-02	92.4	48.0	-9999.0	-9999.0	-9999.0	-9999.0
7.874	171.84	171.85	2.13	0.94	1.24	120.9	0.481	0.000	0.481	41.1	59.3	5.0E-03	92.7	48.0	-9999.0	-9999.0	-9999.0	-9999.0
7.940	171.46	171.48	2.23	1.82	1.30	120.9	0.485	0.000	0.485	41.1	59.0	5.0E-03	92.5	48.0	-9999.0	-9999.0	-9999.0	-9999.0
8.005	169.73	169.75	2.25	1.25	1.32	120.9	0.489	0.000	0.489	40.6	58.1	5.0E-03	92.1	48.0	-9999.0	-9999.0	-9999.0	-9999.0
8.071	169.22	169.23	2.37	1.08	1.40	120.9	0.493	0.000	0.493	40.5	57.7	5.0E-03	91.9	48.0	-9999.0	-9999.0	-9999.0	-9999.0
8.136	167.44	167.44	2.47	0.81	1.47	120.9	0.497	0.000	0.497	40.1	56.9	5.0E-03	91.5	48.0	-9999.0	-9999.0	-9999.0	-9999.0
8.202	169.48	169.51	2.56	2.29	1.51	120.9	0.501	0.000	0.501	40.6	57.3	5.0E-03	91.7	48.0	-9999.0	-9999.0	-9999.0	-9999.0
8.268	172.04	172.05	2.60	1.41	1.51	120.9	0.505	0.000	0.505	41.2	58.0	5.0E-03	92.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
8.333	177.14	177.17	2.62	2.39	1.48	120.9	0.509	0.000	0.509	42.4	59.5	5.0E-03	92.7	48.0	-9999.0	-9999.0	-9999.0	-9999.0
8.399	179.77	179.79	2.60	2.00	1.44	120.9	0.513	0.000	0.513	43.0	60.1	5.0E-03	93.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
8.464	180.34	180.36	2.62	2.37	1.45	120.9	0.517	0.000	0.517	43.2	60.1	5.0E-03	93.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
8.530	179.70	179.71	2.14	1.52	1.19	124.1	0.521	0.000	0.521	34.4	47.7	5.0E-02	92.8	48.0	-9999.0	-9999.0	-9999.0	-9999.0
8.596	181.36	181.37	2.21	0.92	1.22	124.1	0.525	0.000	0.525	34.7	48.0	5.0E-02	93.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
8.661	188.26	188.27	2.35	1.35	1.25	124.1	0.529	0.000	0.529	36.1	49.6	5.0E-02	93.9	48.0	-9999.0	-9999.0	-9999.0	-9999.0
8.727	197.78	197.80	2.67	1.54	1.35	120.9	0.533	0.000	0.533	47.4	64.9	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
8.793	203.27	203.29	3.01	1.27	1.48	120.9	0.537	0.000	0.537	48.7	66.4	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
8.858	197.20	197.24	3.29	4.11	1.67	120.9	0.541	0.000	0.541	47.2	64.2	5.0E-03	94.9	48.0	-9999.0	-9999.0	-9999.0	-9999.0
8.924	206.59	206.62	3.60	3.06	1.74	120.9	0.545	0.000	0.545	49.5	67.0	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
8.989	206.78	206.84	3.91	5.23	1.89	120.9	0.549	0.000	0.549	49.5	66.8	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
9.055	206.85	206.87	4.18	1.70	2.02	120.9	0.553	0.000	0.553	49.5	66.6	5.0E-03	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
9.121	206.34	206.37	4.47	2.98	2.17	117.7	0.557	0.000	0.557	65.9	88.3	5.0E-04	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
9.186	205.13	205.16	4.74	3.40	2.31	117.7	0.561	0.000	0.561	65.5	87.5	5.0E-04	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
9.252	202.69	202.74	4.65	4.56	2.29	117.7	0.564	0.000	0.564	64.7	86.1	5.0E-04	95.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
9.317	199.12	199.16	4.70	2.98	2.36	117.7	0.568	0.000	0.568	63.6	84.3	5.0E-04	94.5	48.0	-9999.0	-9999.0	-9999.0	-9999.0
9.383	193.75	193.78	4.61	3.04	2.38	117.7	0.572	0.000	0.572	61.9	81.8	5.0E-04	93.6	48.0	-9999.0	-9999.0	-9999.0	-9999.0
9.449	190.49	190.53	4.39	3.64	2.30	117.7	0.576	0.000	0.576	60.8	80.1	5.0E-04	93.0	48.0	-9999.0	-9999.0	-9999.0	-9999.0
9.514	184.05	184.08	4.12	3.02	2.24	117.7	0.580	0.000	0.580	58.8	77.2	5.0E-04	92.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
9.580	179.77	179.79	3.86	2.17	2.15	117.7	0.584	0.000	0.584	57.4	75.1	5.0E-04	91.2	46.0	-9999.0	-9999.0	-9999.0	-9999.0
9.646	177.97	178.00	3.62	2.63	2.03	117.7	0.588	0.000	0.588	56.8	74.1	5.0E-04	90.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0
9.711	177.27	177.29	3.34	1.94	1.88	120.9	0.592	0.000	0.592	42.4	55.2	5.0E-03	90.6	46.0	-9999.0	-9999.0	-9999.0	-9999.0
9.777	176.25	176.27	3.22	2.21	1.83	120.9	0.596	0.000	0.596	42.2	54.7	5.0E-03	90.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0
9.842	176.12	176.14	3.24	2.11	1.84	120.9	0.600	0.000	0.600	42.2	54.5	5.0E-03	90.2	46.0	-9999.0	-9999.0	-9999.0	-9999.0
9.908	179.45	179.47	3.26	1.84	1.82	120.9	0.603	0.000	0.603	43.0	55.3	5.0E-03	90.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0
9.974	181.23	181.26	3.29	2.66	1.81	120.9	0.607	0.000	0.607	43.4	55.7	5.0E-03	90.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0
10.039	183.47	183.49	3.34	2.21	1.82	120.9	0.611	0.000	0.611	43.9	56.2	5.0E-03	91.1	46.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
10.105	186.02	186.06	3.43	3.54	1.84	120.9	0.615	0.000	0.615	44.5	56.8	5.0E-03	91.4	46.0	-9999.0	-9999.0	-9999.0	-9999.0
10.170	185.70	185.74	3.46	3.46	1.86	120.9	0.619	0.000	0.619	44.5	56.5	5.0E-03	91.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0
10.236	182.44	182.46	3.46	1.76	1.90	120.9	0.623	0.000	0.623	43.7	55.3	5.0E-03	90.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0
10.302	170.50	170.55	3.41	4.35	2.00	120.9	0.627	0.000	0.627	40.8	51.6	5.0E-03	88.6	46.0	-9999.0	-9999.0	-9999.0	-9999.0
10.367	162.45	162.46	3.25	0.90	2.00	117.7	0.631	0.000	0.631	51.9	65.3	5.0E-04	87.2	46.0	-9999.0	-9999.0	-9999.0	-9999.0
10.433	158.23	158.25	3.09	1.08	1.95	117.7	0.635	0.000	0.635	50.5	63.4	5.0E-04	86.3	46.0	-9999.0	-9999.0	313.0	1.978
10.499	156.70	156.72	2.96	1.60	1.89	120.9	0.639	0.000	0.639	37.5	46.9	5.0E-03	86.0	46.0	-9999.0	-9999.0	306.6	1.957
10.564	158.94	158.96	2.80	2.15	1.76	120.9	0.643	0.000	0.643	38.1	47.5	5.0E-03	86.3	46.0	-9999.0	-9999.0	313.9	1.975
10.630	163.09	163.10	2.67	1.21	1.63	120.9	0.647	0.000	0.647	39.0	48.6	5.0E-03	86.9	46.0	-9999.0	-9999.0	329.6	2.021
10.695	167.12	167.13	2.62	1.39	1.57	120.9	0.651	0.000	0.651	40.0	49.6	5.0E-03	87.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0
10.761	166.47	166.49	2.60	1.15	1.56	120.9	0.655	0.000	0.655	39.9	49.3	5.0E-03	87.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0
10.827	161.04	161.05	2.58	1.21	1.60	120.9	0.659	0.000	0.659	38.6	47.5	5.0E-03	86.3	46.0	-9999.0	-9999.0	318.3	1.977
10.892	154.66	154.66	2.58	0.59	1.67	120.9	0.663	0.000	0.663	37.0	45.5	5.0E-03	85.0	46.0	-9999.0	-9999.0	296.5	1.917
10.958	147.82	147.83	2.57	0.94	1.74	120.9	0.667	0.000	0.667	35.4	43.3	5.0E-03	83.7	46.0	-9999.0	-9999.0	278.8	1.886
11.023	143.03	143.04	2.46	1.37	1.72	120.9	0.671	0.000	0.671	34.2	41.8	5.0E-03	82.6	46.0	-9999.0	-9999.0	268.7	1.878
11.089	139.26	139.27	2.32	1.19	1.66	120.9	0.675	0.000	0.675	33.3	40.6	5.0E-03	81.8	46.0	-9999.0	-9999.0	261.7	1.879
11.155	136.39	136.40	2.17	0.75	1.59	120.9	0.679	0.000	0.679	32.7	39.6	5.0E-03	81.1	46.0	-9999.0	-9999.0	256.9	1.884
11.220	136.39	136.40	2.09	0.65	1.53	120.9	0.683	0.000	0.683	32.7	39.5	5.0E-03	81.0	46.0	-9999.0	-9999.0	257.0	1.884
11.286	135.30	135.30	1.95	0.59	1.44	120.9	0.687	0.000	0.687	32.4	39.1	5.0E-03	80.7	46.0	-9999.0	-9999.0	255.4	1.887
11.352	135.37	135.37	1.90	0.51	1.41	120.9	0.691	0.000	0.691	32.4	39.0	5.0E-03	80.6	44.0	-9999.0	-9999.0	255.6	1.888
11.417	135.69	135.70	1.87	0.59	1.38	120.9	0.695	0.000	0.695	32.5	39.0	5.0E-03	80.6	44.0	-9999.0	-9999.0	256.2	1.888
11.483	136.00	136.01	1.80	0.83	1.33	120.9	0.699	0.000	0.699	32.6	39.0	5.0E-03	80.6	44.0	-9999.0	-9999.0	256.8	1.888
11.548	137.66	137.67	1.81	0.71	1.32	120.9	0.702	0.000	0.702	33.0	39.3	5.0E-03	80.9	44.0	-9999.0	-9999.0	259.6	1.886
11.614	142.07	142.09	1.80	1.27	1.27	120.9	0.706	0.000	0.706	34.0	40.5	5.0E-03	81.7	46.0	-9999.0	-9999.0	267.1	1.880
11.680	149.10	149.12	1.92	1.45	1.29	120.9	0.710	0.000	0.710	35.7	42.4	5.0E-03	83.0	46.0	-9999.0	-9999.0	280.3	1.880
11.745	155.81	155.83	2.05	1.96	1.32	120.9	0.714	0.000	0.714	37.3	44.1	5.0E-03	84.2	46.0	-9999.0	-9999.0	295.2	1.894
11.811	159.52	159.54	1.75	1.80	1.10	124.1	0.718	0.000	0.718	30.6	36.1	5.0E-02	84.8	46.0	-9999.0	-9999.0	304.5	1.909
11.876	161.62	161.65	1.94	2.39	1.20	120.9	0.722	0.000	0.722	38.7	45.5	5.0E-03	85.1	46.0	-9999.0	-9999.0	310.1	1.918
11.942	162.00	162.02	2.13	1.56	1.31	120.9	0.726	0.000	0.726	38.8	45.5	5.0E-03	85.1	46.0	-9999.0	-9999.0	310.7	1.918
12.008	160.98	160.99	2.32	0.92	1.44	120.9	0.730	0.000	0.730	38.5	45.1	5.0E-03	84.8	46.0	-9999.0	-9999.0	307.4	1.910
12.073	159.90	159.91	2.44	1.12	1.52	120.9	0.734	0.000	0.734	38.3	44.7	5.0E-03	84.5	46.0	-9999.0	-9999.0	304.2	1.902
12.139	153.25	153.27	2.55	1.76	1.66	120.9	0.738	0.000	0.738	36.7	42.7	5.0E-03	83.2	46.0	-9999.0	-9999.0	288.3	1.881
12.205	156.51	156.53	2.63	1.78	1.68	120.9	0.742	0.000	0.742	37.5	43.5	5.0E-03	83.8	46.0	-9999.0	-9999.0	295.4	1.887
12.270	159.13	159.15	2.67	1.96	1.68	120.9	0.746	0.000	0.746	38.1	44.1	5.0E-03	84.2	46.0	-9999.0	-9999.0	301.4	1.894
12.336	162.32	162.35	2.76	2.55	1.70	120.9	0.750	0.000	0.750	38.9	44.9	5.0E-03	84.7	46.0	-9999.0	-9999.0	309.4	1.905
12.401	163.60	163.62	2.90	2.00	1.77	120.9	0.754	0.000	0.754	39.2	45.1	5.0E-03	84.8	46.0	-9999.0	-9999.0	312.5	1.910
12.467	166.73	166.76	3.09	2.00	1.85	120.9	0.758	0.000	0.758	39.9	45.9	5.0E-03	85.3	46.0	-9999.0	-9999.0	321.1	1.926
12.533	170.37	170.40	3.22	2.33	1.89	120.9	0.762	0.000	0.762	40.8	46.7	5.0E-03	85.8	46.0	-9999.0	-9999.0	332.3	1.950
12.598	173.57	173.59	3.28	2.04	1.89	120.9	0.766	0.000	0.766	41.6	47.5	5.0E-03	86.3	46.0	-9999.0	-9999.0	343.0	1.976
12.664	176.25	176.27	3.34	2.17	1.89	120.9	0.770	0.000	0.770	42.2	48.1	5.0E-03	86.6	46.0	-9999.0	-9999.0	352.6	2.000
12.730	176.70	176.72	3.39	2.33	1.92	120.9	0.774	0.000	0.774	42.3	48.1	5.0E-03	86.6	46.0	-9999.0	-9999.0	353.5	2.000
12.795	174.71	174.74	3.45	2.49	1.97	120.9	0.778	0.000	0.778	41.8	47.4	5.0E-03	86.3	46.0	-9999.0	-9999.0	344.9	1.974
12.861	174.39	174.41	3.46	2.02	1.98	120.9	0.782	0.000	0.782	41.8	47.2	5.0E-03	86.1	46.0	-9999.0	-9999.0	342.9	1.966
12.926	172.99	173.01	3.44	2.04	1.99	120.9	0.786	0.000	0.786	41.4	46.7	5.0E-03	85.8	46.0	-9999.0	-9999.0	337.4	1.950
12.992	171.78	171.80	3.36	2.23	1.95	120.9	0.790	0.000	0.790	41.1	46.3	5.0E-03	85.5	46.0	-9999.0	-9999.0	332.8	1.937
13.058	168.27	168.29	3.27	2.17	1.94	120.9	0.794	0.000	0.794	40.3	45.2	5.0E-03	84.9	46.0	-9999.0	-9999.0	321.9	1.913
13.123	162.51	162.54	3.17	2.15	1.95	120.9	0.798	0.000	0.798	38.9	43.6	5.0E-03	83.8	46.0	-9999.0	-9999.0	307.1	1.889
13.189	155.94	155.96	3.05	1.58	1.95	117.7	0.802	0.000	0.802	49.8	55.6	5.0E-04	82.6	44.0	-9999.0	-9999.0	293.2	1.880
13.254	151.78	151.80	2.93	1.84	1.93	117.7	0.806	0.000	0.806	48.5	54.0	5.0E-04	81.7	44.0	-9999.0	-9999.0	285.7	1.882
13.320	152.23	152.26	2.82	2.51	1.85	120.9	0.810	0.000	0.810	36.5	40.5	5.0E-03	81.7	44.0	-9999.0	-9999.0	286.6	1.882
13.386	153.25	153.27	2.74	1.74	1.79	120.9	0.813	0.000	0.813	36.7	40.7	5.0E-03	81.9	44.0	-9999.0	-9999.0	288.5	1.882

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
13.451	157.66	157.68	2.77	1.62	1.75	120.9	0.817	0.000	0.817	37.8	41.8	5.0E-03	82.6	44.0	-9999.0	-9999.0	296.7	1.882
13.517	167.82	167.84	2.82	1.94	1.68	120.9	0.821	0.000	0.821	40.2	44.3	5.0E-03	84.3	46.0	-9999.0	-9999.0	318.9	1.900
13.583	179.45	179.48	2.81	3.06	1.56	120.9	0.825	0.000	0.825	43.0	47.3	5.0E-03	86.2	46.0	-9999.0	-9999.0	354.0	1.972
13.648	186.79	186.81	2.80	1.94	1.50	120.9	0.829	0.000	0.829	44.7	49.1	5.0E-03	87.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0
13.714	188.64	188.65	2.89	1.58	1.53	120.9	0.833	0.000	0.833	45.2	49.5	5.0E-03	87.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0
13.779	187.62	187.62	3.04	0.51	1.62	120.9	0.837	0.000	0.837	44.9	49.1	5.0E-03	87.2	46.0	-9999.0	-9999.0	-9999.0	-9999.0
13.845	196.63	196.64	3.16	0.85	1.61	120.9	0.841	0.000	0.841	47.1	51.3	5.0E-03	88.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0
13.911	207.48	207.50	3.42	1.39	1.65	120.9	0.845	0.000	0.845	49.7	54.0	5.0E-03	90.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
13.976	226.40	226.41	3.70	1.31	1.63	120.9	0.849	0.000	0.849	54.2	58.8	5.0E-03	92.4	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.042	231.06	231.08	3.89	1.37	1.68	120.9	0.853	0.000	0.853	55.3	59.9	5.0E-03	92.9	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.107	236.23	236.25	4.01	1.70	1.70	120.9	0.857	0.000	0.857	56.6	61.1	5.0E-03	93.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.173	236.10	236.15	4.15	4.11	1.76	120.9	0.861	0.000	0.861	56.5	60.9	5.0E-03	93.4	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.239	230.42	230.44	4.20	2.04	1.82	120.9	0.865	0.000	0.865	55.2	59.3	5.0E-03	92.7	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.304	221.61	221.63	4.31	2.04	1.94	120.9	0.869	0.000	0.869	53.1	56.9	5.0E-03	91.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.370	211.95	211.97	4.20	1.10	1.98	120.9	0.873	0.000	0.873	50.7	54.3	5.0E-03	90.1	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.436	203.52	203.54	3.89	1.17	1.91	120.9	0.877	0.000	0.877	48.7	52.0	5.0E-03	88.9	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.501	201.67	201.67	3.62	0.00	1.79	120.9	0.881	0.000	0.881	48.3	51.4	5.0E-03	88.6	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.567	197.52	197.54	3.26	1.96	1.65	120.9	0.885	0.000	0.885	47.3	50.3	5.0E-03	87.9	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.632	194.20	194.22	3.05	1.43	1.57	120.9	0.889	0.000	0.889	46.5	49.3	5.0E-03	87.4	46.0	-9999.0	-9999.0	-9999.0	-9999.0
14.698	191.78	191.79	2.85	1.04	1.48	120.9	0.893	0.000	0.893	45.9	48.6	5.0E-03	86.9	46.0	-9999.0	-9999.0	389.6	2.032
14.764	191.58	191.60	2.63	0.98	1.37	120.9	0.897	0.000	0.897	45.9	48.4	5.0E-03	86.9	46.0	-9999.0	-9999.0	387.9	2.025
14.829	187.88	187.88	2.24	0.77	1.19	124.1	0.901	0.000	0.901	36.0	37.9	5.0E-02	86.2	46.0	-9999.0	-9999.0	372.3	1.982
14.895	183.47	183.47	2.01	0.41	1.10	124.1	0.905	0.000	0.905	35.1	36.9	5.0E-02	85.5	46.0	-9999.0	-9999.0	356.7	1.944
14.960	179.77	179.79	1.83	1.96	1.02	124.1	0.909	0.000	0.909	34.4	36.1	5.0E-02	84.8	46.0	-9999.0	-9999.0	345.4	1.921
15.026	175.16	175.18	1.77	1.06	1.01	124.1	0.913	0.000	0.913	33.6	35.1	5.0E-02	84.0	44.0	-9999.0	-9999.0	333.4	1.903
15.092	171.78	171.79	1.40	0.85	0.82	124.1	0.917	0.000	0.917	32.9	34.4	5.0E-02	83.4	44.0	-9999.0	-9999.0	325.6	1.896
15.157	168.07	168.08	1.38	1.04	0.82	124.1	0.921	0.000	0.921	32.2	33.5	5.0E-02	82.7	44.0	-9999.0	-9999.0	318.1	1.892
15.223	169.09	169.10	1.44	0.47	0.85	124.1	0.925	0.000	0.925	32.4	33.7	5.0E-02	82.8	44.0	-9999.0	-9999.0	320.1	1.893
15.289	171.40	171.41	1.50	0.92	0.88	124.1	0.929	0.000	0.929	32.8	34.1	5.0E-02	83.2	44.0	-9999.0	-9999.0	324.8	1.895
15.354	172.74	172.75	1.59	1.31	0.92	124.1	0.933	0.000	0.933	33.1	34.3	5.0E-02	83.3	44.0	-9999.0	-9999.0	327.6	1.896
15.420	169.60	169.61	1.72	0.61	1.02	124.1	0.937	0.000	0.937	32.5	33.6	5.0E-02	82.7	44.0	-9999.0	-9999.0	321.2	1.894
15.485	186.91	186.94	1.88	2.33	1.01	124.1	0.942	0.000	0.942	35.8	36.9	5.0E-02	85.5	46.0	-9999.0	-9999.0	363.7	1.946
15.551	200.21	200.24	2.18	2.74	1.09	124.1	0.946	0.000	0.946	38.4	39.4	5.0E-02	87.4	46.0	-9999.0	-9999.0	-9999.0	-9999.0
15.617	209.41	209.43	2.49	1.76	1.19	124.1	0.950	0.000	0.950	40.1	41.2	5.0E-02	88.6	46.0	-9999.0	-9999.0	-9999.0	-9999.0
15.682	213.75	213.76	2.87	1.25	1.34	124.1	0.954	0.000	0.954	40.9	41.9	5.0E-02	89.1	46.0	-9999.0	-9999.0	-9999.0	-9999.0
15.748	215.34	215.36	3.14	1.90	1.46	120.9	0.958	0.000	0.958	51.6	52.7	5.0E-03	89.3	46.0	-9999.0	-9999.0	-9999.0	-9999.0
15.813	217.52	217.54	3.42	2.00	1.57	120.9	0.962	0.000	0.962	52.1	53.1	5.0E-03	89.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0
15.879	218.35	218.38	3.71	2.39	1.70	120.9	0.966	0.000	0.966	52.3	53.2	5.0E-03	89.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0
15.945	219.05	219.09	4.00	3.33	1.83	120.9	0.970	0.000	0.970	52.5	53.3	5.0E-03	89.6	46.0	-9999.0	-9999.0	-9999.0	-9999.0
16.010	220.97	220.99	4.26	2.41	1.93	120.9	0.974	0.000	0.974	52.9	53.6	5.0E-03	89.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0
16.076	223.65	223.69	4.38	3.27	1.96	120.9	0.978	0.000	0.978	53.6	54.2	5.0E-03	90.1	46.0	-9999.0	-9999.0	-9999.0	-9999.0
16.142	225.31	225.33	4.43	2.53	1.97	120.9	0.982	0.000	0.982	53.9	54.5	5.0E-03	90.2	46.0	-9999.0	-9999.0	-9999.0	-9999.0
16.207	223.46	223.49	4.51	2.92	2.02	120.9	0.986	0.000	0.986	53.5	53.9	5.0E-03	89.9	46.0	-9999.0	-9999.0	-9999.0	-9999.0
16.273	220.84	220.87	4.58	3.04	2.07	120.9	0.990	0.000	0.990	52.9	53.2	5.0E-03	89.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0
16.338	220.84	220.87	4.62	3.35	2.09	120.9	0.994	0.000	0.994	52.9	53.1	5.0E-03	89.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0
16.404	221.35	221.38	4.66	3.40	2.11	120.9	0.997	0.000	0.997	53.0	53.1	5.0E-03	89.5	46.0	-9999.0	-9999.0	-9999.0	-9999.0
16.470	219.11	219.15	4.66	3.56	2.13	120.9	1.001	0.000	1.001	52.5	52.4	5.0E-03	89.1	46.0	-9999.0	-9999.0	-9999.0	-9999.0
16.535	215.79	215.83	4.65	3.29	2.16	117.7	1.005	0.000	1.005	68.9	68.7	5.0E-04	88.6	46.0	-9999.0	-9999.0	-9999.0	-9999.0
16.601	211.83	211.87	4.61	2.96	2.18	117.7	1.009	0.000	1.009	67.6	67.3	5.0E-04	88.0	46.0	-9999.0	-9999.0	-9999.0	-9999.0
16.666	207.74	207.78	4.57	3.78	2.20	117.7	1.013	0.000	1.013	66.3	65.9	5.0E-04	87.4	46.0	-9999.0	-9999.0	-9999.0	-9999.0
16.732	201.67	201.70	4.48	3.25	2.22	117.7	1.017	0.000	1.017	64.4	63.9	5.0E-04	86.5	46.0	-9999.0	-9999.0	405.4	2.010

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
16.798	194.52	194.56	4.39	3.29	2.26	117.7	1.021	0.000	1.021	62.1	61.5	5.0E-04	85.4	44.0	-9999.0	-9999.0	379.7	1.952
16.863	186.21	186.24	4.23	3.02	2.27	117.7	1.025	0.000	1.025	59.5	58.7	5.0E-04	84.1	44.0	-9999.0	-9999.0	356.6	1.915
16.929	180.72	180.75	4.03	3.33	2.23	117.7	1.029	0.000	1.029	57.7	56.9	5.0E-04	83.2	44.0	-9999.0	-9999.0	344.3	1.905
16.995	176.51	176.53	3.89	2.09	2.20	117.7	1.032	0.000	1.032	56.4	55.5	5.0E-04	82.5	44.0	-9999.0	-9999.0	336.0	1.904
17.060	172.86	172.88	3.77	2.29	2.18	117.7	1.036	0.000	1.036	55.2	54.2	5.0E-04	81.8	44.0	-9999.0	-9999.0	329.6	1.906
17.126	168.90	168.93	3.62	3.08	2.14	117.7	1.040	0.000	1.040	53.9	52.9	5.0E-04	81.1	44.0	-9999.0	-9999.0	323.1	1.913
17.191	164.88	164.91	3.43	2.86	2.08	117.7	1.044	0.000	1.044	52.6	51.5	5.0E-04	80.4	44.0	-9999.0	-9999.0	317.0	1.922
17.257	160.22	160.25	3.30	3.12	2.06	117.7	1.048	0.000	1.048	51.2	50.0	5.0E-04	79.5	44.0	-9999.0	-9999.0	310.2	1.936
17.323	154.85	154.87	3.20	2.68	2.06	117.7	1.052	0.000	1.052	49.4	48.2	5.0E-04	78.5	44.0	-9999.0	-9999.0	302.7	1.955
17.388	151.98	152.01	3.19	3.14	2.10	117.7	1.056	0.000	1.056	48.5	47.2	5.0E-04	77.9	44.0	-9999.0	-9999.0	298.9	1.966
17.454	146.61	146.63	3.03	2.41	2.06	117.7	1.059	0.000	1.059	46.8	45.5	5.0E-04	76.8	44.0	-9999.0	-9999.0	291.6	1.989
17.519	142.97	142.99	2.92	2.09	2.04	117.7	1.063	0.000	1.063	45.6	44.3	5.0E-04	76.0	44.0	-9999.0	-9999.0	286.7	2.005
17.585	141.18	141.21	2.79	2.09	1.97	117.7	1.067	0.000	1.067	45.1	43.6	5.0E-04	75.6	44.0	-9999.0	-9999.0	284.5	2.014
17.651	136.70	136.73	2.66	2.96	1.94	117.7	1.071	0.000	1.071	43.6	42.2	5.0E-04	74.6	44.0	-9999.0	-9999.0	278.4	2.036
17.716	134.28	134.30	2.57	2.41	1.91	117.7	1.075	0.000	1.075	42.9	41.4	5.0E-04	74.1	42.0	-9999.0	-9999.0	275.1	2.048
17.782	130.77	130.79	2.53	1.66	1.93	117.7	1.079	0.000	1.079	41.7	40.2	5.0E-04	73.3	42.0	-9999.0	-9999.0	270.3	2.067
17.848	125.65	125.68	2.50	1.92	1.99	117.7	1.083	0.000	1.083	40.1	38.6	5.0E-04	72.1	42.0	-9999.0	-9999.0	263.1	2.093
17.913	120.86	120.88	2.36	1.92	1.95	117.7	1.086	0.000	1.086	38.6	37.0	5.0E-04	70.9	42.0	-9999.0	-9999.0	256.3	2.120
17.979	116.07	116.09	2.32	1.39	1.99	117.7	1.090	0.000	1.090	37.1	35.5	5.0E-04	69.7	42.0	-9999.0	-9999.0	249.4	2.149
18.044	112.05	112.06	2.22	1.13	1.98	117.7	1.094	0.000	1.094	35.8	34.2	5.0E-04	68.6	42.0	-9999.0	-9999.0	243.7	2.175
18.110	108.85	108.86	2.14	0.98	1.96	117.7	1.098	0.000	1.098	34.8	33.2	5.0E-04	67.7	42.0	-9999.0	-9999.0	239.2	2.197
18.176	105.98	106.00	2.08	1.70	1.96	117.7	1.102	0.000	1.102	33.8	32.2	5.0E-04	66.9	42.0	-9999.0	-9999.0	235.2	2.219
18.241	103.93	103.94	2.00	1.02	1.93	117.7	1.106	0.000	1.106	33.2	31.6	5.0E-04	66.3	42.0	-9999.0	-9999.0	232.4	2.236
18.307	103.10	103.11	1.93	0.81	1.88	117.7	1.110	0.000	1.110	32.9	31.2	5.0E-04	66.0	42.0	-9999.0	-9999.0	231.4	2.244
18.372	102.59	102.60	1.49	0.81	1.46	120.9	1.114	0.000	1.114	24.6	23.3	5.0E-03	65.8	42.0	-9999.0	-9999.0	230.9	2.250
18.438	101.38	101.39	1.45	0.98	1.43	120.9	1.118	0.000	1.118	24.3	23.0	5.0E-03	65.5	42.0	-9999.0	-9999.0	229.3	2.262
18.504	101.07	101.08	1.44	1.00	1.43	120.9	1.122	0.000	1.122	24.2	22.9	5.0E-03	65.3	42.0	-9999.0	-9999.0	229.1	2.267
18.569	100.61	100.62	1.50	0.71	1.49	120.9	1.125	0.000	1.125	24.1	22.7	5.0E-03	65.1	42.0	-9999.0	-9999.0	228.7	2.273
18.635	101.45	101.46	1.59	0.83	1.57	120.9	1.129	0.000	1.129	24.3	22.9	5.0E-03	65.3	42.0	-9999.0	-9999.0	230.1	2.268
18.701	100.74	100.77	1.70	2.07	1.69	117.7	1.133	0.000	1.133	32.2	30.2	5.0E-04	65.1	42.0	-9999.0	-9999.0	229.3	2.276
18.766	102.21	102.22	1.80	1.13	1.77	117.7	1.137	0.000	1.137	32.6	30.6	5.0E-04	65.4	42.0	-9999.0	-9999.0	231.7	2.266
18.832	101.07	101.08	1.86	1.33	1.84	117.7	1.141	0.000	1.141	32.3	30.2	5.0E-04	65.1	42.0	-9999.0	-9999.0	230.2	2.277
18.897	98.25	98.27	1.96	1.60	2.00	117.7	1.145	0.000	1.145	31.4	29.3	5.0E-04	64.2	42.0	-9999.0	-9999.0	226.3	2.303
18.963	93.65	93.67	2.04	1.86	2.18	117.7	1.149	0.000	1.149	29.9	27.9	5.0E-04	62.8	42.0	-9999.0	-9999.0	220.0	2.348
19.029	89.05	89.06	2.11	1.58	2.36	117.7	1.153	0.000	1.153	28.4	26.5	5.0E-04	61.3	40.0	-9999.0	-9999.0	213.6	2.399
19.094	85.35	85.36	2.09	1.58	2.44	117.7	1.157	0.000	1.157	27.3	25.3	5.0E-04	60.0	40.0	-9999.0	-9999.0	208.7	2.445
19.160	82.02	82.03	2.00	1.45	2.44	117.7	1.160	0.000	1.160	26.2	24.3	5.0E-04	58.8	40.0	-9999.0	-9999.0	204.3	2.490
19.225	79.27	79.28	1.90	1.12	2.40	117.7	1.164	0.000	1.164	25.3	23.5	5.0E-04	57.8	40.0	-9999.0	-9999.0	200.7	2.532
19.291	78.57	78.58	1.77	1.15	2.26	117.7	1.168	0.000	1.168	25.1	23.2	5.0E-04	57.5	40.0	-9999.0	-9999.0	200.0	2.545
19.357	78.45	78.46	1.66	1.10	2.12	117.7	1.172	0.000	1.172	25.0	23.1	5.0E-04	57.4	40.0	-9999.0	-9999.0	200.0	2.549
19.422	78.19	78.20	1.55	0.90	1.99	117.7	1.176	0.000	1.176	25.0	23.0	5.0E-04	57.3	40.0	-9999.0	-9999.0	199.9	2.556
19.488	78.38	78.39	1.46	0.77	1.87	117.7	1.180	0.000	1.180	25.0	23.0	5.0E-04	57.3	40.0	-9999.0	-9999.0	200.3	2.556
19.554	79.72	79.73	1.39	0.87	1.75	117.7	1.184	0.000	1.184	25.5	23.4	5.0E-04	57.7	40.0	-9999.0	-9999.0	202.4	2.539
19.619	81.39	81.40	1.35	0.85	1.66	117.7	1.187	0.000	1.187	26.0	23.8	5.0E-04	58.3	40.0	-9999.0	-9999.0	204.9	2.517
19.685	83.04	83.05	1.32	0.83	1.59	117.7	1.191	0.000	1.191	26.5	24.3	5.0E-04	58.8	40.0	-9999.0	-9999.0	207.4	2.497
19.750	83.04	83.05	1.30	0.90	1.57	117.7	1.195	0.000	1.195	26.5	24.3	5.0E-04	58.8	40.0	-9999.0	-9999.0	207.6	2.500
19.816	83.36	83.37	1.29	0.71	1.55	117.7	1.199	0.000	1.199	26.6	24.3	5.0E-04	58.8	40.0	-9999.0	-9999.0	208.3	2.498
19.882	81.96	81.97	1.28	0.81	1.57	117.7	1.203	0.000	1.203	26.2	23.9	5.0E-04	58.3	40.0	-9999.0	-9999.0	206.6	2.520
19.947	81.13	81.13	1.29	0.71	1.59	117.7	1.207	0.000	1.207	25.9	23.6	5.0E-04	58.0	40.0	-9999.0	-9999.0	205.6	2.534
20.013	79.98	79.99	1.32	0.55	1.65	117.7	1.211	0.000	1.211	25.5	23.2	5.0E-04	57.5	40.0	-9999.0	-9999.0	204.3	2.554
20.078	79.40	79.41	1.34	0.57	1.69	117.7	1.215	0.000	1.215	25.3	23.0	5.0E-04	57.3	40.0	-9999.0	-9999.0	203.7	2.565

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
20.144	78.64	78.65	1.34	0.81	1.71	117.7	1.218	0.000	1.218	25.1	22.7	5.0E-04	56.9	40.0	-9999.0	-9999.0	202.8	2.579
20.210	76.14	76.15	1.35	0.77	1.78	117.7	1.222	0.000	1.222	24.3	22.0	5.0E-04	56.0	40.0	-9999.0	-9999.0	199.6	2.621
20.275	74.49	74.50	1.37	0.73	1.84	117.7	1.226	0.000	1.226	23.8	21.5	5.0E-04	55.3	40.0	-9999.0	-9999.0	197.6	2.652
20.341	71.86	71.87	1.38	0.65	1.92	117.7	1.230	0.000	1.230	22.9	20.7	5.0E-04	54.2	40.0	-9999.0	-9999.0	194.2	2.701
20.407	71.23	71.24	1.39	0.53	1.96	117.7	1.234	0.000	1.234	22.7	20.5	5.0E-04	53.9	40.0	-9999.0	-9999.0	193.5	2.716
20.472	70.65	70.66	1.38	0.65	1.96	117.7	1.238	0.000	1.238	22.6	20.3	5.0E-04	53.6	40.0	-9999.0	-9999.0	192.9	2.730
20.538	69.89	69.89	1.35	0.49	1.94	117.7	1.242	0.000	1.242	22.3	20.0	5.0E-04	53.3	40.0	-9999.0	-9999.0	192.0	2.748
20.603	65.29	65.29	1.35	0.53	2.07	117.7	1.245	0.000	1.245	20.8	18.7	5.0E-04	51.3	38.0	-9999.0	-9999.0	185.8	2.846
20.669	59.99	59.99	1.37	0.71	2.29	114.6	1.249	0.000	1.249	23.0	20.6	5.0E-05	48.8	38.0	3.916	10.0	178.4	2.974
20.735	55.13	55.14	1.40	0.43	2.55	114.6	1.253	0.000	1.253	21.1	18.9	5.0E-05	46.4	38.0	3.592	10.0	171.3	3.107
20.800	50.66	50.67	1.38	0.61	2.73	114.6	1.257	0.000	1.257	19.4	17.3	5.0E-05	43.9	38.0	3.294	10.0	164.4	3.244
20.866	45.36	45.37	1.34	0.55	2.96	114.6	1.261	0.000	1.261	17.4	15.5	5.0E-05	40.7	38.0	2.940	10.0	155.5	3.427
20.932	41.90	41.91	1.31	0.98	3.13	114.6	1.264	0.000	1.264	16.1	14.3	5.0E-05	38.4	36.0	2.710	10.0	149.2	3.560
20.997	39.61	39.62	1.26	1.02	3.19	114.6	1.268	0.000	1.268	19.0	16.8	5.0E-06	-9999.0	-9999.0	2.557	10.0	-9999.0	-9999.0
21.063	39.09	39.11	1.15	1.12	2.95	114.6	1.272	0.000	1.272	15.0	13.3	5.0E-05	36.3	36.0	2.522	10.0	143.9	3.680
21.128	39.42	39.43	1.04	1.29	2.64	114.6	1.276	0.000	1.276	15.1	13.4	5.0E-05	36.5	36.0	2.544	10.0	144.7	3.670
21.194	43.32	43.33	0.98	1.52	2.27	114.6	1.279	0.000	1.279	16.6	14.7	5.0E-05	39.2	36.0	2.803	10.0	152.5	3.519
21.260	49.00	49.02	0.96	1.52	1.96	117.7	1.283	0.000	1.283	15.6	13.8	5.0E-04	42.6	38.0	-9999.0	-9999.0	162.8	3.321
21.325	56.98	57.00	0.95	1.64	1.67	117.7	1.287	0.000	1.287	18.2	16.0	5.0E-04	46.9	38.0	-9999.0	-9999.0	175.8	3.084
21.391	65.93	65.95	0.98	1.60	1.49	117.7	1.291	0.000	1.291	21.1	18.5	5.0E-04	51.1	38.0	-9999.0	-9999.0	189.1	2.867
21.456	70.14	70.16	1.01	1.37	1.44	117.7	1.295	0.000	1.295	22.4	19.7	5.0E-04	52.8	40.0	-9999.0	-9999.0	195.2	2.783
21.522	65.48	65.49	1.03	0.92	1.58	117.7	1.299	0.000	1.299	20.9	18.3	5.0E-04	50.8	38.0	-9999.0	-9999.0	188.8	2.884
21.588	63.11	63.12	1.07	0.75	1.70	117.7	1.302	0.000	1.302	20.1	17.7	5.0E-04	49.7	38.0	-9999.0	-9999.0	185.6	2.941
21.653	58.96	58.97	1.04	0.81	1.77	117.7	1.306	0.000	1.306	18.8	16.5	5.0E-04	47.7	38.0	-9999.0	-9999.0	179.7	3.047
21.719	55.25	55.26	1.08	0.79	1.96	117.7	1.310	0.000	1.310	17.6	15.4	5.0E-04	45.8	38.0	-9999.0	-9999.0	174.2	3.152
21.785	55.44	55.46	1.13	1.25	2.04	117.7	1.314	0.000	1.314	17.7	15.4	5.0E-04	45.8	38.0	-9999.0	-9999.0	174.7	3.150
21.850	56.41	56.44	1.15	2.80	2.04	117.7	1.318	0.000	1.318	18.0	15.7	5.0E-04	46.3	38.0	-9999.0	-9999.0	176.4	3.125
21.916	57.49	57.52	1.13	2.96	1.97	117.7	1.322	0.000	1.322	18.4	16.0	5.0E-04	46.8	38.0	-9999.0	-9999.0	178.2	3.098
21.981	55.96	55.97	1.11	1.62	1.99	117.7	1.326	0.000	1.326	17.9	15.5	5.0E-04	46.0	38.0	-9999.0	-9999.0	176.0	3.145
22.047	55.51	55.54	1.09	1.94	1.97	117.7	1.329	0.000	1.329	17.7	15.4	5.0E-04	45.7	38.0	-9999.0	-9999.0	175.5	3.160
22.113	53.09	53.11	1.09	2.11	2.06	117.7	1.333	0.000	1.333	17.0	14.7	5.0E-04	44.4	38.0	-9999.0	-9999.0	171.8	3.235
22.178	51.29	51.32	1.04	2.02	2.03	117.7	1.337	0.000	1.337	16.4	14.2	5.0E-04	43.4	38.0	-9999.0	-9999.0	169.0	3.293
22.244	47.98	48.00	1.01	2.25	2.11	114.6	1.341	0.000	1.341	18.4	15.9	5.0E-05	41.4	36.0	3.111	10.0	163.5	3.405
22.309	46.57	46.60	1.00	2.43	2.15	114.6	1.345	0.000	1.345	17.9	15.4	5.0E-05	40.5	36.0	3.017	10.0	161.1	3.457
22.375	46.63	46.68	0.98	4.09	2.10	114.6	1.349	0.000	1.349	17.9	15.4	5.0E-05	40.5	36.0	3.022	10.0	161.4	3.458
22.441	47.98	48.03	0.97	4.94	2.02	114.6	1.352	0.000	1.352	18.4	15.8	5.0E-05	41.3	36.0	3.112	10.0	164.0	3.414
22.506	48.55	48.60	0.97	4.88	2.00	114.6	1.356	0.000	1.356	18.6	16.0	5.0E-05	41.6	38.0	3.150	10.0	165.1	3.398
22.572	47.98	48.03	0.95	4.68	1.98	114.6	1.360	0.000	1.360	18.4	15.8	5.0E-05	41.2	36.0	3.111	10.0	164.3	3.421
22.638	47.20	47.25	0.94	4.21	1.99	114.6	1.364	0.000	1.364	18.1	15.5	5.0E-05	40.7	36.0	3.059	10.0	163.0	3.451
22.703	45.74	45.78	0.95	3.99	2.08	114.6	1.367	0.000	1.367	17.5	15.0	5.0E-05	39.8	36.0	2.961	10.0	160.5	3.506
22.769	44.27	44.31	0.93	4.09	2.10	114.6	1.371	0.000	1.371	17.0	14.5	5.0E-05	38.8	36.0	2.863	10.0	157.9	3.563
22.834	42.48	42.53	0.91	4.60	2.14	114.6	1.375	0.000	1.375	16.3	13.9	5.0E-05	37.6	36.0	2.744	10.0	154.5	3.633
22.900	39.55	39.60	0.90	5.13	2.28	114.6	1.379	0.000	1.379	15.2	12.9	5.0E-05	35.5	36.0	2.548	10.0	148.6	3.753
22.966	38.58	38.65	0.89	5.87	2.31	114.6	1.382	0.000	1.382	14.8	12.6	5.0E-05	34.8	36.0	2.484	10.0	146.7	3.796
23.031	37.56	37.64	0.88	7.13	2.34	114.6	1.386	0.000	1.386	14.4	12.2	5.0E-05	34.0	34.0	2.417	10.0	144.6	3.842
23.097	36.29	36.38	0.87	8.63	2.40	114.6	1.390	0.000	1.390	13.9	11.8	5.0E-05	33.0	34.0	2.333	10.0	141.9	3.900
23.162	35.46	35.55	0.84	8.95	2.37	114.6	1.394	0.000	1.394	13.6	11.5	5.0E-05	32.3	34.0	2.277	9.8	-9999.0	-9999.0
23.228	34.11	34.22	0.84	10.04	2.46	114.6	1.397	0.000	1.397	13.1	11.1	5.0E-05	31.1	34.0	2.188	9.1	-9999.0	-9999.0
23.294	32.90	33.01	0.82	10.57	2.49	114.6	1.401	0.000	1.401	12.6	10.7	5.0E-05	30.1	34.0	2.108	8.6	-9999.0	-9999.0
23.359	32.71	32.83	0.81	11.04	2.47	114.6	1.405	0.000	1.405	12.6	10.6	5.0E-05	30.0	34.0	2.095	8.4	-9999.0	-9999.0
23.425	32.45	32.57	0.79	11.12	2.43	114.6	1.409	0.000	1.409	12.5	10.5	5.0E-05	30.0	34.0	2.077	8.3	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
23.491	32.20	32.31	0.77	10.71	2.39	114.6	1.412	0.000	1.412	12.4	10.4	5.0E-05	30.0	34.0	2.060	8.2	-9999.0	-9999.0
23.556	33.28	33.39	0.74	10.24	2.22	114.6	1.416	0.000	1.416	12.8	10.7	5.0E-05	30.2	34.0	2.132	8.6	-9999.0	-9999.0
23.622	34.30	34.40	0.72	9.38	2.10	114.6	1.420	0.000	1.420	13.2	11.1	5.0E-05	31.0	34.0	2.199	9.0	-9999.0	-9999.0
23.687	36.73	36.82	0.72	8.85	1.96	114.6	1.424	0.000	1.424	14.1	11.8	5.0E-05	33.0	34.0	2.360	10.0	144.0	3.909
23.753	39.74	39.83	0.72	8.57	1.81	114.6	1.427	0.000	1.427	15.3	12.8	5.0E-05	35.2	36.0	2.560	10.0	150.8	3.785
23.819	41.20	41.28	0.71	7.85	1.72	117.7	1.431	0.000	1.431	13.2	11.0	5.0E-04	36.2	36.0	-9999.0	-9999.0	154.0	3.730
23.884	41.14	41.21	0.69	6.93	1.68	117.7	1.435	0.000	1.435	13.2	11.0	5.0E-04	36.1	36.0	-9999.0	-9999.0	154.0	3.736
23.950	39.61	39.67	0.68	5.91	1.72	117.7	1.439	0.000	1.439	12.7	10.6	5.0E-04	34.9	36.0	-9999.0	-9999.0	150.8	3.801
24.015	38.26	38.32	0.68	5.21	1.78	114.6	1.443	0.000	1.443	14.7	12.2	5.0E-05	33.9	34.0	2.458	10.0	147.9	3.861
24.081	35.33	35.38	0.69	5.23	1.95	114.6	1.447	0.000	1.447	13.6	11.3	5.0E-05	31.6	34.0	2.262	9.1	-9999.0	-9999.0
24.147	34.43	34.53	0.67	8.67	1.95	114.6	1.450	0.000	1.450	13.2	11.0	5.0E-05	30.8	34.0	2.205	8.7	-9999.0	-9999.0
24.212	31.69	31.80	0.65	10.31	2.05	114.6	1.454	0.000	1.454	12.2	10.1	5.0E-05	30.0	34.0	2.023	7.6	-9999.0	-9999.0
24.278	28.68	28.79	0.65	10.57	2.26	114.6	1.458	0.000	1.458	11.0	9.1	5.0E-05	30.0	32.0	1.822	6.4	-9999.0	-9999.0
24.344	27.41	27.58	0.63	15.92	2.29	114.6	1.462	0.000	1.462	10.6	8.7	5.0E-05	30.0	32.0	1.741	5.9	-9999.0	-9999.0
24.409	26.63	26.89	0.65	23.38	2.42	114.6	1.465	0.000	1.465	10.3	8.5	5.0E-05	30.0	32.0	1.695	5.7	-9999.0	-9999.0
24.475	28.11	28.38	0.64	24.89	2.26	114.6	1.469	0.000	1.469	10.9	9.0	5.0E-05	30.0	32.0	1.794	6.2	-9999.0	-9999.0
24.540	30.09	30.34	0.65	22.67	2.15	114.6	1.473	0.000	1.473	11.6	9.6	5.0E-05	30.0	32.0	1.924	6.9	-9999.0	-9999.0
24.606	30.85	31.05	0.66	17.74	2.13	114.6	1.477	0.000	1.477	11.9	9.8	5.0E-05	30.0	34.0	1.971	7.1	-9999.0	-9999.0
24.672	30.60	30.76	0.65	14.12	2.12	114.6	1.480	0.000	1.480	11.8	9.7	5.0E-05	30.0	32.0	1.952	7.0	-9999.0	-9999.0
24.737	29.45	29.59	0.65	12.61	2.20	114.6	1.484	0.000	1.484	11.3	9.3	5.0E-05	30.0	32.0	1.874	6.5	-9999.0	-9999.0
24.803	27.98	28.10	0.62	10.92	2.21	114.6	1.488	0.000	1.488	10.8	8.8	5.0E-05	30.0	32.0	1.774	6.0	-9999.0	-9999.0
24.868	27.47	27.58	0.58	10.18	2.11	114.6	1.492	0.000	1.492	10.6	8.7	5.0E-05	30.0	32.0	1.739	5.8	-9999.0	-9999.0
24.934	26.70	26.81	0.52	10.14	1.94	114.6	1.495	0.000	1.495	10.3	8.4	5.0E-05	30.0	32.0	1.688	5.5	-9999.0	-9999.0
25.000	25.36	25.47	0.55	10.45	2.16	114.6	1.499	0.000	1.499	9.8	8.0	5.0E-05	30.0	32.0	1.598	5.0	-9999.0	-9999.0
25.065	28.24	28.38	0.57	12.84	2.01	114.6	1.503	0.000	1.503	10.9	8.9	5.0E-05	30.0	32.0	1.792	6.0	-9999.0	-9999.0
25.131	29.77	29.91	0.58	12.70	1.94	114.6	1.507	0.000	1.507	11.5	9.3	5.0E-05	30.0	32.0	1.894	6.5	-9999.0	-9999.0
25.197	32.71	32.74	0.58	2.53	1.78	114.6	1.510	0.000	1.510	12.5	10.2	5.0E-05	30.0	34.0	2.082	7.5	-9999.0	-9999.0
25.262	31.18	31.20	0.59	2.43	1.90	114.6	1.514	0.000	1.514	12.0	9.7	5.0E-05	30.0	32.0	1.979	6.9	-9999.0	-9999.0
25.328	32.52	32.55	0.61	3.00	1.88	114.6	1.518	0.000	1.518	12.5	10.1	5.0E-05	30.0	34.0	2.069	7.3	-9999.0	-9999.0
25.393	32.58	32.62	0.61	3.62	1.87	114.6	1.522	0.000	1.522	12.5	10.1	5.0E-05	30.0	34.0	2.073	7.3	-9999.0	-9999.0
25.459	33.41	33.45	0.61	3.62	1.83	114.6	1.526	0.000	1.526	12.8	10.4	5.0E-05	30.0	34.0	2.128	7.6	-9999.0	-9999.0
25.525	34.49	34.53	0.60	3.56	1.74	114.6	1.529	0.000	1.529	13.2	10.7	5.0E-05	30.1	34.0	2.200	8.0	-9999.0	-9999.0
25.590	34.87	34.91	0.58	3.46	1.67	114.6	1.533	0.000	1.533	13.4	10.8	5.0E-05	30.4	34.0	2.225	8.1	-9999.0	-9999.0
25.656	34.49	34.53	0.58	3.66	1.68	114.6	1.537	0.000	1.537	13.2	10.7	5.0E-05	30.0	34.0	2.200	7.9	-9999.0	-9999.0
25.721	34.24	34.28	0.56	3.46	1.64	114.6	1.541	0.000	1.541	13.1	10.6	5.0E-05	30.0	34.0	2.183	7.8	-9999.0	-9999.0
25.787	33.15	33.19	0.56	3.46	1.69	114.6	1.544	0.000	1.544	12.7	10.2	5.0E-05	30.0	34.0	2.110	7.4	-9999.0	-9999.0
25.853	33.54	33.58	0.57	3.38	1.70	114.6	1.548	0.000	1.548	12.9	10.3	5.0E-05	30.0	34.0	2.135	7.5	-9999.0	-9999.0
25.918	32.01	32.04	0.59	3.22	1.85	114.6	1.552	0.000	1.552	12.3	9.9	5.0E-05	30.0	32.0	2.033	6.9	-9999.0	-9999.0
25.984	32.20	32.23	0.59	3.29	1.83	114.6	1.556	0.000	1.556	12.3	9.9	5.0E-05	30.0	32.0	2.045	6.9	-9999.0	-9999.0
26.050	30.66	30.70	0.59	3.10	1.93	114.6	1.559	0.000	1.559	11.8	9.4	5.0E-05	30.0	32.0	1.943	6.4	-9999.0	-9999.0
26.115	29.00	29.04	0.57	3.31	1.97	114.6	1.563	0.000	1.563	11.1	8.9	5.0E-05	30.0	32.0	1.832	5.8	-9999.0	-9999.0
26.181	27.85	27.88	0.56	3.20	2.01	114.6	1.567	0.000	1.567	10.7	8.5	5.0E-05	30.0	32.0	1.754	5.4	-9999.0	-9999.0
26.246	26.84	26.87	0.52	3.20	1.94	114.6	1.571	0.000	1.571	10.3	8.2	5.0E-05	30.0	32.0	1.687	5.1	-9999.0	-9999.0
26.312	26.57	26.61	0.50	3.12	1.88	114.6	1.574	0.000	1.574	10.2	8.1	5.0E-05	30.0	32.0	1.669	5.0	-9999.0	-9999.0
26.378	25.74	25.78	0.49	3.02	1.91	114.6	1.578	0.000	1.578	9.9	7.9	5.0E-05	30.0	32.0	1.613	4.7	-9999.0	-9999.0
26.443	25.87	25.91	0.46	3.04	1.78	114.6	1.582	0.000	1.582	9.9	7.9	5.0E-05	30.0	32.0	1.622	4.7	-9999.0	-9999.0
26.509	24.21	24.24	0.44	3.00	1.82	114.6	1.586	0.000	1.586	9.3	7.4	5.0E-05	30.0	32.0	1.510	4.2	-9999.0	-9999.0
26.574	21.46	21.49	0.44	3.00	2.05	114.6	1.589	0.000	1.589	8.2	6.5	5.0E-05	30.0	30.0	1.327	3.5	-9999.0	-9999.0
26.640	19.68	19.71	0.44	2.88	2.24	114.6	1.593	0.000	1.593	9.4	7.5	5.0E-06	-9999.0	-9999.0	1.208	3.0	-9999.0	-9999.0
26.706	17.05	17.08	0.44	2.86	2.58	114.6	1.597	0.000	1.597	8.2	6.5	5.0E-06	-9999.0	-9999.0	1.032	2.4	-9999.0	-9999.0
26.771	14.57	14.60	0.43	3.40	2.95	114.6	1.601	0.000	1.601	7.0	5.5	5.0E-06	-9999.0	-9999.0	0.867	1.9	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
26.837	11.95	12.01	0.41	5.21	3.42	114.6	1.604	0.000	1.604	7.7	6.1	5.0E-07	-9999.0	-9999.0	0.693	1.5	-9999.0	-9999.0
26.903	9.58	9.72	0.37	12.57	3.82	111.4	1.608	0.000	1.608	9.3	7.3	5.0E-08	-9999.0	-9999.0	0.541	1.1	-9999.0	-9999.0
26.968	8.43	8.59	0.31	14.49	3.62	111.4	1.612	0.000	1.612	8.2	6.5	5.0E-08	-9999.0	-9999.0	0.465	1.0	-9999.0	-9999.0
27.034	6.90	7.11	0.26	19.73	3.67	111.4	1.615	0.000	1.615	6.8	5.4	5.0E-08	-9999.0	-9999.0	0.366	0.8	-9999.0	-9999.0
27.099	6.52	6.80	0.21	26.06	3.10	111.4	1.619	0.000	1.619	6.5	5.1	5.0E-08	-9999.0	-9999.0	0.345	0.8	-9999.0	-9999.0
27.165	6.39	6.71	0.19	30.02	2.84	114.6	1.623	0.000	1.623	4.3	3.4	5.0E-07	-9999.0	-9999.0	0.339	0.8	-9999.0	-9999.0
27.231	5.24	5.60	0.17	33.30	3.04	111.4	1.627	0.000	1.627	5.4	4.2	5.0E-08	-9999.0	-9999.0	0.265	0.6	-9999.0	-9999.0
27.296	7.35	7.70	0.18	32.99	2.34	114.6	1.630	0.000	1.630	4.9	3.9	5.0E-07	-9999.0	-9999.0	0.405	0.9	-9999.0	-9999.0
27.362	9.45	9.79	0.22	31.46	2.25	114.6	1.634	0.000	1.634	4.7	3.7	5.0E-06	-9999.0	-9999.0	0.544	1.1	-9999.0	-9999.0
27.427	12.52	12.80	0.27	25.80	2.11	114.6	1.638	0.000	1.638	6.1	4.8	5.0E-06	-9999.0	-9999.0	0.744	1.5	-9999.0	-9999.0
27.493	15.46	15.68	0.31	20.19	1.98	114.6	1.642	0.000	1.642	7.5	5.9	5.0E-06	-9999.0	-9999.0	0.936	2.1	-9999.0	-9999.0
27.559	15.40	15.57	0.34	15.80	2.19	114.6	1.645	0.000	1.645	7.5	5.8	5.0E-06	-9999.0	-9999.0	0.928	2.0	-9999.0	-9999.0
27.624	14.51	14.64	0.34	12.51	2.33	114.6	1.649	0.000	1.649	7.0	5.5	5.0E-06	-9999.0	-9999.0	0.866	1.9	-9999.0	-9999.0
27.690	15.27	15.39	0.34	11.16	2.21	114.6	1.653	0.000	1.653	7.4	5.7	5.0E-06	-9999.0	-9999.0	0.916	2.0	-9999.0	-9999.0
27.756	14.82	14.93	0.34	10.37	2.28	114.6	1.657	0.000	1.657	7.1	5.6	5.0E-06	-9999.0	-9999.0	0.885	1.9	-9999.0	-9999.0
27.821	13.99	14.10	0.34	9.60	2.42	114.6	1.660	0.000	1.660	6.8	5.2	5.0E-06	-9999.0	-9999.0	0.829	1.7	-9999.0	-9999.0
27.887	13.41	13.51	0.33	9.20	2.45	114.6	1.664	0.000	1.664	6.5	5.0	5.0E-06	-9999.0	-9999.0	0.790	1.6	-9999.0	-9999.0
27.952	12.78	12.88	0.32	9.22	2.49	114.6	1.668	0.000	1.668	6.2	4.8	5.0E-06	-9999.0	-9999.0	0.748	1.5	-9999.0	-9999.0
28.018	11.50	11.61	0.32	10.24	2.76	114.6	1.672	0.000	1.672	5.6	4.3	5.0E-06	-9999.0	-9999.0	0.662	1.3	-9999.0	-9999.0
28.084	11.82	11.95	0.33	11.83	2.77	114.6	1.675	0.000	1.675	5.7	4.4	5.0E-06	-9999.0	-9999.0	0.685	1.4	-9999.0	-9999.0
28.149	11.88	12.02	0.34	13.45	2.83	114.6	1.679	0.000	1.679	5.8	4.4	5.0E-06	-9999.0	-9999.0	0.690	1.4	-9999.0	-9999.0
28.215	12.20	12.36	0.33	15.15	2.68	114.6	1.683	0.000	1.683	5.9	4.6	5.0E-06	-9999.0	-9999.0	0.712	1.4	-9999.0	-9999.0
28.280	12.84	13.01	0.30	15.84	2.31	114.6	1.687	0.000	1.687	6.2	4.8	5.0E-06	-9999.0	-9999.0	0.755	1.5	-9999.0	-9999.0
28.346	12.78	12.94	0.30	15.11	2.32	114.6	1.690	0.000	1.690	6.2	4.8	5.0E-06	-9999.0	-9999.0	0.750	1.5	-9999.0	-9999.0
28.412	12.33	12.49	0.30	14.38	2.41	114.6	1.694	0.000	1.694	6.0	4.6	5.0E-06	-9999.0	-9999.0	0.719	1.4	-9999.0	-9999.0
28.477	13.41	13.46	0.28	4.84	2.08	114.6	1.698	0.000	1.698	6.4	4.9	5.0E-06	-9999.0	-9999.0	0.784	1.6	-9999.0	-9999.0
28.543	12.58	12.63	0.28	4.66	2.22	114.6	1.702	0.000	1.702	6.0	4.6	5.0E-06	-9999.0	-9999.0	0.729	1.4	-9999.0	-9999.0
28.609	9.52	9.59	0.25	5.87	2.61	114.6	1.705	0.000	1.705	6.1	4.7	5.0E-07	-9999.0	-9999.0	0.525	1.0	-9999.0	-9999.0
28.674	8.11	8.20	0.24	8.04	2.94	114.6	1.709	0.000	1.709	5.2	4.0	5.0E-07	-9999.0	-9999.0	0.432	0.9	-9999.0	-9999.0
28.740	5.68	5.82	0.22	12.47	3.79	111.4	1.713	0.000	1.713	5.6	4.3	5.0E-08	-9999.0	-9999.0	0.274	0.6	-9999.0	-9999.0
28.805	4.73	4.95	0.19	20.60	3.84	111.4	1.717	0.000	1.717	4.7	3.6	5.0E-08	-9999.0	-9999.0	0.216	0.6	-9999.0	-9999.0
28.871	4.66	4.96	0.15	27.95	3.03	111.4	1.720	0.000	1.720	4.8	3.6	5.0E-08	-9999.0	-9999.0	0.216	0.6	-9999.0	-9999.0
28.937	3.96	4.29	0.12	30.15	2.81	111.4	1.724	0.000	1.724	4.1	3.1	5.0E-08	-9999.0	-9999.0	0.171	0.5	-9999.0	-9999.0
29.002	4.28	4.61	0.09	30.46	1.96	114.6	1.728	0.000	1.728	2.9	2.2	5.0E-07	-9999.0	-9999.0	0.192	0.6	-9999.0	-9999.0
29.068	4.02	4.35	0.06	30.15	1.38	111.4	1.731	0.000	1.731	2.1	1.6	1.0E-07	-9999.0	-9999.0	0.174	0.5	-9999.0	-9999.0
29.134	4.34	4.66	0.04	30.02	0.86	111.4	1.735	0.000	1.735	2.2	1.7	1.0E-07	-9999.0	-9999.0	0.195	0.6	-9999.0	-9999.0
29.199	4.47	4.80	0.03	30.42	0.63	111.4	1.739	0.000	1.739	2.3	1.7	1.0E-07	-9999.0	-9999.0	0.204	0.6	-9999.0	-9999.0
29.265	4.02	4.35	0.04	30.21	0.92	111.4	1.742	0.000	1.742	2.1	1.6	1.0E-07	-9999.0	-9999.0	0.174	0.5	-9999.0	-9999.0
29.330	5.36	5.68	0.06	29.78	1.06	111.4	1.746	0.000	1.746	2.7	2.1	1.0E-07	-9999.0	-9999.0	0.263	0.6	-9999.0	-9999.0
29.396	6.00	6.32	0.07	28.90	1.11	111.4	1.750	0.000	1.750	3.0	2.3	1.0E-07	-9999.0	-9999.0	0.304	0.7	-9999.0	-9999.0
29.462	7.73	8.02	0.09	26.59	1.13	114.6	1.753	0.000	1.753	3.8	2.9	5.0E-06	-9999.0	-9999.0	0.418	0.8	-9999.0	-9999.0
29.527	8.30	8.57	0.11	24.63	1.29	114.6	1.757	0.000	1.757	4.1	3.1	5.0E-06	-9999.0	-9999.0	0.454	0.9	-9999.0	-9999.0
29.593	7.60	7.85	0.15	23.20	1.92	114.6	1.761	0.000	1.761	3.8	2.8	5.0E-06	-9999.0	-9999.0	0.406	0.8	-9999.0	-9999.0
29.658	7.67	7.91	0.15	22.32	1.90	114.6	1.765	0.000	1.765	3.8	2.9	5.0E-06	-9999.0	-9999.0	0.410	0.8	-9999.0	-9999.0
29.724	6.39	6.63	0.15	22.22	2.27	114.6	1.768	0.000	1.768	4.2	3.2	5.0E-07	-9999.0	-9999.0	0.324	0.7	-9999.0	-9999.0
29.790	4.41	4.67	0.14	23.61	3.01	111.4	1.772	0.000	1.772	4.5	3.4	5.0E-08	-9999.0	-9999.0	0.193	0.6	-9999.0	-9999.0
29.855	3.83	4.14	0.12	29.04	2.90	111.4	1.776	0.000	1.776	4.0	3.0	5.0E-08	-9999.0	-9999.0	0.158	0.5	-9999.0	-9999.0
29.921	4.92	5.28	0.11	32.71	2.09	114.6	1.779	0.000	1.779	3.4	2.5	5.0E-07	-9999.0	-9999.0	0.233	0.6	-9999.0	-9999.0
29.987	4.92	5.27	0.08	31.76	1.52	111.4	1.783	0.000	1.783	2.5	1.9	1.0E-07	-9999.0	-9999.0	0.232	0.6	-9999.0	-9999.0
30.052	4.60	4.92	0.07	29.19	1.43	111.4	1.787	0.000	1.787	2.4	1.8	1.0E-07	-9999.0	-9999.0	0.209	0.6	-9999.0	-9999.0
30.118	4.66	4.98	0.05	29.72	1.01	111.4	1.790	0.000	1.790	2.4	1.8	1.0E-07	-9999.0	-9999.0	0.213	0.6	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
30.183	3.20	3.54	0.03	31.98	0.85	111.4	1.794	0.000	1.794	1.7	1.3	1.0E-07	-9999.0	-9999.0	0.117	0.5	-9999.0	-9999.0
30.249	3.58	3.94	0.03	33.28	0.76	111.4	1.798	0.000	1.798	1.9	1.4	1.0E-07	-9999.0	-9999.0	0.143	0.5	-9999.0	-9999.0
30.315	2.88	3.24	0.03	33.28	0.93	111.4	1.801	0.000	1.801	1.5	1.2	1.0E-07	-9999.0	-9999.0	0.096	0.5	-9999.0	-9999.0
30.380	3.20	3.56	0.02	33.66	0.56	111.4	1.805	0.000	1.805	1.7	1.3	1.0E-07	-9999.0	-9999.0	0.117	0.5	-9999.0	-9999.0
30.446	3.20	3.56	0.02	33.38	0.56	111.4	1.809	0.000	1.809	1.7	1.3	1.0E-07	-9999.0	-9999.0	0.117	0.5	-9999.0	-9999.0
30.511	3.13	3.48	0.01	32.97	0.29	111.4	1.812	0.000	1.812	1.7	1.2	1.0E-07	-9999.0	-9999.0	0.111	0.5	-9999.0	-9999.0
30.577	2.75	3.11	0.02	33.44	0.65	111.4	1.816	0.000	1.816	1.5	1.1	1.0E-07	-9999.0	-9999.0	0.086	0.5	-9999.0	-9999.0
30.643	2.62	2.97	0.01	32.77	0.34	111.4	1.820	0.000	1.820	1.4	1.1	1.0E-07	-9999.0	-9999.0	0.077	0.5	-9999.0	-9999.0
30.708	3.32	3.67	0.01	32.44	0.27	111.4	1.823	0.000	1.823	1.8	1.3	1.0E-07	-9999.0	-9999.0	0.123	0.5	-9999.0	-9999.0
30.774	3.13	3.49	0.02	33.20	0.58	111.4	1.827	0.000	1.827	1.7	1.2	1.0E-07	-9999.0	-9999.0	0.111	0.5	-9999.0	-9999.0
30.840	3.51	3.87	0.02	33.42	0.52	111.4	1.831	0.000	1.831	1.9	1.4	1.0E-07	-9999.0	-9999.0	0.136	0.5	-9999.0	-9999.0
30.905	3.39	3.75	0.01	33.03	0.27	111.4	1.834	0.000	1.834	1.8	1.3	1.0E-07	-9999.0	-9999.0	0.127	0.5	-9999.0	-9999.0
30.971	3.26	3.61	0.02	32.67	0.56	111.4	1.838	0.000	1.838	1.7	1.3	1.0E-07	-9999.0	-9999.0	0.118	0.5	-9999.0	-9999.0
31.036	3.20	3.56	0.01	33.11	0.28	111.4	1.842	0.000	1.842	1.7	1.3	1.0E-07	-9999.0	-9999.0	0.114	0.5	-9999.0	-9999.0
31.102	2.43	2.79	0.01	33.64	0.36	111.4	1.845	0.000	1.845	1.3	1.0	1.0E-07	-9999.0	-9999.0	0.063	0.5	-9999.0	-9999.0
31.168	2.75	3.12	0.02	34.61	0.64	111.4	1.849	0.000	1.849	1.5	1.1	1.0E-07	-9999.0	-9999.0	0.085	0.5	-9999.0	-9999.0
31.233	3.77	4.14	0.02	34.05	0.48	111.4	1.853	0.000	1.853	2.0	1.5	1.0E-07	-9999.0	-9999.0	0.152	0.5	-9999.0	-9999.0
31.299	3.90	4.25	0.02	32.09	0.47	111.4	1.856	0.000	1.856	2.0	1.5	1.0E-07	-9999.0	-9999.0	0.159	0.5	-9999.0	-9999.0
31.364	3.71	4.04	0.02	30.83	0.50	111.4	1.860	0.000	1.860	1.9	1.4	1.0E-07	-9999.0	-9999.0	0.145	0.5	-9999.0	-9999.0
31.430	2.18	2.52	0.02	31.76	0.80	111.4	1.863	0.000	1.863	1.2	0.9	1.0E-07	-9999.0	-9999.0	0.044	0.5	-9999.0	-9999.0
31.496	2.81	3.17	0.02	33.83	0.63	111.4	1.867	0.000	1.867	1.5	1.1	1.0E-07	-9999.0	-9999.0	0.087	0.5	-9999.0	-9999.0
31.561	3.07	3.43	0.01	33.93	0.29	111.4	1.871	0.000	1.871	1.6	1.2	1.0E-07	-9999.0	-9999.0	0.104	0.5	-9999.0	-9999.0
31.627	3.45	3.81	0.01	33.34	0.26	111.4	1.874	0.000	1.874	1.8	1.3	1.0E-07	-9999.0	-9999.0	0.129	0.5	-9999.0	-9999.0
31.693	2.50	2.86	0.01	33.24	0.35	111.4	1.878	0.000	1.878	1.4	1.0	1.0E-07	-9999.0	-9999.0	0.065	0.5	-9999.0	-9999.0
31.758	2.75	3.11	0.02	33.46	0.65	111.4	1.882	0.000	1.882	1.5	1.1	1.0E-07	-9999.0	-9999.0	0.082	0.5	-9999.0	-9999.0
31.824	2.69	3.04	0.04	33.11	1.32	111.4	1.885	0.000	1.885	1.5	1.1	1.0E-07	-9999.0	-9999.0	0.077	0.5	-9999.0	-9999.0
31.889	3.83	4.04	0.08	19.75	1.98	111.4	1.889	0.000	1.889	3.9	2.8	5.0E-08	-9999.0	-9999.0	0.144	0.5	-9999.0	-9999.0
31.955	5.81	6.13	0.12	29.57	1.96	114.6	1.893	0.000	1.893	3.9	2.8	5.0E-07	-9999.0	-9999.0	0.283	0.6	-9999.0	-9999.0
32.021	18.14	18.45	0.14	28.11	0.76	114.6	1.897	0.000	1.897	7.1	5.1	5.0E-05	30.0	30.0	1.103	2.1	-9999.0	-9999.0
32.086	26.51	26.71	0.17	18.07	0.64	117.7	1.900	0.000	1.900	8.5	6.2	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
32.152	29.26	29.36	0.18	8.87	0.61	117.7	1.904	0.000	1.904	9.4	6.8	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
32.217	30.92	30.99	0.22	7.21	0.71	117.7	1.908	0.000	1.908	9.9	7.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
32.283	31.69	31.75	0.22	6.26	0.69	117.7	1.912	0.000	1.912	10.1	7.3	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
32.349	36.61	36.67	0.23	5.61	0.63	117.7	1.916	0.000	1.916	11.7	8.5	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
32.414	44.27	44.32	0.23	4.98	0.52	120.9	1.920	0.000	1.920	10.6	7.7	5.0E-03	34.0	34.0	-9999.0	-9999.0	176.7	3.986
32.480	50.78	50.84	0.25	4.80	0.49	120.9	1.924	0.000	1.924	12.2	8.8	5.0E-03	37.9	34.0	-9999.0	-9999.0	191.1	3.758
32.546	55.96	56.01	0.29	4.68	0.52	120.9	1.928	0.000	1.928	13.4	9.7	5.0E-03	40.6	36.0	-9999.0	-9999.0	201.5	3.597
32.611	59.86	59.90	0.37	4.58	0.62	120.9	1.932	0.000	1.932	14.3	10.3	5.0E-03	42.5	36.0	-9999.0	-9999.0	208.9	3.486
32.677	64.40	64.45	0.48	4.94	0.75	120.9	1.936	0.000	1.936	15.4	11.1	5.0E-03	44.6	36.0	-9999.0	-9999.0	217.0	3.367
32.742	65.99	66.04	0.57	5.03	0.87	120.9	1.940	0.000	1.940	15.8	11.4	5.0E-03	45.3	36.0	-9999.0	-9999.0	219.9	3.330
32.808	66.82	66.88	0.69	5.01	1.03	120.9	1.944	0.000	1.944	16.0	11.5	5.0E-03	45.6	36.0	-9999.0	-9999.0	221.5	3.312
32.874	66.18	66.23	0.77	4.64	1.17	120.9	1.947	0.000	1.947	15.9	11.4	5.0E-03	45.3	36.0	-9999.0	-9999.0	220.6	3.330
32.939	62.98	63.03	0.82	4.58	1.30	117.7	1.951	0.000	1.951	20.1	14.4	5.0E-04	43.8	36.0	-9999.0	-9999.0	215.2	3.415
33.005	61.71	61.76	0.84	4.54	1.36	117.7	1.955	0.000	1.955	19.7	14.1	5.0E-04	43.2	36.0	-9999.0	-9999.0	213.1	3.451
33.070	62.35	62.40	0.86	4.60	1.38	117.7	1.959	0.000	1.959	19.9	14.2	5.0E-04	43.5	36.0	-9999.0	-9999.0	214.4	3.437
33.136	61.84	61.89	0.87	4.37	1.41	117.7	1.963	0.000	1.963	19.8	14.1	5.0E-04	43.2	36.0	-9999.0	-9999.0	213.7	3.453
33.202	63.81	63.86	0.90	4.54	1.41	117.7	1.967	0.000	1.967	20.4	14.5	5.0E-04	44.1	36.0	-9999.0	-9999.0	217.3	3.403
33.267	65.22	65.27	0.98	4.56	1.51	117.7	1.971	0.000	1.971	20.8	14.8	5.0E-04	44.7	36.0	-9999.0	-9999.0	219.9	3.370
33.333	66.82	66.87	1.00	4.66	1.50	117.7	1.975	0.000	1.975	21.3	15.2	5.0E-04	45.4	36.0	-9999.0	-9999.0	222.8	3.332
33.399	67.14	67.19	0.98	4.78	1.46	117.7	1.978	0.000	1.978	21.5	15.3	5.0E-04	45.5	36.0	-9999.0	-9999.0	223.5	3.327
33.464	65.48	65.53	0.96	4.96	1.47	117.7	1.982	0.000	1.982	20.9	14.9	5.0E-04	44.7	36.0	-9999.0	-9999.0	220.9	3.371

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
33.530	63.56	63.62	0.92	4.76	1.45	117.7	1.986	0.000	1.986	20.3	14.4	5.0E-04	43.9	36.0	-9999.0	-9999.0	217.7	3.422
33.595	61.26	61.31	0.87	4.94	1.42	117.7	1.990	0.000	1.990	19.6	13.9	5.0E-04	42.8	36.0	-9999.0	-9999.0	213.8	3.487
33.661	58.90	58.95	0.82	4.33	1.39	117.7	1.994	0.000	1.994	18.8	13.3	5.0E-04	41.6	36.0	-9999.0	-9999.0	209.6	3.556
33.727	55.38	55.43	0.74	3.85	1.34	117.7	1.998	0.000	1.998	17.7	12.5	5.0E-04	39.8	36.0	-9999.0	-9999.0	203.0	3.663
33.792	53.21	53.25	0.64	3.68	1.20	117.7	2.002	0.000	2.002	17.0	12.0	5.0E-04	38.6	34.0	-9999.0	-9999.0	198.8	3.733
33.858	53.92	53.96	0.57	3.31	1.06	117.7	2.005	0.000	2.005	17.2	12.2	5.0E-04	39.0	34.0	-9999.0	-9999.0	200.4	3.714
33.923	53.92	53.96	0.56	3.31	1.04	117.7	2.009	0.000	2.009	17.2	12.2	5.0E-04	39.0	34.0	-9999.0	-9999.0	200.5	3.716
33.989	55.84	55.87	0.57	3.16	1.02	117.7	2.013	0.000	2.013	17.8	12.6	5.0E-04	39.9	36.0	-9999.0	-9999.0	204.5	3.660
34.055	56.22	56.26	0.61	3.66	1.09	117.7	2.017	0.000	2.017	18.0	12.6	5.0E-04	40.1	36.0	-9999.0	-9999.0	205.4	3.651
34.120	55.57	55.62	0.66	4.01	1.19	117.7	2.021	0.000	2.021	17.8	12.5	5.0E-04	39.8	36.0	-9999.0	-9999.0	204.3	3.673
34.186	55.90	55.94	0.74	4.27	1.33	117.7	2.025	0.000	2.025	17.9	12.6	5.0E-04	39.9	36.0	-9999.0	-9999.0	205.0	3.665
34.252	54.62	54.67	0.80	4.62	1.47	117.7	2.029	0.000	2.029	17.5	12.3	5.0E-04	39.2	34.0	-9999.0	-9999.0	202.7	3.707
34.317	55.71	55.76	0.86	4.70	1.55	117.7	2.033	0.000	2.033	17.8	12.5	5.0E-04	39.7	36.0	-9999.0	-9999.0	205.0	3.676
34.383	57.24	57.29	0.87	4.46	1.52	117.7	2.036	0.000	2.036	18.3	12.8	5.0E-04	40.5	36.0	-9999.0	-9999.0	208.1	3.633
34.448	59.15	59.21	0.89	4.90	1.51	117.7	2.040	0.000	2.040	18.9	13.2	5.0E-04	41.4	36.0	-9999.0	-9999.0	211.9	3.579
34.514	59.86	59.91	0.90	4.84	1.51	117.7	2.044	0.000	2.044	19.1	13.4	5.0E-04	41.7	36.0	-9999.0	-9999.0	213.4	3.562
34.580	63.69	63.75	0.98	4.72	1.54	117.7	2.048	0.000	2.048	20.3	14.2	5.0E-04	43.5	36.0	-9999.0	-9999.0	220.5	3.460
34.645	65.35	65.40	1.05	4.90	1.61	117.7	2.052	0.000	2.052	20.9	14.6	5.0E-04	44.2	36.0	-9999.0	-9999.0	223.6	3.419
34.711	61.65	61.70	1.11	4.86	1.80	117.7	2.056	0.000	2.056	19.7	13.7	5.0E-04	42.5	36.0	-9999.0	-9999.0	217.2	3.519
34.776	58.26	58.31	1.10	4.70	1.89	117.7	2.060	0.000	2.060	18.6	13.0	5.0E-04	40.8	36.0	-9999.0	-9999.0	211.0	3.618
34.842	55.13	55.19	1.16	4.98	2.11	117.7	2.063	0.000	2.063	17.6	12.3	5.0E-04	39.2	34.0	-9999.0	-9999.0	205.0	3.714
34.908	52.83	52.89	1.20	5.27	2.27	114.6	2.067	0.000	2.067	20.3	14.1	5.0E-05	38.0	34.0	3.388	9.8	200.4	3.790
34.973	52.39	52.45	1.22	5.85	2.33	114.6	2.071	0.000	2.071	20.1	14.0	5.0E-05	37.7	34.0	3.359	9.7	199.6	3.806
35.039	54.36	54.45	1.26	8.08	2.32	114.6	2.075	0.001	2.074	20.9	14.5	5.0E-05	38.8	34.0	3.492	10.0	203.9	3.744
35.105	60.44	60.51	1.28	6.62	2.12	117.7	2.079	0.003	2.075	19.3	13.4	5.0E-04	41.8	36.0	-9999.0	-9999.0	215.7	3.565
35.170	63.69	63.76	1.32	6.24	2.08	117.7	2.082	0.005	2.077	20.4	14.1	5.0E-04	43.3	36.0	-9999.0	-9999.0	221.8	3.478
35.236	66.05	66.12	1.37	6.40	2.08	117.7	2.086	0.007	2.079	21.1	14.6	5.0E-04	44.3	36.0	-9999.0	-9999.0	226.0	3.418
35.301	66.24	66.31	1.34	6.48	2.03	117.7	2.090	0.009	2.081	21.2	14.7	5.0E-04	44.4	36.0	-9999.0	-9999.0	226.4	3.415
35.367	66.63	66.71	1.33	6.95	2.00	117.7	2.094	0.011	2.083	21.3	14.8	5.0E-04	44.5	36.0	-9999.0	-9999.0	227.2	3.406
35.433	68.87	68.95	1.31	7.50	1.90	117.7	2.098	0.014	2.084	22.0	15.2	5.0E-04	45.5	36.0	-9999.0	-9999.0	231.1	3.352
35.498	73.91	74.00	1.29	7.96	1.75	117.7	2.102	0.016	2.086	23.6	16.4	5.0E-04	47.5	36.0	-9999.0	-9999.0	239.6	3.238
35.564	77.11	77.19	1.25	7.74	1.62	117.7	2.106	0.018	2.088	24.6	17.1	5.0E-04	48.7	38.0	-9999.0	-9999.0	244.9	3.172
35.629	77.30	77.38	1.25	7.23	1.62	117.7	2.109	0.020	2.090	24.7	17.1	5.0E-04	48.7	38.0	-9999.0	-9999.0	245.2	3.169
35.695	73.47	73.54	1.28	6.77	1.74	117.7	2.113	0.022	2.092	23.5	16.2	5.0E-04	47.3	36.0	-9999.0	-9999.0	239.1	3.252
35.761	69.12	69.19	1.33	6.52	1.93	117.7	2.117	0.024	2.093	22.1	15.3	5.0E-04	45.5	36.0	-9999.0	-9999.0	231.9	3.352
35.826	65.99	66.06	1.37	6.70	2.08	117.7	2.121	0.026	2.095	21.1	14.6	5.0E-04	44.2	36.0	-9999.0	-9999.0	226.6	3.430
35.892	65.03	65.11	1.35	7.87	2.08	117.7	2.125	0.028	2.097	20.8	14.4	5.0E-04	43.7	36.0	-9999.0	-9999.0	225.0	3.456
35.958	63.30	63.40	1.34	8.83	2.12	117.7	2.129	0.030	2.099	20.2	14.0	5.0E-04	43.0	36.0	-9999.0	-9999.0	222.0	3.502
36.023	61.39	61.49	1.32	9.09	2.15	117.7	2.133	0.032	2.101	19.6	13.5	5.0E-04	42.1	36.0	-9999.0	-9999.0	218.6	3.555
36.089	60.37	60.47	1.30	9.30	2.16	117.7	2.137	0.034	2.103	19.3	13.3	5.0E-04	41.6	36.0	-9999.0	-9999.0	216.7	3.584
36.154	59.80	59.90	1.27	9.52	2.13	117.7	2.140	0.036	2.104	19.1	13.2	5.0E-04	41.3	36.0	-9999.0	-9999.0	215.7	3.602
36.220	58.96	59.07	1.25	9.58	2.12	117.7	2.144	0.038	2.106	18.9	13.0	5.0E-04	40.9	36.0	-9999.0	-9999.0	214.2	3.627
36.286	58.32	58.43	1.24	9.83	2.13	117.7	2.148	0.040	2.108	18.7	12.8	5.0E-04	40.6	36.0	-9999.0	-9999.0	213.1	3.646
36.351	60.95	61.06	1.24	10.49	2.04	117.7	2.152	0.042	2.110	19.5	13.4	5.0E-04	41.8	36.0	-9999.0	-9999.0	218.1	3.572
36.417	64.21	64.32	1.26	10.98	1.96	117.7	2.156	0.044	2.112	20.5	14.1	5.0E-04	43.3	36.0	-9999.0	-9999.0	224.2	3.486
36.482	61.20	61.32	1.29	11.10	2.11	117.7	2.160	0.046	2.113	19.6	13.5	5.0E-04	41.9	36.0	-9999.0	-9999.0	218.8	3.568
36.548	58.26	58.38	1.34	10.88	2.30	114.6	2.164	0.048	2.115	22.4	15.4	5.0E-05	40.5	36.0	3.748	10.0	213.2	3.653
36.614	57.30	57.41	1.38	10.69	2.41	114.6	2.167	0.050	2.117	22.0	15.1	5.0E-05	40.0	34.0	3.683	10.0	211.4	3.682
36.679	58.13	58.25	1.41	11.18	2.43	114.6	2.171	0.052	2.119	22.3	15.3	5.0E-05	40.4	36.0	3.739	10.0	213.1	3.659
36.745	62.60	62.72	1.43	11.18	2.29	114.6	2.175	0.054	2.120	24.0	16.5	5.0E-05	42.5	36.0	4.037	10.0	221.6	3.534
36.811	73.59	73.71	1.49	10.90	2.03	117.7	2.179	0.057	2.122	23.5	16.2	5.0E-04	47.1	36.0	-9999.0	-9999.0	240.8	3.267

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
36.876	87.52	87.64	1.64	10.53	1.88	117.7	2.182	0.059	2.124	28.0	19.2	5.0E-04	52.1	38.0	-9999.0	-9999.0	262.9	3.000
36.942	96.84	96.95	1.83	9.71	1.89	117.7	2.186	0.061	2.126	30.9	21.2	5.0E-04	55.0	38.0	-9999.0	-9999.0	277.1	2.859
37.007	99.72	99.82	2.03	8.87	2.04	117.7	2.190	0.063	2.128	31.9	21.8	5.0E-04	55.8	38.0	-9999.0	-9999.0	281.6	2.821
37.073	97.17	97.25	2.22	7.40	2.28	117.7	2.194	0.065	2.129	31.0	21.3	5.0E-04	55.0	38.0	-9999.0	-9999.0	277.8	2.856
37.139	92.76	92.82	2.25	5.57	2.42	117.7	2.198	0.067	2.131	29.6	20.3	5.0E-04	53.7	38.0	-9999.0	-9999.0	271.1	2.921
37.204	87.26	87.30	2.21	3.60	2.53	117.7	2.202	0.069	2.133	27.9	19.1	5.0E-04	51.9	38.0	-9999.0	-9999.0	262.8	3.010
37.270	80.62	80.63	2.17	1.15	2.69	114.6	2.206	0.071	2.135	30.9	21.1	5.0E-05	49.6	38.0	5.228	10.0	252.5	3.132
37.336	73.72	73.72	2.05	0.08	2.79	114.6	2.209	0.073	2.136	28.2	19.3	5.0E-05	47.0	36.0	4.767	10.0	241.4	3.275
37.401	67.97	67.97	1.91	-0.39	2.82	114.6	2.213	0.075	2.138	26.0	17.8	5.0E-05	44.7	36.0	4.384	10.0	231.8	3.410
37.467	65.03	65.02	1.74	-0.49	2.68	114.6	2.217	0.077	2.140	24.9	17.0	5.0E-05	43.4	36.0	4.187	10.0	226.6	3.485
37.532	69.95	69.97	1.57	1.50	2.25	117.7	2.221	0.079	2.142	22.3	15.3	5.0E-04	45.5	36.0	-9999.0	-9999.0	235.4	3.364
37.598	75.76	75.82	1.50	5.17	1.98	117.7	2.225	0.081	2.143	24.2	16.5	5.0E-04	47.8	36.0	-9999.0	-9999.0	245.2	3.234
37.664	82.41	82.49	1.50	7.17	1.82	117.7	2.228	0.083	2.145	26.3	18.0	5.0E-04	50.2	38.0	-9999.0	-9999.0	255.9	3.103
37.729	84.52	84.60	1.54	8.02	1.82	117.7	2.232	0.085	2.147	27.0	18.4	5.0E-04	50.9	38.0	-9999.0	-9999.0	259.3	3.065
37.795	83.36	83.45	1.57	8.26	1.89	117.7	2.236	0.087	2.149	26.6	18.2	5.0E-04	50.5	38.0	-9999.0	-9999.0	257.6	3.087
37.860	83.17	83.27	1.61	8.87	1.94	117.7	2.240	0.089	2.151	26.6	18.1	5.0E-04	50.4	38.0	-9999.0	-9999.0	257.4	3.092
37.926	86.30	86.41	1.66	9.85	1.93	117.7	2.244	0.091	2.153	27.6	18.8	5.0E-04	51.5	38.0	-9999.0	-9999.0	262.4	3.037
37.992	94.10	94.21	1.67	10.04	1.78	117.7	2.248	0.093	2.154	30.1	20.5	5.0E-04	53.9	38.0	-9999.0	-9999.0	274.4	2.913
38.057	101.96	102.06	1.54	9.95	1.51	120.9	2.252	0.095	2.156	24.4	16.6	5.0E-03	56.2	38.0	-9999.0	-9999.0	286.4	2.807
38.123	101.96	102.06	1.58	9.22	1.55	120.9	2.256	0.098	2.158	24.4	16.6	5.0E-03	56.2	38.0	-9999.0	-9999.0	286.5	2.808
38.189	95.82	95.91	1.66	8.26	1.73	117.7	2.260	0.100	2.160	30.6	20.8	5.0E-04	54.4	38.0	-9999.0	-9999.0	277.3	2.891
38.254	91.09	91.15	1.73	5.51	1.90	117.7	2.263	0.102	2.162	29.1	19.8	5.0E-04	53.0	38.0	-9999.0	-9999.0	270.2	2.964
38.320	90.07	90.11	1.75	3.64	1.95	117.7	2.267	0.104	2.164	28.8	19.6	5.0E-04	52.6	38.0	-9999.0	-9999.0	268.6	2.981
38.385	90.90	90.95	1.69	4.56	1.86	117.7	2.271	0.106	2.165	29.0	19.7	5.0E-04	52.9	38.0	-9999.0	-9999.0	270.0	2.969
38.451	88.80	88.85	1.70	4.78	1.92	117.7	2.275	0.108	2.167	28.4	19.3	5.0E-04	52.2	38.0	-9999.0	-9999.0	266.9	3.004
38.517	82.92	82.98	1.71	5.43	2.07	117.7	2.279	0.110	2.169	26.5	18.0	5.0E-04	50.2	38.0	-9999.0	-9999.0	257.9	3.108
38.582	76.08	76.14	1.74	5.55	2.29	117.7	2.283	0.112	2.171	24.3	16.5	5.0E-04	47.7	36.0	-9999.0	-9999.0	247.0	3.244
38.648	73.27	73.34	1.74	6.40	2.38	117.7	2.287	0.114	2.173	23.4	15.9	5.0E-04	46.6	36.0	-9999.0	-9999.0	242.4	3.306
38.713	72.32	72.41	1.62	8.83	2.24	117.7	2.290	0.116	2.175	23.1	15.7	5.0E-04	46.3	36.0	-9999.0	-9999.0	241.0	3.328
38.779	71.54	71.65	1.47	10.10	2.06	117.7	2.294	0.118	2.176	22.9	15.5	5.0E-04	46.0	36.0	-9999.0	-9999.0	239.8	3.346
38.845	72.25	72.36	1.37	10.53	1.90	117.7	2.298	0.120	2.178	23.1	15.7	5.0E-04	46.2	36.0	-9999.0	-9999.0	241.0	3.331
38.910	74.55	74.66	1.31	10.47	1.76	117.7	2.302	0.122	2.180	23.8	16.1	5.0E-04	47.1	36.0	-9999.0	-9999.0	245.0	3.281
38.976	75.57	75.68	1.26	9.42	1.67	117.7	2.306	0.124	2.182	24.2	16.4	5.0E-04	47.5	36.0	-9999.0	-9999.0	246.7	3.260
39.042	72.32	72.40	1.23	7.48	1.70	117.7	2.310	0.126	2.184	23.1	15.6	5.0E-04	46.2	36.0	-9999.0	-9999.0	241.3	3.334
39.107	66.95	67.03	1.20	7.21	1.79	117.7	2.314	0.128	2.185	21.4	14.5	5.0E-04	44.0	36.0	-9999.0	-9999.0	232.1	3.463
39.173	62.54	62.62	1.15	7.70	1.84	117.7	2.317	0.130	2.187	20.0	13.5	5.0E-04	42.0	36.0	-9999.0	-9999.0	224.1	3.579
39.238	62.09	62.19	1.13	9.20	1.82	117.7	2.321	0.132	2.189	19.9	13.4	5.0E-04	41.8	36.0	-9999.0	-9999.0	223.4	3.592
39.304	62.54	62.65	1.10	10.31	1.76	117.7	2.325	0.134	2.191	20.0	13.5	5.0E-04	42.0	36.0	-9999.0	-9999.0	224.3	3.581
39.370	65.61	65.74	1.08	11.65	1.65	117.7	2.329	0.136	2.193	21.0	14.2	5.0E-04	43.4	36.0	-9999.0	-9999.0	230.1	3.500
39.435	65.86	65.98	1.06	10.71	1.61	117.7	2.333	0.138	2.194	21.1	14.2	5.0E-04	43.5	36.0	-9999.0	-9999.0	230.6	3.495
39.501	64.52	64.62	1.06	9.18	1.64	117.7	2.337	0.141	2.196	20.6	13.9	5.0E-04	42.9	36.0	-9999.0	-9999.0	228.2	3.532
39.566	59.86	59.94	1.07	7.89	1.79	117.7	2.341	0.143	2.198	19.1	12.9	5.0E-04	40.7	34.0	-9999.0	-9999.0	219.4	3.661
39.632	54.68	54.76	1.10	7.44	2.01	117.7	2.345	0.145	2.200	17.5	11.8	5.0E-04	38.1	34.0	-9999.0	-9999.0	209.0	3.817
39.698	50.97	51.07	1.13	8.65	2.22	114.6	2.348	0.147	2.202	19.6	13.2	5.0E-05	36.1	34.0	3.248	8.3	201.1	3.938
39.763	49.51	49.62	1.16	9.81	2.34	114.6	2.352	0.149	2.203	19.0	12.8	5.0E-05	35.2	34.0	3.151	7.9	197.9	3.988
39.829	47.79	47.90	1.18	10.39	2.47	114.6	2.356	0.151	2.205	18.3	12.4	5.0E-05	34.2	34.0	3.036	7.5	194.0	4.049
39.895	46.82	46.94	1.11	10.47	2.37	114.6	2.360	0.153	2.207	18.0	12.1	5.0E-05	33.6	34.0	2.972	7.2	191.7	4.085
39.960	45.87	45.99	1.06	10.63	2.31	114.6	2.363	0.155	2.209	17.6	11.9	5.0E-05	33.0	34.0	2.908	6.9	189.5	4.120
40.026	45.42	45.53	1.04	10.01	2.29	114.6	2.367	0.157	2.210	17.4	11.7	5.0E-05	32.7	32.0	2.877	6.8	-9999.0	-9999.0
40.091	46.25	46.36	0.98	9.89	2.12	114.6	2.371	0.159	2.212	17.8	11.9	5.0E-05	33.2	34.0	2.933	7.0	190.5	4.109
40.157	49.06	49.16	0.92	9.36	1.88	117.7	2.375	0.161	2.214	15.7	10.5	5.0E-04	34.9	34.0	-9999.0	-9999.0	197.2	4.011

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
40.223	51.81	51.90	0.85	8.95	1.64	117.7	2.379	0.163	2.216	16.6	11.1	5.0E-04	36.5	34.0	-9999.0	-9999.0	203.4	3.919
40.288	55.19	55.29	0.82	8.55	1.49	117.7	2.382	0.165	2.217	17.6	11.9	5.0E-04	38.3	34.0	-9999.0	-9999.0	210.8	3.812
40.354	58.96	59.05	0.80	8.20	1.36	117.7	2.386	0.167	2.219	18.9	12.7	5.0E-04	40.1	34.0	-9999.0	-9999.0	218.5	3.700
40.419	61.39	61.47	0.81	7.89	1.32	117.7	2.390	0.169	2.221	19.6	13.2	5.0E-04	41.3	36.0	-9999.0	-9999.0	223.3	3.632
40.485	64.59	64.67	0.76	8.08	1.18	117.7	2.394	0.171	2.223	20.6	13.8	5.0E-04	42.7	36.0	-9999.0	-9999.0	229.4	3.547
40.551	64.65	64.73	0.76	7.74	1.18	117.7	2.398	0.173	2.225	20.7	13.9	5.0E-04	42.7	36.0	-9999.0	-9999.0	229.6	3.547
40.616	66.63	66.72	0.77	7.83	1.16	120.9	2.402	0.175	2.226	16.0	10.7	5.0E-03	43.6	36.0	-9999.0	-9999.0	233.3	3.496
40.682	66.12	66.20	0.76	7.48	1.15	120.9	2.406	0.177	2.228	15.8	10.6	5.0E-03	43.3	36.0	-9999.0	-9999.0	232.4	3.511
40.748	67.39	67.48	0.74	7.81	1.10	120.9	2.410	0.179	2.230	16.2	10.8	5.0E-03	43.9	36.0	-9999.0	-9999.0	234.8	3.480
40.813	64.46	64.53	0.74	7.19	1.15	120.9	2.414	0.182	2.232	15.5	10.3	5.0E-03	42.6	36.0	-9999.0	-9999.0	229.5	3.556
40.879	59.53	59.61	0.78	7.01	1.31	117.7	2.418	0.184	2.234	19.0	12.7	5.0E-04	40.3	34.0	-9999.0	-9999.0	220.2	3.694
40.944	56.28	56.35	0.82	6.56	1.46	117.7	2.422	0.186	2.236	18.0	12.0	5.0E-04	38.7	34.0	-9999.0	-9999.0	213.6	3.792
41.010	56.22	56.29	0.87	6.46	1.55	117.7	2.425	0.188	2.238	18.0	12.0	5.0E-04	38.6	34.0	-9999.0	-9999.0	213.6	3.795
41.076	55.38	55.45	0.92	6.40	1.66	117.7	2.429	0.190	2.240	17.7	11.8	5.0E-04	38.2	34.0	-9999.0	-9999.0	211.9	3.821
41.141	53.98	54.05	0.98	6.36	1.82	117.7	2.433	0.192	2.241	17.3	11.5	5.0E-04	37.5	34.0	-9999.0	-9999.0	209.0	3.867
41.207	50.97	51.05	1.06	6.72	2.08	114.6	2.437	0.194	2.243	19.6	13.1	5.0E-05	35.8	34.0	3.241	8.0	202.4	3.966
41.272	49.06	49.14	1.13	7.85	2.30	114.6	2.441	0.196	2.245	18.8	12.6	5.0E-05	34.7	34.0	3.114	7.5	198.1	4.032
41.338	47.47	47.57	1.13	9.34	2.38	114.6	2.444	0.198	2.247	18.2	12.2	5.0E-05	33.8	34.0	3.008	7.1	194.5	4.088
41.404	45.99	46.11	1.13	10.88	2.46	114.6	2.448	0.200	2.248	17.7	11.8	5.0E-05	32.9	32.0	2.911	6.8	191.0	4.142
41.469	45.04	45.18	1.11	12.57	2.46	114.6	2.452	0.202	2.250	17.3	11.5	5.0E-05	32.3	32.0	2.848	6.5	-9999.0	-9999.0
41.535	46.18	46.33	1.10	13.59	2.38	114.6	2.456	0.204	2.252	17.7	11.8	5.0E-05	33.0	32.0	2.925	6.8	191.6	4.136
41.601	47.72	47.79	1.10	7.09	2.31	114.6	2.459	0.206	2.253	18.3	12.2	5.0E-05	33.8	34.0	3.022	7.2	195.2	4.085
41.666	48.55	48.62	1.07	7.11	2.21	114.6	2.463	0.208	2.255	18.6	12.4	5.0E-05	34.3	34.0	3.077	7.3	197.2	4.056
41.732	47.47	47.55	1.03	7.60	2.17	114.6	2.467	0.210	2.257	18.2	12.1	5.0E-05	33.7	34.0	3.005	7.1	194.7	4.095
41.797	44.21	44.29	0.98	7.89	2.22	114.6	2.471	0.212	2.259	17.0	11.3	5.0E-05	31.6	32.0	2.788	6.3	-9999.0	-9999.0
41.863	41.52	41.61	0.97	8.67	2.34	114.6	2.474	0.214	2.260	15.9	10.6	5.0E-05	30.0	32.0	2.609	5.7	-9999.0	-9999.0
41.929	41.14	41.25	0.98	10.12	2.38	114.6	2.478	0.216	2.262	15.8	10.5	5.0E-05	30.0	32.0	2.585	5.6	-9999.0	-9999.0
41.994	41.52	41.66	0.97	12.55	2.33	114.6	2.482	0.218	2.264	16.0	10.6	5.0E-05	30.0	32.0	2.612	5.7	-9999.0	-9999.0
42.060	40.89	41.03	0.95	13.39	2.32	114.6	2.486	0.220	2.265	15.7	10.4	5.0E-05	30.0	32.0	2.570	5.5	-9999.0	-9999.0
42.125	42.29	42.46	0.96	15.09	2.27	114.6	2.490	0.222	2.267	16.3	10.8	5.0E-05	30.4	32.0	2.664	5.8	-9999.0	-9999.0
42.191	46.44	46.61	0.96	15.21	2.06	114.6	2.493	0.225	2.269	17.9	11.9	5.0E-05	33.0	32.0	2.941	6.8	192.8	4.137
42.257	46.18	46.34	0.94	14.41	2.03	114.6	2.497	0.227	2.270	17.8	11.8	5.0E-05	32.9	32.0	2.923	6.7	192.2	4.148
42.322	41.65	41.79	0.97	12.98	2.33	114.6	2.501	0.229	2.272	16.0	10.6	5.0E-05	30.0	32.0	2.619	5.7	-9999.0	-9999.0
42.388	37.82	37.96	1.01	12.92	2.67	114.6	2.505	0.231	2.274	14.5	9.6	5.0E-05	30.0	32.0	2.364	4.8	-9999.0	-9999.0
42.454	35.39	35.54	1.02	14.14	2.88	114.6	2.508	0.233	2.276	13.6	9.0	5.0E-05	30.0	32.0	2.202	4.3	-9999.0	-9999.0
42.519	34.75	34.93	0.98	16.69	2.81	114.6	2.512	0.235	2.277	13.4	8.9	5.0E-05	30.0	32.0	2.161	4.2	-9999.0	-9999.0
42.585	34.94	35.12	0.91	16.27	2.60	114.6	2.516	0.237	2.279	13.5	8.9	5.0E-05	30.0	32.0	2.174	4.2	-9999.0	-9999.0
42.650	36.48	36.64	0.85	14.58	2.33	114.6	2.520	0.239	2.281	14.0	9.3	5.0E-05	30.0	32.0	2.274	4.5	-9999.0	-9999.0
42.716	39.67	39.80	0.79	12.31	1.99	114.6	2.523	0.241	2.282	15.2	10.1	5.0E-05	30.0	32.0	2.485	5.2	-9999.0	-9999.0
42.782	39.67	39.78	0.74	10.18	1.86	114.6	2.527	0.243	2.284	15.2	10.1	5.0E-05	30.0	32.0	2.483	5.2	-9999.0	-9999.0
42.847	37.43	37.52	0.69	8.55	1.84	114.6	2.531	0.245	2.286	14.4	9.5	5.0E-05	30.0	32.0	2.333	4.7	-9999.0	-9999.0
42.913	35.65	35.73	0.63	7.85	1.77	114.6	2.535	0.247	2.288	13.7	9.1	5.0E-05	30.0	32.0	2.213	4.3	-9999.0	-9999.0
42.978	31.50	31.58	0.57	7.72	1.81	114.6	2.538	0.249	2.289	12.1	8.0	5.0E-05	30.0	30.0	1.936	3.6	-9999.0	-9999.0
43.044	28.94	29.02	0.52	7.29	1.80	114.6	2.542	0.251	2.291	11.1	7.3	5.0E-05	30.0	30.0	1.765	3.1	-9999.0	-9999.0
43.110	26.96	27.03	0.47	7.27	1.74	114.6	2.546	0.253	2.293	10.4	6.8	5.0E-05	30.0	30.0	1.633	2.8	-9999.0	-9999.0
43.175	25.68	25.76	0.42	7.11	1.63	114.6	2.550	0.255	2.294	9.9	6.5	5.0E-05	30.0	30.0	1.547	2.6	-9999.0	-9999.0
43.241	25.81	25.89	0.37	7.19	1.43	114.6	2.553	0.257	2.296	9.9	6.5	5.0E-05	30.0	30.0	1.556	2.6	-9999.0	-9999.0
43.307	24.34	24.42	0.34	7.15	1.40	114.6	2.557	0.259	2.298	9.4	6.2	5.0E-05	30.0	30.0	1.457	2.4	-9999.0	-9999.0
43.372	24.47	24.55	0.32	7.09	1.31	114.6	2.561	0.261	2.300	9.4	6.2	5.0E-05	30.0	30.0	1.466	2.4	-9999.0	-9999.0
43.438	25.04	25.12	0.31	7.17	1.24	114.6	2.565	0.263	2.301	9.6	6.3	5.0E-05	30.0	30.0	1.504	2.5	-9999.0	-9999.0
43.503	26.84	26.91	0.31	7.15	1.15	117.7	2.569	0.266	2.303	8.6	5.7	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
43.569	30.15	30.23	0.31	7.23	1.03	117.7	2.572	0.268	2.305	9.7	6.4	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
43.635	33.15	33.23	0.31	7.09	0.94	117.7	2.576	0.270	2.307	10.6	7.0	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
43.700	34.49	34.57	0.30	7.23	0.87	117.7	2.580	0.272	2.308	11.0	7.3	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
43.766	33.03	33.11	0.30	7.07	0.91	117.7	2.584	0.274	2.310	10.6	7.0	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
43.831	33.41	33.49	0.32	7.17	0.96	117.7	2.588	0.276	2.312	10.7	7.0	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
43.897	34.05	34.13	0.32	7.05	0.94	117.7	2.592	0.278	2.314	10.9	7.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
43.963	31.50	31.57	0.35	7.09	1.11	117.7	2.596	0.280	2.316	10.1	6.6	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
44.028	29.83	29.91	0.35	7.11	1.17	117.7	2.599	0.282	2.318	9.5	6.3	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
44.094	26.96	27.03	0.36	6.97	1.34	114.6	2.603	0.284	2.319	10.4	6.8	5.0E-05	30.0	30.0	1.628	2.7	-9999.0	-9999.0
44.160	25.42	25.50	0.37	7.27	1.45	114.6	2.607	0.286	2.321	9.8	6.4	5.0E-05	30.0	30.0	1.526	2.5	-9999.0	-9999.0
44.225	23.45	23.52	0.36	7.11	1.53	114.6	2.611	0.288	2.323	9.0	5.9	5.0E-05	30.0	30.0	1.394	2.2	-9999.0	-9999.0
44.291	23.64	23.72	0.36	7.44	1.52	114.6	2.615	0.290	2.324	9.1	6.0	5.0E-05	30.0	30.0	1.407	2.2	-9999.0	-9999.0
44.356	23.32	23.40	0.35	7.42	1.50	114.6	2.618	0.292	2.326	9.0	5.9	5.0E-05	30.0	30.0	1.385	2.2	-9999.0	-9999.0
44.422	25.04	25.12	0.33	7.33	1.32	114.6	2.622	0.294	2.328	9.6	6.3	5.0E-05	30.0	30.0	1.500	2.4	-9999.0	-9999.0
44.488	26.12	26.21	0.26	7.66	0.99	117.7	2.626	0.296	2.330	8.4	5.5	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
44.553	28.49	28.57	0.28	7.58	0.98	117.7	2.630	0.298	2.331	9.1	6.0	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
44.619	30.72	30.81	0.31	7.66	1.01	117.7	2.634	0.300	2.333	9.8	6.4	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
44.684	32.58	32.66	0.32	7.64	0.98	117.7	2.637	0.302	2.335	10.4	6.8	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
44.750	33.92	34.00	0.35	7.31	1.03	117.7	2.641	0.304	2.337	10.9	7.1	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
44.816	36.03	36.11	0.37	7.91	1.03	117.7	2.645	0.306	2.339	11.5	7.5	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
44.881	37.75	37.84	0.38	8.32	1.01	117.7	2.649	0.309	2.341	12.1	7.9	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
44.947	38.39	38.48	0.41	8.16	1.07	117.7	2.653	0.311	2.342	12.3	8.0	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
45.013	36.73	36.82	0.45	8.32	1.23	117.7	2.657	0.313	2.344	11.8	7.7	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
45.078	35.39	35.47	0.46	8.04	1.30	117.7	2.661	0.315	2.346	11.3	7.4	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
45.144	33.28	33.37	0.46	8.20	1.38	117.7	2.664	0.317	2.348	10.7	7.0	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
45.209	30.66	30.75	0.46	8.32	1.50	114.6	2.668	0.319	2.350	11.8	7.7	5.0E-05	30.0	30.0	1.872	3.3	-9999.0	-9999.0
45.275	29.96	30.05	0.46	8.24	1.53	114.6	2.672	0.321	2.351	11.5	7.5	5.0E-05	30.0	30.0	1.825	3.1	-9999.0	-9999.0
45.341	28.05	28.14	0.46	8.42	1.64	114.6	2.676	0.323	2.353	10.8	7.0	5.0E-05	30.0	30.0	1.698	2.8	-9999.0	-9999.0
45.406	28.30	28.39	0.45	8.48	1.59	114.6	2.680	0.325	2.355	10.9	7.1	5.0E-05	30.0	30.0	1.714	2.9	-9999.0	-9999.0
45.472	27.41	27.50	0.45	8.59	1.64	114.6	2.683	0.327	2.356	10.5	6.9	5.0E-05	30.0	30.0	1.654	2.7	-9999.0	-9999.0
45.538	27.28	27.37	0.46	8.32	1.69	114.6	2.687	0.329	2.358	10.5	6.8	5.0E-05	30.0	30.0	1.645	2.7	-9999.0	-9999.0
45.603	28.43	28.52	0.45	8.38	1.58	114.6	2.691	0.331	2.360	10.9	7.1	5.0E-05	30.0	30.0	1.722	2.9	-9999.0	-9999.0
45.669	28.81	28.90	0.43	8.57	1.49	114.6	2.695	0.333	2.362	11.1	7.2	5.0E-05	30.0	30.0	1.747	2.9	-9999.0	-9999.0
45.734	29.45	29.54	0.41	8.16	1.39	114.6	2.698	0.335	2.363	11.3	7.4	5.0E-05	30.0	30.0	1.789	3.0	-9999.0	-9999.0
45.800	29.77	29.86	0.41	8.12	1.38	114.6	2.702	0.337	2.365	11.4	7.4	5.0E-05	30.0	30.0	1.811	3.1	-9999.0	-9999.0
45.866	28.68	28.77	0.42	8.36	1.46	114.6	2.706	0.339	2.367	11.0	7.2	5.0E-05	30.0	30.0	1.738	2.9	-9999.0	-9999.0
45.931	27.54	27.63	0.43	8.32	1.56	114.6	2.710	0.341	2.368	10.6	6.9	5.0E-05	30.0	30.0	1.661	2.7	-9999.0	-9999.0
45.997	25.61	25.70	0.44	8.26	1.72	114.6	2.713	0.343	2.370	9.8	6.4	5.0E-05	30.0	30.0	1.533	2.4	-9999.0	-9999.0
46.062	24.79	24.88	0.44	8.38	1.77	114.6	2.717	0.345	2.372	9.5	6.2	5.0E-05	30.0	30.0	1.478	2.3	-9999.0	-9999.0
46.128	24.28	24.37	0.44	8.42	1.81	114.6	2.721	0.347	2.373	9.3	6.1	5.0E-05	30.0	30.0	1.443	2.2	-9999.0	-9999.0
46.194	24.53	24.62	0.44	8.75	1.79	114.6	2.725	0.349	2.375	9.4	6.1	5.0E-05	30.0	30.0	1.460	2.3	-9999.0	-9999.0
46.259	25.04	25.14	0.44	9.20	1.75	114.6	2.728	0.352	2.377	9.6	6.2	5.0E-05	30.0	30.0	1.494	2.3	-9999.0	-9999.0
46.325	25.10	25.20	0.44	9.52	1.75	114.6	2.732	0.354	2.379	9.7	6.3	5.0E-05	30.0	30.0	1.498	2.3	-9999.0	-9999.0
46.391	24.34	24.44	0.43	9.12	1.76	114.6	2.736	0.356	2.380	9.4	6.1	5.0E-05	30.0	30.0	1.447	2.2	-9999.0	-9999.0
46.456	22.94	23.03	0.41	8.75	1.78	114.6	2.740	0.358	2.382	8.8	5.7	5.0E-05	30.0	30.0	1.353	2.0	-9999.0	-9999.0
46.522	22.94	23.03	0.38	8.36	1.65	114.6	2.743	0.360	2.384	8.8	5.7	5.0E-05	30.0	30.0	1.352	2.0	-9999.0	-9999.0
46.587	22.35	22.45	0.35	8.57	1.56	114.6	2.747	0.362	2.385	8.6	5.6	5.0E-05	30.0	30.0	1.313	2.0	-9999.0	-9999.0
46.653	22.10	22.20	0.34	8.73	1.54	114.6	2.751	0.364	2.387	8.5	5.5	5.0E-05	30.0	30.0	1.296	1.9	-9999.0	-9999.0
46.719	22.75	22.84	0.32	8.87	1.40	114.6	2.755	0.366	2.389	8.7	5.7	5.0E-05	30.0	30.0	1.339	2.0	-9999.0	-9999.0
46.784	24.02	24.11	0.32	8.83	1.33	114.6	2.759	0.368	2.391	9.2	6.0	5.0E-05	30.0	30.0	1.424	2.2	-9999.0	-9999.0
46.850	25.10	25.19	0.33	8.65	1.31	114.6	2.762	0.370	2.392	9.7	6.2	5.0E-05	30.0	30.0	1.495	2.3	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
46.915	26.00	26.10	0.34	8.71	1.31	114.6	2.766	0.372	2.394	10.0	6.5	5.0E-05	30.0	30.0	1.555	2.4	-9999.0	-9999.0
46.981	27.54	27.63	0.34	8.67	1.23	117.7	2.770	0.374	2.396	8.8	5.7	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
47.047	29.96	30.06	0.35	8.73	1.17	117.7	2.774	0.376	2.398	9.6	6.2	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
47.112	32.39	32.48	0.36	8.85	1.11	117.7	2.778	0.378	2.399	10.4	6.7	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
47.178	35.97	36.06	0.38	8.93	1.06	117.7	2.781	0.380	2.401	11.5	7.4	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
47.244	39.74	39.83	0.40	8.83	1.01	117.7	2.785	0.382	2.403	12.7	8.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
47.309	41.90	42.00	0.44	8.75	1.05	117.7	2.789	0.384	2.405	13.4	8.6	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
47.375	41.65	41.75	0.47	8.77	1.13	117.7	2.793	0.386	2.407	13.3	8.6	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
47.440	43.24	43.34	0.50	8.97	1.16	117.7	2.797	0.388	2.408	13.8	8.9	5.0E-04	30.1	32.0	-9999.0	-9999.0	-9999.0	-9999.0
47.506	43.12	43.22	0.53	8.93	1.23	117.7	2.801	0.390	2.410	13.8	8.9	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
47.572	42.67	42.77	0.54	9.18	1.27	117.7	2.805	0.393	2.412	13.7	8.8	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
47.637	43.24	43.34	0.58	9.24	1.34	117.7	2.808	0.395	2.414	13.8	8.9	5.0E-04	30.1	32.0	-9999.0	-9999.0	-9999.0	-9999.0
47.703	42.86	42.96	0.61	9.05	1.42	117.7	2.812	0.397	2.416	13.7	8.8	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
47.768	42.54	42.64	0.64	9.14	1.50	117.7	2.816	0.399	2.418	13.6	8.8	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
47.834	42.61	42.72	0.49	9.44	1.15	117.7	2.820	0.401	2.419	13.6	8.8	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
47.900	42.03	42.13	0.51	9.28	1.21	117.7	2.824	0.403	2.421	13.4	8.6	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
47.965	41.01	41.11	0.53	9.26	1.29	117.7	2.828	0.405	2.423	13.1	8.4	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
48.031	40.63	40.73	0.54	9.50	1.33	117.7	2.832	0.407	2.425	13.0	8.4	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
48.097	40.25	40.35	0.54	9.42	1.34	117.7	2.836	0.409	2.427	12.9	8.3	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
48.162	36.80	36.89	0.53	8.53	1.44	117.7	2.839	0.411	2.428	11.8	7.6	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
48.228	34.87	34.97	0.52	8.73	1.49	117.7	2.843	0.413	2.430	11.2	7.2	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
48.293	33.03	33.13	0.48	8.81	1.45	117.7	2.847	0.415	2.432	10.6	6.8	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
48.359	30.85	30.95	0.47	8.95	1.52	114.6	2.851	0.417	2.434	11.9	7.6	5.0E-05	30.0	30.0	1.873	3.1	-9999.0	-9999.0
48.425	27.66	27.76	0.48	9.20	1.73	114.6	2.855	0.419	2.436	10.6	6.8	5.0E-05	30.0	30.0	1.660	2.6	-9999.0	-9999.0
48.490	25.49	25.59	0.47	9.14	1.84	114.6	2.858	0.421	2.437	9.8	6.3	5.0E-05	30.0	30.0	1.515	2.3	-9999.0	-9999.0
48.556	22.68	22.78	0.47	9.48	2.07	114.6	2.862	0.423	2.439	8.7	5.6	5.0E-05	30.0	30.0	1.328	1.9	-9999.0	-9999.0
48.621	20.76	20.86	0.46	9.68	2.21	114.6	2.866	0.425	2.441	8.0	5.1	5.0E-05	30.0	30.0	1.200	1.7	-9999.0	-9999.0
48.687	20.00	20.11	0.46	10.26	2.29	114.6	2.870	0.427	2.442	9.6	6.2	5.0E-06	-9999.0	-9999.0	1.149	1.6	-9999.0	-9999.0
48.753	18.59	18.71	0.47	11.32	2.52	114.6	2.873	0.429	2.444	9.0	5.7	5.0E-06	-9999.0	-9999.0	1.056	1.5	-9999.0	-9999.0
48.818	18.46	18.60	0.49	12.84	2.64	114.6	2.877	0.431	2.446	8.9	5.7	5.0E-06	-9999.0	-9999.0	1.048	1.4	-9999.0	-9999.0
48.884	17.50	17.66	0.50	14.82	2.84	114.6	2.881	0.433	2.448	8.5	5.4	5.0E-06	-9999.0	-9999.0	0.985	1.3	-9999.0	-9999.0
48.950	14.95	15.13	0.50	17.07	3.31	114.6	2.885	0.436	2.449	9.7	6.2	5.0E-07	-9999.0	-9999.0	0.816	1.1	-9999.0	-9999.0
49.015	13.29	13.50	0.47	19.12	3.49	114.6	2.889	0.438	2.451	8.6	5.5	5.0E-07	-9999.0	-9999.0	0.707	1.0	-9999.0	-9999.0
49.081	10.61	10.83	0.44	20.52	4.07	111.4	2.892	0.440	2.453	10.4	6.6	5.0E-08	-9999.0	-9999.0	0.529	0.8	-9999.0	-9999.0
49.146	9.77	10.08	0.41	28.45	4.08	111.4	2.896	0.442	2.454	9.7	6.2	5.0E-08	-9999.0	-9999.0	0.479	0.7	-9999.0	-9999.0
49.212	8.69	9.09	0.41	37.31	4.52	111.4	2.900	0.444	2.456	8.7	5.6	5.0E-08	-9999.0	-9999.0	0.413	0.7	-9999.0	-9999.0
49.278	9.39	9.83	0.40	40.16	4.08	111.4	2.903	0.446	2.457	9.4	6.0	5.0E-08	-9999.0	-9999.0	0.462	0.7	-9999.0	-9999.0
49.343	10.54	10.96	0.41	39.66	3.75	111.4	2.907	0.448	2.459	10.5	6.7	5.0E-08	-9999.0	-9999.0	0.537	0.8	-9999.0	-9999.0
49.409	13.48	13.89	0.44	37.39	3.18	114.6	2.911	0.450	2.461	8.9	5.7	5.0E-07	-9999.0	-9999.0	0.732	1.0	-9999.0	-9999.0
49.474	16.67	16.96	0.47	26.41	2.78	114.6	2.914	0.452	2.462	8.1	5.2	5.0E-06	-9999.0	-9999.0	0.936	1.3	-9999.0	-9999.0
49.540	16.55	16.77	0.49	20.48	2.93	114.6	2.918	0.454	2.464	8.0	5.1	5.0E-06	-9999.0	-9999.0	0.924	1.2	-9999.0	-9999.0
49.606	15.33	15.52	0.50	17.68	3.23	114.6	2.922	0.456	2.466	7.4	4.7	5.0E-06	-9999.0	-9999.0	0.840	1.1	-9999.0	-9999.0
49.671	13.60	13.78	0.49	16.53	3.56	114.6	2.926	0.458	2.468	8.8	5.6	5.0E-07	-9999.0	-9999.0	0.724	1.0	-9999.0	-9999.0
49.737	11.82	12.00	0.48	16.95	4.01	111.4	2.929	0.460	2.469	11.5	7.3	5.0E-08	-9999.0	-9999.0	0.605	0.8	-9999.0	-9999.0
49.803	10.09	10.34	0.48	23.15	4.65	111.4	2.933	0.462	2.471	9.9	6.3	5.0E-08	-9999.0	-9999.0	0.494	0.7	-9999.0	-9999.0
49.868	9.64	9.98	0.46	31.07	4.62	111.4	2.937	0.464	2.472	9.6	6.1	5.0E-08	-9999.0	-9999.0	0.469	0.7	-9999.0	-9999.0
49.934	11.18	11.57	0.46	35.97	3.99	111.4	2.940	0.466	2.474	11.1	7.0	5.0E-08	-9999.0	-9999.0	0.575	0.8	-9999.0	-9999.0
49.999	13.73	14.11	0.46	34.50	3.27	114.6	2.944	0.468	2.476	9.0	5.7	5.0E-07	-9999.0	-9999.0	0.744	1.0	-9999.0	-9999.0
50.065	16.04	16.31	0.46	25.40	2.83	114.6	2.948	0.470	2.477	7.8	5.0	5.0E-06	-9999.0	-9999.0	0.891	1.2	-9999.0	-9999.0
50.131	18.14	18.36	0.46	20.19	2.51	114.6	2.951	0.472	2.479	8.8	5.6	5.0E-06	-9999.0	-9999.0	1.027	1.4	-9999.0	-9999.0
50.196	19.49	19.68	0.44	18.11	2.24	114.6	2.955	0.474	2.481	9.4	6.0	5.0E-06	-9999.0	-9999.0	1.115	1.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
50.262	20.32	20.51	0.41	17.23	2.00	114.6	2.959	0.477	2.482	7.9	5.0	5.0E-05	30.0	30.0	1.170	1.6	-9999.0	-9999.0
50.327	20.82	21.00	0.40	16.37	1.91	114.6	2.963	0.479	2.484	8.0	5.1	5.0E-05	30.0	30.0	1.202	1.7	-9999.0	-9999.0
50.393	21.27	21.44	0.40	15.15	1.87	114.6	2.967	0.481	2.486	8.2	5.2	5.0E-05	30.0	30.0	1.231	1.7	-9999.0	-9999.0
50.459	21.91	22.07	0.40	14.30	1.82	114.6	2.970	0.483	2.488	8.5	5.4	5.0E-05	30.0	30.0	1.273	1.8	-9999.0	-9999.0
50.524	20.51	20.66	0.39	13.96	1.89	114.6	2.974	0.485	2.489	7.9	5.0	5.0E-05	30.0	30.0	1.179	1.6	-9999.0	-9999.0
50.590	18.46	18.61	0.40	13.53	2.15	114.6	2.978	0.487	2.491	8.9	5.6	5.0E-06	-9999.0	-9999.0	1.042	1.4	-9999.0	-9999.0
50.656	18.72	18.86	0.41	13.63	2.18	114.6	2.982	0.489	2.493	9.0	5.7	5.0E-06	-9999.0	-9999.0	1.059	1.4	-9999.0	-9999.0
50.721	17.76	17.92	0.41	14.32	2.29	114.6	2.985	0.491	2.494	8.6	5.4	5.0E-06	-9999.0	-9999.0	0.995	1.3	-9999.0	-9999.0
50.787	16.99	17.16	0.42	15.60	2.45	114.6	2.989	0.493	2.496	8.2	5.2	5.0E-06	-9999.0	-9999.0	0.945	1.3	-9999.0	-9999.0
50.852	15.53	15.72	0.42	17.95	2.68	114.6	2.993	0.495	2.498	7.5	4.8	5.0E-06	-9999.0	-9999.0	0.849	1.1	-9999.0	-9999.0
50.918	13.73	13.94	0.40	19.22	2.88	114.6	2.997	0.497	2.500	6.7	4.2	5.0E-06	-9999.0	-9999.0	0.730	1.0	-9999.0	-9999.0
50.984	11.69	11.94	0.38	23.32	3.19	114.6	3.000	0.499	2.501	7.6	4.8	5.0E-07	-9999.0	-9999.0	0.596	0.8	-9999.0	-9999.0
51.049	10.28	10.59	0.37	28.23	3.50	114.6	3.004	0.501	2.503	6.8	4.3	5.0E-07	-9999.0	-9999.0	0.506	0.7	-9999.0	-9999.0
51.115	8.30	8.65	0.33	32.67	3.82	111.4	3.008	0.503	2.505	8.3	5.2	5.0E-08	-9999.0	-9999.0	0.376	0.6	-9999.0	-9999.0
51.180	7.99	8.41	0.33	38.79	3.93	111.4	3.011	0.505	2.506	8.1	5.1	5.0E-08	-9999.0	-9999.0	0.360	0.6	-9999.0	-9999.0
51.246	6.46	6.94	0.30	44.66	4.33	111.4	3.015	0.507	2.508	6.6	4.2	5.0E-08	-9999.0	-9999.0	0.262	0.5	-9999.0	-9999.0
51.312	5.75	6.26	0.28	46.75	4.48	111.4	3.019	0.509	2.509	6.0	3.8	5.0E-08	-9999.0	-9999.0	0.216	0.5	-9999.0	-9999.0
51.377	7.35	7.85	0.26	46.48	3.32	111.4	3.022	0.511	2.511	7.5	4.7	5.0E-08	-9999.0	-9999.0	0.322	0.6	-9999.0	-9999.0
51.443	7.16	7.64	0.25	44.46	3.28	111.4	3.026	0.513	2.513	7.3	4.6	5.0E-08	-9999.0	-9999.0	0.307	0.6	-9999.0	-9999.0
51.509	7.28	7.51	0.22	21.05	2.94	114.6	3.030	0.515	2.514	4.8	3.0	5.0E-07	-9999.0	-9999.0	0.298	0.6	-9999.0	-9999.0
51.574	7.16	7.53	0.19	34.38	2.53	114.6	3.034	0.517	2.516	4.8	3.0	5.0E-07	-9999.0	-9999.0	0.300	0.6	-9999.0	-9999.0
51.640	7.16	7.60	0.16	41.31	2.11	114.6	3.037	0.520	2.518	4.9	3.1	5.0E-07	-9999.0	-9999.0	0.304	0.6	-9999.0	-9999.0
51.705	5.81	6.28	0.15	42.90	2.40	114.6	3.041	0.522	2.519	4.0	2.5	5.0E-07	-9999.0	-9999.0	0.216	0.5	-9999.0	-9999.0
51.771	5.94	6.41	0.13	42.98	2.03	114.6	3.045	0.524	2.521	4.1	2.6	5.0E-07	-9999.0	-9999.0	0.224	0.5	-9999.0	-9999.0
51.837	5.17	5.65	0.11	44.36	1.95	114.6	3.049	0.526	2.523	3.6	2.3	5.0E-07	-9999.0	-9999.0	0.174	0.5	-9999.0	-9999.0
51.902	4.47	4.97	0.10	46.50	2.02	114.6	3.052	0.528	2.525	3.2	2.0	5.0E-07	-9999.0	-9999.0	0.128	0.5	-9999.0	-9999.0
51.968	5.68	6.20	0.07	47.95	1.13	111.4	3.056	0.530	2.526	3.0	1.9	1.0E-07	-9999.0	-9999.0	0.210	0.5	-9999.0	-9999.0
52.033	5.75	6.29	0.05	49.63	0.80	111.4	3.060	0.532	2.528	3.0	1.9	1.0E-07	-9999.0	-9999.0	0.215	0.5	-9999.0	-9999.0
52.099	5.55	6.08	0.06	49.16	0.99	111.4	3.063	0.534	2.529	2.9	1.8	1.0E-07	-9999.0	-9999.0	0.201	0.5	-9999.0	-9999.0
52.165	6.00	6.51	0.05	46.87	0.77	111.4	3.067	0.536	2.531	3.1	2.0	1.0E-07	-9999.0	-9999.0	0.230	0.5	-9999.0	-9999.0
52.230	5.30	5.78	0.05	44.11	0.87	111.4	3.071	0.538	2.533	2.8	1.7	1.0E-07	-9999.0	-9999.0	0.181	0.5	-9999.0	-9999.0
52.296	4.53	5.04	0.05	47.54	0.99	111.4	3.074	0.540	2.534	2.4	1.5	1.0E-07	-9999.0	-9999.0	0.131	0.5	-9999.0	-9999.0
52.362	5.04	5.56	0.05	48.14	0.90	111.4	3.078	0.542	2.536	2.7	1.7	1.0E-07	-9999.0	-9999.0	0.166	0.5	-9999.0	-9999.0
52.427	5.36	5.89	0.05	48.47	0.85	111.4	3.082	0.544	2.538	2.8	1.8	1.0E-07	-9999.0	-9999.0	0.187	0.5	-9999.0	-9999.0
52.493	5.17	5.70	0.05	48.59	0.88	111.4	3.085	0.546	2.539	2.7	1.7	1.0E-07	-9999.0	-9999.0	0.174	0.5	-9999.0	-9999.0
52.558	5.94	6.47	0.05	48.75	0.77	111.4	3.089	0.548	2.541	3.1	1.9	1.0E-07	-9999.0	-9999.0	0.225	0.5	-9999.0	-9999.0
52.624	6.78	7.27	0.06	45.25	0.83	111.4	3.093	0.550	2.542	3.5	2.2	1.0E-07	-9999.0	-9999.0	0.278	0.6	-9999.0	-9999.0
52.690	6.52	7.00	0.06	44.62	0.86	111.4	3.096	0.552	2.544	3.4	2.1	1.0E-07	-9999.0	-9999.0	0.260	0.5	-9999.0	-9999.0
52.755	6.97	7.45	0.06	44.80	0.81	111.4	3.100	0.554	2.546	3.6	2.2	1.0E-07	-9999.0	-9999.0	0.290	0.6	-9999.0	-9999.0
52.821	6.33	6.82	0.07	45.93	1.03	111.4	3.104	0.556	2.547	3.3	2.0	1.0E-07	-9999.0	-9999.0	0.248	0.5	-9999.0	-9999.0
52.886	5.17	5.68	0.07	47.38	1.23	111.4	3.107	0.558	2.549	2.7	1.7	1.0E-07	-9999.0	-9999.0	0.172	0.5	-9999.0	-9999.0
52.952	5.30	5.83	0.07	48.63	1.20	111.4	3.111	0.561	2.550	2.8	1.7	1.0E-07	-9999.0	-9999.0	0.181	0.5	-9999.0	-9999.0
53.018	4.34	4.88	0.06	50.15	1.23	111.4	3.115	0.563	2.552	2.3	1.5	1.0E-07	-9999.0	-9999.0	0.118	0.5	-9999.0	-9999.0
53.083	4.66	5.20	0.05	50.27	0.96	111.4	3.118	0.565	2.554	2.5	1.6	1.0E-07	-9999.0	-9999.0	0.139	0.5	-9999.0	-9999.0
53.149	5.43	5.98	0.04	50.27	0.67	111.4	3.122	0.567	2.555	2.9	1.8	1.0E-07	-9999.0	-9999.0	0.190	0.5	-9999.0	-9999.0
53.215	4.85	5.40	0.03	50.65	0.56	111.4	3.126	0.569	2.557	2.6	1.6	1.0E-07	-9999.0	-9999.0	0.152	0.5	-9999.0	-9999.0
53.280	5.36	5.92	0.04	51.20	0.68	111.4	3.129	0.571	2.558	2.8	1.8	1.0E-07	-9999.0	-9999.0	0.186	0.5	-9999.0	-9999.0
53.346	5.43	5.98	0.03	50.77	0.50	111.4	3.133	0.573	2.560	2.9	1.8	1.0E-07	-9999.0	-9999.0	0.190	0.5	-9999.0	-9999.0
53.411	6.00	6.54	0.04	49.77	0.61	111.4	3.136	0.575	2.562	3.1	2.0	1.0E-07	-9999.0	-9999.0	0.227	0.5	-9999.0	-9999.0
53.477	5.30	5.83	0.04	48.49	0.69	111.4	3.140	0.577	2.563	2.8	1.7	1.0E-07	-9999.0	-9999.0	0.179	0.5	-9999.0	-9999.0
53.543	4.66	5.20	0.04	49.54	0.77	111.4	3.144	0.579	2.565	2.5	1.6	1.0E-07	-9999.0	-9999.0	0.137	0.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
53.608	3.96	4.52	0.05	51.53	1.11	111.4	3.147	0.581	2.566	2.2	1.4	1.0E-07	-9999.0	-9999.0	0.091	0.5	-9999.0	-9999.0
53.674	4.73	5.30	0.05	53.04	0.94	111.4	3.151	0.583	2.568	2.5	1.6	1.0E-07	-9999.0	-9999.0	0.144	0.5	-9999.0	-9999.0
53.740	3.83	4.42	0.04	54.65	0.91	111.4	3.155	0.585	2.570	2.1	1.3	1.0E-07	-9999.0	-9999.0	0.084	0.5	-9999.0	-9999.0
53.805	4.60	5.19	0.03	54.18	0.58	111.4	3.158	0.587	2.571	2.5	1.5	1.0E-07	-9999.0	-9999.0	0.135	0.5	-9999.0	-9999.0
53.871	5.11	5.69	0.03	53.43	0.53	111.4	3.162	0.589	2.573	2.7	1.7	1.0E-07	-9999.0	-9999.0	0.169	0.5	-9999.0	-9999.0
53.936	4.60	5.18	0.04	53.23	0.77	111.4	3.166	0.591	2.574	2.5	1.5	1.0E-07	-9999.0	-9999.0	0.134	0.5	-9999.0	-9999.0
54.002	4.98	5.56	0.05	53.69	0.90	111.4	3.169	0.593	2.576	2.7	1.7	1.0E-07	-9999.0	-9999.0	0.160	0.5	-9999.0	-9999.0
54.068	4.98	5.60	0.06	56.82	1.07	111.4	3.173	0.595	2.578	2.7	1.7	1.0E-07	-9999.0	-9999.0	0.162	0.5	-9999.0	-9999.0
54.133	4.66	5.29	0.06	58.25	1.14	111.4	3.177	0.597	2.579	2.5	1.6	1.0E-07	-9999.0	-9999.0	0.141	0.5	-9999.0	-9999.0
54.199	5.55	6.20	0.08	59.69	1.29	111.4	3.180	0.599	2.581	3.0	1.8	1.0E-07	-9999.0	-9999.0	0.201	0.5	-9999.0	-9999.0
54.264	7.16	7.83	0.08	62.20	1.02	111.4	3.184	0.601	2.582	3.7	2.3	1.0E-07	-9999.0	-9999.0	0.310	0.6	-9999.0	-9999.0
54.330	7.09	7.81	0.10	67.35	1.28	114.6	3.188	0.604	2.584	3.7	2.3	5.0E-06	-9999.0	-9999.0	0.308	0.6	-9999.0	-9999.0
54.396	7.86	8.60	0.11	68.13	1.28	114.6	3.191	0.606	2.586	4.1	2.6	5.0E-06	-9999.0	-9999.0	0.360	0.6	-9999.0	-9999.0
54.461	6.90	7.64	0.12	68.56	1.58	114.6	3.195	0.608	2.588	3.7	2.3	5.0E-06	-9999.0	-9999.0	0.296	0.6	-9999.0	-9999.0
54.527	7.99	8.73	0.15	68.37	1.72	114.6	3.199	0.610	2.589	4.2	2.6	5.0E-06	-9999.0	-9999.0	0.369	0.6	-9999.0	-9999.0
54.593	8.30	9.04	0.19	68.37	2.11	114.6	3.203	0.612	2.591	4.3	2.7	5.0E-06	-9999.0	-9999.0	0.389	0.6	-9999.0	-9999.0
54.658	9.90	10.64	0.23	67.75	2.17	114.6	3.206	0.614	2.593	5.1	3.2	5.0E-06	-9999.0	-9999.0	0.495	0.7	-9999.0	-9999.0
54.724	11.50	12.25	0.24	69.76	1.96	114.6	3.210	0.616	2.594	5.9	3.6	5.0E-06	-9999.0	-9999.0	0.603	0.8	-9999.0	-9999.0
54.789	12.39	13.06	0.25	62.10	1.92	114.6	3.214	0.618	2.596	6.3	3.9	5.0E-06	-9999.0	-9999.0	0.656	0.9	-9999.0	-9999.0
54.855	12.65	13.13	0.27	43.93	2.06	114.6	3.218	0.620	2.598	6.3	3.9	5.0E-06	-9999.0	-9999.0	0.661	0.9	-9999.0	-9999.0
54.921	11.44	11.95	0.30	47.60	2.52	114.6	3.222	0.622	2.600	5.7	3.5	5.0E-06	-9999.0	-9999.0	0.582	0.8	-9999.0	-9999.0
54.986	11.76	12.27	0.35	46.99	2.86	114.6	3.225	0.624	2.601	5.9	3.6	5.0E-06	-9999.0	-9999.0	0.603	0.8	-9999.0	-9999.0
55.052	11.95	12.47	0.38	48.26	3.05	114.6	3.229	0.626	2.603	8.0	4.9	5.0E-07	-9999.0	-9999.0	0.616	0.8	-9999.0	-9999.0
55.117	12.39	12.88	0.36	45.52	2.80	114.6	3.233	0.628	2.605	6.2	3.8	5.0E-06	-9999.0	-9999.0	0.643	0.8	-9999.0	-9999.0
55.183	12.33	12.70	0.37	34.61	2.92	114.6	3.237	0.630	2.606	6.1	3.8	5.0E-06	-9999.0	-9999.0	0.631	0.8	-9999.0	-9999.0
55.249	12.01	12.37	0.35	33.18	2.84	114.6	3.240	0.632	2.608	5.9	3.7	5.0E-06	-9999.0	-9999.0	0.608	0.8	-9999.0	-9999.0
55.314	10.28	10.67	0.34	36.07	3.19	114.6	3.244	0.634	2.610	6.8	4.2	5.0E-07	-9999.0	-9999.0	0.495	0.7	-9999.0	-9999.0
55.380	9.83	10.30	0.33	43.58	3.21	114.6	3.248	0.636	2.612	6.6	4.1	5.0E-07	-9999.0	-9999.0	0.470	0.7	-9999.0	-9999.0
55.446	9.90	10.41	0.30	46.99	2.89	114.6	3.252	0.638	2.613	6.6	4.1	5.0E-07	-9999.0	-9999.0	0.477	0.7	-9999.0	-9999.0
55.511	9.07	9.61	0.29	49.48	3.03	114.6	3.255	0.640	2.615	6.1	3.8	5.0E-07	-9999.0	-9999.0	0.423	0.6	-9999.0	-9999.0
55.577	9.83	10.39	0.27	51.75	2.60	114.6	3.259	0.642	2.617	5.0	3.1	5.0E-06	-9999.0	-9999.0	0.476	0.7	-9999.0	-9999.0
55.642	9.83	10.40	0.24	52.60	2.31	114.6	3.263	0.645	2.618	5.0	3.1	5.0E-06	-9999.0	-9999.0	0.476	0.7	-9999.0	-9999.0
55.708	9.77	10.33	0.24	51.71	2.33	114.6	3.267	0.647	2.620	4.9	3.1	5.0E-06	-9999.0	-9999.0	0.471	0.7	-9999.0	-9999.0
55.774	8.75	9.30	0.26	50.80	2.80	114.6	3.270	0.649	2.622	5.9	3.7	5.0E-07	-9999.0	-9999.0	0.402	0.6	-9999.0	-9999.0
55.839	9.26	9.87	0.29	56.63	2.94	114.6	3.274	0.651	2.623	6.3	3.9	5.0E-07	-9999.0	-9999.0	0.440	0.7	-9999.0	-9999.0
55.905	10.28	11.01	0.32	66.70	2.91	114.6	3.278	0.653	2.625	7.0	4.3	5.0E-07	-9999.0	-9999.0	0.515	0.7	-9999.0	-9999.0
55.970	12.07	12.79	0.31	67.02	2.43	114.6	3.282	0.655	2.627	6.1	3.8	5.0E-06	-9999.0	-9999.0	0.634	0.8	-9999.0	-9999.0
56.036	13.03	13.64	0.31	56.59	2.28	114.6	3.285	0.657	2.629	6.5	4.0	5.0E-06	-9999.0	-9999.0	0.691	0.9	-9999.0	-9999.0
56.102	12.71	13.23	0.31	47.93	2.35	114.6	3.289	0.659	2.630	6.3	3.9	5.0E-06	-9999.0	-9999.0	0.663	0.9	-9999.0	-9999.0
56.167	12.52	13.01	0.30	45.54	2.31	114.6	3.293	0.661	2.632	6.2	3.8	5.0E-06	-9999.0	-9999.0	0.648	0.8	-9999.0	-9999.0
56.233	11.82	12.37	0.32	50.98	2.59	114.6	3.297	0.663	2.634	5.9	3.6	5.0E-06	-9999.0	-9999.0	0.605	0.8	-9999.0	-9999.0
56.299	11.69	12.27	0.33	53.94	2.70	114.6	3.300	0.665	2.635	5.9	3.6	5.0E-06	-9999.0	-9999.0	0.598	0.8	-9999.0	-9999.0
56.364	12.14	12.75	0.34	56.80	2.67	114.6	3.304	0.667	2.637	6.1	3.8	5.0E-06	-9999.0	-9999.0	0.630	0.8	-9999.0	-9999.0
56.430	11.12	11.79	0.34	62.18	2.89	114.6	3.308	0.669	2.639	7.5	4.6	5.0E-07	-9999.0	-9999.0	0.565	0.8	-9999.0	-9999.0
56.495	11.18	11.85	0.31	62.67	2.62	114.6	3.312	0.671	2.641	5.7	3.5	5.0E-06	-9999.0	-9999.0	0.569	0.8	-9999.0	-9999.0
56.561	11.82	12.48	0.30	61.25	2.41	114.6	3.315	0.673	2.642	6.0	3.7	5.0E-06	-9999.0	-9999.0	0.611	0.8	-9999.0	-9999.0
56.627	11.31	11.95	0.27	59.73	2.26	114.6	3.319	0.675	2.644	5.7	3.5	5.0E-06	-9999.0	-9999.0	0.576	0.8	-9999.0	-9999.0
56.692	11.56	12.18	0.28	58.01	2.30	114.6	3.323	0.677	2.646	5.8	3.6	5.0E-06	-9999.0	-9999.0	0.591	0.8	-9999.0	-9999.0
56.758	11.18	11.82	0.27	59.93	2.29	114.6	3.327	0.679	2.647	5.7	3.5	5.0E-06	-9999.0	-9999.0	0.567	0.8	-9999.0	-9999.0
56.823	10.15	10.79	0.27	58.82	2.51	114.6	3.331	0.681	2.649	5.2	3.2	5.0E-06	-9999.0	-9999.0	0.497	0.7	-9999.0	-9999.0
56.889	10.54	11.23	0.26	64.39	2.32	114.6	3.334	0.683	2.651	5.4	3.3	5.0E-06	-9999.0	-9999.0	0.526	0.7	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
56.955	10.93	11.61	0.25	62.97	2.16	114.6	3.338	0.685	2.653	5.6	3.4	5.0E-06	-9999.0	-9999.0	0.551	0.7	-9999.0	-9999.0
57.020	9.90	10.61	0.27	65.49	2.55	114.6	3.342	0.688	2.654	5.1	3.1	5.0E-06	-9999.0	-9999.0	0.485	0.7	-9999.0	-9999.0
57.086	12.01	12.71	0.25	64.96	1.97	114.6	3.346	0.690	2.656	6.1	3.7	5.0E-06	-9999.0	-9999.0	0.624	0.8	-9999.0	-9999.0
57.152	10.93	11.60	0.24	62.61	2.07	114.6	3.349	0.692	2.658	5.6	3.4	5.0E-06	-9999.0	-9999.0	0.550	0.7	-9999.0	-9999.0
57.217	10.42	11.06	0.23	59.56	2.08	114.6	3.353	0.694	2.659	5.3	3.2	5.0E-06	-9999.0	-9999.0	0.514	0.7	-9999.0	-9999.0
57.283	10.03	10.67	0.23	58.78	2.16	114.6	3.357	0.696	2.661	5.1	3.1	5.0E-06	-9999.0	-9999.0	0.488	0.7	-9999.0	-9999.0
57.348	10.22	10.90	0.23	62.87	2.11	114.6	3.361	0.698	2.663	5.2	3.2	5.0E-06	-9999.0	-9999.0	0.503	0.7	-9999.0	-9999.0
57.414	9.71	10.41	0.23	64.77	2.21	114.6	3.364	0.700	2.665	5.0	3.1	5.0E-06	-9999.0	-9999.0	0.470	0.7	-9999.0	-9999.0
57.480	9.77	10.47	0.23	64.18	2.20	114.6	3.368	0.702	2.666	5.0	3.1	5.0E-06	-9999.0	-9999.0	0.473	0.7	-9999.0	-9999.0
57.545	10.03	10.74	0.22	65.69	2.05	114.6	3.372	0.704	2.668	5.1	3.1	5.0E-06	-9999.0	-9999.0	0.491	0.7	-9999.0	-9999.0
57.611	10.74	11.47	0.23	67.92	2.01	114.6	3.376	0.706	2.670	5.5	3.4	5.0E-06	-9999.0	-9999.0	0.540	0.7	-9999.0	-9999.0
57.676	10.48	11.17	0.22	64.14	1.97	114.6	3.379	0.708	2.671	5.3	3.3	5.0E-06	-9999.0	-9999.0	0.519	0.7	-9999.0	-9999.0
57.742	10.09	10.79	0.22	64.63	2.04	114.6	3.383	0.710	2.673	5.2	3.2	5.0E-06	-9999.0	-9999.0	0.494	0.7	-9999.0	-9999.0
57.808	10.61	11.30	0.22	63.98	1.95	114.6	3.387	0.712	2.675	5.4	3.3	5.0E-06	-9999.0	-9999.0	0.527	0.7	-9999.0	-9999.0
57.873	10.74	11.40	0.24	61.55	2.11	114.6	3.391	0.714	2.677	5.5	3.3	5.0E-06	-9999.0	-9999.0	0.534	0.7	-9999.0	-9999.0
57.939	11.25	11.91	0.25	61.01	2.10	114.6	3.394	0.716	2.678	5.7	3.5	5.0E-06	-9999.0	-9999.0	0.567	0.8	-9999.0	-9999.0
58.005	10.93	11.60	0.24	61.94	2.07	114.6	3.398	0.718	2.680	5.6	3.4	5.0E-06	-9999.0	-9999.0	0.547	0.7	-9999.0	-9999.0
58.070	11.05	11.71	0.24	61.61	2.05	114.6	3.402	0.720	2.682	5.6	3.4	5.0E-06	-9999.0	-9999.0	0.554	0.7	-9999.0	-9999.0
58.136	10.74	11.40	0.24	61.29	2.11	114.6	3.406	0.722	2.683	5.5	3.3	5.0E-06	-9999.0	-9999.0	0.533	0.7	-9999.0	-9999.0
58.201	10.67	11.35	0.23	63.24	2.03	114.6	3.409	0.724	2.685	5.4	3.3	5.0E-06	-9999.0	-9999.0	0.529	0.7	-9999.0	-9999.0
58.267	9.13	9.86	0.23	67.33	2.34	114.6	3.413	0.726	2.687	4.7	2.9	5.0E-06	-9999.0	-9999.0	0.430	0.6	-9999.0	-9999.0
58.333	9.52	10.26	0.21	68.40	2.05	114.6	3.417	0.729	2.688	4.9	3.0	5.0E-06	-9999.0	-9999.0	0.456	0.7	-9999.0	-9999.0
58.398	9.13	9.85	0.20	66.66	2.03	114.6	3.421	0.731	2.690	4.7	2.9	5.0E-06	-9999.0	-9999.0	0.429	0.6	-9999.0	-9999.0
58.464	9.39	10.12	0.19	66.88	1.88	114.6	3.425	0.733	2.692	4.8	3.0	5.0E-06	-9999.0	-9999.0	0.446	0.7	-9999.0	-9999.0
58.529	8.75	9.49	0.18	68.44	1.90	114.6	3.428	0.735	2.694	4.5	2.8	5.0E-06	-9999.0	-9999.0	0.404	0.6	-9999.0	-9999.0
58.595	9.07	9.88	0.17	75.00	1.72	114.6	3.432	0.737	2.695	4.7	2.9	5.0E-06	-9999.0	-9999.0	0.430	0.6	-9999.0	-9999.0
58.661	9.83	10.66	0.18	76.50	1.69	114.6	3.436	0.739	2.697	5.1	3.1	5.0E-06	-9999.0	-9999.0	0.482	0.7	-9999.0	-9999.0
58.726	9.20	10.02	0.17	75.93	1.70	114.6	3.440	0.741	2.699	4.8	2.9	5.0E-06	-9999.0	-9999.0	0.439	0.6	-9999.0	-9999.0
58.792	9.52	10.37	0.17	78.10	1.64	114.6	3.443	0.743	2.700	5.0	3.0	5.0E-06	-9999.0	-9999.0	0.462	0.7	-9999.0	-9999.0
58.858	9.83	10.66	0.17	76.36	1.60	114.6	3.447	0.745	2.702	5.1	3.1	5.0E-06	-9999.0	-9999.0	0.481	0.7	-9999.0	-9999.0
58.923	9.90	10.68	0.17	71.36	1.60	114.6	3.451	0.747	2.704	5.1	3.1	5.0E-06	-9999.0	-9999.0	0.482	0.7	-9999.0	-9999.0
58.989	9.71	10.45	0.18	68.33	1.73	114.6	3.455	0.749	2.706	5.0	3.0	5.0E-06	-9999.0	-9999.0	0.466	0.7	-9999.0	-9999.0
59.054	9.71	10.45	0.19	67.71	1.82	114.6	3.458	0.751	2.707	5.0	3.0	5.0E-06	-9999.0	-9999.0	0.466	0.7	-9999.0	-9999.0
59.120	10.03	10.80	0.20	70.56	1.86	114.6	3.462	0.753	2.709	5.2	3.1	5.0E-06	-9999.0	-9999.0	0.489	0.7	-9999.0	-9999.0
59.186	9.39	10.24	0.21	78.28	2.06	114.6	3.466	0.755	2.711	4.9	3.0	5.0E-06	-9999.0	-9999.0	0.452	0.7	-9999.0	-9999.0
59.251	10.15	10.99	0.22	77.23	2.01	114.6	3.470	0.757	2.712	5.3	3.2	5.0E-06	-9999.0	-9999.0	0.501	0.7	-9999.0	-9999.0
59.317	10.15	10.96	0.23	74.21	2.10	114.6	3.473	0.759	2.714	5.2	3.2	5.0E-06	-9999.0	-9999.0	0.499	0.7	-9999.0	-9999.0
59.382	10.61	11.41	0.22	74.03	1.93	114.6	3.477	0.761	2.716	5.5	3.3	5.0E-06	-9999.0	-9999.0	0.529	0.7	-9999.0	-9999.0
59.448	10.86	11.65	0.21	73.44	1.81	114.6	3.481	0.763	2.718	5.6	3.4	5.0E-06	-9999.0	-9999.0	0.545	0.7	-9999.0	-9999.0
59.514	10.67	11.42	0.23	69.78	2.02	114.6	3.485	0.765	2.719	5.5	3.3	5.0E-06	-9999.0	-9999.0	0.529	0.7	-9999.0	-9999.0
59.579	10.74	11.46	0.24	67.23	2.10	114.6	3.488	0.767	2.721	5.5	3.3	5.0E-06	-9999.0	-9999.0	0.532	0.7	-9999.0	-9999.0
59.645	10.61	11.34	0.24	67.57	2.12	114.6	3.492	0.769	2.723	5.4	3.3	5.0E-06	-9999.0	-9999.0	0.523	0.7	-9999.0	-9999.0
59.711	10.48	11.21	0.25	68.42	2.23	114.6	3.496	0.772	2.724	5.4	3.3	5.0E-06	-9999.0	-9999.0	0.515	0.7	-9999.0	-9999.0
59.776	10.67	11.38	0.24	66.29	2.11	114.6	3.500	0.774	2.726	5.5	3.3	5.0E-06	-9999.0	-9999.0	0.525	0.7	-9999.0	-9999.0
59.842	10.86	11.53	0.24	62.36	2.09	114.6	3.503	0.776	2.728	5.5	3.3	5.0E-06	-9999.0	-9999.0	0.535	0.7	-9999.0	-9999.0
59.907	10.74	11.40	0.24	61.79	2.11	114.6	3.507	0.778	2.730	5.5	3.3	5.0E-06	-9999.0	-9999.0	0.526	0.7	-9999.0	-9999.0
59.973	10.67	11.39	0.23	67.00	2.02	114.6	3.511	0.780	2.731	5.5	3.3	5.0E-06	-9999.0	-9999.0	0.525	0.7	-9999.0	-9999.0
60.039	10.93	11.66	0.24	68.19	2.06	114.6	3.515	0.782	2.733	5.6	3.4	5.0E-06	-9999.0	-9999.0	0.543	0.7	-9999.0	-9999.0
60.104	10.80	11.52	0.24	67.33	2.09	114.6	3.518	0.784	2.735	5.5	3.3	5.0E-06	-9999.0	-9999.0	0.534	0.7	-9999.0	-9999.0
60.170	11.12	11.83	0.25	66.25	2.12	114.6	3.522	0.786	2.736	5.7	3.4	5.0E-06	-9999.0	-9999.0	0.554	0.7	-9999.0	-9999.0
60.235	10.93	11.68	0.27	69.70	2.32	114.6	3.526	0.788	2.738	5.6	3.4	5.0E-06	-9999.0	-9999.0	0.544	0.7	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
60.301	11.18	11.91	0.29	67.67	2.44	114.6	3.530	0.790	2.740	5.7	3.4	5.0E-06	-9999.0	-9999.0	0.559	0.7	-9999.0	-9999.0
60.367	11.76	12.42	0.30	60.81	2.42	114.6	3.534	0.792	2.742	5.9	3.6	5.0E-06	-9999.0	-9999.0	0.592	0.8	-9999.0	-9999.0
60.432	10.86	11.48	0.30	58.13	2.62	114.6	3.537	0.794	2.743	5.5	3.3	5.0E-06	-9999.0	-9999.0	0.530	0.7	-9999.0	-9999.0
60.498	11.12	11.77	0.31	60.32	2.64	114.6	3.541	0.796	2.745	5.6	3.4	5.0E-06	-9999.0	-9999.0	0.549	0.7	-9999.0	-9999.0
60.564	10.99	11.66	0.32	62.65	2.75	114.6	3.545	0.798	2.747	5.6	3.4	5.0E-06	-9999.0	-9999.0	0.541	0.7	-9999.0	-9999.0
60.629	10.61	11.34	0.32	68.15	2.83	114.6	3.549	0.800	2.748	7.2	4.4	5.0E-07	-9999.0	-9999.0	0.520	0.7	-9999.0	-9999.0
60.695	10.67	11.39	0.30	67.41	2.64	114.6	3.552	0.802	2.750	5.5	3.3	5.0E-06	-9999.0	-9999.0	0.523	0.7	-9999.0	-9999.0
60.760	11.37	12.15	0.29	72.75	2.39	114.6	3.556	0.804	2.752	5.8	3.5	5.0E-06	-9999.0	-9999.0	0.573	0.7	-9999.0	-9999.0
60.826	10.93	11.70	0.28	71.27	2.40	114.6	3.560	0.806	2.753	5.6	3.4	5.0E-06	-9999.0	-9999.0	0.542	0.7	-9999.0	-9999.0
60.892	11.18	11.97	0.28	73.85	2.34	114.6	3.564	0.808	2.755	5.7	3.5	5.0E-06	-9999.0	-9999.0	0.561	0.7	-9999.0	-9999.0
60.957	11.37	12.14	0.29	71.27	2.40	114.6	3.567	0.810	2.757	5.8	3.5	5.0E-06	-9999.0	-9999.0	0.571	0.7	-9999.0	-9999.0
61.023	11.05	11.78	0.29	68.13	2.47	114.6	3.571	0.813	2.759	5.6	3.4	5.0E-06	-9999.0	-9999.0	0.547	0.7	-9999.0	-9999.0
61.088	11.50	12.20	0.30	65.14	2.46	114.6	3.575	0.815	2.760	5.8	3.5	5.0E-06	-9999.0	-9999.0	0.575	0.7	-9999.0	-9999.0
61.154	11.56	12.26	0.31	65.28	2.53	114.6	3.579	0.817	2.762	5.9	3.5	5.0E-06	-9999.0	-9999.0	0.579	0.8	-9999.0	-9999.0
61.220	12.07	12.72	0.32	60.48	2.52	114.6	3.582	0.819	2.764	6.1	3.7	5.0E-06	-9999.0	-9999.0	0.609	0.8	-9999.0	-9999.0
61.285	11.37	11.95	0.31	54.08	2.60	114.6	3.586	0.821	2.765	5.7	3.4	5.0E-06	-9999.0	-9999.0	0.558	0.7	-9999.0	-9999.0
61.351	10.28	10.88	0.31	55.13	2.86	114.6	3.590	0.823	2.767	6.9	4.2	5.0E-07	-9999.0	-9999.0	0.486	0.7	-9999.0	-9999.0
61.417	10.35	10.94	0.30	55.47	2.75	114.6	3.594	0.825	2.769	7.0	4.2	5.0E-07	-9999.0	-9999.0	0.490	0.7	-9999.0	-9999.0
61.482	9.96	10.58	0.29	57.07	2.75	114.6	3.597	0.827	2.771	6.8	4.1	5.0E-07	-9999.0	-9999.0	0.466	0.7	-9999.0	-9999.0
61.548	9.96	10.61	0.27	59.73	2.55	114.6	3.601	0.829	2.772	5.1	3.1	5.0E-06	-9999.0	-9999.0	0.467	0.7	-9999.0	-9999.0
61.613	9.96	10.64	0.25	62.22	2.36	114.6	3.605	0.831	2.774	5.1	3.1	5.0E-06	-9999.0	-9999.0	0.469	0.7	-9999.0	-9999.0
61.679	9.01	9.69	0.23	62.87	2.38	114.6	3.609	0.833	2.776	4.6	2.8	5.0E-06	-9999.0	-9999.0	0.405	0.6	-9999.0	-9999.0
61.745	9.32	9.99	0.22	61.96	2.21	114.6	3.612	0.835	2.777	4.8	2.9	5.0E-06	-9999.0	-9999.0	0.425	0.6	-9999.0	-9999.0
61.810	9.52	10.18	0.22	60.99	2.17	114.6	3.616	0.837	2.779	4.9	2.9	5.0E-06	-9999.0	-9999.0	0.438	0.6	-9999.0	-9999.0
61.876	9.83	10.48	0.22	60.26	2.10	114.6	3.620	0.839	2.781	5.0	3.0	5.0E-06	-9999.0	-9999.0	0.458	0.7	-9999.0	-9999.0
61.942	9.77	10.40	0.22	57.72	2.12	114.6	3.624	0.841	2.783	5.0	3.0	5.0E-06	-9999.0	-9999.0	0.452	0.6	-9999.0	-9999.0
62.007	9.26	9.84	0.23	53.31	2.34	114.6	3.628	0.843	2.784	4.7	2.8	5.0E-06	-9999.0	-9999.0	0.414	0.6	-9999.0	-9999.0
62.073	9.07	9.64	0.23	52.98	2.39	114.6	3.631	0.845	2.786	4.6	2.8	5.0E-06	-9999.0	-9999.0	0.401	0.6	-9999.0	-9999.0
62.138	9.07	9.66	0.21	54.22	2.18	114.6	3.635	0.847	2.788	4.6	2.8	5.0E-06	-9999.0	-9999.0	0.402	0.6	-9999.0	-9999.0
62.204	8.11	8.69	0.20	53.29	2.31	114.6	3.639	0.849	2.789	4.2	2.5	5.0E-06	-9999.0	-9999.0	0.336	0.6	-9999.0	-9999.0
62.270	7.67	8.24	0.19	52.60	2.31	114.6	3.643	0.851	2.791	5.3	3.1	5.0E-07	-9999.0	-9999.0	0.306	0.6	-9999.0	-9999.0
62.335	7.54	8.11	0.17	52.98	2.10	114.6	3.646	0.853	2.793	3.9	2.3	5.0E-06	-9999.0	-9999.0	0.298	0.5	-9999.0	-9999.0
62.401	6.78	7.37	0.15	54.84	2.04	114.6	3.650	0.856	2.795	4.7	2.8	5.0E-07	-9999.0	-9999.0	0.248	0.5	-9999.0	-9999.0
62.466	6.84	7.43	0.14	55.15	1.89	114.6	3.654	0.858	2.796	3.6	2.1	5.0E-06	-9999.0	-9999.0	0.252	0.5	-9999.0	-9999.0
62.532	7.35	7.95	0.14	55.86	1.76	114.6	3.658	0.860	2.798	3.8	2.3	5.0E-06	-9999.0	-9999.0	0.286	0.5	-9999.0	-9999.0
62.598	6.58	7.18	0.13	55.98	1.81	114.6	3.661	0.862	2.800	3.4	2.1	5.0E-06	-9999.0	-9999.0	0.235	0.5	-9999.0	-9999.0
62.663	8.18	8.81	0.13	58.01	1.48	114.6	3.665	0.864	2.801	4.2	2.5	5.0E-06	-9999.0	-9999.0	0.343	0.6	-9999.0	-9999.0
62.729	7.79	8.42	0.12	58.29	1.43	114.6	3.669	0.866	2.803	4.0	2.4	5.0E-06	-9999.0	-9999.0	0.317	0.6	-9999.0	-9999.0
62.795	8.43	9.05	0.12	57.15	1.33	114.6	3.673	0.868	2.805	4.3	2.6	5.0E-06	-9999.0	-9999.0	0.358	0.6	-9999.0	-9999.0
62.860	7.67	8.30	0.12	58.15	1.45	114.6	3.676	0.870	2.807	4.0	2.4	5.0E-06	-9999.0	-9999.0	0.308	0.6	-9999.0	-9999.0
62.926	8.37	9.01	0.13	59.42	1.45	114.6	3.680	0.872	2.808	4.3	2.6	5.0E-06	-9999.0	-9999.0	0.355	0.6	-9999.0	-9999.0
62.991	9.07	9.76	0.14	63.96	1.44	114.6	3.684	0.874	2.810	4.7	2.8	5.0E-06	-9999.0	-9999.0	0.405	0.6	-9999.0	-9999.0
63.057	9.32	9.97	0.15	59.73	1.51	114.6	3.688	0.876	2.812	4.8	2.8	5.0E-06	-9999.0	-9999.0	0.419	0.6	-9999.0	-9999.0
63.123	9.96	10.61	0.16	59.40	1.51	114.6	3.691	0.878	2.813	5.1	3.0	5.0E-06	-9999.0	-9999.0	0.461	0.7	-9999.0	-9999.0
63.188	9.32	9.96	0.18	58.58	1.81	114.6	3.695	0.880	2.815	4.8	2.8	5.0E-06	-9999.0	-9999.0	0.417	0.6	-9999.0	-9999.0
63.254	9.20	9.75	0.22	51.08	2.26	114.6	3.699	0.882	2.817	4.7	2.8	5.0E-06	-9999.0	-9999.0	0.404	0.6	-9999.0	-9999.0
63.319	8.62	9.10	0.25	44.72	2.75	114.6	3.703	0.884	2.818	5.8	3.5	5.0E-07	-9999.0	-9999.0	0.360	0.6	-9999.0	-9999.0
63.385	7.28	7.69	0.27	38.08	3.52	111.4	3.706	0.886	2.820	7.4	4.4	5.0E-08	-9999.0	-9999.0	0.266	0.5	-9999.0	-9999.0
63.451	7.54	7.95	0.28	38.32	3.53	111.4	3.710	0.888	2.822	7.6	4.5	5.0E-08	-9999.0	-9999.0	0.283	0.5	-9999.0	-9999.0
63.516	8.11	8.56	0.30	41.82	3.51	111.4	3.714	0.890	2.823	8.2	4.9	5.0E-08	-9999.0	-9999.0	0.323	0.6	-9999.0	-9999.0
63.582	8.62	9.11	0.33	45.31	3.63	111.4	3.717	0.892	2.825	8.7	5.2	5.0E-08	-9999.0	-9999.0	0.360	0.6	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
63.648	10.67	11.19	0.32	48.16	2.87	114.6	3.721	0.894	2.827	7.1	4.2	5.0E-07	-9999.0	-9999.0	0.498	0.7	-9999.0	-9999.0
63.713	13.29	13.83	0.32	49.67	2.32	114.6	3.725	0.897	2.828	6.6	3.9	5.0E-06	-9999.0	-9999.0	0.674	0.8	-9999.0	-9999.0
63.779	15.33	15.80	0.30	43.89	1.90	114.6	3.729	0.899	2.830	7.6	4.5	5.0E-06	-9999.0	-9999.0	0.805	1.0	-9999.0	-9999.0
63.844	16.04	16.54	0.29	45.99	1.76	114.6	3.732	0.901	2.832	6.3	3.8	5.0E-05	30.0	30.0	0.854	1.0	-9999.0	-9999.0
63.910	17.12	17.62	0.23	46.58	1.31	114.6	3.736	0.903	2.833	6.8	4.0	5.0E-05	30.0	30.0	0.926	1.1	-9999.0	-9999.0
63.976	16.99	17.50	0.18	47.03	1.03	114.6	3.740	0.905	2.835	6.7	4.0	5.0E-05	30.0	30.0	0.917	1.1	-9999.0	-9999.0
64.041	16.74	17.25	0.14	47.54	0.81	114.6	3.744	0.907	2.837	6.6	3.9	5.0E-05	30.0	30.0	0.901	1.1	-9999.0	-9999.0
64.107	15.59	16.12	0.16	49.08	1.00	114.6	3.747	0.909	2.839	6.2	3.7	5.0E-05	30.0	30.0	0.825	1.0	-9999.0	-9999.0
64.172	14.63	15.20	0.22	53.63	1.45	114.6	3.751	0.911	2.840	5.8	3.5	5.0E-05	30.0	30.0	0.764	0.9	-9999.0	-9999.0
64.238	13.48	14.15	0.21	61.49	1.49	114.6	3.755	0.913	2.842	5.4	3.2	5.0E-05	30.0	30.0	0.693	0.8	-9999.0	-9999.0
64.304	14.76	15.52	0.21	70.62	1.36	114.6	3.759	0.915	2.844	5.9	3.5	5.0E-05	30.0	30.0	0.784	0.9	-9999.0	-9999.0
64.369	14.82	15.56	0.18	68.70	1.16	114.6	3.762	0.917	2.845	6.0	3.5	5.0E-05	30.0	30.0	0.786	0.9	-9999.0	-9999.0
64.435	15.27	15.87	0.20	55.72	1.26	114.6	3.766	0.919	2.847	6.1	3.6	5.0E-05	30.0	30.0	0.807	1.0	-9999.0	-9999.0
64.501	14.11	14.71	0.19	54.76	1.30	114.6	3.770	0.921	2.849	5.6	3.3	5.0E-05	30.0	30.0	0.729	0.9	-9999.0	-9999.0
64.566	12.39	13.05	0.22	61.19	1.69	114.6	3.774	0.923	2.851	6.2	3.7	5.0E-06	-9999.0	-9999.0	0.618	0.8	-9999.0	-9999.0
64.632	12.46	13.23	0.25	71.29	1.89	114.6	3.777	0.925	2.852	6.3	3.8	5.0E-06	-9999.0	-9999.0	0.630	0.8	-9999.0	-9999.0
64.697	13.29	14.06	0.30	70.91	2.14	114.6	3.781	0.927	2.854	6.7	4.0	5.0E-06	-9999.0	-9999.0	0.685	0.8	-9999.0	-9999.0
64.763	14.05	14.74	0.33	63.42	2.24	114.6	3.785	0.929	2.856	7.1	4.2	5.0E-06	-9999.0	-9999.0	0.730	0.9	-9999.0	-9999.0
64.829	13.48	14.06	0.32	53.25	2.28	114.6	3.789	0.931	2.857	6.7	4.0	5.0E-06	-9999.0	-9999.0	0.685	0.8	-9999.0	-9999.0
64.894	14.05	14.57	0.35	48.00	2.41	114.6	3.792	0.933	2.859	7.0	4.1	5.0E-06	-9999.0	-9999.0	0.719	0.9	-9999.0	-9999.0
64.960	13.35	13.88	0.34	48.95	2.46	114.6	3.796	0.935	2.861	6.6	3.9	5.0E-06	-9999.0	-9999.0	0.672	0.8	-9999.0	-9999.0
65.025	13.60	14.17	0.30	52.14	2.12	114.6	3.800	0.937	2.863	6.8	4.0	5.0E-06	-9999.0	-9999.0	0.691	0.8	-9999.0	-9999.0
65.091	12.97	13.60	0.27	58.23	1.99	114.6	3.804	0.940	2.864	6.5	3.8	5.0E-06	-9999.0	-9999.0	0.653	0.8	-9999.0	-9999.0
65.157	13.35	13.97	0.23	56.86	1.65	114.6	3.808	0.942	2.866	6.7	4.0	5.0E-06	-9999.0	-9999.0	0.677	0.8	-9999.0	-9999.0
65.222	13.03	13.64	0.23	56.51	1.69	114.6	3.811	0.944	2.868	6.5	3.9	5.0E-06	-9999.0	-9999.0	0.655	0.8	-9999.0	-9999.0
65.288	12.52	13.09	0.22	53.10	1.68	114.6	3.815	0.946	2.869	6.3	3.7	5.0E-06	-9999.0	-9999.0	0.619	0.8	-9999.0	-9999.0
65.354	12.33	12.96	0.23	58.54	1.78	114.6	3.819	0.948	2.871	6.2	3.7	5.0E-06	-9999.0	-9999.0	0.610	0.8	-9999.0	-9999.0
65.419	12.78	13.49	0.22	65.61	1.63	114.6	3.823	0.950	2.873	6.5	3.8	5.0E-06	-9999.0	-9999.0	0.644	0.8	-9999.0	-9999.0
65.485	11.82	12.56	0.20	68.84	1.60	114.6	3.826	0.952	2.875	6.0	3.5	5.0E-06	-9999.0	-9999.0	0.582	0.7	-9999.0	-9999.0
65.550	12.78	13.52	0.25	68.37	1.85	114.6	3.830	0.954	2.876	6.5	3.8	5.0E-06	-9999.0	-9999.0	0.646	0.8	-9999.0	-9999.0
65.616	12.52	13.17	0.26	60.54	1.98	114.6	3.834	0.956	2.878	6.3	3.7	5.0E-06	-9999.0	-9999.0	0.623	0.8	-9999.0	-9999.0
65.682	11.63	12.24	0.19	56.55	1.56	114.6	3.838	0.958	2.880	5.9	3.5	5.0E-06	-9999.0	-9999.0	0.560	0.7	-9999.0	-9999.0
65.747	10.54	11.11	0.17	53.27	1.53	114.6	3.841	0.960	2.881	5.3	3.1	5.0E-06	-9999.0	-9999.0	0.485	0.7	-9999.0	-9999.0
65.813	10.03	10.63	0.17	55.37	1.60	114.6	3.845	0.962	2.883	5.1	3.0	5.0E-06	-9999.0	-9999.0	0.452	0.6	-9999.0	-9999.0
65.878	9.83	10.51	0.18	62.42	1.72	114.6	3.849	0.964	2.885	5.0	3.0	5.0E-06	-9999.0	-9999.0	0.444	0.6	-9999.0	-9999.0
65.944	9.71	10.46	0.18	69.51	1.72	114.6	3.853	0.966	2.886	5.0	2.9	5.0E-06	-9999.0	-9999.0	0.441	0.6	-9999.0	-9999.0
66.010	9.32	10.13	0.17	74.58	1.68	114.6	3.856	0.968	2.888	4.8	2.9	5.0E-06	-9999.0	-9999.0	0.418	0.6	-9999.0	-9999.0
66.075	9.58	10.41	0.16	76.73	1.54	114.6	3.860	0.970	2.890	5.0	2.9	5.0E-06	-9999.0	-9999.0	0.437	0.6	-9999.0	-9999.0
66.141	10.42	11.22	0.16	74.58	1.43	114.6	3.864	0.972	2.892	5.4	3.2	5.0E-06	-9999.0	-9999.0	0.490	0.7	-9999.0	-9999.0
66.207	10.99	11.76	0.16	71.58	1.36	114.6	3.868	0.974	2.893	5.6	3.3	5.0E-06	-9999.0	-9999.0	0.526	0.7	-9999.0	-9999.0
66.272	11.05	11.84	0.11	73.58	0.93	114.6	3.871	0.976	2.895	4.5	2.7	5.0E-05	30.0	30.0	0.531	0.7	-9999.0	-9999.0
66.338	11.76	12.58	0.12	76.14	0.96	114.6	3.875	0.978	2.897	4.8	2.8	5.0E-05	30.0	30.0	0.580	0.7	-9999.0	-9999.0
66.403	12.78	13.61	0.18	76.79	1.33	114.6	3.879	0.981	2.898	5.2	3.1	5.0E-05	30.0	30.0	0.649	0.8	-9999.0	-9999.0
66.469	14.76	15.68	0.21	85.25	1.34	114.6	3.883	0.983	2.900	6.0	3.5	5.0E-05	30.0	30.0	0.786	0.9	-9999.0	-9999.0
66.535	24.34	25.38	0.33	95.98	1.30	114.6	3.886	0.985	2.902	9.7	5.7	5.0E-05	30.0	30.0	1.433	1.7	-9999.0	-9999.0
66.600	37.88	38.51	0.59	57.91	1.54	117.7	3.890	0.987	2.904	12.3	7.2	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
66.666	40.38	40.55	0.68	15.60	1.68	117.7	3.894	0.989	2.905	12.9	7.6	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
66.731	36.73	36.88	0.57	14.10	1.55	117.7	3.898	0.991	2.907	11.8	6.9	5.0E-04	30.0	30.0	-9999.0	-9999.0	-9999.0	-9999.0
66.797	31.62	31.80	0.63	16.63	1.99	114.6	3.902	0.993	2.909	12.2	7.1	5.0E-05	30.0	30.0	1.860	2.4	-9999.0	-9999.0
66.863	28.81	29.07	0.85	23.94	2.93	114.6	3.906	0.995	2.911	13.9	8.2	5.0E-06	-9999.0	-9999.0	1.678	2.1	-9999.0	-9999.0
66.928	26.44	26.85	0.95	37.92	3.55	114.6	3.909	0.997	2.912	12.9	7.5	5.0E-06	-9999.0	-9999.0	1.530	1.9	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
66.994	26.63	27.24	1.00	56.02	3.68	114.6	3.913	0.999	2.914	13.0	7.6	5.0E-06	-9999.0	-9999.0	1.555	1.9	-9999.0	-9999.0
67.060	36.86	37.42	0.92	52.24	2.46	114.6	3.917	1.001	2.916	14.3	8.4	5.0E-05	30.0	30.0	2.234	3.1	-9999.0	-9999.0
67.125	52.77	52.85	0.01	7.21	0.02	120.9	3.921	1.003	2.918	12.7	7.4	5.0E-03	33.0	32.0	-9999.0	-9999.0	228.0	4.315
67.191	69.70	69.73	0.01	3.18	0.01	120.9	3.925	1.005	2.920	16.7	9.8	5.0E-03	41.0	34.0	-9999.0	-9999.0	266.7	3.825
67.256	85.41	85.44	0.01	2.61	0.01	124.1	3.929	1.007	2.922	16.4	9.6	5.0E-02	46.8	36.0	-9999.0	-9999.0	296.7	3.473
67.322	101.32	101.32	0.01	0.47	0.01	124.1	3.933	1.009	2.924	19.4	11.4	5.0E-02	51.7	36.0	-9999.0	-9999.0	324.0	3.198
67.388	109.37	109.36	0.01	-0.77	0.01	124.1	3.937	1.011	2.926	20.9	12.2	5.0E-02	53.8	38.0	-9999.0	-9999.0	337.3	3.085

Gregg In Situ, Inc. - CPT Interpretation

Interpretation Output - Release	1.20l
Run No:	04-0524-0703-4220
Job No:	04-073SC
Client:	MACTEC
Project:	TVA Bull Run Ash Disposal Facility
Site:	CPT-11
Location:	TVA Bull Run
Cone:	H. Bankayal
CPT Date:	04/21/05
CPT Time:	08:58
CPT File:	073CP11.COR
Northing (m):	0.000000
Easting (m):	0.000000
Elevation (m):	0.000000

Water Table (m):	3.96	(ft):	13.0
Unit Weight of Water (default):	62.40 pcf		
Averaging Increment (m):	0.0 (Every Data Point)		
Phi Method :	Robertson and Campanella, 1983		
Su Nkt used:	15.00	Su/P' (nc):	0.30
Dr Method :	Jamiolkowski - All Sands		
State Parameter M:	1.20		

Used Unit Weights Assigned to Soil Zones

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
0.066	28.68	28.69	0.27	0.67	0.94	117.7	0.004	0.000	0.004	9.2	18.3	5.0E-04	95.0	50.0	-9999.0	-9999.0	80.4	2.802
0.131	56.47	56.47	0.35	0.10	0.62	120.9	0.008	0.000	0.008	13.5	27.0	5.0E-03	95.0	50.0	-9999.0	-9999.0	118.4	2.097
0.197	93.02	93.02	0.52	0.43	0.56	120.9	0.012	0.000	0.012	22.3	44.5	5.0E-03	95.0	50.0	-9999.0	-9999.0	175.6	1.888
0.262	99.72	99.73	0.75	0.98	0.75	120.9	0.016	0.000	0.016	23.9	47.8	5.0E-03	95.0	50.0	-9999.0	-9999.0	194.5	1.950
0.328	88.67	88.66	1.15	-0.53	1.30	120.9	0.020	0.000	0.020	21.2	42.5	5.0E-03	95.0	50.0	-9999.0	-9999.0	166.5	1.878
0.394	94.99	94.99	1.58	0.08	1.67	117.7	0.024	0.000	0.024	30.3	60.6	5.0E-04	95.0	50.0	-9999.0	-9999.0	180.4	1.900
0.459	87.52	87.53	2.14	1.15	2.44	117.7	0.027	0.000	0.027	27.9	55.9	5.0E-04	95.0	50.0	-9999.0	-9999.0	164.4	1.878
0.525	97.61	97.61	2.57	0.53	2.63	117.7	0.031	0.000	0.031	31.2	62.3	5.0E-04	95.0	50.0	-9999.0	-9999.0	187.7	1.923
0.591	102.40	102.40	2.99	-0.22	2.92	114.6	0.035	0.000	0.035	39.2	78.4	5.0E-05	95.0	50.0	6.824	10.0	204.3	1.996
0.656	101.32	101.32	3.39	-0.02	3.34	114.6	0.039	0.000	0.039	38.8	77.6	5.0E-05	95.0	50.0	6.752	10.0	200.1	1.975
0.722	98.44	98.43	3.67	-0.41	3.73	114.6	0.043	0.000	0.043	37.7	75.4	5.0E-05	95.0	50.0	6.559	10.0	190.2	1.933
0.787	94.35	94.34	3.80	-0.69	4.03	114.6	0.046	0.000	0.046	45.2	90.3	5.0E-06	-9999.0	-9999.0	6.286	10.0	-9999.0	-9999.0
0.853	89.37	89.36	3.86	-0.83	4.32	114.6	0.050	0.000	0.050	42.8	85.6	5.0E-06	-9999.0	-9999.0	5.954	10.0	-9999.0	-9999.0
0.919	80.17	80.16	3.83	-1.56	4.78	130.5	0.054	0.000	0.054	76.8	153.5	1.0E-15	95.0	50.0	-9999.0	-9999.0	152.4	1.902
0.984	72.38	72.36	3.70	-1.52	5.11	130.5	0.058	0.000	0.058	69.3	138.6	1.0E-15	95.0	50.0	-9999.0	-9999.0	141.2	1.952
1.050	67.65	67.64	3.55	-1.21	5.25	130.5	0.063	0.000	0.063	64.8	129.6	1.0E-15	95.0	50.0	-9999.0	-9999.0	134.5	1.989
1.115	63.49	63.48	3.34	-1.02	5.26	130.5	0.067	0.000	0.067	60.8	121.6	1.0E-15	92.4	50.0	-9999.0	-9999.0	128.6	2.026
1.181	58.70	58.69	3.08	-0.90	5.24	130.5	0.071	0.000	0.071	56.2	112.4	1.0E-15	89.2	50.0	-9999.0	-9999.0	121.7	2.073
1.247	58.13	58.12	3.04	-1.00	5.23	130.5	0.076	0.000	0.076	55.7	111.3	1.0E-15	88.1	50.0	-9999.0	-9999.0	120.8	2.079
1.312	61.52	61.52	2.98	-0.10	4.84	130.5	0.080	0.000	0.080	58.9	117.8	1.0E-15	88.9	50.0	-9999.0	-9999.0	125.8	2.044
1.378	64.84	64.85	2.96	1.00	4.56	114.6	0.084	0.000	0.084	41.4	82.8	5.0E-07	-9999.0	-9999.0	4.318	10.0	-9999.0	-9999.0
1.444	66.75	66.76	2.92	0.85	4.37	114.6	0.088	0.000	0.088	32.0	63.9	5.0E-06	-9999.0	-9999.0	4.445	10.0	-9999.0	-9999.0
1.509	65.48	65.45	2.99	-2.31	4.56	114.6	0.091	0.000	0.091	41.8	83.6	5.0E-07	-9999.0	-9999.0	4.357	10.0	-9999.0	-9999.0
1.575	67.97	67.93	3.18	-3.85	4.68	114.6	0.095	0.000	0.095	43.4	86.7	5.0E-07	-9999.0	-9999.0	4.523	10.0	-9999.0	-9999.0
1.640	67.26	67.21	3.31	-4.50	4.92	130.5	0.099	0.000	0.099	64.4	128.7	1.0E-15	88.4	50.0	-9999.0	-9999.0	133.9	1.993
1.706	66.88	66.83	3.33	-4.72	4.98	130.5	0.103	0.000	0.103	64.0	128.0	1.0E-15	87.6	50.0	-9999.0	-9999.0	133.4	1.996
1.772	62.92	62.86	3.24	-5.65	5.15	130.5	0.108	0.000	0.108	60.2	120.4	1.0E-15	85.3	50.0	-9999.0	-9999.0	127.7	2.031
1.837	54.55	54.49	3.18	-5.99	5.83	111.4	0.112	0.000	0.112	52.2	104.4	5.0E-08	-9999.0	-9999.0	3.625	10.0	-9999.0	-9999.0
1.903	48.93	48.86	2.99	-6.03	6.11	111.4	0.115	0.000	0.115	46.8	93.6	5.0E-08	-9999.0	-9999.0	3.250	10.0	-9999.0	-9999.0
1.968	47.01	46.95	2.82	-5.91	6.00	111.4	0.119	0.000	0.119	45.0	89.9	5.0E-08	-9999.0	-9999.0	3.122	10.0	-9999.0	-9999.0
2.034	46.31	46.25	2.61	-6.20	5.64	111.4	0.123	0.000	0.123	44.3	88.6	5.0E-08	-9999.0	-9999.0	3.075	10.0	-9999.0	-9999.0
2.100	45.55	45.48	1.80	-6.15	3.97	114.6	0.126	0.000	0.126	21.8	43.6	5.0E-06	-9999.0	-9999.0	3.024	10.0	-9999.0	-9999.0
2.165	45.61	45.54	1.79	-6.11	3.94	114.6	0.130	0.000	0.130	21.8	43.6	5.0E-06	-9999.0	-9999.0	3.028	10.0	-9999.0	-9999.0
2.231	42.99	42.93	1.76	-6.20	4.11	114.6	0.134	0.000	0.134	20.6	41.1	5.0E-06	-9999.0	-9999.0	2.853	10.0	-9999.0	-9999.0
2.297	39.61	39.54	1.74	-6.34	4.41	114.6	0.138	0.000	0.138	25.2	50.5	5.0E-07	-9999.0	-9999.0	2.627	10.0	-9999.0	-9999.0
2.362	36.54	36.47	1.75	-6.48	4.81	114.6	0.141	0.000	0.141	23.3	46.6	5.0E-07	-9999.0	-9999.0	2.422	10.0	-9999.0	-9999.0
2.428	38.52	38.50	1.84	-2.07	4.79	114.6	0.145	0.000	0.145	24.6	49.2	5.0E-07	-9999.0	-9999.0	2.557	10.0	-9999.0	-9999.0
2.493	43.83	43.80	1.86	-2.84	4.26	114.6	0.149	0.000	0.149	21.0	41.9	5.0E-06	-9999.0	-9999.0	2.910	10.0	-9999.0	-9999.0
2.559	42.86	42.83	1.87	-3.38	4.38	114.6	0.153	0.000	0.153	27.3	54.7	5.0E-07	-9999.0	-9999.0	2.845	10.0	-9999.0	-9999.0
2.625	41.59	41.55	1.85	-3.68	4.46	114.6	0.156	0.000	0.156	26.5	53.1	5.0E-07	-9999.0	-9999.0	2.760	10.0	-9999.0	-9999.0
2.690	38.77	38.72	1.79	-4.58	4.63	114.6	0.160	0.000	0.160	24.7	49.4	5.0E-07	-9999.0	-9999.0	2.571	10.0	-9999.0	-9999.0
2.756	33.28	33.23	1.76	-4.92	5.31	111.4	0.164	0.000	0.164	31.8	63.6	5.0E-08	-9999.0	-9999.0	2.204	10.0	-9999.0	-9999.0
2.821	32.26	32.21	1.71	-4.56	5.32	111.4	0.168	0.000	0.168	30.8	61.7	5.0E-08	-9999.0	-9999.0	2.136	10.0	-9999.0	-9999.0
2.887	33.15	33.10	1.70	-4.58	5.15	111.4	0.171	0.000	0.171	31.7	63.4	5.0E-08	-9999.0	-9999.0	2.195	10.0	-9999.0	-9999.0
2.953	33.92	33.87	1.68	-4.84	4.97	111.4	0.175	0.000	0.175	32.4	64.9	5.0E-08	-9999.0	-9999.0	2.246	10.0	-9999.0	-9999.0
3.018	33.66	33.61	1.75	-5.21	5.22	111.4	0.179	0.000	0.179	32.2	64.4	5.0E-08	-9999.0	-9999.0	2.228	10.0	-9999.0	-9999.0
3.084	32.84	32.78	1.78	-5.27	5.44	111.4	0.182	0.000	0.182	31.4	62.8	5.0E-08	-9999.0	-9999.0	2.173	10.0	-9999.0	-9999.0
3.150	30.99	30.93	1.81	-5.57	5.87	111.4	0.186	0.000	0.186	29.6	59.2	5.0E-08	-9999.0	-9999.0	2.049	10.0	-9999.0	-9999.0
3.215	30.21	30.15	1.79	-5.65	5.95	111.4	0.190	0.000	0.190	28.9	57.8	5.0E-08	-9999.0	-9999.0	1.998	10.0	-9999.0	-9999.0
3.281	27.85	27.79	1.70	-5.55	6.13	111.4	0.193	0.000	0.193	26.6	53.2	5.0E-08	-9999.0	-9999.0	1.840	10.0	-9999.0	-9999.0
3.346	27.73	27.66	1.59	-5.89	5.76	111.4	0.197	0.000	0.197	26.5	53.0	5.0E-08	-9999.0	-9999.0	1.831	10.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
3.412	29.07	29.01	1.50	-5.77	5.18	111.4	0.200	0.000	0.200	27.8	55.6	5.0E-08	-9999.0	-9999.0	1.921	10.0	-9999.0	-9999.0
3.478	33.03	32.97	1.47	-5.87	4.47	114.6	0.204	0.000	0.204	21.0	42.1	5.0E-07	-9999.0	-9999.0	2.184	10.0	-9999.0	-9999.0
3.543	34.68	34.62	1.45	-5.81	4.20	114.6	0.208	0.000	0.208	22.1	44.2	5.0E-07	-9999.0	-9999.0	2.294	10.0	-9999.0	-9999.0
3.609	31.94	31.87	1.41	-6.44	4.44	114.6	0.212	0.000	0.212	20.3	40.7	5.0E-07	-9999.0	-9999.0	2.110	10.0	-9999.0	-9999.0
3.674	31.69	31.61	1.39	-6.72	4.41	114.6	0.215	0.000	0.215	20.2	40.4	5.0E-07	-9999.0	-9999.0	2.093	10.0	-9999.0	-9999.0
3.740	26.84	26.76	1.31	-6.85	4.91	111.4	0.219	0.000	0.219	25.6	51.3	5.0E-08	-9999.0	-9999.0	1.769	10.0	-9999.0	-9999.0
3.806	20.82	20.74	1.26	-7.50	6.09	111.4	0.223	0.000	0.223	19.9	39.7	5.0E-08	-9999.0	-9999.0	1.368	10.0	-9999.0	-9999.0
3.871	17.69	17.61	1.11	-7.40	6.32	111.4	0.226	0.000	0.226	16.9	33.7	5.0E-08	-9999.0	-9999.0	1.159	10.0	-9999.0	-9999.0
3.937	14.37	14.29	1.00	-7.60	7.01	111.4	0.230	0.000	0.230	13.7	27.4	5.0E-08	-9999.0	-9999.0	0.938	10.0	-9999.0	-9999.0
4.003	13.60	13.52	0.84	-7.52	6.23	111.4	0.234	0.000	0.234	12.9	25.9	5.0E-08	-9999.0	-9999.0	0.886	10.0	-9999.0	-9999.0
4.068	13.22	13.14	0.66	-7.52	5.03	111.4	0.237	0.000	0.237	12.6	25.2	5.0E-08	-9999.0	-9999.0	0.860	10.0	-9999.0	-9999.0
4.134	11.37	11.29	0.61	-6.83	5.41	111.4	0.241	0.000	0.241	10.8	21.6	5.0E-08	-9999.0	-9999.0	0.737	10.0	-9999.0	-9999.0
4.199	12.33	12.25	0.50	-6.97	4.09	111.4	0.245	0.000	0.245	11.7	23.5	5.0E-08	-9999.0	-9999.0	0.801	10.0	-9999.0	-9999.0
4.265	13.99	13.92	0.42	-7.21	3.03	114.6	0.248	0.000	0.248	6.7	13.3	5.0E-06	-9999.0	-9999.0	0.911	10.0	-9999.0	-9999.0
4.331	14.24	14.25	0.36	0.18	2.53	114.6	0.252	0.000	0.252	6.8	13.6	5.0E-06	-9999.0	-9999.0	0.933	10.0	-9999.0	-9999.0
4.396	8.94	8.97	0.31	2.55	3.46	111.4	0.256	0.000	0.256	8.6	17.0	5.0E-08	-9999.0	-9999.0	0.581	10.0	-9999.0	-9999.0
4.462	8.75	8.82	0.30	6.36	3.41	111.4	0.260	0.000	0.260	8.4	16.6	5.0E-08	-9999.0	-9999.0	0.571	10.0	-9999.0	-9999.0
4.528	10.80	10.88	0.34	8.06	3.13	114.6	0.263	0.000	0.263	6.9	13.5	5.0E-07	-9999.0	-9999.0	0.708	10.0	-9999.0	-9999.0
4.593	11.56	11.61	0.38	4.94	3.28	114.6	0.267	0.000	0.267	7.4	14.3	5.0E-07	-9999.0	-9999.0	0.756	10.0	-9999.0	-9999.0
4.659	11.25	11.28	0.43	3.31	3.82	111.4	0.271	0.000	0.271	10.8	20.8	5.0E-08	-9999.0	-9999.0	0.734	10.0	-9999.0	-9999.0
4.724	11.37	11.41	0.48	4.23	4.22	111.4	0.274	0.000	0.274	10.9	20.9	5.0E-08	-9999.0	-9999.0	0.743	10.0	-9999.0	-9999.0
4.790	12.52	12.57	0.51	5.03	4.07	111.4	0.278	0.000	0.278	12.0	22.8	5.0E-08	-9999.0	-9999.0	0.820	10.0	-9999.0	-9999.0
4.856	13.09	13.14	0.58	4.66	4.42	111.4	0.282	0.000	0.282	12.6	23.7	5.0E-08	-9999.0	-9999.0	0.857	10.0	-9999.0	-9999.0
4.921	12.52	12.53	0.60	0.61	4.80	111.4	0.285	0.000	0.285	12.0	22.5	5.0E-08	-9999.0	-9999.0	0.816	10.0	-9999.0	-9999.0
4.987	14.70	14.68	0.57	-1.21	3.89	114.6	0.289	0.000	0.289	9.4	17.4	5.0E-07	-9999.0	-9999.0	0.960	10.0	-9999.0	-9999.0
5.052	15.72	15.71	0.56	-0.85	3.57	114.6	0.293	0.000	0.293	10.0	18.5	5.0E-07	-9999.0	-9999.0	1.028	10.0	-9999.0	-9999.0
5.118	14.82	14.78	0.57	-2.90	3.86	114.6	0.297	0.000	0.297	9.4	17.3	5.0E-07	-9999.0	-9999.0	0.966	10.0	-9999.0	-9999.0
5.184	15.02	14.98	0.56	-3.00	3.75	114.6	0.300	0.000	0.300	9.6	17.5	5.0E-07	-9999.0	-9999.0	0.979	10.0	-9999.0	-9999.0
5.249	14.11	14.08	0.30	-3.12	2.14	114.6	0.304	0.000	0.304	6.7	12.2	5.0E-06	-9999.0	-9999.0	0.918	10.0	-9999.0	-9999.0
5.315	12.65	12.62	0.38	-2.98	3.02	114.6	0.308	0.000	0.308	8.1	14.5	5.0E-07	-9999.0	-9999.0	0.821	10.0	-9999.0	-9999.0
5.381	12.46	12.43	0.33	-2.66	2.66	114.6	0.312	0.000	0.312	6.0	10.7	5.0E-06	-9999.0	-9999.0	0.808	10.0	-9999.0	-9999.0
5.446	17.69	17.67	0.66	-2.35	3.74	114.6	0.315	0.000	0.315	11.3	20.1	5.0E-07	-9999.0	-9999.0	1.157	10.0	-9999.0	-9999.0
5.512	40.06	40.04	0.66	-1.80	1.65	117.7	0.319	0.000	0.319	12.8	22.6	5.0E-04	56.8	42.0	-9999.0	-9999.0	99.9	2.495
5.577	45.29	45.30	0.76	0.55	1.68	117.7	0.323	0.000	0.323	14.5	25.4	5.0E-04	60.1	44.0	-9999.0	-9999.0	107.1	2.365
5.643	46.38	46.38	0.81	0.12	1.75	117.7	0.327	0.000	0.327	14.8	25.9	5.0E-04	60.7	44.0	-9999.0	-9999.0	108.9	2.347
5.709	40.76	40.76	0.77	0.16	1.89	114.6	0.331	0.000	0.331	15.6	27.2	5.0E-05	56.8	42.0	2.695	10.0	101.7	2.494
5.774	33.41	33.41	0.75	-0.28	2.25	114.6	0.335	0.000	0.335	12.8	22.1	5.0E-05	50.9	42.0	2.205	10.0	92.3	2.762
5.840	27.15	27.15	0.74	0.59	2.73	114.6	0.338	0.000	0.338	13.0	22.4	5.0E-06	-9999.0	-9999.0	1.788	10.0	-9999.0	-9999.0
5.905	23.45	23.47	0.70	1.80	2.99	114.6	0.342	0.000	0.342	11.2	19.2	5.0E-06	-9999.0	-9999.0	1.542	10.0	-9999.0	-9999.0
5.971	29.26	29.28	0.65	2.02	2.23	114.6	0.346	0.000	0.346	11.2	19.1	5.0E-05	46.7	42.0	1.929	10.0	87.3	2.980
6.037	35.97	35.99	0.45	2.11	1.25	117.7	0.350	0.000	0.350	11.5	19.4	5.0E-04	52.4	42.0	-9999.0	-9999.0	96.8	2.689
6.102	39.23	39.23	0.37	0.00	0.95	117.7	0.353	0.000	0.353	12.5	21.1	5.0E-04	54.7	42.0	-9999.0	-9999.0	101.3	2.582
6.168	40.50	40.49	0.31	-1.19	0.77	117.7	0.357	0.000	0.357	12.9	21.6	5.0E-04	55.5	42.0	-9999.0	-9999.0	103.2	2.550
6.234	40.69	40.67	0.23	-1.64	0.57	117.7	0.361	0.000	0.361	13.0	21.6	5.0E-04	55.5	42.0	-9999.0	-9999.0	103.7	2.551
6.299	39.36	39.33	0.12	-2.00	0.31	120.9	0.365	0.000	0.365	9.4	15.6	5.0E-03	54.4	42.0	-9999.0	-9999.0	102.3	2.600
6.365	38.39	38.37	0.06	-2.02	0.16	120.9	0.369	0.000	0.369	9.2	15.1	5.0E-03	53.5	42.0	-9999.0	-9999.0	101.3	2.639
6.430	36.92	36.90	0.04	-1.90	0.11	120.9	0.373	0.000	0.373	8.8	14.5	5.0E-03	52.2	42.0	-9999.0	-9999.0	99.6	2.699
6.496	35.97	35.95	0.05	-1.56	0.14	120.9	0.377	0.000	0.377	8.6	14.0	5.0E-03	51.3	42.0	-9999.0	-9999.0	98.6	2.743
6.562	34.05	34.04	0.03	-1.37	0.09	120.9	0.381	0.000	0.381	8.1	13.2	5.0E-03	49.6	42.0	-9999.0	-9999.0	96.3	2.828
6.627	31.75	31.73	0.03	-1.31	0.09	117.7	0.385	0.000	0.385	10.1	16.3	5.0E-04	47.4	42.0	-9999.0	-9999.0	93.3	2.940
6.693	30.21	30.20	0.03	-0.96	0.10	117.7	0.389	0.000	0.389	9.6	15.5	5.0E-04	45.9	40.0	-9999.0	-9999.0	91.3	3.023

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
6.758	28.81	28.80	0.03	-1.04	0.10	117.7	0.393	0.000	0.393	9.2	14.7	5.0E-04	44.4	40.0	-9999.0	-9999.0	89.4	3.104
6.824	27.98	27.97	0.03	-0.57	0.11	117.7	0.396	0.000	0.396	8.9	14.2	5.0E-04	43.4	40.0	-9999.0	-9999.0	88.3	3.157
6.890	25.68	25.68	0.02	-0.33	0.08	117.7	0.400	0.000	0.400	8.2	13.0	5.0E-04	40.8	40.0	-9999.0	-9999.0	84.8	3.300
6.955	23.19	23.18	0.01	-0.22	0.04	117.7	0.404	0.000	0.404	7.4	11.6	5.0E-04	37.7	40.0	-9999.0	-9999.0	80.5	3.471
7.021	21.46	21.46	0.01	0.14	0.05	117.7	0.408	0.000	0.408	6.9	10.7	5.0E-04	35.4	38.0	-9999.0	-9999.0	77.3	3.600
7.087	19.30	19.30	0.01	0.43	0.05	117.7	0.412	0.000	0.412	6.2	9.6	5.0E-04	32.2	38.0	-9999.0	-9999.0	-9999.0	-9999.0
7.152	17.76	17.77	0.01	0.63	0.06	117.7	0.416	0.000	0.416	5.7	8.8	5.0E-04	30.0	38.0	-9999.0	-9999.0	-9999.0	-9999.0
7.218	16.23	16.24	0.01	0.94	0.06	117.7	0.420	0.000	0.420	5.2	8.0	5.0E-04	30.0	38.0	-9999.0	-9999.0	-9999.0	-9999.0
7.283	14.30	14.31	0.03	0.90	0.21	114.6	0.423	0.000	0.423	5.5	8.4	5.0E-05	30.0	36.0	0.926	10.0	-9999.0	-9999.0
7.349	13.99	14.01	0.02	1.31	0.14	114.6	0.427	0.000	0.427	5.4	8.2	5.0E-05	30.0	36.0	0.905	10.0	-9999.0	-9999.0
7.415	12.65	12.66	0.03	1.25	0.24	114.6	0.431	0.000	0.431	4.9	7.4	5.0E-05	30.0	36.0	0.816	10.0	-9999.0	-9999.0
7.480	12.39	12.41	0.01	1.68	0.08	114.6	0.435	0.000	0.435	4.8	7.2	5.0E-05	30.0	36.0	0.798	10.0	-9999.0	-9999.0
7.546	12.39	12.41	0.01	1.58	0.08	114.6	0.439	0.000	0.439	4.8	7.2	5.0E-05	30.0	36.0	0.798	10.0	-9999.0	-9999.0
7.611	12.39	12.41	0.01	1.60	0.08	114.6	0.442	0.000	0.442	4.8	7.1	5.0E-05	30.0	36.0	0.798	10.0	-9999.0	-9999.0
7.677	10.86	10.87	0.01	1.45	0.09	114.6	0.446	0.000	0.446	4.2	6.2	5.0E-05	30.0	34.0	0.695	9.1	-9999.0	-9999.0
7.743	11.56	11.58	0.01	2.43	0.09	114.6	0.450	0.000	0.450	4.4	6.6	5.0E-05	30.0	34.0	0.742	9.9	-9999.0	-9999.0
7.808	11.18	11.20	0.01	2.17	0.09	114.6	0.454	0.000	0.454	4.3	6.4	5.0E-05	30.0	34.0	0.716	9.3	-9999.0	-9999.0
7.874	11.76	11.78	0.01	2.37	0.09	114.6	0.457	0.000	0.457	4.5	6.7	5.0E-05	30.0	34.0	0.755	9.9	-9999.0	-9999.0
7.940	11.37	11.39	0.01	2.17	0.09	114.6	0.461	0.000	0.461	4.4	6.4	5.0E-05	30.0	34.0	0.729	9.3	-9999.0	-9999.0
8.005	10.93	10.95	0.01	2.19	0.09	114.6	0.465	0.000	0.465	4.2	6.2	5.0E-05	30.0	34.0	0.699	8.6	-9999.0	-9999.0
8.071	11.18	11.20	0.01	2.29	0.09	114.6	0.469	0.000	0.469	4.3	6.3	5.0E-05	30.0	34.0	0.716	8.8	-9999.0	-9999.0
8.136	11.76	11.78	0.01	2.25	0.09	114.6	0.472	0.000	0.472	4.5	6.6	5.0E-05	30.0	34.0	0.754	9.4	-9999.0	-9999.0
8.202	11.44	11.46	0.01	2.17	0.09	114.6	0.476	0.000	0.476	4.4	6.4	5.0E-05	30.0	34.0	0.732	8.9	-9999.0	-9999.0
8.268	11.56	11.58	0.01	2.23	0.09	114.6	0.480	0.000	0.480	4.4	6.4	5.0E-05	30.0	34.0	0.740	8.9	-9999.0	-9999.0
8.333	11.88	11.90	0.01	1.98	0.08	114.6	0.484	0.000	0.484	4.6	6.6	5.0E-05	30.0	34.0	0.761	9.2	-9999.0	-9999.0
8.399	12.07	12.09	0.01	2.23	0.08	114.6	0.487	0.000	0.487	4.6	6.6	5.0E-05	30.0	34.0	0.774	9.3	-9999.0	-9999.0
8.464	11.95	11.98	0.01	2.57	0.08	114.6	0.491	0.000	0.491	4.6	6.5	5.0E-05	30.0	34.0	0.766	9.1	-9999.0	-9999.0
8.530	11.50	11.53	0.01	2.66	0.09	114.6	0.495	0.000	0.495	4.4	6.3	5.0E-05	30.0	34.0	0.735	8.4	-9999.0	-9999.0
8.596	12.39	12.42	0.01	2.61	0.08	114.6	0.499	0.000	0.499	4.8	6.7	5.0E-05	30.0	34.0	0.795	9.4	-9999.0	-9999.0
8.661	12.46	12.49	0.01	2.61	0.08	114.6	0.502	0.000	0.502	4.8	6.7	5.0E-05	30.0	34.0	0.799	9.4	-9999.0	-9999.0
8.727	12.20	12.23	0.01	2.66	0.08	114.6	0.506	0.000	0.506	4.7	6.6	5.0E-05	30.0	34.0	0.781	8.9	-9999.0	-9999.0
8.793	12.97	13.00	0.01	2.53	0.08	114.6	0.510	0.000	0.510	5.0	7.0	5.0E-05	30.0	34.0	0.833	9.8	-9999.0	-9999.0
8.858	11.88	11.92	0.02	3.46	0.17	114.6	0.514	0.000	0.514	4.6	6.4	5.0E-05	30.0	34.0	0.760	8.3	-9999.0	-9999.0
8.924	12.97	13.01	0.01	3.25	0.08	114.6	0.517	0.000	0.517	5.0	6.9	5.0E-05	30.0	34.0	0.833	9.5	-9999.0	-9999.0
8.989	13.29	13.33	0.02	3.10	0.15	114.6	0.521	0.000	0.521	5.1	7.1	5.0E-05	30.0	34.0	0.854	9.8	-9999.0	-9999.0
9.055	14.82	14.85	0.01	3.12	0.07	114.6	0.525	0.000	0.525	5.7	7.9	5.0E-05	30.0	36.0	0.955	10.0	-9999.0	-9999.0
9.121	15.53	15.56	0.03	2.63	0.19	114.6	0.529	0.000	0.529	6.0	8.2	5.0E-05	30.0	36.0	1.002	10.0	-9999.0	-9999.0
9.186	17.63	17.66	0.02	2.80	0.11	117.7	0.533	0.000	0.533	5.6	7.7	5.0E-04	30.0	36.0	-9999.0	-9999.0	-9999.0	-9999.0
9.252	21.46	21.50	0.06	3.87	0.28	117.7	0.536	0.000	0.536	6.9	9.4	5.0E-04	31.5	38.0	-9999.0	-9999.0	-9999.0	-9999.0
9.317	25.42	25.45	0.04	3.06	0.16	117.7	0.540	0.000	0.540	8.1	11.1	5.0E-04	36.3	38.0	-9999.0	-9999.0	90.4	3.553
9.383	30.15	30.19	0.04	3.20	0.13	117.7	0.544	0.000	0.544	9.6	13.1	5.0E-04	41.0	40.0	-9999.0	-9999.0	99.2	3.287
9.449	33.35	33.38	0.03	3.14	0.09	117.7	0.548	0.000	0.548	10.7	14.4	5.0E-04	43.8	40.0	-9999.0	-9999.0	104.6	3.134
9.514	35.84	35.87	0.04	3.00	0.11	120.9	0.552	0.000	0.552	8.6	11.6	5.0E-03	45.8	40.0	-9999.0	-9999.0	108.6	3.028
9.580	38.26	38.30	0.04	3.74	0.10	120.9	0.556	0.000	0.556	9.2	12.3	5.0E-03	47.6	40.0	-9999.0	-9999.0	112.3	2.933
9.646	37.69	37.73	0.04	3.18	0.11	120.9	0.560	0.000	0.560	9.0	12.1	5.0E-03	47.0	40.0	-9999.0	-9999.0	111.7	2.961
9.711	38.77	38.81	0.05	2.92	0.13	120.9	0.564	0.000	0.564	9.3	12.4	5.0E-03	47.7	40.0	-9999.0	-9999.0	113.5	2.924
9.777	36.35	36.38	0.05	2.92	0.14	120.9	0.568	0.000	0.568	8.7	11.6	5.0E-03	45.8	40.0	-9999.0	-9999.0	110.1	3.028
9.842	35.71	35.73	0.06	2.41	0.17	120.9	0.572	0.000	0.572	8.6	11.3	5.0E-03	45.2	40.0	-9999.0	-9999.0	109.4	3.061
9.908	34.24	34.27	0.05	2.80	0.15	120.9	0.576	0.000	0.576	8.2	10.8	5.0E-03	43.9	40.0	-9999.0	-9999.0	107.3	3.131
9.974	32.90	32.93	0.05	3.04	0.15	117.7	0.580	0.000	0.580	10.5	13.8	5.0E-04	42.6	40.0	-9999.0	-9999.0	105.4	3.199
10.039	32.13	32.16	0.04	3.40	0.12	117.7	0.583	0.000	0.583	10.3	13.4	5.0E-04	41.9	40.0	-9999.0	-9999.0	104.3	3.242

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
10.105	31.43	31.46	0.03	3.35	0.10	117.7	0.587	0.000	0.587	10.0	13.1	5.0E-04	41.1	38.0	-9999.0	-9999.0	103.3	3.282
10.170	30.02	30.06	0.06	3.10	0.20	117.7	0.591	0.000	0.591	9.6	12.5	5.0E-04	39.7	38.0	-9999.0	-9999.0	101.0	3.360
10.236	28.81	28.85	0.05	3.31	0.17	117.7	0.595	0.000	0.595	9.2	11.9	5.0E-04	38.5	38.0	-9999.0	-9999.0	99.0	3.431
10.302	27.60	27.63	0.07	3.33	0.25	117.7	0.599	0.000	0.599	8.8	11.4	5.0E-04	37.1	38.0	-9999.0	-9999.0	96.8	3.504
10.367	27.79	27.82	0.06	3.35	0.22	117.7	0.603	0.000	0.603	8.9	11.4	5.0E-04	37.2	38.0	-9999.0	-9999.0	97.3	3.498
10.433	26.90	26.94	0.05	4.13	0.19	117.7	0.607	0.000	0.607	8.6	11.0	5.0E-04	36.2	38.0	-9999.0	-9999.0	95.8	3.555
10.499	26.32	26.37	0.06	4.48	0.23	117.7	0.611	0.000	0.611	8.4	10.8	5.0E-04	35.5	38.0	-9999.0	-9999.0	94.8	3.593
10.564	26.06	26.11	0.06	4.54	0.23	117.7	0.614	0.000	0.614	8.3	10.6	5.0E-04	35.1	38.0	-9999.0	-9999.0	94.4	3.614
10.630	24.72	24.76	0.12	3.44	0.49	117.7	0.618	0.000	0.618	7.9	10.1	5.0E-04	33.5	38.0	-9999.0	-9999.0	91.7	3.702
10.695	25.23	25.28	0.09	4.58	0.36	117.7	0.622	0.000	0.622	8.1	10.2	5.0E-04	34.0	38.0	-9999.0	-9999.0	92.9	3.674
10.761	24.02	24.07	0.07	4.37	0.29	117.7	0.626	0.000	0.626	7.7	9.7	5.0E-04	32.5	38.0	-9999.0	-9999.0	-9999.0	-9999.0
10.827	22.87	22.90	0.07	3.40	0.31	117.7	0.630	0.000	0.630	7.3	9.2	5.0E-04	31.0	38.0	-9999.0	-9999.0	-9999.0	-9999.0
10.892	24.59	24.63	0.04	3.52	0.16	117.7	0.634	0.000	0.634	7.9	9.9	5.0E-04	33.0	38.0	-9999.0	-9999.0	91.8	3.729
10.958	23.13	23.18	0.05	4.56	0.22	117.7	0.638	0.000	0.638	7.4	9.3	5.0E-04	31.2	38.0	-9999.0	-9999.0	-9999.0	-9999.0
11.023	23.83	23.87	0.04	4.11	0.17	117.7	0.641	0.000	0.641	7.6	9.5	5.0E-04	32.0	38.0	-9999.0	-9999.0	-9999.0	-9999.0
11.089	23.89	23.93	0.04	4.09	0.17	117.7	0.645	0.000	0.645	7.6	9.5	5.0E-04	31.9	38.0	-9999.0	-9999.0	-9999.0	-9999.0
11.155	22.23	22.27	0.03	3.68	0.14	117.7	0.649	0.000	0.649	7.1	8.8	5.0E-04	30.0	36.0	-9999.0	-9999.0	-9999.0	-9999.0
11.220	22.61	22.66	0.21	4.03	0.93	117.7	0.653	0.000	0.653	7.2	9.0	5.0E-04	30.2	36.0	-9999.0	-9999.0	-9999.0	-9999.0
11.286	22.68	22.72	0.18	4.46	0.79	117.7	0.657	0.000	0.657	7.3	9.0	5.0E-04	30.2	36.0	-9999.0	-9999.0	-9999.0	-9999.0
11.352	22.87	22.91	0.11	3.93	0.48	117.7	0.661	0.000	0.661	7.3	9.0	5.0E-04	30.4	36.0	-9999.0	-9999.0	-9999.0	-9999.0
11.417	23.19	23.23	0.05	3.99	0.22	117.7	0.665	0.000	0.665	7.4	9.1	5.0E-04	30.7	36.0	-9999.0	-9999.0	-9999.0	-9999.0
11.483	23.00	23.05	0.05	4.64	0.22	117.7	0.668	0.000	0.668	7.4	9.0	5.0E-04	30.4	36.0	-9999.0	-9999.0	-9999.0	-9999.0
11.548	21.46	21.49	0.04	2.55	0.19	117.7	0.672	0.000	0.672	6.9	8.4	5.0E-04	30.0	36.0	-9999.0	-9999.0	-9999.0	-9999.0
11.614	21.97	22.01	0.05	3.70	0.23	117.7	0.676	0.000	0.676	7.0	8.5	5.0E-04	30.0	36.0	-9999.0	-9999.0	-9999.0	-9999.0
11.680	23.83	23.87	0.03	4.01	0.13	117.7	0.680	0.000	0.680	7.6	9.2	5.0E-04	31.1	36.0	-9999.0	-9999.0	-9999.0	-9999.0
11.745	21.46	21.51	0.04	4.01	0.19	117.7	0.684	0.000	0.684	6.9	8.3	5.0E-04	30.0	36.0	-9999.0	-9999.0	-9999.0	-9999.0
11.811	20.82	20.87	0.02	4.88	0.10	117.7	0.688	0.000	0.688	6.7	8.0	5.0E-04	30.0	36.0	-9999.0	-9999.0	-9999.0	-9999.0
11.876	21.46	21.52	0.01	5.23	0.05	117.7	0.692	0.000	0.692	6.9	8.3	5.0E-04	30.0	36.0	-9999.0	-9999.0	-9999.0	-9999.0
11.942	20.51	20.56	0.01	4.21	0.05	117.7	0.696	0.000	0.696	6.6	7.9	5.0E-04	30.0	36.0	-9999.0	-9999.0	-9999.0	-9999.0
12.008	20.19	20.24	0.02	4.52	0.10	117.7	0.699	0.000	0.699	6.5	7.7	5.0E-04	30.0	36.0	-9999.0	-9999.0	-9999.0	-9999.0
12.073	19.87	19.92	0.02	4.50	0.10	117.7	0.703	0.000	0.703	6.4	7.6	5.0E-04	30.0	36.0	-9999.0	-9999.0	-9999.0	-9999.0
12.139	19.61	19.66	0.04	4.62	0.20	117.7	0.707	0.000	0.707	6.3	7.5	5.0E-04	30.0	36.0	-9999.0	-9999.0	-9999.0	-9999.0
12.205	18.98	19.03	0.01	4.94	0.05	117.7	0.711	0.000	0.711	6.1	7.2	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
12.270	19.10	19.14	0.05	4.11	0.26	117.7	0.715	0.000	0.715	6.1	7.2	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
12.336	19.42	19.46	0.03	3.68	0.15	117.7	0.719	0.000	0.719	6.2	7.3	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
12.401	19.93	20.00	0.08	6.24	0.40	117.7	0.723	0.000	0.723	6.4	7.5	5.0E-04	30.0	36.0	-9999.0	-9999.0	-9999.0	-9999.0
12.467	19.68	19.73	0.04	4.86	0.20	117.7	0.726	0.000	0.726	6.3	7.4	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
12.533	18.01	18.06	0.03	4.54	0.17	117.7	0.730	0.000	0.730	5.8	6.7	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
12.598	20.06	20.11	0.01	4.31	0.05	117.7	0.734	0.000	0.734	6.4	7.5	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
12.664	17.37	17.42	0.01	4.29	0.06	117.7	0.738	0.000	0.738	5.6	6.5	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
12.730	16.42	16.48	0.01	5.27	0.06	117.7	0.742	0.000	0.742	5.3	6.1	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
12.795	16.93	16.98	0.02	4.90	0.12	117.7	0.746	0.000	0.746	5.4	6.3	5.0E-04	30.0	34.0	-9999.0	-9999.0	-9999.0	-9999.0
12.861	14.11	14.15	0.13	3.27	0.92	114.6	0.750	0.000	0.750	5.4	6.3	5.0E-05	30.0	32.0	0.893	6.0	-9999.0	-9999.0
12.926	18.52	18.57	0.18	4.09	0.97	114.6	0.753	0.000	0.753	7.1	8.2	5.0E-05	30.0	34.0	1.188	9.2	-9999.0	-9999.0
12.992	22.29	22.34	0.30	4.35	1.35	114.6	0.757	0.000	0.757	8.6	9.8	5.0E-05	30.0	36.0	1.439	10.0	-9999.0	-9999.0
13.058	26.57	26.62	0.45	3.78	1.69	114.6	0.761	0.002	0.759	10.2	11.7	5.0E-05	32.7	36.0	1.724	10.0	-9999.0	-9999.0
13.123	38.13	38.19	0.39	5.09	1.02	117.7	0.765	0.004	0.761	12.2	14.0	5.0E-04	43.0	38.0	-9999.0	-9999.0	121.4	3.180
13.189	53.15	53.18	0.43	3.33	0.81	120.9	0.769	0.006	0.763	12.7	14.6	5.0E-03	52.4	40.0	-9999.0	-9999.0	143.0	2.688
13.254	59.66	59.72	0.45	4.76	0.76	120.9	0.773	0.008	0.765	14.3	16.4	5.0E-03	55.7	40.0	-9999.0	-9999.0	151.6	2.539
13.320	72.64	72.69	0.56	5.03	0.77	120.9	0.777	0.010	0.767	17.4	19.9	5.0E-03	61.3	42.0	-9999.0	-9999.0	168.9	2.324
13.386	71.61	71.66	0.67	4.42	0.94	120.9	0.780	0.012	0.768	17.2	19.6	5.0E-03	60.9	42.0	-9999.0	-9999.0	167.6	2.339

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
13.451	59.72	59.77	0.77	4.52	1.29	117.7	0.784	0.014	0.770	19.1	21.7	5.0E-04	55.6	40.0	-9999.0	-9999.0	152.0	2.543
13.517	48.36	48.40	0.83	3.87	1.72	117.7	0.788	0.016	0.772	15.5	17.6	5.0E-04	49.6	40.0	-9999.0	-9999.0	137.0	2.830
13.583	41.97	42.03	0.91	5.37	2.17	114.6	0.792	0.018	0.774	16.1	18.3	5.0E-05	45.5	40.0	2.749	10.0	127.9	3.044
13.648	37.75	37.88	1.10	12.28	2.91	114.6	0.796	0.020	0.776	14.5	16.5	5.0E-05	42.5	38.0	2.473	10.0	121.5	3.208
13.714	39.09	39.31	1.19	19.97	3.03	114.6	0.800	0.022	0.777	15.1	17.1	5.0E-05	43.5	38.0	2.567	10.0	123.9	3.152
13.779	47.60	47.86	1.19	24.14	2.49	114.6	0.803	0.024	0.779	18.3	20.8	5.0E-05	49.1	40.0	3.137	10.0	136.5	2.853
13.845	58.64	58.82	1.12	16.61	1.91	117.7	0.807	0.026	0.781	18.8	21.3	5.0E-04	55.0	40.0	-9999.0	-9999.0	151.2	2.571
13.911	58.58	58.73	1.08	13.79	1.84	117.7	0.811	0.028	0.783	18.7	21.2	5.0E-04	54.9	40.0	-9999.0	-9999.0	151.2	2.575
13.976	48.23	48.36	1.08	11.93	2.24	114.6	0.815	0.030	0.784	18.5	20.9	5.0E-05	49.3	40.0	3.169	10.0	137.5	2.843
14.042	36.73	36.86	1.01	11.85	2.75	114.6	0.819	0.033	0.786	14.1	15.9	5.0E-05	41.5	38.0	2.403	10.0	120.3	3.263
14.107	26.44	26.73	0.97	26.63	3.64	114.6	0.822	0.035	0.788	12.8	14.4	5.0E-06	-9999.0	-9999.0	1.727	10.0	-9999.0	-9999.0
14.173	20.38	21.02	0.92	59.40	4.39	114.6	0.826	0.037	0.789	13.4	15.1	5.0E-07	-9999.0	-9999.0	1.346	10.0	-9999.0	-9999.0
14.239	26.57	27.63	0.90	97.56	3.27	114.6	0.830	0.039	0.791	13.2	14.9	5.0E-06	-9999.0	-9999.0	1.787	10.0	-9999.0	-9999.0
14.304	37.62	38.58	0.93	88.91	2.42	114.6	0.834	0.041	0.793	14.8	16.6	5.0E-05	42.7	38.0	2.517	10.0	123.4	3.199
14.370	40.57	41.05	0.96	44.50	2.34	114.6	0.837	0.043	0.795	15.7	17.6	5.0E-05	44.4	38.0	2.681	10.0	127.4	3.104
14.436	39.93	40.31	1.00	35.77	2.49	114.6	0.841	0.045	0.796	15.4	17.3	5.0E-05	43.9	38.0	2.631	10.0	126.4	3.134
14.501	35.59	36.07	1.04	44.90	2.89	114.6	0.845	0.047	0.798	13.8	15.5	5.0E-05	40.7	38.0	2.348	10.0	119.5	3.312
14.567	31.05	31.62	0.98	53.45	3.11	114.6	0.849	0.049	0.800	15.1	16.9	5.0E-06	-9999.0	-9999.0	2.052	10.0	-9999.0	-9999.0
14.632	27.54	28.23	0.86	63.94	3.05	114.6	0.852	0.051	0.801	13.5	15.1	5.0E-06	-9999.0	-9999.0	1.825	10.0	-9999.0	-9999.0
14.698	25.17	25.97	0.83	74.21	3.20	114.6	0.856	0.053	0.803	12.4	13.9	5.0E-06	-9999.0	-9999.0	1.674	10.0	-9999.0	-9999.0
14.764	23.89	24.77	0.76	81.68	3.08	114.6	0.860	0.055	0.805	11.9	13.2	5.0E-06	-9999.0	-9999.0	1.594	10.0	-9999.0	-9999.0
14.829	25.55	26.41	0.68	79.47	2.58	114.6	0.864	0.057	0.807	10.1	11.3	5.0E-05	31.6	36.0	1.703	10.0	-9999.0	-9999.0
14.895	26.19	26.98	0.65	73.03	2.41	114.6	0.867	0.059	0.808	10.3	11.5	5.0E-05	32.2	36.0	1.741	10.0	-9999.0	-9999.0
14.960	25.04	25.84	0.63	74.09	2.44	114.6	0.871	0.061	0.810	9.9	11.0	5.0E-05	30.9	36.0	1.665	10.0	-9999.0	-9999.0
15.026	22.35	23.24	0.56	81.97	2.42	114.6	0.875	0.063	0.812	8.9	9.9	5.0E-05	30.0	36.0	1.491	10.0	-9999.0	-9999.0
15.092	21.72	22.72	0.49	92.24	2.16	114.6	0.879	0.065	0.813	8.7	9.7	5.0E-05	30.0	36.0	1.456	10.0	-9999.0	-9999.0
15.157	21.46	22.49	0.70	95.15	3.12	114.6	0.883	0.067	0.815	10.8	11.9	5.0E-06	-9999.0	-9999.0	1.441	10.0	-9999.0	-9999.0
15.223	22.87	23.87	0.74	93.15	3.11	114.6	0.886	0.069	0.817	11.4	12.6	5.0E-06	-9999.0	-9999.0	1.532	10.0	-9999.0	-9999.0
15.289	24.21	25.11	0.78	83.79	3.11	114.6	0.890	0.071	0.819	12.0	13.3	5.0E-06	-9999.0	-9999.0	1.615	10.0	-9999.0	-9999.0
15.354	26.32	27.33	0.89	93.45	3.26	114.6	0.894	0.074	0.820	13.1	14.5	5.0E-06	-9999.0	-9999.0	1.763	10.0	-9999.0	-9999.0
15.420	31.05	32.28	1.02	114.22	3.17	114.6	0.898	0.076	0.822	15.5	17.0	5.0E-06	-9999.0	-9999.0	2.092	10.0	-9999.0	-9999.0
15.485	49.25	49.84	1.05	55.01	2.11	114.6	0.901	0.078	0.824	19.1	21.0	5.0E-05	49.5	40.0	3.263	10.0	141.7	2.843
15.551	48.17	48.68	1.07	47.91	2.20	114.6	0.905	0.080	0.825	18.6	20.5	5.0E-05	48.8	40.0	3.185	10.0	140.2	2.880
15.617	42.73	43.34	1.10	55.98	2.54	114.6	0.909	0.082	0.827	16.6	18.3	5.0E-05	45.4	38.0	2.829	10.0	132.5	3.058
15.682	35.14	35.55	1.03	38.53	2.90	114.6	0.913	0.084	0.829	13.6	15.0	5.0E-05	39.7	38.0	2.309	10.0	119.9	3.373
15.748	30.21	30.62	0.95	37.69	3.11	114.6	0.916	0.086	0.831	14.7	16.1	5.0E-06	-9999.0	-9999.0	1.980	10.0	-9999.0	-9999.0
15.813	27.85	28.27	0.85	39.19	3.01	114.6	0.920	0.088	0.832	13.5	14.8	5.0E-06	-9999.0	-9999.0	1.823	10.0	-9999.0	-9999.0
15.879	27.60	28.02	0.75	39.15	2.68	114.6	0.924	0.090	0.834	10.7	11.8	5.0E-05	32.8	36.0	1.806	10.0	105.2	3.756
15.945	28.87	29.27	0.65	37.14	2.23	114.6	0.928	0.092	0.836	11.2	12.3	5.0E-05	34.0	36.0	1.890	10.0	108.0	3.690
16.010	27.79	28.14	0.64	32.85	2.28	114.6	0.931	0.094	0.837	10.8	11.8	5.0E-05	32.9	36.0	1.814	10.0	105.6	3.754
16.076	21.97	22.33	0.59	33.38	2.65	114.6	0.935	0.096	0.839	10.7	11.7	5.0E-06	-9999.0	-9999.0	1.427	10.0	-9999.0	-9999.0
16.142	18.72	19.04	0.53	30.40	2.79	114.6	0.939	0.098	0.841	9.1	9.9	5.0E-06	-9999.0	-9999.0	1.207	8.0	-9999.0	-9999.0
16.207	15.59	15.97	0.43	35.20	2.70	114.6	0.943	0.100	0.843	7.6	8.3	5.0E-06	-9999.0	-9999.0	1.002	5.9	-9999.0	-9999.0
16.273	13.54	13.96	0.37	38.18	2.66	114.6	0.946	0.102	0.844	6.7	7.3	5.0E-06	-9999.0	-9999.0	0.867	4.7	-9999.0	-9999.0
16.338	10.86	11.27	0.43	38.22	3.82	111.4	0.950	0.104	0.846	10.8	11.7	5.0E-08	-9999.0	-9999.0	0.688	3.4	-9999.0	-9999.0
16.404	8.43	8.92	0.70	45.33	7.87	111.4	0.954	0.106	0.847	8.5	9.3	5.0E-08	-9999.0	-9999.0	0.531	2.3	-9999.0	-9999.0
16.470	7.22	7.71	0.62	45.66	8.06	82.7	0.957	0.108	0.849	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0	-9999.0
16.535	6.33	6.91	0.46	53.74	6.68	111.4	0.960	0.110	0.850	6.6	7.2	5.0E-08	-9999.0	-9999.0	0.396	1.6	-9999.0	-9999.0
16.601	6.78	7.44	0.56	61.67	7.54	111.4	0.964	0.112	0.851	7.1	7.7	5.0E-08	-9999.0	-9999.0	0.432	1.8	-9999.0	-9999.0
16.666	32.45	33.18	0.61	67.53	1.84	114.6	0.968	0.114	0.853	12.7	13.8	5.0E-05	37.3	38.0	2.147	10.0	116.6	3.513
16.732	167.37	167.62	1.35	23.88	0.81	124.1	0.971	0.117	0.855	32.1	34.7	5.0E-02	83.7	44.0	-9999.0	-9999.0	317.3	1.893

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
16.798	215.09	215.18	2.83	7.98	1.31	124.1	0.975	0.119	0.857	41.2	44.5	5.0E-02	90.8	46.0	-9999.0	-9999.0	-9999.0	-9999.0
16.863	184.24	184.24	3.03	0.22	1.64	120.9	0.980	0.121	0.859	44.1	47.6	5.0E-03	86.4	46.0	-9999.0	-9999.0	365.9	1.986
16.929	154.14	154.13	2.53	-1.72	1.64	120.9	0.983	0.123	0.861	36.9	39.8	5.0E-03	81.2	44.0	-9999.0	-9999.0	291.6	1.892
16.995	115.24	115.31	2.29	6.26	1.98	117.7	0.987	0.125	0.863	36.8	39.6	5.0E-04	72.9	44.0	-9999.0	-9999.0	235.2	2.039
17.060	94.55	94.62	2.20	6.13	2.32	117.7	0.991	0.127	0.864	30.2	32.5	5.0E-04	67.2	42.0	-9999.0	-9999.0	205.2	2.169
17.126	169.99	169.99	1.91	-0.16	1.13	124.1	0.995	0.129	0.866	32.6	35.0	5.0E-02	83.9	44.0	-9999.0	-9999.0	322.5	1.897
17.191	76.28	76.23	1.23	-3.97	1.62	117.7	0.999	0.131	0.868	24.3	26.1	5.0E-04	60.9	42.0	-9999.0	-9999.0	179.6	2.356
17.257	58.39	58.30	1.07	-8.63	1.84	117.7	1.003	0.133	0.870	18.6	20.0	5.0E-04	53.2	40.0	-9999.0	-9999.0	155.8	2.672
17.323	45.42	45.29	1.03	-12.33	2.28	114.6	1.007	0.135	0.872	17.3	18.6	5.0E-05	45.9	38.0	2.952	10.0	137.7	3.042
17.388	32.52	32.40	1.01	-10.77	3.12	114.6	1.011	0.137	0.874	15.5	16.6	5.0E-06	-9999.0	-9999.0	2.093	10.0	-9999.0	-9999.0
17.454	33.09	33.00	0.92	-7.89	2.79	114.6	1.014	0.139	0.875	12.6	13.5	5.0E-05	36.8	38.0	2.133	10.0	117.1	3.548
17.519	17.25	17.24	0.96	-1.29	5.58	111.4	1.018	0.141	0.877	16.5	17.6	5.0E-08	-9999.0	-9999.0	1.081	6.3	-9999.0	-9999.0
17.585	19.23	19.23	1.06	0.18	5.53	111.4	1.022	0.143	0.879	18.4	19.6	5.0E-08	-9999.0	-9999.0	1.214	7.5	-9999.0	-9999.0
17.651	21.53	21.56	1.04	2.39	4.84	111.4	1.025	0.145	0.880	20.6	22.0	5.0E-08	-9999.0	-9999.0	1.369	9.0	-9999.0	-9999.0
17.716	22.75	22.79	0.88	4.23	3.87	114.6	1.029	0.147	0.882	14.6	15.5	5.0E-07	-9999.0	-9999.0	1.451	9.9	-9999.0	-9999.0
17.782	23.00	23.05	0.66	5.43	2.87	114.6	1.033	0.149	0.884	11.0	11.7	5.0E-06	-9999.0	-9999.0	1.468	10.0	-9999.0	-9999.0
17.848	21.65	21.64	0.63	-1.15	2.92	114.6	1.037	0.151	0.885	10.4	11.0	5.0E-06	-9999.0	-9999.0	1.374	9.0	-9999.0	-9999.0
17.913	21.33	21.39	0.59	5.35	2.77	114.6	1.040	0.153	0.887	10.2	10.9	5.0E-06	-9999.0	-9999.0	1.357	8.8	-9999.0	-9999.0
17.979	21.40	21.47	0.54	6.50	2.52	114.6	1.044	0.155	0.889	10.3	10.9	5.0E-06	-9999.0	-9999.0	1.362	8.8	-9999.0	-9999.0
18.044	20.25	20.33	0.46	7.48	2.27	114.6	1.048	0.158	0.890	9.7	10.3	5.0E-06	-9999.0	-9999.0	1.285	8.0	-9999.0	-9999.0
18.110	19.30	19.39	0.40	8.57	2.07	114.6	1.052	0.160	0.892	7.4	7.9	5.0E-05	30.0	34.0	1.223	7.4	-9999.0	-9999.0
18.176	17.88	18.01	0.35	11.91	1.95	114.6	1.055	0.162	0.894	6.9	7.3	5.0E-05	30.0	32.0	1.130	6.5	-9999.0	-9999.0
18.241	16.55	16.69	0.32	13.04	1.92	114.6	1.059	0.164	0.896	6.4	6.8	5.0E-05	30.0	32.0	1.042	5.7	-9999.0	-9999.0
18.307	14.95	15.11	0.28	15.39	1.86	114.6	1.063	0.166	0.897	7.2	7.6	5.0E-06	-9999.0	-9999.0	0.937	4.9	-9999.0	-9999.0
18.372	13.73	13.90	0.31	15.72	2.24	114.6	1.067	0.168	0.899	6.7	7.0	5.0E-06	-9999.0	-9999.0	0.856	4.2	-9999.0	-9999.0
18.438	12.27	12.45	0.30	16.67	2.42	114.6	1.070	0.170	0.901	6.0	6.3	5.0E-06	-9999.0	-9999.0	0.759	3.5	-9999.0	-9999.0
18.504	10.93	11.14	0.26	19.97	2.34	114.6	1.074	0.172	0.902	5.3	5.6	5.0E-06	-9999.0	-9999.0	0.671	3.0	-9999.0	-9999.0
18.569	11.31	11.56	0.24	23.17	2.08	114.6	1.078	0.174	0.904	5.5	5.8	5.0E-06	-9999.0	-9999.0	0.699	3.1	-9999.0	-9999.0
18.635	10.35	10.59	0.23	22.56	2.18	114.6	1.082	0.176	0.906	5.1	5.3	5.0E-06	-9999.0	-9999.0	0.634	2.7	-9999.0	-9999.0
18.701	10.93	11.10	0.22	16.00	1.99	114.6	1.085	0.178	0.908	5.3	5.6	5.0E-06	-9999.0	-9999.0	0.668	2.9	-9999.0	-9999.0
18.766	10.74	11.01	0.23	24.96	2.09	114.6	1.089	0.180	0.909	5.3	5.5	5.0E-06	-9999.0	-9999.0	0.661	2.9	-9999.0	-9999.0
18.832	10.80	11.09	0.22	27.45	1.99	114.6	1.093	0.182	0.911	5.3	5.6	5.0E-06	-9999.0	-9999.0	0.667	2.9	-9999.0	-9999.0
18.897	10.09	10.35	0.23	23.28	2.23	114.6	1.097	0.184	0.913	5.0	5.2	5.0E-06	-9999.0	-9999.0	0.617	2.6	-9999.0	-9999.0
18.963	9.39	9.64	0.22	23.32	2.29	114.6	1.101	0.186	0.914	4.6	4.8	5.0E-06	-9999.0	-9999.0	0.570	2.3	-9999.0	-9999.0
19.029	9.07	9.28	0.24	19.34	2.59	114.6	1.104	0.188	0.916	5.9	6.2	5.0E-07	-9999.0	-9999.0	0.545	2.2	-9999.0	-9999.0
19.094	9.01	9.20	0.25	17.21	2.72	114.6	1.108	0.190	0.918	5.9	6.1	5.0E-07	-9999.0	-9999.0	0.539	2.1	-9999.0	-9999.0
19.160	7.60	7.78	0.27	16.75	3.48	111.4	1.112	0.192	0.919	7.5	7.8	5.0E-08	-9999.0	-9999.0	0.445	1.7	-9999.0	-9999.0
19.225	7.86	8.03	0.29	16.02	3.62	111.4	1.115	0.194	0.921	7.7	8.0	5.0E-08	-9999.0	-9999.0	0.461	1.7	-9999.0	-9999.0
19.291	7.16	7.33	0.28	15.96	3.83	111.4	1.119	0.196	0.923	7.0	7.3	5.0E-08	-9999.0	-9999.0	0.414	1.5	-9999.0	-9999.0
19.357	7.48	7.66	0.29	17.01	3.79	111.4	1.123	0.198	0.924	7.3	7.6	5.0E-08	-9999.0	-9999.0	0.436	1.6	-9999.0	-9999.0
19.422	7.48	7.65	0.30	16.21	3.93	111.4	1.126	0.201	0.926	7.3	7.6	5.0E-08	-9999.0	-9999.0	0.435	1.6	-9999.0	-9999.0
19.488	7.60	7.80	0.29	18.47	3.73	111.4	1.130	0.203	0.927	7.5	7.8	5.0E-08	-9999.0	-9999.0	0.445	1.7	-9999.0	-9999.0
19.554	7.92	8.10	0.30	16.99	3.71	111.4	1.134	0.205	0.929	7.8	8.1	5.0E-08	-9999.0	-9999.0	0.465	1.7	-9999.0	-9999.0
19.619	7.41	7.61	0.31	19.01	4.08	111.4	1.137	0.207	0.931	7.3	7.6	5.0E-08	-9999.0	-9999.0	0.432	1.6	-9999.0	-9999.0
19.685	8.56	8.78	0.32	20.15	3.65	111.4	1.141	0.209	0.932	8.4	8.7	5.0E-08	-9999.0	-9999.0	0.509	1.9	-9999.0	-9999.0
19.750	8.69	8.88	0.33	17.52	3.73	111.4	1.145	0.211	0.934	8.5	8.8	5.0E-08	-9999.0	-9999.0	0.516	2.0	-9999.0	-9999.0
19.816	8.88	9.09	0.34	19.32	3.75	111.4	1.148	0.213	0.935	8.7	9.0	5.0E-08	-9999.0	-9999.0	0.529	2.0	-9999.0	-9999.0
19.882	9.45	9.65	0.34	18.68	3.53	111.4	1.152	0.215	0.937	9.2	9.6	5.0E-08	-9999.0	-9999.0	0.567	2.2	-9999.0	-9999.0
19.947	9.96	10.16	0.35	17.74	3.45	114.6	1.156	0.217	0.939	6.5	6.7	5.0E-07	-9999.0	-9999.0	0.600	2.4	-9999.0	-9999.0
20.013	10.09	10.27	0.36	16.35	3.51	114.6	1.159	0.219	0.940	6.6	6.8	5.0E-07	-9999.0	-9999.0	0.607	2.4	-9999.0	-9999.0
20.078	10.93	11.10	0.40	16.10	3.61	114.6	1.163	0.221	0.942	7.1	7.3	5.0E-07	-9999.0	-9999.0	0.662	2.7	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
20.144	10.67	10.80	0.45	12.31	4.18	111.4	1.167	0.223	0.944	10.3	10.6	5.0E-08	-9999.0	-9999.0	0.642	2.6	-9999.0	-9999.0
20.210	10.48	10.58	0.46	9.44	4.36	111.4	1.171	0.225	0.945	10.1	10.4	5.0E-08	-9999.0	-9999.0	0.627	2.5	-9999.0	-9999.0
20.275	10.48	10.59	0.43	10.24	4.07	111.4	1.174	0.227	0.947	10.1	10.4	5.0E-08	-9999.0	-9999.0	0.627	2.5	-9999.0	-9999.0
20.341	10.48	10.61	0.42	12.35	3.97	111.4	1.178	0.229	0.949	10.2	10.4	5.0E-08	-9999.0	-9999.0	0.629	2.5	-9999.0	-9999.0
20.407	10.74	10.83	0.45	8.89	4.16	111.4	1.182	0.231	0.950	10.4	10.6	5.0E-08	-9999.0	-9999.0	0.643	2.6	-9999.0	-9999.0
20.472	11.25	11.39	0.48	12.84	4.23	111.4	1.185	0.233	0.952	10.9	11.2	5.0E-08	-9999.0	-9999.0	0.680	2.8	-9999.0	-9999.0
20.538	11.69	11.82	0.52	12.29	4.41	111.4	1.189	0.235	0.953	11.3	11.6	5.0E-08	-9999.0	-9999.0	0.709	3.0	-9999.0	-9999.0
20.603	12.07	12.08	0.53	1.06	4.40	111.4	1.192	0.237	0.955	11.6	11.8	5.0E-08	-9999.0	-9999.0	0.726	3.0	-9999.0	-9999.0
20.669	11.95	12.02	0.57	6.48	4.75	111.4	1.196	0.239	0.957	11.5	11.8	5.0E-08	-9999.0	-9999.0	0.722	3.0	-9999.0	-9999.0
20.735	12.01	12.08	0.59	6.42	4.90	111.4	1.200	0.241	0.958	11.6	11.8	5.0E-08	-9999.0	-9999.0	0.725	3.0	-9999.0	-9999.0
20.800	12.33	12.45	0.59	11.06	4.75	111.4	1.203	0.244	0.960	11.9	12.2	5.0E-08	-9999.0	-9999.0	0.750	3.2	-9999.0	-9999.0
20.866	12.39	12.55	0.61	14.66	4.87	111.4	1.207	0.246	0.962	12.0	12.3	5.0E-08	-9999.0	-9999.0	0.756	3.2	-9999.0	-9999.0
20.932	12.71	12.85	0.62	12.49	4.84	111.4	1.211	0.248	0.963	12.3	12.5	5.0E-08	-9999.0	-9999.0	0.776	3.3	-9999.0	-9999.0
20.997	12.71	12.84	0.63	11.83	4.92	111.4	1.214	0.250	0.965	12.3	12.5	5.0E-08	-9999.0	-9999.0	0.775	3.3	-9999.0	-9999.0
21.063	12.46	12.58	0.63	11.40	5.02	111.4	1.218	0.252	0.966	12.1	12.3	5.0E-08	-9999.0	-9999.0	0.758	3.2	-9999.0	-9999.0
21.128	12.65	12.74	0.63	8.30	4.96	111.4	1.222	0.254	0.968	12.2	12.4	5.0E-08	-9999.0	-9999.0	0.768	3.2	-9999.0	-9999.0
21.194	12.52	12.61	0.66	7.98	5.25	111.4	1.225	0.256	0.970	12.1	12.3	5.0E-08	-9999.0	-9999.0	0.759	3.2	-9999.0	-9999.0
21.260	12.71	12.81	0.68	9.26	5.32	111.4	1.229	0.258	0.971	12.3	12.5	5.0E-08	-9999.0	-9999.0	0.772	3.2	-9999.0	-9999.0
21.325	12.07	12.19	0.74	11.42	6.08	111.4	1.233	0.260	0.973	11.7	11.8	5.0E-08	-9999.0	-9999.0	0.731	3.0	-9999.0	-9999.0
21.391	11.37	11.49	0.75	11.26	6.54	111.4	1.236	0.262	0.974	11.0	11.1	5.0E-08	-9999.0	-9999.0	0.684	2.7	-9999.0	-9999.0
21.456	11.50	11.55	0.72	5.09	6.25	111.4	1.240	0.264	0.976	11.1	11.2	5.0E-08	-9999.0	-9999.0	0.688	2.7	-9999.0	-9999.0
21.522	11.69	11.75	0.69	6.15	5.88	111.4	1.244	0.266	0.978	11.3	11.4	5.0E-08	-9999.0	-9999.0	0.701	2.8	-9999.0	-9999.0
21.588	11.37	11.42	0.69	4.68	6.06	111.4	1.247	0.268	0.979	10.9	11.1	5.0E-08	-9999.0	-9999.0	0.678	2.7	-9999.0	-9999.0
21.653	10.54	10.62	0.68	8.16	6.42	111.4	1.251	0.270	0.981	10.2	10.3	5.0E-08	-9999.0	-9999.0	0.625	2.4	-9999.0	-9999.0
21.719	10.48	10.55	0.63	7.29	5.98	111.4	1.255	0.272	0.982	10.1	10.2	5.0E-08	-9999.0	-9999.0	0.620	2.4	-9999.0	-9999.0
21.785	9.77	9.83	0.58	4.78	5.92	111.4	1.258	0.274	0.984	9.4	9.5	5.0E-08	-9999.0	-9999.0	0.571	2.1	-9999.0	-9999.0
21.850	9.01	9.04	0.55	2.57	6.10	111.4	1.262	0.276	0.986	8.7	8.7	5.0E-08	-9999.0	-9999.0	0.519	1.9	-9999.0	-9999.0
21.916	8.75	8.80	0.51	4.11	5.81	111.4	1.266	0.278	0.987	8.4	8.5	5.0E-08	-9999.0	-9999.0	0.502	1.8	-9999.0	-9999.0
21.981	7.86	7.97	0.49	9.99	6.17	111.4	1.269	0.280	0.989	7.6	7.7	5.0E-08	-9999.0	-9999.0	0.447	1.5	-9999.0	-9999.0
22.047	8.11	8.19	0.47	7.85	5.75	111.4	1.273	0.282	0.990	7.8	7.9	5.0E-08	-9999.0	-9999.0	0.461	1.6	-9999.0	-9999.0
22.113	8.62	8.71	0.46	8.53	5.29	111.4	1.277	0.285	0.992	8.3	8.4	5.0E-08	-9999.0	-9999.0	0.496	1.7	-9999.0	-9999.0
22.178	8.69	8.77	0.47	7.58	5.37	111.4	1.280	0.287	0.994	8.4	8.4	5.0E-08	-9999.0	-9999.0	0.500	1.8	-9999.0	-9999.0
22.244	8.75	8.81	0.48	5.87	5.46	111.4	1.284	0.289	0.995	8.4	8.5	5.0E-08	-9999.0	-9999.0	0.502	1.8	-9999.0	-9999.0
22.309	8.11	8.16	0.49	4.68	6.02	111.4	1.287	0.291	0.997	7.8	7.8	5.0E-08	-9999.0	-9999.0	0.458	1.6	-9999.0	-9999.0
22.375	7.35	7.39	0.49	3.70	6.65	111.4	1.291	0.293	0.998	7.1	7.1	5.0E-08	-9999.0	-9999.0	0.406	1.4	-9999.0	-9999.0
22.441	7.22	7.27	0.47	5.21	6.48	111.4	1.295	0.295	1.000	7.0	7.0	5.0E-08	-9999.0	-9999.0	0.399	1.3	-9999.0	-9999.0
22.506	6.97	7.04	0.46	7.21	6.55	111.4	1.298	0.297	1.002	6.7	6.7	5.0E-08	-9999.0	-9999.0	0.383	1.3	-9999.0	-9999.0
22.572	6.90	7.00	0.42	9.91	6.01	111.4	1.302	0.299	1.003	6.7	6.7	5.0E-08	-9999.0	-9999.0	0.380	1.3	-9999.0	-9999.0
22.638	6.84	7.00	0.38	14.88	5.44	111.4	1.306	0.301	1.005	6.7	6.7	5.0E-08	-9999.0	-9999.0	0.379	1.3	-9999.0	-9999.0
22.703	7.86	8.05	0.37	17.88	4.61	111.4	1.309	0.303	1.006	7.7	7.7	5.0E-08	-9999.0	-9999.0	0.450	1.5	-9999.0	-9999.0
22.769	7.28	7.42	0.37	13.16	5.00	111.4	1.313	0.305	1.008	7.1	7.1	5.0E-08	-9999.0	-9999.0	0.407	1.4	-9999.0	-9999.0
22.834	7.48	7.63	0.36	13.96	4.73	111.4	1.317	0.307	1.010	7.3	7.3	5.0E-08	-9999.0	-9999.0	0.421	1.4	-9999.0	-9999.0
22.900	7.35	7.52	0.36	15.60	4.80	111.4	1.320	0.309	1.011	7.2	7.2	5.0E-08	-9999.0	-9999.0	0.413	1.4	-9999.0	-9999.0
22.966	7.73	7.82	0.36	8.50	4.61	111.4	1.324	0.311	1.013	7.5	7.4	5.0E-08	-9999.0	-9999.0	0.433	1.4	-9999.0	-9999.0
23.031	6.65	6.75	0.35	9.77	5.20	111.4	1.328	0.313	1.014	6.5	6.4	5.0E-08	-9999.0	-9999.0	0.362	1.2	-9999.0	-9999.0
23.097	6.46	6.59	0.34	12.82	5.17	111.4	1.331	0.315	1.016	6.3	6.3	5.0E-08	-9999.0	-9999.0	0.351	1.1	-9999.0	-9999.0
23.162	5.43	5.66	0.34	20.60	6.03	111.4	1.335	0.317	1.018	5.4	5.4	5.0E-08	-9999.0	-9999.0	0.288	0.9	-9999.0	-9999.0
23.228	6.00	6.22	0.32	20.17	5.16	111.4	1.339	0.319	1.019	6.0	5.9	5.0E-08	-9999.0	-9999.0	0.326	1.1	-9999.0	-9999.0
23.294	5.87	6.08	0.29	18.84	4.78	111.4	1.342	0.321	1.021	5.8	5.8	5.0E-08	-9999.0	-9999.0	0.316	1.0	-9999.0	-9999.0
23.359	5.94	6.16	0.28	19.54	4.56	111.4	1.346	0.323	1.023	5.9	5.8	5.0E-08	-9999.0	-9999.0	0.321	1.0	-9999.0	-9999.0
23.425	5.36	5.57	0.26	18.96	4.68	111.4	1.350	0.325	1.024	5.3	5.3	5.0E-08	-9999.0	-9999.0	0.281	0.9	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
23.491	4.85	5.08	0.24	21.53	4.73	111.4	1.353	0.328	1.026	4.9	4.8	5.0E-08	-9999.0	-9999.0	0.249	0.8	-9999.0	-9999.0
23.556	4.66	4.91	0.23	22.73	4.70	111.4	1.357	0.330	1.027	4.7	4.6	5.0E-08	-9999.0	-9999.0	0.237	0.8	-9999.0	-9999.0
23.622	4.47	4.74	0.20	24.51	4.23	111.4	1.361	0.332	1.029	4.5	4.5	5.0E-08	-9999.0	-9999.0	0.225	0.8	-9999.0	-9999.0
23.687	3.83	4.12	0.20	27.37	4.86	111.4	1.364	0.334	1.031	4.0	3.9	5.0E-08	-9999.0	-9999.0	0.184	0.7	-9999.0	-9999.0
23.753	3.96	4.31	0.18	32.67	4.18	111.4	1.368	0.336	1.032	4.1	4.1	5.0E-08	-9999.0	-9999.0	0.196	0.7	-9999.0	-9999.0
23.819	3.96	4.34	0.18	35.28	4.16	111.4	1.372	0.338	1.034	4.2	4.1	5.0E-08	-9999.0	-9999.0	0.198	0.7	-9999.0	-9999.0
23.884	4.60	5.13	0.18	48.49	3.52	111.4	1.375	0.340	1.035	4.9	4.8	5.0E-08	-9999.0	-9999.0	0.250	0.8	-9999.0	-9999.0
23.950	4.60	5.13	0.21	49.22	4.10	111.4	1.379	0.342	1.037	4.9	4.8	5.0E-08	-9999.0	-9999.0	0.250	0.8	-9999.0	-9999.0
24.015	5.43	5.99	0.25	51.22	4.19	111.4	1.383	0.344	1.039	5.7	5.6	5.0E-08	-9999.0	-9999.0	0.307	1.0	-9999.0	-9999.0
24.081	7.16	7.66	0.28	46.87	3.66	111.4	1.386	0.346	1.040	7.3	7.2	5.0E-08	-9999.0	-9999.0	0.419	1.3	-9999.0	-9999.0
24.147	10.09	10.46	0.35	33.93	3.35	114.6	1.390	0.348	1.042	6.7	6.5	5.0E-07	-9999.0	-9999.0	0.605	2.1	-9999.0	-9999.0
24.212	10.93	11.14	0.39	20.11	3.51	114.6	1.394	0.350	1.044	7.1	7.0	5.0E-07	-9999.0	-9999.0	0.650	2.3	-9999.0	-9999.0
24.278	11.82	12.08	0.44	24.34	3.65	114.6	1.397	0.352	1.045	7.7	7.5	5.0E-07	-9999.0	-9999.0	0.712	2.6	-9999.0	-9999.0
24.344	12.14	12.42	0.47	25.88	3.79	114.6	1.401	0.354	1.047	7.9	7.7	5.0E-07	-9999.0	-9999.0	0.735	2.7	-9999.0	-9999.0
24.409	11.95	12.20	0.49	23.03	4.03	111.4	1.405	0.356	1.049	11.7	11.4	5.0E-08	-9999.0	-9999.0	0.720	2.6	-9999.0	-9999.0
24.475	10.74	10.97	0.49	21.32	4.48	111.4	1.409	0.358	1.050	10.5	10.2	5.0E-08	-9999.0	-9999.0	0.637	2.2	-9999.0	-9999.0
24.540	10.54	10.79	0.49	23.94	4.55	111.4	1.412	0.360	1.052	10.3	10.1	5.0E-08	-9999.0	-9999.0	0.625	2.2	-9999.0	-9999.0
24.606	10.15	10.51	0.49	33.07	4.67	111.4	1.416	0.362	1.053	10.1	9.8	5.0E-08	-9999.0	-9999.0	0.606	2.1	-9999.0	-9999.0
24.672	9.32	9.71	0.52	35.89	5.37	111.4	1.419	0.364	1.055	9.3	9.1	5.0E-08	-9999.0	-9999.0	0.553	1.8	-9999.0	-9999.0
24.737	9.96	10.45	0.54	45.01	5.18	111.4	1.423	0.366	1.057	10.0	9.7	5.0E-08	-9999.0	-9999.0	0.602	2.1	-9999.0	-9999.0
24.803	10.35	10.87	0.52	48.32	4.80	111.4	1.427	0.369	1.058	10.4	10.1	5.0E-08	-9999.0	-9999.0	0.629	2.2	-9999.0	-9999.0
24.868	12.52	13.06	0.49	50.09	3.76	114.6	1.431	0.371	1.060	8.3	8.1	5.0E-07	-9999.0	-9999.0	0.775	2.9	-9999.0	-9999.0
24.934	13.16	13.41	0.51	22.79	3.81	114.6	1.434	0.373	1.062	8.6	8.3	5.0E-07	-9999.0	-9999.0	0.798	3.0	-9999.0	-9999.0
25.000	12.90	13.25	0.35	31.88	2.65	114.6	1.438	0.375	1.063	6.3	6.2	5.0E-06	-9999.0	-9999.0	0.787	2.9	-9999.0	-9999.0
25.065	11.44	11.92	0.35	44.82	2.94	114.6	1.442	0.377	1.065	7.6	7.4	5.0E-07	-9999.0	-9999.0	0.699	2.5	-9999.0	-9999.0
25.131	11.25	11.79	0.43	50.45	3.66	114.6	1.446	0.379	1.067	7.5	7.3	5.0E-07	-9999.0	-9999.0	0.690	2.4	-9999.0	-9999.0
25.197	11.12	11.75	0.43	58.66	3.67	114.6	1.449	0.381	1.068	7.5	7.3	5.0E-07	-9999.0	-9999.0	0.687	2.4	-9999.0	-9999.0
25.262	11.05	11.83	0.42	72.63	3.56	114.6	1.453	0.383	1.070	7.6	7.3	5.0E-07	-9999.0	-9999.0	0.692	2.4	-9999.0	-9999.0
25.328	11.05	11.81	0.39	70.58	3.31	114.6	1.457	0.385	1.072	7.5	7.3	5.0E-07	-9999.0	-9999.0	0.690	2.4	-9999.0	-9999.0
25.393	10.99	11.75	0.37	70.31	3.16	114.6	1.461	0.387	1.074	7.5	7.2	5.0E-07	-9999.0	-9999.0	0.686	2.4	-9999.0	-9999.0
25.459	11.82	12.58	0.36	70.54	2.87	114.6	1.464	0.389	1.075	6.0	5.8	5.0E-06	-9999.0	-9999.0	0.741	2.7	-9999.0	-9999.0
25.525	12.39	13.28	0.38	82.64	2.87	114.6	1.468	0.391	1.077	6.4	6.1	5.0E-06	-9999.0	-9999.0	0.788	2.9	-9999.0	-9999.0
25.590	13.92	14.79	0.46	79.78	3.12	114.6	1.472	0.393	1.079	7.1	6.8	5.0E-06	-9999.0	-9999.0	0.888	3.4	-9999.0	-9999.0
25.656	15.40	16.29	0.53	83.00	3.26	114.6	1.476	0.395	1.080	7.8	7.5	5.0E-06	-9999.0	-9999.0	0.988	4.0	-9999.0	-9999.0
25.721	16.67	17.42	0.59	69.84	3.39	114.6	1.479	0.397	1.082	8.3	8.0	5.0E-06	-9999.0	-9999.0	1.063	4.4	-9999.0	-9999.0
25.787	18.01	18.57	0.66	51.10	3.56	114.6	1.483	0.399	1.084	11.9	11.4	5.0E-07	-9999.0	-9999.0	1.139	4.9	-9999.0	-9999.0
25.853	18.14	18.62	0.74	43.64	3.98	114.6	1.487	0.401	1.086	11.9	11.4	5.0E-07	-9999.0	-9999.0	1.142	4.9	-9999.0	-9999.0
25.918	18.46	18.88	0.83	38.87	4.41	111.4	1.491	0.403	1.087	18.1	17.3	5.0E-08	-9999.0	-9999.0	1.160	5.0	-9999.0	-9999.0
25.984	17.82	18.16	0.91	31.58	5.02	111.4	1.494	0.405	1.089	17.4	16.7	5.0E-08	-9999.0	-9999.0	1.111	4.7	-9999.0	-9999.0
26.050	17.69	18.10	0.92	37.63	5.10	111.4	1.498	0.407	1.090	17.3	16.6	5.0E-08	-9999.0	-9999.0	1.107	4.7	-9999.0	-9999.0
26.115	17.05	17.49	0.88	40.75	5.04	111.4	1.502	0.409	1.092	16.8	16.0	5.0E-08	-9999.0	-9999.0	1.066	4.4	-9999.0	-9999.0
26.181	17.44	17.95	0.84	46.77	4.69	111.4	1.505	0.412	1.094	17.2	16.4	5.0E-08	-9999.0	-9999.0	1.096	4.6	-9999.0	-9999.0
26.246	17.63	18.21	0.80	53.78	4.40	111.4	1.509	0.414	1.095	17.4	16.7	5.0E-08	-9999.0	-9999.0	1.114	4.7	-9999.0	-9999.0
26.312	18.39	19.11	0.85	66.19	4.46	111.4	1.513	0.416	1.097	18.3	17.5	5.0E-08	-9999.0	-9999.0	1.173	5.0	-9999.0	-9999.0
26.378	19.36	20.14	0.90	72.83	4.48	111.4	1.516	0.418	1.098	19.3	18.4	5.0E-08	-9999.0	-9999.0	1.242	5.5	-9999.0	-9999.0
26.443	19.87	20.56	0.92	63.94	4.49	111.4	1.520	0.420	1.100	19.7	18.8	5.0E-08	-9999.0	-9999.0	1.269	5.7	-9999.0	-9999.0
26.509	21.08	21.63	0.97	50.41	4.50	111.4	1.523	0.422	1.102	20.7	19.7	5.0E-08	-9999.0	-9999.0	1.340	6.1	-9999.0	-9999.0
26.574	22.35	22.66	1.09	28.62	4.82	111.4	1.527	0.424	1.103	21.7	20.7	5.0E-08	-9999.0	-9999.0	1.409	6.6	-9999.0	-9999.0
26.640	22.61	22.87	1.20	23.26	5.26	111.4	1.531	0.426	1.105	21.9	20.8	5.0E-08	-9999.0	-9999.0	1.422	6.7	-9999.0	-9999.0
26.706	22.87	23.17	1.29	28.50	5.58	111.4	1.534	0.428	1.107	22.2	21.1	5.0E-08	-9999.0	-9999.0	1.443	6.8	-9999.0	-9999.0
26.771	22.87	23.15	1.34	26.21	5.80	111.4	1.538	0.430	1.108	22.2	21.1	5.0E-08	-9999.0	-9999.0	1.441	6.8	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
26.837	24.15	24.45	1.39	27.57	5.70	111.4	1.542	0.432	1.110	23.4	22.2	5.0E-08	-9999.0	-9999.0	1.527	7.4	-9999.0	-9999.0
26.903	25.93	26.25	1.46	29.80	5.57	111.4	1.545	0.434	1.111	25.1	23.9	5.0E-08	-9999.0	-9999.0	1.647	8.4	-9999.0	-9999.0
26.968	27.60	27.93	1.52	30.52	5.46	111.4	1.549	0.436	1.113	26.7	25.4	5.0E-08	-9999.0	-9999.0	1.759	9.3	-9999.0	-9999.0
27.034	28.36	28.67	1.58	28.58	5.52	111.4	1.553	0.438	1.115	27.5	26.0	5.0E-08	-9999.0	-9999.0	1.808	9.7	-9999.0	-9999.0
27.099	29.96	30.14	1.65	16.06	5.49	111.4	1.556	0.440	1.116	28.9	27.3	5.0E-08	-9999.0	-9999.0	1.905	10.0	-9999.0	-9999.0
27.165	30.92	31.03	1.69	10.67	5.46	111.4	1.560	0.442	1.118	29.7	28.1	5.0E-08	-9999.0	-9999.0	1.965	10.0	-9999.0	-9999.0
27.231	31.18	31.37	1.72	17.72	5.50	111.4	1.564	0.444	1.119	30.0	28.4	5.0E-08	-9999.0	-9999.0	1.987	10.0	-9999.0	-9999.0
27.296	31.75	31.99	1.76	22.93	5.51	111.4	1.567	0.446	1.121	30.6	28.9	5.0E-08	-9999.0	-9999.0	2.028	10.0	-9999.0	-9999.0
27.362	31.94	32.21	1.78	25.24	5.54	111.4	1.571	0.448	1.123	30.8	29.1	5.0E-08	-9999.0	-9999.0	2.043	10.0	-9999.0	-9999.0
27.427	32.20	32.47	1.80	25.57	5.56	111.4	1.575	0.450	1.124	31.1	29.3	5.0E-08	-9999.0	-9999.0	2.060	10.0	-9999.0	-9999.0
27.493	32.01	32.21	1.82	18.52	5.66	111.4	1.578	0.453	1.126	30.8	29.1	5.0E-08	-9999.0	-9999.0	2.042	10.0	-9999.0	-9999.0
27.559	31.94	32.11	1.81	15.86	5.65	111.4	1.582	0.455	1.127	30.7	29.0	5.0E-08	-9999.0	-9999.0	2.035	10.0	-9999.0	-9999.0
27.624	30.72	30.90	1.77	16.53	5.74	111.4	1.586	0.457	1.129	29.6	27.9	5.0E-08	-9999.0	-9999.0	1.954	10.0	-9999.0	-9999.0
27.690	30.09	30.29	1.75	17.78	5.79	111.4	1.589	0.459	1.131	29.0	27.3	5.0E-08	-9999.0	-9999.0	1.913	10.0	-9999.0	-9999.0
27.756	29.26	29.50	1.70	22.50	5.78	111.4	1.593	0.461	1.132	28.3	26.6	5.0E-08	-9999.0	-9999.0	1.861	9.9	-9999.0	-9999.0
27.821	29.58	29.94	1.64	33.30	5.49	111.4	1.597	0.463	1.134	28.7	26.9	5.0E-08	-9999.0	-9999.0	1.890	10.0	-9999.0	-9999.0
27.887	29.51	29.81	1.57	27.90	5.28	111.4	1.600	0.465	1.135	28.6	26.8	5.0E-08	-9999.0	-9999.0	1.881	10.0	-9999.0	-9999.0
27.952	29.70	30.10	1.52	37.08	5.06	111.4	1.604	0.467	1.137	28.8	27.0	5.0E-08	-9999.0	-9999.0	1.900	10.0	-9999.0	-9999.0
28.018	30.02	30.47	1.48	41.40	4.87	111.4	1.608	0.469	1.139	29.2	27.3	5.0E-08	-9999.0	-9999.0	1.924	10.0	-9999.0	-9999.0
28.084	30.34	30.70	1.53	33.34	5.00	111.4	1.611	0.471	1.140	29.4	27.5	5.0E-08	-9999.0	-9999.0	1.940	10.0	-9999.0	-9999.0
28.149	30.09	30.40	1.56	28.43	5.14	111.4	1.615	0.473	1.142	29.1	27.2	5.0E-08	-9999.0	-9999.0	1.919	10.0	-9999.0	-9999.0
28.215	30.09	30.37	1.58	25.86	5.21	111.4	1.619	0.475	1.143	29.1	27.2	5.0E-08	-9999.0	-9999.0	1.917	10.0	-9999.0	-9999.0
28.280	29.64	29.90	1.62	23.90	5.43	111.4	1.622	0.477	1.145	28.6	26.8	5.0E-08	-9999.0	-9999.0	1.885	9.9	-9999.0	-9999.0
28.346	29.89	30.08	1.47	17.17	4.90	111.4	1.626	0.479	1.147	28.8	26.9	5.0E-08	-9999.0	-9999.0	1.897	10.0	-9999.0	-9999.0
28.412	29.64	29.86	1.62	19.73	5.44	111.4	1.629	0.481	1.148	28.6	26.7	5.0E-08	-9999.0	-9999.0	1.882	9.8	-9999.0	-9999.0
28.477	29.96	30.16	1.65	17.82	5.48	111.4	1.633	0.483	1.150	28.9	26.9	5.0E-08	-9999.0	-9999.0	1.901	10.0	-9999.0	-9999.0
28.543	30.21	30.40	1.65	17.05	5.44	111.4	1.637	0.485	1.151	29.1	27.1	5.0E-08	-9999.0	-9999.0	1.917	10.0	-9999.0	-9999.0
28.609	30.28	30.44	1.62	14.88	5.33	111.4	1.640	0.487	1.153	29.2	27.2	5.0E-08	-9999.0	-9999.0	1.920	10.0	-9999.0	-9999.0
28.674	29.38	29.51	1.57	11.49	5.33	111.4	1.644	0.489	1.155	28.3	26.3	5.0E-08	-9999.0	-9999.0	1.857	9.5	-9999.0	-9999.0
28.740	28.94	29.12	1.54	16.53	5.30	111.4	1.648	0.491	1.156	27.9	25.9	5.0E-08	-9999.0	-9999.0	1.831	9.3	-9999.0	-9999.0
28.805	28.24	28.46	1.49	20.50	5.25	111.4	1.651	0.493	1.158	27.3	25.3	5.0E-08	-9999.0	-9999.0	1.787	8.9	-9999.0	-9999.0
28.871	27.73	27.98	1.46	23.47	5.23	111.4	1.655	0.496	1.160	26.8	24.9	5.0E-08	-9999.0	-9999.0	1.755	8.6	-9999.0	-9999.0
28.937	27.09	27.36	1.45	25.84	5.31	111.4	1.659	0.498	1.161	26.2	24.3	5.0E-08	-9999.0	-9999.0	1.714	8.3	-9999.0	-9999.0
29.002	27.15	27.42	1.45	25.32	5.30	111.4	1.662	0.500	1.163	26.3	24.4	5.0E-08	-9999.0	-9999.0	1.717	8.3	-9999.0	-9999.0
29.068	27.92	28.19	1.49	24.87	5.30	111.4	1.666	0.502	1.164	27.0	25.0	5.0E-08	-9999.0	-9999.0	1.768	8.7	-9999.0	-9999.0
29.134	29.13	29.34	1.55	19.52	5.30	111.4	1.670	0.504	1.166	28.1	26.0	5.0E-08	-9999.0	-9999.0	1.845	9.3	-9999.0	-9999.0
29.199	29.13	29.28	1.60	13.43	5.48	111.4	1.673	0.506	1.168	28.0	25.9	5.0E-08	-9999.0	-9999.0	1.840	9.2	-9999.0	-9999.0
29.265	29.38	29.53	1.63	14.22	5.53	111.4	1.677	0.508	1.169	28.3	26.2	5.0E-08	-9999.0	-9999.0	1.857	9.3	-9999.0	-9999.0
29.330	29.13	29.27	1.65	12.47	5.65	111.4	1.681	0.510	1.171	28.0	25.9	5.0E-08	-9999.0	-9999.0	1.839	9.2	-9999.0	-9999.0
29.396	28.56	28.67	1.67	10.63	5.84	111.4	1.684	0.512	1.172	27.5	25.4	5.0E-08	-9999.0	-9999.0	1.799	8.8	-9999.0	-9999.0
29.462	27.60	27.72	1.67	11.73	6.04	111.4	1.688	0.514	1.174	26.6	24.5	5.0E-08	-9999.0	-9999.0	1.736	8.3	-9999.0	-9999.0
29.527	26.70	26.84	1.65	12.96	6.16	111.4	1.692	0.516	1.176	25.7	23.7	5.0E-08	-9999.0	-9999.0	1.677	7.9	-9999.0	-9999.0
29.593	26.44	26.60	1.63	14.78	6.14	111.4	1.695	0.518	1.177	25.5	23.5	5.0E-08	-9999.0	-9999.0	1.661	7.7	-9999.0	-9999.0
29.658	26.19	26.34	1.62	13.79	6.16	111.4	1.699	0.520	1.179	25.2	23.2	5.0E-08	-9999.0	-9999.0	1.643	7.6	-9999.0	-9999.0
29.724	25.61	25.78	1.63	15.51	6.34	111.4	1.703	0.522	1.180	24.7	22.7	5.0E-08	-9999.0	-9999.0	1.605	7.3	-9999.0	-9999.0
29.790	25.10	25.26	1.61	14.56	6.39	111.4	1.706	0.524	1.182	24.2	22.3	5.0E-08	-9999.0	-9999.0	1.570	7.0	-9999.0	-9999.0
29.855	24.91	25.05	1.56	12.74	6.24	111.4	1.710	0.526	1.184	24.0	22.1	5.0E-08	-9999.0	-9999.0	1.556	6.9	-9999.0	-9999.0
29.921	24.79	24.91	1.51	11.40	6.08	111.4	1.714	0.528	1.185	23.9	21.9	5.0E-08	-9999.0	-9999.0	1.547	6.9	-9999.0	-9999.0
29.987	24.66	24.76	1.47	8.95	5.95	111.4	1.717	0.530	1.187	23.7	21.8	5.0E-08	-9999.0	-9999.0	1.536	6.8	-9999.0	-9999.0
30.052	24.79	24.95	1.49	15.09	5.99	111.4	1.721	0.532	1.188	23.9	21.9	5.0E-08	-9999.0	-9999.0	1.549	6.8	-9999.0	-9999.0
30.118	24.02	24.19	1.54	15.68	6.38	111.4	1.724	0.534	1.190	23.2	21.2	5.0E-08	-9999.0	-9999.0	1.498	6.5	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
30.183	23.96	24.13	1.52	16.10	6.31	111.4	1.728	0.537	1.192	23.1	21.2	5.0E-08	-9999.0	-9999.0	1.494	6.4	-9999.0	-9999.0
30.249	24.02	24.21	1.53	18.13	6.33	111.4	1.732	0.539	1.193	23.2	21.2	5.0E-08	-9999.0	-9999.0	1.499	6.5	-9999.0	-9999.0
30.315	24.08	24.26	1.56	16.45	6.45	111.4	1.735	0.541	1.195	23.2	21.3	5.0E-08	-9999.0	-9999.0	1.501	6.5	-9999.0	-9999.0
30.380	23.70	23.86	1.52	14.78	6.39	111.4	1.739	0.543	1.196	22.8	20.9	5.0E-08	-9999.0	-9999.0	1.475	6.3	-9999.0	-9999.0
30.446	23.19	23.37	1.46	17.42	6.26	111.4	1.743	0.545	1.198	22.4	20.5	5.0E-08	-9999.0	-9999.0	1.442	6.0	-9999.0	-9999.0
30.511	23.00	23.18	1.40	17.34	6.05	111.4	1.746	0.547	1.200	22.2	20.3	5.0E-08	-9999.0	-9999.0	1.429	5.9	-9999.0	-9999.0
30.577	22.75	22.97	1.35	20.68	5.89	111.4	1.750	0.549	1.201	22.0	20.1	5.0E-08	-9999.0	-9999.0	1.415	5.8	-9999.0	-9999.0
30.643	22.35	22.68	1.27	29.76	5.61	111.4	1.754	0.551	1.203	21.7	19.8	5.0E-08	-9999.0	-9999.0	1.395	5.7	-9999.0	-9999.0
30.708	22.10	22.51	1.25	37.90	5.57	111.4	1.757	0.553	1.204	21.6	19.6	5.0E-08	-9999.0	-9999.0	1.384	5.6	-9999.0	-9999.0
30.774	22.75	23.17	1.21	39.13	5.24	111.4	1.761	0.555	1.206	22.2	20.2	5.0E-08	-9999.0	-9999.0	1.427	5.9	-9999.0	-9999.0
30.840	23.89	24.32	1.21	40.00	4.99	111.4	1.765	0.557	1.208	23.3	21.2	5.0E-08	-9999.0	-9999.0	1.504	6.4	-9999.0	-9999.0
30.905	24.15	24.56	1.25	38.36	5.10	111.4	1.768	0.559	1.209	23.5	21.4	5.0E-08	-9999.0	-9999.0	1.520	6.5	-9999.0	-9999.0
30.971	25.68	26.05	1.30	33.58	5.00	111.4	1.772	0.561	1.211	24.9	22.7	5.0E-08	-9999.0	-9999.0	1.618	7.1	-9999.0	-9999.0
31.036	26.32	26.70	1.35	35.06	5.07	111.4	1.776	0.563	1.213	25.6	23.2	5.0E-08	-9999.0	-9999.0	1.662	7.4	-9999.0	-9999.0
31.102	27.15	27.54	1.40	36.50	5.10	111.4	1.779	0.565	1.214	26.4	23.9	5.0E-08	-9999.0	-9999.0	1.717	7.8	-9999.0	-9999.0
31.168	27.79	28.10	1.39	28.92	4.96	111.4	1.783	0.567	1.216	26.9	24.4	5.0E-08	-9999.0	-9999.0	1.754	8.0	-9999.0	-9999.0
31.233	27.66	27.97	1.42	29.15	5.09	111.4	1.787	0.569	1.217	26.8	24.3	5.0E-08	-9999.0	-9999.0	1.746	7.9	-9999.0	-9999.0
31.299	27.54	27.84	1.48	27.81	5.33	111.4	1.790	0.571	1.219	26.7	24.1	5.0E-08	-9999.0	-9999.0	1.736	7.9	-9999.0	-9999.0
31.364	27.15	27.46	1.50	29.51	5.47	111.4	1.794	0.573	1.221	26.3	23.8	5.0E-08	-9999.0	-9999.0	1.711	7.7	-9999.0	-9999.0
31.430	26.84	27.16	1.51	30.32	5.57	111.4	1.798	0.575	1.222	26.0	23.5	5.0E-08	-9999.0	-9999.0	1.691	7.5	-9999.0	-9999.0
31.496	26.51	26.80	1.53	26.78	5.72	111.4	1.801	0.577	1.224	25.7	23.2	5.0E-08	-9999.0	-9999.0	1.667	7.3	-9999.0	-9999.0
31.561	25.93	26.23	1.54	27.26	5.89	111.4	1.805	0.580	1.225	25.1	22.7	5.0E-08	-9999.0	-9999.0	1.628	7.0	-9999.0	-9999.0
31.627	25.30	25.60	1.20	27.87	4.70	111.4	1.809	0.582	1.227	24.5	22.1	5.0E-08	-9999.0	-9999.0	1.586	6.8	-9999.0	-9999.0
31.693	24.08	24.34	1.24	24.47	5.11	111.4	1.812	0.584	1.229	23.3	21.0	5.0E-08	-9999.0	-9999.0	1.502	6.2	-9999.0	-9999.0
31.758	23.00	23.27	1.24	25.70	5.34	111.4	1.816	0.586	1.230	22.3	20.1	5.0E-08	-9999.0	-9999.0	1.431	5.7	-9999.0	-9999.0
31.824	22.10	22.41	1.23	28.43	5.50	111.4	1.820	0.588	1.232	21.5	19.3	5.0E-08	-9999.0	-9999.0	1.373	5.4	-9999.0	-9999.0
31.889	21.97	22.30	1.16	30.06	5.21	111.4	1.823	0.590	1.233	21.4	19.2	5.0E-08	-9999.0	-9999.0	1.365	5.3	-9999.0	-9999.0
31.955	20.89	21.03	1.12	12.66	5.34	111.4	1.827	0.592	1.235	20.1	18.1	5.0E-08	-9999.0	-9999.0	1.280	4.8	-9999.0	-9999.0
32.021	21.14	21.34	1.10	18.49	5.17	111.4	1.830	0.594	1.237	20.4	18.4	5.0E-08	-9999.0	-9999.0	1.301	4.9	-9999.0	-9999.0
32.086	20.76	21.05	1.05	26.35	5.00	111.4	1.834	0.596	1.238	20.2	18.1	5.0E-08	-9999.0	-9999.0	1.281	4.8	-9999.0	-9999.0
32.152	19.81	20.19	1.00	35.30	4.97	111.4	1.838	0.598	1.240	19.3	17.4	5.0E-08	-9999.0	-9999.0	1.223	4.5	-9999.0	-9999.0
32.217	20.51	20.87	0.98	33.77	4.71	111.4	1.841	0.600	1.241	20.0	17.9	5.0E-08	-9999.0	-9999.0	1.269	4.7	-9999.0	-9999.0
32.283	19.74	20.14	0.98	37.41	4.88	111.4	1.845	0.602	1.243	19.3	17.3	5.0E-08	-9999.0	-9999.0	1.220	4.4	-9999.0	-9999.0
32.349	19.93	20.34	0.94	37.69	4.63	111.4	1.849	0.604	1.245	19.5	17.5	5.0E-08	-9999.0	-9999.0	1.232	4.5	-9999.0	-9999.0
32.414	19.04	19.43	0.92	36.28	4.75	111.4	1.852	0.606	1.246	18.6	16.7	5.0E-08	-9999.0	-9999.0	1.172	4.2	-9999.0	-9999.0
32.480	18.91	19.29	0.94	35.73	4.88	111.4	1.856	0.608	1.248	18.5	16.5	5.0E-08	-9999.0	-9999.0	1.162	4.1	-9999.0	-9999.0
32.546	18.52	18.93	0.94	37.55	4.98	111.4	1.860	0.610	1.249	18.1	16.2	5.0E-08	-9999.0	-9999.0	1.138	4.0	-9999.0	-9999.0
32.611	17.69	18.14	0.96	41.74	5.30	111.4	1.863	0.612	1.251	17.4	15.5	5.0E-08	-9999.0	-9999.0	1.085	3.7	-9999.0	-9999.0
32.677	17.31	17.72	0.92	38.20	5.20	111.4	1.867	0.614	1.253	17.0	15.2	5.0E-08	-9999.0	-9999.0	1.057	3.5	-9999.0	-9999.0
32.742	16.48	16.87	0.86	36.03	5.11	111.4	1.871	0.616	1.254	16.2	14.4	5.0E-08	-9999.0	-9999.0	1.000	3.3	-9999.0	-9999.0
32.808	15.72	16.16	0.82	40.59	5.09	111.4	1.874	0.618	1.256	15.5	13.8	5.0E-08	-9999.0	-9999.0	0.952	3.0	-9999.0	-9999.0
32.874	14.18	14.66	0.76	44.09	5.20	111.4	1.878	0.621	1.257	14.0	12.5	5.0E-08	-9999.0	-9999.0	0.852	2.6	-9999.0	-9999.0
32.939	13.67	14.21	0.70	49.60	4.94	111.4	1.882	0.623	1.259	13.6	12.1	5.0E-08	-9999.0	-9999.0	0.822	2.5	-9999.0	-9999.0
33.005	13.60	14.24	0.65	59.38	4.57	111.4	1.885	0.625	1.261	13.6	12.2	5.0E-08	-9999.0	-9999.0	0.824	2.5	-9999.0	-9999.0
33.070	14.11	14.79	0.59	62.18	4.00	114.6	1.889	0.627	1.262	9.4	8.4	5.0E-07	-9999.0	-9999.0	0.860	2.6	-9999.0	-9999.0
33.136	14.30	14.91	0.57	56.00	3.83	114.6	1.893	0.629	1.264	9.5	8.5	5.0E-07	-9999.0	-9999.0	0.868	2.6	-9999.0	-9999.0
33.202	14.51	15.14	0.58	58.54	3.84	114.6	1.897	0.631	1.266	9.7	8.6	5.0E-07	-9999.0	-9999.0	0.883	2.7	-9999.0	-9999.0
33.267	14.76	15.47	0.54	66.13	3.50	114.6	1.900	0.633	1.267	9.9	8.8	5.0E-07	-9999.0	-9999.0	0.905	2.8	-9999.0	-9999.0
33.333	14.95	15.66	0.52	65.65	3.33	114.6	1.904	0.635	1.269	10.0	8.9	5.0E-07	-9999.0	-9999.0	0.917	2.8	-9999.0	-9999.0
33.399	15.40	16.02	0.47	57.95	2.94	114.6	1.908	0.637	1.271	7.7	6.8	5.0E-06	-9999.0	-9999.0	0.941	2.9	-9999.0	-9999.0
33.464	15.14	15.68	0.46	50.01	2.94	114.6	1.912	0.639	1.273	7.5	6.7	5.0E-06	-9999.0	-9999.0	0.918	2.8	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
33.530	14.76	15.48	0.47	67.02	3.04	114.6	1.915	0.641	1.274	7.4	6.6	5.0E-06	-9999.0	-9999.0	0.904	2.8	-9999.0	-9999.0
33.595	14.89	15.51	0.48	58.11	3.10	114.6	1.919	0.643	1.276	7.4	6.6	5.0E-06	-9999.0	-9999.0	0.906	2.8	-9999.0	-9999.0
33.661	13.99	14.57	0.48	52.92	3.30	114.6	1.923	0.645	1.278	9.3	8.2	5.0E-07	-9999.0	-9999.0	0.843	2.5	-9999.0	-9999.0
33.727	13.67	14.16	0.47	45.07	3.33	114.6	1.927	0.647	1.279	9.0	8.0	5.0E-07	-9999.0	-9999.0	0.816	2.4	-9999.0	-9999.0
33.792	12.58	13.19	0.43	56.86	3.27	114.6	1.930	0.649	1.281	8.4	7.4	5.0E-07	-9999.0	-9999.0	0.751	2.1	-9999.0	-9999.0
33.858	12.52	13.18	0.43	60.89	3.27	114.6	1.934	0.651	1.283	8.4	7.4	5.0E-07	-9999.0	-9999.0	0.750	2.1	-9999.0	-9999.0
33.923	12.27	12.88	0.44	56.06	3.43	114.6	1.938	0.653	1.285	8.2	7.3	5.0E-07	-9999.0	-9999.0	0.729	2.0	-9999.0	-9999.0
33.989	12.46	13.03	0.45	52.53	3.46	114.6	1.942	0.655	1.286	8.3	7.3	5.0E-07	-9999.0	-9999.0	0.739	2.1	-9999.0	-9999.0
34.055	12.97	13.65	0.44	63.05	3.23	114.6	1.945	0.657	1.288	8.7	7.7	5.0E-07	-9999.0	-9999.0	0.780	2.2	-9999.0	-9999.0
34.120	13.35	13.96	0.41	56.27	2.94	114.6	1.949	0.659	1.290	6.7	5.9	5.0E-06	-9999.0	-9999.0	0.801	2.3	-9999.0	-9999.0
34.186	13.09	13.65	0.38	51.47	2.79	114.6	1.953	0.661	1.291	6.5	5.8	5.0E-06	-9999.0	-9999.0	0.780	2.2	-9999.0	-9999.0
34.252	12.78	13.42	0.34	58.80	2.54	114.6	1.957	0.664	1.293	6.4	5.6	5.0E-06	-9999.0	-9999.0	0.764	2.2	-9999.0	-9999.0
34.317	12.71	13.42	0.35	65.77	2.61	114.6	1.960	0.666	1.295	6.4	5.6	5.0E-06	-9999.0	-9999.0	0.764	2.2	-9999.0	-9999.0
34.383	13.03	13.77	0.35	68.68	2.55	114.6	1.964	0.668	1.297	6.6	5.8	5.0E-06	-9999.0	-9999.0	0.787	2.2	-9999.0	-9999.0
34.448	13.54	14.30	0.34	70.19	2.38	114.6	1.968	0.670	1.298	6.8	6.0	5.0E-06	-9999.0	-9999.0	0.822	2.4	-9999.0	-9999.0
34.514	13.41	14.19	0.32	71.62	2.26	114.6	1.972	0.672	1.300	6.8	6.0	5.0E-06	-9999.0	-9999.0	0.814	2.3	-9999.0	-9999.0
34.580	13.16	13.85	0.31	63.48	2.24	114.6	1.975	0.674	1.302	6.6	5.8	5.0E-06	-9999.0	-9999.0	0.791	2.2	-9999.0	-9999.0
34.645	12.84	13.55	0.32	65.30	2.37	114.6	1.979	0.676	1.303	6.5	5.7	5.0E-06	-9999.0	-9999.0	0.771	2.2	-9999.0	-9999.0
34.711	13.29	14.06	0.37	70.93	2.64	114.6	1.983	0.678	1.305	6.7	5.9	5.0E-06	-9999.0	-9999.0	0.805	2.3	-9999.0	-9999.0
34.776	14.05	14.83	0.40	71.56	2.70	114.6	1.987	0.680	1.307	7.1	6.2	5.0E-06	-9999.0	-9999.0	0.856	2.5	-9999.0	-9999.0
34.842	14.76	15.45	0.47	64.31	3.05	114.6	1.991	0.682	1.309	7.4	6.5	5.0E-06	-9999.0	-9999.0	0.897	2.6	-9999.0	-9999.0
34.908	14.70	15.31	0.52	57.28	3.40	114.6	1.994	0.684	1.310	9.8	8.5	5.0E-07	-9999.0	-9999.0	0.888	2.6	-9999.0	-9999.0
34.973	14.63	15.14	0.40	47.84	2.65	114.6	1.998	0.686	1.312	7.3	6.3	5.0E-06	-9999.0	-9999.0	0.876	2.5	-9999.0	-9999.0
35.039	14.70	15.25	0.46	51.47	3.02	114.6	2.002	0.688	1.314	7.3	6.4	5.0E-06	-9999.0	-9999.0	0.883	2.6	-9999.0	-9999.0
35.105	14.76	15.33	0.48	52.90	3.14	114.6	2.006	0.690	1.315	7.3	6.4	5.0E-06	-9999.0	-9999.0	0.888	2.6	-9999.0	-9999.0
35.170	15.08	15.68	0.53	55.84	3.39	114.6	2.009	0.692	1.317	10.0	8.7	5.0E-07	-9999.0	-9999.0	0.911	2.7	-9999.0	-9999.0
35.236	15.46	16.12	0.58	61.61	3.61	114.6	2.013	0.694	1.319	10.3	9.0	5.0E-07	-9999.0	-9999.0	0.941	2.8	-9999.0	-9999.0
35.301	15.72	16.28	0.66	51.59	4.07	114.6	2.017	0.696	1.321	10.4	9.0	5.0E-07	-9999.0	-9999.0	0.951	2.8	-9999.0	-9999.0
35.367	15.72	16.23	0.75	47.48	4.63	111.4	2.021	0.698	1.322	15.5	13.5	5.0E-08	-9999.0	-9999.0	0.947	2.8	-9999.0	-9999.0
35.433	15.91	16.41	0.78	46.77	4.76	111.4	2.024	0.700	1.324	15.7	13.7	5.0E-08	-9999.0	-9999.0	0.959	2.8	-9999.0	-9999.0
35.498	14.82	15.28	0.78	43.31	5.12	111.4	2.028	0.702	1.325	14.6	12.7	5.0E-08	-9999.0	-9999.0	0.884	2.5	-9999.0	-9999.0
35.564	14.18	14.64	0.74	41.72	5.07	111.4	2.031	0.705	1.327	14.0	12.2	5.0E-08	-9999.0	-9999.0	0.840	2.4	-9999.0	-9999.0
35.629	13.41	13.87	0.72	42.76	5.20	111.4	2.035	0.707	1.329	13.3	11.5	5.0E-08	-9999.0	-9999.0	0.789	2.2	-9999.0	-9999.0
35.695	12.46	13.02	0.68	52.26	5.23	111.4	2.039	0.709	1.330	12.5	10.8	5.0E-08	-9999.0	-9999.0	0.732	2.0	-9999.0	-9999.0
35.761	11.76	12.40	0.64	59.38	5.17	111.4	2.042	0.711	1.332	11.9	10.3	5.0E-08	-9999.0	-9999.0	0.691	1.8	-9999.0	-9999.0
35.826	10.54	11.18	0.60	59.83	5.38	111.4	2.046	0.713	1.333	10.7	9.3	5.0E-08	-9999.0	-9999.0	0.609	1.6	-9999.0	-9999.0
35.892	10.93	11.57	0.60	59.69	5.20	111.4	2.050	0.715	1.335	11.1	9.6	5.0E-08	-9999.0	-9999.0	0.635	1.6	-9999.0	-9999.0
35.958	11.25	11.95	0.62	64.88	5.20	111.4	2.053	0.717	1.337	11.4	9.9	5.0E-08	-9999.0	-9999.0	0.660	1.7	-9999.0	-9999.0
36.023	11.82	12.48	0.59	61.53	4.74	111.4	2.057	0.719	1.338	12.0	10.3	5.0E-08	-9999.0	-9999.0	0.695	1.8	-9999.0	-9999.0
36.089	11.76	12.46	0.57	64.47	4.59	111.4	2.061	0.721	1.340	11.9	10.3	5.0E-08	-9999.0	-9999.0	0.693	1.8	-9999.0	-9999.0
36.154	11.63	12.24	0.55	56.76	4.50	111.4	2.064	0.723	1.341	11.7	10.1	5.0E-08	-9999.0	-9999.0	0.678	1.8	-9999.0	-9999.0
36.220	10.35	10.92	0.54	53.41	4.96	111.4	2.068	0.725	1.343	10.5	9.0	5.0E-08	-9999.0	-9999.0	0.590	1.5	-9999.0	-9999.0
36.286	10.74	11.42	0.56	63.50	4.91	111.4	2.072	0.727	1.345	10.9	9.4	5.0E-08	-9999.0	-9999.0	0.623	1.6	-9999.0	-9999.0
36.351	10.09	10.79	0.55	64.16	5.11	111.4	2.075	0.729	1.346	10.3	8.9	5.0E-08	-9999.0	-9999.0	0.581	1.5	-9999.0	-9999.0
36.417	9.90	10.59	0.53	63.28	5.02	111.4	2.079	0.731	1.348	10.1	8.7	5.0E-08	-9999.0	-9999.0	0.567	1.4	-9999.0	-9999.0
36.482	9.90	10.57	0.53	61.67	5.03	111.4	2.083	0.733	1.349	10.1	8.7	5.0E-08	-9999.0	-9999.0	0.566	1.4	-9999.0	-9999.0
36.548	9.52	10.22	0.53	64.75	5.20	111.4	2.086	0.735	1.351	9.8	8.4	5.0E-08	-9999.0	-9999.0	0.542	1.3	-9999.0	-9999.0
36.614	8.69	9.41	0.50	66.64	5.33	111.4	2.090	0.737	1.353	9.0	7.7	5.0E-08	-9999.0	-9999.0	0.488	1.2	-9999.0	-9999.0
36.679	9.26	9.81	0.48	51.02	4.90	111.4	2.094	0.739	1.354	9.4	8.1	5.0E-08	-9999.0	-9999.0	0.515	1.3	-9999.0	-9999.0
36.745	8.05	8.64	0.44	54.43	5.11	111.4	2.097	0.741	1.356	8.3	7.1	5.0E-08	-9999.0	-9999.0	0.436	1.1	-9999.0	-9999.0
36.811	7.79	8.44	0.40	60.09	4.75	111.4	2.101	0.743	1.357	8.1	6.9	5.0E-08	-9999.0	-9999.0	0.422	1.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
36.876	7.67	8.35	0.36	63.36	4.32	111.4	2.105	0.745	1.359	8.0	6.9	5.0E-08	-9999.0	-9999.0	0.417	1.0	-9999.0	-9999.0
36.942	6.90	7.57	0.32	62.08	4.24	111.4	2.108	0.748	1.361	7.2	6.2	5.0E-08	-9999.0	-9999.0	0.364	0.9	-9999.0	-9999.0
37.007	6.78	7.52	0.29	68.80	3.87	111.4	2.112	0.750	1.362	7.2	6.2	5.0E-08	-9999.0	-9999.0	0.361	0.9	-9999.0	-9999.0
37.073	6.78	7.57	0.26	73.87	3.44	111.4	2.116	0.752	1.364	7.3	6.2	5.0E-08	-9999.0	-9999.0	0.364	0.9	-9999.0	-9999.0
37.139	6.71	7.52	0.24	75.49	3.20	111.4	2.119	0.754	1.366	7.2	6.2	5.0E-08	-9999.0	-9999.0	0.360	0.9	-9999.0	-9999.0
37.204	7.09	7.95	0.23	80.25	2.90	114.6	2.123	0.756	1.367	5.1	4.3	5.0E-07	-9999.0	-9999.0	0.389	1.0	-9999.0	-9999.0
37.270	8.05	8.89	0.23	78.18	2.59	114.6	2.127	0.758	1.369	5.7	4.9	5.0E-07	-9999.0	-9999.0	0.451	1.1	-9999.0	-9999.0
37.336	9.52	10.44	0.28	85.23	2.69	114.6	2.130	0.760	1.371	6.7	5.7	5.0E-07	-9999.0	-9999.0	0.554	1.4	-9999.0	-9999.0
37.401	9.52	10.35	0.31	76.81	3.00	114.6	2.134	0.762	1.372	6.6	5.6	5.0E-07	-9999.0	-9999.0	0.548	1.3	-9999.0	-9999.0
37.467	9.71	10.36	0.31	59.97	3.00	114.6	2.138	0.764	1.374	6.6	5.6	5.0E-07	-9999.0	-9999.0	0.548	1.3	-9999.0	-9999.0
37.532	8.37	8.92	0.30	50.47	3.37	114.6	2.142	0.766	1.376	5.7	4.9	5.0E-07	-9999.0	-9999.0	0.452	1.1	-9999.0	-9999.0
37.598	6.97	7.52	0.28	50.94	3.73	111.4	2.145	0.768	1.377	7.2	6.1	5.0E-08	-9999.0	-9999.0	0.358	0.9	-9999.0	-9999.0
37.664	6.13	6.74	0.27	55.92	4.02	111.4	2.149	0.770	1.379	6.5	5.5	5.0E-08	-9999.0	-9999.0	0.306	0.8	-9999.0	-9999.0
37.729	6.13	6.78	0.26	60.15	3.84	111.4	2.153	0.772	1.381	6.5	5.5	5.0E-08	-9999.0	-9999.0	0.309	0.8	-9999.0	-9999.0
37.795	5.62	6.31	0.22	63.67	3.49	111.4	2.156	0.774	1.382	6.0	5.1	5.0E-08	-9999.0	-9999.0	0.277	0.7	-9999.0	-9999.0
37.860	6.06	6.76	0.17	64.47	2.52	114.6	2.160	0.776	1.384	4.3	3.7	5.0E-07	-9999.0	-9999.0	0.307	0.8	-9999.0	-9999.0
37.926	5.87	6.56	0.15	63.26	2.29	114.6	2.164	0.778	1.386	4.2	3.6	5.0E-07	-9999.0	-9999.0	0.293	0.8	-9999.0	-9999.0
37.992	5.17	5.89	0.20	65.94	3.41	111.4	2.168	0.780	1.387	5.6	4.8	5.0E-08	-9999.0	-9999.0	0.248	0.7	-9999.0	-9999.0
38.057	6.39	7.16	0.24	72.11	3.36	111.4	2.171	0.782	1.389	6.9	5.8	5.0E-08	-9999.0	-9999.0	0.333	0.8	-9999.0	-9999.0
38.123	9.58	10.39	0.21	74.66	2.03	114.6	2.175	0.784	1.391	5.0	4.2	5.0E-06	-9999.0	-9999.0	0.548	1.3	-9999.0	-9999.0
38.189	11.88	12.56	0.42	62.85	3.35	114.6	2.179	0.786	1.392	8.0	6.8	5.0E-07	-9999.0	-9999.0	0.692	1.7	-9999.0	-9999.0
38.254	14.24	14.77	0.32	48.73	2.17	114.6	2.182	0.789	1.394	7.1	6.0	5.0E-06	-9999.0	-9999.0	0.839	2.2	-9999.0	-9999.0
38.320	15.14	15.66	0.29	48.18	1.86	114.6	2.186	0.791	1.396	7.5	6.3	5.0E-06	-9999.0	-9999.0	0.898	2.4	-9999.0	-9999.0
38.385	15.21	15.59	0.22	35.65	1.41	114.6	2.190	0.793	1.397	6.0	5.1	5.0E-05	30.0	30.0	0.893	2.4	-9999.0	-9999.0
38.451	13.67	13.94	0.21	24.43	1.51	114.6	2.194	0.795	1.399	5.3	4.5	5.0E-05	30.0	30.0	0.783	2.0	-9999.0	-9999.0
38.517	14.18	14.25	0.23	6.13	1.62	114.6	2.197	0.797	1.401	5.5	4.6	5.0E-05	30.0	30.0	0.804	2.1	-9999.0	-9999.0
38.582	11.56	11.74	0.21	17.13	1.79	114.6	2.201	0.799	1.402	5.6	4.7	5.0E-06	-9999.0	-9999.0	0.636	1.5	-9999.0	-9999.0
38.648	9.45	9.64	0.21	17.62	2.18	114.6	2.205	0.801	1.404	4.6	3.9	5.0E-06	-9999.0	-9999.0	0.496	1.2	-9999.0	-9999.0
38.713	11.95	12.28	0.26	30.42	2.12	114.6	2.209	0.803	1.406	5.9	5.0	5.0E-06	-9999.0	-9999.0	0.671	1.6	-9999.0	-9999.0
38.779	14.76	15.02	0.22	24.14	1.47	114.6	2.213	0.805	1.408	5.8	4.8	5.0E-05	30.0	30.0	0.854	2.2	-9999.0	-9999.0
38.845	15.84	16.03	0.11	18.05	0.69	114.6	2.216	0.807	1.409	6.1	5.2	5.0E-05	30.0	30.0	0.921	2.5	-9999.0	-9999.0
38.910	14.30	14.44	0.08	12.08	0.56	114.6	2.220	0.809	1.411	5.5	4.7	5.0E-05	30.0	30.0	0.814	2.1	-9999.0	-9999.0
38.976	10.74	10.93	0.13	18.39	1.19	114.6	2.224	0.811	1.413	5.2	4.4	5.0E-06	-9999.0	-9999.0	0.581	1.4	-9999.0	-9999.0
39.042	8.18	8.38	0.18	18.31	2.15	114.6	2.228	0.813	1.414	4.0	3.4	5.0E-06	-9999.0	-9999.0	0.410	1.0	-9999.0	-9999.0
39.107	7.03	7.36	0.17	30.89	2.32	114.6	2.231	0.815	1.416	4.7	3.9	5.0E-07	-9999.0	-9999.0	0.342	0.8	-9999.0	-9999.0
39.173	8.18	8.65	0.15	43.39	1.74	114.6	2.235	0.817	1.418	4.1	3.5	5.0E-06	-9999.0	-9999.0	0.428	1.0	-9999.0	-9999.0
39.238	9.71	10.13	0.18	38.87	1.78	114.6	2.239	0.819	1.420	4.9	4.1	5.0E-06	-9999.0	-9999.0	0.526	1.2	-9999.0	-9999.0
39.304	10.22	10.63	0.21	37.18	1.98	114.6	2.243	0.821	1.421	5.1	4.3	5.0E-06	-9999.0	-9999.0	0.559	1.3	-9999.0	-9999.0
39.370	10.67	11.09	0.25	39.15	2.26	114.6	2.246	0.823	1.423	5.3	4.5	5.0E-06	-9999.0	-9999.0	0.590	1.4	-9999.0	-9999.0
39.435	13.54	14.15	0.30	55.76	2.13	114.6	2.250	0.825	1.425	6.8	5.7	5.0E-06	-9999.0	-9999.0	0.793	2.0	-9999.0	-9999.0
39.501	17.82	18.20	0.29	34.87	1.60	114.6	2.254	0.827	1.426	7.0	5.8	5.0E-05	30.0	30.0	1.063	3.0	-9999.0	-9999.0
39.566	19.68	19.88	0.33	18.29	1.66	114.6	2.258	0.829	1.428	7.6	6.4	5.0E-05	30.0	30.0	1.175	3.4	-9999.0	-9999.0
39.632	18.20	18.38	0.35	16.37	1.91	114.6	2.261	0.832	1.430	7.0	5.9	5.0E-05	30.0	30.0	1.075	3.0	-9999.0	-9999.0
39.698	19.61	19.76	0.31	14.34	1.57	114.6	2.265	0.834	1.432	7.6	6.3	5.0E-05	30.0	30.0	1.166	3.4	-9999.0	-9999.0
39.763	22.81	22.95	0.29	13.14	1.27	114.6	2.269	0.836	1.433	8.8	7.3	5.0E-05	30.0	32.0	1.379	4.3	-9999.0	-9999.0
39.829	28.87	29.03	0.34	14.82	1.17	117.7	2.273	0.838	1.435	9.3	7.7	5.0E-04	30.0	32.0	-9999.0	-9999.0	-9999.0	-9999.0
39.895	32.26	32.35	0.54	8.85	1.67	114.6	2.277	0.840	1.437	12.4	10.3	5.0E-05	30.0	34.0	2.005	7.6	-9999.0	-9999.0
39.960	32.84	32.88	0.60	3.87	1.83	114.6	2.280	0.842	1.438	12.6	10.5	5.0E-05	30.0	34.0	2.040	7.8	-9999.0	-9999.0
40.026	30.15	30.21	0.72	5.13	2.39	114.6	2.284	0.844	1.440	11.6	9.6	5.0E-05	30.0	34.0	1.862	6.7	-9999.0	-9999.0
40.091	25.42	25.48	0.60	5.51	2.36	114.6	2.288	0.846	1.442	9.8	8.1	5.0E-05	30.0	32.0	1.546	5.1	-9999.0	-9999.0
40.157	21.97	22.07	0.59	9.38	2.68	114.6	2.292	0.848	1.444	10.6	8.8	5.0E-06	-9999.0	-9999.0	1.319	4.0	-9999.0	-9999.0

Col-02 Depth (ft)	Col-05 qc (tsf)	Col-06 qt (tsf)	Col-07 fs (tsf)	Col-08 u (psi)	Col-09 Rf (%)	Col-10 Unit Wt (pcf)	Col-11 T Stress (tsf)	Col-12 U Stress (tsf)	Col-13 E Stress (tsf)	Col-16 N60 (blows/ft)	Col-17 N1(60) (blows/ft)	Col-18 k (cm/s)	Col-19 Dr (%)	Col-20 Phi (Deg)	Col-22 Su (tsf)	Col-23 OCR	Col-32 YoungE (tsf)	Col-33 E/qc
40.223	22.55	22.97	0.57	38.24	2.49	114.6	2.295	0.850	1.445	11.0	9.1	5.0E-06	-9999.0	-9999.0	1.378	4.2	-9999.0	-9999.0
40.288	57.24	57.72	0.01	44.84	0.02	120.9	2.299	0.852	1.447	13.8	11.5	5.0E-03	45.6	38.0	-9999.0	-9999.0	184.4	3.194
40.354	126.55	126.91	0.01	33.50	0.01	124.1	2.303	0.854	1.449	24.3	20.2	5.0E-02	68.2	42.0	-9999.0	-9999.0	285.7	2.252
40.419	182.00	182.11	0.01	10.29	0.01	124.1	2.307	0.856	1.451	34.9	29.0	5.0E-02	78.5	42.0	-9999.0	-9999.0	365.6	2.007
40.485	218.79	218.86	0.01	6.42	0.00	127.3	2.311	0.858	1.453	34.9	29.0	5.0E+00	83.7	44.0	-9999.0	-9999.0	426.6	1.949
40.551	242.37	242.46	0.01	8.75	0.00	127.3	2.316	0.860	1.455	38.7	32.1	5.0E+00	86.7	44.0	-9999.0	-9999.0	497.9	2.053

APPENDIX D

LABORATORY TEST PROCEDURES

LABORATORY TEST RESULTS

LABORATORY TEST PROCEDURES

Moisture Content

The moisture content in a given mass of soil is the ratio, expressed as a percentage, of the weight of the water to the weight of the solid particles. This test was conducted in accordance with ASTM D 2216.

Unit Weights

The moist or dry unit weight of a given soil mass is obtained by dividing the weight of the soil mass by the volume. Selected portions of the 3-inch split spoon and Shelby tube samples obtained during the exploration were measured and weighed in our laboratory to determine sample unit weights.

Specific Gravity of Soil Solids

The specific gravity of soil solids is the ratio of the mass of a unit volume of a soil solid to the mass of the same volume of gas-free distilled water at 20C. The test method for determining the specific gravity of soil solids that passes the 4.75-mm (No. 4) sieve using a water pycnometer is described in ASTM D 854, Method B, and "Test Methods for Specific Gravity of Soil Solids by Water Pycnometer".

Atterberg Limits

Originally, the Atterberg Limits consisted of seven "limits of consistency" of fine-grained soils. In current engineering usage, the term usually refers only to the liquid limit (LL) and plastic limit (PL). The LL (between the liquid and plastic states) is the water content at which a trapezoidal groove of specified shape, cut in moist soil held in a special cup, is closed after 25 taps on a hard rubber plate. The PL (between plastic and semi-solid states) is the water content at which the soil crumbles when rolled into threads of 1/8 inch in diameter.

The LL has been found to be proportional to the compressibility of the normally consolidated soil. The PI is the calculated difference in water contents between the LL and the PL. Together the LL and PI are used to classify silts and clays according to the Unified Soil Classification System

(ASTM D 2487). The PI is used to predict the potential for volume changes in confined soils beneath foundations or grade slabs. The LL, PL, and PI are determined in accordance with ASTM D 4318.

Grain Size Distribution

Grain Size Tests are performed to aid in determining the soil classification and the grain size distribution. The soil samples are prepared for testing according to ASTM D 421 (dry preparation) or ASTM D 2217 (wet preparation). If only the grain size distribution of soils coarser than a number 200 sieve (0.074-mm opening) is desired, the grain size distribution is determined by washing the sample over a number 200 sieve and, after drying, passing the samples through a standard set of nested sieves. If the grain size distribution of the soils finer than the number 200 sieve is also desired, the grain size distribution of the soils coarser than the number 10 sieve is determined by passing the sample through a set of nested sieves. Materials passing the number 10 sieve are dispersed with a dispersing agent and suspended in water, and the grain size distribution calculated from the measured settlement rate of the particles. These tests are conducted in accordance with ASTM D 422.

Triaxial Shear Tests

Triaxial shear tests are used to determine the strength characteristics and friction angle of a given soil sample. Triaxial tests are also used to determine the elastic properties of the soil specimen.

Triaxial shear tests are performed on several sections of a relatively undisturbed sample extruded from the sampling tube. The samples are trimmed into cylinders 1.4 to 2.8 inches in diameter and encased in rubber membranes. Each is then placed in a compression chamber and confined by all-around air pressure. The test results are presented in the form of stress-strain curves and Mohr envelopes, or p-q plots on the accompanying Triaxial Shear Test Sheets.

One of three types of triaxial tests is normally performed, the most suitable type being determined by the loading conditions imposed on the soil in the field and the soil characteristics.

1. Consolidated-Undrained (Designated as a CU or R Test)
2. Consolidated-Drained (designated as a CD or S Test)
3. Unconsolidated-Undrained (designated as a UU or Q Test)

Consolidation Test

Consolidation tests are conducted on representative soil samples to determine the change in height of the sample with increasing load. The results of these tests are used to estimate the amount and rate of settlement of structures constructed on similar soils.

A consolidation test is conducted according to ASTM D-2435 on a single section of an undisturbed sample extruded from a sample tube. The sample is trimmed into a disc 2.0 or 2.5 inches in diameter and 1 inch thick. The disc is confined in a steel ring and sandwiched between porous plates. Depending on the conditions in the field, the test may be conducted with a sample either at its natural moisture content or saturated. It is then subjected to incrementally increasing vertical loads, and the resulting deformations are measured with a micrometer dial gauge. Void ratios are then calculated from these deformation readings. The test results are presented in the form of pressure-versus-void-ratio curves on the accompanying Consolidation Test Sheet.

Falling Head Permeability Test

The tests were performed on undisturbed samples. The physical dimensions and weight were obtained and the sample was encased in a rubber membrane and placed in a triaxial chamber. The sample was then back-pressure saturated until a B value of 0.95 or greater was reached. After saturation was obtained, the sample was consolidated under 10-psi confining stress. Upon completion of consolidation, a falling head permeability test was performed. The test was conducted in accordance with ASTM D 5084.

MACTEC

UNIT WEIGHT AND MOISTURE CONTENT

DATE 6/10/04
TECHNICIAN MH.
CHECKED CDL 7/4/04
CTJ

JOB NUMBER 3043-04-1022/01 JOB NAME TVA Bull Run Ash Disposal Area

SAMPLE NUMBER	B-1A	B-8A	B-8A	B-8A	B-3A		
DEPTH	30'-32'	5'-7'	7'-9'	9'-11'	5'-7'		
WEIGHT TUBE & SOIL (lb)	—						
WEIGHT TUBE (lb)	—						
WEIGHT SOIL (g)	568.53	638.82	678.52	663.51	1093.90		
LENGTH TUBE (in)							
Diameter (in)	2.88"	2.88"	2.88"	2.88	2.88"		
LENGTH SOIL (in)	3.2750"	3.743"	4.274"	3.8424"	7.652		
VOLUME (cu. ft.)							
WET UNIT WEIGHT (pcf)	101.5	99.8	92.8	101.0	83.6		
WET WEIGHT SOIL (gm)	567.56g	638.81	678.52	663.30	107.79		
DRY WEIGHT SOIL (gm)	418.51	471.39	440.03	488.52	91.20		
WEIGHT WATER (gm)							
MOISTURE (%)	35.6	35.5	54.2	35.8	18.2		
DRY UNIT WEIGHT (pcf)	74.9	73.7	60.2	74.4	70.7		
PAN NUMBER	CREAM	B-6	pan	BOT	BC-6		
SAMPLE DESCRIPTION							

MACTEC Engineering and Consulting
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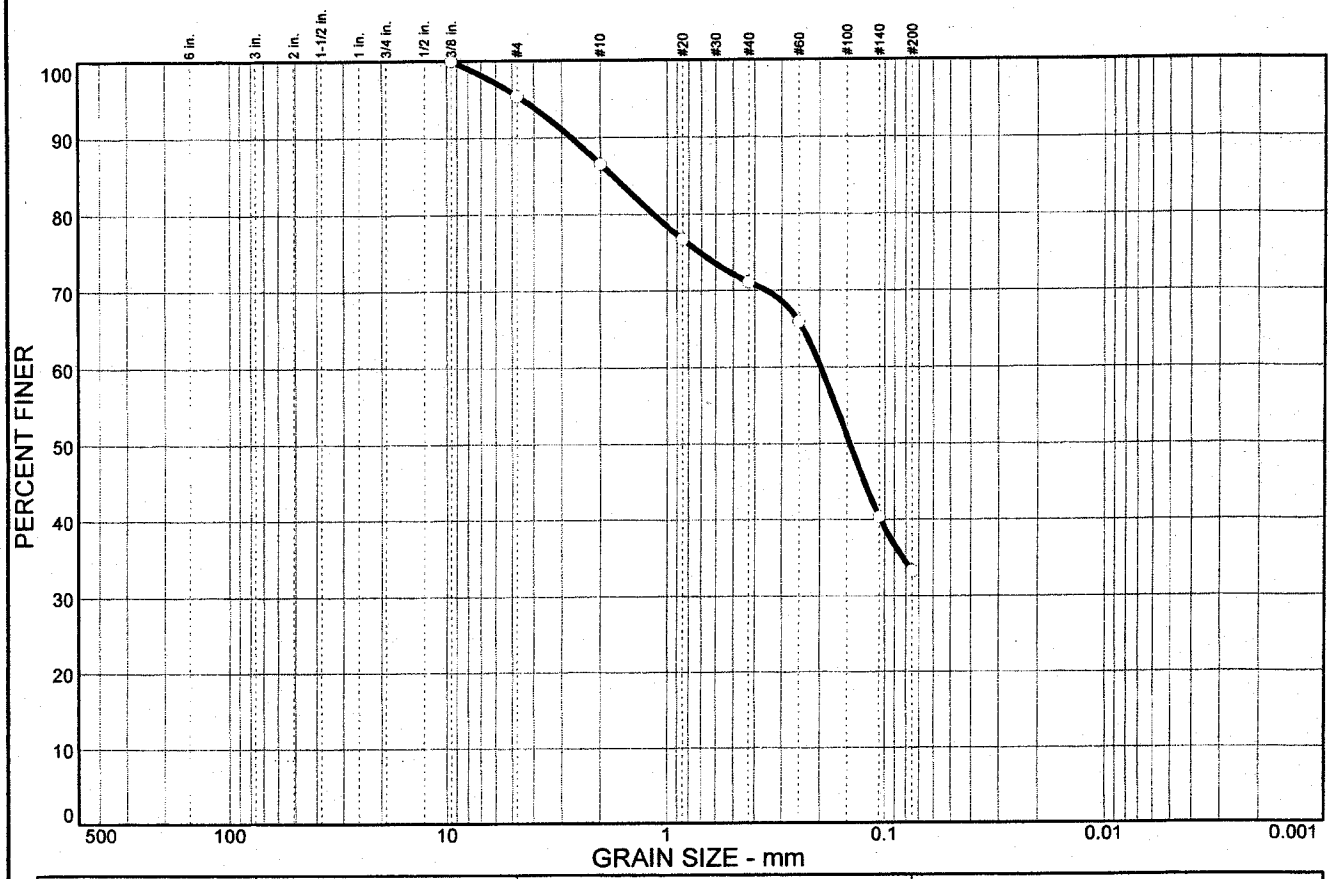
Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	4.6	8.9	15.4	37.9	33.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in.	100.0		
#4	95.4		
#10	86.5		
#20	76.7		
#40	71.1		
#60	65.9		
#140	40.3		
#200	33.2		

* (no specification provided)

Soil Description

Grey Bottom Ash

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 1.76 D_{60}= 0.198 D_{50}= 0.146
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Sample No.: **Source of Sample:** **Date:** 06-21-04
Location: B-1A UD @ 15'-16' **Elev./Depth:**

MACTEC ENGINEERING AND CONSULTING, INC.

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project No: 3043-04-1022 **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project Number: 3043-04-1022

Sample Data

Source:
Sample No.:
Elev. or Depth:
Sample Length(in./cm.):
Location: B-1A UD @ 15'-16'
Description: Grey Bottom Ash
Date: 06-21-04 **PL:**
LL: **PI:**
USCS Classification:
AASHTO Classification:
Testing Remarks:

Mechanical Analysis Data

	Initial
Dry sample and tare=	261.88
Tare =	0.00
Dry sample weight =	261.88

Tare for cumulative weight retained= .00

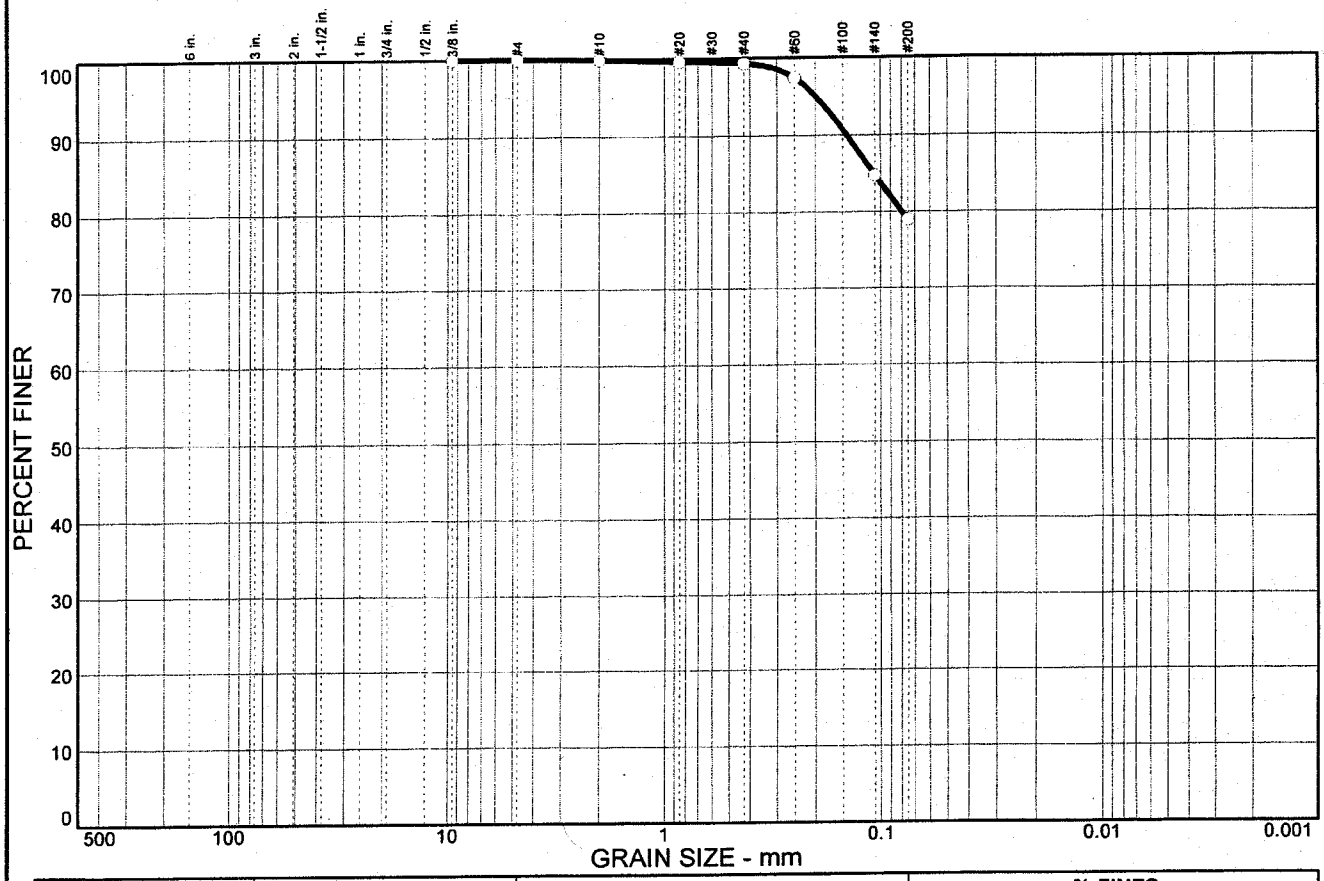
Sieve	Cumul. Wt. retained	Percent finer
0.375 inch	0.00	100.0
# 4	11.94	95.4
# 10	35.39	86.5
# 20	60.91	76.7
# 40	75.58	71.1
# 60	89.33	65.9
# 140	156.33	40.3
# 200	175.03	33.2

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =** 4.6 **(% coarse =** **% fine =** 4.6)
% SAND = 62.2 **(% coarse =** 8.9 **% medium =** 15.4 **% fine =** 37.9)
% FINES = 33.2

D_{85}= 1.76 D_{60}= 0.20 D_{50}= 0.15

Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.1	0.6	20.4	78.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in.	100.0		
#4	100.0		
#10	99.9		
#20	99.6		
#40	99.3		
#60	97.4		
#140	84.7		
#200	78.9		

* (no specification provided)

Soil Description

Grey Fly Ash

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.108 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Sample No.: **Source of Sample:** **Date:** 07-02-04
Location: B-1A UD @ 32'-33.5' **Elev./Depth:**

MACTEC ENGINEERING AND CONSULTING, INC.

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project No: 3043-04-1022 **Figure** CA

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project Number: 3043-04-1022

Sample Data

Source:
Sample No.:
Elev. or Depth:
Sample Length(in./cm.):
Location: B-1A UD @ 32'-33.5'
Description: Grey Fly Ash
Date: 07-02-04 **PL:**
LL: **PI:**
USCS Classification:
AASHTO Classification:
Testing Remarks:

Mechanical Analysis Data

	Initial
Dry sample and tare=	310.78
Tare =	0.00
Dry sample weight =	310.78

Tare for cumulative weight retained= .00

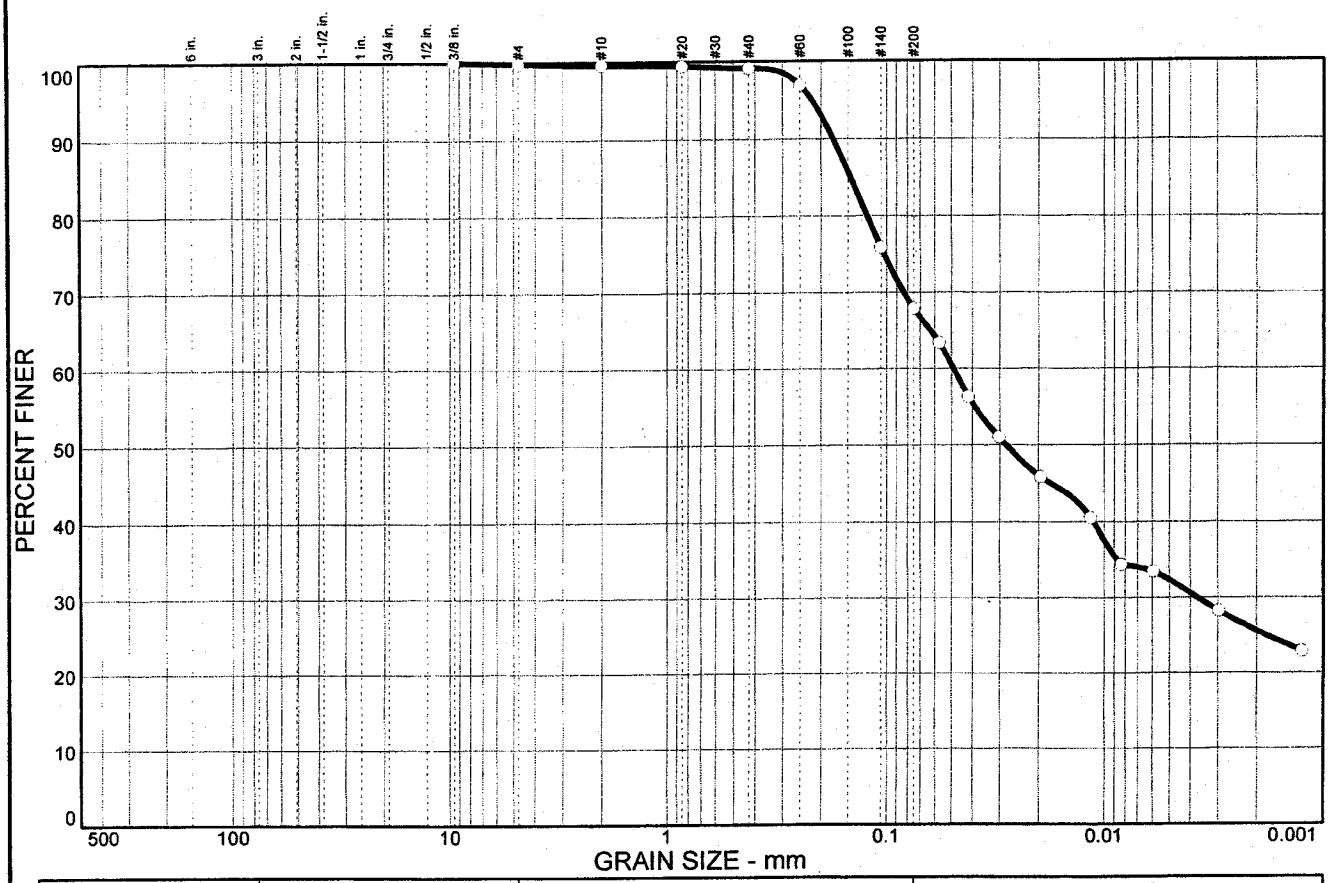
Sieve	Cumul. Wt. retained	Percent finer
0.375 inch	0.00	100.0
# 4	0.00	100.0
# 10	0.17	99.9
# 20	1.24	99.6
# 40	2.30	99.3
# 60	7.95	97.4
# 140	47.56	84.7
# 200	65.52	78.9

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =**
% SAND = 21.1 (**% coarse** = 0.1 **% medium** = 0.6 **% fine** = 20.4)
% FINES = 78.9

D_{85}= 0.11

Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.2	0.2	0.5	31.2	35.6	32.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in.	100.0		
#4	99.8		
#10	99.6		
#20	99.4		
#40	99.1		
#60	96.9		
#140	75.9		
#200	67.9		

* (no specification provided)

Soil Description

Tan-Brown Sandy Silty Clay

Atterberg Limits

PL= 16 LL= 27 PI= 11

Coefficients

D_{85}= 0.146 D_{60}= 0.0490 D_{50}= 0.0281
D_{30}= 0.0037 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Specific Gravity: 2.62

Sample No.: **Source of Sample:** **Date:** 06-21-04
Location: B-2 UD @ 35.5'-37.5' **Elev./Depth:**

MACTEC ENGINEERING AND CONSULTING, INC.

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project No: 3043-04-1022 **Figure** C7

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project Number: 3043-04-1022

Sample Data

Source:
Sample No.:
Elev. or Depth:
Sample Length(in./cm.):
Location: B-2 UD @ 35.5'-37.5'
Description: Tan-Brown Sandy Silty Clay
Date: 06-21-04 **PL:** 16 **LL:** 27 **PI:** 11
USCS Classification: CL **AASHTO Classification:**
Testing Remarks: Specific Gravity: 2.62

Mechanical Analysis Data

	Initial
Dry sample and tare=	286.21
Tare =	0.00
Dry sample weight =	286.21

Sample split on number 10 sieve
Split sample data:
Sample and tare = 56.98 Tare = .00 Sample weight = 56.98
Cumulative weight retained tare= .00
Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
0.375 inch	0.00	100.0
# 4	0.62	99.8
# 10	1.05	99.6
# 20	0.14	99.4
# 40	0.26	99.1
# 60	1.52	96.9
# 140	13.54	75.9
# 200	18.16	67.9

Hydrometer Analysis Data

Separation sieve is #10
Percent -#10 based upon complete sample= 99.6
Weight of hydrometer sample: 56.98
Calculated biased weight= 57.21
Table of composite correction values:

Temp, deg C:	20.0	22.0	24.0
Comp. corr:	-5.5	-4.8	-4.0

Meniscus correction only= 1.0
Specific gravity of solids= 2.62
Specific gravity correction factor= 1.007
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

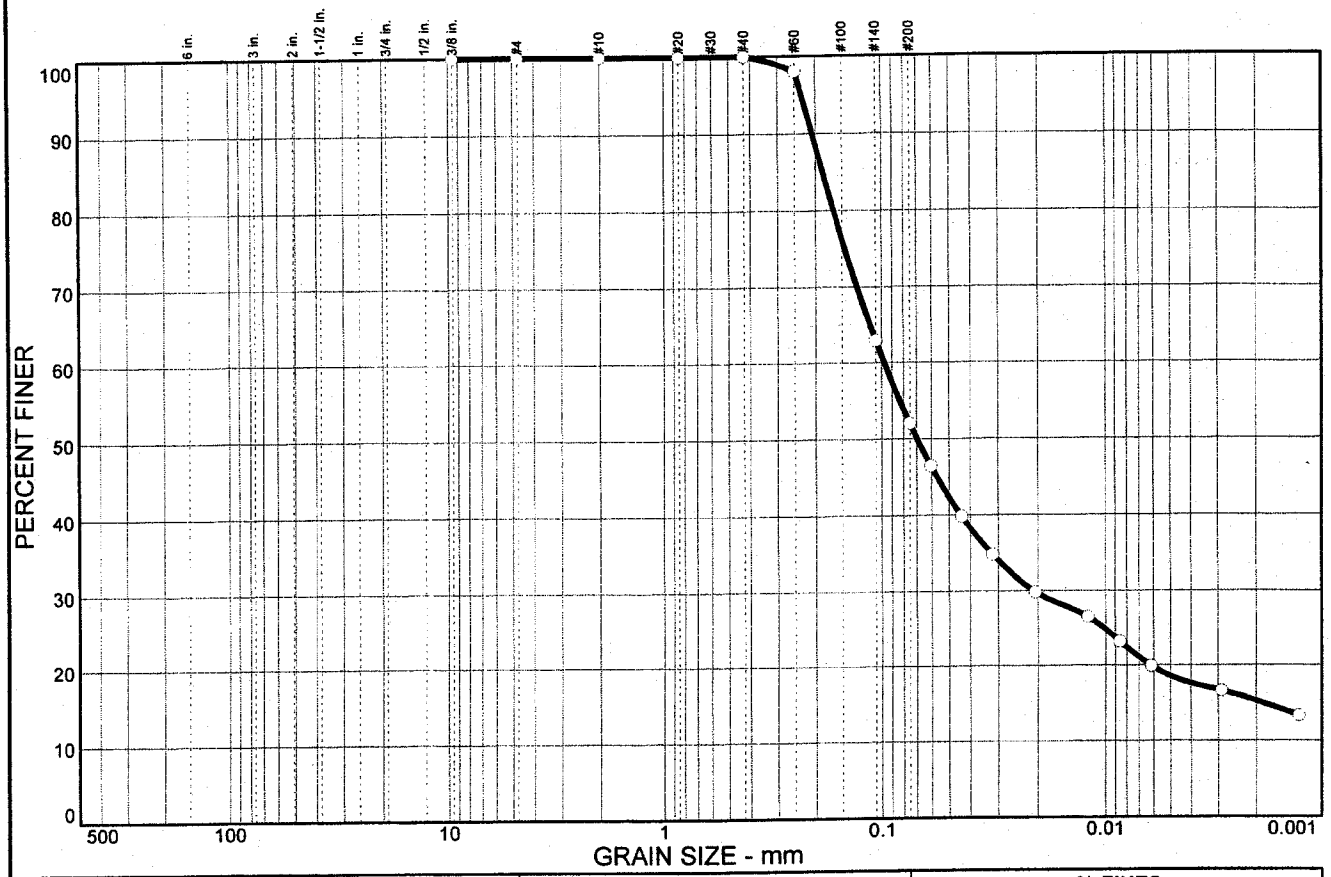
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
0.50	24.4	40.0	36.0	0.0131	41.0	9.6	0.0571	63.4
1.00	24.4	36.0	32.0	0.0131	37.0	10.2	0.0417	56.3
2.00	24.4	33.0	29.0	0.0131	34.0	10.7	0.0302	51.0
5.00	24.4	30.0	26.0	0.0131	31.0	11.2	0.0195	45.8
15.00	24.4	27.0	23.0	0.0131	28.0	11.7	0.0115	40.5
30.00	24.4	23.5	19.5	0.0131	24.5	12.3	0.0084	34.3
60.00	24.4	23.0	19.0	0.0131	24.0	12.4	0.0059	33.4
250.00	24.4	20.0	16.0	0.0131	21.0	12.9	0.0030	28.2
1446.00	24.4	17.0	13.0	0.0131	18.0	13.3	0.0013	22.9

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =** 0.2 **(% coarse =** **% fine =** 0.2)
% SAND = 31.9 **(% coarse =** 0.2 **% medium =** 0.5 **% fine =** 31.2)
% SILT = 35.6 **% CLAY =** 32.3

D_{85}= 0.15 D_{60}= 0.05 D_{50}= 0.03
D_{30}= 0.00

Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.0	48.0	33.4	18.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in.	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	100.0		
#60	98.0		
#140	62.9		
#200	52.0		

* (no specification provided)

Soil Description

Orange-Brown Sandy Silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.185 D_{60}= 0.0974 D_{50}= 0.0697
D_{30}= 0.0210 D_{15}= 0.0019 D_{10}=
C_u= C_c=

Classification

USCS= ML AASHTO=

Remarks

Specific Gravity: 2.65

Sample No.: **Source of Sample:** **Date:** 06-21-04
Location: B-2 UD @ 39'-41' **Elev./Depth:**

MACTEC ENGINEERING AND CONSULTING, INC.

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project No: 3043-04-1022 **Figure** CTA

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project Number: 3043-04-1022

Sample Data

Source:
Sample No.:
Elev. or Depth: **Sample Length(in./cm.):**
Location: B-2 UD @ 39'-41'
Description: Orange-Brown Sandy Silt
Date: 06-21-04 **PL:** **LL:** **PI:**
USCS Classification: ML **AASHTO Classification:**
Testing Remarks: Specific Gravity: 2.65

Mechanical Analysis Data

	Initial
Dry sample and tare=	383.02
Tare =	0.00
Dry sample weight =	383.02

Sample split on number 10 **sieve**
Split sample data:
Sample and tare = 60.33 **Tare =** .00 **Sample weight =** 60.33
Cumulative weight retained tare= .00
Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
0.375 inch	0.00	100.0
# 4	0.00	100.0
# 10	0.00	100.0
# 20	0.00	100.0
# 40	0.00	100.0
# 60	1.20	98.0
# 140	22.41	62.9
# 200	28.98	52.0

Hydrometer Analysis Data

Separation sieve is #10
Percent -#10 based upon complete sample= 100.0
Weight of hydrometer sample: 60.33
Calculated biased weight= 60.33
Table of composite correction values:

Temp, deg C:	20.0	22.0	24.0
Comp. corr:	-5.5	-4.8	-4.0

Meniscus correction only= 1.0
Specific gravity of solids= 2.65
Specific gravity correction factor= 1.000
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

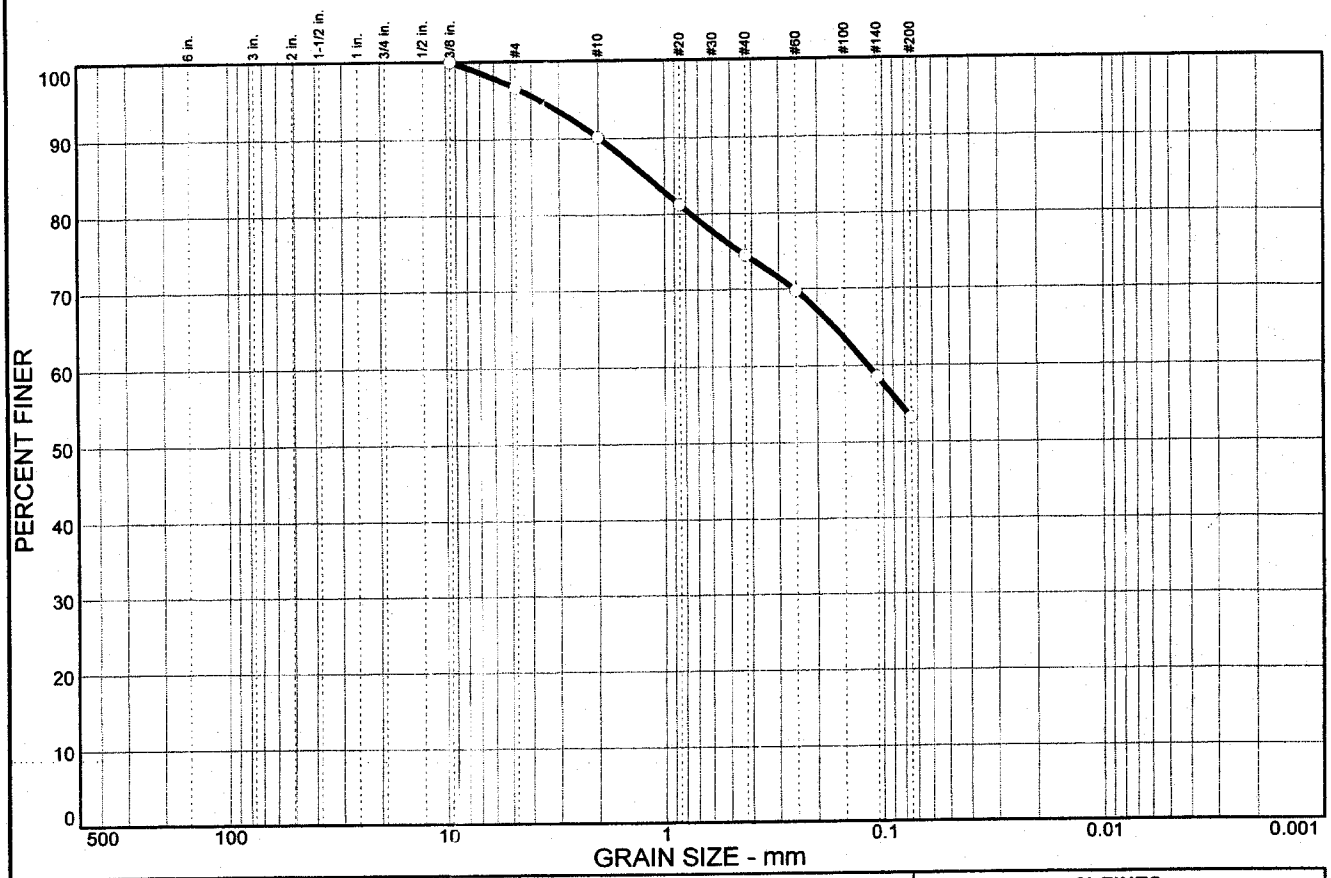
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
0.50	24.4	32.0	28.0	0.0129	33.0	10.9	0.0604	46.4
1.00	24.4	28.0	24.0	0.0129	29.0	11.5	0.0439	39.8
2.00	24.4	25.0	21.0	0.0129	26.0	12.0	0.0317	34.8
5.00	24.4	22.0	18.0	0.0129	23.0	12.5	0.0205	29.8
15.00	24.4	20.0	16.0	0.0129	21.0	12.9	0.0120	26.5
30.00	24.4	18.0	14.0	0.0129	19.0	13.2	0.0086	23.2
60.00	24.4	16.0	12.0	0.0129	17.0	13.5	0.0061	19.9
280.00	24.4	14.0	10.0	0.0129	15.0	13.8	0.0029	16.6
1440.00	24.4	12.0	8.0	0.0129	13.0	14.2	0.0013	13.3

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =**
% SAND = 48.0 **(% coarse =** 0.0 **% medium =** 0.0 **% fine =** 48.0**)**
% SILT = 33.4 **% CLAY =** 18.6

D_{85}= 0.18 D_{60}= 0.10 D_{50}= 0.07
D_{30}= 0.02 D_{15}= 0.00

Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	3.4	6.5	15.6	21.3	53.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in.	100.0		
#4	96.6		
#10	90.1		
#20	81.2		
#40	74.5		
#60	69.8		
#140	58.5		
#200	53.2		

* (no specification provided)

Soil Description

Grey Bottom Ash

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 1.21 D_{60}= 0.117 D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Specific Gravity: 2.26

Sample No.: **Source of Sample:** **Date:** 06-21-04
Location: B-2P UD @ 2'-4' **Elev./Depth:**

MACTEC ENGINEERING AND CONSULTING, INC.

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project No: 3043-04-1022 **Figure** CTJ

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project Number: 3043-04-1022

Sample Data

Source:
Sample No.:
Elev. or Depth: **Sample Length(in./cm.):**
Location: B-2P UD @ 2'-4'
Description: Grey Bottom Ash
Date: 06-21-04 **PL:** **LL:** **PI:**
USCS Classification: **AASHTO Classification:**
Testing Remarks: Specific Gravity: 2.26

Mechanical Analysis Data

	Initial
Dry sample and tare=	184.55
Tare =	0.00
Dry sample weight =	184.55

Tare for cumulative weight retained= .00

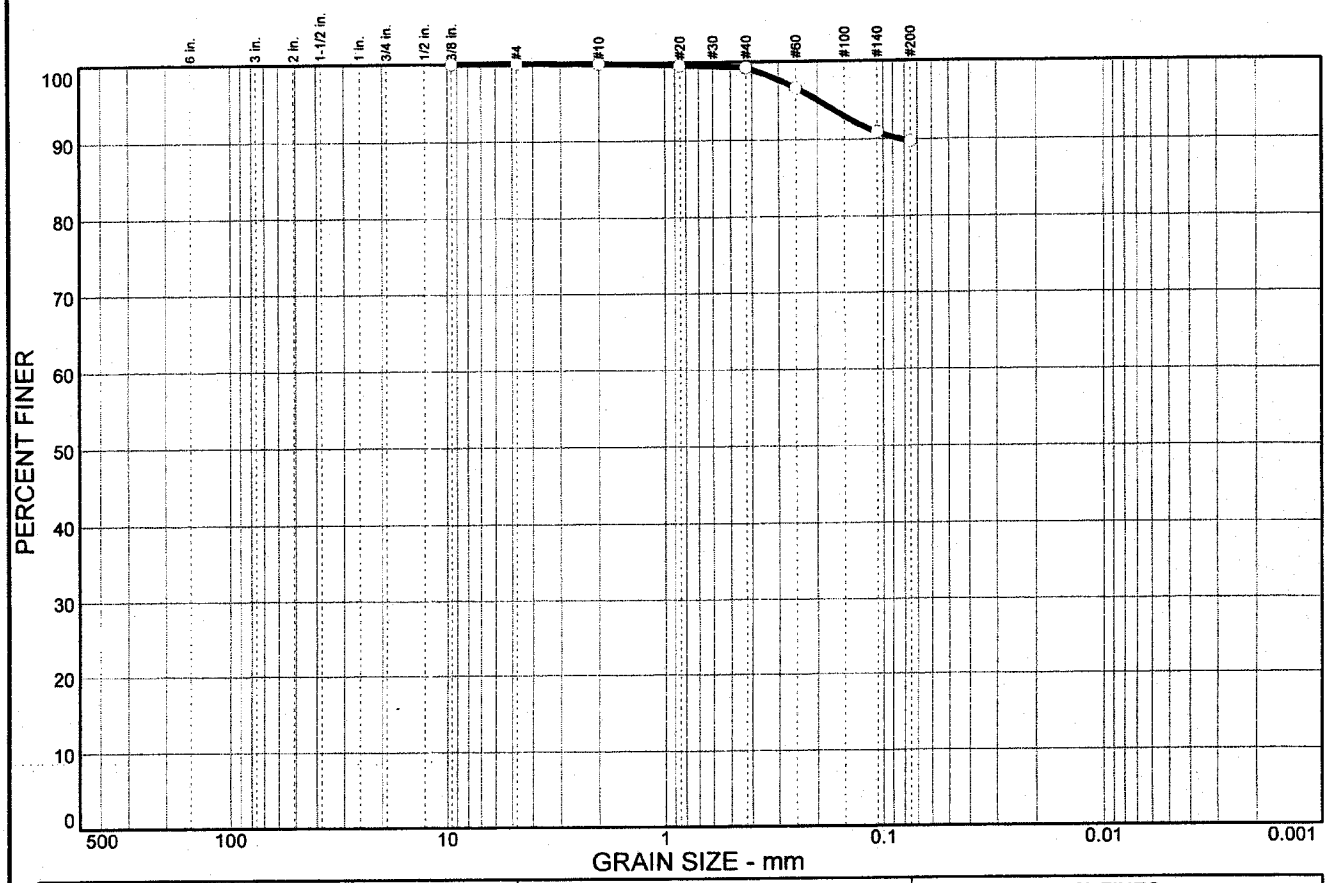
Sieve	Cumul. Wt. retained	Percent finer
0.375 inch	0.00	100.0
# 4	6.20	96.6
# 10	18.22	90.1
# 20	34.68	81.2
# 40	46.97	74.5
# 60	55.75	69.8
# 140	76.52	58.5
# 200	86.36	53.2

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =** 3.4 **(% coarse =** **% fine =** 3.4)
% SAND = 43.4 **(% coarse =** 6.5 **% medium =** 15.6 **% fine =** 21.3)
% FINES = 53.2

D_{85}= 1.21 D_{60}= 0.12

Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.1	0.6	9.6	89.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in.	100.0		
#4	100.0		
#10	99.9		
#20	99.6		
#40	99.3		
#60	96.6		
#140	90.9		
#200	89.7		

* (no specification provided)

Soil Description

Grey Fly Ash

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Specific Gravity: 2.22

Sample No.: **Source of Sample:** **Date:** 06-21-04
Location: B-2P UD @ 14'-16' **Elev./Depth:**

MACTEC ENGINEERING AND CONSULTING, INC.

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project No: 3043-04-1022 **Figure** C7

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project Number: 3043-04-1022

Sample Data

Source:
Sample No.:
Elev. or Depth: **Sample Length(in./cm.):**
Location: B-2P UD @ 14'-16'
Description: Grey Fly Ash
Date: 06-21-04 **PL:** **LL:** **PI:**
USCS Classification: **AASHTO Classification:**
Testing Remarks: Specific Gravity: 2.22

Mechanical Analysis Data

	Initial
Dry sample and tare=	145.53
Tare =	0.00
Dry sample weight =	145.53

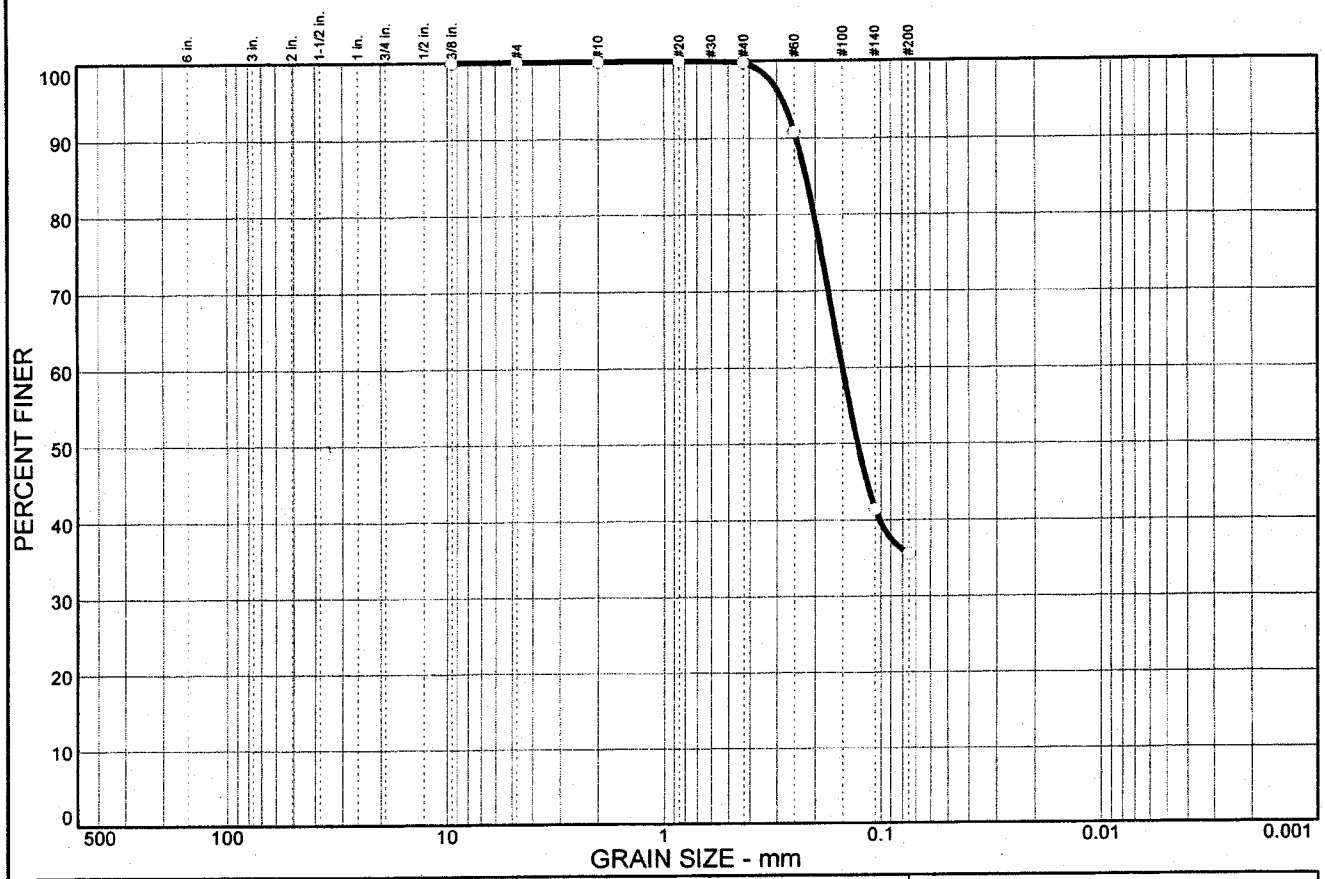
Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
0.375 inch	0.00	100.0
# 4	0.00	100.0
# 10	0.20	99.9
# 20	0.63	99.6
# 40	1.08	99.3
# 60	5.01	96.6
# 140	13.30	90.9
# 200	14.95	89.7

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =**
% SAND = 10.3 **(% coarse** = 0.1 **% medium** = 0.6 **% fine** = 9.6)
% FINES = 89.7

Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.2	64.3	35.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in.	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.8		
#60	90.8		
#140	41.4		
#200	35.5		

* (no specification provided)

Soil Description

Grey Bottom Ash

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.221 D_{60}= 0.150 D_{50}= 0.128
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Specific Gravity: 2.20

Sample No.: B-2P UD @ 18'-20' **Source of Sample:** **Date:** 07-02-04
Location: **Elev./Depth:**

MACTEC ENGINEERING AND CONSULTING, INC.

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project No: 3043-04-1022 **Figure** C7

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project Number: 3043-04-1022

Sample Data

Source:
Sample No.: B-2P UD @ 18'-20'
Elev. or Depth: **Sample Length(in./cm.):**
Location:
Description: Grey Bottom Ash
Date: 07-02-04 **PL:** **LL:** **PI:**
USCS Classification: **AASHTO Classification:**
Testing Remarks:

Mechanical Analysis Data

	Initial
Dry sample and tare=	111.71
Tare =	0.00
Dry sample weight =	111.71

Tare for cumulative weight retained= .00

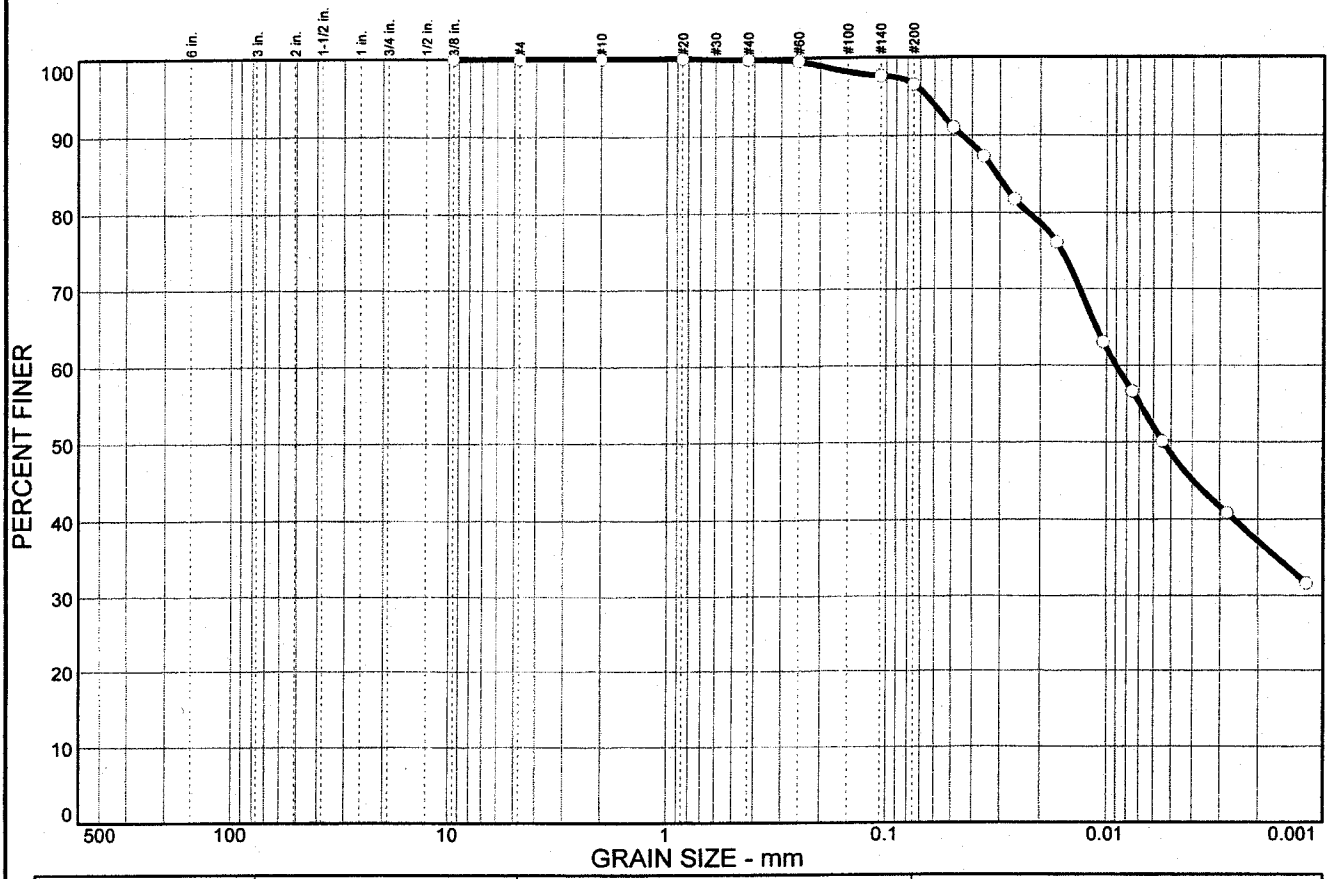
Sieve	Cumul. Wt. retained	Percent finer
0.375 inch	0.00	100.0
# 4	0.00	100.0
# 10	0.00	100.0
# 20	0.00	100.0
# 40	0.19	99.8
# 60	10.25	90.8
# 140	65.44	41.4
# 200	72.10	35.5

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =**
% SAND = 64.5 **(% coarse =** 0.0 **% medium =** 0.2 **% fine =** 64.3**)**
% FINES = 35.5

D_{85}= 0.22 D_{60}= 0.15 D_{50}= 0.13

Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.2	3.3	48.0	48.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in.	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.8		
#60	99.6		
#140	97.6		
#200	96.5		

* (no specification provided)

Soil Description

Tan-Brown Silty Clay

Atterberg Limits

PL= 23 LL= 44 PI= 21

Coefficients

D_{85}= 0.0311 D_{60}= 0.0090 D_{50}= 0.0054
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Specific Gravity: 2.70

Sample No.: **Source of Sample:** **Date:** 06-21-04
Location: B-3 UD @ 39'-41' **Elev./Depth:**

MACTEC ENGINEERING AND CONSULTING, INC.

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project No: 3043-04-1022 **Figure** CTJ

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project Number: 3043-04-1022

Sample Data

Source:
Sample No.:
Elev. or Depth:
Sample Length(in./cm.):
Location: B-3 UD @ 39'-41'
Description: Tan-Brown Silty Clay
Date: 06-21-04 **PL:** 23 **LL:** 44 **PI:** 21
USCS Classification: CL **AASHTO Classification:**
Testing Remarks: Specific Gravity: 2.70

Mechanical Analysis Data

	Initial
Dry sample and tare=	144.58
Tare =	0.00
Dry sample weight =	144.58

Sample split on number 10 sieve
Split sample data:
Sample and tare = 53.27 Tare = .00 Sample weight = 53.27
Cumulative weight retained tare= .00
Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
0.375 inch	0.00	100.0
# 4	0.00	100.0
# 10	0.00	100.0
# 20	0.00	100.0
# 40	0.10	99.8
# 60	0.22	99.6
# 140	1.27	97.6
# 200	1.86	96.5

Hydrometer Analysis Data

Separation sieve is #10
Percent -#10 based upon complete sample= 100.0
Weight of hydrometer sample: 53.27
Calculated biased weight= 53.27
Table of composite correction values:

Temp, deg C:	20.0	22.0	24.0
Comp. corr:	-5.5	-4.8	-4.0

Meniscus correction only= 1.0
Specific gravity of solids= 2.70
Specific gravity correction factor= 0.989
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

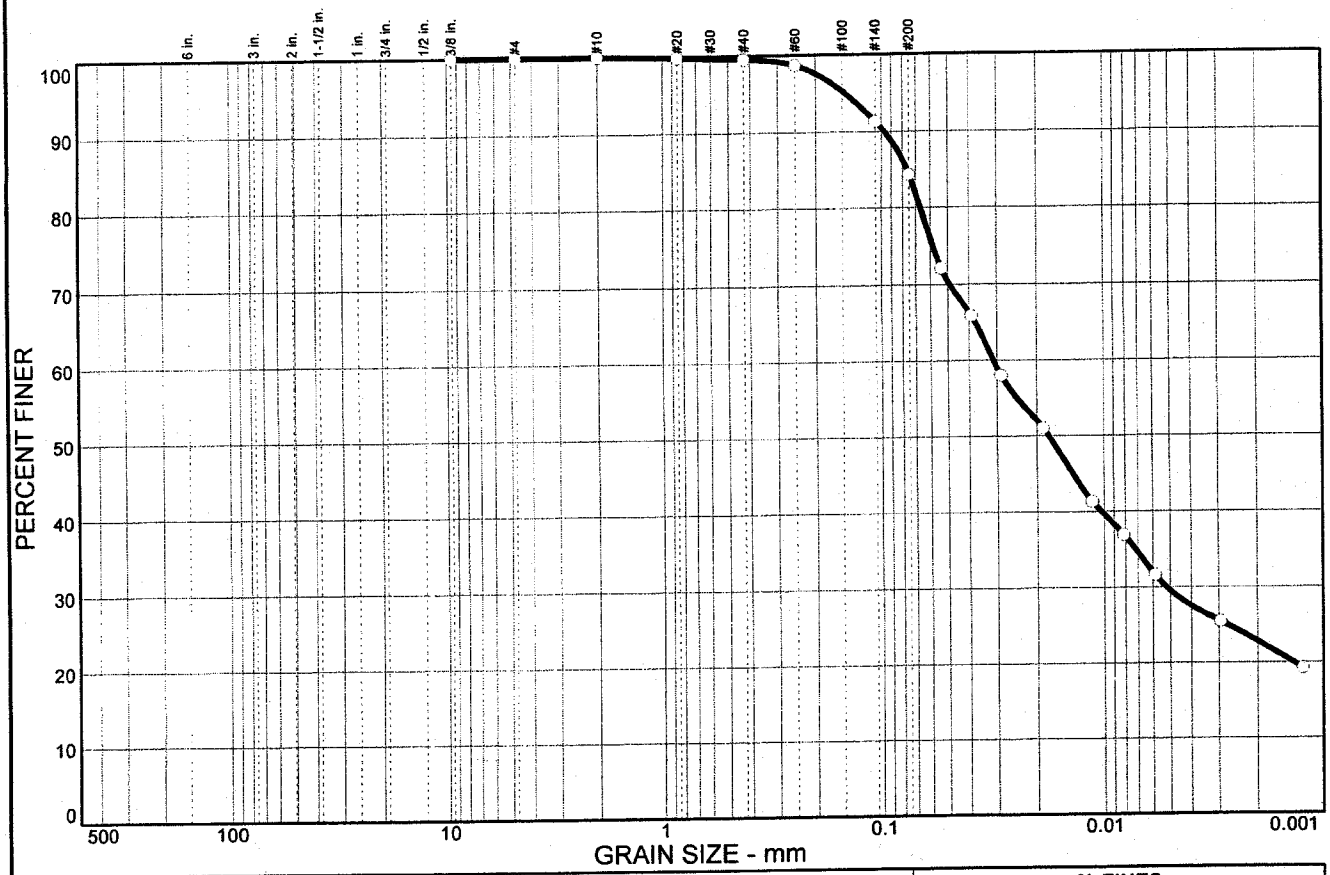
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
0.50	24.4	53.0	49.0	0.0127	54.0	7.4	0.0492	91.0
1.00	24.4	51.0	47.0	0.0127	52.0	7.8	0.0355	87.3
2.00	24.4	48.0	44.0	0.0127	49.0	8.3	0.0259	81.7
5.00	24.4	45.0	41.0	0.0127	46.0	8.8	0.0169	76.1
15.00	24.4	38.0	34.0	0.0127	39.0	9.9	0.0104	63.1
30.00	24.4	34.5	30.5	0.0127	35.5	10.5	0.0075	56.6
60.00	24.4	31.0	27.0	0.0127	32.0	11.0	0.0055	50.1
250.00	24.4	26.0	22.0	0.0127	27.0	11.9	0.0028	40.8
1440.00	24.4	21.0	17.0	0.0127	22.0	12.7	0.0012	31.6

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =**
% SAND = 3.5 **(% coarse =** 0.0 **% medium =** 0.2 **% fine =** 3.3**)**
% SILT = 48.0 **% CLAY =** 48.5

D_{85}= 0.03 **D_{60}=** 0.01 **D_{50}=** 0.01

Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.5	15.2	54.7	29.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in.	100.0		
#4	100.0		
#10	100.0		
#20	99.8		
#40	99.5		
#60	98.7		
#140	91.3		
#200	84.3		

* (no specification provided)

Soil Description

Tan-Brown Silty Clay with Sand

Atterberg Limits

PL= 19 LL= 33 PI= 14

Coefficients

D_{85}= 0.0767 D_{60}= 0.0311 D_{50}= 0.0177
D_{30}= 0.0052 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Specific Gravity: 2.68

Sample No.: **Source of Sample:** **Date:** 06-21-04
Location: B-3 UD @ 45'-47' **Elev./Depth:**

MACTEC ENGINEERING AND CONSULTING, INC.

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project No: 3043-04-1022 **Figure** CTJ

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project Number: 3043-04-1022

Sample Data

Source:
Sample No.:
Elev. or Depth: **Sample Length(in./cm.):**
Location: B-3 UD @ 45'-47'
Description: Tan-Brown Silty Clay with Sand
Date: 06-21-04 **PL:** 19 **LL:** 33 **PI:** 14
USCS Classification: CL **AASHTO Classification:**
Testing Remarks: Specific Gravity: 2.68

Mechanical Analysis Data

	Initial
Dry sample and tare=	174.54
Tare =	0.00
Dry sample weight =	174.54

Sample split on number 10 **sieve**
Split sample data:
Sample and tare = 56.50 **Tare =** .00 **Sample weight =** 56.50
Cumulative weight retained tare= .00
Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
0.375 inch	0.00	100.0
# 4	0.00	100.0
# 10	0.00	100.0
# 20	0.12	99.8
# 40	0.28	99.5
# 60	0.75	98.7
# 140	4.91	91.3
# 200	8.85	84.3

Hydrometer Analysis Data

Separation sieve is #10
Percent -#10 based upon complete sample= 100.0
Weight of hydrometer sample: 56.50
Calculated biased weight= 56.50
Table of composite correction values:

Temp, deg C:	20.0	22.0	24.0
Comp. corr:	-5.5	-4.8	-4.0

Meniscus correction only= 1.0
Specific gravity of solids= 2.68
Specific gravity correction factor= 0.993
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

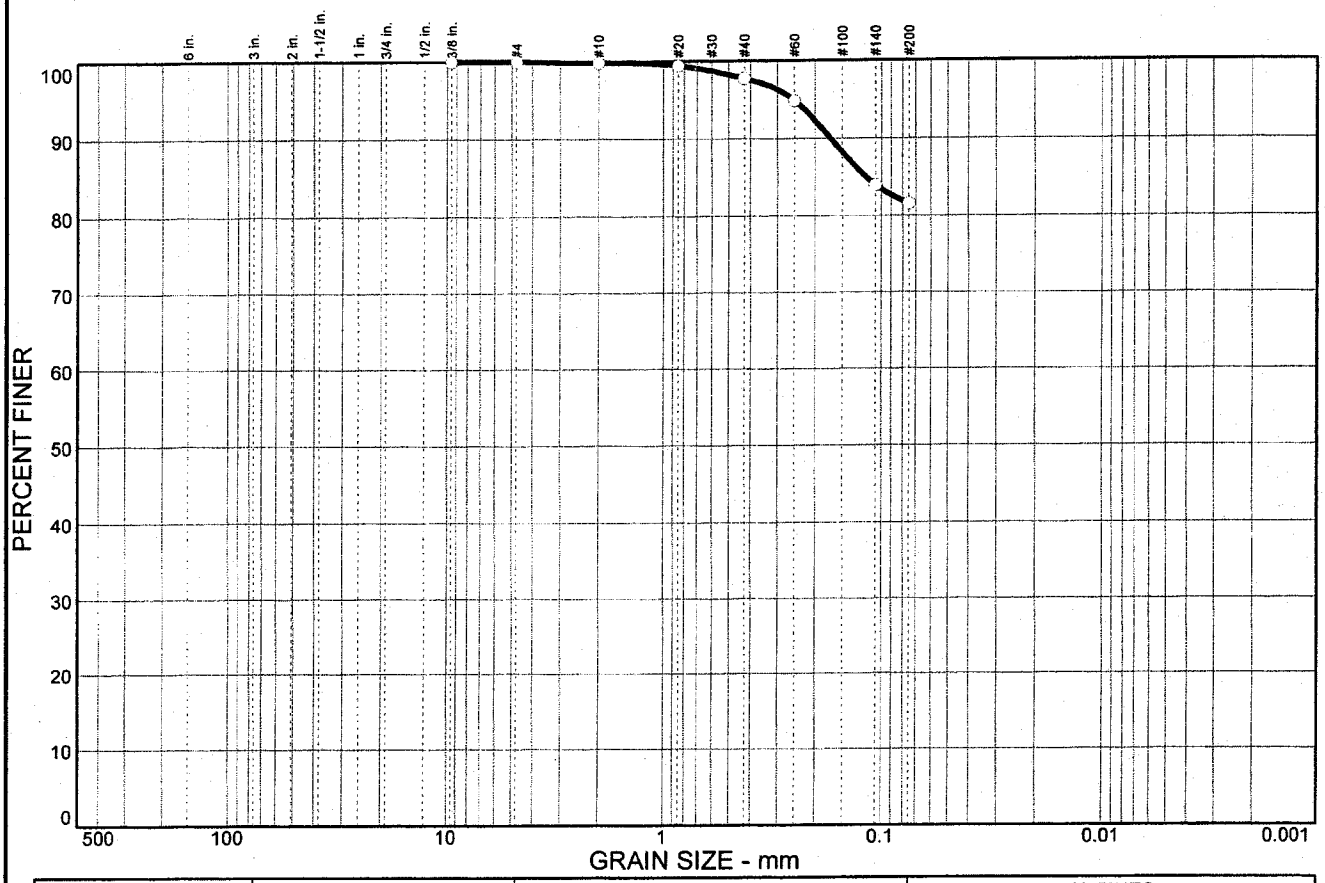
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
0.50	24.4	45.0	41.0	0.0128	46.0	8.8	0.0536	72.1
1.00	24.4	41.5	37.5	0.0128	42.5	9.3	0.0391	65.9
2.00	24.4	37.0	33.0	0.0128	38.0	10.1	0.0288	58.0
5.00	24.4	33.0	29.0	0.0128	34.0	10.7	0.0188	51.0
15.00	24.4	27.5	23.5	0.0128	28.5	11.6	0.0113	41.3
30.00	24.4	25.0	21.0	0.0128	26.0	12.0	0.0081	36.9
60.00	24.4	22.0	18.0	0.0128	23.0	12.5	0.0059	31.6
250.00	24.4	18.5	14.5	0.0128	19.5	13.1	0.0029	25.5
1440.00	24.4	15.0	11.0	0.0128	16.0	13.7	0.0012	19.3

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =**
% SAND = 15.7 **(% coarse =** 0.0 **% medium =** 0.5 **% fine =** 15.2**)**
% SILT = 54.7 **% CLAY =** 29.6

D_{85}= 0.08 D_{60}= 0.03 D_{50}= 0.02
D_{30}= 0.01

Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.2	2.1	16.2	81.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in.	100.0		
#4	100.0		
#10	99.8		
#20	99.4		
#40	97.7		
#60	94.8		
#140	83.9		
#200	81.5		

* (no specification provided)

Soil Description

Grey Fly Ash

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.118 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Sample No.: B-3A UD @ 15'-17' **Source of Sample:** **Date:** 07-02-04
Location: **Elev./Depth:**

MACTEC ENGINEERING AND CONSULTING, INC.

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project No: 3043-04-1022 **Figure** CTA

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project Number: 3043-04-1022

Sample Data

Source:
Sample No.: B-3A UD @ 15'-17'
Elev. or Depth: **Sample Length(in./cm.):**
Location:
Description: Grey Fly Ash
Date: 07-02-04 **PL:** **LL:** **PI:**
USCS Classification: **AASHTO Classification:**
Testing Remarks:

Mechanical Analysis Data

	Initial
Dry sample and tare=	302.90
Tare =	0.00
Dry sample weight =	302.90

Tare for cumulative weight retained= .00

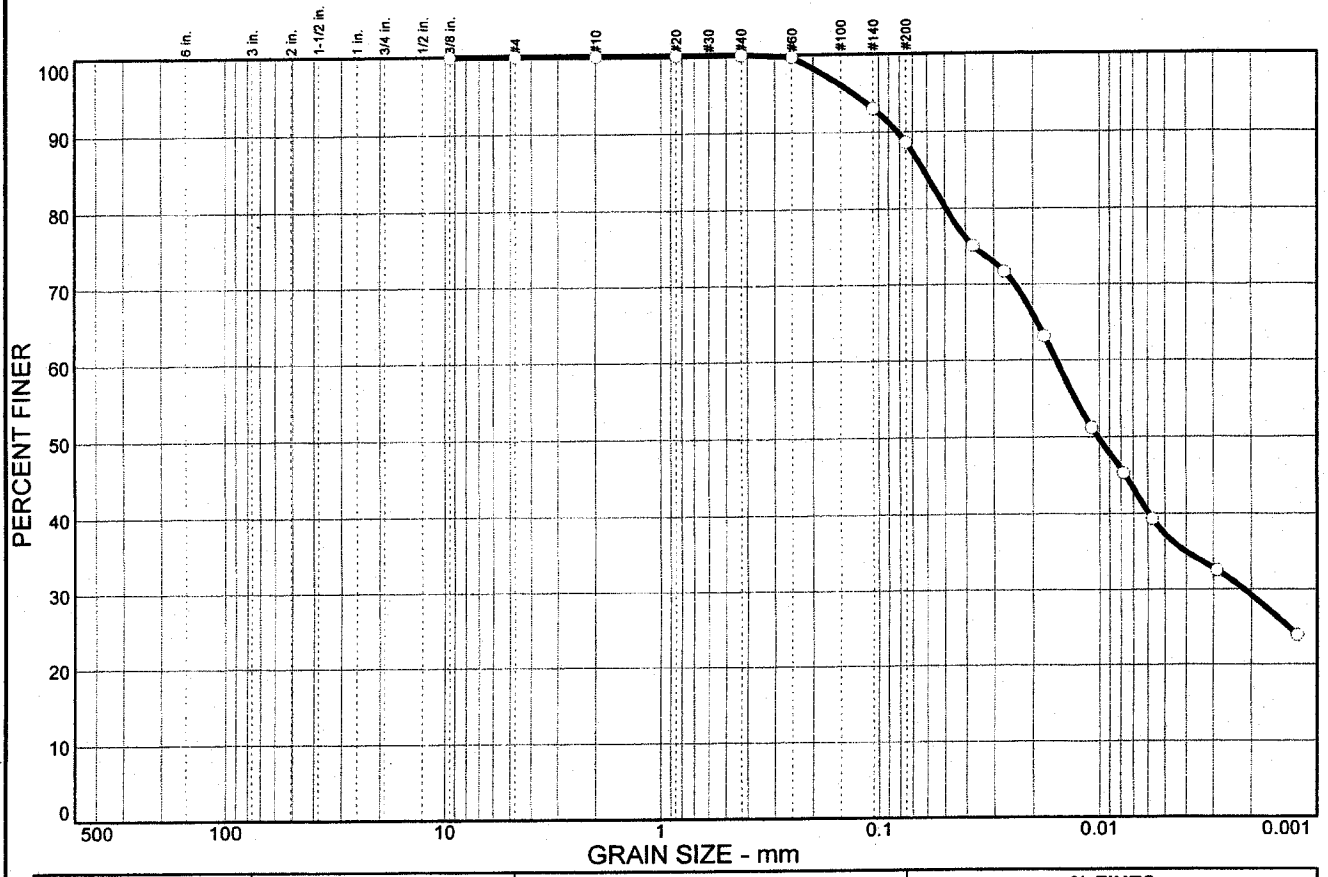
Sieve	Cumul. Wt. retained	Percent finer
0.375 inch	0.00	100.0
# 4	0.00	100.0
# 10	0.55	99.8
# 20	1.67	99.4
# 40	6.84	97.7
# 60	15.84	94.8
# 140	48.68	83.9
# 200	56.08	81.5

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =**
% SAND = 18.5 **(% coarse** = 0.2 **% medium** = 2.1 **% fine** = 16.2)
% FINES = 81.5

D_{85}= 0.12

Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.0	11.4	51.3	37.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in.	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	100.0		
#60	99.7		
#140	93.0		
#200	88.6		

* (no specification provided)

Soil Description

Olive-Grey Silty Clay

Atterberg Limits

PL= 20 LL= 38 PI= 18

Coefficients

D_{85}= 0.0622 D_{60}= 0.0157 D_{50}= 0.0102
D_{30}= 0.0022 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Specific Gravity: 2.65

Sample No.: **Source of Sample:** **Date:** 06-21-04
Location: B-6 UD @ 33'-35' **Elev./Depth:**

MACTEC ENGINEERING AND CONSULTING, INC.

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project No: 3043-04-1022 **Figure** CTA

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project Number: 3043-04-1022

Sample Data

Source:
Sample No.:
Elev. or Depth: **Sample Length(in./cm.):**
Location: B-6 UD @ 33'-35'
Description: Olive-Grey Silty Clay
Date: 06-21-04 **PL:** 20 **LL:** 38 **PI:** 18
USCS Classification: CL **AASHTO Classification:**
Testing Remarks: Specific Gravity: 2.65

Mechanical Analysis Data

	Initial
Dry sample and tare=	166.22
Tare =	0.00
Dry sample weight =	166.22

Sample split on number 10 sieve
Split sample data:
Sample and tare = 58.55 Tare = .00 Sample weight = 58.55
Cumulative weight retained tare= .00
Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
0.375 inch	0.00	100.0
# 4	0.00	100.0
# 10	0.00	100.0
# 20	0.00	100.0
# 40	0.00	100.0
# 60	0.18	99.7
# 140	4.11	93.0
# 200	6.70	88.6

Hydrometer Analysis Data

Separation sieve is #10
Percent -#10 based upon complete sample= 100.0
Weight of hydrometer sample: 58.55
Calculated biased weight= 58.55
Table of composite correction values:

Temp, deg C:	20.0	22.0	24.0
Comp. corr:	-5.5	-4.8	-4.0

Meniscus correction only= 1.0
Specific gravity of solids= 2.65
Specific gravity correction factor= 1.000
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

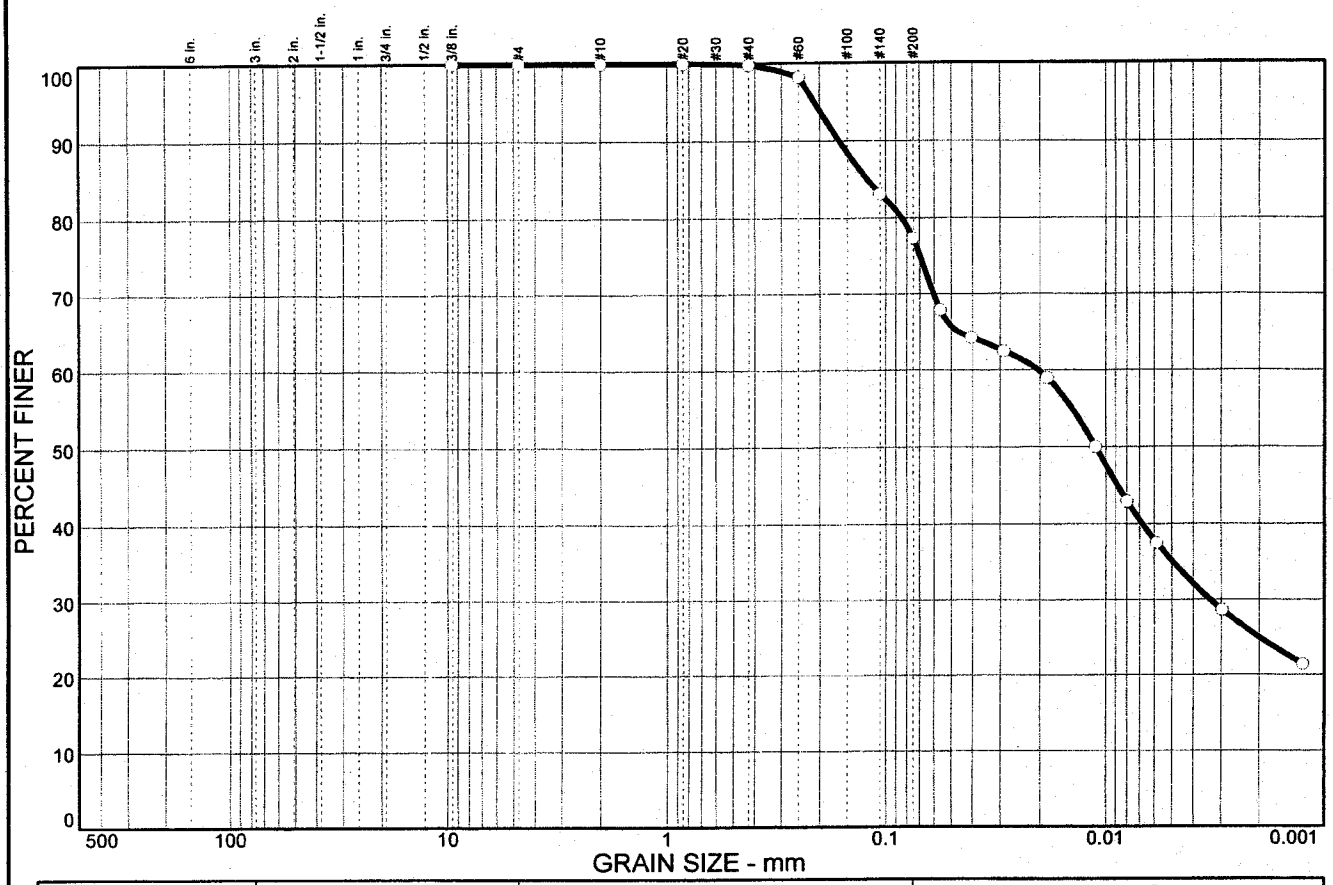
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.00	24.4	48.0	44.0	0.0129	49.0	8.3	0.0372	75.1
2.00	24.4	46.0	42.0	0.0129	47.0	8.6	0.0268	71.7
5.00	24.4	41.0	37.0	0.0129	42.0	9.4	0.0177	63.2
15.00	24.4	34.0	30.0	0.0129	35.0	10.6	0.0109	51.2
31.00	24.4	30.5	26.5	0.0129	31.5	11.1	0.0078	45.3
60.00	24.4	27.0	23.0	0.0129	28.0	11.7	0.0057	39.3
250.00	24.4	23.0	19.0	0.0129	24.0	12.4	0.0029	32.5
1444.00	24.4	18.0	14.0	0.0129	19.0	13.2	0.0012	23.9

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =**
% SAND = 11.4 **(% coarse =** 0.0 **% medium =** 0.0 **% fine =** 11.4)
% SILT = 51.3 **% CLAY =** 37.3

D_{85}= 0.06 D_{60}= 0.02 D_{50}= 0.01
D_{30}= 0.00

Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.2	22.5	42.2	35.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in.	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	99.8		
#60	98.2		
#140	83.1		
#200	77.3		

* (no specification provided)

Soil Description

Grey Lean Clay with Sand

Atterberg Limits

PL= 19 LL= 37 PI= 18

Coefficients

D_{85}= 0.121 D_{60}= 0.0203 D_{50}= 0.0111
D_{30}= 0.0034 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Specific Gravity: 2.62

Sample No.: **Source of Sample:** **Date:** 06-21-04
Location: B-10 UD @ 58'-60' **Elev./Depth:**

MACTEC ENGINEERING AND CONSULTING, INC.

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project No: 3043-04-1022 **Figure** CTJ

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project Number: 3043-04-1022

Sample Data

Source:
Sample No.:
Elev. or Depth: **Sample Length(in./cm.):**
Location: B-10 UD @ 58'-60'
Description: Grey Lean Clay with Sand
Date: 06-21-04 **PL:** 19 **LL:** 37 **PI:** 18
USCS Classification: CL **AASHTO Classification:**
Testing Remarks: Specific Gravity: 2.62

Mechanical Analysis Data

	Initial
Dry sample and tare=	232.18
Tare =	0.00
Dry sample weight =	232.18

Sample split on number 10 **sieve**
Split sample data:
Sample and tare = 56.35 **Tare =** .00 **Sample weight =** 56.35
Cumulative weight retained tare= .00
Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
0.375 inch	0.00	100.0
# 4	0.00	100.0
# 10	0.00	100.0
# 20	0.02	100.0
# 40	0.09	99.8
# 60	1.04	98.2
# 140	9.54	83.1
# 200	12.81	77.3

Hydrometer Analysis Data

Separation sieve is #10
Percent -#10 based upon complete sample= 100.0
Weight of hydrometer sample: 56.35
Calculated biased weight= 56.35
Table of composite correction values:

Temp, deg C:	20.0	22.0	24.0
Comp. corr:	-5.5	-4.8	-4.0

Meniscus correction only= 1.0
Specific gravity of solids= 2.62
Specific gravity correction factor= 1.007
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

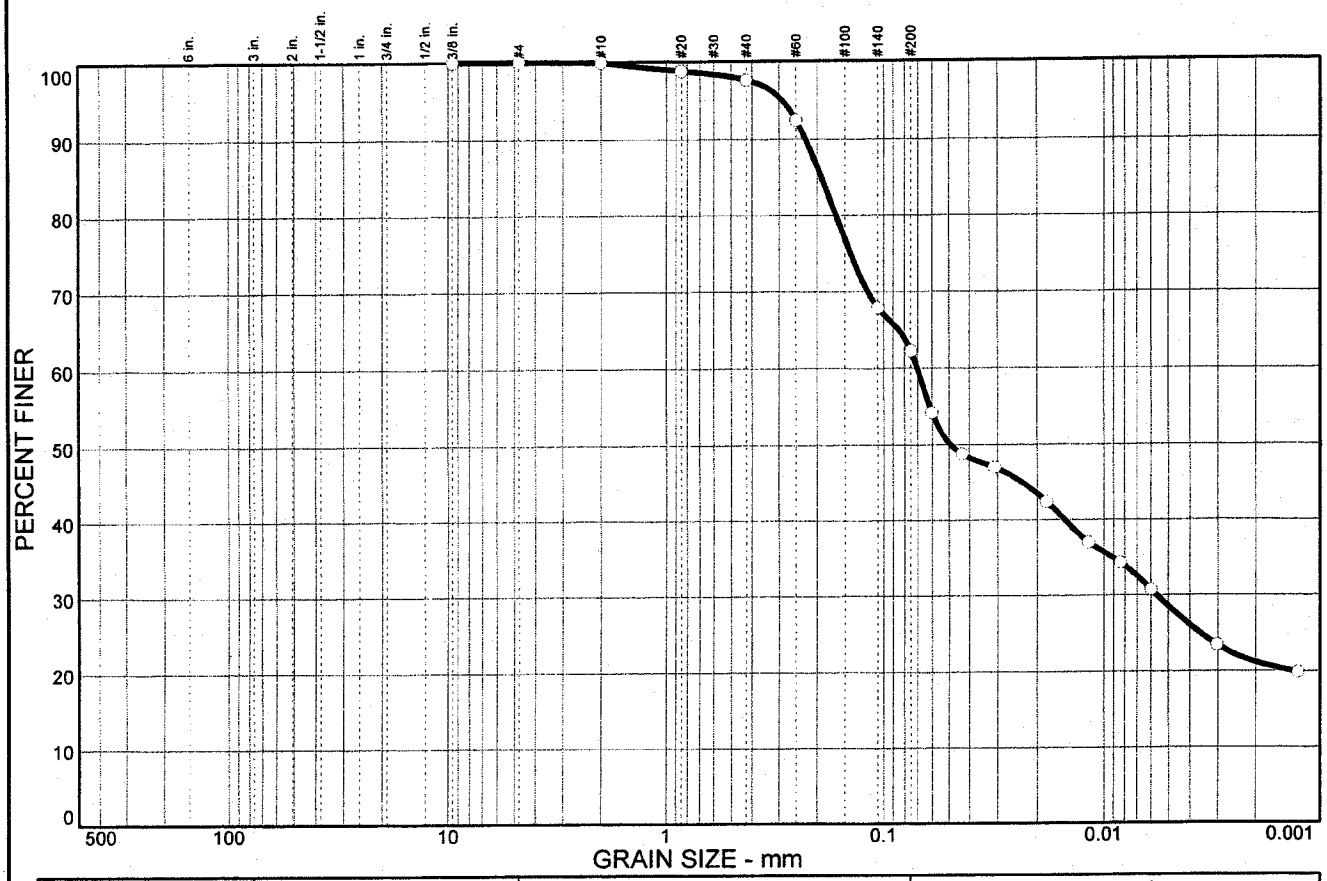
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
0.50	24.4	42.0	38.0	0.0131	43.0	9.2	0.0561	67.9
1.00	24.4	40.0	36.0	0.0131	41.0	9.6	0.0404	64.3
2.00	24.4	39.0	35.0	0.0131	40.0	9.7	0.0288	62.5
5.00	24.4	37.0	33.0	0.0131	38.0	10.1	0.0185	59.0
15.00	24.4	32.0	28.0	0.0131	33.0	10.9	0.0111	50.0
31.00	24.4	28.0	24.0	0.0131	29.0	11.5	0.0080	42.9
60.00	24.4	25.0	21.0	0.0131	26.0	12.0	0.0058	37.5
250.00	24.4	20.0	16.0	0.0131	21.0	12.9	0.0030	28.6
1440.00	24.4	16.0	12.0	0.0131	17.0	13.5	0.0013	21.4

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =**
% SAND = 22.7 **(% coarse =** 0.0 **% medium =** 0.2 **% fine =** 22.5**)**
% SILT = 42.2 **% CLAY =** 35.1

D_{85}= 0.12 D_{60}= 0.02 D_{50}= 0.01
D_{30}= 0.00

Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.1	2.3	35.3	33.7	28.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in.	100.0		
#4	100.0		
#10	99.9		
#20	98.8		
#40	97.6		
#60	92.4		
#140	67.9		
#200	62.3		

* (no specification provided)

Soil Description

Grey Sandy Lean Clay

Atterberg Limits

PL= 14 LL= 25 PI= 11

Coefficients

D_{85}= 0.192 D_{60}= 0.0701 D_{50}= 0.0492
D_{30}= 0.0057 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

SPECIFIC GRAVITY: 2.62 CTJ

Sample No.: B-10 UD @ 62'-64' **Source of Sample:** **Date:** 07-02-04
Location: **Elev./Depth:**

MACTEC ENGINEERING AND CONSULTING, INC.

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project No: 3043-04-1022 **Figure** CTJ

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project Number: 3043-04-1022

Sample Data

Source:
Sample No.: B-10 UD @ 62'-64'
Elev. or Depth: **Sample Length(in./cm.):**
Location:
Description: Grey Sandy Lean Clay
Date: 07-02-04 **PL:** 14 **LL:** 25 **PI:** 11
USCS Classification: CL **AASHTO Classification:**
Testing Remarks:

Mechanical Analysis Data

	Initial
Dry sample and tare=	216.76
Tare =	0.00
Dry sample weight =	216.76

Sample split on number 10 sieve
Split sample data:
Sample and tare = 55.70 Tare = .00 Sample weight = 55.70
Cumulative weight retained tare= .00
Tare for cumulative weight retained= .00

Sieve	Cumul. Wt. retained	Percent finer
0.375 inch	0.00	100.0
# 4	0.00	100.0
# 10	0.29	99.9
# 20	0.63	98.8
# 40	1.26	97.6
# 60	4.18	92.4
# 140	17.85	67.9
# 200	20.98	62.3

Hydrometer Analysis Data

Separation sieve is #10
Percent -#10 based upon complete sample= 99.9
Weight of hydrometer sample: 55.70
Calculated biased weight= 55.76
Table of composite correction values:

Temp, deg C:	20.0	22.0	24.0
Comp. corr:	-5.5	-4.8	-4.0

Meniscus correction only= 1.0
Specific gravity of solids= 2.62
Specific gravity correction factor= 1.007
Hydrometer type: 152H
Effective depth L= 16.294964 - 0.164 x Rm

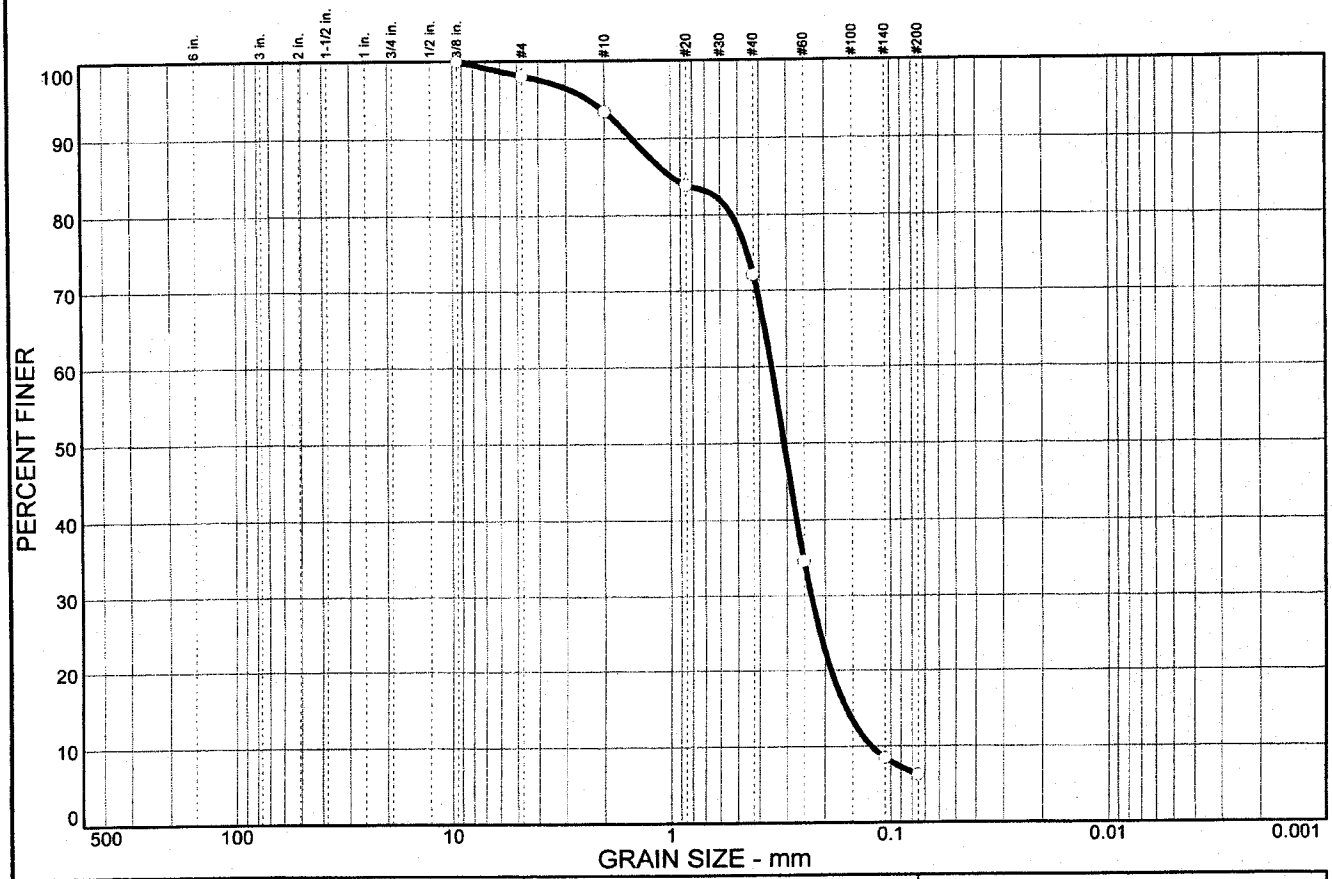
Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
0.50	24.5	34.0	30.0	0.0130	35.0	10.6	0.0599	54.2
1.00	24.5	31.0	27.0	0.0130	32.0	11.0	0.0433	48.8
2.00	24.5	30.0	26.0	0.0130	31.0	11.2	0.0309	47.0
6.00	24.5	27.5	23.5	0.0130	28.5	11.6	0.0181	42.4
15.00	24.5	24.5	20.5	0.0130	25.5	12.1	0.0117	37.0
30.00	24.5	23.0	19.0	0.0130	24.0	12.4	0.0084	34.3
60.00	24.5	21.0	17.0	0.0130	22.0	12.7	0.0060	30.7
250.00	24.5	17.0	13.0	0.0130	18.0	13.3	0.0030	23.5
1440.00	24.5	15.0	11.0	0.0130	16.0	13.7	0.0013	19.9

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =**
% SAND = 37.7 **(% coarse =** 0.1 **% medium =** 2.3 **% fine =** 35.3**)**
% SILT = 33.7 **% CLAY =** 28.6

D_{85}= 0.19 D_{60}= 0.07 D_{50}= 0.05
D_{30}= 0.01

Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	1.9	4.6	21.4	65.8	6.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in.	100.0		
#4	98.1		
#10	93.5		
#20	83.9		
#40	72.1		
#60	34.6		
#140	8.5		
#200	6.3		

* (no specification provided)

Soil Description

Grey Bottom Ash

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.991 D_{60}= 0.352 D_{50}= 0.308
D_{30}= 0.232 D_{15}= 0.160 D_{10}= 0.122
C_u= 2.88 C_c= 1.25

Classification

USCS= AASHTO=

Remarks

Sample No.: B-10A UD @ 10'-11.5 **Source of Sample:** **Date:** 07-02-04
Location: **Elev./Depth:**

MACTEC ENGINEERING AND CONSULTING, INC.

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project No: 3043-04-1022 **Figure** C7

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project Number: 3043-04-1022

Sample Data

Source:
Sample No.: B-10A UD @ 10'-11.5'
Elev. or Depth: **Sample Length(in./cm.):**
Location:
Description: Grey Bottom Ash
Date: 07-02-04 **PL:** **LL:** **PI:**
USCS Classification: **AASHTO Classification:**
Testing Remarks:

Mechanical Analysis Data

	Initial
Dry sample and tare=	191.49
Tare =	0.00
Dry sample weight =	191.49

Tare for cumulative weight retained= .00

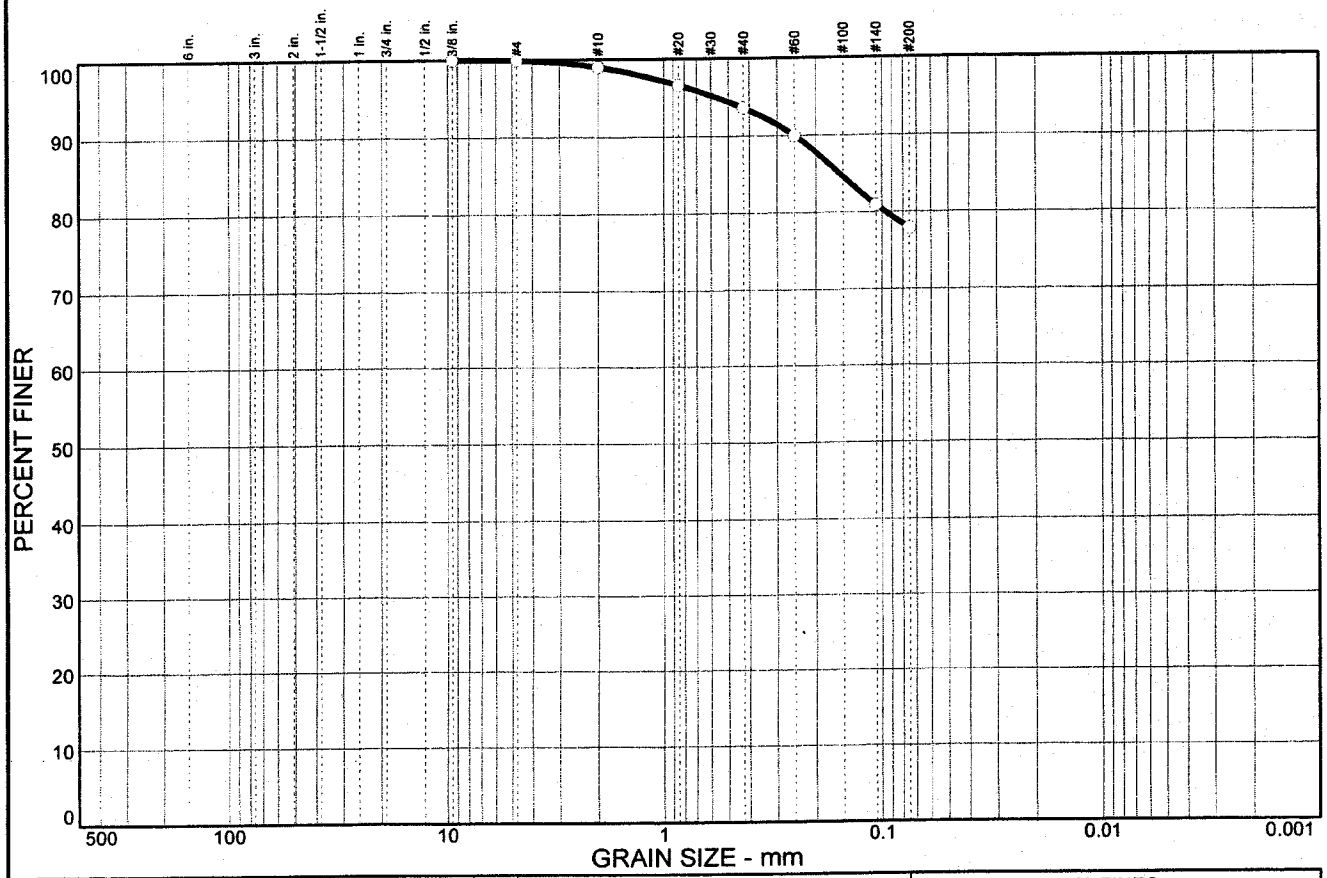
Sieve	Cumul. Wt. retained	Percent finer
0.375 inch	0.00	100.0
# 4	3.57	98.1
# 10	12.48	93.5
# 20	30.76	83.9
# 40	53.51	72.1
# 60	125.28	34.6
# 140	175.25	8.5
# 200	179.43	6.3

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL** = 1.9 **(% coarse =** **% fine** = 1.9)
% SAND = 91.8 **(% coarse** = 4.6 **% medium** = 21.4 **% fine** = 65.8)
% FINES = 6.3

D_{85}= 0.99 D_{60}= 0.35 D_{50}= 0.31
D_{30}= 0.23 D_{15}= 0.16 D_{10}= 0.12
C_c= 1.2498 C_u= 2.875

Grain Size Analysis



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.1	0.9	5.4	15.7	77.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in.	100.0		
#4	99.9		
#10	99.0		
#20	96.6		
#40	93.6		
#60	90.0		
#140	80.9		
#200	77.9		

* (no specification provided)

Soil Description

Grey Bottom Ash

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.155 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Sample No.: **Source of Sample:** **Date:** 06-21-04
Location: B-10A UD @ 30'-32' **Elev./Depth:**

MACTEC ENGINEERING AND CONSULTING, INC.

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project No: 3043-04-1022 **Figure** C7

GRAIN SIZE DISTRIBUTION TEST DATA

Client: TVA
Project: TVA Bull Run Ash Disposal Area
Project Number: 3043-04-1022

Sample Data

Source:
Sample No.:
Elev. or Depth: **Sample Length(in./cm.):**
Location: B-10A UD @ 30'-32'
Description: Grey Bottom Ash
Date: 06-21-04 **PL:** **LL:** **PI:**
USCS Classification: **AASHTO Classification:**
Testing Remarks:

Mechanical Analysis Data

	Initial
Dry sample and tare=	274.55
Tare =	0.00
Dry sample weight =	274.55

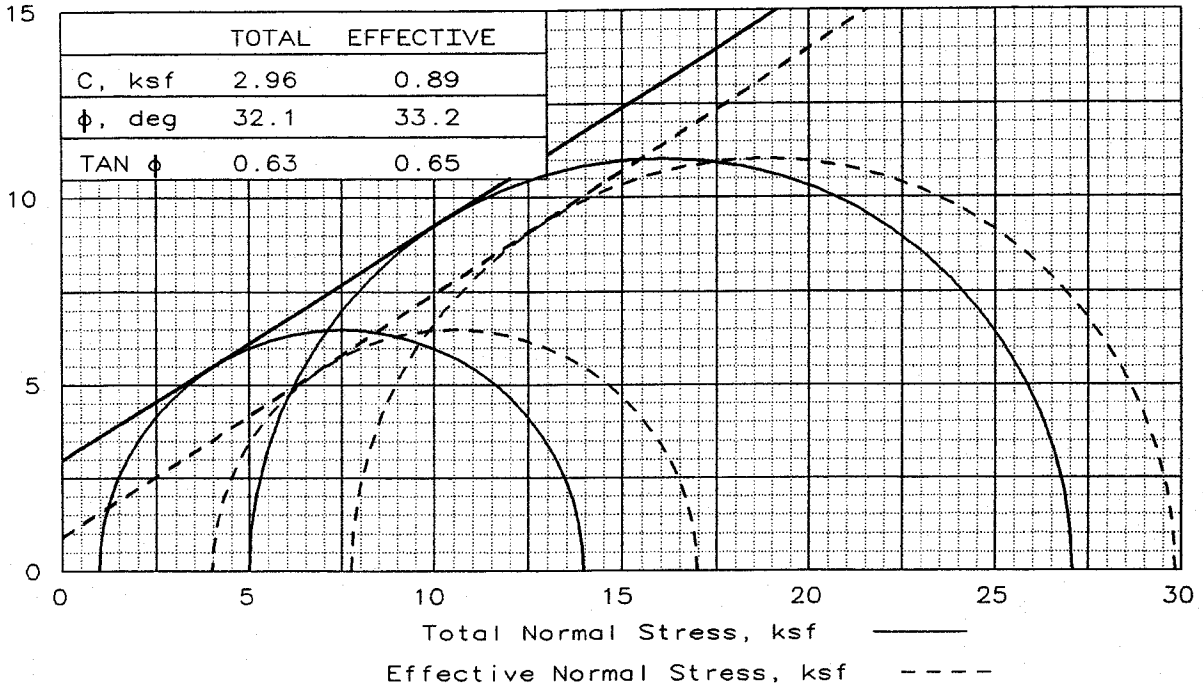
Tare for cumulative weight retained= .00

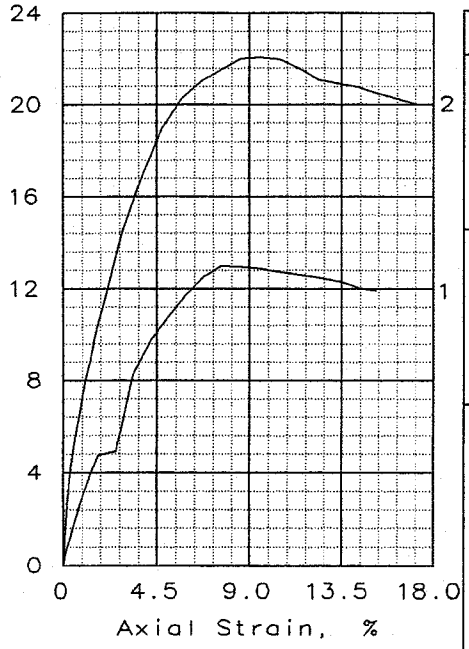
Sieve	Cumul. Wt. retained	Percent finer
0.375 inch	0.00	100.0
# 4	0.20	99.9
# 10	2.68	99.0
# 20	9.41	96.6
# 40	17.47	93.6
# 60	27.59	90.0
# 140	52.48	80.9
# 200	60.71	77.9

Fractional Components

Gravel/Sand based on #4
Sand/Fines based on #200
% COBBLES = **% GRAVEL =** 0.1 **(% coarse =** **% fine =** 0.1)
% SAND = 22.0 **(% coarse =** 0.9 **% medium =** 5.4 **% fine =** 15.7)
% FINES = 77.9

D_{85}= 0.16





SAMPLE NO.:		1	2
INITIAL	WATER CONTENT, %	54.8	46.6
	DRY DENSITY, pcf	62.5	69.2
	SATURATION, %	97.3	99.8
	VOID RATIO	1.296	1.075
	DIAMETER, in	2.82	2.83
	HEIGHT, in	5.92	5.85
AT TEST	WATER CONTENT, %	52.8	43.5
	DRY DENSITY, pcf	64.8	71.7
	SATURATION, %	100.0	100.0
	VOID RATIO	1.215	1.002
	DIAMETER, in	2.77	2.93
	HEIGHT, in	5.92	5.26
Strain rate, %/min		0.17	0.17
BACK PRESSURE, ksf		7.2	7.2
CELL PRESSURE, ksf		8.2	12.2
FAIL. STRESS, ksf		13.0	22.1
TOTAL PORE PR., ksf		4.2	4.4
ULT. STRESS, ksf			
TOTAL PORE PR., ksf			
$\bar{\sigma}_1$ FAILURE, ksf		17.0	29.8
$\bar{\sigma}_3$ FAILURE, ksf		4.0	7.8

TYPE OF TEST:
CU with Pore Pressures
SAMPLE TYPE: Shelby Tube
DESCRIPTION: Grey Fly Ash

SPECIFIC GRAVITY= 2.3
REMARKS:

CTA

Fig. No.: _____

CLIENT: TVA

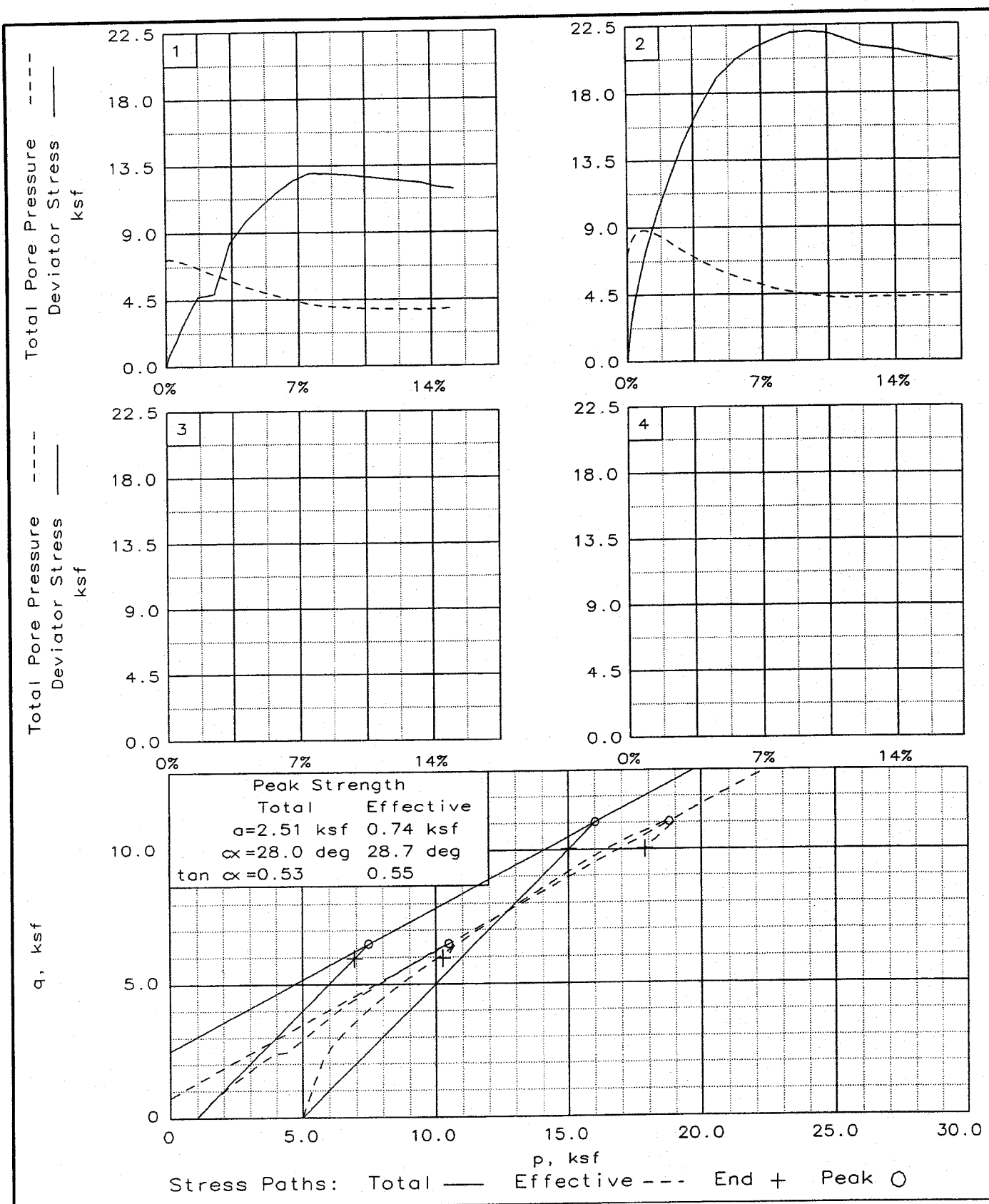
PROJECT: TVA Bull Run Ash Disposal Area

SAMPLE LOCATION: B-1A UD @ 32'-33.5'

PROJ. NO.: 3043-04-1022 DATE: 06-30-04

TRIAXIAL SHEAR TEST REPORT

LAW ENGINEERING AND ENVIRONMENTAL SERVICES



Client: TVA

Project: TVA Bull Run Ash Disposal Area

Location: B-1A UD @ 32'-33.5'

File: BULLRUN1 Project No.: 3043-04-1022 Fig. No.: ____

TRIAXIAL COMPRESSION TEST
CU with Pore Pressures

Project and Sample Data

Date: 06-30-04
Client: TVA
Project: TVA Bull Run Ash Disposal Area
Sample location: B-1A UD @ 32'-33.5'
Sample description: Grey Fly Ash
Remarks:

Fig no.: 2nd page Fig no. (if applicable):
Type of sample: Shelby Tube
Specific gravity= 2.30 LL= PL= PI=
Test method: Corps of Eng. - saturation assumed

Specimen Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Wt. moist soil and tare:	940.760			934.280
Wt. dry soil and tare:	607.720			607.720
Wt. of tare:	0.000			0.000
Weight, gms:	940.8			
Diameter, in:	2.821	2.784	2.772	
Area, in²:	6.250	6.086	6.037	
Height, in:	5.923	5.923	5.916	
Net decrease in height, in:		0.000	0.007	
Net decrease in water volume, cc:		6.600	5.400	
% Moisture:	54.8	53.7	52.8	53.7
Wet density, pcf:	96.8	98.7	99.1	
Dry density, pcf:	62.5	64.2	64.8	
Void ratio:	1.2960	1.2355	1.2150	
% Saturation:	97.3	100.0	100.0	

Test Readings Data for Specimen No. 1

Deformation dial constant= 1 in per input unit
Primary load ring constant= 0.72 lbs per input unit
Secondary load ring constant= 0 lbs per input unit
Crossover reading for secondary load ring= 0 input units
Membrane modulus = 0.14000 kN/cm²
Membrane thickness = 0.012 cm
Consolidation cell pressure = 56.90 psi = 8.19 ksf
Consolidation back pressure = 50.00 psi = 7.20 ksf
Consolidation effective confining stress = 0.99 ksf
Strain rate, %/min = 0.17
FAIL. STRESS = 12.98 ksf at reading no. 17
ULT. STRESS = not selected

Test Readings Data for Specimen No. 1

No.	Def. Dial Units	Def. in	Load Dial Units	Load lbs	Strain %	Deviator Stress ksf	Effective Stresses Minor ksf	Effective Stresses Major ksf	Effective Stresses 1:3 Ratio	Pore Pres. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.0	0.00	0.99	0.99	1.00	50.00	0.99	0.00
1	0.0100	0.010	40.0	28.8	0.2	0.69	0.95	1.64	1.72	50.30	1.29	0.34
2	0.0200	0.020	70.0	50.4	0.3	1.20	0.96	2.16	2.24	50.20	1.56	0.60
3	0.0300	0.030	97.0	69.8	0.5	1.66	1.01	2.67	2.64	49.90	1.84	0.83
4	0.0400	0.040	128.0	92.2	0.7	2.18	1.07	3.25	3.05	49.50	2.16	1.09
5	0.0500	0.050	158.0	113.8	0.8	2.69	1.14	3.83	3.37	49.00	2.48	1.35
6	0.0600	0.060	185.0	133.2	1.0	3.14	1.21	4.35	3.60	48.50	2.78	1.57
7	0.0700	0.070	210.0	151.2	1.2	3.56	1.28	4.85	3.78	48.00	3.06	1.78
8	0.0800	0.080	234.0	168.5	1.4	3.96	1.35	5.32	3.93	47.50	3.34	1.98
9	0.0900	0.090	257.0	185.0	1.5	4.35	1.44	5.79	4.02	46.90	3.61	2.17
10	0.1000	0.100	280.0	201.6	1.7	4.73	1.54	6.27	4.07	46.20	3.90	2.36
11	0.1500	0.150	292.0	210.2	2.5	4.89	1.99	6.87	3.46	43.10	4.43	2.44
12	0.2000	0.200	501.0	360.7	3.4	8.31	2.38	10.69	4.50	40.40	6.53	4.16
13	0.2500	0.250	595.0	428.4	4.2	9.79	2.81	12.59	4.49	37.40	7.70	4.89
14	0.3000	0.300	663.0	477.4	5.1	10.81	3.14	13.95	4.44	35.10	8.54	5.40
15	0.3500	0.350	727.0	523.4	5.9	11.75	3.46	15.20	4.40	32.90	9.33	5.87
16	0.4000	0.400	782.0	563.0	6.8	12.52	3.76	16.28	4.33	30.80	10.02	6.26
17	0.4500	0.450	818.0	589.0	7.6	12.98	4.00	16.98	4.24	29.10	10.49	6.49
18	0.5000	0.500	824.0	593.3	8.5	12.96	4.15	17.10	4.12	28.10	10.62	6.48
19	0.5500	0.550	828.0	596.2	9.3	12.90	4.23	17.13	4.05	27.50	10.68	6.45
20	0.6000	0.600	828.0	596.2	10.1	12.78	4.29	17.07	3.98	27.10	10.68	6.39
21	0.6500	0.650	828.0	596.2	11.0	12.66	4.32	16.98	3.93	26.90	10.65	6.33
22	0.7000	0.700	829.0	596.9	11.8	12.55	4.35	16.90	3.89	26.70	10.63	6.28
23	0.7500	0.750	828.0	596.2	12.7	12.42	4.36	16.78	3.85	26.60	10.57	6.21
24	0.8000	0.800	828.0	596.2	13.5	12.30	4.39	16.69	3.80	26.40	10.54	6.15
25	0.8500	0.850	818.0	589.0	14.4	12.03	4.33	16.36	3.78	26.80	10.35	6.01
26	0.9000	0.900	818.0	589.0	15.2	11.91	4.32	16.23	3.76	26.90	10.28	5.96

Specimen Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Wt. moist soil and tare:	980.760			951.210
Wt. dry soil and tare:	668.890			668.890
Wt. of tare:	0.000			0.000
Weight, gms:	980.8			
Diameter, in:	2.831	2.815	2.933	
Area, in²:	6.295	6.225	6.757	
Height, in:	5.850	5.850	5.257	
Net decrease in height, in:		0.000	0.593	
Net decrease in water volume, cc:		5.900	14.700	
% Moisture:	46.6	45.7	43.5	42.2
Wet density, pcf:	101.5	102.0	103.0	
Dry density, pcf:	69.2	70.0	71.7	
Void ratio:	1.0749	1.0521	1.0015	
% Saturation:	99.8	100.0	100.0	

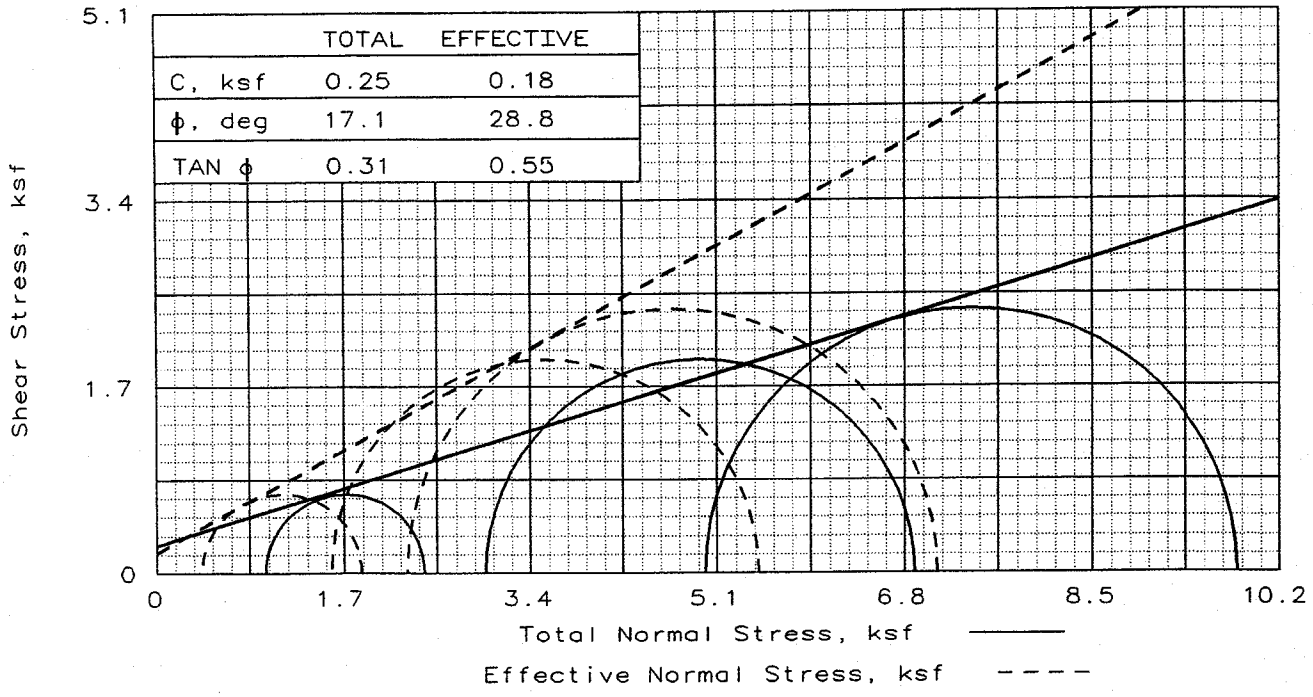
Test Readings Data for Specimen No. 2

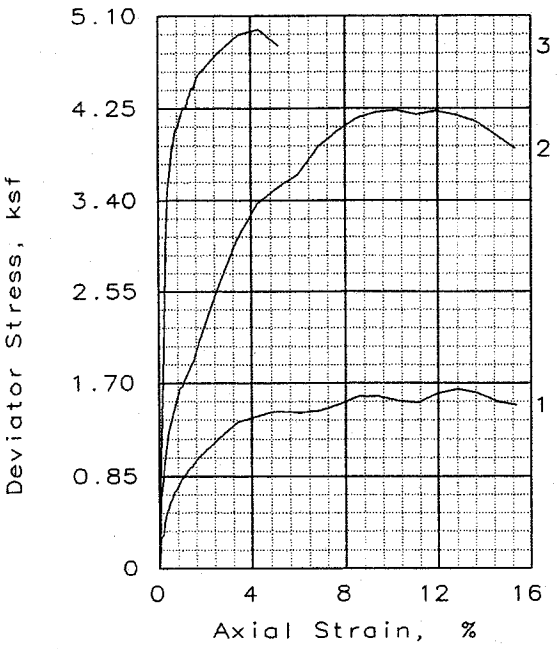
Deformation dial constant= 1 in per input unit
Primary load ring constant= 0.72 lbs per input unit
Secondary load ring constant= 0 lbs per input unit
Crossover reading for secondary load ring= 0 input units
Membrane modulus = 0.14000 kN/cm²
Membrane thickness = 0.012 cm
Consolidation cell pressure = 84.70 psi = 12.20 ksf
Consolidation back pressure = 50.00 psi = 7.20 ksf
Consolidation effective confining stress = 5.00 ksf
Strain rate, %/min = 0.17
FAIL. STRESS = 22.08 ksf at reading no. 18
ULT. STRESS = not selected

No.	Def. Dial Units	Def. in	Load Dial Units	Load lbs	Strain %	Deviator Stress ksf	Effective Stresses Minor ksf	Effective Stresses Major ksf	1:3 Ratio	Pore Pres. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.0	0.00	5.00	5.00	1.00	50.00	5.00	0.00
1	0.0100	0.010	173.0	124.6	0.2	2.65	4.13	6.78	1.64	56.00	5.46	1.32
2	0.0200	0.020	273.0	196.6	0.4	4.17	3.67	7.85	2.14	59.20	5.76	2.09
3	0.0300	0.030	347.0	249.8	0.6	5.29	3.46	8.75	2.53	60.70	6.10	2.65
4	0.0400	0.040	415.0	298.8	0.8	6.32	3.38	9.70	2.87	61.20	6.54	3.16
5	0.0500	0.050	483.0	347.8	1.0	7.34	3.38	10.72	3.17	61.20	7.05	3.67
6	0.0600	0.060	538.0	387.4	1.1	8.16	3.44	11.60	3.37	60.80	7.52	4.08
7	0.0700	0.070	588.0	423.4	1.3	8.90	3.51	12.42	3.53	60.30	7.96	4.45
8	0.0800	0.080	646.0	465.1	1.5	9.76	3.64	13.40	3.68	59.40	8.52	4.88
9	0.0900	0.090	695.0	500.4	1.7	10.48	3.77	14.25	3.78	58.50	9.01	5.24
10	0.1000	0.100	740.0	532.8	1.9	11.14	3.90	15.04	3.85	57.60	9.47	5.57
11	0.1500	0.150	970.0	698.4	2.9	14.46	4.71	19.17	4.07	52.00	11.94	7.23
12	0.2000	0.200	1147.0	825.8	3.8	16.93	5.40	22.33	4.14	47.20	13.87	8.47
13	0.2500	0.250	1300.0	936.0	4.8	19.00	6.05	25.05	4.14	42.70	15.55	9.50
14	0.3000	0.300	1400.0	1008.0	5.7	20.26	6.54	26.79	4.10	39.30	16.67	10.13
15	0.3500	0.350	1468.0	1057.0	6.7	21.03	6.91	27.94	4.04	36.70	17.42	10.51
16	0.4000	0.400	1518.0	1093.0	7.6	21.52	7.30	28.82	3.95	34.00	18.06	10.76
17	0.4500	0.450	1569.0	1129.7	8.6	22.01	7.55	29.56	3.92	32.30	18.55	11.01
18	0.5000	0.500	1590.0	1144.8	9.5	22.08	7.76	29.84	3.84	30.80	18.80	11.04
19	0.5500	0.550	1600.0	1152.0	10.5	21.98	7.89	29.87	3.79	29.90	18.88	10.99
20	0.6000	0.600	1587.0	1142.6	11.4	21.57	7.95	29.52	3.71	29.50	18.73	10.79

Test Readings Data for Specimen No. 2

No.	Def. Dial Units	Def. in	Load Dial Units	Load lbs	Strain %	Deviator Stress ksf	Effective Stresses Minor ksf	Effective Stresses Major ksf	Effective Stresses 1:3 Ratio	Pore Pres. psi	P ksf	Q ksf
21	0.6500	0.650	1569.0	1129.7	12.4	21.10	7.92	29.02	3.66	29.70	18.47	10.55
22	0.7000	0.700	1574.0	1133.3	13.3	20.94	7.91	28.84	3.65	29.80	18.37	10.47
23	0.7500	0.750	1579.0	1136.9	14.3	20.77	7.89	28.66	3.63	29.90	18.28	10.39
24	0.8000	0.800	1576.0	1134.7	15.2	20.50	7.86	28.36	3.61	30.10	18.11	10.25
25	0.8500	0.850	1576.0	1134.7	16.2	20.27	7.86	28.13	3.58	30.10	18.00	10.14
26	0.9000	0.900	1576.0	1134.7	17.1	20.04	7.86	27.90	3.55	30.10	17.88	10.02





SAMPLE NO.:		1	2	3
INITIAL	WATER CONTENT, %	24.8	20.6	26.2
	DRY DENSITY, pcf	99.5	106.6	98.7
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	0.643	0.534	0.658
	DIAMETER, in	2.87	2.86	2.87
	HEIGHT, in	5.97	5.91	5.92
AT TEST	WATER CONTENT, %	24.1	17.6	21.5
	DRY DENSITY, pcf	100.2	111.9	104.7
	SATURATION, %	100.0	100.0	100.0
	VOID RATIO	0.632	0.462	0.562
	DIAMETER, in	2.89	2.80	2.81
	HEIGHT, in	5.85	5.88	5.79
Strain rate, %/min		0.09	0.09	0.09
BACK PRESSURE, ksf		7.20	7.20	7.20
CELL PRESSURE, ksf		8.19	10.20	12.20
FAIL. STRESS, ksf		1.44	3.89	4.82
TOTAL PORE PR., ksf		7.78	8.61	9.92
ULT. STRESS, ksf				
TOTAL PORE PR., ksf				
$\bar{\sigma}_1$ FAILURE, ksf		1.86	5.48	7.10
$\bar{\sigma}_3$ FAILURE, ksf		0.42	1.58	2.28

TYPE OF TEST:
CU with Pore Pressures
SAMPLE TYPE: Shelby Tube
DESCRIPTION: Grey Lean Clay with Sand
LL= 25 PL= 14 PI= 11
SPECIFIC GRAVITY= 2.62
REMARKS:

CTJ

Fig. No.: _____

CLIENT: TVA

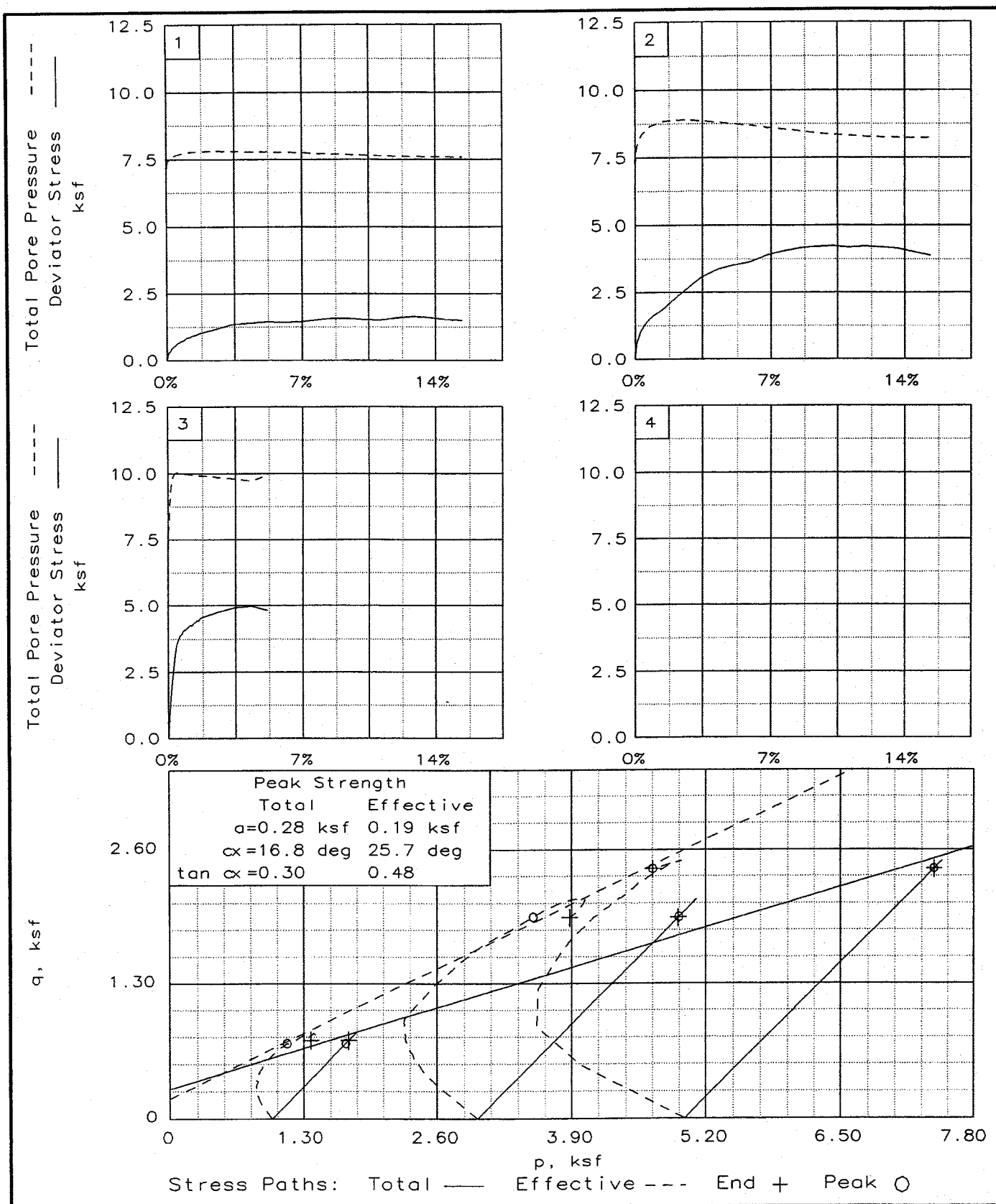
PROJECT: TVA Bull Run Ash Disposal Area

SAMPLE LOCATION: B-10 UD @ 62'-64'

PROJ. NO.: 3043-04-1022 DATE: 06-30-04

TRIAXIAL SHEAR TEST REPORT

LAW ENGINEERING AND ENVIRONMENTAL SERVICES



Client: TVA

Project: TVA Bull Run Ash Disposal Area

Location: B-10 UD @ 62'-64'

File: BULLRUN Project No.: 3043-04-1022 Fig. No.: ____

TRIAXIAL COMPRESSION TEST
CU with Pore Pressures

Project and Sample Data

Date: 06-30-04
Client: TVA
Project: TVA Bull Run Ash Disposal Area
Sample location: B-10 UD @ 62'-64'
Sample description: Grey Lean Clay with Sand
Remarks:

Fig no.: 2nd page Fig no. (if applicable):
Type of sample: Shelby Tube
Specific gravity= 2.62 LL= 25 PL= 14 PI= 11
Test method: Corps of Eng. - saturation assumed

Specimen Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Wt. moist soil and tare:	1257.940			1243.640
Wt. dry soil and tare:	1008.330			1008.330
Wt. of tare:	0.000			0.000
Weight, gms:	1257.9			
Diameter, in:	2.868	2.872	2.888	
Area, in²:	6.460	6.478	6.552	
Height, in:	5.974	5.974	5.849	
Net decrease in height, in:		0.000	0.125	
Net decrease in water volume, cc:		0.300	6.200	
% Moisture:	24.8	24.7	24.1	23.3
Wet density, pcf:	124.2	123.8	124.4	
Dry density, pcf:	99.5	99.3	100.2	
Void ratio:	0.6433	0.6478	0.6317	
% Saturation:	100.8	100.0	100.0	

Test Readings Data for Specimen No. 1

Deformation dial constant= 1 in per input unit
Primary load ring constant= 0.72 lbs per input unit
Secondary load ring constant= 0 lbs per input unit
Crossover reading for secondary load ring= 0 input units
Membrane modulus = 0.14000 kN/cm²
Membrane thickness = 0.012 cm
Consolidation cell pressure = 56.90 psi = 8.19 ksf
Consolidation back pressure = 50.00 psi = 7.20 ksf
Consolidation effective confining stress = 0.99 ksf
Strain rate, %/min = 0.09
FAIL. STRESS = 1.44 ksf at reading no. 24
ULT. STRESS = not selected

Test Readings Data for Specimen No. 1

No.	Def. Dial Units	Def. in	Load Dial Units	Load lbs	Strain %	Deviator Stress ksf	Effective Stresses Minor ksf	Effective Stresses Major ksf	Effective Stresses 1:3 Ratio	Pore Pres. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.0	0.00	0.99	0.99	1.00	50.00	0.99	0.00
1	0.0050	0.005	18.0	13.0	0.1	0.28	0.75	1.03	1.38	51.70	0.89	0.14
2	0.0100	0.010	20.0	14.4	0.2	0.32	0.72	1.04	1.44	51.90	0.88	0.16
3	0.0150	0.015	28.0	20.2	0.3	0.44	0.63	1.08	1.70	52.50	0.85	0.22
4	0.0200	0.020	32.0	23.0	0.3	0.50	0.59	1.10	1.85	52.80	0.84	0.25
5	0.0250	0.025	35.0	25.2	0.4	0.55	0.56	1.11	1.98	53.00	0.84	0.28
6	0.0300	0.030	39.0	28.1	0.5	0.61	0.53	1.15	2.15	53.20	0.84	0.31
7	0.0350	0.035	41.0	29.5	0.6	0.64	0.52	1.16	2.24	53.30	0.84	0.32
8	0.0400	0.040	45.0	32.4	0.7	0.71	0.50	1.21	2.40	53.40	0.86	0.35
9	0.0450	0.045	46.0	33.1	0.8	0.72	0.48	1.20	2.52	53.60	0.84	0.36
10	0.0500	0.050	48.0	34.6	0.9	0.75	0.48	1.23	2.58	53.60	0.85	0.38
11	0.0550	0.055	51.0	36.7	0.9	0.80	0.45	1.25	2.79	53.80	0.85	0.40
12	0.0600	0.060	53.0	38.2	1.0	0.83	0.45	1.28	2.86	53.80	0.86	0.42
13	0.0650	0.065	54.0	38.9	1.1	0.85	0.43	1.28	2.96	53.90	0.85	0.42
14	0.0700	0.070	56.0	40.3	1.2	0.88	0.43	1.31	3.03	53.90	0.87	0.44
15	0.0750	0.075	58.0	41.8	1.3	0.91	0.42	1.32	3.17	54.00	0.87	0.45
16	0.0800	0.080	60.0	43.2	1.4	0.94	0.42	1.35	3.24	54.00	0.89	0.47
17	0.0850	0.085	60.0	43.2	1.5	0.94	0.42	1.35	3.24	54.00	0.89	0.47
18	0.0900	0.090	62.0	44.6	1.5	0.97	0.42	1.38	3.31	54.00	0.90	0.48
19	0.0950	0.095	64.0	46.1	1.6	1.00	0.40	1.40	3.47	54.10	0.90	0.50
20	0.1000	0.100	65.0	46.8	1.7	1.01	0.40	1.41	3.51	54.10	0.91	0.51
21	0.1500	0.150	77.0	55.4	2.6	1.19	0.39	1.58	4.05	54.20	0.98	0.59
22	0.2000	0.200	88.0	63.4	3.4	1.34	0.40	1.75	4.34	54.10	1.08	0.67
23	0.2800	0.280	95.0	68.4	4.8	1.43	0.42	1.85	4.43	54.00	1.13	0.72
24	0.3000	0.300	96.0	69.1	5.1	1.44	0.42	1.86	4.45	54.00	1.14	0.72
25	0.3500	0.350	96.0	69.1	6.0	1.43	0.43	1.86	4.31	53.90	1.15	0.71
26	0.4000	0.400	98.0	70.6	6.8	1.44	0.45	1.89	4.24	53.80	1.17	0.72
27	0.4500	0.450	103.0	74.2	7.7	1.50	0.48	1.98	4.17	53.60	1.23	0.75
28	0.5000	0.500	109.0	78.5	8.5	1.58	0.49	2.07	4.22	53.50	1.28	0.79
29	0.5500	0.550	110.0	79.2	9.4	1.58	0.52	2.10	4.04	53.30	1.31	0.79
30	0.6000	0.600	108.0	77.8	10.3	1.53	0.53	2.07	3.88	53.20	1.30	0.77
31	0.6500	0.650	108.0	77.8	11.1	1.52	0.56	2.08	3.71	53.00	1.32	0.76
32	0.7000	0.700	115.0	82.8	12.0	1.60	0.58	2.18	3.78	52.90	1.38	0.80
33	0.7500	0.750	119.0	85.7	12.8	1.64	0.58	2.22	3.85	52.90	1.40	0.82
34	0.8000	0.800	118.0	85.0	13.7	1.61	0.60	2.22	3.67	52.70	1.41	0.81
35	0.8500	0.850	113.0	81.4	14.5	1.53	0.60	2.13	3.53	52.70	1.37	0.76
36	0.9000	0.900	112.0	80.6	15.4	1.50	0.62	2.12	3.42	52.60	1.37	0.75

Specimen Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Wt. moist soil and tare:	1280.570			1246.020
Wt. dry soil and tare:	1061.600			1061.600
Wt. of tare:	0.000			0.000
Weight, gms:	1280.6			
Diameter, in:	2.858	2.856	2.799	
Area, in²:	6.415	6.408	6.154	
Height, in:	5.913	5.913	5.875	
Net decrease in height, in:		0.000	0.038	
Net decrease in water volume, cc:		3.200	28.500	
% Moisture:	20.6	20.3	17.6	17.4
Wet density, pcf:	128.6	128.4	131.6	
Dry density, pcf:	106.6	106.7	111.9	
Void ratio:	0.5341	0.5325	0.4622	
% Saturation:	101.2	100.0	100.0	

Test Readings Data for Specimen No. 2

Deformation dial constant= 1 in per input unit
Primary load ring constant= 0.72 lbs per input unit
Secondary load ring constant= 0 lbs per input unit
Crossover reading for secondary load ring= 0 input units
Membrane modulus = 0.14000 kN/cm²
Membrane thickness = 0.012 cm
Consolidation cell pressure = 70.80 psi = 10.20 ksf
Consolidation back pressure = 50.00 psi = 7.20 ksf
Consolidation effective confining stress = 3.00 ksf
Strain rate, %/min = 0.09
FAIL. STRESS = 3.89 ksf at reading no. 26
ULT. STRESS = not selected

No.	Def. Dial Units	Def. in	Load Dial Units	Load lbs	Strain %	Deviator Stress ksf	Effective Stresses Minor ksf	Effective Stresses Major ksf	Effective Stresses 1:3 Ratio	Pore Pres. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.0	0.00	3.00	3.00	1.00	50.00	3.00	0.00
1	0.0050	0.005	38.0	27.4	0.1	0.64	2.28	2.91	1.28	55.00	2.60	0.32
2	0.0100	0.010	49.0	35.3	0.2	0.82	2.09	2.91	1.39	56.30	2.50	0.41
3	0.0150	0.015	59.0	42.5	0.3	0.99	1.94	2.94	1.51	57.30	2.44	0.50
4	0.0200	0.020	66.0	47.5	0.3	1.11	1.83	2.94	1.61	58.10	2.38	0.55
5	0.0250	0.025	73.0	52.6	0.4	1.22	1.76	2.98	1.70	58.60	2.37	0.61
6	0.0300	0.030	78.0	56.2	0.5	1.31	1.68	2.99	1.78	59.10	2.34	0.65
7	0.0350	0.035	83.0	59.8	0.6	1.39	1.64	3.03	1.85	59.40	2.34	0.70
8	0.0400	0.040	87.0	62.6	0.7	1.46	1.58	3.04	1.92	59.80	2.31	0.73
9	0.0450	0.045	91.0	65.5	0.8	1.52	1.54	3.06	1.99	60.10	2.30	0.76
10	0.0500	0.050	95.0	68.4	0.9	1.59	1.51	3.10	2.05	60.30	2.31	0.79
11	0.0550	0.055	99.0	71.3	0.9	1.65	1.47	3.12	2.12	60.60	2.29	0.83
12	0.0600	0.060	100.0	72.0	1.0	1.67	1.45	3.12	2.15	60.70	2.29	0.83
13	0.0650	0.065	103.0	74.2	1.1	1.72	1.43	3.14	2.20	60.90	2.28	0.86
14	0.0700	0.070	105.0	75.6	1.2	1.75	1.41	3.16	2.24	61.00	2.29	0.87
15	0.0750	0.075	108.0	77.8	1.3	1.80	1.40	3.19	2.29	61.10	2.29	0.90
16	0.0800	0.080	110.0	79.2	1.4	1.83	1.37	3.20	2.34	61.30	2.28	0.91
17	0.0850	0.085	113.0	81.4	1.4	1.88	1.35	3.23	2.39	61.40	2.29	0.94
18	0.0900	0.090	115.0	82.8	1.5	1.91	1.34	3.25	2.42	61.50	2.29	0.95
19	0.0950	0.095	120.0	86.4	1.6	1.99	1.34	3.33	2.49	61.50	2.33	0.99
20	0.1000	0.100	123.0	88.6	1.7	2.04	1.32	3.36	2.54	61.60	2.34	1.02

Test Readings Data for Specimen No. 2

No.	Def. Dial Units	Def. in	Load Dial Units	Load lbs	Strain %	Deviator Stress ksf	Effective Stresses Minor ksf	Effective Stresses Major ksf	Effective Stresses 1:3 Ratio	Pore Pres. psi	P ksf	Q ksf
21	0.1500	0.150	157.0	113.0	2.6	2.58	1.30	3.87	2.99	61.80	2.58	1.29
22	0.2000	0.200	187.0	134.6	3.4	3.04	1.32	4.37	3.30	61.60	2.85	1.52
23	0.2500	0.250	209.0	150.5	4.3	3.37	1.38	4.75	3.44	61.20	3.07	1.69
24	0.3000	0.300	220.0	158.4	5.1	3.52	1.44	4.96	3.44	60.80	3.20	1.76
25	0.3500	0.350	230.0	165.6	6.0	3.64	1.50	5.14	3.43	60.40	3.32	1.82
26	0.4000	0.400	248.0	178.6	6.8	3.89	1.58	5.48	3.46	59.80	3.53	1.95
27	0.4500	0.450	260.0	187.2	7.7	4.04	1.64	5.69	3.46	59.40	3.66	2.02
28	0.5000	0.500	270.0	194.4	8.5	4.16	1.71	5.88	3.43	58.90	3.79	2.08
29	0.5500	0.550	276.0	198.7	9.4	4.21	1.79	6.00	3.36	58.40	3.89	2.11
30	0.6000	0.600	280.0	201.6	10.2	4.24	1.83	6.06	3.32	58.10	3.95	2.12
31	0.6500	0.650	280.0	201.6	11.1	4.20	1.87	6.07	3.24	57.80	3.97	2.10
32	0.7000	0.700	285.0	205.2	11.9	4.23	1.92	6.14	3.21	57.50	4.03	2.11
33	0.7500	0.750	285.0	205.2	12.8	4.19	1.93	6.12	3.17	57.40	4.02	2.09
34	0.8000	0.800	284.0	204.5	13.6	4.13	1.94	6.08	3.13	57.30	4.01	2.07
35	0.8500	0.850	278.0	200.2	14.5	4.01	1.96	5.96	3.05	57.20	3.96	2.00
36	0.9000	0.900	272.0	195.8	15.3	3.88	1.94	5.82	3.00	57.30	3.88	1.94

Specimen Parameters for Specimen No. 3

Specimen Parameter	Initial	Saturated	Consolidated	Final
Wt. moist soil and tare:	1248.900			1194.610
Wt. dry soil and tare:	989.990			989.990
Wt. of tare:	0.000			0.000
Weight, gms:	1248.9			
Diameter, in:	2.867	2.889	2.813	
Area, in²:	6.456	6.555	6.217	
Height, in:	5.921	5.921	5.794	
Net decrease in height, in:		0.000	0.127	
Net decrease in water volume, cc:		0.800	45.700	
% Moisture:	26.2	26.1	21.5	20.7
Wet density, pcf:	124.5	122.5	127.2	
Dry density, pcf:	98.7	97.2	104.7	
Void ratio:	0.6577	0.6831	0.5621	
% Saturation:	104.2	100.0	100.0	

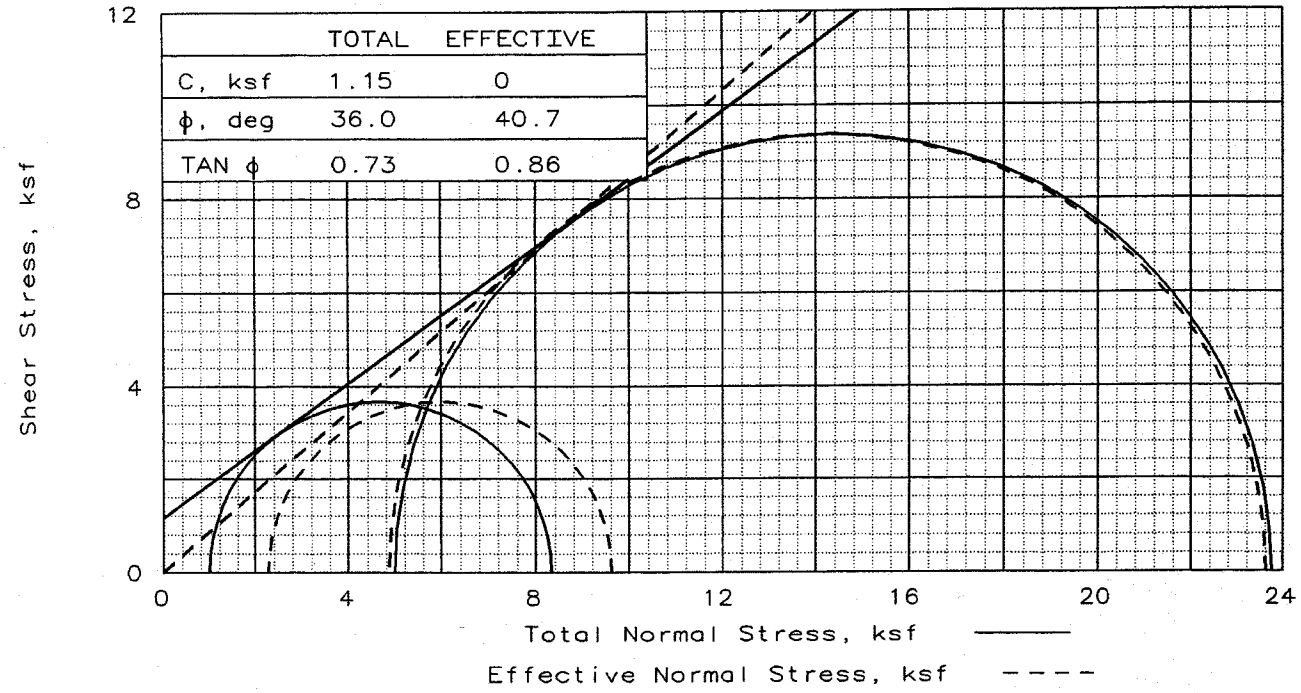
Test Readings Data for Specimen No. 3

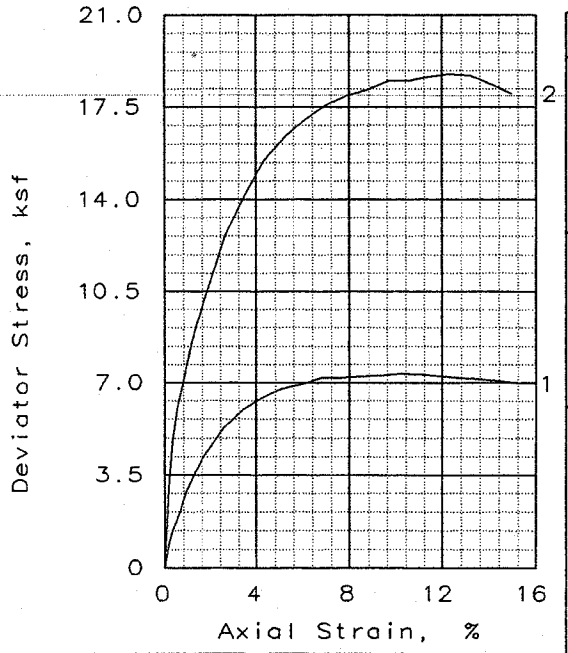
Deformation dial constant= 1 in per input unit
Primary load ring constant= 0.72 lbs per input unit
Secondary load ring constant= 0 lbs per input unit
Crossover reading for secondary load ring= 0 input units
Membrane modulus = 0.14000 kN/cm²
Membrane thickness = 0.012 cm
Consolidation cell pressure = 84.70 psi = 12.20 ksf
Consolidation back pressure = 50.00 psi = 7.20 ksf
Consolidation effective confining stress = 5.00 ksf
Strain rate, %/min = 0.09
FAIL. STRESS = 4.82 ksf at reading no. 24
ULT. STRESS = not selected

No.	Def. Dial Units	Def. in	Load Dial Units	Load lbs	Strain %	Deviator Stress ksf	Effective Stresses Minor ksf	Effective Stresses Major ksf	Effective Stresses 1:3 Ratio	Pore Pres. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.0	0.00	5.00	5.00	1.00	50.00	5.00	0.00
1	0.0050	0.005	61.0	43.9	0.1	1.02	3.48	4.50	1.29	60.50	3.99	0.51
2	0.0100	0.010	105.0	75.6	0.2	1.75	2.69	4.44	1.65	66.00	3.57	0.87
3	0.0150	0.015	150.0	108.0	0.3	2.50	2.33	4.83	2.07	68.50	3.58	1.25
4	0.0200	0.020	190.0	136.8	0.3	3.16	2.20	5.36	2.43	69.40	3.78	1.58
5	0.0250	0.025	211.0	151.9	0.4	3.50	2.16	5.66	2.62	69.70	3.91	1.75
6	0.0300	0.030	223.0	160.6	0.5	3.70	2.17	5.87	2.70	69.60	4.02	1.85
7	0.0350	0.035	234.0	168.5	0.6	3.88	2.17	6.05	2.78	69.60	4.11	1.94
8	0.0400	0.040	238.0	171.4	0.7	3.94	2.19	6.13	2.80	69.50	4.16	1.97
9	0.0450	0.045	245.0	176.4	0.8	4.05	2.20	6.26	2.84	69.40	4.23	2.03
10	0.0500	0.050	247.0	177.8	0.9	4.08	2.22	6.30	2.84	69.30	4.26	2.04
11	0.0550	0.055	252.0	181.4	0.9	4.16	2.22	6.38	2.88	69.30	4.30	2.08
12	0.0600	0.060	255.0	183.6	1.0	4.21	2.23	6.44	2.89	69.20	4.34	2.10
13	0.0650	0.065	258.0	185.8	1.1	4.25	2.23	6.49	2.91	69.20	4.36	2.13
14	0.0700	0.070	258.0	185.8	1.2	4.25	2.25	6.50	2.89	69.10	4.37	2.13
15	0.0750	0.075	263.0	189.4	1.3	4.33	2.26	6.59	2.91	69.00	4.43	2.16
16	0.0800	0.080	266.0	191.5	1.4	4.37	2.26	6.64	2.94	69.00	4.45	2.19
17	0.0850	0.085	270.0	194.4	1.5	4.44	2.26	6.70	2.96	69.00	4.48	2.22
18	0.0900	0.090	270.0	194.4	1.6	4.43	2.28	6.71	2.95	68.90	4.49	2.22
19	0.0950	0.095	275.0	198.0	1.6	4.51	2.28	6.79	2.98	68.90	4.53	2.26
20	0.1000	0.100	278.0	200.2	1.7	4.56	2.28	6.83	3.00	68.90	4.55	2.28

Test Readings Data for Specimen No. 3

No.	Def. Dial Units	Def. in	Load Dial Units	Load lbs	Strain %	Deviator Stress ksf	Effective Stresses Minor ksf	Effective Stresses Major ksf	Effective Stresses 1:3 Ratio	Pore Pres. psi	P ksf	Q ksf
21	0.1500	0.150	293.0	211.0	2.6	4.76	2.35	7.11	3.03	68.40	4.73	2.38
22	0.2000	0.200	306.0	220.3	3.5	4.93	2.40	7.33	3.05	68.00	4.87	2.46
23	0.2500	0.250	312.0	224.6	4.3	4.98	2.48	7.46	3.01	67.50	4.97	2.49
24	0.3000	0.300	305.0	219.6	5.2	4.82	2.28	7.10	3.12	68.90	4.69	2.41





SAMPLE NO.:		1	2
INITIAL	WATER CONTENT, %	22.2	22.2
	DRY DENSITY, pcf	62.5	63.3
	SATURATION, %	39.3	40.3
	VOID RATIO	1.299	1.267
	DIAMETER, in	2.84	2.84
	HEIGHT, in	5.89	5.68
AT TEST	WATER CONTENT, %	48.6	40.9
	DRY DENSITY, pcf	67.8	74.0
	SATURATION, %	100.0	100.0
	VOID RATIO	1.119	0.941
	DIAMETER, in	2.73	2.63
	HEIGHT, in	5.89	5.68
Strain rate, %/min		0.34	0.35
BACK PRESSURE, ksf		7.2	7.2
CELL PRESSURE, ksf		8.2	12.2
FAIL. STRESS, ksf		7.3	18.8
TOTAL PORE PR., ksf		5.9	7.3
ULT. STRESS, ksf			
TOTAL PORE PR., ksf			
$\bar{\sigma}_1$ FAILURE, ksf		9.6	23.6
$\bar{\sigma}_3$ FAILURE, ksf		2.3	4.9

TYPE OF TEST:
CU with Pore Pressures
SAMPLE TYPE: Shelby Tube
DESCRIPTION: Grey Bottom Ash

SPECIFIC GRAVITY= 2.3
REMARKS:

Fig. No.: _____ CTJ

CLIENT: TVA

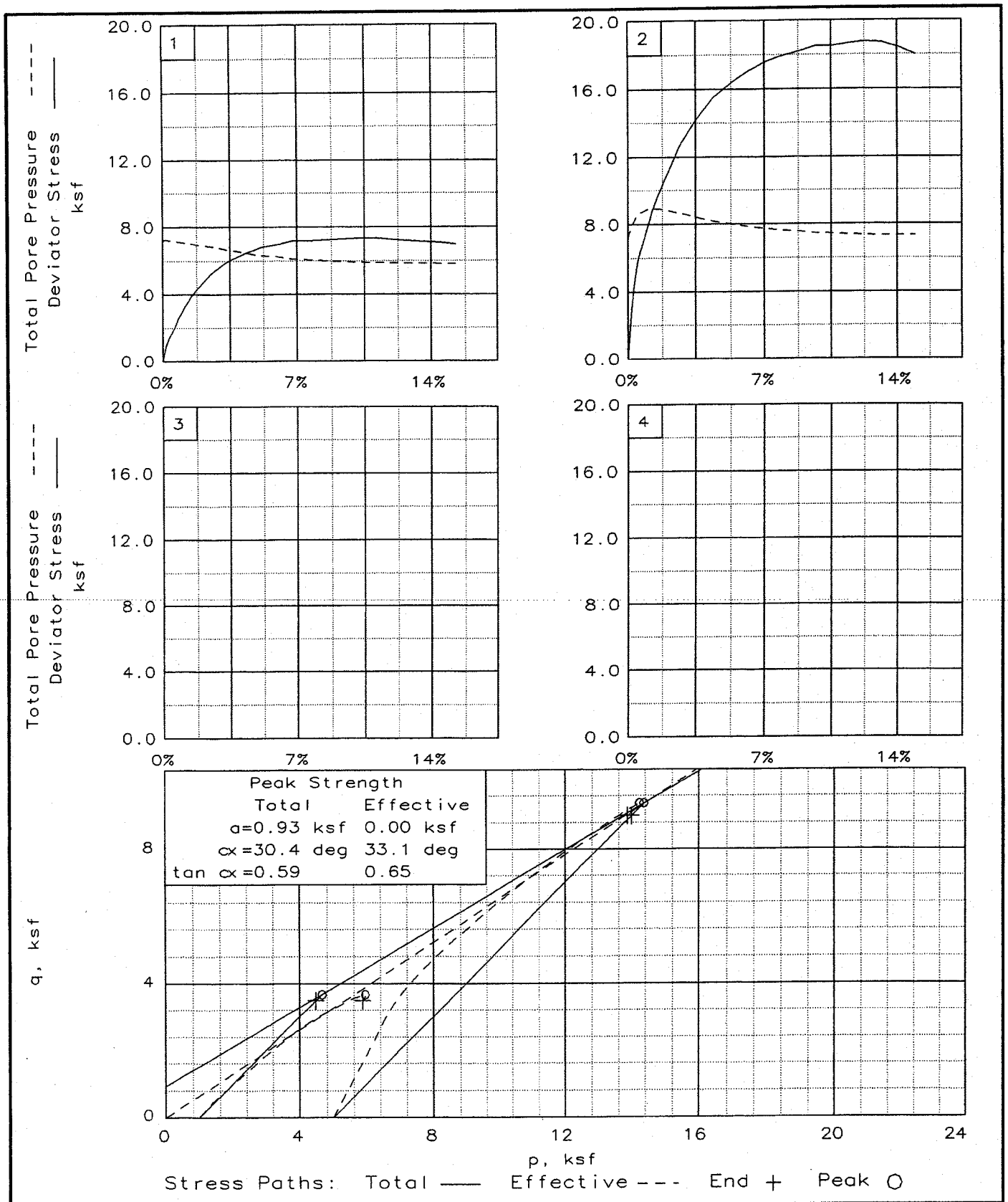
PROJECT: TVA Bull Run Ash Disposal Area

SAMPLE LOCATION: B-10A UD @ 10'-11.5'

PROJ. NO.: 3043-04-1022.01 DATE: 07-04-04

TRIAXIAL SHEAR TEST REPORT

LAW ENGINEERING AND ENVIRONMENTAL SERVICES



Client: TVA

Project: TVA Bull Run Ash Disposal Area

Location: B-10A UD @ 10'-11.5'

File: BULLRUN2 Project No.: 3043-04-1022.01 Fig. No.: ____

TRIAXIAL COMPRESSION TEST
CU with Pore Pressures

Project and Sample Data

Date: 07-04-04
Client: TVA
Project: TVA Bull Run Ash Disposal Area
Sample location: B-10A UD @ 10'-11.5'
Sample description: Grey Bottom Ash
Remarks:

Fig no.: 2nd page Fig no. (if applicable):
Type of sample: Shelby Tube
Specific gravity= 2.30 LL= PL= PI=
Test method: Corps of Eng. - saturation assumed

Specimen Parameters for Specimen No. 1

Specimen Parameter	Initial	Saturated	Consolidated	Final
Wt. moist soil and tare:	747.460			915.200
Wt. dry soil and tare:	611.670			611.670
Wt. of tare:	0.000			0.000
Weight, gms:	747.5			
Diameter, in:	2.840	2.734	2.726	
Area, in²:	6.335	5.869	5.838	
Height, in:	5.890	5.890	5.890	
Net decrease in height, in:		0.000	0.000	
Net decrease in water volume, cc:		-164.740	3.000	
% Moisture:	22.2	49.1	48.6	49.6
Wet density, pcf:	76.3	100.5	100.7	
Dry density, pcf:	62.5	67.4	67.8	
Void ratio:	1.2991	1.1301	1.1188	
% Saturation:	39.3	100.0	100.0	

Test Readings Data for Specimen No. 1

Deformation dial constant= 1 in per input unit
Primary load ring constant= 0.72 lbs per input unit
Secondary load ring constant= 0 lbs per input unit
Crossover reading for secondary load ring= 0 input units
Membrane modulus = 0.14000 kN/cm²
Membrane thickness = 0.012 cm
Consolidation cell pressure = 56.90 psi = 8.19 ksf
Consolidation back pressure = 50.00 psi = 7.20 ksf
Consolidation effective confining stress = 0.99 ksf
Strain rate, %/min = 0.34
FAIL. STRESS = 7.34 ksf at reading no. 20
ULT. STRESS = not selected

Specimen Parameters for Specimen No. 2

Specimen Parameter	Initial	Saturated	Consolidated	Final
Wt. moist soil and tare:	730.860			849.450
Wt. dry soil and tare:	598.090			598.090
Wt. of tare:	0.000			0.000
Weight, gms:	730.9			
Diameter, in:	2.840	2.636	2.628	
Area, in²:	6.335	5.456	5.423	
Height, in:	5.680	5.680	5.680	
Net decrease in height, in:		0.000	0.000	
Net decrease in water volume, cc:		-115.000	3.000	
% Moisture:	22.2	41.4	40.9	42.0
Wet density, pcf:	77.4	104.0	104.2	
Dry density, pcf:	63.3	73.5	74.0	
Void ratio:	1.2674	0.9528	0.9413	
% Saturation:	40.3	100.0	100.0	

Test Readings Data for Specimen No. 2

Deformation dial constant= 1 in per input unit
Primary load ring constant= 0.72 lbs per input unit
Secondary load ring constant= 0 lbs per input unit
Crossover reading for secondary load ring= 0 input units
Membrane modulus = 0.14000 kN/cm²
Membrane thickness = 0.012 cm
Consolidation cell pressure = 84.70 psi = 12.20 ksf
Consolidation back pressure = 50.00 psi = 7.20 ksf
Consolidation effective confining stress = 5.00 ksf
Strain rate, %/min = 0.35
FAIL. STRESS = 18.76 ksf at reading no. 22
ULT. STRESS = not selected

No.	Def. Dial Units	Def. in	Load Dial Units	Load lbs	Strain %	Deviator Stress ksf	Effective Stresses Minor ksf	Effective Stresses Major ksf	1:3 Ratio	Pore Pres. psi	P ksf	Q ksf
0	0.0000	0.000	0.0	0.0	0.0	0.00	5.00	5.00	1.00	50.00	5.00	0.00
1	0.0100	0.010	158.0	113.8	0.2	3.02	4.31	7.32	1.70	54.80	5.81	1.51
2	0.0200	0.020	250.0	180.0	0.4	4.76	3.90	8.66	2.22	57.60	6.28	2.38
3	0.0300	0.030	315.0	226.8	0.5	5.99	3.59	9.58	2.67	59.80	6.58	3.00
4	0.0400	0.040	350.0	252.0	0.7	6.64	3.47	10.11	2.91	60.60	6.79	3.32
5	0.0500	0.050	385.0	277.2	0.9	7.30	3.38	10.68	3.16	61.20	7.03	3.65
6	0.0600	0.060	425.0	306.0	1.1	8.04	3.31	11.35	3.43	61.70	7.33	4.02
7	0.0700	0.070	460.0	331.2	1.2	8.69	3.28	11.97	3.65	61.90	7.63	4.34
8	0.0800	0.080	493.0	355.0	1.4	9.29	3.28	12.58	3.83	61.90	7.93	4.65
9	0.0900	0.090	520.0	374.4	1.6	9.78	3.30	13.08	3.97	61.80	8.19	4.89
10	0.1000	0.100	547.0	393.8	1.8	10.27	3.31	13.58	4.10	61.70	8.45	5.14
11	0.1500	0.150	680.0	489.6	2.6	12.66	3.54	16.20	4.57	60.10	9.87	6.33
12	0.2000	0.200	771.0	555.1	3.5	14.22	3.79	18.01	4.75	58.40	10.90	7.11
13	0.2500	0.250	850.0	612.0	4.4	15.53	4.03	19.57	4.85	56.70	11.80	7.77
14	0.3000	0.300	905.0	651.6	5.3	16.39	4.19	20.58	4.91	55.60	12.38	8.19
15	0.3500	0.350	951.0	684.7	6.2	17.06	4.35	21.41	4.92	54.50	12.88	8.53
16	0.4000	0.400	990.0	712.8	7.0	17.59	4.48	22.07	4.93	53.60	13.27	8.80
17	0.4500	0.450	1020.0	734.4	7.9	17.95	4.58	22.53	4.92	52.90	13.56	8.98
18	0.5000	0.500	1043.0	751.0	8.8	18.18	4.65	22.83	4.91	52.40	13.74	9.09
19	0.5500	0.550	1071.0	771.1	9.7	18.49	4.74	23.23	4.90	51.80	13.98	9.25
20	0.6000	0.600	1082.0	779.0	10.6	18.50	4.78	23.28	4.87	51.50	14.03	9.25

Test Readings Data for Specimen No. 2

No.	Def. Dial Units	Def. in	Load Dial Units	Load lbs	Strain %	Deviator Stress ksf	Effective Stresses Minor ksf	Effective Stresses Major ksf	Effective Stresses 1:3 Ratio	Pore Pres. psi	P ksf	Q ksf
21	0.6500	0.650	1102.0	793.4	11.4	18.66	4.82	23.48	4.87	51.20	14.15	9.33
22	0.7000	0.700	1119.0	805.7	12.3	18.76	4.87	23.62	4.85	50.90	14.24	9.38
23	0.7500	0.750	1128.0	812.2	13.2	18.72	4.88	23.60	4.83	50.80	14.24	9.36
24	0.8000	0.800	1120.0	806.4	14.1	18.40	4.90	23.29	4.76	50.70	14.09	9.20
25	0.8500	0.850	1108.0	797.8	15.0	18.01	4.88	22.89	4.69	50.80	13.89	9.01

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 5.11
Specimen Diameter (cm): 7.25
Dry Unit Weight (pcf): 109.2
Moisture Before Test (%): 18.8
Moisture After Test (%): 19.1

Run Number:	1 ●	2 ▲
Cell Pressure (psi):	57.0	
Test Pressure(psi):	52.0	
Back Pressure(psi):	50.2	
Diff. Head (psi):	1.8	
Flow Rate (cc/sec):	5.52 x 10^-5	
Perm. (cm/sec):	5.18 x 10^-8	

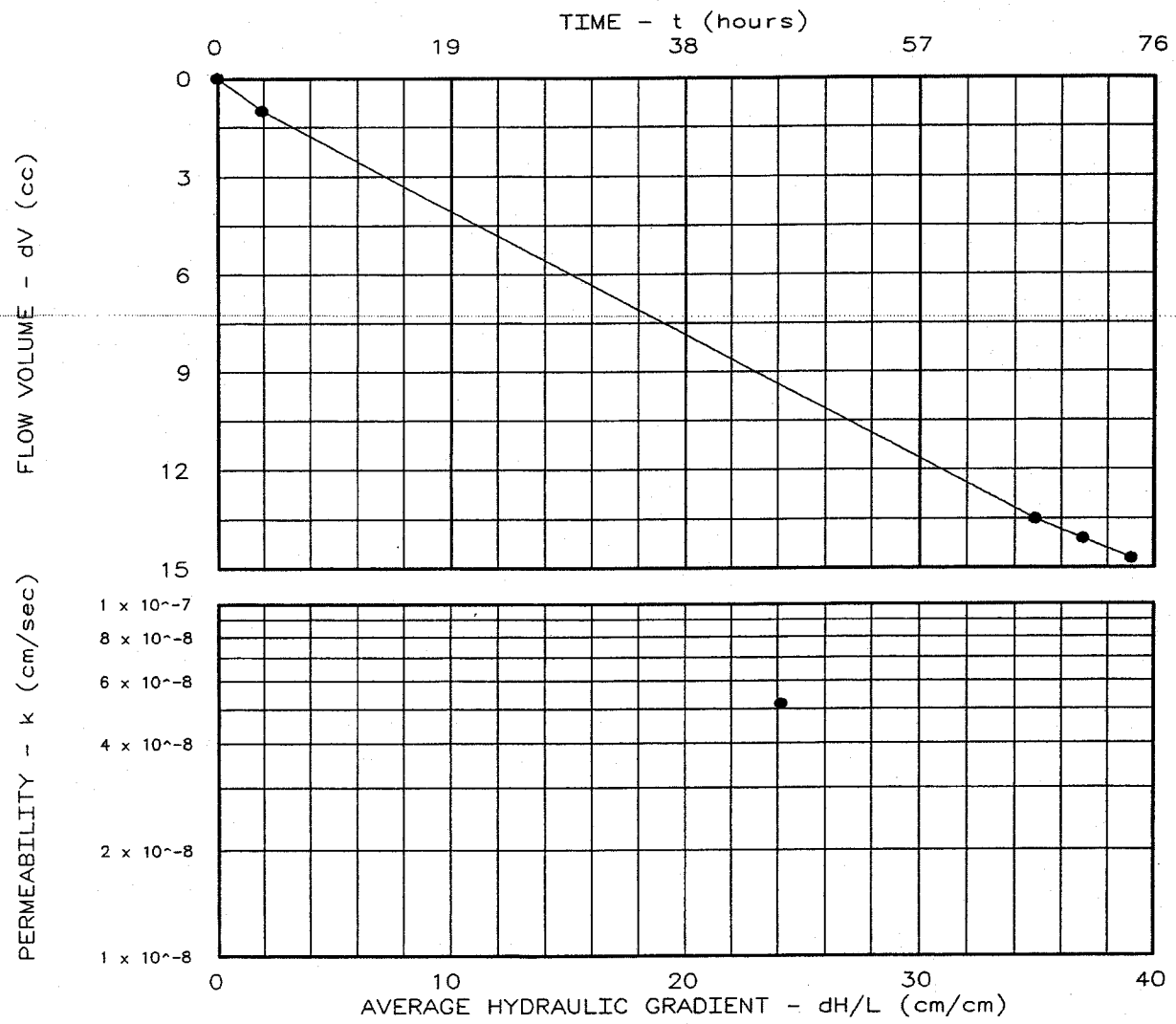
SAMPLE DATA:

Sample Identification: B-2 UD @ 35.5'-37.5'

Visual Description: Tan-Brown Sandy Silty Clay (CL)
Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: Flexible Wall
Sample type: Shelby Tube



Project: TVA Bull Run Ash Disposal Area
Location:
Date: 07-04-04

PERMEABILITY TEST REPORT

LAW ENGINEERING AND ENVIRONMENTAL SERVICES

Project No.: 3043041022
File No.: As# 2678
Lab No.: 6226
Tested by: MH
Checked by: CPT CTF
Test: CH - Constant head

CONSTANT HEAD PERMEABILITY TEST CONDITIONS DATA

Cell No.: 1 Panel No.: 13 Positions: 1

Run Number:	1	2
Cell Pressure:	57.0 psi	0.0 psi
Saturation Pressure:	50.0 psi	0.0 psi
Inflow Corr. Factor:	1.00	1.00
Outflow Corr. Factor:	1.00	1.00
Test Temperature:	22.8 °C	0.0 °C

PERMEABILITY TEST READINGS DATA

CASE D X S R	DATE	TIME (24 hr)	ELAPSED TIME-hrs	GAUGE PRESSURE-psi IN	GAUGE PRESSURE-psi OUT	BURET READING-cc IN	BURET READING-cc OUT	OUTFLOW/ INFLOW RATIO
S	6/18/ 4	13:26:00	0.00	52.0	50.0	50.00	50.00	0.00
	6/18/ 4	17:05:00	3.65	52.0	50.0	51.00	49.00	1.00
	6/21/ 4	7:39:00	66.22	52.0	50.0	63.50	36.50	1.00
	6/21/ 4	11:34:00	70.13	52.0	50.0	64.10	35.90	1.00
	6/21/ 4	15:34:00	74.13	52.0	50.0	64.70	35.30	1.00

Test Pressure = 52.0 psi Differential Head = 1.8 psi, 123.3 cm H2O
Gradient = 2.415E 01 Flow rate = 5.523E-05 cc/sec R squared = 0.99952
Permeability, K22.8° = 5.538E-08 cm/sec, K20° = 5.180E-08 cm/sec

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 7.62
Specimen Diameter (cm): 7.32
Dry Unit Weight (pcf): 71.6
Moisture Before Test (%): 17.9
Moisture After Test (%): 33.2

Run Number:	1 ●	2 ▲
Cell Pressure (psi):	57.0	
Test Pressure(psi):	51.0	
Back Pressure(psi):	50.3	
Diff. Head (psi):	0.7	
Flow Rate (cc/sec):	3.65 x 10^-1	
Perm. (cm/sec):	1.29 x 10^-3	

SAMPLE DATA:

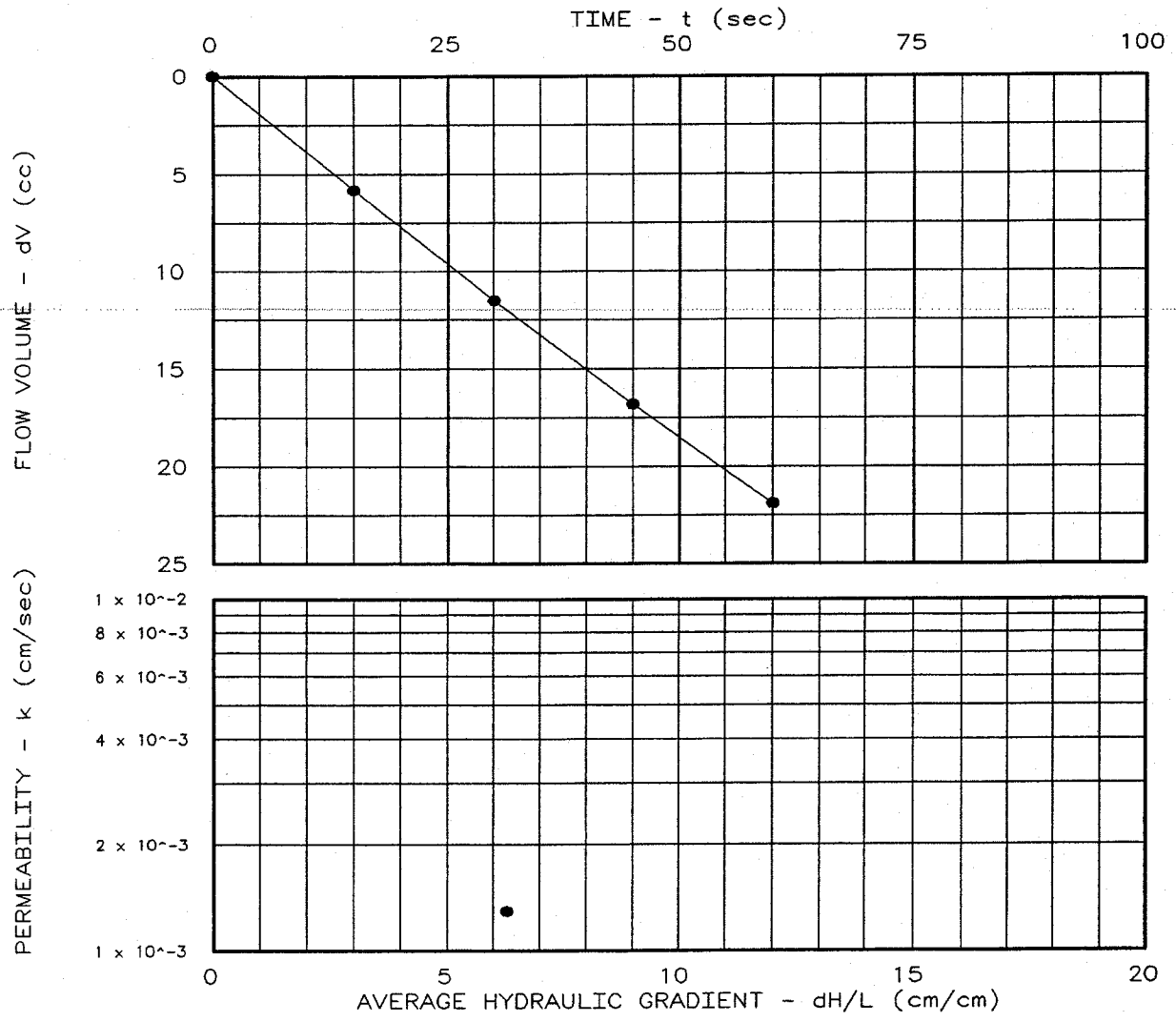
Sample Identification: B-2P UD @ 2'-4'

Visual Description: Grey Bottom Ash

Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: Flexible Wall
Sample type: Shelby Tube



Project: TVA Bull Run Ash Disposal Area
Location:
Date: 07-04-04

PERMEABILITY TEST REPORT

LAW ENGINEERING AND ENVIRONMENTAL SERVICES

Project No.: 3043041022
File No.: As# 2678
Lab No.: 6226
Tested by: MH
Checked by: CPT CJA
Test: CH - Constant head

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	TVA Bull Run Ash Disposal Area
File No.:	As# 2678
Project Location:	
Project No.:	3043041022
Sample Identification:	B-2P UD @ 2'-4'
Lab No.:	6226
Description:	Grey Bottom Ash
Sample Type:	Shelby Tube
Max. Dry Dens.:	
Method (D1557/D698):	
Opt. Water Content:	
Date:	07-04-04
Remarks:	
Permeameter Type:	Flexible Wall
Tested by:	MH
Checked by:	CPT
Test type:	CH - Constant head

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.880 in	in		2.880 in	in	
Middle:	in	in		in	in	
Bottom:	in	in		in	in	
Average:	2.88 in	7.32 cm		2.88 in	7.32 cm	
Length:	1	2	3	1	2	3
	3.000 in	in	in	3.000 in	in	in
Average:	3.00 in	7.62 cm		3.00 in	7.62 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.26	
Wet Wt. & Tare:	432.95	489.17
Dry Wt. & Tare:	367.33	367.33
Tare Wt.:	0.00	0.00
Moisture Content:	17.9 %	33.2 %
Dry Unit Weight:	71.6 pcf	71.6 pcf
Porosity:	0.4925	0.4925
Saturation:	41.6 %	77.3 %

CONSTANT HEAD PERMEABILITY TEST CONDITIONS DATA

Cell No.: 2 Panel No.: 14 Positions: 0

Run Number:	1	2
Cell Pressure:	57.0 psi	0.0 psi
Saturation Pressure:	50.0 psi	0.0 psi
Inflow Corr. Factor:	1.00	1.00
Outflow Corr. Factor:	1.00	1.00
Test Temperature:	22.8 °C	0.0 °C

PERMEABILITY TEST READINGS DATA

CASE D X S R	DATE	TIME (24 hr)	ELAPSED TIME-sec	GAUGE PRESSURE-psi IN	GAUGE PRESSURE-psi OUT	BURET READING-cc IN	BURET READING-cc OUT	OUTFLOW/ INFLOW RATIO
S	6/18/ 4	13:34:00	0	51.0	50.0	50.00	50.00	0.00
	6/18/ 4	13:34:15	15	51.0	50.0	55.80	44.20	1.00
	6/18/ 4	13:34:30	30	51.0	50.0	61.50	38.50	1.00
	6/18/ 4	13:34:45	45	51.0	50.0	66.80	33.20	1.00
	6/18/ 4	13:35:00	60	51.0	50.0	71.90	28.10	1.00

Test Pressure = 51.0 psi Differential Head = 0.7 psi, 47.9 cm H2O
Gradient = 6.287E 00 Flow rate = 3.653E-01 cc/sec R squared = 0.99921
Permeability, K22.8° = 1.383E-03 cm/sec, K20° = 1.293E-03 cm/sec

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 6.33
Specimen Diameter (cm): 7.27
Dry Unit Weight (pcf): 85.6
Moisture Before Test (%): 27.0
Moisture After Test (%): 27.8

Run Number:	1 ●	2 ▲
Cell Pressure (psi):	57.0	
Test Pressure(psi):	52.0	
Back Pressure(psi):	50.3	
Diff. Head (psi):	1.7	
Flow Rate (cc/sec):	1.27 x 10^-2	
Perm. (cm/sec):	1.53 x 10^-5	

SAMPLE DATA:

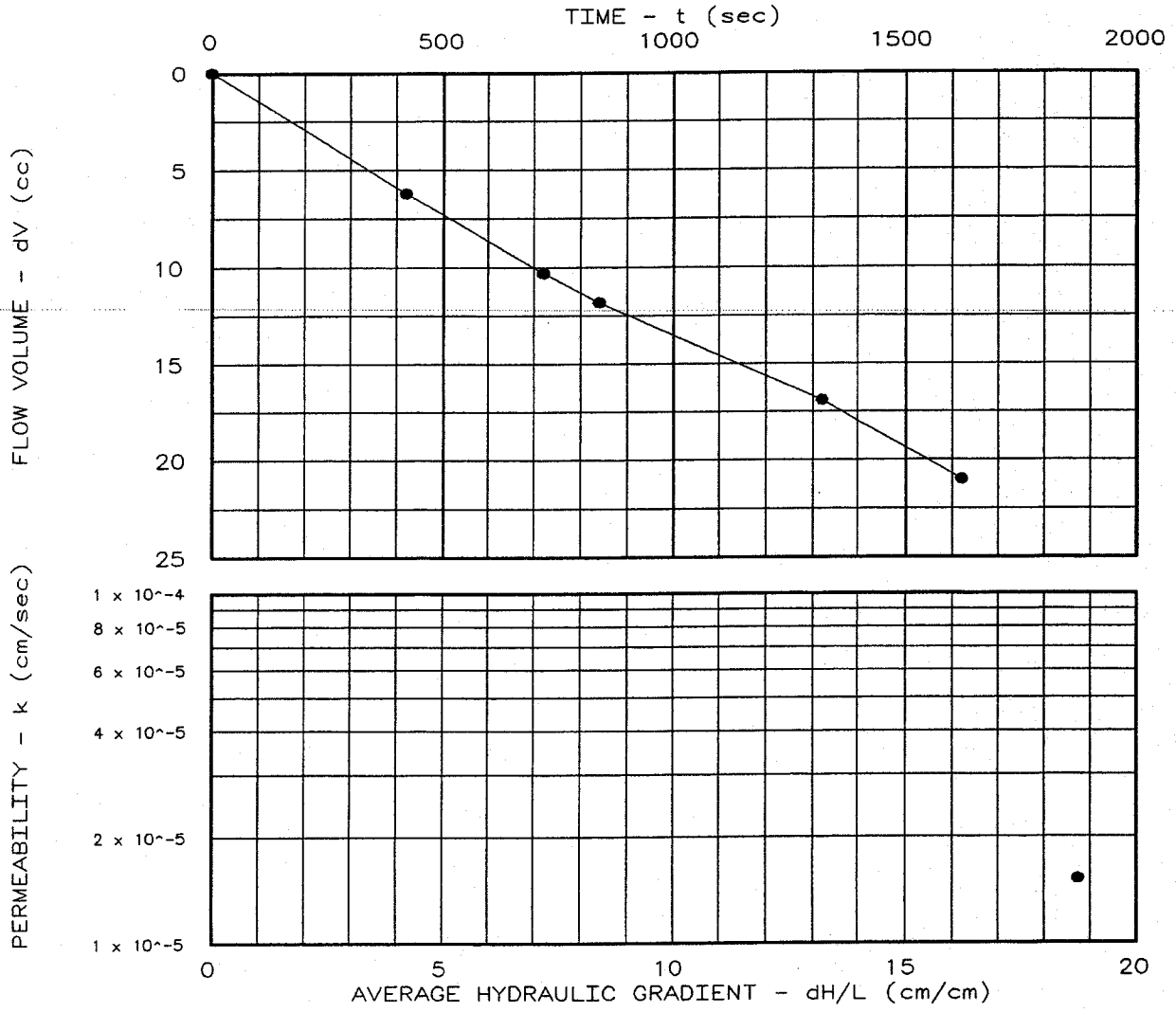
Sample Identification: B-2P UD @ 14'-16'

Visual Description: Grey Fly Ash

Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: Flexible Wall
Sample type: Shelby Tube



Project: TVA Bull Run Ash Disposal Area
Location:
Date: 07-04-04

PERMEABILITY TEST REPORT

LAW ENGINEERING AND ENVIRONMENTAL SERVICES

Project No.: 3043041022
File No.: As# 2678
Lab No.: 6226
Tested by: MH
Checked by: CPT CTA
Test: CH - Constant head

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	TVA Bull Run Ash Disposal Area
File No.:	As# 2678
Project Location:	
Project No.:	3043041022
Sample Identification:	B-2P UD @ 14'-16'
Lab No.:	6226
Description:	Grey Fly Ash
Sample Type:	Shelby Tube
Max. Dry Dens.:	
Method (D1557/D698):	
Opt. Water Content:	
Date:	07-04-04
Remarks:	
Permeameter Type:	Flexible Wall
Tested by:	MH
Checked by:	CPT
Test type:	CH - Constant head

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.862 in	in		2.862 in	in	
Middle:	in	in		in	in	
Bottom:	in	in		in	in	
Average:	2.86 in	7.27 cm		2.86 in	7.27 cm	
Length:	1	2	3	1	2	3
	2.492 in	in	in	2.492 in	in	in
Average:	2.49 in	6.33 cm		2.49 in	6.33 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.22	
Wet Wt. & Tare:	457.38	460.15
Dry Wt. & Tare:	360.07	360.07
Tare Wt.:	0.00	0.00
Moisture Content:	27.0 %	27.8 %
Dry Unit Weight:	85.6 pcf	85.6 pcf
Porosity:	0.3826	0.3826
Saturation:	96.8 %	99.6 %

CONSTANT HEAD PERMEABILITY TEST CONDITIONS DATA

Cell No.: 3 Panel No.: 14 Positions: 0

Run Number:	1	2
Cell Pressure:	57.0 psi	0.0 psi
Saturation Pressure:	50.0 psi	0.0 psi
Inflow Corr. Factor:	1.00	1.00
Outflow Corr. Factor:	1.00	1.00
Test Temperature:	22.8 °C	0.0 °C

PERMEABILITY TEST READINGS DATA

CASE D X S R	DATE	TIME (24 hr)	ELAPSED TIME-sec	GAUGE PRESSURE-psi IN	GAUGE PRESSURE-psi OUT	BURET READING-cc IN	BURET READING-cc OUT	OUTFLOW/ INFLOW RATIO
S	6/18/ 4	13:26:00	0	52.0	50.0	50.00	50.00	0.00
	6/18/ 4	13:33:00	420	52.0	50.0	56.20	43.80	1.00
	6/18/ 4	13:38:00	720	52.0	50.0	60.30	39.70	1.00
	6/18/ 4	13:40:00	840	52.0	50.0	61.80	38.20	1.00
	6/18/ 4	13:48:00	1,320	52.0	50.0	66.90	33.10	1.00
	6/18/ 4	13:53:00	1,620	52.0	50.0	71.00	29.00	1.00

Test Pressure = 52.0 psi Differential Head = 1.7 psi, 118.5 cm H2O
Gradient = 1.873E 01 Flow rate = 1.268E-02 cc/sec R squared = 0.99548
Permeability, K22.8° = 1.632E-05 cm/sec, K20° = 1.526E-05 cm/sec

PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 5.03
Specimen Diameter (cm): 7.25
Dry Unit Weight (pcf): 72.3
Moisture Before Test (%): 38.8
Moisture After Test (%): 39.8

Run Number:	1 ●	2 ▲
Cell Pressure (psi):	57.0	
Test Pressure(psi):	52.0	
Back Pressure(psi):	50.2	
Diff. Head (psi):	1.8	
Flow Rate (cc/sec):	3.63 x 10^-2	
Perm. (cm/sec):	3.24 x 10^-5	

SAMPLE DATA:

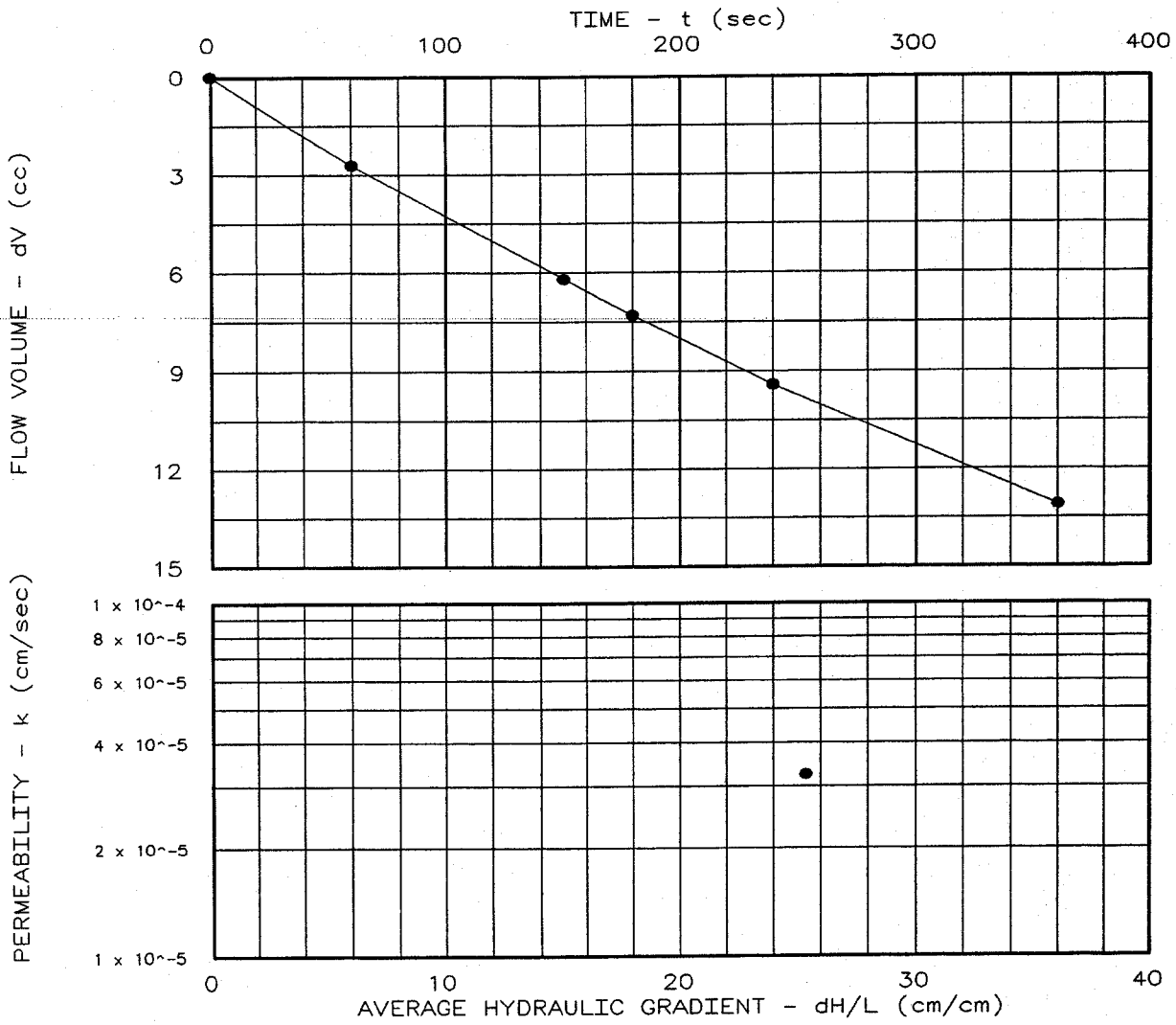
Sample Identification: B-2P UD @ 18'-20'

Visual Description: Grey Bottom Ash

Remarks:

Maximum Dry Density (pcf):
Optimum Moisture Content (%):

Percent Compaction:
Permeameter type: Flexible Wall
Sample type: Shelby Tube



Project: TVA Bull Run Ash Disposal Area
Location:
Date: 07-04-04

PERMEABILITY TEST REPORT

LAW ENGINEERING AND ENVIRONMENTAL SERVICES

Project No.: 3043041022
File No.: As# 2678
Lab No.: 6226
Tested by: MH
Checked by: CPT CTJ
Test: CH - Constant head

PERMEABILITY TEST DATA

PROJECT DATA

Project Name:	TVA Bull Run Ash Disposal Area
File No.:	As# 2678
Project Location:	
Project No.:	3043041022
Sample Identification:	B-2P UD @ 18'-20'
Lab No.:	6226
Description:	Grey Bottom Ash
Sample Type:	Shelby Tube
Max. Dry Dens.:	
Method (D1557/D698):	
Opt. Water Content:	
Date:	07-04-04
Remarks:	
Permeameter Type:	Flexible Wall
Tested by:	MH
Checked by:	CPT
Test type:	CH - Constant head

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.855 in	in		2.855 in	in	
Middle:	in	in		in	in	
Bottom:	in	in		in	in	
Average:	2.85 in	7.25 cm		2.86 in	7.25 cm	
Length:	1	2	3	1	2	3
	1.981 in	in	in	1.981 in	in	in
Average:	1.98 in	5.03 cm		1.98 in	5.03 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.20	
Wet Wt. & Tare:	333.95	336.44
Dry Wt. & Tare:	240.66	240.66
Tare Wt.:	0.00	0.00
Moisture Content:	38.8 %	39.8 %
Dry Unit Weight:	72.3 pcf	72.3 pcf
Porosity:	0.4734	0.4736
Saturation:	94.8 %	97.3 %

CONSTANT HEAD PERMEABILITY TEST CONDITIONS DATA

Cell No.: 2 Panel No.: 15 Positions: 1

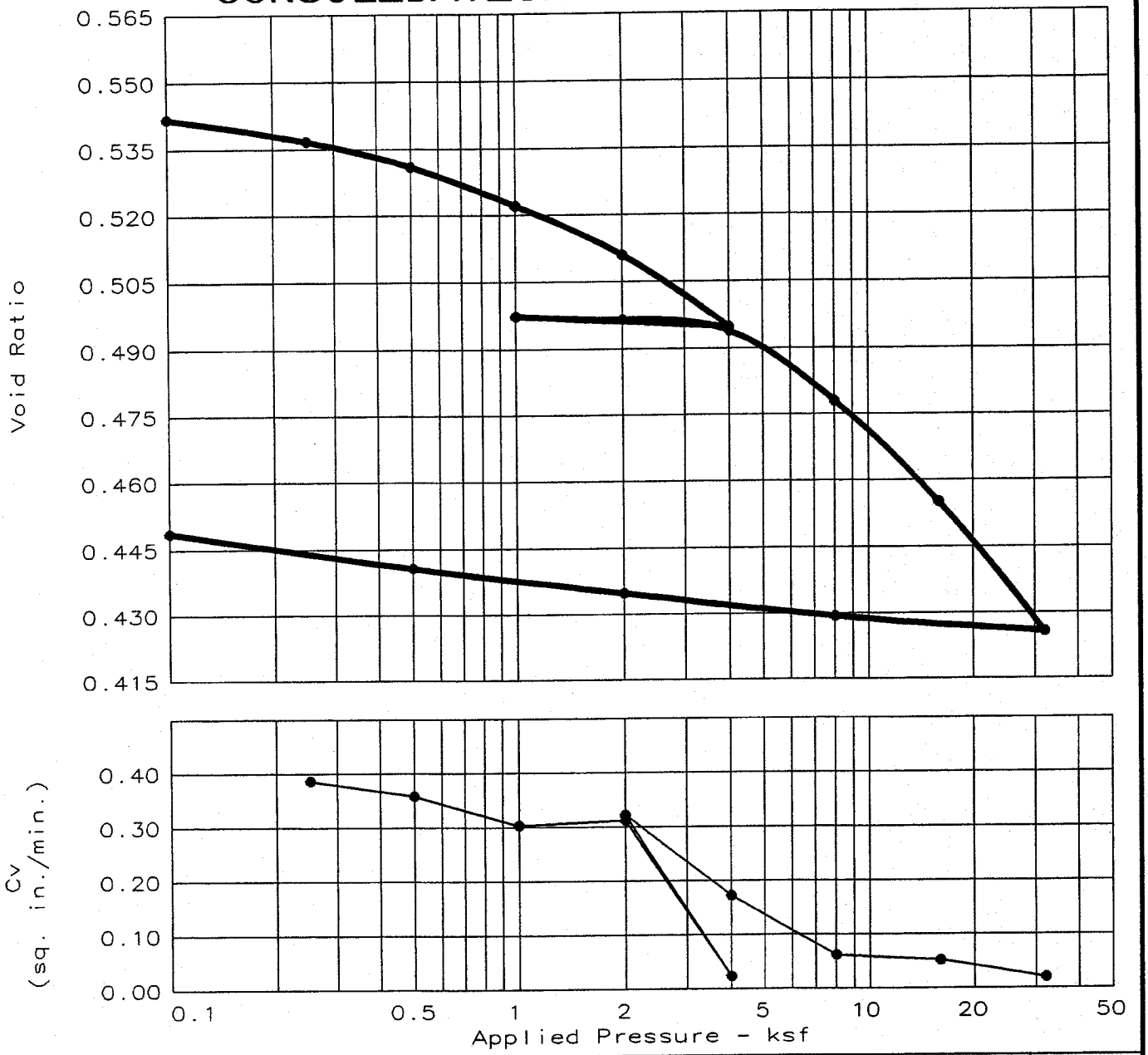
Run Number:	1	2
Cell Pressure:	57.0 psi	0.0 psi
Saturation Pressure:	50.0 psi	0.0 psi
Inflow Corr. Factor:	1.00	1.00
Outflow Corr. Factor:	1.00	1.00
Test Temperature:	22.8 °C	0.0 °C

PERMEABILITY TEST READINGS DATA

CASE D X S R	DATE	TIME (24 hr)	ELAPSED TIME-sec	GAUGE PRESSURE-psi IN	GAUGE PRESSURE-psi OUT	BURET READING-cc IN	BURET READING-cc OUT	OUTFLOW/ INFLOW RATIO
S	6/18/ 4	13:26:00	0	52.0	50.0	50.00	50.00	0.00
	6/18/ 4	13:27:00	60	52.0	50.0	52.70	47.30	1.00
	6/18/ 4	13:28:30	150	52.0	50.0	56.20	43.80	1.00
	6/18/ 4	13:29:00	180	52.0	50.0	57.30	42.70	1.00
	6/18/ 4	13:30:00	240	52.0	50.0	59.40	40.60	1.00
	6/18/ 4	13:32:00	360	52.0	50.0	63.10	36.90	1.00

Test Pressure = 52.0 psi Differential Head = 1.8 psi, 127.7 cm H2O
Gradient = 2.538E 01 Flow rate = 3.634E-02 cc/sec R squared = 0.99423
Permeability, K22.8° = 3.468E-05 cm/sec, K20° = 3.244E-05 cm/sec

CONSOLIDATION TEST REPORT



Wet Density	Natural Moisture	Dry Dens. (pcf)	LL	PI	Sp.Gr.	Precons. (ksf)	C_c	e_o
128.9	20.3 %	107.2	NP	NP	2.650	7.36	0.10	0.5418

TEST RESULTS

Compression Index = 0.10

MATERIAL DESCRIPTION

Orange-Brown Sandy Silt

Class: ML

Project No.: 3043-04-1022.01
Project: TVA Bull Run Ash Disposal Area
Location: B-2 UD @ 39'-41'

Date: 06-22-04

Remarks:

CONSOLIDATION TEST REPORT

LAW ENGINEERING AND ENVIRONMENTAL SERVICES

CTA

Fig. No. 1

15:48, 6-22-1904 CONSOLIDATION TEST PROJECT DATA Test No. 226

Project Number: 3043-04-1022.01
Project: TVA Bull Run Ash Disposal Area
Date: 06-22-04
Location 1: B-2 UD @ 39'-41'
2:
Remarks 1:
2:
3:
4:
5:
Material description Orange-Brown Sandy Silt

Classification: ML
Liquid limit: NP
Plasticity index: NP
Figure Number: 1

CONSOLIDATION TEST SPECIMEN DATA

TOTAL SAMPLE	BEFORE TEST	AFTER TEST
Wet w+t = 149.69 g.	Oedometer No. = 5	Wet w+t = 146.26 g.
Dry w+t = 124.48 g	Machine No. = 5	Dry w+t = 124.48 g.
Tare wt. = 0.00 g.	Spec. Gravity = 2.650	Tare wt. = 0.00 g.
Height = 1.9990 in.	Height = 0.9993 in.	
Diameter = 2.8850 in.	Diameter = 2.3730 in.	
Weight = 442.10 g.		
Moisture = 20.3 %	Ht. Solids = 0.6481 in.	Moisture = 17.5 %
Wet Den. = 128.9 pcf	Dry wt. = 124.34 g.	Dry wt. = 124.48 g. *
Dry Den. = 107.2 pcf	Void ratio = 0.5418	Void ratio = 0.4486
	Saturation = 99.1 %	

* Final dry weight used in calculations

CONSOLIDATION TEST READINGS SUMMARY

LOAD (ksf)	DIAL (in.)	DEFLECTION (in.)	CORRECTED DIAL (in.)	VOID RATIO	% SWELL/COMPRS.
Initial	0.30000			0.5418	
0.10	0.30000	0.0000	0.30000	0.5418	0.0
0.25	0.29660	0.0001	0.29670	0.5367	0.3 Comprs.
0.50	0.29275	0.0002	0.29295	0.5309	0.7 Comprs.
1.00	0.28680	0.0004	0.28720	0.5221	1.3 Comprs.
2.00	0.27920	0.0008	0.28000	0.5109	2.0 Comprs.
4.00	0.26820	0.0014	0.26960	0.4949	3.0 Comprs.
1.00	0.27080	0.0004	0.27120	0.4974	2.9 Comprs.
2.00	0.26990	0.0008	0.27070	0.4966	2.9 Comprs.
4.00	0.26760	0.0014	0.26900	0.4940	3.1 Comprs.
8.00	0.25630	0.0023	0.25860	0.4779	4.1 Comprs.
16.00	0.24040	0.0034	0.24380	0.4551	5.6 Comprs.
32.00	0.21980	0.0050	0.22480	0.4258	7.5 Comprs.
8.00	0.22480	0.0023	0.22710	0.4293	7.3 Comprs.

CONSOLIDATION TEST READINGS SUMMARY

LOAD (ksf)	DIAL (in.)	DEFLECTION (in.)	CORRECTED DIAL (in.)	VOID RATIO	% SWELL/COMPRS.
2.00	0.22980	0.0008	0.23060	0.4347	6.9 Comprs.
0.50	0.23420	0.0002	0.23440	0.4406	6.6 Comprs.
0.10	0.23960	0.0000	0.23960	0.4486	6.0 Comprs.

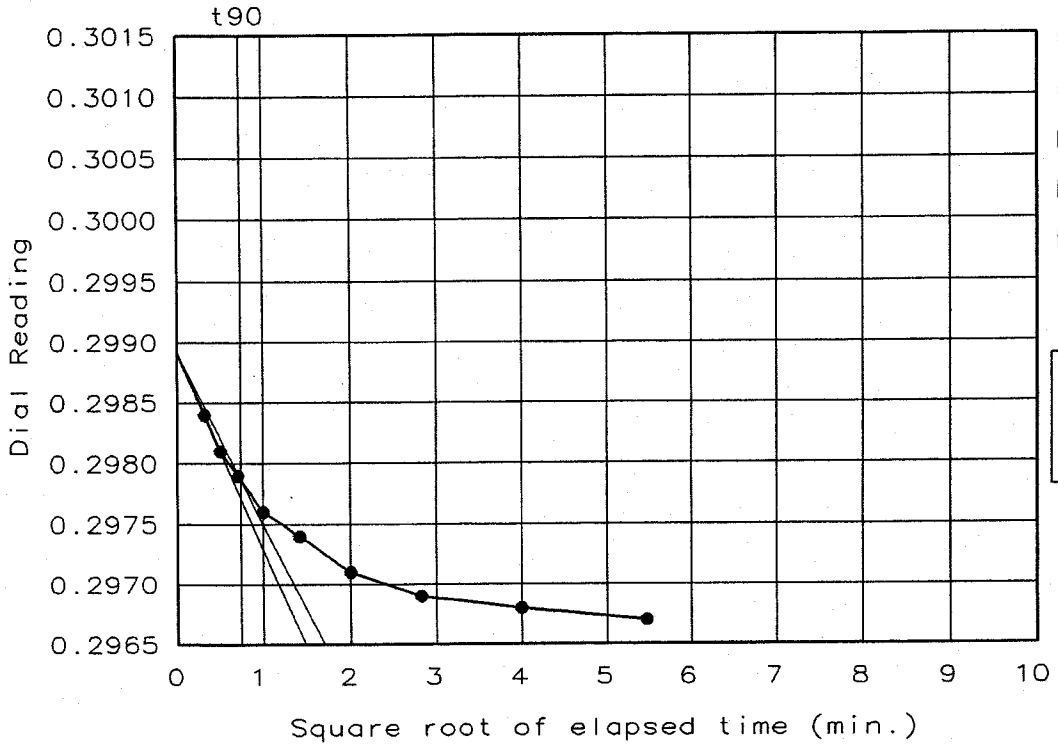
CONSOLIDATION TEST RESULTS

Compression index = 0.10
Preconsolidation pressure = 7.36 ksf

Dial Reading vs. Time

Project No.: 3043-04-1022.01
Project: TVA Bull Run Ash Disposal Area
Location: B-2 UD @ 39'-41'

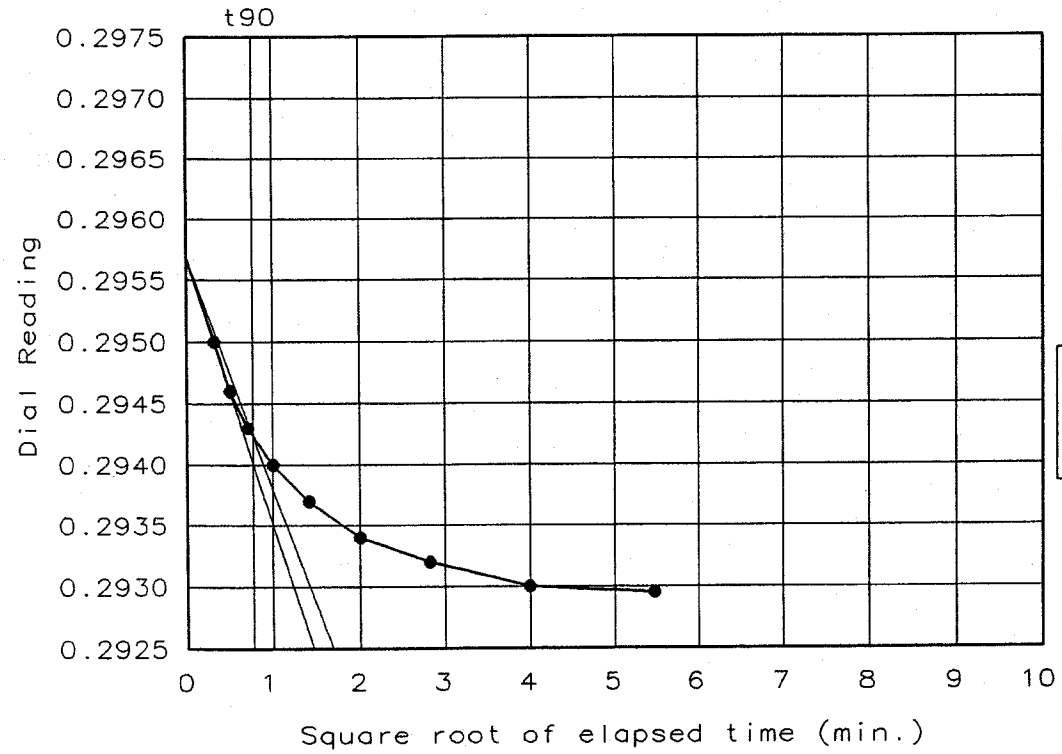
Date: 06-22-04



Load No.= 2
Load= 0.25 ksf
D_0 = 0.2989
D_{90} = 0.2979
D_{100}= 0.2978
T_{90}= 0.55 min.

C_v @ T_{90} =
.386 $in.^2/min.$

I.C.=50.0 %



Load No.= 3
Load= 0.50 ksf
D_0 = 0.2957
D_{90} = 0.2942
D_{100}= 0.2941
T_{90}= 0.58 min.

C_v @ T_{90} =
.358 $in.^2/min.$

I.C.=38.5 %

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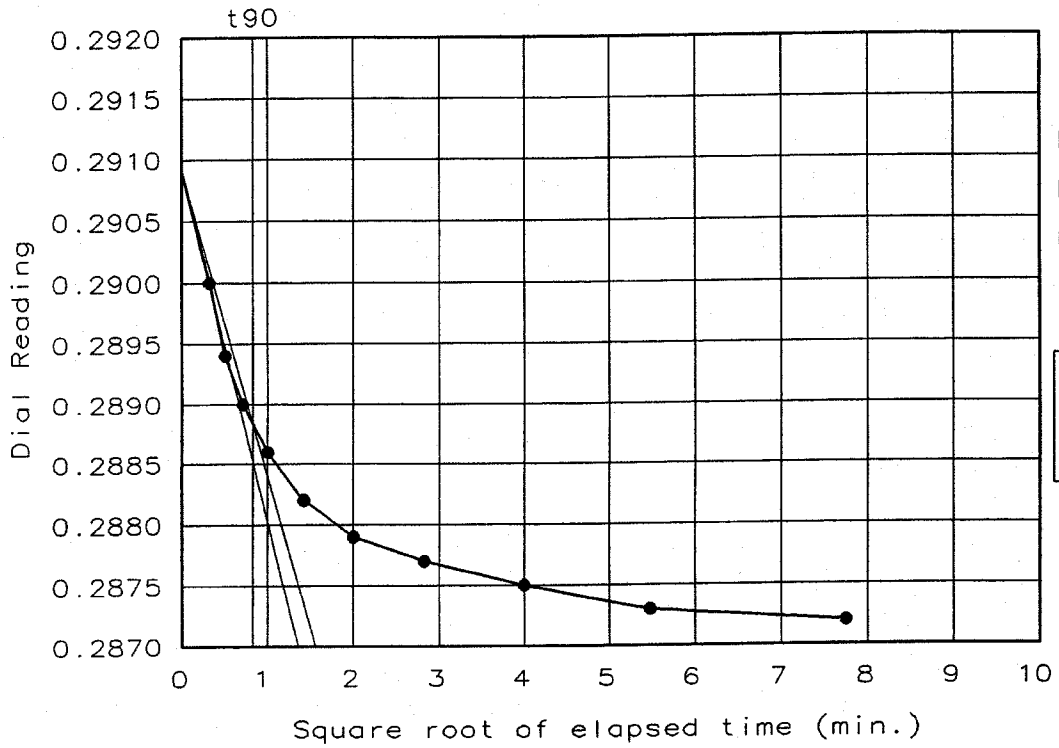
Dial Reading vs. Time

Project No.: 3043-04-1022.01
Project: TVA Bull Run Ash Disposal Area
Location: B-2 UD @ 39'-41'

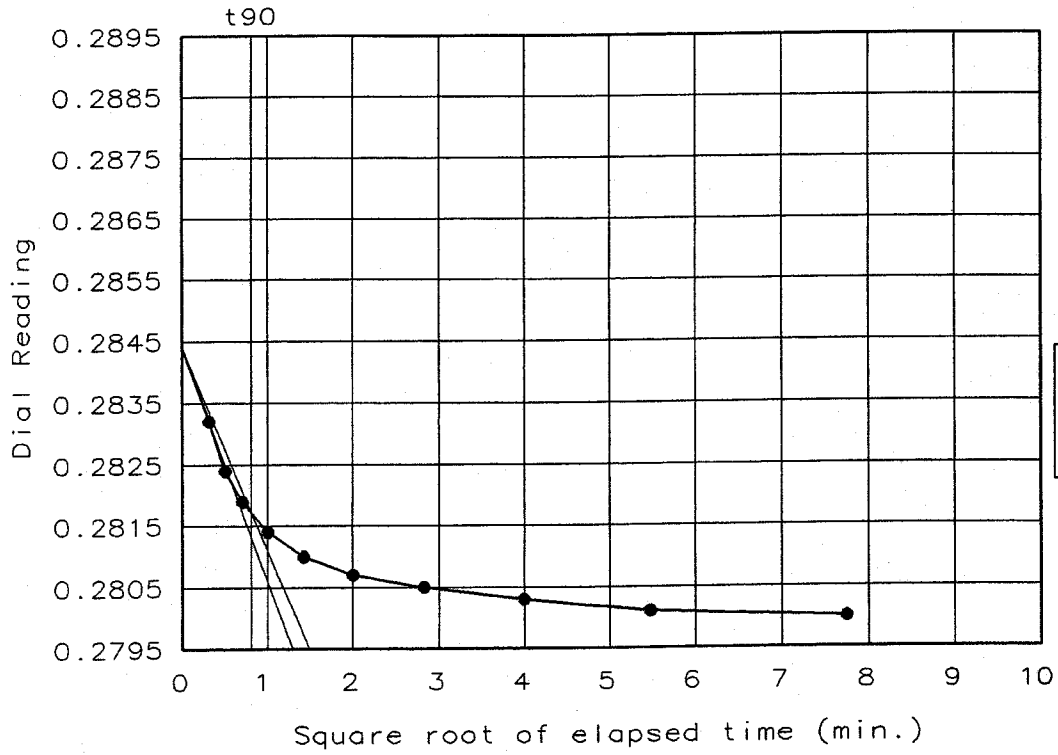
Date: 06-22-04



Load No.= 4
Load= 1.00 ksf
D_0 = 0.2909
D_{90} = 0.2888
D_{100}= 0.2886
T_{90}= 0.69 min.

C_v @ T_{90} = .303 $in.^2/min.$

I.C.=47.1 %



Load No.= 5
Load= 2.00 ksf
D_0 = 0.2844
D_{90} = 0.2817
D_{100}= 0.2814
T_{90}= 0.66 min.

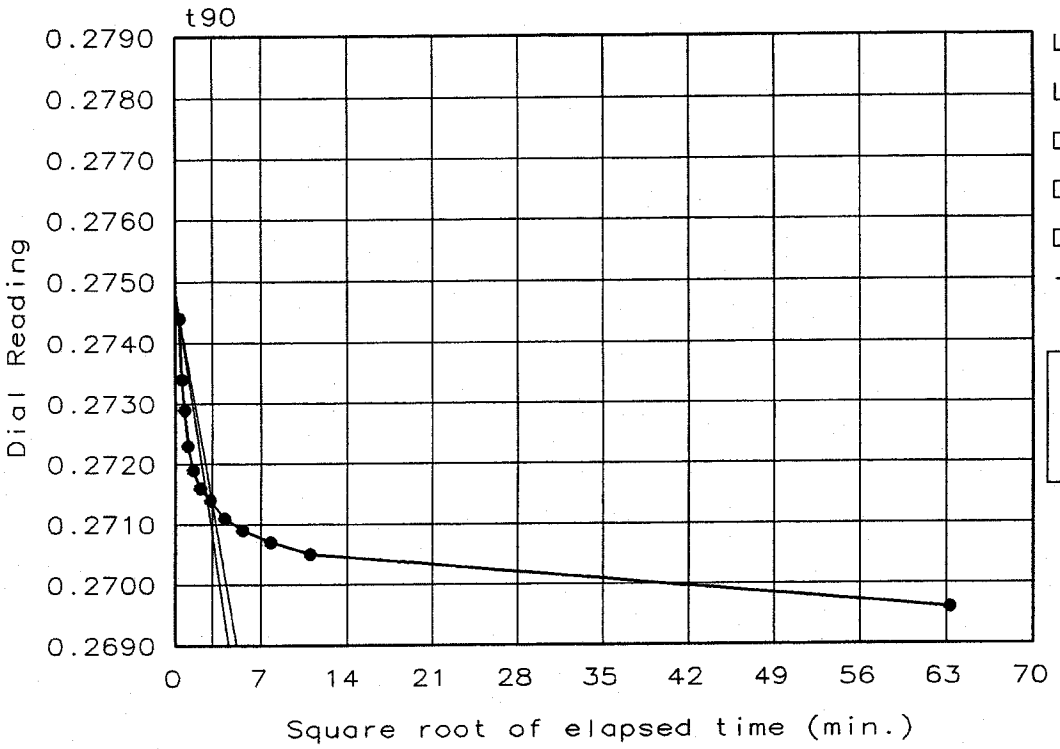
C_v @ T_{90} = .312 $in.^2/min.$

I.C.=48.3 %

Dial Reading vs. Time

Project No.: 3043-04-1022.01
Project: TVA Bull Run Ash Disposal Area
Location: B-2 UD @ 39'-41'

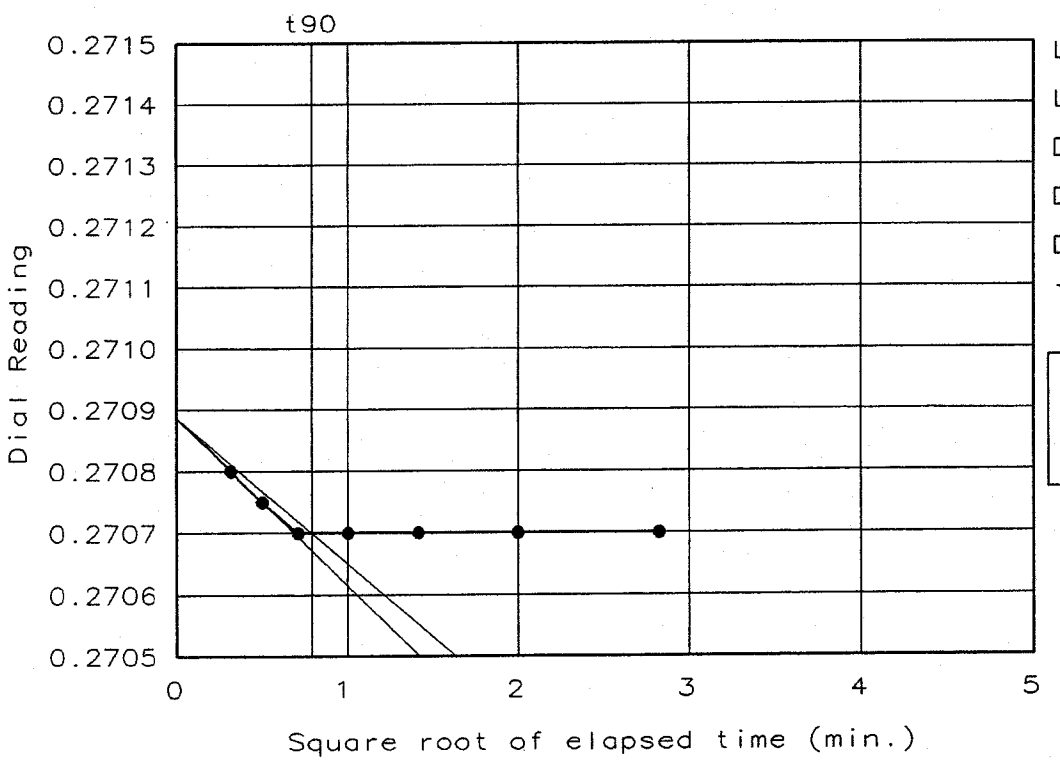
Date: 06-22-04



Load No.= 6
Load= 4.00 ksf
D_0 = 0.2748
D_{90} = 0.2714
D_{100}= 0.2710
T_{90}= 8.76 min.

C_v @ T_{90} =
.023 $in.^2/min.$

I.C.=57.8 %



Load No.= 8
Load= 2.00 ksf
D_0 = 0.2709
D_{90} = 0.2707
D_{100}= 0.2707
T_{90}= 0.62 min.

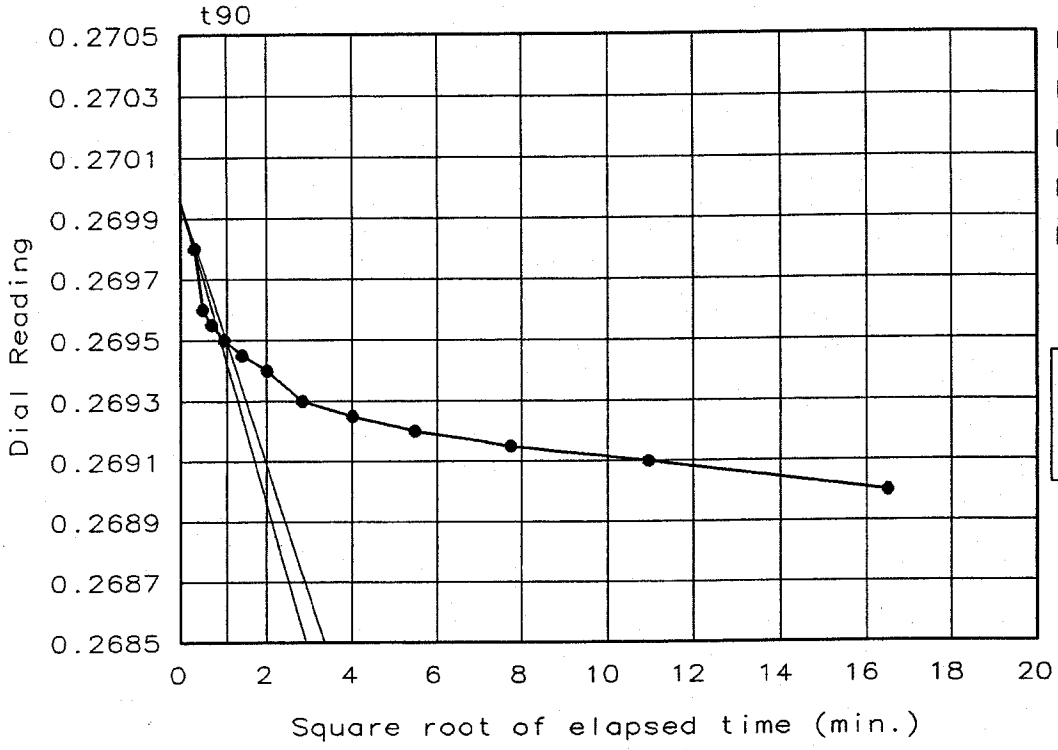
C_v @ T_{90} =
.322 $in.^2/min.$

I.C.=60.0 %

Dial Reading vs. Time

Project No.: 3043-04-1022.01
Project: TVA Bull Run Ash Disposal Area
Location: B-2 UD @ 39'-41'

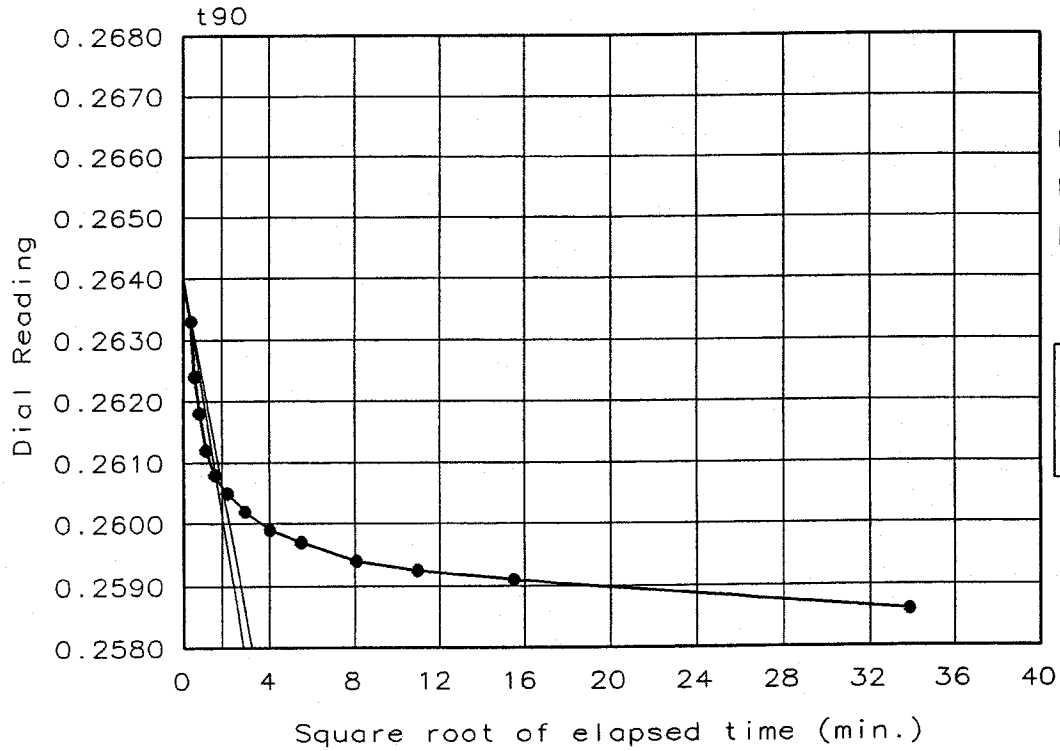
Date: 06-22-04



Load No.= 9
Load= 4.00 ksf
D_0 = 0.2700
D_{90} = 0.2695
D_{100}= 0.2694
T_{90}= 1.15 min.

C_v @ T_{90} = .172 $in.^2/min.$

I.C.=53.8 %



Load No.= 10
Load= 8.00 ksf
D_0 = 0.2640
D_{90} = 0.2606
D_{100}= 0.2602
T_{90}= 3.15 min.

C_v @ T_{90} = .062 $in.^2/min.$

I.C.=56.8 %

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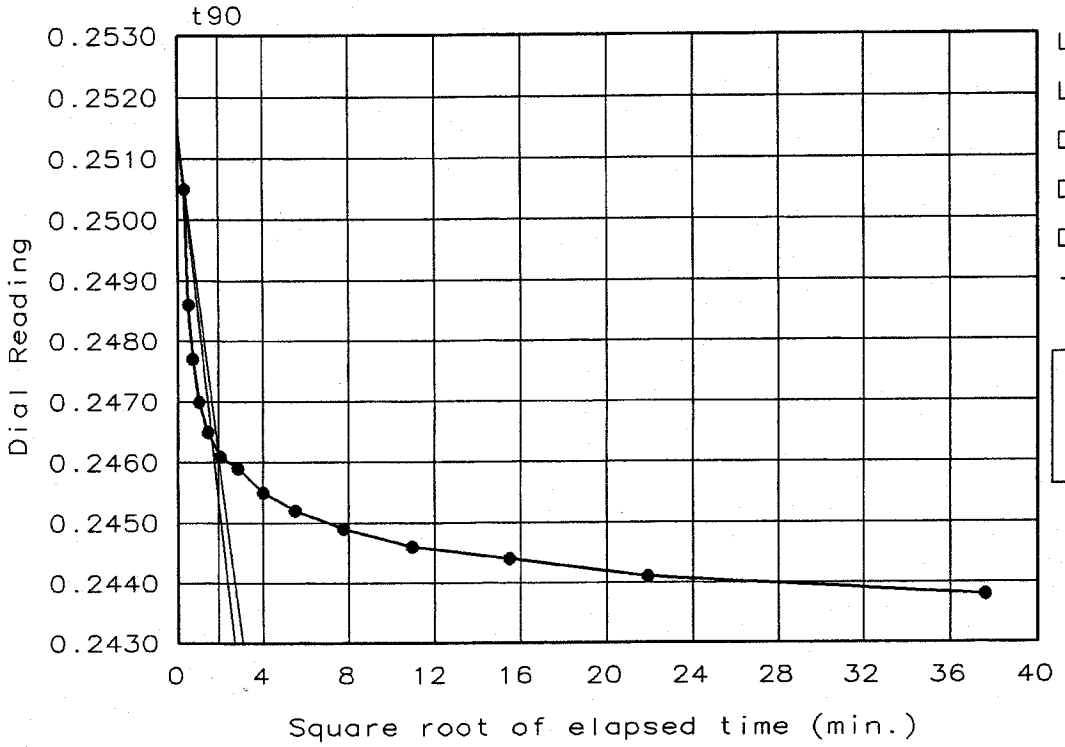
Dial Reading vs. Time

Project No.: 3043-04-1022.01
Project: TVA Bull Run Ash Disposal Area
Location: B-2 UD @ 39'-41'

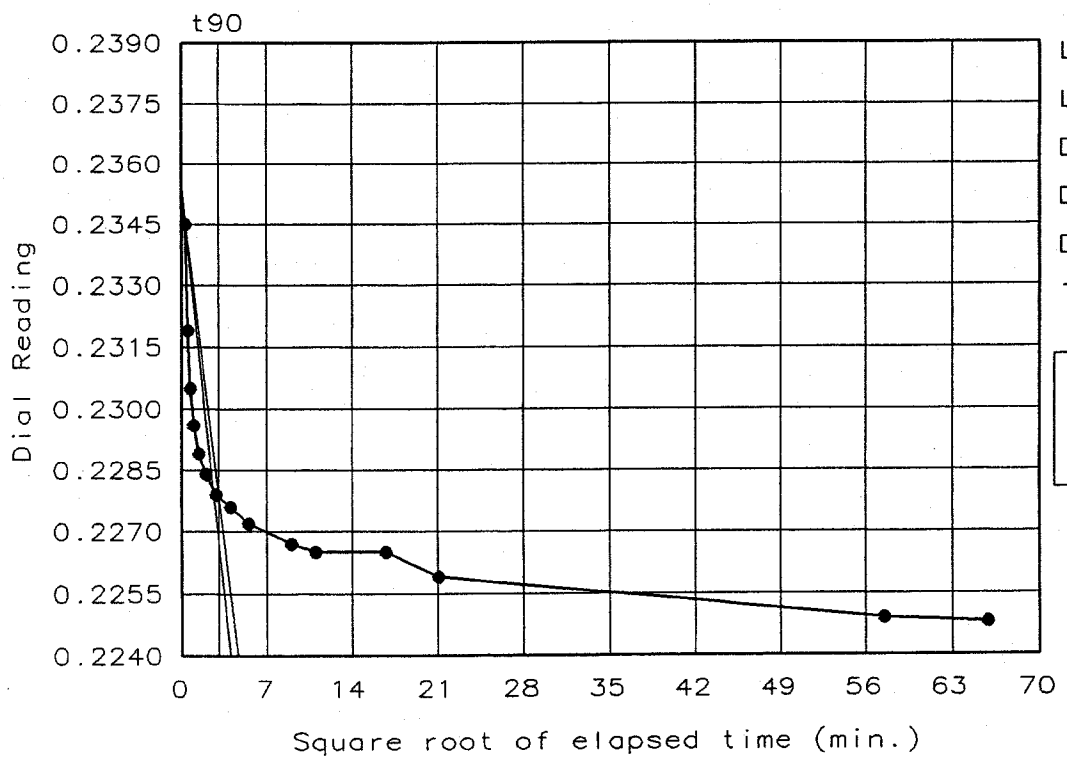
Date: 06-22-04



Load No.= 11
Load= 16.00 ksf
D_0 = 0.2515
D_{90} = 0.2462
D_{100}= 0.2456
T_{90}= 3.69 min.

C_v @ T_{90} =
.052 $in.^2/min.$

I.C.=54.6 %



Load No.= 12
Load= 32.00 ksf
D_0 = 0.2354
D_{90} = 0.2278
D_{100}= 0.2270
T_{90}= 9.28 min.

C_v @ T_{90} =
.020 $in.^2/min.$

I.C.=50.0 %

Reference No. 9

TVA Bull Run Fossil Plant

FGD Disposal Area
Dike Seepage and Stability
April 4 2007

TVA

Geosyntec consultants

Situation Analysis

- Dikes have been recently constructed to form a gypsum disposal area as part of the BRF FGD Project
- Seepage and stability issues have been identified in the lower portions of the new dikes
- Geosyntec performed a site visit on March 28 2007 to review current situation and review TVA's proposed solutions

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Situation Analysis

- Good quality dike construction
- Sloughing of lower portion (5-10 ft) of slope
- Area appears to be wet/saturated to a relatively consistent height

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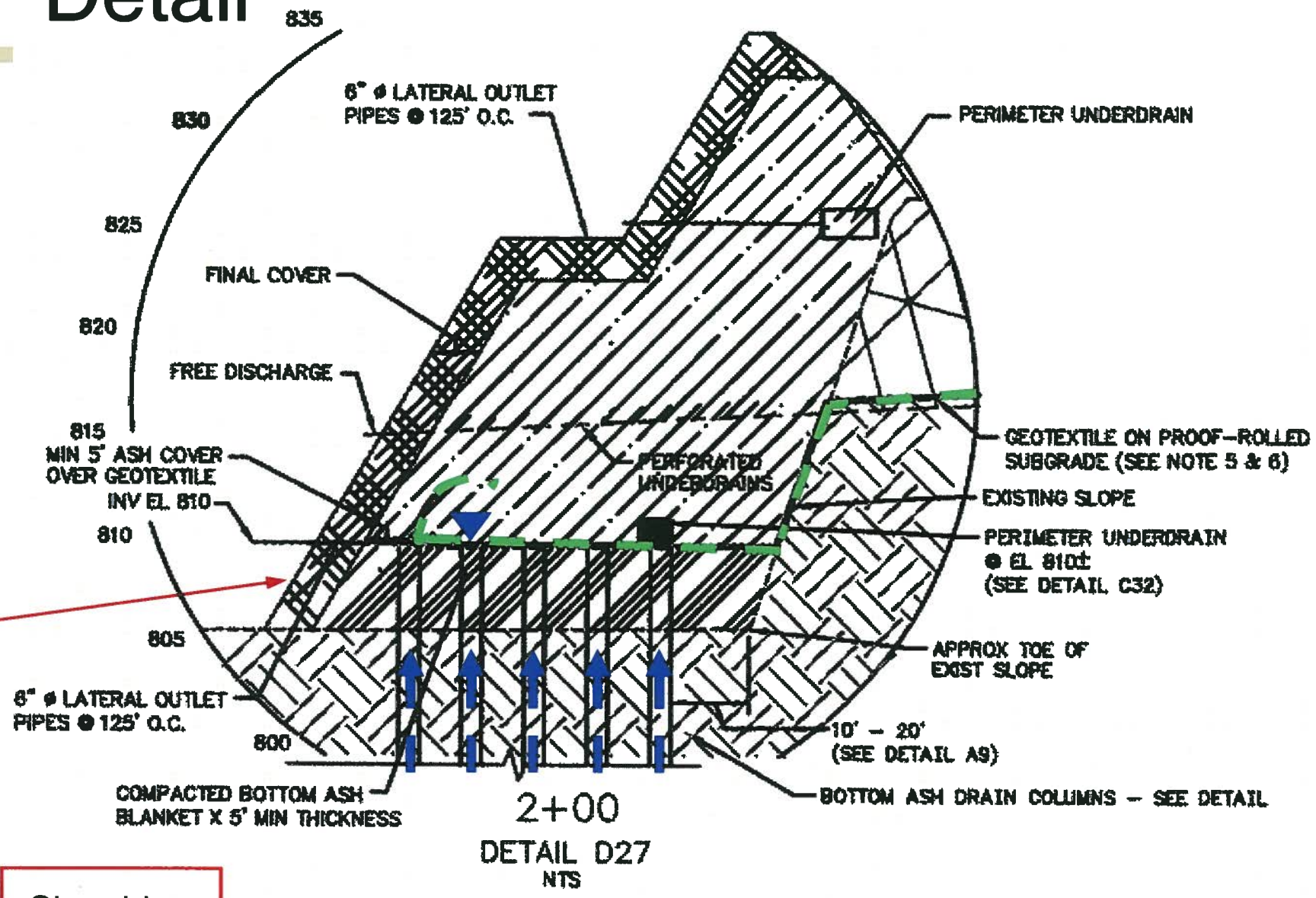
Detail



Sloughing

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Toe Instability - Likely Cause

- Column drains were installed to improve dike foundation (accelerate consolidation through relief of excess pore pressure)
- First underdrain is located at EL 810 (i.e., 5 ft above the top of the column drains
- If drains are functional, consolidation water will saturate the bottom ash layer and tend to "blow out" the interim clay layer
- While water pressure is not sufficient to "lift" the clay layer, it has become saturated and tended to slough off the slope face

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Situation Analysis – Other Issues

Item	Proposed Fix
Apparent failure of CMP drainage pipes	▪Slip-line with HDPE and grout annulus ▪Suggest camera survey of "pig" with a short length of pipe in advance ▪Avoid excessive grout pressures
Disposal area bottom ash/fly ash underdrains extend into dikes using perforated pipes resulting in potential source of water to saturate dikes during operation	▪Grout inboard length (~20 ft) of pipe to cut off future water path ▪Construct interceptor/header to convey under-drainage through dike to existing outfalls ▪Utilize perforated length with thin the dike for future drainage

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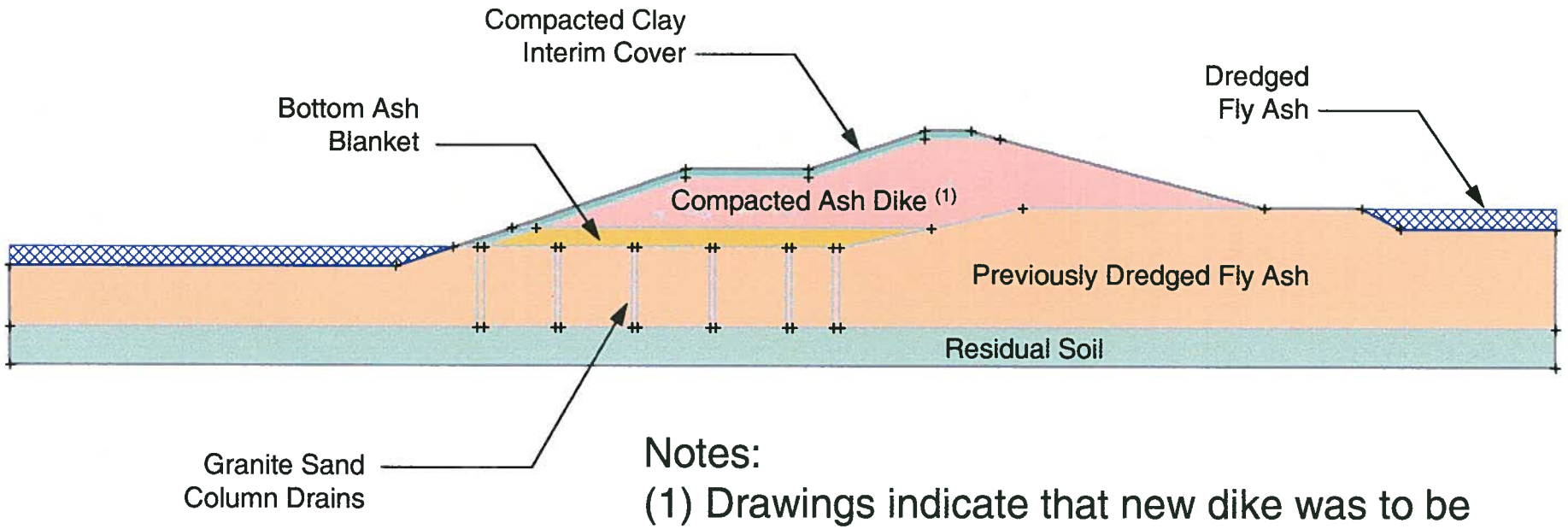
Analysis Section



Notes:

(1) Drawings indicate that new dike was to be constructed "bottom ash", but permeability is more like bottom/fly ash blend (1.29 x 10-3 cm/sec)

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Material Parameters

Material #	Material	Horizontal hydraulic conductivity (K_h)		K_h/K_v
		cm/sec	ft/sec	
1	Dredged Fly Ash	1.29E-03	4.23E-05	2
2	Bottom Ash	1.80E-02	5.90E-04	2
3	Compacted Fly Ash Dike	1.29E-03	4.23E-05	2
4	Final Clay Cover	1.00E-05	3.28E-07	1
5	Residual	5.18E-08	1.70E-09	1
6	Granite Sand Column	1.00E-01	3.28E-03	1
7	Rip Rap	1.00E+02	3.28E+00	1

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Seepage Analysis

- Existing Conditions (2 cases)
  - Excess head due to consolidation water, no toe drain
  - Excess head due to consolidation water, rip-rap toe drain
- Future Conditions (3 cases)

  Note: Consolidation complete, therefore no excess head
  - Underdrains blocked, no toe drain
  - Underdrains functioning, no toe drain
  - Underdrains functioning, rip-rap toe drain

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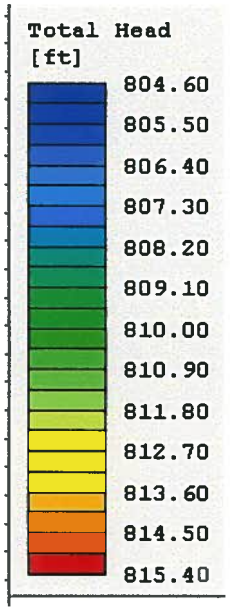
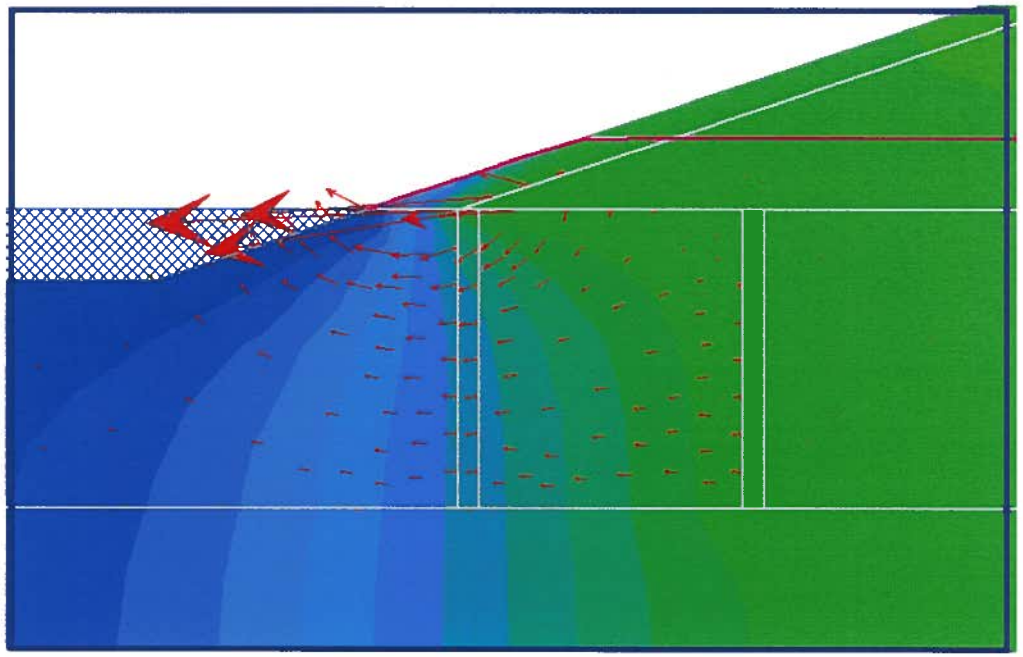
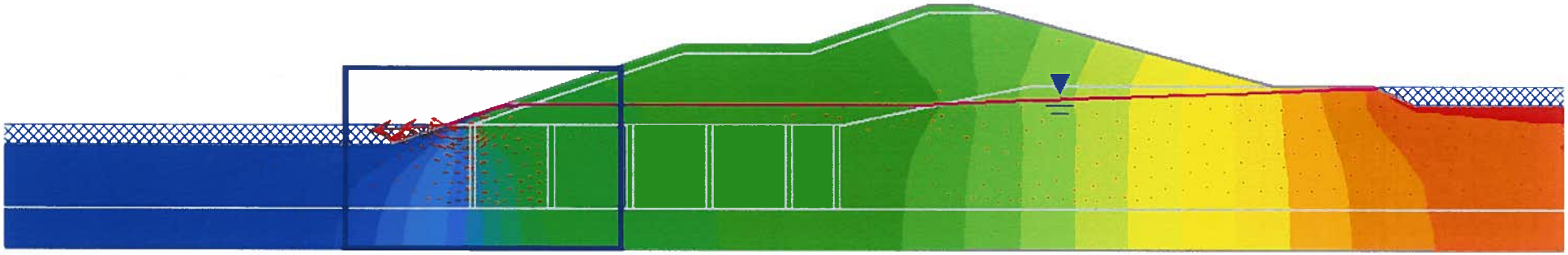
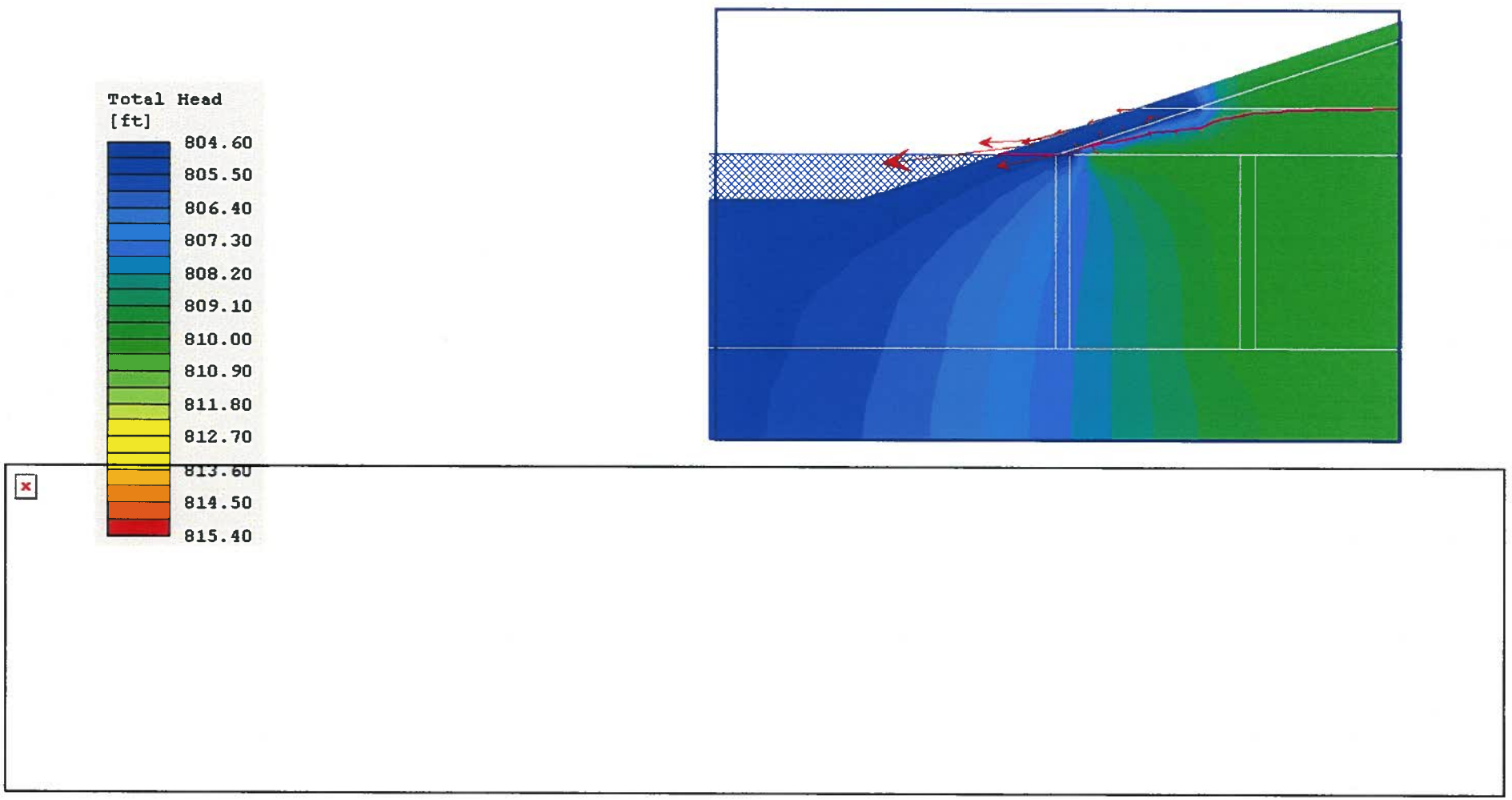
Existing Condition: Excess head due to consolidation water, no toe drain







Existing Condition: Excess head due to consolidation water, rip-rap toe drain



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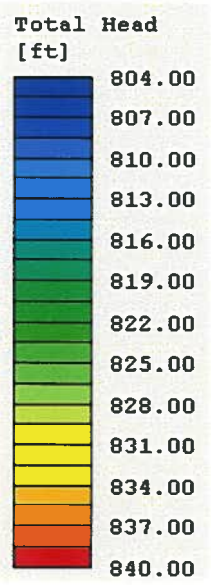
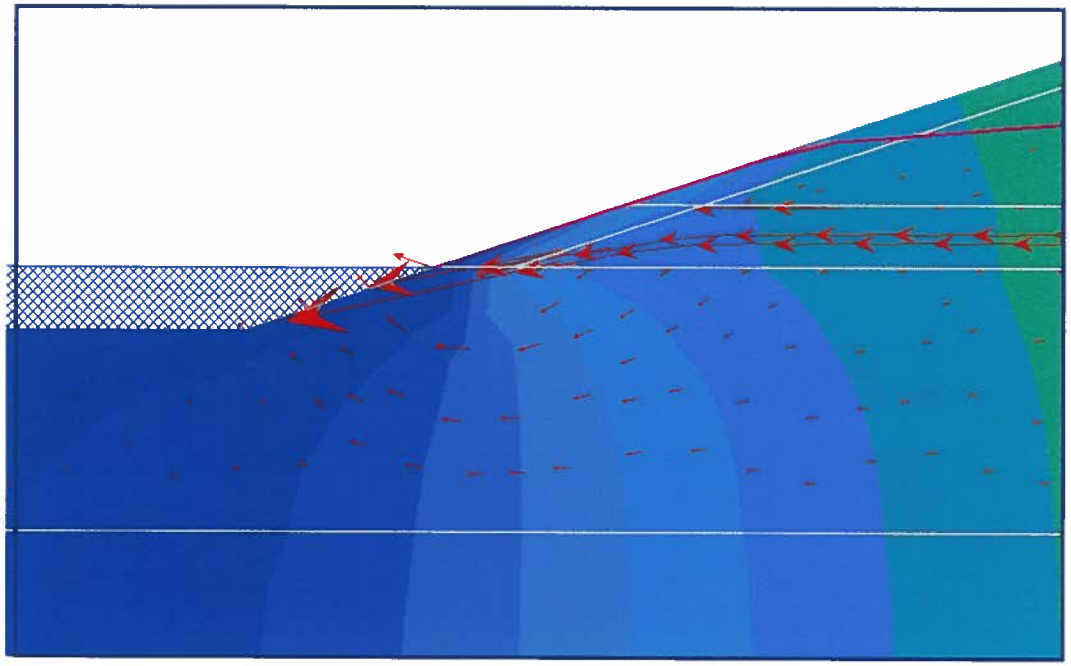
Future Condition: Underdrains blocked, no toe drain





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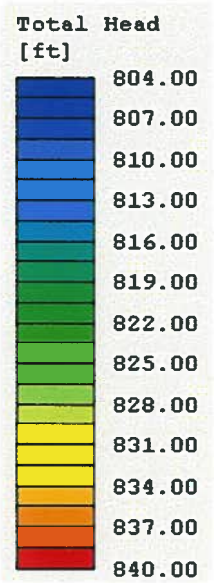
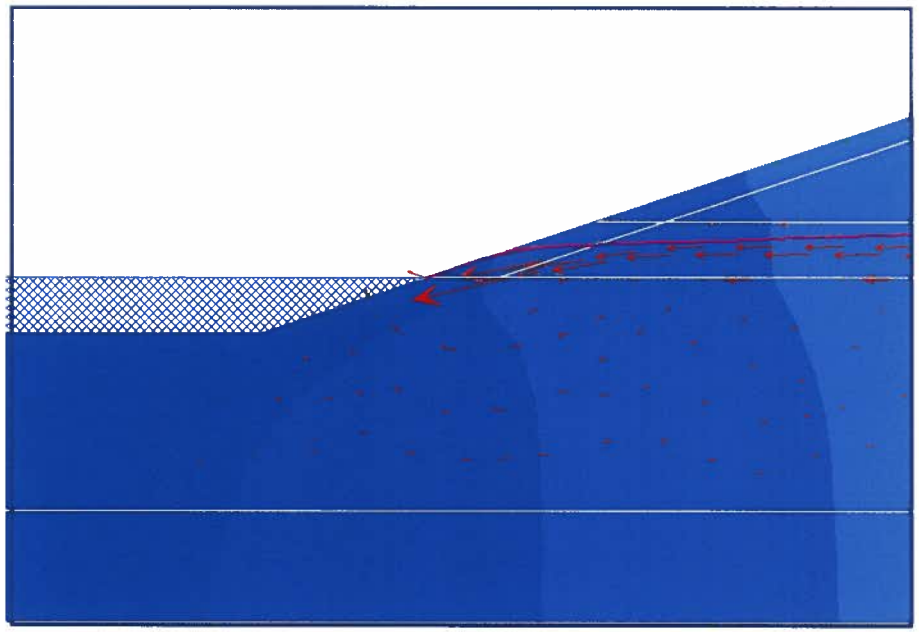
Future Condition: Underdrains functioning, no toe drain





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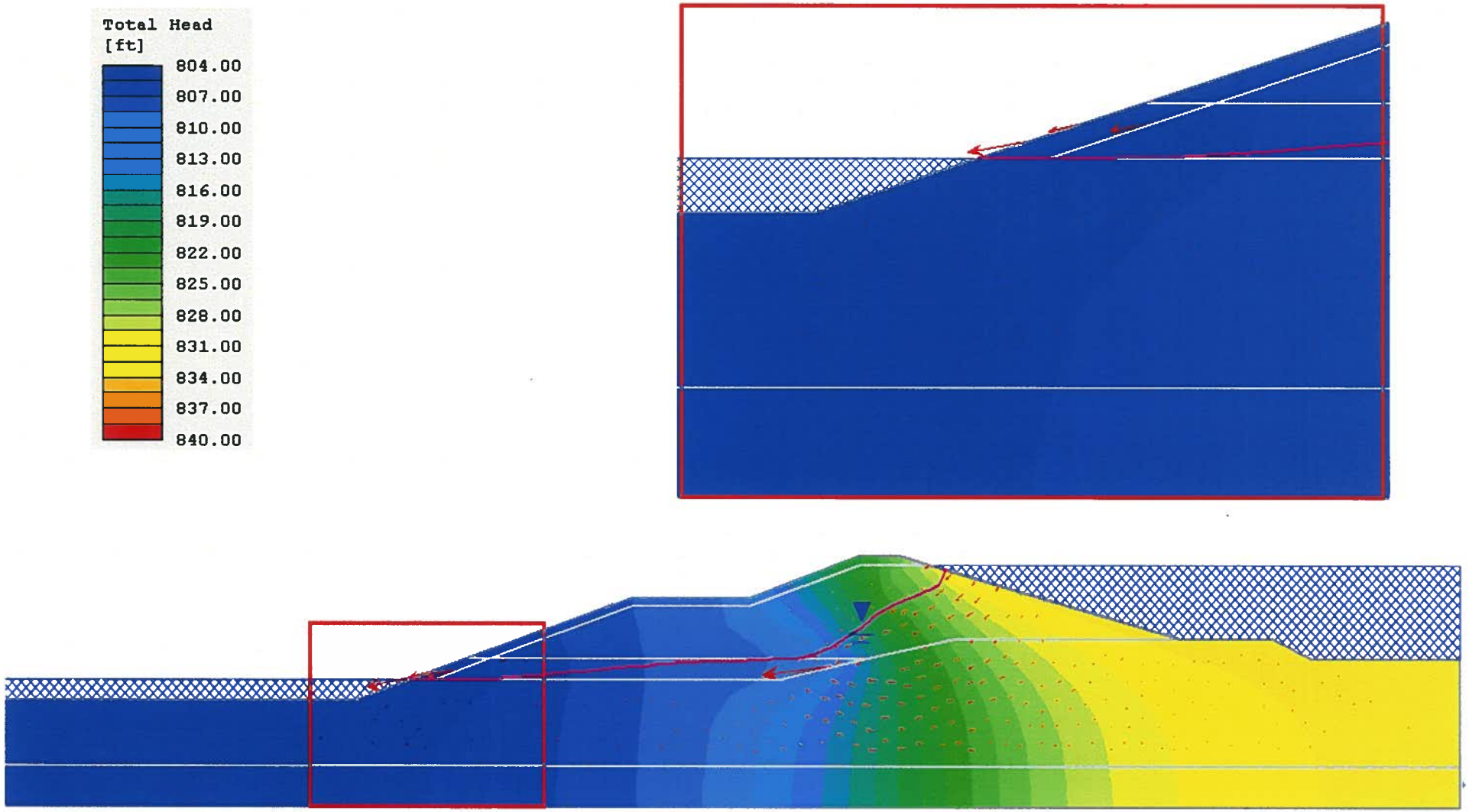
Future Condition: Underdrains functioning, rip-rap toe drain



Sensitivity Analysis

Assess sensitivity to two key parameters:

- Permeability of dike material
  - Use $K=1.29 \times 10^{-3}$ cm/sec
  - Use $K=4 \times 10^{-5}$ cm/sec
- Functionality of drains
  - Vary functionality by limiting the flux out of the model at the drain location (this is analogous to a drain blocking over time)
  - Flux (drainage) varied from Q=0 gpm to Q=20 gpm per drain (assuming a 200 ft lateral spacing)

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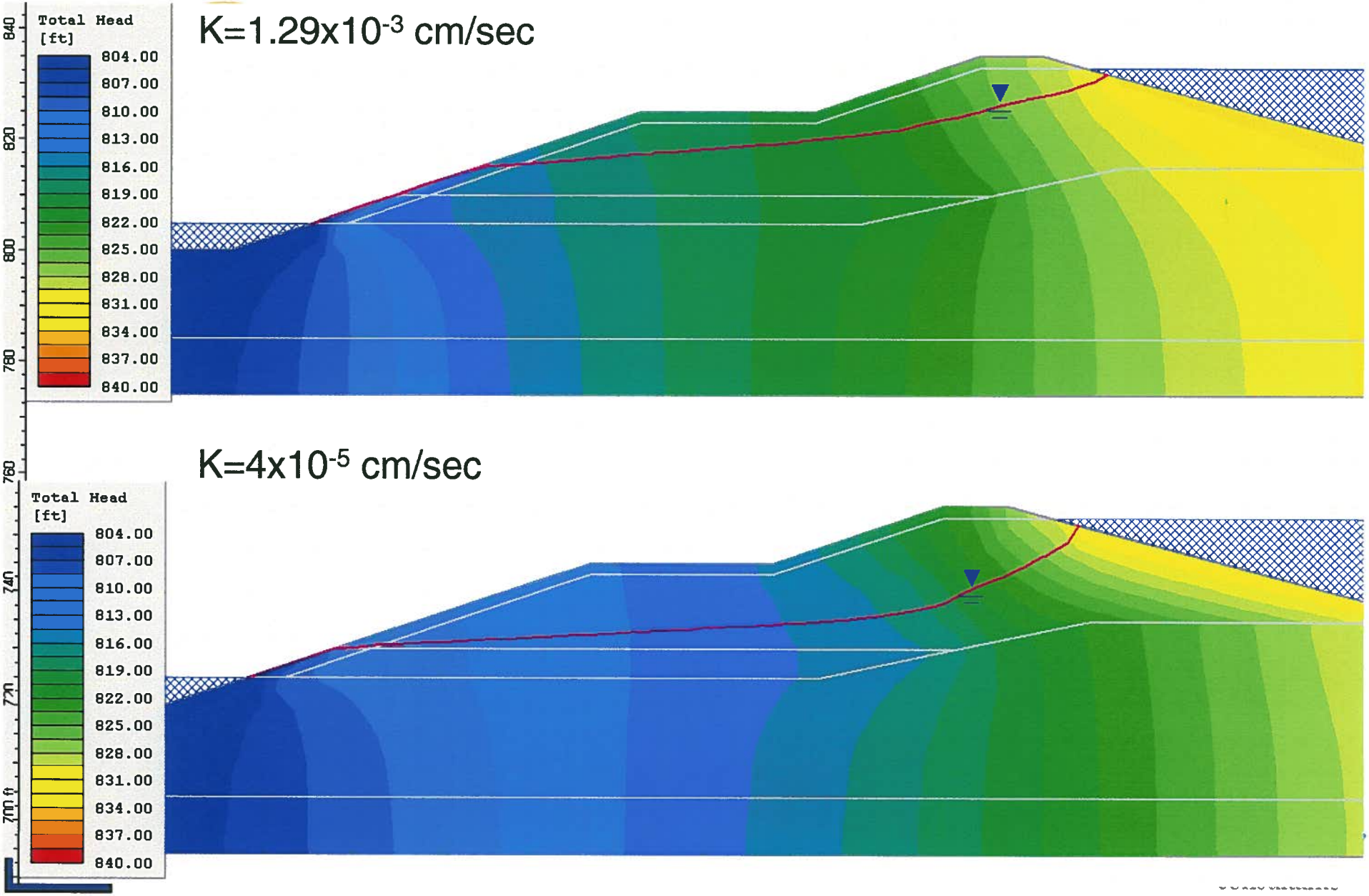
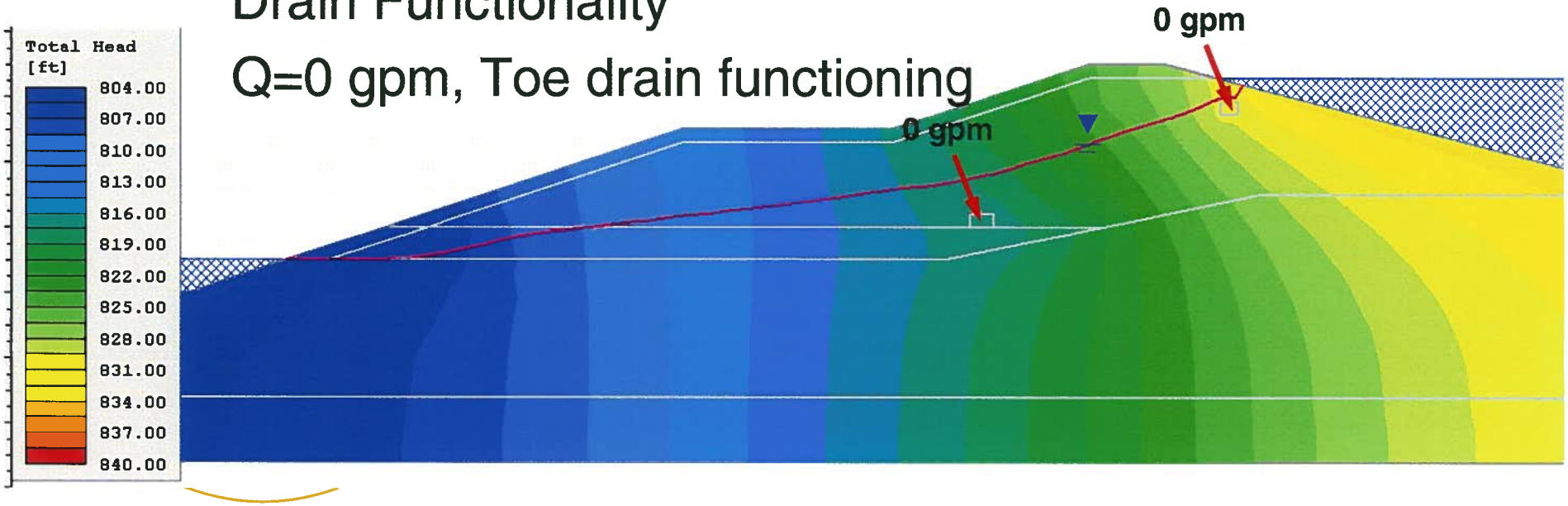
Sensitivity to Permeability

Future Condition: No toe drain, underdrains blocked

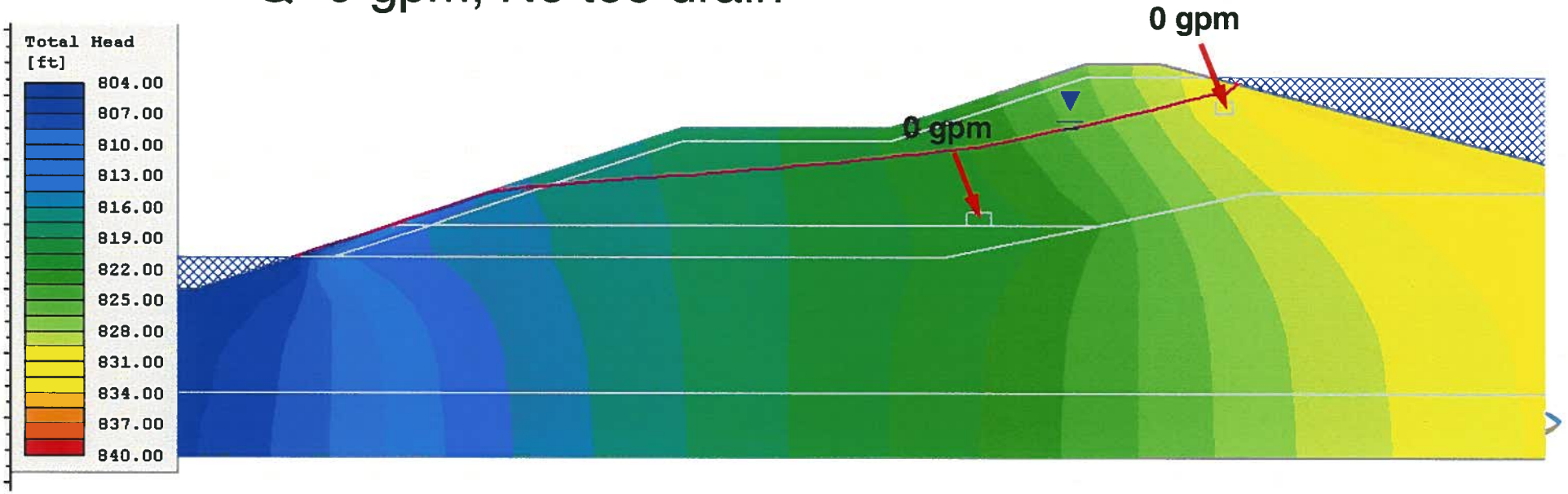


Drain Functionality

Q=0 gpm, Toe drain functioning

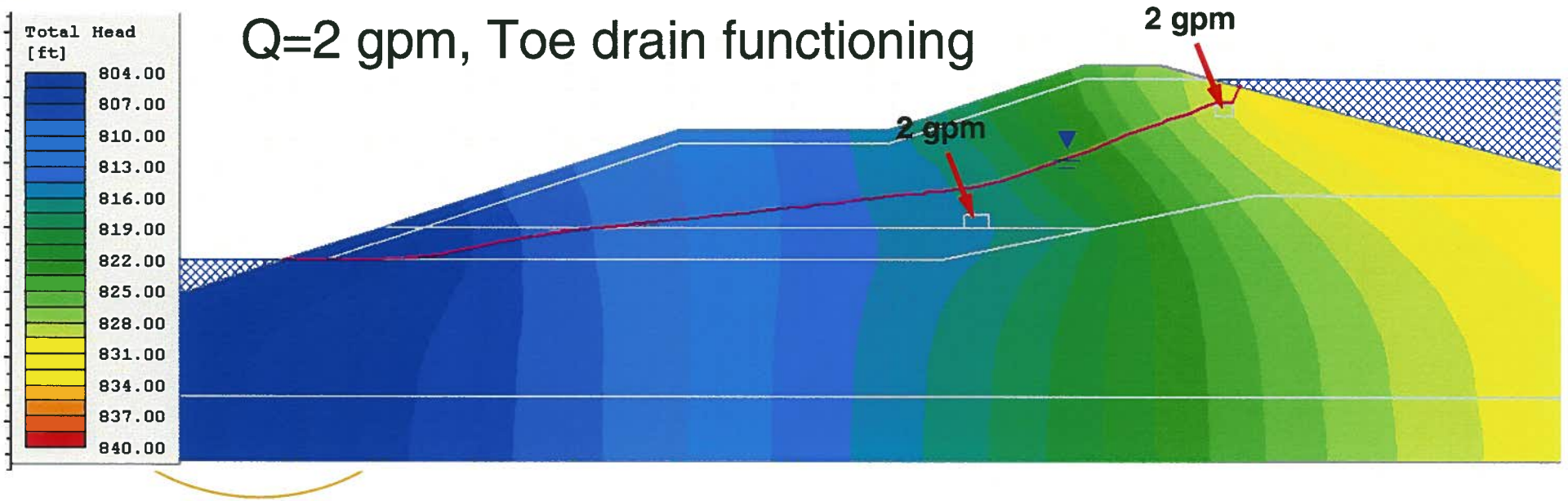


Q=0 gpm, No toe drain

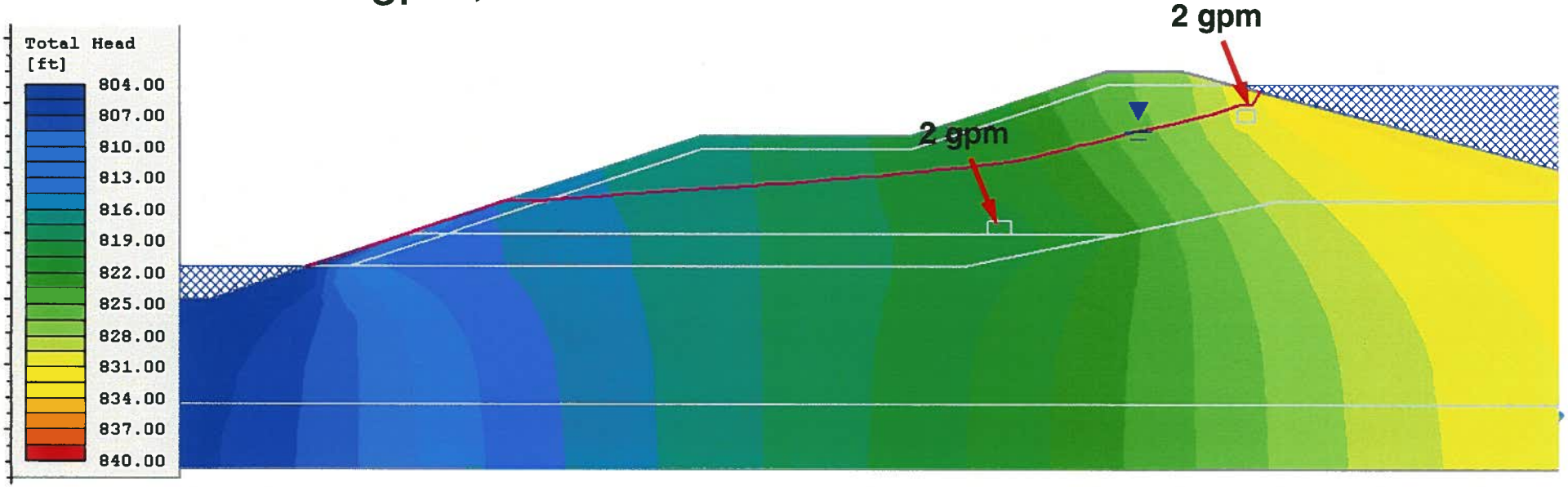


Drain Functionality

Q=2 gpm, Toe drain functioning

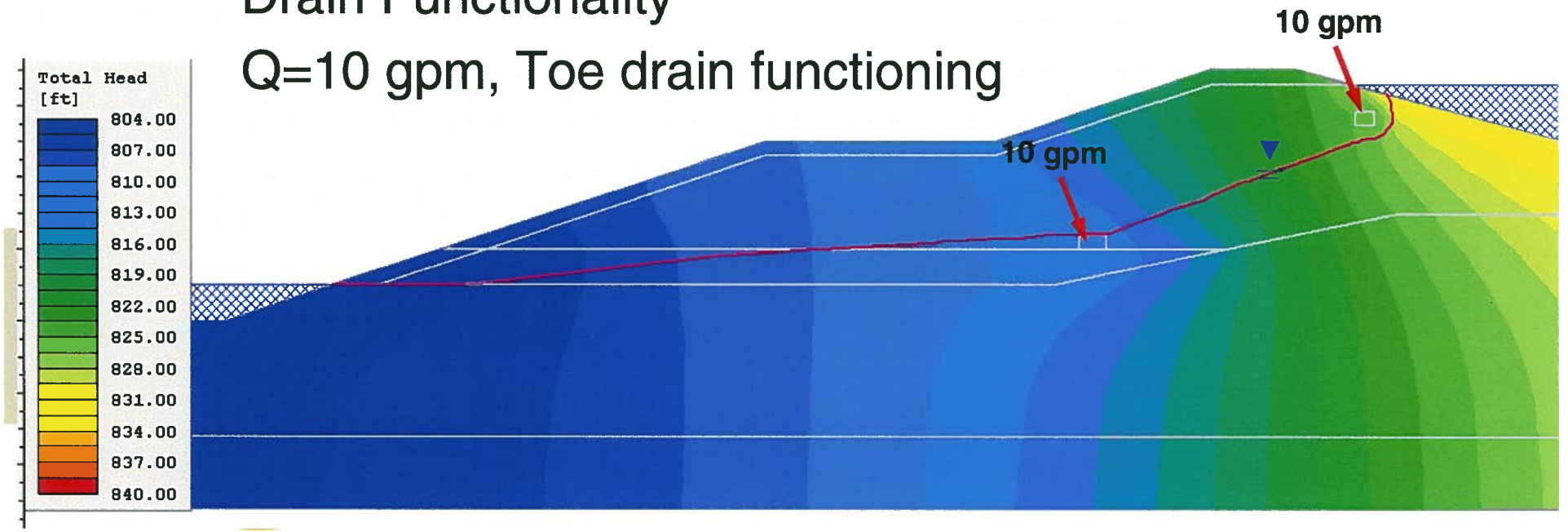


Q=2 gpm, No toe drain

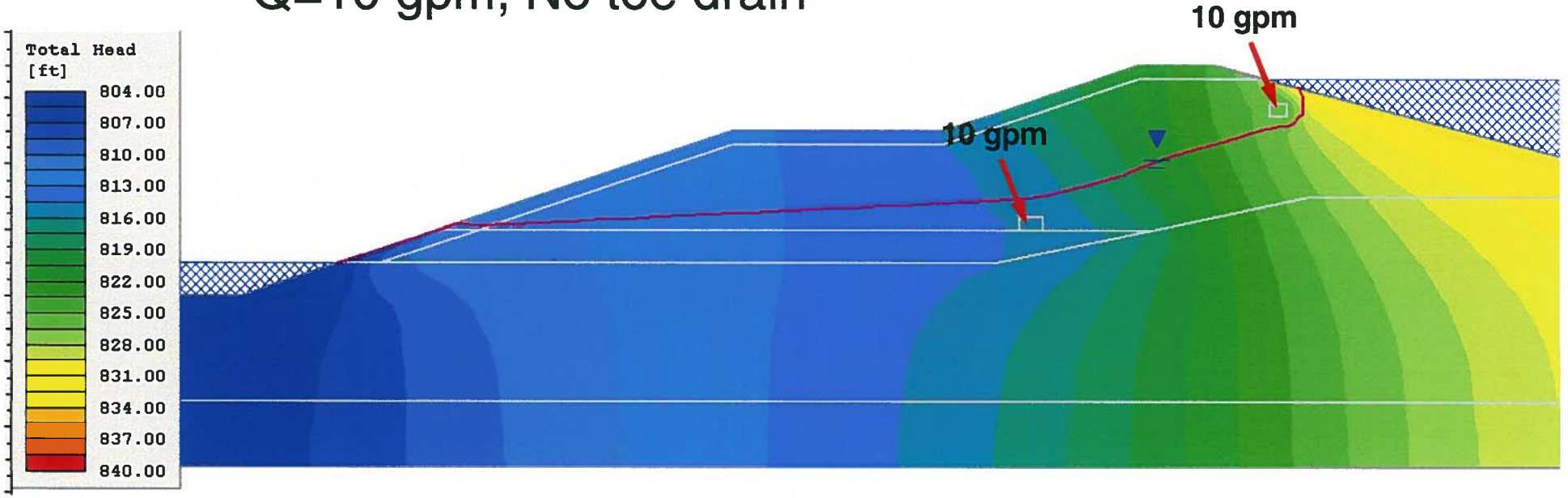


Drain Functionality

Q=10 gpm, Toe drain functioning

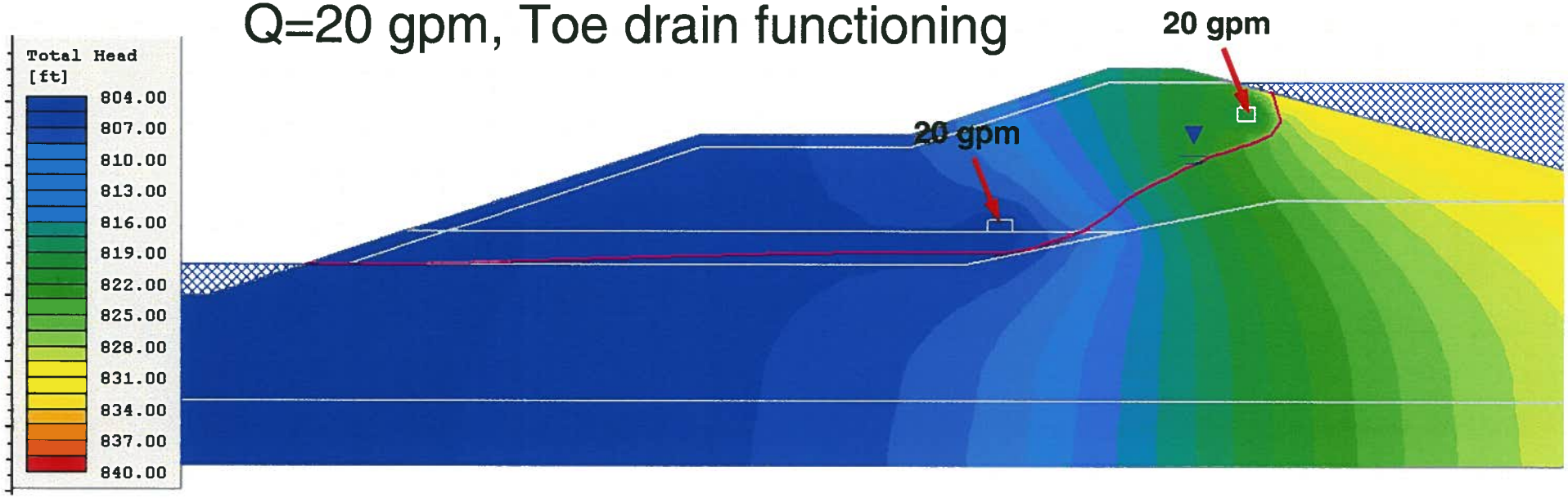


Q=10 gpm, No toe drain

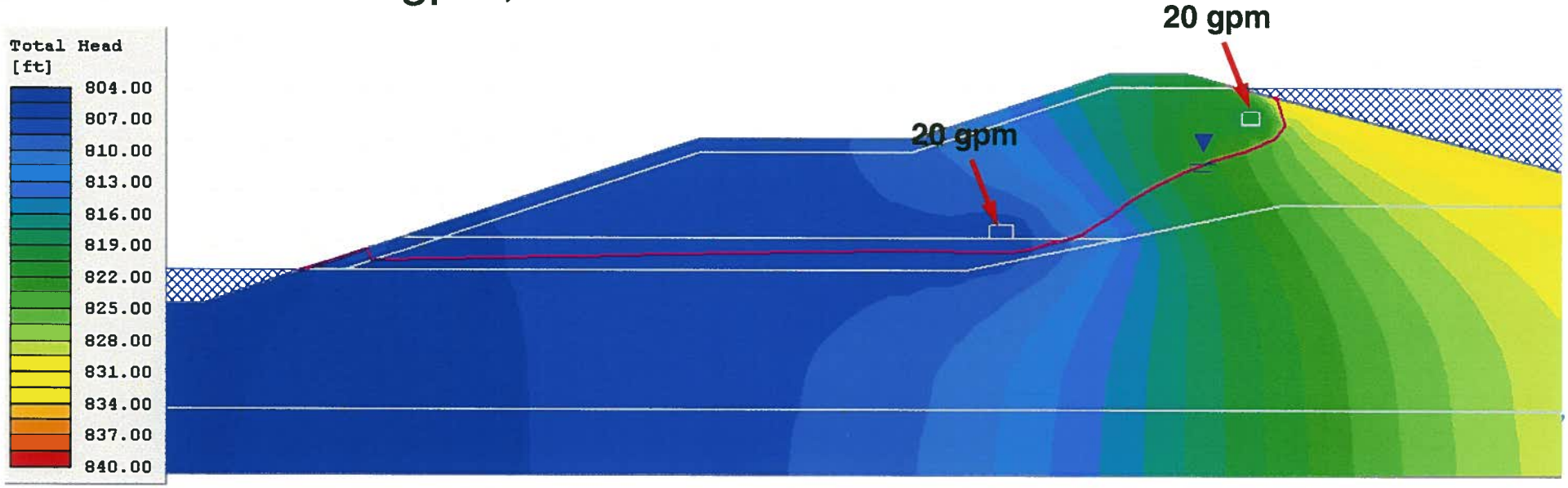


Drain functionality

Q=20 gpm, Toe drain functioning



Q=20 gpm, No toe drain



Conclusions

- Short-term seepage and stability issues should be addressed by installing pocket drains as recommended by TVA
- Seepage and stability are highly dependant on functionality of internal drainage
- Sensitivity to permeability of dike material has the most impact if drains are not functioning
- TVA's Proposed fix for CMP outfalls and bottom ash/fly ash underdrains is appropriate

Geosyntec consultants

Recommendations

Other Go-forward Recommendations

- Assess stability and seepage under full build-out conditions
- Review need for any additional drainage measures while the opportunity exists

Geosyntec consultants

Reference No. 10

Stantec Consulting Services Inc.
1409 North Forbes Road
Lexington KY 40511-2050
Tel: (859) 422-3000
Fax: (859) 422-3100

February 25, 2009 let_001_brf_171468118

Mr. Alan Casaday
Tennessee Valley Authority
1101 Market Street
LP 5E-C
Chattanooga, Tennessee 37402

Re: Bull Run Fossil Plant
Gypsum Stack and Ash Disposal Dike
February 12, 2009 Field Observation and Recommended Actions

Dear Mr. Casaday:

Stantec engineers Roger Denick and Hugo Aparicio visited the referenced site February 12, 2009 and met briefly with Travis Markum and John Settles of TVA prior to reviewing surface conditions along different slopes of the Gypsum Stack and Ash Disposal dikes. The primary purpose of the visit was to review exterior slopes of the Ash Pond and adjacent stilling basin. In addition, the slopes of the Gypsum stack and the south slope of the Bottom Ash Storage area were reviewed. A description of our observations, conclusions and recommendations is presented in the next paragraphs.

- A walk along the downhill side of the dike that separates the stilling basin and ash pond from Clinch River and Bull Run Creek revealed relatively steep but well vegetated slope conditions. We closely reviewed areas located toward the north corner of the stilling basin where plant personnel had noticed wet conditions. Similar wet conditions were also observed in three other areas of the dike. In each case the wet conditions were located on a narrow bench next to the toe of the dike, not on the slope of the dike. The narrow bench appears to be used mostly as access for mowing equipment (see Photo 1).

  Although the source of water creating wet conditions in some of these areas may be pool water from the ash pond or stilling basin, no water flow or ground erosion was observed in any of the wet areas. It is recommended that plant personnel continue observing these areas periodically until a formal monitoring program is prepared and implemented. Wet areas where mowing equipment has difficulty crossing should be stabilized by placing No. 57 or No. 2 stone as necessary. The purpose of placing the stone is to prevent the equipment from creating deep ruts next to the toe of the dike.

Photo 1 Ash Pond Dike Slope

- During a prior visit to the site Stantec personnel had observed slumping/erosion along a Bull Run river bank area located toward the southeast corner of the ash pond, immediately below the narrow bench described above. TVA has since proceeded to stabilize this area by placing riprap on the river bank.

  The river (Clinch River and Bull Run) bank areas below the ash pond and stilling basin should be monitored periodically and stabilization measures implemented as necessary. Once current topographic mapping is obtained during Phase 2 of the facility assessment, Stantec will prepare a formal monitoring program which will include installing piezometers near some of the locations exhibiting wet conditions.

- There are at least four locations along the south exterior slope of the gypsum stack where relatively small, round or elongated depressions have formed (see Photo 2). In each case these depressions are occurring where the ground surface has been recently lined with erosion control blanket. The largest depression is located directly above one of the decant pipes; it is possible piping of the subsoil (gypsum and/or clay) into coarse material typically placed as bedding or trench backfill of buried pipes may have caused the ground to subside. It is not obvious what caused other smaller depressions to form. In addition, the toe of the slope appears to be wet and soft.

  The subsurface conditions of these depressed areas should be explored using a backhoe or excavator and treated accordingly based on the results of the exploration. The exploratory and treatment work should be performed under the monitoring of a geotechnical engineer, who should formulate the treatment measures to be used based on his observations. Depending on the subsurface material encountered, the treatment may require the use of geotextile fabric, fine (1” maximum dimension) and medium (2”) coarse stone, clayey soil, topsoil and erosion control blanket. Proper equipment to

compact the fill material will be required in addition to the backhoe and excavator. This work can be implemented as soon as TVA's resources are available, preferably within the next two to three weeks.

Photo 2 Depression along south slope of Gypsum Stack

It is possible the design of the structure allows for controlled seepage to occur along the toe of the slope. A more detailed review of design documents during Phase 2 of the facility assessment may determine if additional measures are necessary to correct these conditions. In the mean time, the wet conditions observed along the toe of the slope should be monitored periodically.

- The east side of the gypsum stack exterior slope toes out along the bank of an ash sluice ditch traversing from north to south. The ditch bank height is less than 10 feet but relatively steep or practically vertical in some intervals. The existing grading of several ditch intervals does not appear to allow positive drainage as indicated by standing or pooled water observed in several areas along the ditch (see Photo 3). It is possible current ditch bank conditions have not changed significantly in recent years but have occasionally become more unstable due to uncontrolled flow or standing water along the ash sluice ditch. One bank area exhibiting slumping and erosion has been stabilized using riprap since the initial visit to the site by Stantec personnel in early January.

  The dike slope is 3:1 or flatter and includes an intermediate bench. Therefore, the unstable ash ditch bank areas will probably not cause a sudden failure of the gypsum stack dike unless slumping and erosion of the bank is left uncontrolled. The bank slope should be stabilized by either (1) grading it back and lining it with a clay cover and erosion control blanket, or (2) by lining it with a layer of filter blanket and riprap as recently performed. Once current topographic mapping of the site is provided by TVA and current ash sluice ditch/ash pond operations are reviewed, Stantec will prepare a work plan to establish long term stability as well as positive drainage conditions.

Photo 3 Ash sluice ditch eroded bank along toe of gypsum stack east slope

- Certain interior slopes of the gypsum stack have been severely eroded or rutted by surface runoff (see Photo 4) . This is occurring because gypsum erodes readily when exposed to rainfall runoff for an extended period of time. In this case, the pool elevation is several feet below the top of the dike, which leaves the gypsum on the interior slopes exposed and subject to erosion.

Photo 4 Interior slope of gypsum stack eroded by surface runoff

Interior slope areas of the gypsum stack showing severe rutting should be re-graded periodically to prevent ruts from creating slumps or slope failures.

- Standing water was observed in surface ditches traversing (1) the toe of the Bottom Ash Storage Area - Pond 1 (see Photo 5) and Gypsum Stack west slopes; and (2) the roadside ditch of the access road traversing along the south side of Pond 1.

  These ditch areas need to be re-graded to provide positive drainage (eliminate standing water) to allow proper inspection of the slopes. At this time it is not known if the source of the standing water is rainfall runoff, seepage through the dike slopes, or both. Stantec will obtain current topographic information during the next phase of the facility assessments and prepare re-grade plans to provide positive drainage along these ditch areas. A monitoring program will be prepared and implemented after these ditch areas are repaired to allow proper assessment of the dike surface conditions.

Photo 5 Standing water in ditch traversing along west slope of Bottom Ash Storage Area – Pond 1

- Red water seeps were observed surfacing along the toe of the south slope of Pond 1, near the southeast corner of the pond (see Photo 6). In this area, the slope between the access road and the bottom ditch (separating Pond 1 from the gypsum stack) has apparently failed in the past as indicated by the slumped configuration of the slope. The bottom ditch, which separates Pond 1 and the Gypsum Stack, detains water for undetermined reasons.

  The purpose of detaining water along the bottom ditch described above should be reviewed. If practical, this water detention should be eliminated. Once the detained water is drained, the slumped slope area and red water seeps can be evaluated to determine what corrective actions may be appropriate. Since this appears to be a localized failure, the corrective measures may consist of placing fill material along the toe of the slope to provide additional support. Further movement of the slumped area may require more substantial corrective measures.

Photo 6 Red water seeps surfacing along toe of failed bank below south side of Bottom Ash Storage Area – Pond 1

If you have any questions or require additional information, please contact our office.

Sincerely,

STANTEC CONSULTING SERVICES INC.

Hugo R. Aparicio, PE
Principal

/rdr

Reference No. 11

BULL RUN STEAM PLANT

ASH PONDS 1 AND 2A

SOIL INVESTIGATION

OE SOILS SCHEDULE 81.4

TVA 64 (OS-9-65)

UNITED STATES GOVERNMENT

Memorandum

B46 850326 001

TENNESSEE VALLEY AUTHORITY

TO : R. O. Barnett, Chief Civil Engineer, W9D224 C-K

FROM : John A. Raulston, Chief Nuclear Engineer, W10C126 C-K

DATE : MAR 26 1985

SUBJECT: BULL RUN STEAM PLANT - ASH PONDS 1 AND 2A - SOIL INVESTIGATION - OE SOILS SCHEDULE 81.4

The soils investigation requested in a memorandum from R. E. Harris to J. Floyd Best, dated November 30, 1984, has been completed. Its purpose was to provide data for (1) a stability analysis of the existing dikes and (2) an analysis of any remedial treatments that may be necessary to improve the dikes' stability. The field exploration was completed intermittently from December 3 through December 31, 1984, and January 11 through January 16, 1985. During the intervening period the higher priority railroad loop exploration was completed. A total of 896 lin ft was drilled and sampled at 32 locations. Borings were advanced by a CME model 55 drill equipped with 3-3/8-in. and 6-in. id hollow stem augers and AW drill rod. Dry drill procedures were used and methods conformed to ASTM D 1586, D 1587, D 2488, and D 2573.

Certain boring locations were changed from where indicated in the memorandum. These changes were either initiated by or made in coordination with the Geotechnical Group after initial sampling, primarily to better define conditions in the earlier underlying dikes. Figures 1 and 2 are schematics of the actual relative positions of the completed borings. They also show the location of V-8, where vane shear tests were conducted, and piezometer locations. Boring locations are in the plan and table 1. Surface profiles have been previously submitted for ranges 1, 2, 3, 4, and 5. General cross sections showing the surface and subsurface profiles are included for ranges 1, 2, and 4. The on-shore profiles were done by CSB (Gary Neibert, extension 8658, Knoxville) and the subaqueous profiles were done by Maps Data (Kary Kaley, extension 5437, Chattanooga).

All borings were backfilled and tamped immediately after the job's completion. However, settlement was reported and certain locations had to have additional backfill several weeks later.

Site Conditions

Both ponds 1 and 2A are contained by a series of stair-stepped dikes built at progressively higher levels as the ponds are approached. These are designated for purposes of discussion as: A, the lower, outermost and oldest dike; B, the intermediate dike; and C, the highest, innermost and youngest dike. (See figure 1.)

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BULL RUN STEAM PLANT - ASH PONDS 1 AND 2A - SOIL INVESTIGATION - OE SOILS SCHEDULE 81.4

In general the dikes' profiles are as follows:

Dike A is composed of compacted saprolitic fill or earthfill resting directly on the in-place alluvial soils. Dike B is typically compacted saprolitic fill of variable thickness resting on either equipment-placed bottom ash or hydraulically placed fly ash. Usually the outer margins of this dike abut the inner slope of dike A. Dike C is composed of equipment-placed bottom ash fill resting on hydraulically placed fly ash. Except on the cross dike segment, separating ponds 2 and 2A, it abuts against the inner slope of dike B. The foundations of both dikes B and C are alluvial soils.

Dike A Fill

Dike A level fill soils were penetrated in borings SS-2P and SS-5P at pond 1 and at pond 2A in boring SS-9C. The pond 1 fill was saprolitic and classified as silty clayey sand, SM-SC. Here it was about 10 ft thick and of medium to stiff consistencies. In boring SS-9C at pond 2A the fill soils of dike A were encountered between depths of 15 to 18 ft. They were silty clays, CL, of medium consistency.

Dike B Fill

At pond 1, borings SS-1, SS-3, SS-4, SS-6, and SS-14 penetrated dike B level fill. Typically, compacted saprolitic fill soils were present from the surface to depths of 8 to 12 ft. They classified as clayey sands or silty clayey sands, SC, SM-SC, with very soft to very stiff consistencies, the weaker soils occurring normally near the bottom of the fill. Underlying the saprolitic fill, bottom ash fill was present at depths between 8 and 17 ft. These soils classify as silty sands, SM, and based on N values have relative densities ranging from very loose to medium. The looser soils were concentrated near the interface of the overlying saprolitic fill. At boring SS-6 on the inner margin of the dike, bottom ash fill was present from the surface and loose ash occurred immediately above the foundation alluvium.

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BULL RUN STEAM PLANT - ASH PONDS 1 AND 2A - SOIL INVESTIGATION - OE SOILS SCHEDULE 81.4

At pond 2A the dike B level was penetrated by boring SS-9A on the inner margin and borings SS-9B and SS-9C on the outer margin. Saprolitic fill soils extended from the surface to a depth of 13 to 15 ft. These soils classified as sandy silt, ML, or silty sand, SM. They had loose to medium relative densities based on SPT results. Underlying the saprolitic fill silty sand, SM, bottom ash extends up to a depth of 21 ft. It has a loose to medium relative density. Borings SS-9B and SS-9C on the outer margin of this dike level penetrate a riprap layer at a depth of about 15 ft facing and above dike A fill.

Dike C Fill

Borings SS-7 through SS-13 penetrated dike C level fill at pond 2A. Typically, equipment-placed bottom ash classifying as silty sand, SM, extends to a depth of 15 to 26 ft. The upper 12 ft had high medium to dense relative densities and the lower portion very loose to loose relative densities. This bottom ash fill was underlain by hydraulically placed fly ash typically classifying as sandy silt, ML, and showing very loose to loose relative densities.

Stacked Fly Ash

Two locations in pond 1, US-2ST and US-5ST, were sampled to obtain undisturbed samples of the equipment-stacked fly ash.

Foundation Soils

Where penetrated at both pond areas, the alluvial foundation soils exhibit a generally consistent profile. The upper portions immediately under the fill materials were typically silty clays, CL, grading downward into sandy silts, ML; silty sands, SM; or poorly graded sands, SP. N values showed a wide range. Cohesive soils had consistencies ranging from soft to very stiff and sandy soils were normally weak with relative densities ranging from very loose to loose.

Bedrock

Refusal on bedrock, where encountered, varied from elevation 763.6 to elevation 789.0 giving a total known top of rock relief of 25.4 ft.

R. O. Barnett

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BULL RUN STEAM PLANT - ASH PONDS 1 AND 2A - SOIL INVESTIGATION - OE SOILS SCHEDULE 81.4

Water Levels

Along that portion of the pond 1 dikes facing Melton Hill Lake, water levels in the open borings on the dike B level ranged from elevation 804 to elevation 807 and averaged about 806. At SS-4, water adjusted at only 0.3 ft beneath the surface. In contrast, the piezometric water levels established at SS-2P, 2P, SS-5P, and 5P were between elevations 794 and 797. This suggests the general GWL is reflected in the piezometers and the higher levels seen in the open borings are fed either through the fly ash or directly from the water-filled ditch between dikes B and C. (The perforated sections of the 2-in. PVC pipes were in the lower 5 ft of the borings centered approximately at elevation 768.)

On the dike B level of pond 2A at SS-9A, water level in the open boring was at elevation 807.4 or 1.5 ft below the surface. This was the approximate level of water in the ditch between dike B and dike C levels. At pond 2A on the dike C level, all borings showed water levels near elevation 810, some 15 ft below the surface.

Vane Shear Testing

Due to the difficulty of taking undisturbed samples on the hydraulically placed fly ash underlying the bottom ash fill on dike C level at pond 2A, vane shear tests were conducted 5 ft from boring SS-8. Testing was in sandy silts, ML, with N values of 0 to 1 between depths of 20 to 27 ft. Testing, which essentially followed ASTM D 2573, was with a 2.5-in. diameter, tampered vane taken through and below the 3-3/8-in. id hollow stem auger. Measurements were made with a calibrated torque wrench rotated at approximately 0.1 degrees per second. Results are tabulated in table 2.

Laboratory Testing

Laboratory testing of split-spoon samples included tests for Atterberg limits (ASTM D 4318), specific gravity (ASTM D 854), and grain-size anlysis (ASTM D 422). These index tests were also performed on all undisturbed samples, in addition to tests for moisture content (ASTM D 2216) and dry density (SLP-1 and SLP-2, SM-106). Selected undisturbed samples were also tested for shear strength under triaxial R test and direct shear S test conditions. Triaxial R tests were conducted on samples at natural moisture content and saturated samples. Test results are summarized in the attached table 3.

R. O. Barnett

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BULL RUN STEAM PLANT - ASH PONDS 1 AND 2A - SOIL INVESTIGATION - OE SOILS SCHEDULE 81.4

Dikes A, B, and C, as previously described, consist of materials of variable origin, methods of placement, and age of placement. Saprolitic compacted fill, encountered in dikes A and B, can be defined by test results from US-2SS, US-4, US-4A, and US-9A. The natural moistures range from 18.5 to 30.8 percent with dry densities from 88.9 to 109.5 pcf. The fill is composed of silty clayey sands, SM-SC; silty sands, SM; and sandy silts, ML. Friction angles from natural moisture R tests range from 22.3 to 26.5 degrees with 0.28 to 0.81 tsf cohesion. Saturated R-test apparent friction angles vary from 10.4 to 19.9 degrees with 0.25 to 1.20 tsf cohesion. Corresponding S-test values range from 21.9 to 42.4 degrees and 0.06 to 0.74 tsf cohesion.

Compacted earthfill encountered at SS-9C was penetrated at US-9B (sample 1). Because its density was relatively high, no shear strength testing was requested.

Equipment-placed bottom ash, silty sand, SM, was encountered at US-6, US-4A, US-9B, and US-11 and sampled at US-11, where natural moistures range from 19.7 to 24.9 percent with dry densities from 58.3 to 59.3 pcf. Friction angles from natural R, saturated R, and direct shear S tests are 33.7, 21.3, and 35.0 degrees, respectively, with corresponding cohesions of 0.64, 1.02, and 0.28 tsf.

Equipment-stacked fly ash was encountered at US-2ST, US-2AST, and US-5ST. It is classified as sandy silt, ML, or silty clay or sand, CL or SM. Natural moistures average 25.3 percent, ranging from 16.8 to 31.7 percent. Dry densities range from 60.8 to 96.1 pcf. A natural moisture R test resulted in a friction angle of 31.0 degrees with 0.11 tsf cohesion, while saturated R-test apparent values are 15.0 degrees and 0.31 tsf. Direct shear test values are 37.8 degrees, 0.00 tsf cohesion.

Alluvial foundation soils, sampled at US-6, US-2B, US-4A, and US-9B, classify as silty clays, CL, or silty sands, SM. Natural moistures range from 17.8 to 30.6 degrees, with dry densities from 86.9 to 106.2 pcf. Only saturated R tests were conducted on these foundation soils. Resulting apparent friction angles average 17.1 degrees, ranging from 14.3 to 18.6 degrees, and cohesions vary from 0.12 to 1.34 tsf.

R. O. Barnett

MAR 26 1985

BULL RUN STEAM PLANT - ASH PONDS 1 AND 2A - SOIL INVESTIGATION - OE SOILS
SCHEDULE 81.4

Summary

The stepped sequence of dikes containing the present ponds are composed of compacted saprolitic fill or earthfill, equipment-placed bottom ash, and hydraulically placed fly ash. The alluvial foundation soils consist of clays overlying and grading downward into sands.

Field and laboratory testing indicate variable conditions. However, general relative weaknesses are seen in the hydraulically placed fly ash and in the lower portion of the alluvial foundation soils. Elsewhere low strengths are common on both sides of the interfaces of the differing fill material types.

High water levels in the open borings on the intermediate dikes (B level) indicate water is migrating either from the adjacent drainage ditches into the saprolitic fill or is rising from the underlying ash under positive head.

Original Signed By
John E. Cox

John A. Raulston

HPM:BCJ
Attachments
cc (Attachments):
W. H. Childres, SME-K
O. P. Thornton, W3A2 C-K
RIMS, SL26 C-K

Principally prepared by H. P. Matthews, extension 2771.

A35078.2

INFORMAL MEMORANDUM

J. Floyd Best, SME-K

R. E. Harris, 338 SPT-K

NOV 3 0 1984

BULL RUN STEAM PLANT - ASH PONDS 1 AND 2A - SOIL INVESTIGATION - OE SOILS SCHEDULE NO. 81.4

We request that you arrange for a soils investigation at the Bull Run Steam Plant for Ash Ponds 1 and 2A. The investigation's results will be used to provide data for (1) a stability analysis of the existing conditions of the ash pond dikes, and (2) analysis of any remedial treatments that may be necessary to improve the stability of the ash pond dikes. This investigation will include field and laboratory testing of the soil material in the existing dikes and of the ash in the pond.

Field Investigation

The field investigation will consist of borings for standard penetration tests (SPT) (ASTM D 1586), borings for undisturbed sampling, possible test pits in the ash pond, and piezometers for monitoring the groundwater. Figure 1 shows the proposed locations of the borings, test pits, and piezometers. The borings may be shifted slightly to avoid obstructions (coordinate the boring locations with site personnel to avoid obstructions), but final locations are to be included in the final report. Borings along the perimeter dike road for Ash Pond 1 should be located on the pond side of the road. The ash pond dike for Pond 2A is an interior pond to Ash Pond 2, and the borings should be located on approximately the centerline of the dike. The one boring in the dike for Ash Pond 2 (shown on cross-section line 4) should be located on the pond side of the road.

Each boring for SPT sampling is to be extended to a minimum of 5 feet below the dike/foundation interface, except for those borings shown on figure 1 to extend to the top of rock or 25 feet below the dike/foundation interface. SPTs are to be made at a minimum of 5-feet-on-center intervals or at each material change if layers are less than 5-feet thick. Jar samples of each SPT sample are to be taken. The SPT borings for Ash Pond 1 should be done before the SPT borings for Ash Pond 2A.

A copy of the field drilling logs for the borings should be submitted to Ray Threlkeld, 163 LB-K, as soon, after completion of the borings for each pond, as possible to allow for prompt review and determination in coordination with SME of the soils that need to have undisturbed samples taken. Undisturbed sampling should be done in borings located 5 feet from the borings for SPTs.

J. Floyd Best

NOV 3 0 1984

BULL RUN STEAM PLANT - ASH PONDS 1 AND 2A - SOIL INVESTIGATION - OE SOILS SCHEDULE NO. 81.4

The ash that has been dry-stacked above the level of the perimeter dike of Ash Pond 1 needs to be sampled. The capacity of the ash to adequately support a drilling rig is uncertain. Undisturbed samples are to be obtained by taking block samples at a depth of 5 feet, or if access with a drill rig is possible, by taking shelby tube samples at depths of 5 and 10 feet. Sample locations are shown on figure 1.

Seepage from Ash Pond 1 can be visually seen to extend to near the midpoint of the road on top of the dike for Ash Pond 1. Two piezometers need to be installed at the locations shown on figure 1. One piezometer may be installed in the boring for SPT sampling, and the second piezometer should be located on the riverside slope of the dike 10 to 15 feet off the road. The piezometers should be installed as early possible in the investigation.

Groundwater readings should be taken daily from each piezometer during the investigation. In addition, the 1-hour and 24-hour groundwater levels should be determined after completion of field drilling.

Each boring/test pit is to be backfilled with tamped earth (or ash for those borings in the ash pond) upon completion.

Due to the wide spacing of the borings, additional borings to define the extent of soft or weak areas may be identified during the course of the investigation. The need for additional borings will be coordinated with SME, FEP, and CEB.

Laboratory Testing

The laboratory testing shall consist of determining the moisture content of each SPT sample and classification of a representative sample of each layer identified for the site. The representative sample should be an actual sample and not a mixture of several samples representing a layer. Also, a sample should not be selected to represent two layers in the same boring.

Testing of undisturbed samples will be dependent on the existing and future loading conditions for each ash pond. Testing will include determination of moisture, density, and classification of each sample. The attached Table 1 shows the laboratory tests to be carried out on each undisturbed sample.

J. Floyd Best

NOV 3 0 1984

BULL RUN STEAM PLANT - ASH PONDS 1 AND 2A - SOIL INVESTIGATION -
OE SOILS SCHEDULE NO. 81.4

Report

The report should contain the final locations of each boring, graphic logs, generalized soil profile, and summary tables on each SPT and undisturbed boring and sample testing.

Work on this investigation should be charged to Account No. 544-68-31207.XXX. Per agreement, this work is authorized in the amount of $44,500. Per discussions with you, the completion date for this investigation will be dependent on the amount of undisturbed sampling and testing and the number of extra borings for SPTs that are required to define weak or soft areas, but based on the scope of your estimate for this work, the final report should be completed by March 1, 1984.

Other Items

You are responsible for arranging for a survey to locate the borings, surveying to provide five cross-sections of the dikes being investigated, and for obtaining site clearances to do this work. The locations of the cross-sections are shown on figure 1. The three cross-sections shown to extend into the reservoir are to be extended approximately 150 feet from the shoreline into the reservoir. The cost of the surveying is included in the estimate prepared for this work.

R. E. Harris

HRT:BSH
Attachments
cc: O. P. Thornton, 102 SPT-K (Attachments)

OPT:REH:BSH
cc: F. Van Meter, 500 SPT-K (3) (Attachments)--Please coordinate any required support with SME.

Principally Prepared By: H. R. Threlkeld, Extension 4774

Table 1

Laboratory Test	Ash Pond 1		Ash Pond 2A	
	Soil	Ash	Soil	Ash
Moisture	X	X	X	X
Density	X	X	X	X
Classification[1]	X		X	
Sieve Analysis		X		X
R Test				
@ Natural Moisture	X		X	
@ 100% Saturation[2]	X	X	X	X
S Test				
@ Natural Moisture	X		X	

1. Includes Atterberg Limits tests and sieve analysis.

2. Monitor pore water pressure.

Table 1

BULL RUN STEAM PLANT

ASH PONDS 1 AND 2A

ACTUAL BORING COORDINATES

Boring	North	East	Elevation
SS-1	595,028	2,544,073	809.2
SS-2P	594,652	2,544,230	806.2
SS-3	594,308	2,544,434	808.3
SS-4	593,962	2,544,644	807.7
SS-5P	593,604	2,544,812	805.0
SS-6	593,270	2,545,040	807.9
SS-7	592,645	2,545,240	820.9
SS-8	592,270	2,545,365	824.7
SS-9	591,885	2,545,475	824.4
SS-9A	591,860	2,545,400	808.9
SS-9B	591,860	2,545,385	808.9
SS-9C	591,862	2,545,390	808.9
SS-10	591,530	2,545,715	824.9
SS-11	591,700	2,546,210	826.0
SS-12	591,900	2,546,665	824.6
SS-13	593,165	2,545,690	825.5
SS-14	593,350	2,545,615	809.5
2P	594,660	2,544,250	809.2
5P	593,615	2,544,840	808.2
V-8	592,275	2,545,365	824.7
US-2SS	594,657	2,544,230	806.2
US-2E	594,662	2,544,228	805.0
US-2ST	594,689	2,544,319	821.7
US-2AST	594,694	2,544,317	821.7
US-4	593,962	2,544,639	807.7
US-4A	593,962	2,544,649	807.9
US-5ST	593,638	2,544,895	818.5
US-6	593,270	2,545,030	807.9
US-9A	591,865	2,545,400	808.9
US-9B	591,865	2,545,385	808.9
US-11	591,705	2,546,210	826.0

A35063.1

Table 2

BULL RUN STEAM PLANT

POND 2A

Depth ft	Maximum Torque in/lb* T	Remolded Torque in/lb* Tr	Maximum Shear Strength lb/ft^2 S	Remolded Shear Strength lb/ft^2 Sr	Ratio S/Sr	Equivalent N Value
		Location V-8, Surface Elevation 824.7				
		Hydraulically Placed Fly Ash				
21.5	125	25	296	59	5.0	1
22.5	150	25	356	59	6.0	--
24.5**	350	75	830	178	4.7	0
26.5	175	25	415	59	7.0	0
		Location V-8A, Surface Elevation 824.7				
21.6	325	75	770	178	4.3	1
26.6	65	10	154	24	6.4	0
Maximum			770	178	7.0	
Minimum			154	24	4.3	
Average			398	76	5.7	

*2.5 in diameter tapered vane, 1/2-in. diameter rod.
**This reading may have been effected by the diameter of AW rod and is not included in average.

A35071.1

Table 3

BULL RUN STEAM PLANT

ASH PONDS 1 AND 2A

SUMMARY OF LABORATORY TEST DATA

Elevation	Soil Symbol	Nat. Moist. %	Nat. Moist. % Sat.	Grain-Size Analysis Gravel %	Sand %	Silt %	Clay %	D_{10} mm	Liq Limit %	Plastic. Index %	Dry Dens pcf	Void Ratio	Natural Moisture Triaxial R ϕ deg	Natural Moisture Triaxial R c tsf	Saturated Triaxial R Apparent ϕ deg	Saturated Triaxial R Apparent c tsf	Saturated Triaxial R Effective ϕ deg	Saturated Triaxial R Effective c tsf	Direct Shear S ϕ deg	Direct Shear S c tsf
Ash Pond 1																				
Boring US-2AST, Surface Elevation 821.7																				
813.7-812.6	ML	27.0	84.0	0	15	73	12	--	NP	NP	80.0	0.704								
Boring US-2ST, Surface Elevation 821.7																				
816.7-814.3	SM	16.8	27.9	4	75	19	2	0.0359	NP	NP	60.8	1.425								
Boring US-2SS, Surface Elevation 806.2																				
805.2-803.4	SM-SC	24.7	90.1	9	58	21	12	0.0033	37	11	99.2	0.765	22.3	0.81	13.6	0.85	31.4	0.00	21.9	0.74
801.2-799.4	SM-SC	22.7	89.8	8	46	23	23	0.0007	45	19	101.8	0.701	26.5	0.28	19.9	0.25	28.2	0.18	41.1	0.20
Boring US-4, Surface Elevation 807.7																				
806.7-804.6	SM-SC	18.5	86.6	39	47	9	5	0.0246	33	10	109.5	0.598	26.1	0.49	10.4	0.83	35.2	0.11	42.4	0.06
Boring US-4A, Surface Elevation 807.9																				
802.9-801.2	SM	22.2	100.0	22	43	21	14	0.0028	30	5	103.7	0.576	24.0	0.43	18.6	0.24	33.6	0.00	30.5	0.60
790.4-789.0	CL	21.6	94.5	4	21	44	31	--	33	14	103.9	0.614								
787.9-786.1	CL	25.5	97.1	0	7	44	49	--	45	24	98.7	0.707			16.0	0.37	25.6	0.29		
Boring US-5, Surface Elevation 818.5																				
813.5-812.1	CL	25.6	95.0	1	13	39	47	--	42	20	96.1	0.707			15.0	0.31	28.1	0.14		
812.1-811.5	ML	31.7	97.5	0	9	81	10	--	NP	NP	80.5	0.693	31.0	0.11					37.8	0.00

Table 3

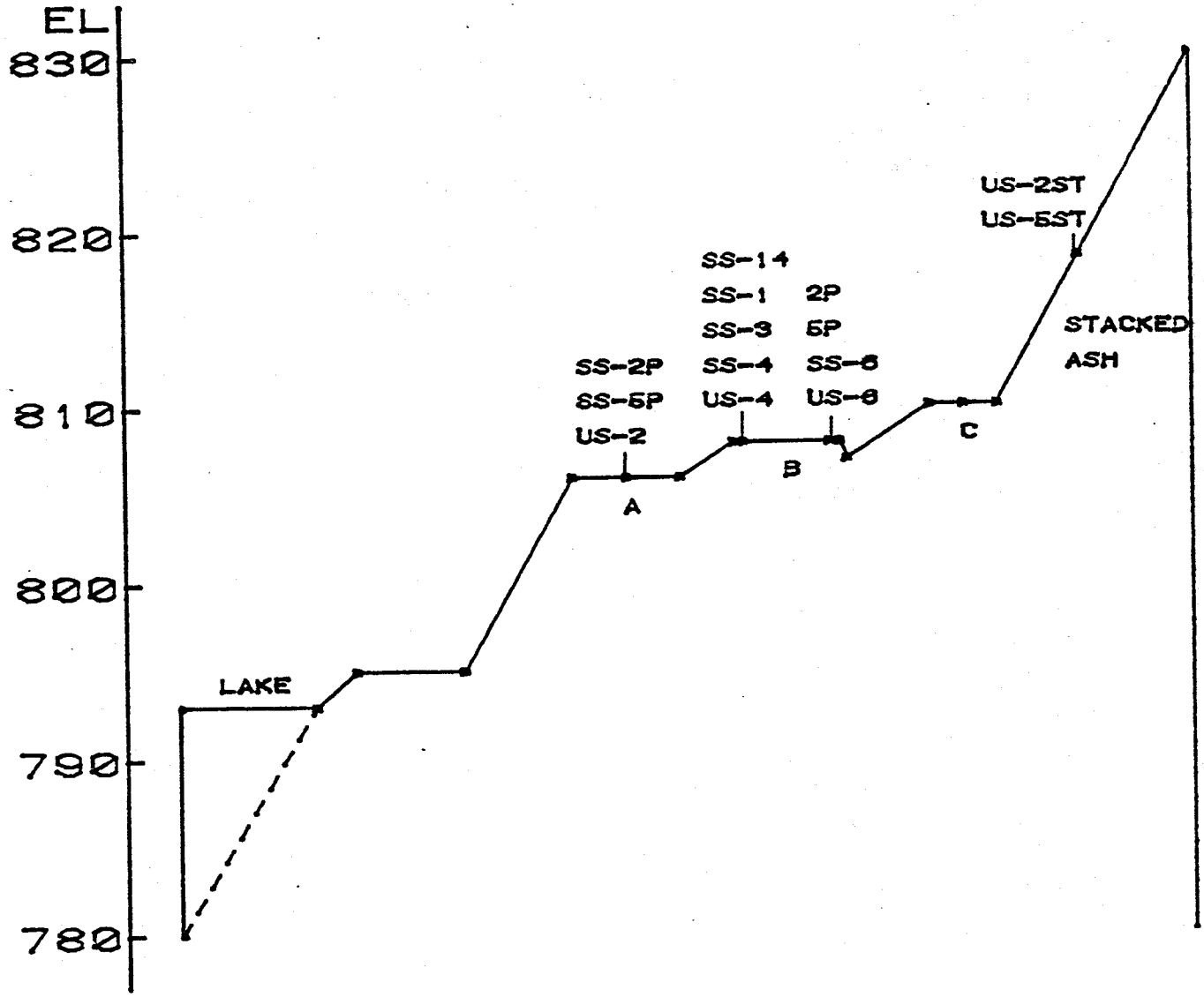
BULL RUN STEAM PLANT

ASH PONDS 1 AND 2A

SUMMARY OF LABORATORY TEST DATA

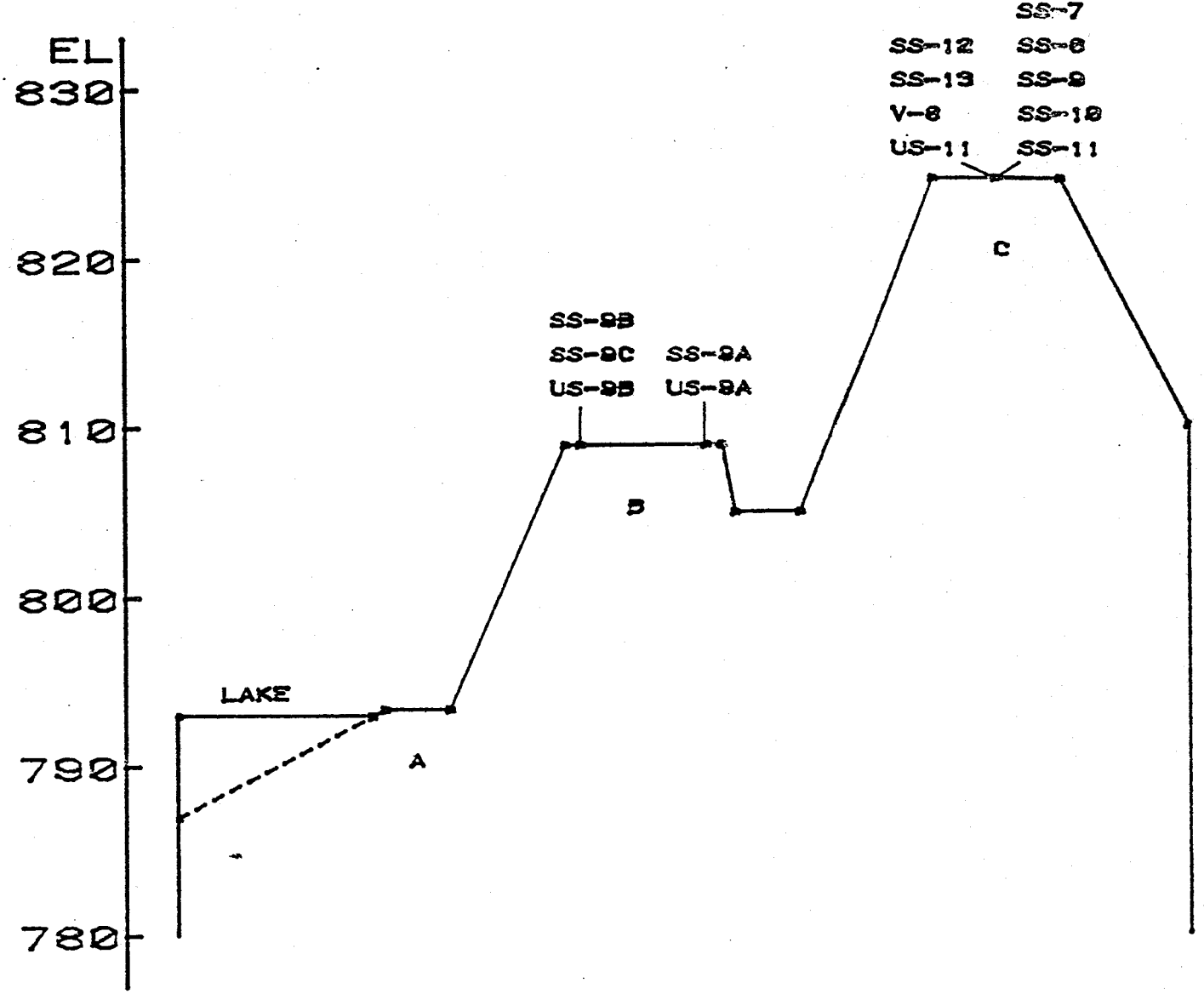
(Continued)

Elevation	Soil Symbol	Nat. Moist. %	Nat. Moist. % Sat.	Grain-Size Analysis Gravel %	Sand %	Silt %	Clay %	D_{10} mm	Liq Limit %	Plastic. Index %	Dry Dens pcf	Void Ratio	Natural Moisture Triaxial R ϕ deg	Natural Moisture Triaxial R c tsf	Saturated Triaxial R Apparent ϕ deg	Saturated Triaxial R Apparent c tsf	Saturated Triaxial R Effective ϕ deg	Saturated Triaxial R Effective c tsf	Direct Shear S ϕ deg	Direct Shear S c tsf
Boring US-6, Surface Elevation 807.9																				
791.9-789.8	CL	21.6	90.0	0	7	49	44	--	46	21	102.3	0.648			18.4	1.34	33.6	0.00		
787.9-786.1	CL	21.6	97.1	0	6	51	43	--	41	19	105.5	0.604								
Boring US-2B, Surface Elevation 805.0																				
780.0-777.9	SM	17.8	83.5	24	60	9	7	0.0169	NP	NP	106.2	0.567			14.3	0.70	33.7	0.00		
Ash Pond 2A																				
Boring US-9A, Surface Elevation 808.9																				
803.9-801.4	ML	21.2	93.7	6	32	41	21	--	39	12	104.4	0.608	24.6	0.63	11.0	1.20	34.4	0.01	31.9	0.47
798.9-796.9	ML	30.8	92.0	9	36	34	21	--	42	13	88.9	0.903								
Boring US-9B, Surface Elevation 808.9																				
791.4-790.0	CL	27.1	100.0	0	8	46	46	--	44	22	100.5	0.678								
783.9-782.6	CL	25.7	97.2	0	5	46	49	--	47	24	98.2	0.713								
778.9-777.3	CL	23.0	100.0	0	6	56	38	--	37	15	104.6	0.585								
768.9-766.5	CL	30.6	89.7	0	14	54	32	--	44	20	86.9	0.900			18.1	0.12	37.3	0.00		
Boring US-11, Surface Elevation 826.0																				
825.0-822.6	SM	19.9	34.3	3	66	31	0	0.0303	NP	NP	59.2	1.226								
821.0-818.8	SM	19.7	34.0	2	67	31	0	0.0297	NP	NP	59.3	1.221	33.7	0.64	21.3	1.02	36.2	0.09	35.0	0.28
816.0-814.0	SM	24.9	42.0	2	63	33	2	0.0221	NP	NP	58.3	1.240								



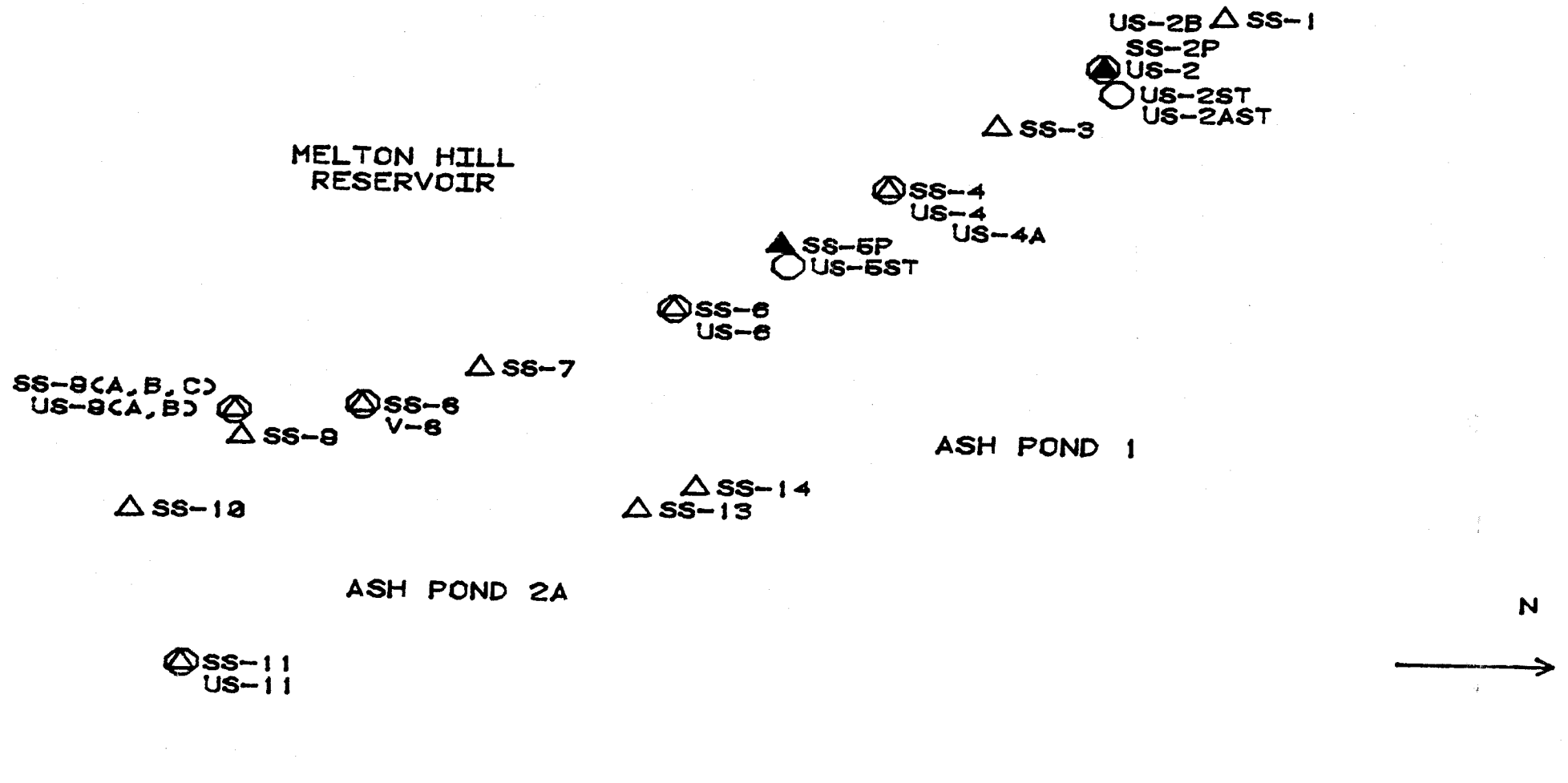
SCALE: VERT. 1'' = 10'
HORIZ. NOT TO SCALE

FIGURE 1
BULL RUN STEAM PLANT
ASH POND 1 DIKES



SCALE: VERT. 1'' = 10'
HORIZ. NOT TO SCALE

FIGURE 2
BULL RUN STEAM PLANT
ASH POND 2A DIKES



LEGEND

- △ SPLITSPOON BORING
- ▲ PIEZOMETER BORING
- ○ UNDISTURBED OR VANE SHEAR BORING

SCALE : 1'' = 500'

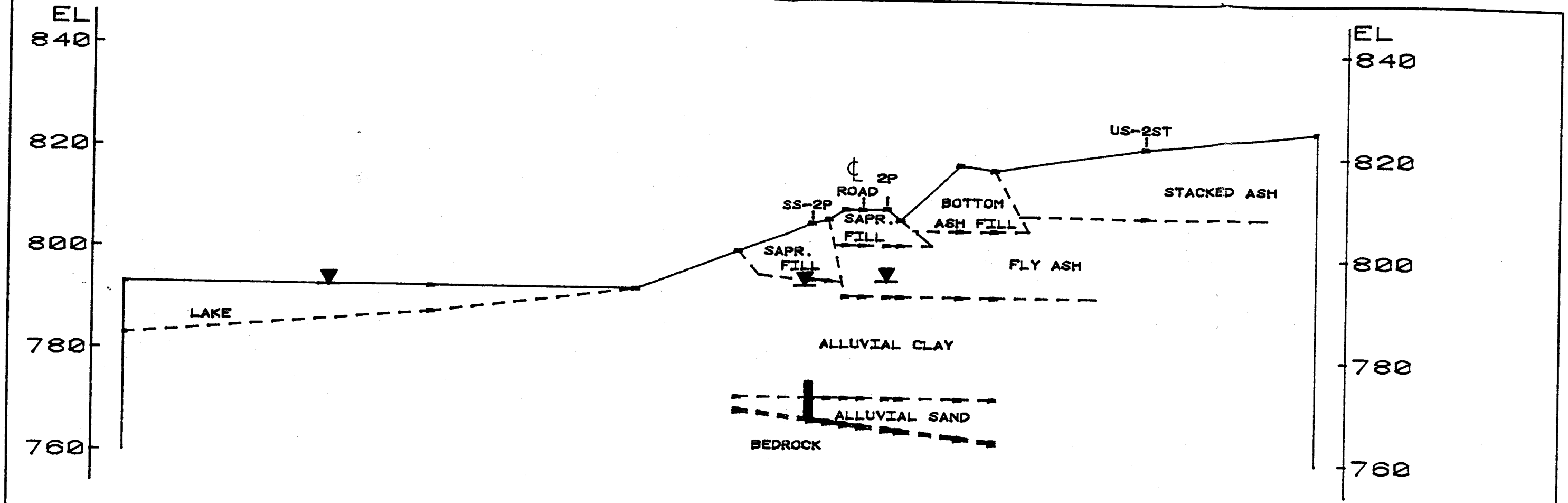
BULL RUN STEAM PLANT

ASH PONDS 1 AND 2A
PLAN OF BORING LOCATIONS

TENNESSEE VALLEY AUTHORITY
MATERIALS ENGINEERING LABORATORY

SUBMITTED	RECOMMENDED	APPROVED
BA	HPM	C. F. Best

KNOXVILLE	022885	49	CS	3	604B2069R0



LEGEND

N ≤ 10

WATER TABLE

NOTE : STRATA CONTINUITY BETWEEN BORINGS ASSUMED

SCALE: VERT. 1'' = 20'
HORIZ. 1'' = 30'

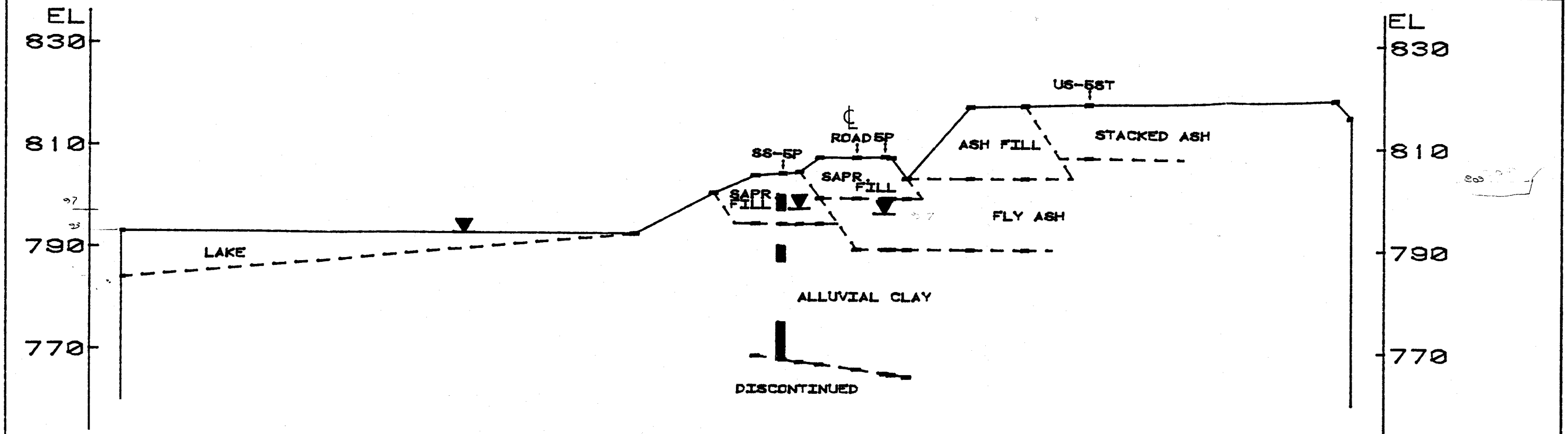
BULL RUN STEAM PLANT

ASH PONDS 1 AND 2A
GENERALIZED CROSS SECTION
POND 1 RANGE 1

TENNESSEE VALLEY AUTHORITY
MATERIALS ENGINEERING LABORATORY

SUBMITTED	RECOMMENDED	APPROVED
BA	HPM	J. I. Bent

KNOXVILLE	031385	49	CS	3	604B2070R0



LEGEND

N ≤ 10

WATER TABLE

NOTE : STRATA CONTINUITY BETWEEN BORINGS ASSUMED

SCALE: VERT. 1'' = 20'
HORIZ. 1'' = 30'

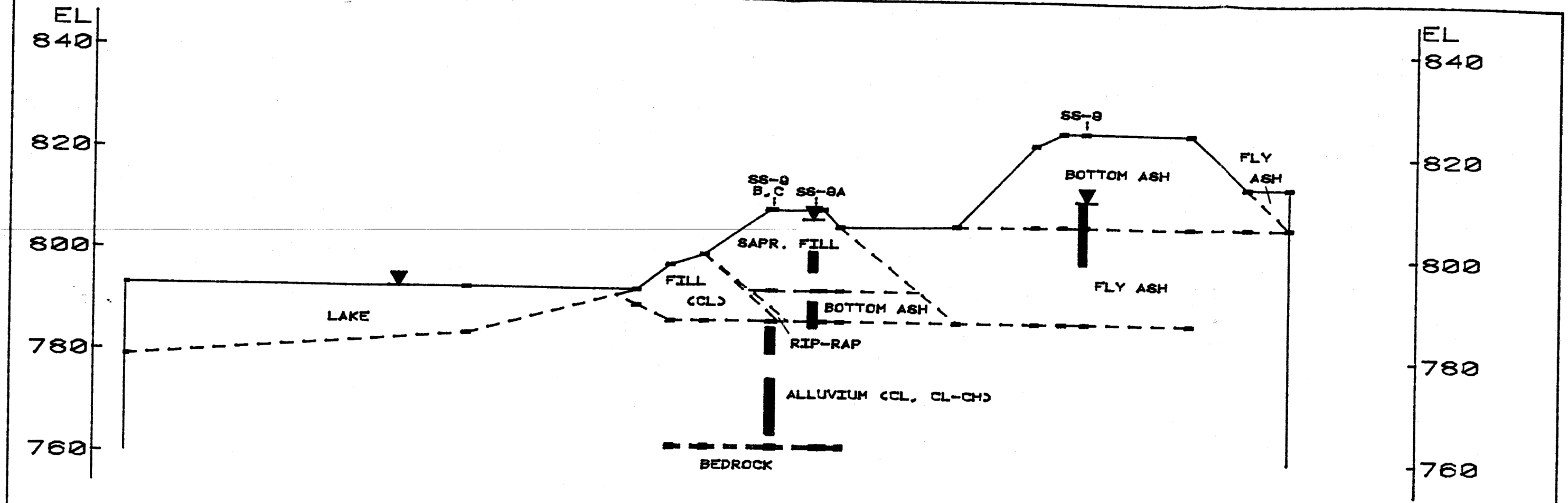
BULL RUN STEAM PLANT

ASH PONDS 1 AND 2A
GENERALIZED CROSS SECTION
POND 1 RANGE 2

TENNESSEE VALLEY AUTHORITY
MATERIALS ENGINEERING LABORATORY

SUBMITTED	RECOMMENDED	APPROVED
BA	HPM	

KNOXVILLE	031385	49	CS	3	604B2071R0



LEGEND

N ≤ 10

WATER TABLE

NOTE : STRATA CONTINUITY BETWEEN BORINGS ASSUMED

SCALE: VERT. 1'' = 20'
HORIZ. 1'' = 30'

BULL RUN STEAM PLANT

ASH PONDS 1 AND 2A
GENERALIZED CROSS SECTION
POND 2A RANGE 4

TENNESSEE VALLEY AUTHORITY
MATERIALS ENGINEERING LABORATORY

SUBMITTED	RECOMMENDED	APPROVED
BA	HPM	J. F. Bost

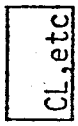
KNOXVILLE	031385	49	CS	3	604B2072R0

TENNESSEE VALLEY AUTHORITY
SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE LEGEND AND SYMBOLS

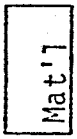
DEPTH 1"=5'	EL	SPT (N)	LOG	W	LL	PI	X	REMARKS OR TEST RESULTS
Boring Depth and Scale	Elevation	Blows/Foot (SS Boring)	Lab Soil Type	Moisture Content	Liquid Limit	Plasticity Index	Soil Letter	

LEGEND

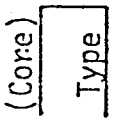
Topsoil



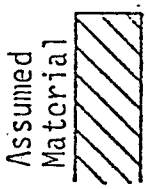
Soil Type (Unified Classification)



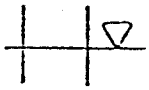
Notation of Soil Not Sampled (SS, PA, HA Logs)



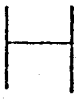
Bedrock (Note Core if Cored)



Refusal (Impractical to Penetrate with Boring Equipment Used)



Watertable (Date)



Explanation of UD Sampling Limits if Applicable

BORING SYMBOLS

SS - 2" OD Splitspoon Boring
SPT - Standard Penetration Test Blows Per Foot with 2" Splitspoon
UD - Undisturbed Sample Boring
PA - Power Auger Boring
HA - Hand Auger Boring
TP - Test Pit or Trench

IN BLOCKS BESIDE UD BORING SAMPLES		
Test	Engineering Test Results	
Q, R, R̄, S	Friction Angle (Degrees)	Cohesion (tsf)
UC	Unconfined Compressive Strength (tsf)	Sensitivity Ratio
C	Compression Index	Preconsolidatic Pressure (tsf)
k	Coefficient of Permeability (cm/sec x 10^{-4})	

Example: Blocks as Required:

Q	12.0	0.62	R	19.6	0.21	S	34.0	0
UC	4.0	2.6	C	0.27	2.0	k	5.6	

SOIL TEST SYMBOLS

Q - Unconsolidated-Undrained Triaxial Compression
R - Consolidated-Undrained Triaxial Compression
R̄ - Effective Consolidated-Undrained Triaxial Compression
S - Consolidated-Drained Direct Shear
UC - Unconfined Compression
C - Consolidation
k - Permeability
X - Letter Identification of Soil Type. Lower Case (a, etc.), By Index Tests. Capital (A, etc.), Subjected to Additional Tests.

SINGLETON MATERIALS ENGINEERING LABORATORY

FIELD LOG ABBREVIATIONS

Typical Name	Abbreviation
Sandy gravel	sd Gv
Silty gravel	si Gv
Clayey gravel	cl Gv
Sand	Sd
Silty sand	si Sd
Clayey sand	cl Sd
Sandy silt	sd Si
Clayey silt	cl Si
Fat silt	ft Si
Sandy clay	sd Cl
Silty clay	si Cl
Riprap	RR
Medium clay	md Cl
Fat clay	ft Cl
Cobble	Cob
Boulder	Bld
Topsoil	TS

Name Modifiers

Clean	cln
Coarse	crs
Dirty	dty
Fine	fn
Organic	org
Poorly graded	pgd
Well graded	wgd
Degraded	degdd

Gravel Shape

Angular	ang
Platy	plty
Rounded	rd
Subangular	sb ang
Subrounded	sb rd

Lithology and Mineralogy	Abbreviation
Bedrock	br
Chert	cht
Dolomite	dol
Limestone	ls
Manganese	mn
Micaceous	mic
Pyrite	py
Quartz	qtz
Sandstone	ss
Shale	sh
Bentonite	bent
Hematite	hem

Color

Black	blk
Blue	blu
Brown	brn
Cream	crm
Dark	dk
Gray	gy
Green	grn
Light	lt
Mottled	mott
Pink	pk
Red	r
Tan	tn
White	wht
Yellow	yel
Purple	pur

Moisture

Dry	d
Moist	mst
Very moist	V mst
Wet	w

Structure	Abbreviation
Blocky	blky
Fissured	fis
Homogeneous	homo
Laminated	lam
Saprolitic	sapr
Shaly	shly
Slickensided	slsid
Stratified	strat

Consistency	Abbreviation
Dense	dns
Firm	f
Hard	hd
Loose	lse
Soft	s
Stiff	stf
Very stiff	v stf

Origin

Alluvial	all
Colluvial	coll
Loess	lss
Residual	resd

General Modifiers

Alternating	altng
Angle	∠
Augering	augg
Contaminated	cont
Dip	dp
Debris	dbr
Discontinued	Disc
Drilling mud	mud
Drive	dr
Elevation	El
Feet	ft
Fill	fl
High	H
Horizontal	hor
Inch	in
Inclusion	inc
Incomplete recovery	IR
Low	L
Medium	Med
Original	orig
Partings	ptgs
Roots	rts
Rough	rou
Slow	sl
Small	sm
Spoil	sp
Thick	thk
Thin	thn

Trace	tr
Variable	var
Vertical	vert
Weathered	wth
With	w/

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 1
BORING: SS-1 STATION: RANGE: SURFACE EL: 809.2
DATE DRILLED: 12/5/84 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
		25	CL	20.8			SI CL, BRN, SAPR, MST, FL
5	805	18	SC	16.7	35	12	SI CL, BRN-YEL, SAPR, TR GV, FL
10	800	17	GM	5.3			IR; LS GV (DEGDD BY DR)
15	795	9	SM	31.3	NP	NP	SI SD, BLK, W, BOTT ASH FL
20	790	75+	GM/GC	12.5	26	7	ASH; SOIL; LS CHIPS ON SPOON
							REFUSAL. BEDROCK EL 789.0
25	785						
30	780						
35	775						

1''=5'

*Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 1
BORING: SS-2p STATION: RANGE: SURFACE EL: 806.2
DATE DRILLED: 12/7/84 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	805	11	SM/SC	19.2			SI CL, YEL-BRN, SAPR, TR GV, MST, FL
5		16	SM/SC	17.0	36	11	SI CL, YEL-BRN, SAPR, TR GV, MST, FL
	800						SOIL
							COB
10							SI CL, BLK, ORG, MST, ALL
	795	11	CL	19.7	31	11	
15		17	CL	24.2	47	23	SI CL, BRN, MICA, MST, ALL
	790						
20		19	CL	18.6	31	13	SI CL, GY-BRN, MST, ALL
	785						
25		11	SM/SC	17.5	23	7	CL SI, BRN, MICA, TR GV, MST, ALL
	780						
30		4	SM/SC	21.4	20	5	50% CL SI, BRN, W, ALL 50% SI SD, BRN, W, ALL
	775						
35		5	SP	27.9	NP	NP	SI SD, BRN, W, ALL

1''=5'

*Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 1
BORING: SS-2p STATION: RANGE: SURFACE EL: 806.2
DATE DRILLED: 12/7/84 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	770						
		--		--			RESD
40							REFUSAL. EL 767.9
	765						
45							
	760						
50							
	755						
55							
	750						
60							
	745						
65							
	740						
70							
1''=5'		* Lab. Classif.					

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 1
BORING: SS-3 STATION: RANGE: SURFACE EL: 808.3
DATE DRILLED: 12/7/84 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
		12	SM SC	19.7			SI CL, YEL-BRN, SAPR, MST, FL
	805						
5		5	SM SC	18.0	33	11	SI CL, YEL-BRN, SAPR, TR SH(DEGD BY DR), MST, FL
	800						
10		3	SM	33.5			SI SD, TR GV, BLK, W, BOTT ASH
	795						
15		8	SM	27.4	NP	NP	SI SD, BLK, BOTT ASH, V MST, FL
		--	GC	11.9	30	10	80% LS(DEGDD BY DR), 20% SI CL, BRN-BLK(TS), ORG, MST, ALL
	790						
20		23	CL	25.1	49	24	SI CL, DK BRN, HOMO, TR MICA, MST, ALL
	785						
25		14	CL	26.0			40% SI CL, DK BRN, TR ORG, W, ALL, 60% SD SI, BRN, MST, ALL
							DISCONTINUED. EL 781.8
	780						
30							
	775						
35							
1''=5'		* Lab. Classif.					

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 1
BORING: SS-4 STATION: RANGE: SURFACE EL: 807.7
DATE DRILLED: 12/4/84 TO PREPARED BY: MHD CHECKED BY: GA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
			SM/SC				SI CL, BRN, MST, FL
	805	11	SM/SC	17.0			SI CL, BRN, MST, SH LUMPS, SAPR, FL
5		2	SM/SC	24.2	35	12	SI CL, BRN, MST, SH LUMPS, SAPR; TR GV, FL
		1	SM/SC	28.5			SI CL, BRN, MST, SH LUMPS, SAPR, TR GV, FL
	800		SM	24.9	NP	NP	SI SD, BRN-BLK, W, BOTT ASH, FL
10		5	SM	27.9	NP	NP	SI SD, BRN-BLK, W, BOTT ASH, FL
	795						
15		13	SM	8.2			IR; BLOCKED BY LS GV(BOTT ASH)
		5	SM	32.4			SI SD, BLK, W, BOTT ASH, FL
	790		OL	22.8			SI CL, ORG, BLK, MST, ALL
20		4	CL	30.1	47	25	SI CL, GY-BRN, MOTT, V MST, F, ALL
	785						
25		6	CL	22.5	46	22	SI CL, BRN-GY, MOTT, F, MST, TR ORG, ALL
	780						DISCONTINUED. EL 781.2
30							
	775						
35							
1''=5'							

* Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 1
BORING: SS-5p STATION: RANGE: SURFACE EL: ±805.0
DATE DRILLED: 12/5/84 TO PREPARED BY: MGD CHECKED BY: BA

DEPTH ft.	EL 805	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
		11	SM SC	20.8	36	12	SI CL, BRN, SH(DEGDD BY DR), MST, FL
5	800	7	SM SC	25.6			SI CL, BRN, SH(DEGDD BY DR), MST, FL
10	795	14	CL	23.9	40	19	SI CL, BRN-DK BRN, TR ORG, MST, ALL
15	790	7	CL	23.3			SI CL, DK BRN, V MST, ALL
20	785	19	CL	22.9			SI CL, MOTT BRN-GY, TR MICA, MST, ALL
25	780	20	CL	23.9	45	21	SI CL, MOTT BRN-GY, TR MICA, MST, ALL
30	775	8	CL	25.0	37	16	SI CL, MOTT BRN-GY, V MST, ALL
35	770	3	CL	31.9	30	9	CL SI, GY, TR ORG, V MST, ALL

1''=5'

*Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 1
BORING: SS-5p STATION: RANGE: SURFACE EL: +805.0
DATE DRILLED: 12/5/84 TO PREPARED BY: MGD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	~~770~~						
							DISCONTINUED. EL 768.5
40	765						
45	760						
50	755						
55	750						
60	745						
65	740						
70	735						

1''=5'

* Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 1
BORING: SS-6 STATION: RANGE: SURFACE EL: 807.9
DATE DRILLED: 12/3/84 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	805	34	SM	14.6			SI SD, ±10% FN ANG GV, BLK, MST, BOTT ASH, FL
5		14	SM	26.6	NP	NP	SI SD±10% FN ANG GV, GY, MST, BOTT ASH FL
	800						
10		4	ML	49.3	NP	NP	50% SD SI, GY, MST, ASH FL; 50% SD SI, TR CL, YEL-GY, W, SOIL FL
	795						
15		2	SM	35.0	NP	NP	GV SD, GY-BLK, SAT, BOTT ASH FL
	790						
20		19	CL	23.7	46	23	SI CL, BRN, MST, HOMO, MICA, ALL
	785						
25		6	ML	27.4			SI SD CL, BRN, MST, MICA, ALL
	780						
30		6	ML	22.7	24	3	SD SI, MOTT BRN-CRM, V MST, ALL
	775						
35		7	SM	22.9	NP	NP	SI SD, LT BRN, MST, ALL

1''=5'

* Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 1
BORING: SS-6 STATION: RANGE: SURFACE EL: 807.9
DATE DRILLED: 12/3/84 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	770						DISCONTINUED. EL 771.4
40							
	765						
45							
	760						
50							
	755						
55							
	750						
60							
	745						
65							
	740						
70							
1''=5'		* Lab. Classif.					

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 2A
BORING: SS-7 STATION: RANGE: SURFACE EL: 820.9
DATE DRILLED: 12/10/84 TO PREPARED BY: MHD CHECKED BY: EA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	820	31	SM	18.1			SOIL; FLY ASH SI SD, BLK, MST, BOTT ASH FL
5	815	29	SM	22.6	NP	NP	SI SD, BLK, MST, BOTT ASH FL
10	810	5	SM	60.1			SI SD, BLK, W, BOTT ASH FL
15	805	4	SM	59.4			SI SD, BLK, W, BOTT ASH FL
20	800	6	ML	43.9			SD SI, GY, W, FL, FLY ASH
25		0	ML	51.2	NP	NP	CL SI, DK OLV, W, FL (TR CL)
	795	--	ML	53.3			SI SD, GY-BLK, W, FL
30	790	--	ML	38.0			CL SI, GY, W, FL (FLY ASH)
35		--	ML	41.9	NP	NP	CL SI, GY, W, FL (FLY ASH)

1''=5'

* Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 2A
BORING: SS-7 STATION: RANGE: SURFACE EL: 820.9
DATE DRILLED: 12/10/84 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	785						
40		14	CL	23.1	31	12	CL SI, BRN, MST, MICA, ALL
	780						
45		5	CL	24.0			70% SD SI, BRN, W, ALL; 30%SI CL BRN, MST, LAM, ALL
	775						
50		3	SM	26.1	NP	NP	SI SD, BRN, MICA, W, ALL
	770						
							DISCONTINUED. EL 769.4
55							
	765						
60							
	760						
65							
	755						
70							
1''=5'							

*Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 2A
BORING: SS-8 STATION: RANGE: SURFACE EL: 824.7
DATE DRILLED: 12/11/84 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
		32	SM	26.5			SI SD, GY-BLK, D, BOTT ASH FL
5	820	33	SM	22.7	NP	NP	SI SD, GY-BLK, D, BOTT ASH FL
10	815	30	SM	26.3			SI SD, GY-BLK, D, BOTT ASH FL
15	810	6	SM	50.5	NP	NP	SI SD, GY-BLK, W, BOTT ASH FL
20	805	1	ML	41.7			CL SI, GY-BLK, W, FL, FLY ASH& BOTT ASH
25	800	0	ML	32.5			CL SI, GY, W, FL
30	795	0	ML	54.5			SI SD, GY-BLK, W, FL, FLY ASH& BOTT ASH
35	790	0	ML	53.1			SI SD, GY-BLK, W, FL, FLY ASH& BOTT ASH

1''=5'

* Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 2A
BORING: SS-8 STATION: RANGE: SURFACE EL: 824.7
DATE DRILLED: 12/11/84 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
40	785	0	SM	46.5	NP	NP	SI SD, GY-BLK, W, FL, FLY ASH BOTT ASH
45	780	0	SM	38.5			SI SD, GY BLK, W, FL, FLY ASH& BOTT ASH
50	775	6	SM	36.9			SI SD, GY-BLK, W, FL, FLY ASH& BOTT ASH
							DISCONTINUED. EL 773.2
55	770						
60	765						
65	760						
70	755						
1''=5'		* Lab. Classif.					

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 2A
BORING: SS-9A STATION: RANGE: SURFACE EL: 808.9
DATE DRILLED: 12/12/84 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
		22	ML	21.9			SI CL, BRN, SAPR, MST, FL
5	805	15	ML	25.0	NP	NP	SI CL, YEL-BRN, TR SH, SAPR, MST, FL
10	800	8	ML	30.4			SI CL, BRN-R, TR GV, MST, SAPR, FL
15	795	22	SM	41.1	NP	NP	SD SI, BLK, W, FL (BOTT ASH)
20	790	5	SM	39.0			SD SI, BLK, W, FL (BOTT ASH)
		--	OL	12.0			SI CL, BRN, TR ORG, MST, ALL
25	785	13	CL	27.4			IR; SI CL, BRN-BLK, MST, ORG, ALL
30	780	28	CL	22.5	47	23	SI CL, DK BRN, TR VEG, ORG, MST, ALL
35	775	15	CL	28.3	37	14	SI CL, OLV, VEG, ORG, V MST, MICA, ALL

1''=5'

* Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 2A
BORING: SS-9A STATION: RANGE: SURFACE EL: 808.9
DATE DRILLED: 12/12/84 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							DISCONTINUED. EL 772.4
40	770						
45	765						
50	760						
55	755						
60	750						
65	745						
70	740						

1''=5'

*Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 2A
BORING: SS-9B STATION: RANGE: SURFACE EL: 808.9
DATE DRILLED: 12/12/84 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
5	805						SI CL, R-BRN, MST, FL
							SI CL, GRN, MST, FL
10	800	11	SM	21.3			SI CL, YEL-BRN, SAPR, TR LS GV, MST, FL; IR
		13	SM	26.2	47	16	SI CL, R-YEL, TR LS GV, SAPR, MST, FL
15	795	13	SM	38.0	NP	NP	SI SD, BLK, MST, FL (BOTT ASH)
							FLY ASH
							RIPRAP
20	790						CL
		29	CL/CH	24.2			SI CL, DK BRN-BLK, TR VEG, MICA, MST, ALL
25	785	8	CL/CH	27.5			SI CL, BLK, ORG, TR VEG, MICA, MST, ALL
30	780	23	CL/CH	23.8	49	25	SI CL, DK BRN, MST, ALL
35	775	8	CL	28.5	43	20	SI CL, BRN-GY, ORG, V MST, ALL

1''=5'

* Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 2A
BORING: SS-9B STATION: RANGE: SURFACE EL: 808.9
DATE DRILLED: 12/12/84 TO PREPARED BY: MHD CHECKED BY: EA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
40	770	6	CL	28.3			SI CL, BRN, ORG, MST, ALL
45	765						REFUSAL. EL 763.6
50	760						
55	755						
60	750						
65	745						
70	740						

1''=5'

*Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 2A
BORING: SS-9C STATION: RANGE: SURFACE EL: 808.9
DATE DRILLED: 12/18/84 TO PREPARED BY: MHD CHECKED BY: EA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
5	805						
10	800						SI CL, LT BRN, MST, FL
15	795	33	SP SM	7.8	NP	NP	BOTT ASH MIX W/LS&RR DEGDD BY DRIVE
		7	CL CL	27.8	46	22	SI CL, BRN-DK BRN, MST, ORG
20	790	12		21.2			SI CL, BRN-DK BRN, TR MICA, MST, ALL
25	785						DISCONTINUED. ELEV. 790.4
30	780						
35	775						

1''=5'

*Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 2A
BORING: SS-9 STATION: RANGE: SURFACE EL: 824.4
DATE DRILLED: 12/19/84 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							~~SI CL, BRN, D, FL~~ BOTTOM ASH
		33	SM	18.4			SI SD, GY, D, FL (BOTT ASH)
5	820	32	SM	20.9			SI SD, GY, D, FL (BOTT ASH)
10	815	19	SM	34.5	NP	NP	SI SD, GY, D, FL (BOTT ASH)
15	810	4	SM	52.0			SI SD, GY, W, FL (BOTT ASH)
20	805	2	ML	40.5	NP	NP	CL SI, GY, LAM, W, FL (FLY ASH)
25	800	0	SM	52.7			50% CL SI, 50% SI SD, GY, W, FL (FLY ASH)
							DISCONTINUED. EL 797.9
30	795						
35	790						

1''=5'

*Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 2A
BORING: SS-10 STATION: RANGE: SURFACE EL: 824.9
DATE DRILLED: 12/19/84 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							SI CL, BRN, SAPR, D, FL
		34	SM	11.6			SI SD, DK GY, MST, FL (BOTT ASH)
5	820	61	SM	16.0			SI SD, DK GY, D, FL (BOTT ASH)
10	815	29	SM	23.8	NP	NP	SI SD, DK GY, D, FL (BOTT ASH)
15	810	10	SM	40.4			SI SD, GY-BLK, MST, FL(BOTT ASH)
20	805	1	SM	60.3			SI SD, GY-BLK, W, FL (BOTT ASH)
25	800	0	SM	57.0			CL SI, GY-BLK, W, FL (FLY ASH)
30	795	0	SM	45.4			CL SI, GY, W, FL (FLY ASH)
35	790						DISCONTINUED. EL 793.4

1''=5'

*Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 2A
BORING: SS-11 STATION: RANGE: SURFACE EL: 826.0
DATE DRILLED: 12/19/84 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	825	23	SM	16.4			BOTTOM ASH SD SI, GY-BLK, MST, FL (BOTT ASH)
5	820	4	SM	27.0			SD SI, GY-BLK, MST, FL (BOTT ASH)
10	815	10	SM	24.4	NP	NP	SI SD, GY-WHT, D, TR GV, FL (BOTT ASH)
15	810	5	SM	57.0			SD SI, GY-BLK, V MST, FL (BOTT ASH)
20	805	1	SM	71.8			SD SI, GY-BLK, W, FL (BOTT ASH)
25	800	0	ML	51.7	NP	NP	SD SI, GY, W, FL (FLY ASH)
30	795						DISCONTINUED. EL 799.5
35							
1''=5'		* Lab. Classif.					

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 2A
BORING: SS-12 STATION: RANGE: SURFACE EL: 824.6
DATE DRILLED: 12/19/84 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
		12	SM	14.8			BOTTOM ASH SD SI, GY-BLK, D, FL (BOTT ASH)
5	820	5	SM	26.4	NP	NP	SD SI, GY-BLK, D, FL (BOTT ASH)
10	815	3	SM	22.4			SD SI, GY-BLK, D, FL (BOTT ASH)
15	810	0	SM	49.9			SD SI, GY-BLK, W, FL (FLY ASH & BOTT ASH)
20	805	0	SM	62.5			IR; SD SI, GY-BLK, W, FL (FLY ASH & BOTT ASH)
25	800	0	ML	38.0	NP	NP	CL SI, DK GY, W, FL (FLY ASH)
30	795						DISCONTINUED. EL 798.1
35	790						

1''=5'

*Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 2A
BORING: SS-13 STATION: RANGE: SURFACE EL: 825.5
DATE DRILLED: 12/20/84 TO PREPARED BY: MHD CHECKED BY: EA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
	825						BOTT ASH
		29	SM	27.2			SD SI, GY-BLK, D, FL (BOTT ASH)
5	820	31	SM	25.6	NP	NP	SD SI, GY-BLK, D, FL (BOTT ASH)
10	815	29	SM	23.6			SD SI, GY-BLK, D, FL (BOTT ASH)
15	810	13	SM	45.9			SD SI, GY-BLK, MST, FL (BOTT ASH)
20	805	9	ML	39.7			CL SI, GY-BLK, W, FL (FLY ASH)
25	800	0	ML	30.9	NP	NP	IR; CL SI, GY-BLK, W, FL (FLY ASH)
							DISCONTINUED. EL 799.0
30	795						
35							
1''=5'							

*Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (SPLIT SPOON BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND (2A)
BORING: SS-14 STATION: RANGE: SURFACE EL: 809.5
DATE DRILLED: 12/20/84 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	FIELD DESCRIPTION
							SI CL, BRN, MST, FL
		19	SM	22.6			SI CL, BRN, MST, SAPR, TR SH GV, FL
5	805	9	SM	25.6	37	7	SI CL, BRN, MST, SAPR, TR SH GV& BLK ORG MTL, FL
10	800	13	SM	19.0			GV SD, BLK, W, FL (BOTT ASH & TR COAL)
15	795	32	SM	11.4	NP	NP	50% SD SI, BLK, W, FL (FLY ASH), 50% LS GV, RR(DEGDD BY DR)
		4	CL	21.2			IR; SI CL BRN-BLK, MST, TR ORG ALL
20	790	8	CL	22.6			SI CL, GY-BRN MOTT, TR ORG, W, ALL
25	785	5	CL	20.8	31	12	SI CL, BRN-GY MOTT, MICA, TR ORG MST, ALL
							DISCONTINUED. EL 783.0
30	780						
35	775						
1''=5'		*Lab. Classif.					

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (UNDISTURBED BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 1
BORING: US-2A STATION: RANGE: SURFACE EL: 821.7
DATE DRILLED: 12/21/84 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	DESCRIPTION (ENGINEERING TEST RESULTS)
0	820						FLY ASH (DRY STACKED)
5							
	815						
10			Σ	27.0	NP	NP	IR; FLY ASH, SD SI, GY, MST, FL (DRY STACKED)
	810						DISCONTINUED. EL 811.2
15							
	805						
20							
	800						
25							
	795						
30							
	790						
35							

1''=5'

*Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (UNDISTURBED BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 1
BORING: US-2B STATION: RANGE: SURFACE EL: 805.0
DATE DRILLED: 1/14/85 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	DESCRIPTION (ENGINEERING TEST RESULTS)
	~~805~~						
5	800						
10	795						
15	790						
20	785						
25	780		Σ S	16.8	NP	NP	MED SD SI, TR RD GV, BRN, V MST, ALL R SAT 14.3 0.70
30	775						NO RECOVERY
35	770						DISCONTINUED. EL 773.0

1''=5'

*Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (UNDISTURBED BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 1
BORING: US-2SS STATION: RANGE: SURFACE EL: 806.2
DATE DRILLED: 12/28/84 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	DESCRIPTION (ENGINEERING TEST RESULTS)
	805						SI CL, R BRN, MST, FL
			SM/SC	22.0	37	11	SI CL, R BRN, SAPR, MST, FL (F) R NAT 22.3 0.81 S 21.9 0.74 R SAT 13.6 0.85
5			SM/SC	24.0	45	19	SI CL W/LS GV, R BRN, MST, FL R NAT 26.5 0.28 S 41.1 0.20 R SAT 19.9 0.25
	800						DISCONTINUED.
10							
	795						
15							
	790						
20							
	785						
25							
	780						
30							
	775						
35							
1''=5'			* Lab. Classif.				

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (UNDISTURBED BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 1
BORING: US-2ST STATION: RANGE: SURFACE EL: 821.7
DATE DRILLED: 12/21/84 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	DESCRIPTION (ENGINEERING TEST RESULTS)
	820						FLY ASH (DRY STACKED)
5							
	815		SM	16.8	NP	NP	SD SI, GY-WHT, D, FL FLY ASH (DRY STACKED)(HD)
10							IR; FLY ASH
	810						
15							DISCONTINUED. EL 809.0
	805						
20							
	800						
25							
	795						
30							
	790						
35							
1"=5'		* Lab. Classif.					

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (UNDISTURBED BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 1
BORING: US-4 STATION: RANGE: SURFACE EL: 807.7
DATE DRILLED: 12/27/84 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	DESCRIPTION (ENGINEERING TEST RESULTS)
							SI CL, R BRN, MST, FL
			SM SC				SI CL, BRN, SAPR, TR GV SH, MST, FL (F)
	805			14.1	33	10	R NAT 26.1 0.49 S 42.4 0.06
5							R SAT 10.4 0.83
							NO RECOVERY
	800						
10							NO RECOVERY
	795						
							NO RECOVERY
15							RR
	790						DISCONTINUED. EL 791.9
20							
	785						
25							
	780						
30							
	775						
35							
1''=5'			* Lab. Classif.				

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (UNDISTURBED BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 1
BORING: US-4A STATION: RANGE: SURFACE EL: 807.9
DATE DRILLED: 12/27/84 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	DESCRIPTION (ENGINEERING TEST RESULTS)
0	805						SI CL, R BRN, MST, FL
5			SM	22.3	30	5	SI SD, BL, BOTT ASH, FL R NAT 24.0 0.43 S 30.5 0.68 R SAT 18.6 0.24
10	800						NO RECOVERY
15	795						NO RECOVERY
20	790		CL	21.6	33	14	SI CL, DK BRN, ORG, TR VEG, MICA V MST, ALL (S)
25	785		CL	24.3	45	24	SI CL, GY-BRN MOTT, V MST, FL, ALL (F) R SAT 16.0 0.37 DISCONTINUED. EL 785.1
30	780						
35	775						

1''=5'

* Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (UNDISTURBED BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 1
BORING: US-5 ST STATION: RANGE: SURFACE EL: 818.5
DATE DRILLED: 12/21/85 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	DESCRIPTION (ENGINEERING TEST RESULTS)
							BOTTOM ASH
	815						
5			CL	28.4	42	20	STACKED FLY ASH
			ML	36.5	—	—	R SAT 15.0 0.31
							R NAT 31.0 0.11 S 37.8 0.00
	810						
10							NO RECOVERY
	805						NO RECOVERY
15							
							DISCONTINUED. EL 804.0
	800						
20							
	795						
25							
	790						
30							
	785						
35							
1"=5'		*Lab. Classif.					

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (UNDISTURBED BORING)

SHEET 1 OF

PROJECT: BULL RUN S.P. FEATURE: ASH POND 1
BORING: US-6 STATION: RANGE: SURFACE EL: 807.9
DATE DRILLED: 12/26/84 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	DESCRIPTION (ENGINEERING TEST RESULTS)
							SI SD, DK GY, BOTT ASH, FL
	805						
5							SI CL, BRN, MST, FL
	800						
10							SD SI, GY-OLIVE, W, BOTT ASH
	795						
15							
	790		CL	21.9	46	21	SI CL, DK BRN, MST, ALL (F) R SAT 18.4 1.34
20			CL	21.6	41	19	SI CL, BRN, MST, MICA, ALL (HD) R SAT 14.3 0.70
	785						
25							DISCONTINUED. EL 785.4
	780						
30							
	775						
35							
1''=5'							

*Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (UNDISTURBED BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 2A
BORING: US-9A STATION: RANGE: SURFACE EL: 808.9
DATE DRILLED: 1/10/85 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	DESCRIPTION (ENGINEERING TEST RESULTS)
5	805		ML	21.2	39	12	SI CL (TR GV), BRN, MST, FL (F)
10	800		ML	30.8	42	13	SI CL (TR WTH SH&GV), BRN, MST, FL (MED) R NAT 24.6 0.63 S 31.9 0.47 R SAT 11.0 1.20
15	795						DISCONTINUED. EL 796.4
20	790						
25	785						
30	780						
35	775						
1''=5'							

*Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (UNDISTURBED BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 2A
BORING: US-9B STATION: RANGE: SURFACE EL: 808.9
DATE DRILLED: 1/11/85 TO PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	DESCRIPTION (ENGINEERING TEST RESULTS)
5	805						
10	800						GV OR RR
15	795						GV LAYER
20	790		CL	27.1	44	22	SI CL, BRN, MST, ALL (F)
25	785		CL	25.7	47	24	SI CL, DK BRN, MST, ALL (MED)
30	780		CL	23.0	37	15	SI CL, DK BRN, MST, ALL (F)
35	775						

1''=5'

*Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (UNDISTURBED BORING)

PROJECT: BULL RUN S.P.
BORING: US-9B STATION:
DATE DRILLED: 1/11/85 TO

FEATURE: ASH POND 2A
RANGE: SURFACE EL: 808.9
PREPARED BY: MHD CHECKED BY: BA

DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	DESCRIPTION (ENGINEERING TEST RESULTS)
40	770		CL	30.6	44	20	CL SI, TR RTS, DK GY, V MST, ALL (S) R SAT 18.1 0.12
45	765						DISCONTINUED. EL 766.4
50	760						
55	755						
60	750						
65	745						
70	740						

1''=5'

* Lab. Classif.

TENNESSEE VALLEY AUTHORITY

SINGLETON MATERIALS ENGINEERING LABORATORY
SOIL PROFILE (UNDISTURBED BORING)

PROJECT: BULL RUN S.P. FEATURE: ASH POND 2A
BORING: US-11 STATION: RANGE: SURFACE EL: 826.0
DATE DRILLED: 1/14/85 TO PREPARED BY: MHD CHECKED BY: BA

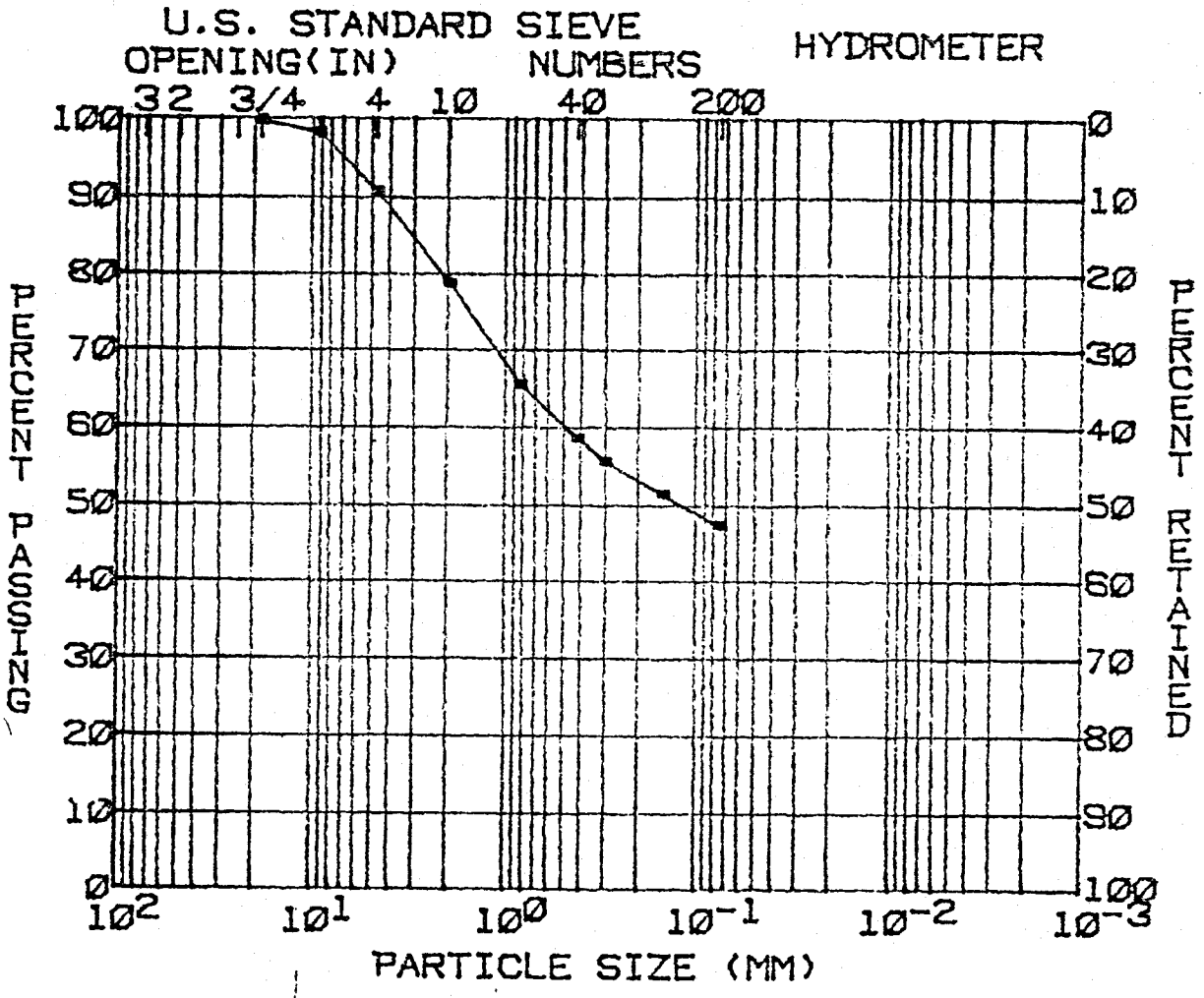
DEPTH ft.	EL	SPT (N)	* LOG	W	LL	PI	DESCRIPTION (ENGINEERING TEST RESULTS)
	825						
			SM	19.9	NP	NP	SI FN SD, LT GY, MST, FLY ASH(CS)
5							SI FN SD, LT GY-DK GY, MST, FLY ASH (MED)
	820		SM	19.7	NP	NP	R NAT 33.7 0.64 S 35.0 0.28 R SAT 21.3 1.02
10				24.9	NP	NP	SI FN SD, LT GY-DK GY, MST, FLY ASH (MED)
	815		SM				
							DISCONTINUED. EL 813.9
15							
	810						
20							
	805						
25							
	800						
30							
	795						
35							
1''=5'			*Lab. Classif.				

ASH POND 1

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-1
EL. :
SAMPLE:GR.16
DATE :12-17-84



GRAVEL(%)= 9
SAND(%) = 44
SILT(%) = 47
CLAY(%) = 0

D10(MM) = 0.0001
D30(MM) = 0.0039
D60(MM) = 0.4625
COEF UNIF) 100

SOIL SYMBOL= SC/CL BJK 6-29-87
MOISTURE(%)= --
SP. GR. = 2.65

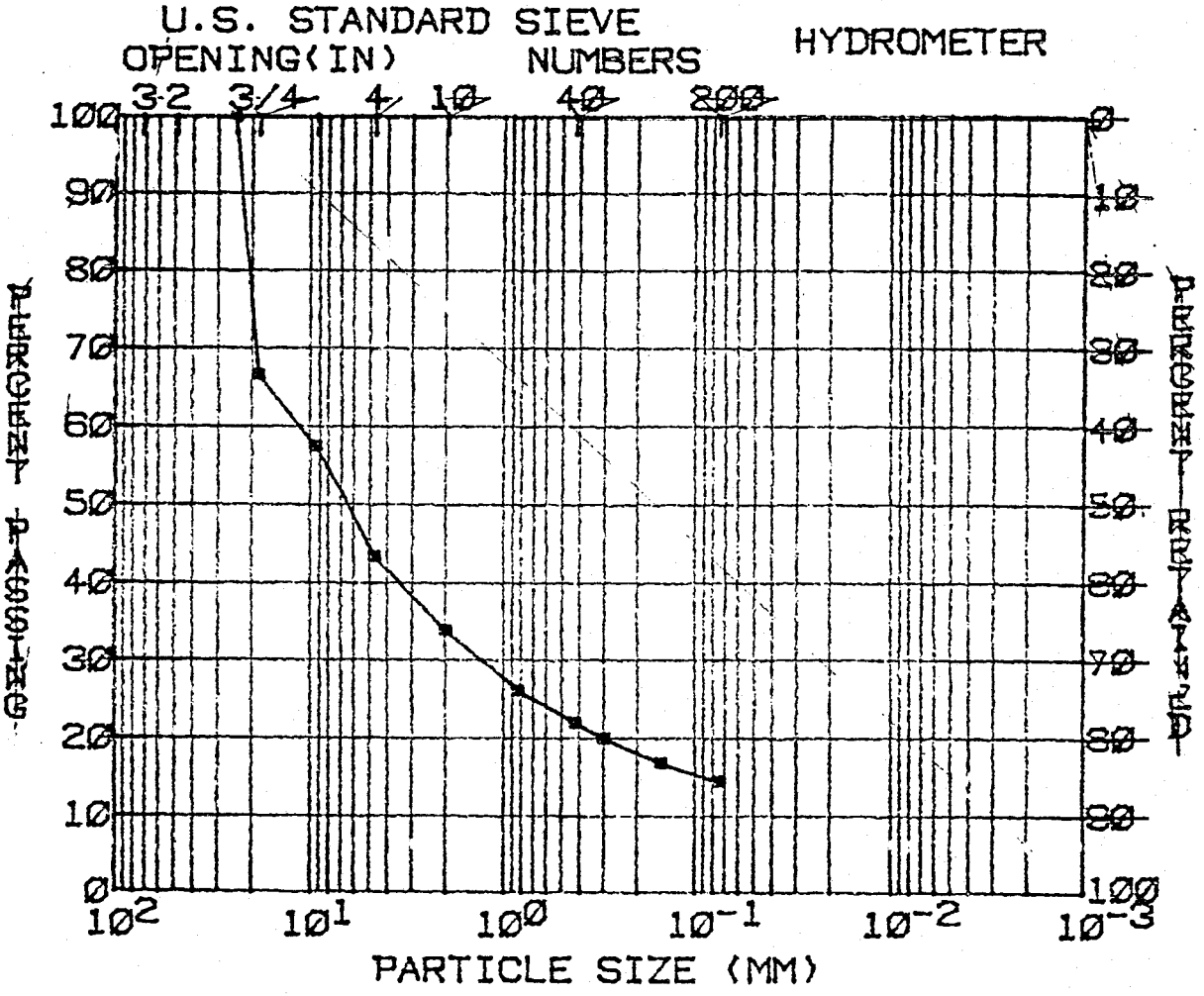
L.L.(%) = 35
P.I.(%) = 12

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-1
EL. :
SAMPLE:GR.17
DATE :12-17-84



GRAVEL(%)= 56
SAND(%) = 29
SILT(%) = 15
CLAY(%) = Ø

D1Ø(MM) = Ø.ØØØØ
D3Ø(MM) = Ø.ØØØØ
D6Ø(MM) = Ø.ØØØØ
COEF UNIF= Ø.Ø

SOIL SYMBOL=
MOISTURE(%)= --
SP. GR. = 2.65

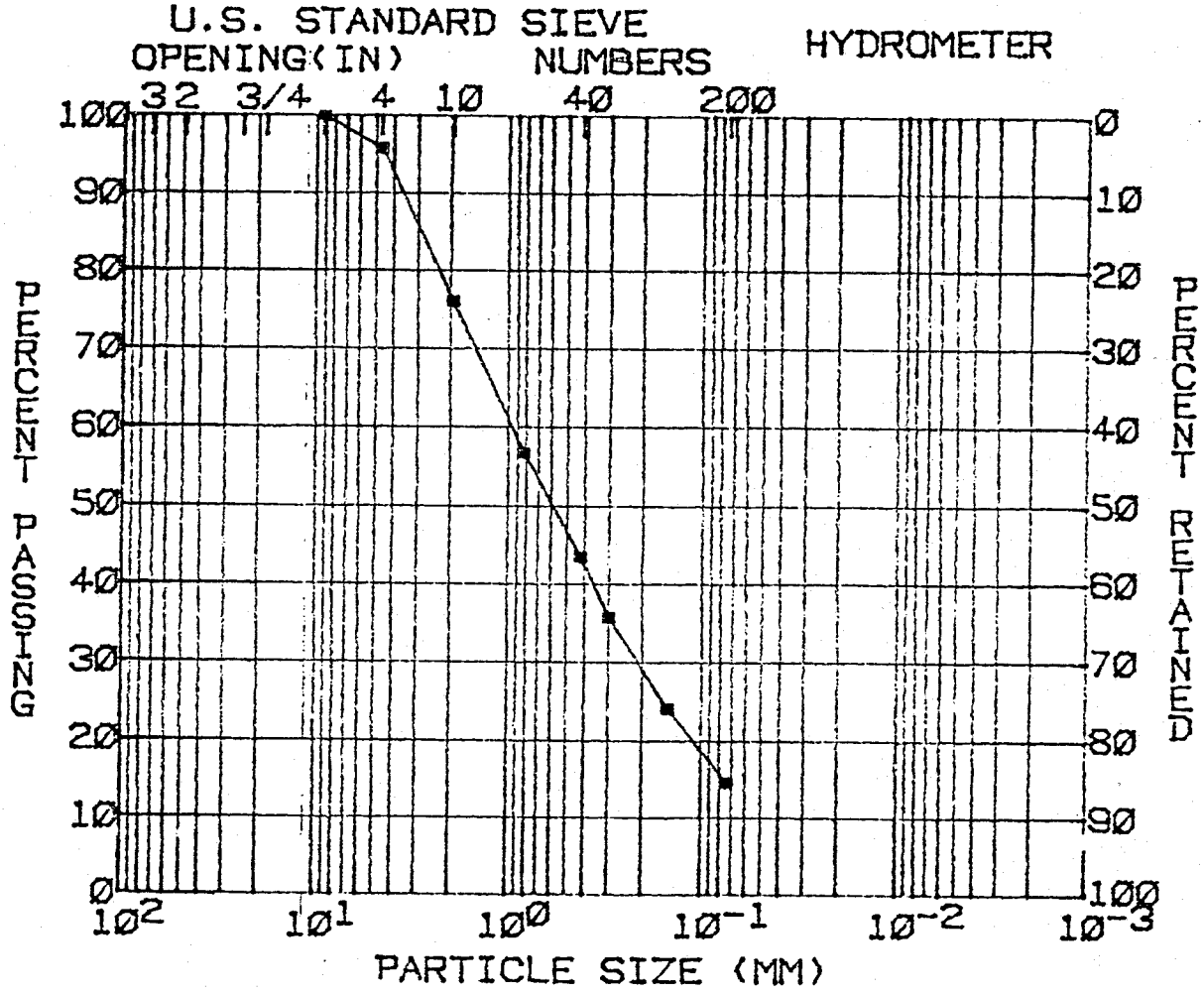
L.L.(%) = Ø
P.I.(%) = Ø

REMARKS: VISUAL GM

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-1
EL. :
SAMPLE:GR.18
DATE :12-17-84



GRAVEL(%)= 4
SAND(%) = 82
SILT(%) = 14
CLAY(%) = 0

D10(MM) = 0.0541
D30(MM) = 0.2118
D60(MM) = 0.9666
COEF UNIF=17.9

SOIL SYMBOL= SM
MOISTURE(%)= --
SP. GR. = 2.65

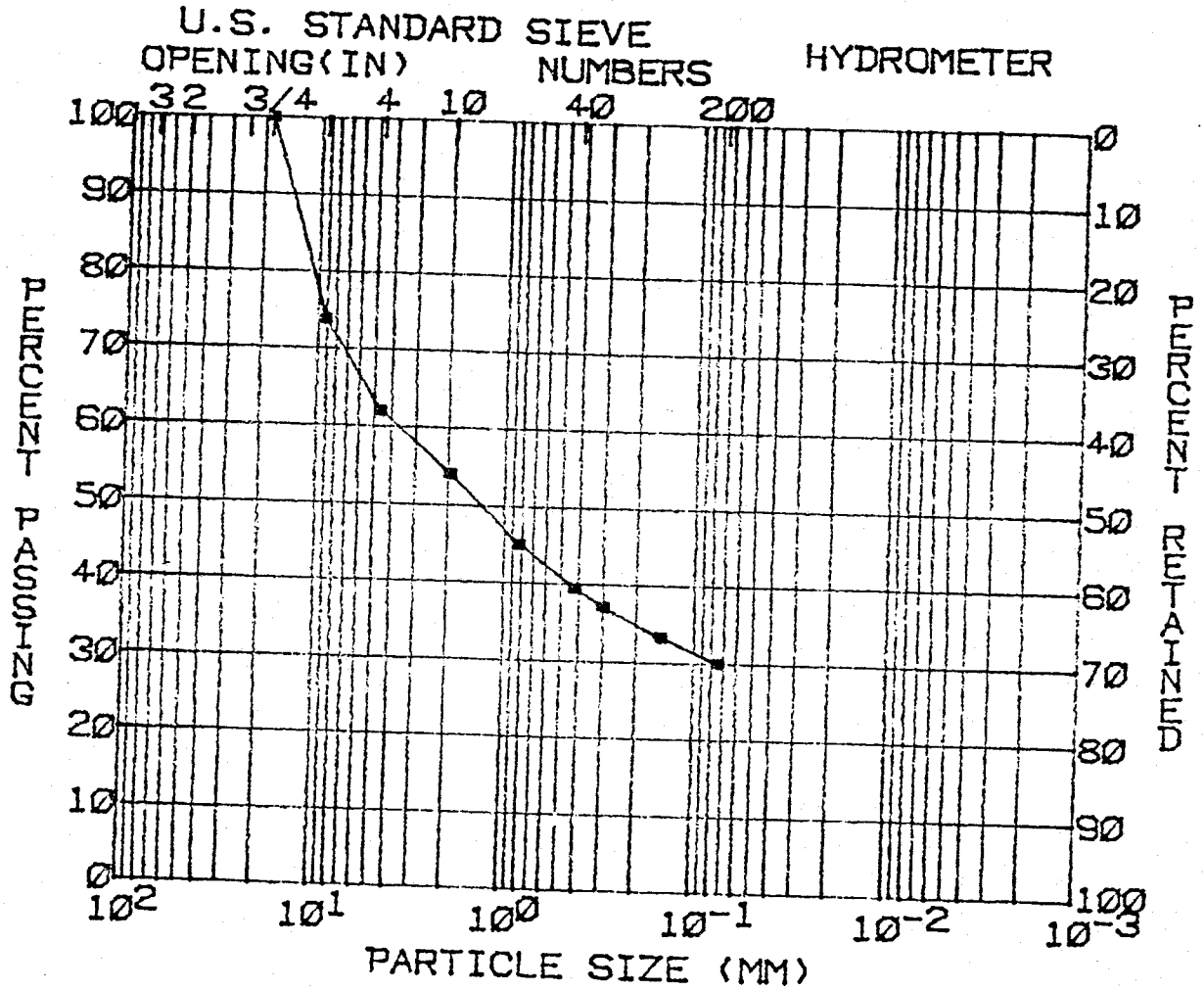
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-1
EL. :
SAMPLE:GR.19
DATE :12-17-84



GRAVEL(%)= 38
SAND(%) = 32
SILT(%) = 30
CLAY(%) = 0

D10(MM) = 0.0013
D30(MM) = 0.0750
D60(MM) = 3.6450
COEF UNIF) 100

SOIL SYMBOL= GM-GC
MOISTURE(%)= --
SP. GR. = 2.65

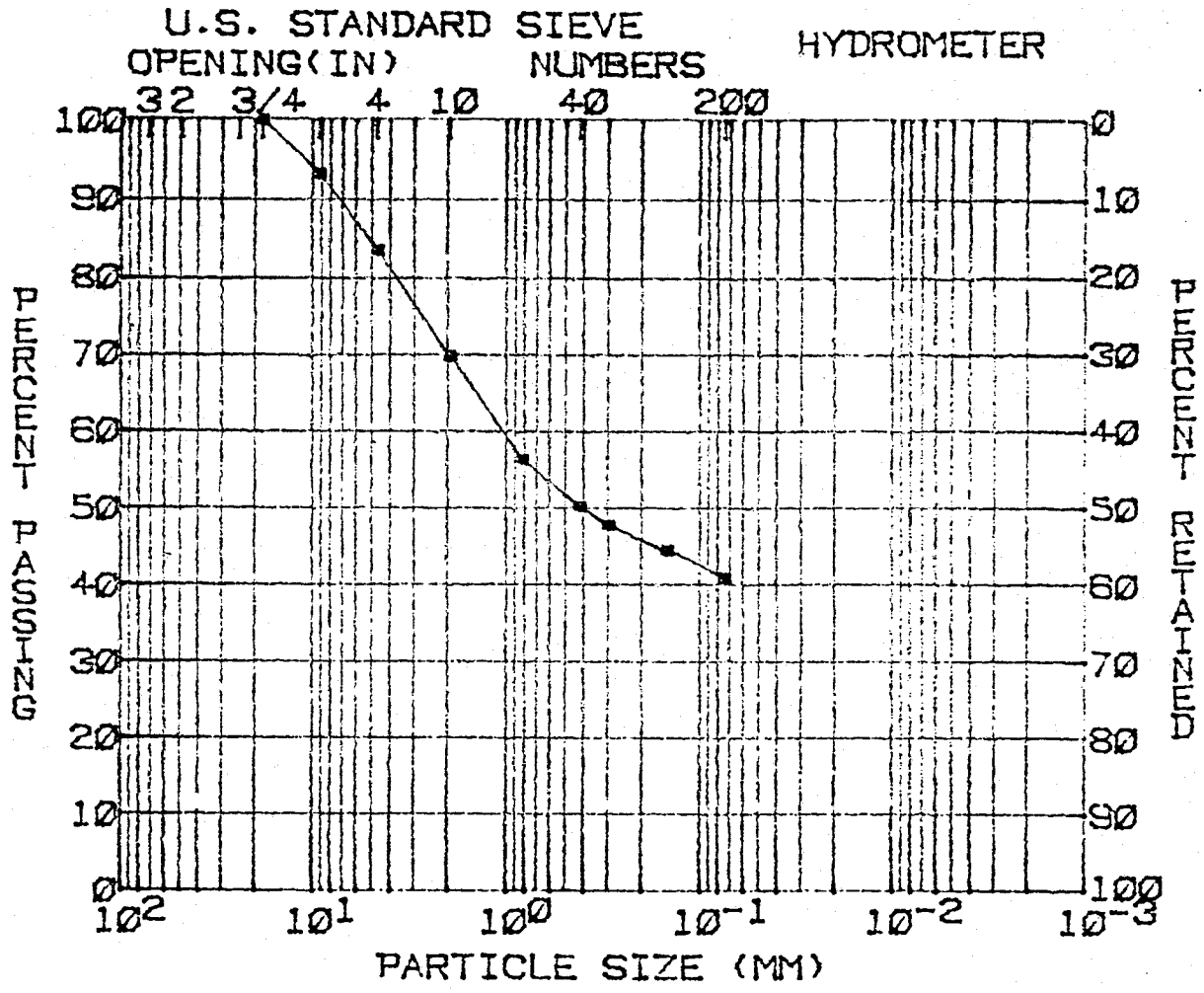
L.L.(%) = 26
P.I.(%) = 7

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-2P
EL. :
SAMPLE:GR.25
DATE :12-18-84



GRAVEL(%)= 16
SAND(%) = 43
SILT(%) = 41
CLAY(%) = 0

D10(MM) = 0.0003
D30(MM) = 0.0110
D60(MM) = 1.0305
COEF UNIF> 100

SOIL SYMBOL= SM-SC
MOISTURE(%)= --
SP. GR. = 2.65

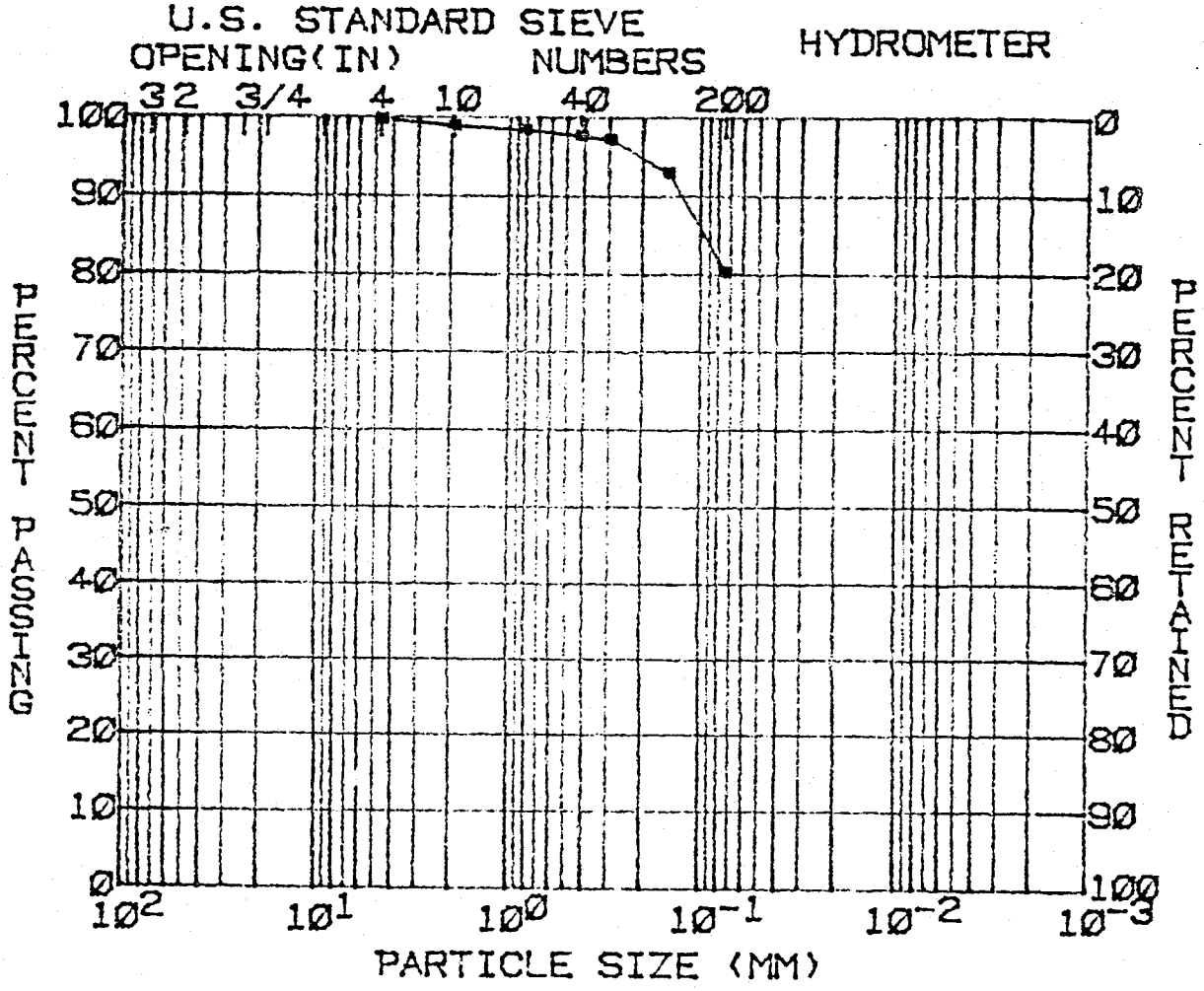
L.L.(%) = 36
P.I.(%) = 11

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-2P
EL. :
SAMPLE:GR.26
DATE :12-18-84



GRAVEL(%)= 0
SAND(%) = 20
SILT(%) = 80
CLAY(%) = 0

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL
MOISTURE(%)= --
SP. GR. = 2.65

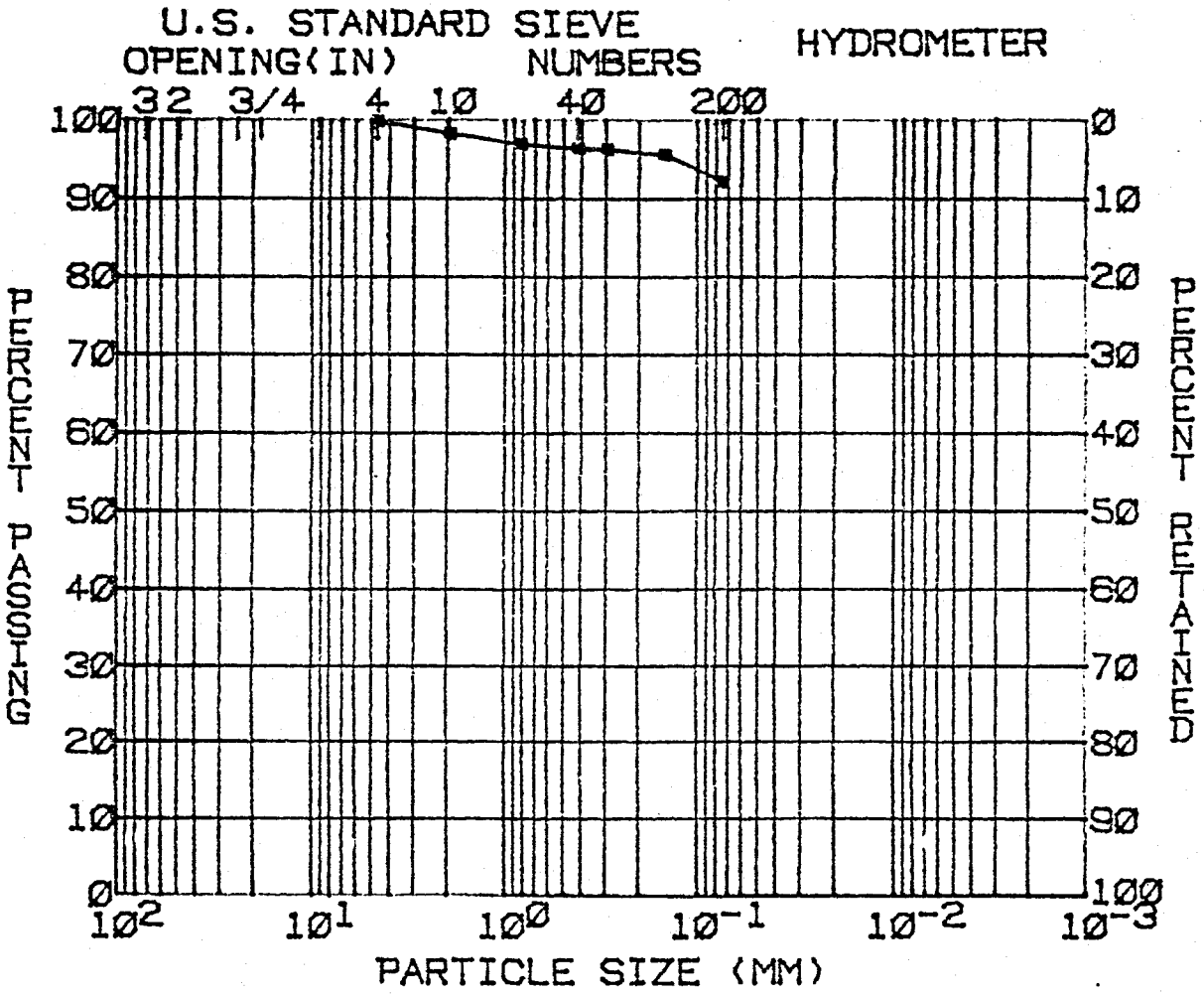
L.L.(%) = 31
P.I.(%) = 11

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-2P
EL. :
SAMPLE:GR.27
DATE :12-18-84



GRAVEL(%)= 0
SAND(%) = 8
SILT(%) = 92
CLAY(%) = 0

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL
MOISTURE(%)= --
SP. GR. = 2.65

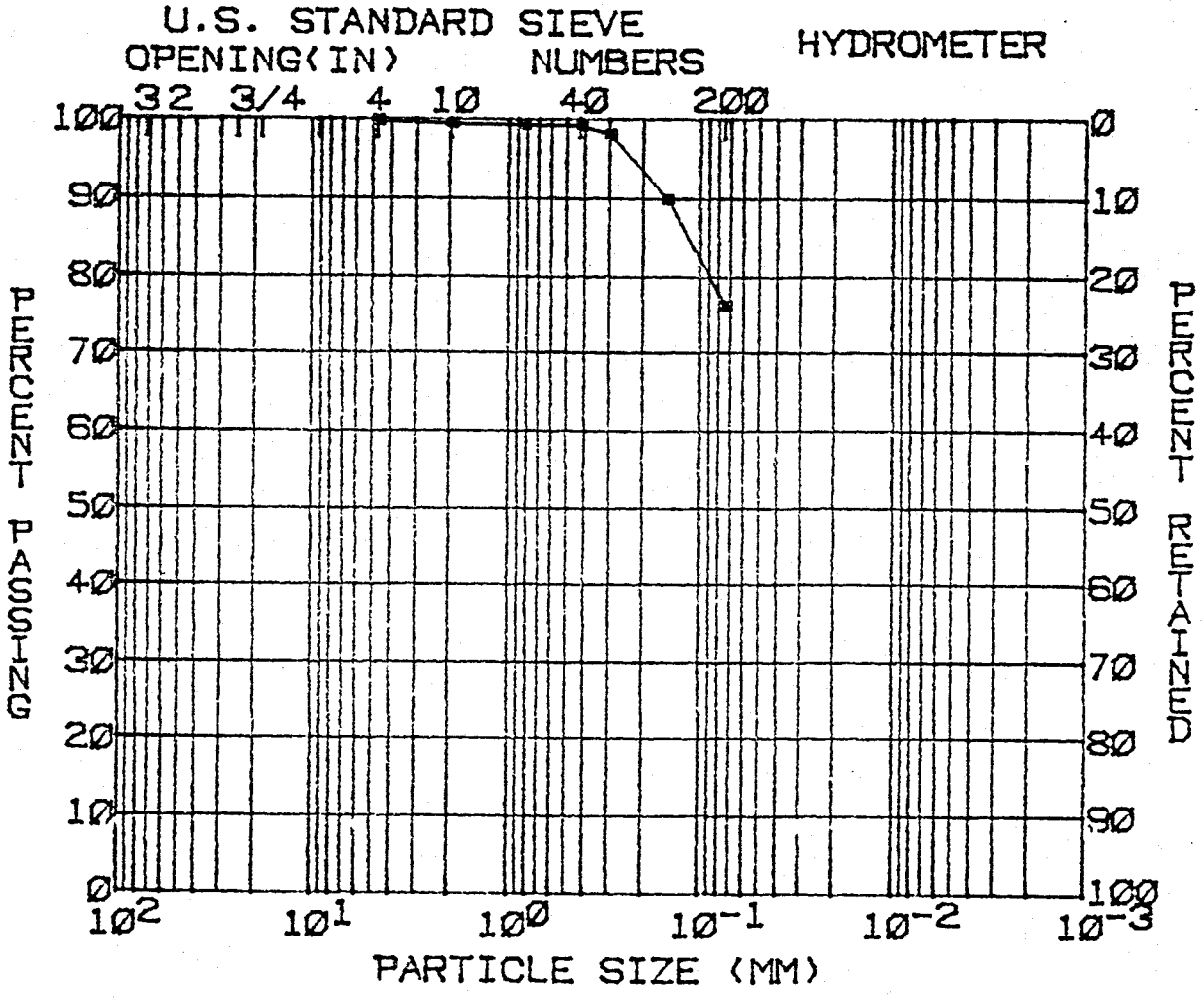
L.L.(%) = 47
P.I.(%) = 23

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-2P
EL. :
SAMPLE:GR.28
DATE :12-18-84



GRAVEL(%)= 0
SAND(%) = 24
SILT(%) = 76
CLAY(%) = 0

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL
MOISTURE(%)= --
SP. GR. = 2.65

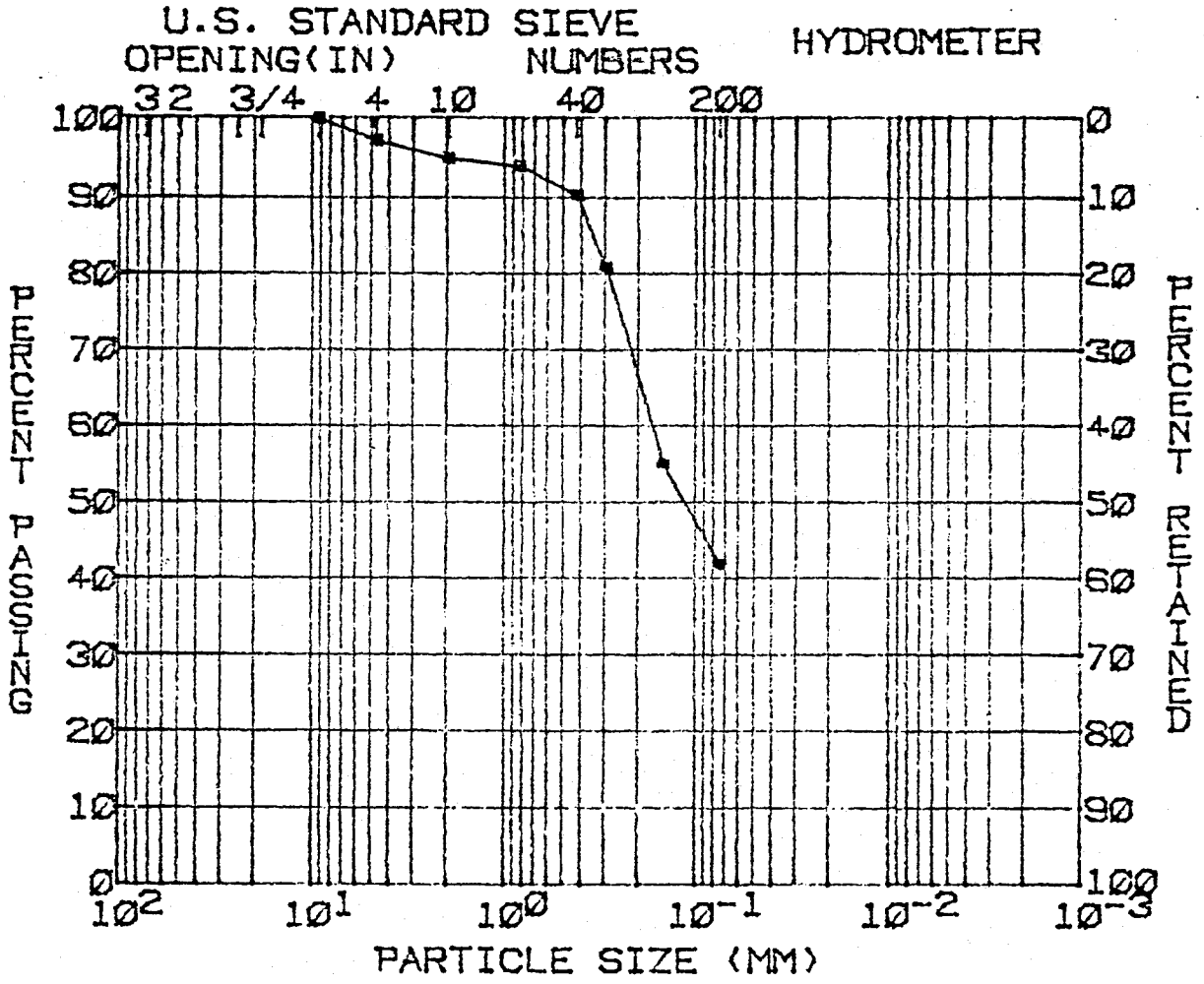
L.L.(%) = 31
P.I.(%) = 13

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-2P
EL. :
SAMPLE:GR.29
DATE :12-18-84



GRAVEL(%)= 2
SAND(%) = 55
SILT(%) = 42
CLAY(%) = 1

D10(MM) = 0.0137
D30(MM) = 0.0394
D60(MM) = 0.1698
COEF UNIF=12.4

SOIL SYMBOL= SM-SC
MOISTURE(%)= --
SP. GR. = 2.65

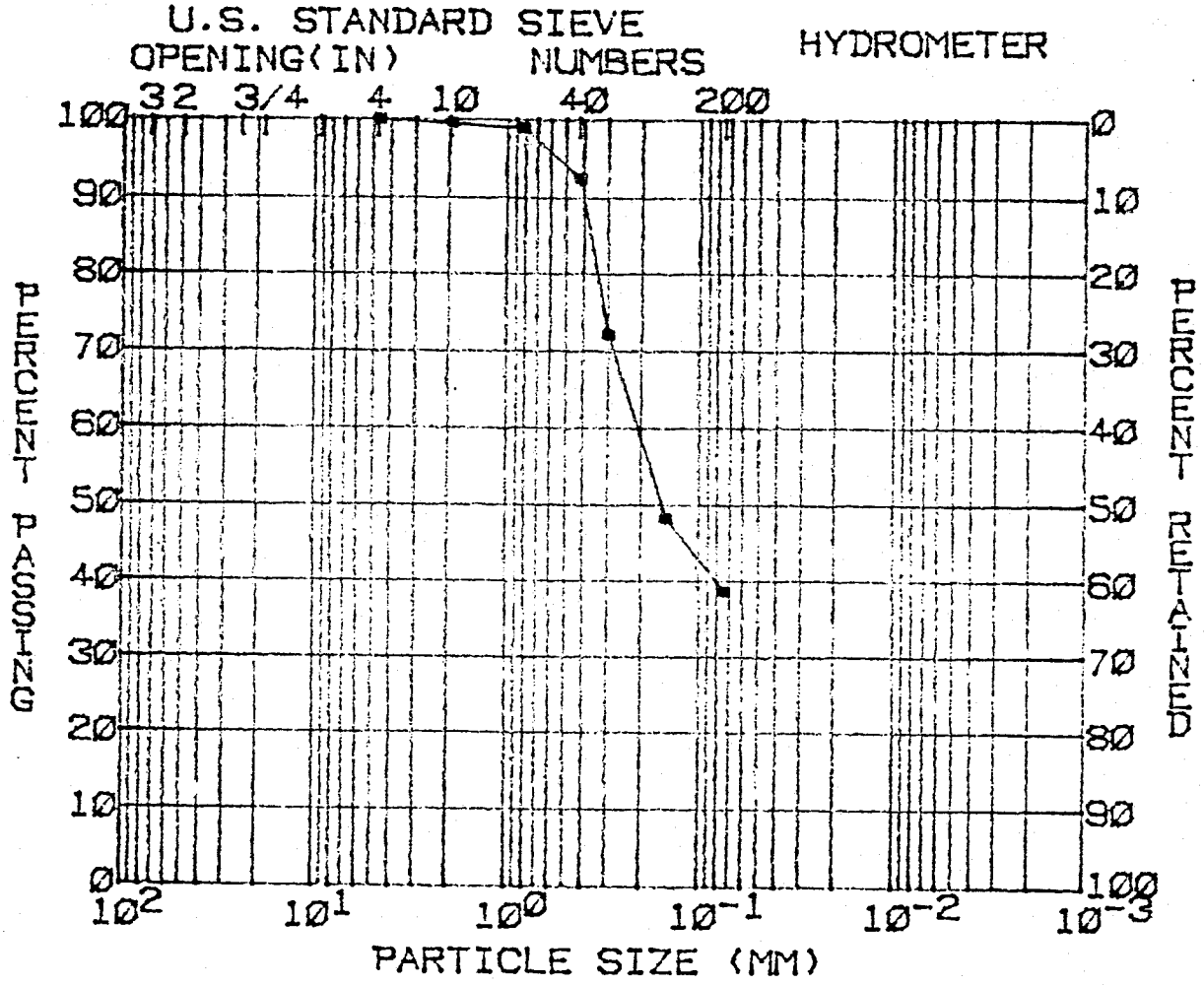
L.L.(%) = 23
P.I.(%) = 7

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-2P
EL. :
SAMPLE:GR.30
DATE :12-19-84



GRAVEL(%)= 0
SAND(%) = 61
SILT(%) = 39
CLAY(%) = 0

D10(MM) = 0.0093
D30(MM) = 0.0396
D60(MM) = 0.2101
COEF UNIF=22.6

SOIL SYMBOL= SM-SC
MOISTURE(%)= --
SP. GR. = 2.65

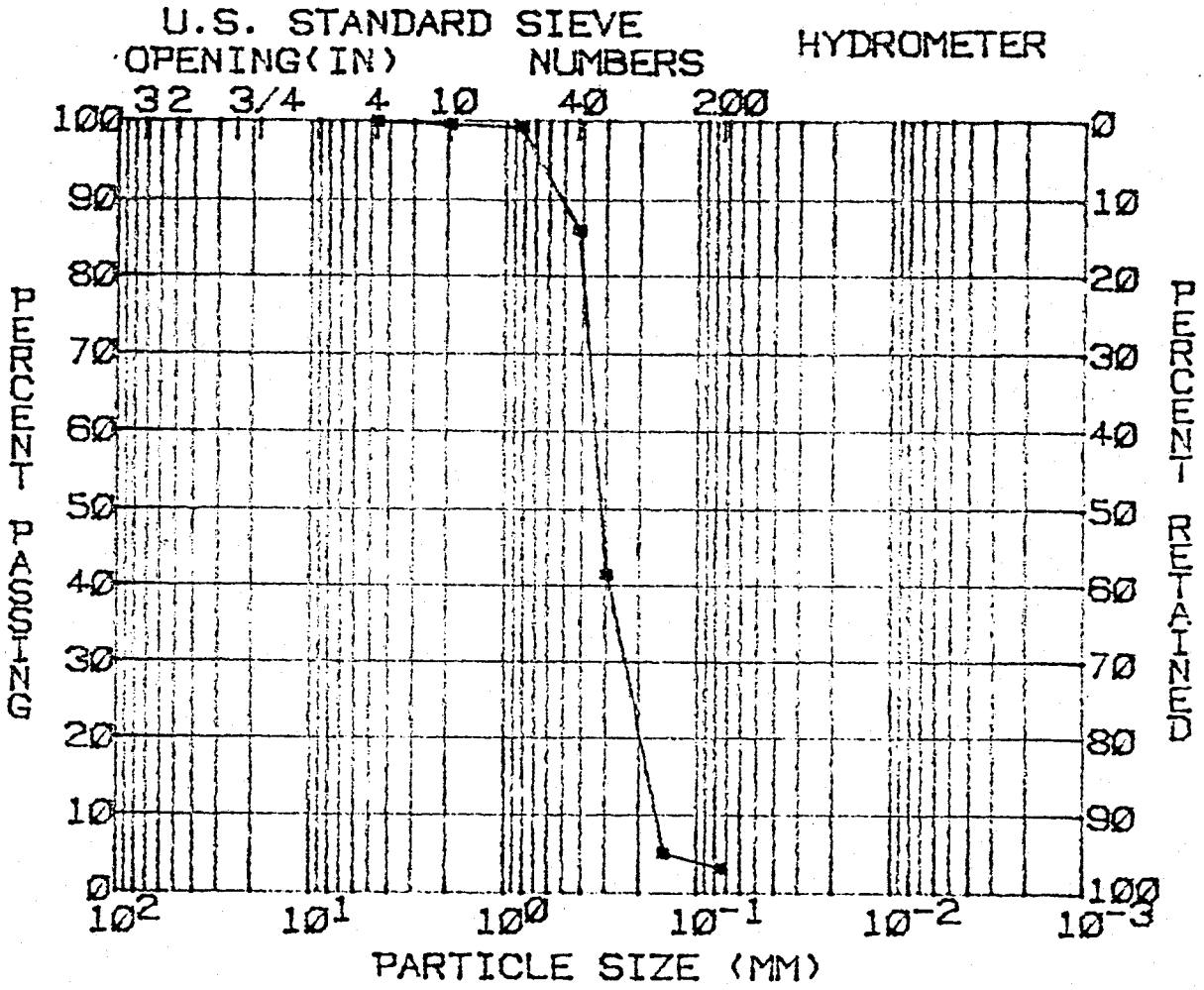
L.L.(%) = 20
P.I.(%) = 5

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-2P
EL. :
SAMPLE:GR.31
DATE :12-19-84



GRAVEL(%)= 0
SAND(%) = 97
SILT(%) = 3
CLAY(%) = 0

D10(MM) = 0.1647
D30(MM) = 0.2408
D60(MM) = 0.3465
COEF UNIF= 2.1

SOIL SYMBOL= SP
MOISTURE(%)= --
SP. GR. = 2.65

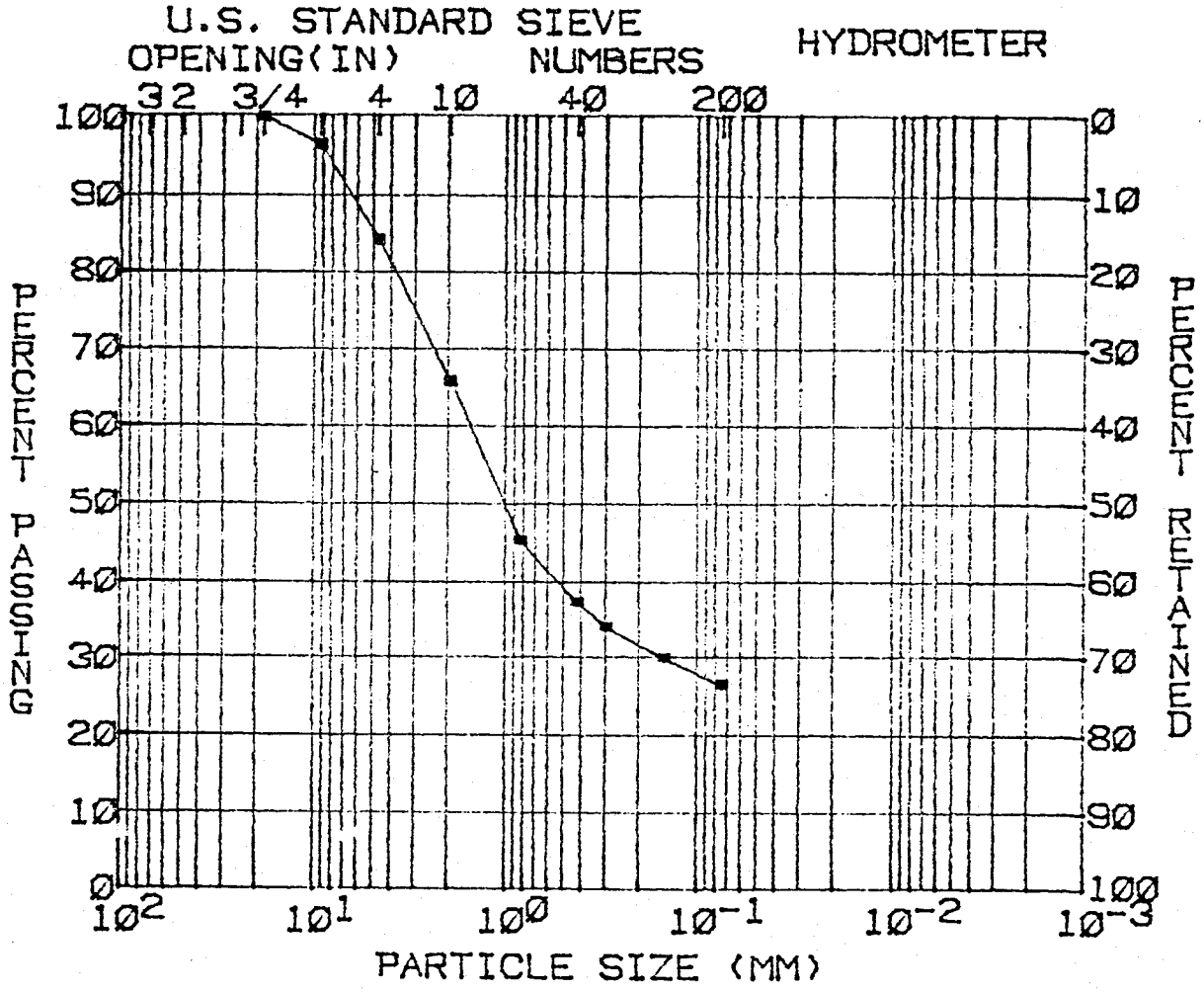
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-3
EL. :
SAMPLE:GR.12
DATE :12-17-84



GRAVEL(%)= 16
SAND(%) = 58
SILT(%) = 26
CLAY(%) = 0

D10(MM) = 0.0028
D30(MM) = 0.1403
D60(MM) = 1.5546
COEF UNIF) 100

SOIL SYMBOL= SM-SC
MOISTURE(%)= --
SP. GR. = 2.65

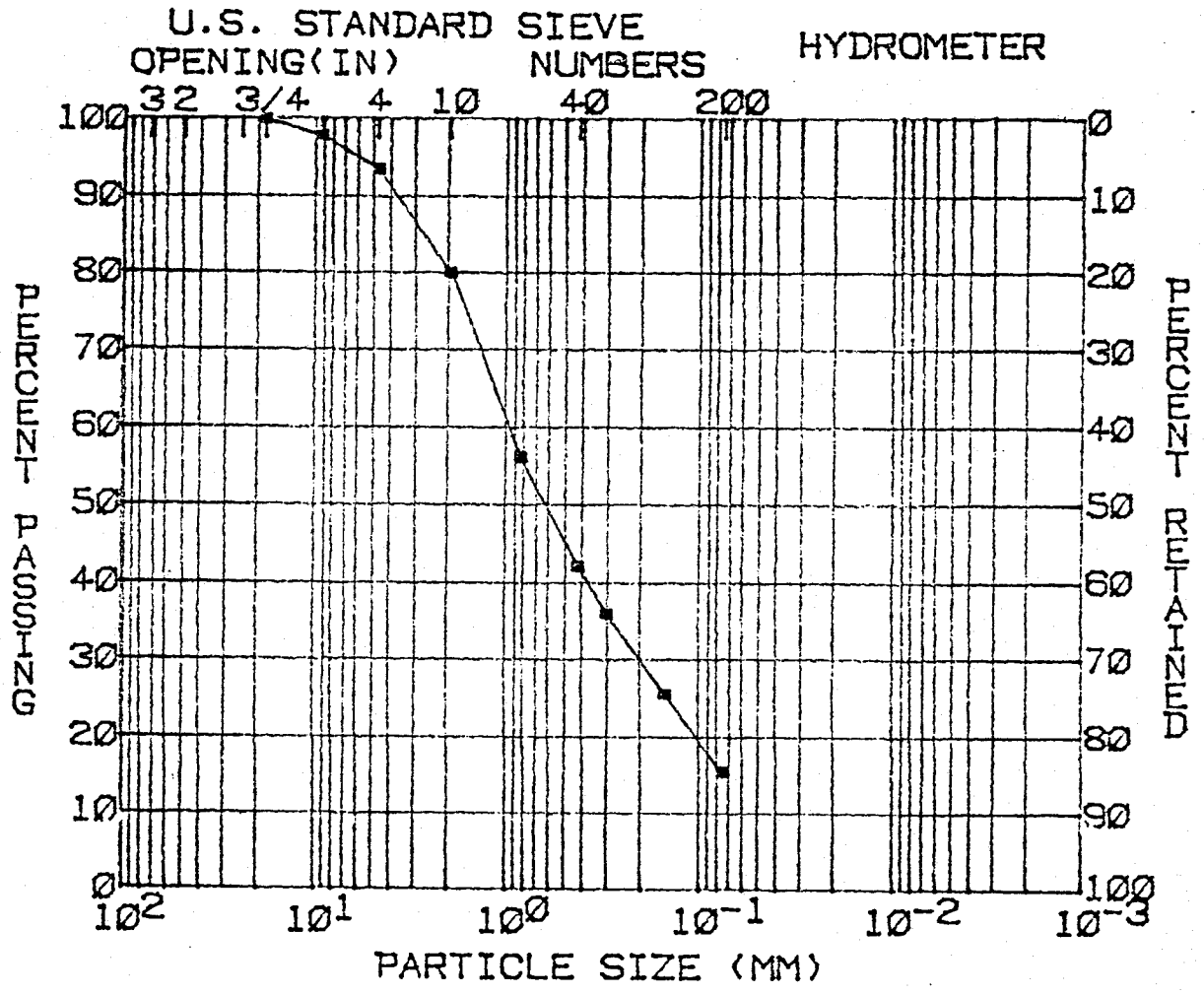
L.L.(%) = 33
P.I.(%) = 11

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-3
EL. :
SAMPLE:GR.13
DATE :12-17-84



GRAVEL(%)= 6
SAND(%) = 79
SILT(%) = 15
CLAY(%) = 0

D10(MM) = 0.0516
D30(MM) = 0.2005
D60(MM) = 0.9654
COEF UNIF=18.7

SOIL SYMBOL= SM
MOISTURE(%)= --
SP. GR. = 2.65

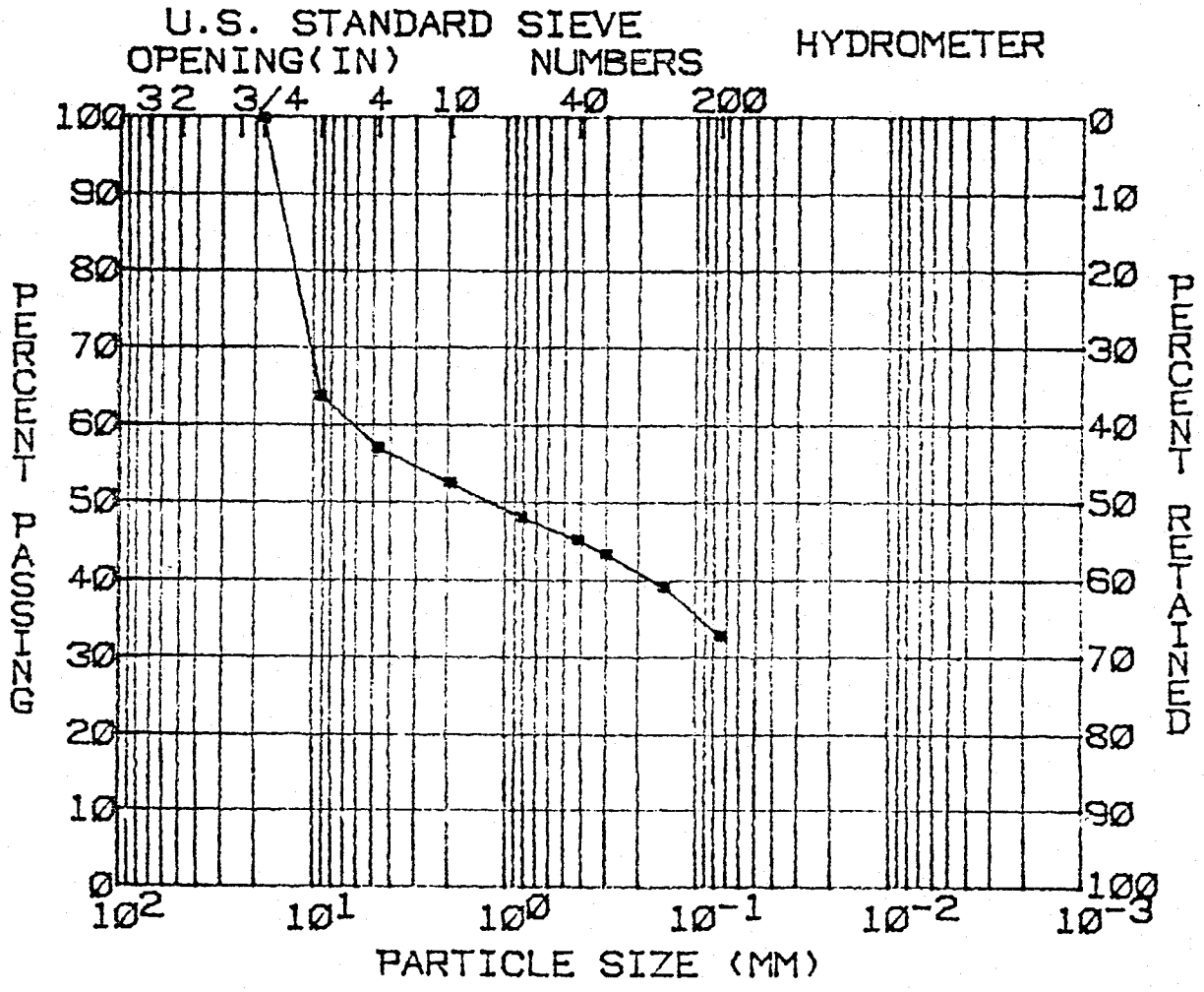
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-3
EL. :
SAMPLE:GR.14
DATE :12-17-84



GRAVEL(%)= 43
SAND(%) = 25
SILT(%) = 32
CLAY(%) = 0

D10(MM) = 0.0063
D30(MM) = 0.0555
D60(MM) = 6.2145
COEF UNIF> 100

SOIL SYMBOL= GC
MOISTURE(%)= --
SP. GR. = 2.65

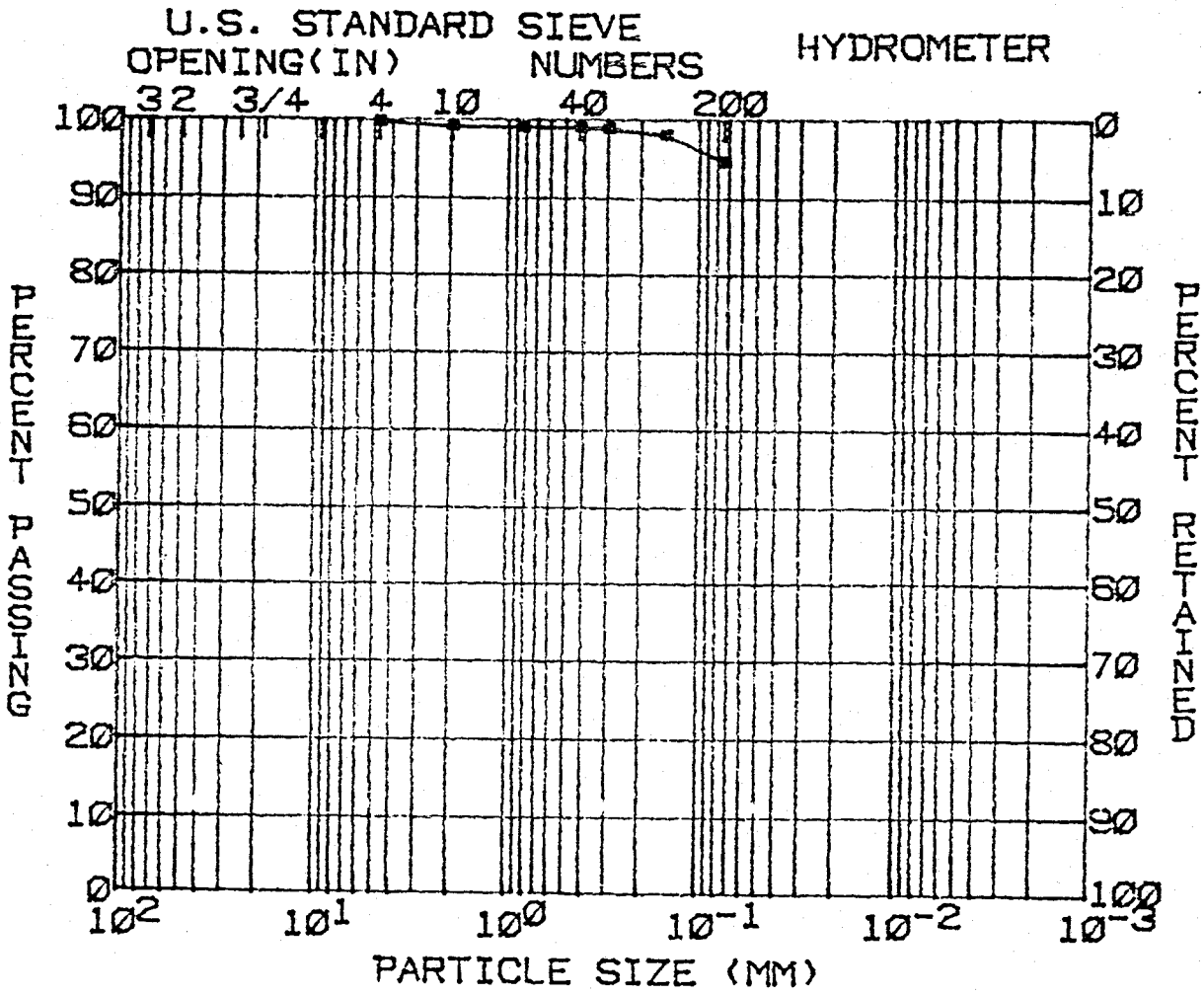
L.L.(%) = 30
P.I.(%) = 10

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-3
EL. :
SAMPLE:GR.15
DATE :12-17-84



GRAVEL(%)= 0
SAND(%) = 5
SILT(%) = 95
CLAY(%) = 0

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL
MOISTURE(%)= --
SP. GR. = 2.65

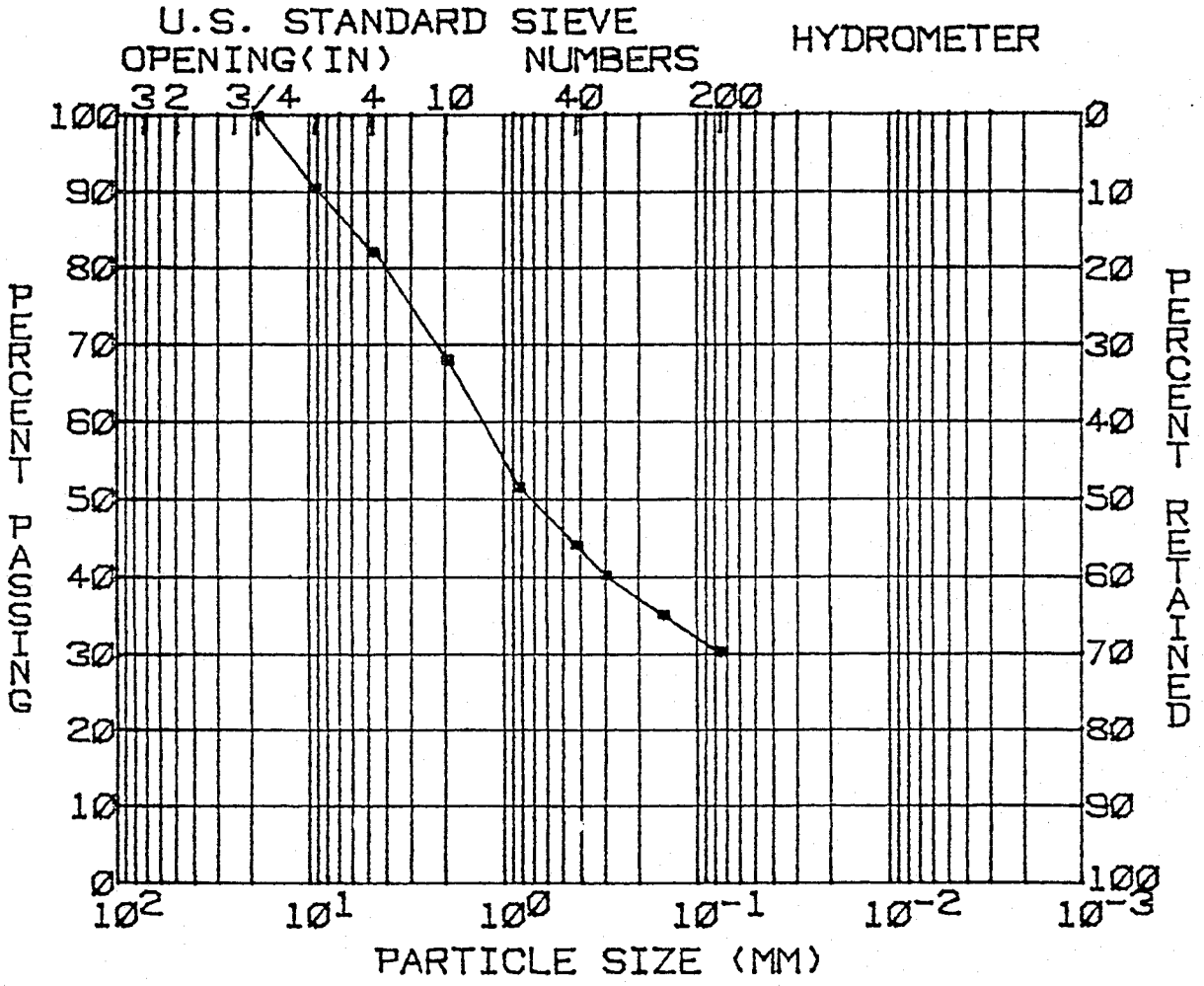
L.L.(%) = 49
P.I.(%) = 24

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-4
EL. :
SAMPLE:GR.7
DATE :12-17-84



GRAVEL(%)= 17
SAND(%) = 52
SILT(%) = 30
CLAY(%) = 1

D10(MM) = 0.0043
D30(MM) = 0.0716
D60(MM) = 1.2902
COEF UNIF> 100

SOIL SYMBOL= SM-SC
MOISTURE(%)= --
SP. GR. = 2.65

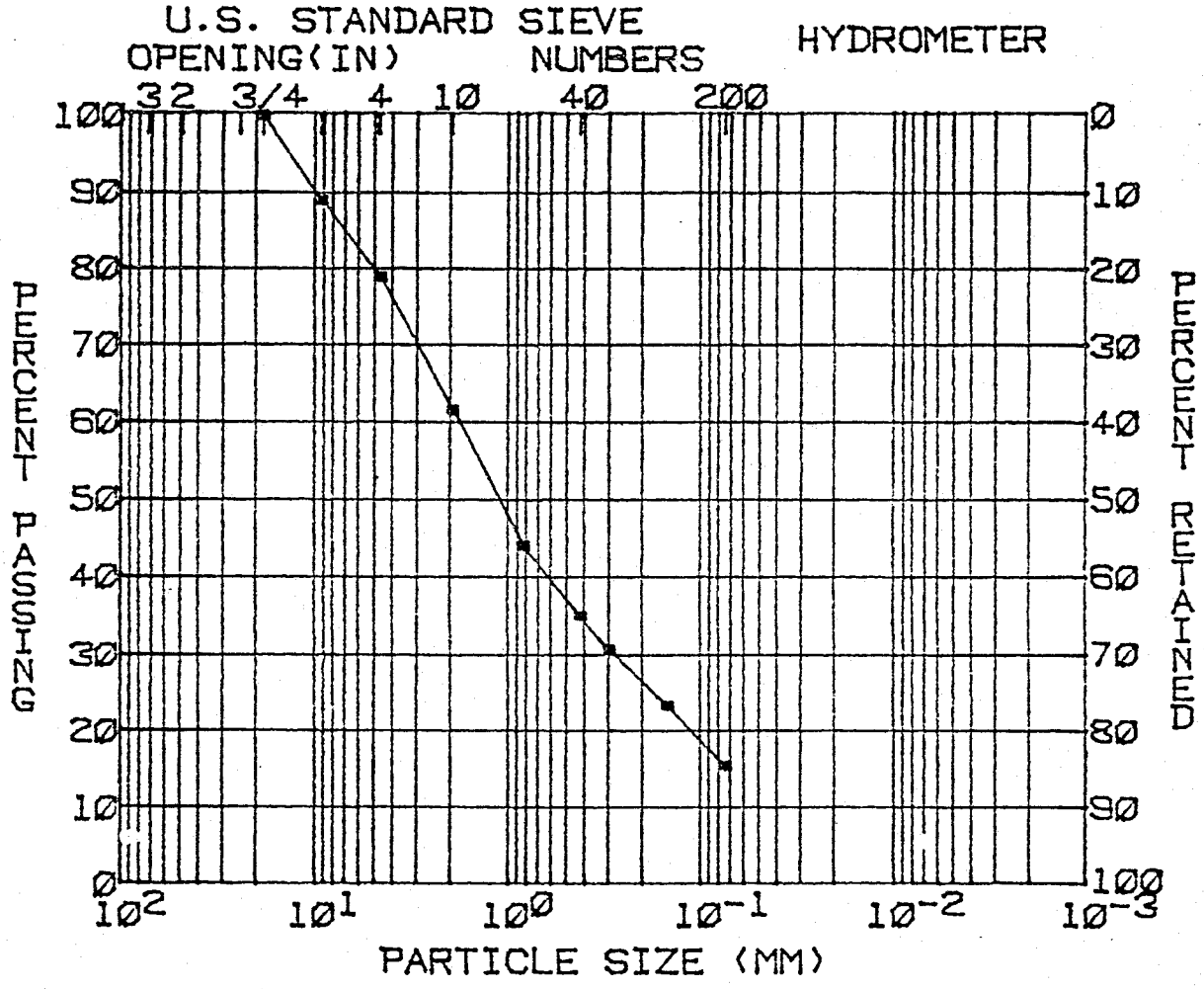
L.L.(%) = 35
P.I.(%) = 12

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-4
EL. :
SAMPLE:GR.8
DATE :12-7-84



GRAVEL(%)= 21
SAND(%) = 64
SILT(%) = 15
CLAY(%) = 0

D10(MM) = 0.0460
D30(MM) = 0.2721
D60(MM) = 1.8016
COEF UNIF=39.2

SOIL SYMBOL= SM
MOISTURE(%)= --
SP. GR. = 2.65

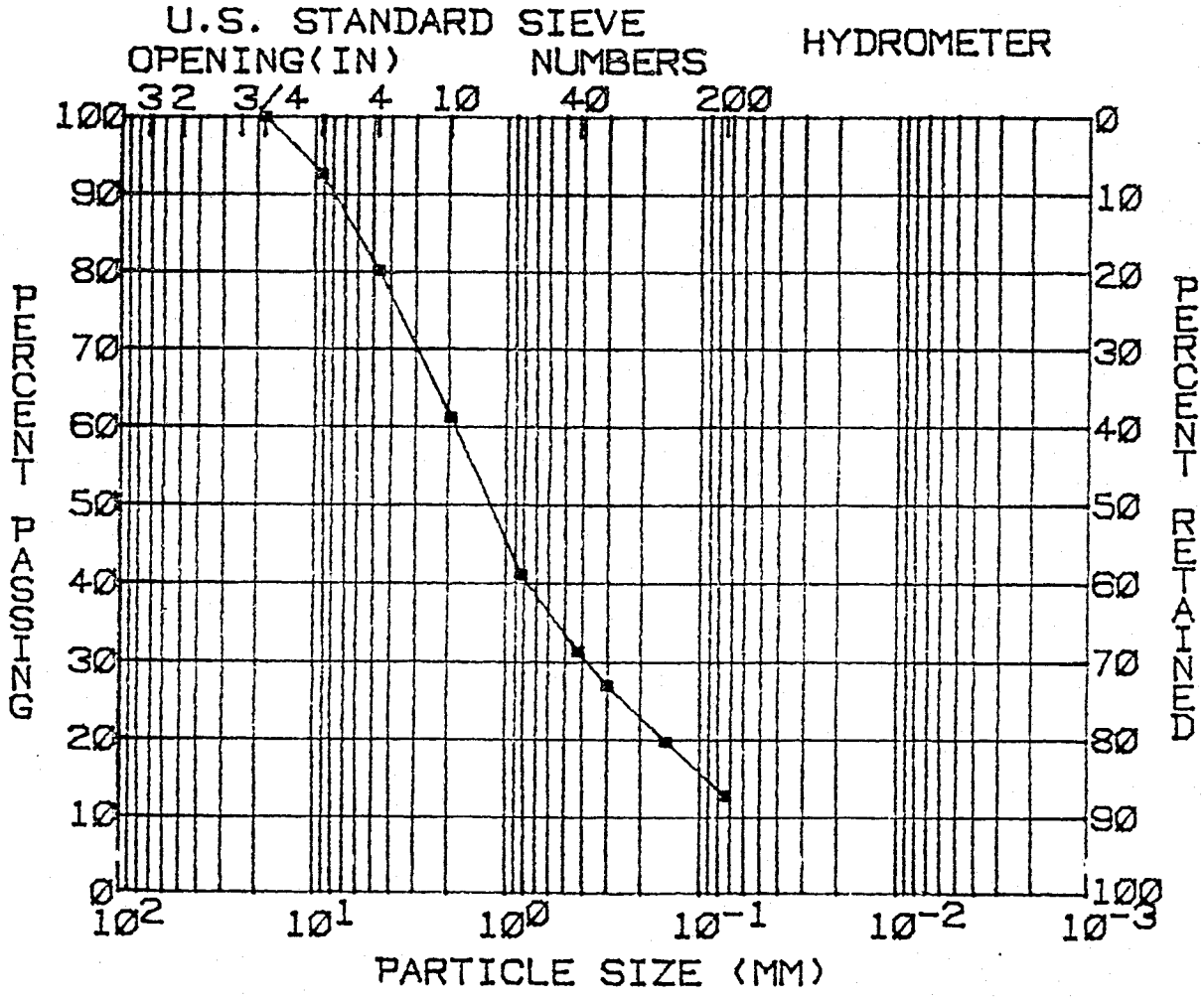
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-4
EL. :
SAMPLE:GR.9
DATE :12-17-84



GRAVEL(%)= 19
SAND(%) = 68
SILT(%) = 13
CLAY(%) = 0

D10(MM) = 0.0568
D30(MM) = 0.3749
D60(MM) = 1.8717
COEF UNIF=32.9

SOIL SYMBOL= SM
MOISTURE(%)= --
SP. GR. = 2.65

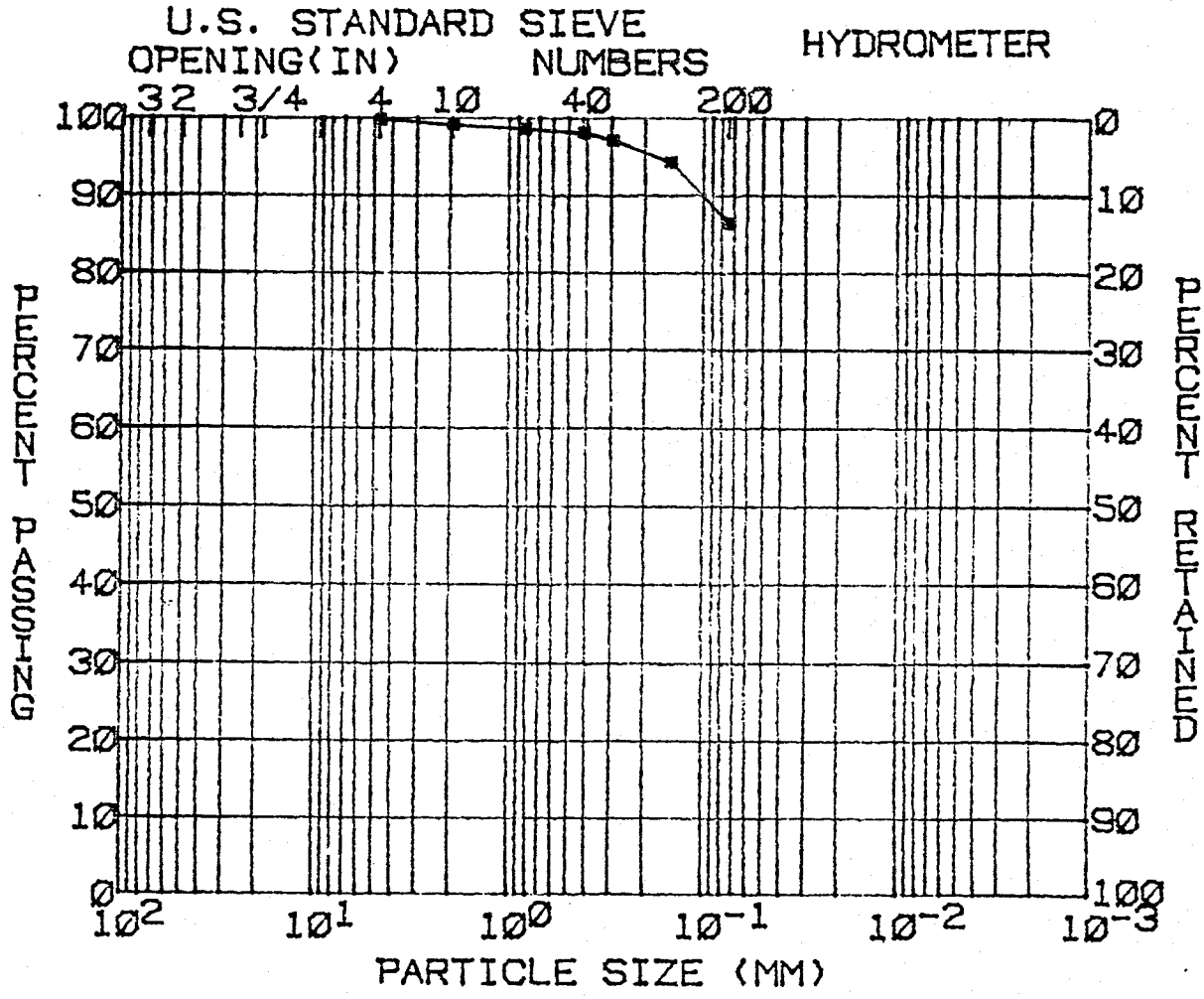
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-4
EL. :
SAMPLE:GR.10
DATE :12-17-84



GRAVEL(%)= 0
SAND(%) = 13
SILT(%) = 87
CLAY(%) = 0

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL
MOISTURE(%)= --
SP. GR. = 2.65

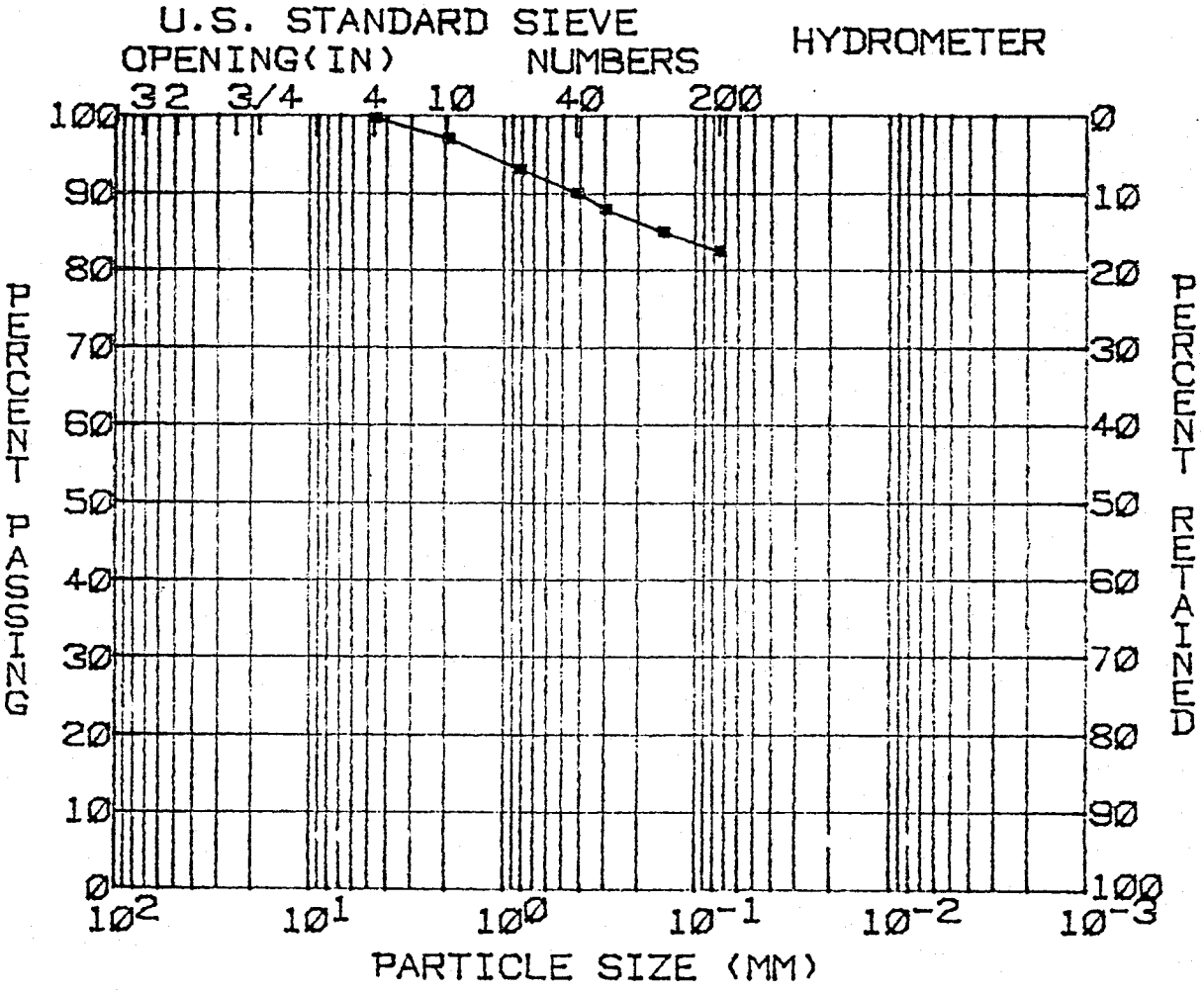
L.L.(%) = 47
P.I.(%) = 25

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-4
EL. :
SAMPLE:GR.11
DATE :12-17-84



GRAVEL(%)= 0
SAND(%) = 17
SILT(%) = 83
CLAY(%) = 0

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL
MOISTURE(%)= --
SP. GR. = 2.65

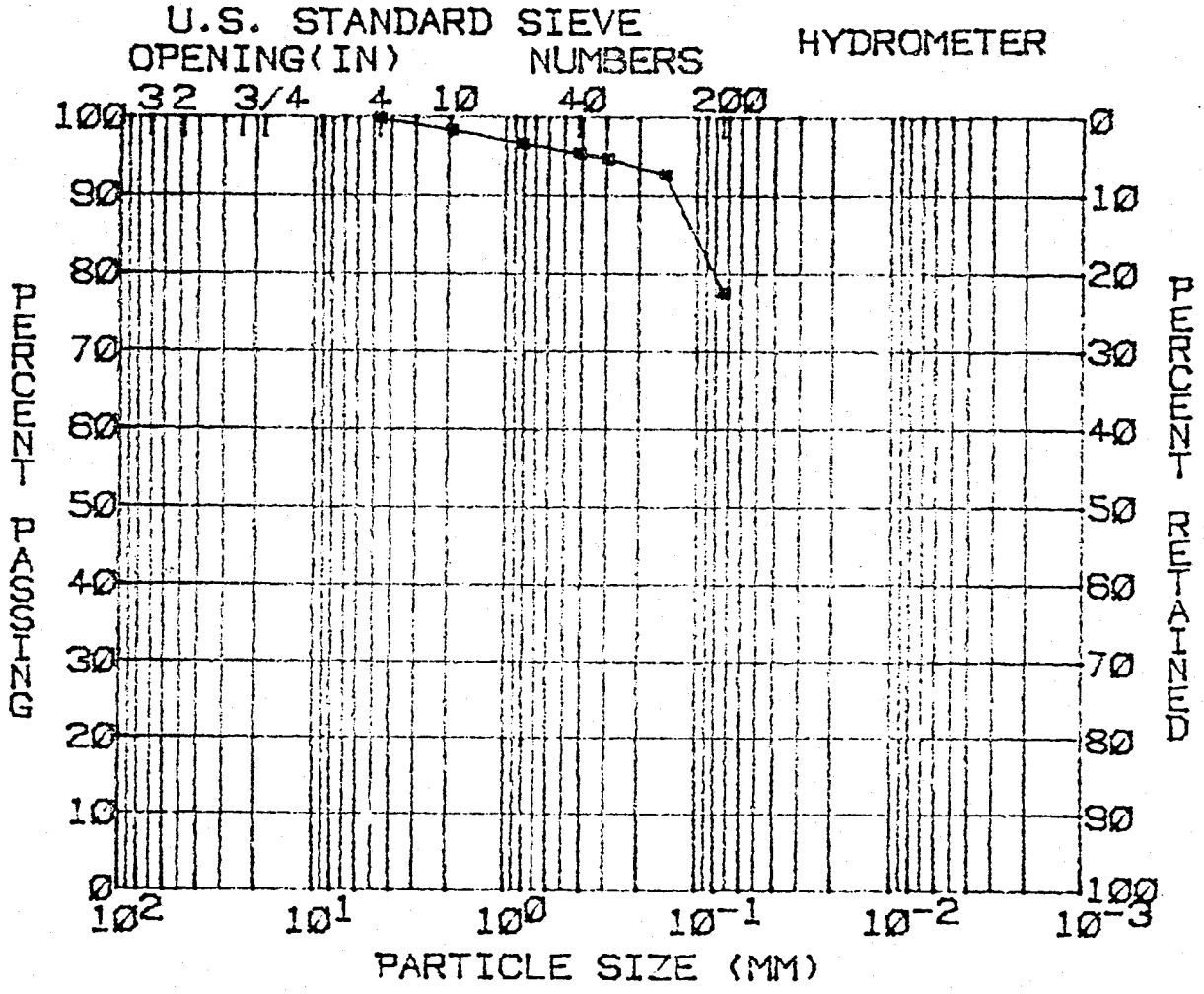
L.L.(%) = 46
P.I.(%) = 22

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-5
EL. :
SAMPLE:GR.23
DATE :12-18-84



GRAVEL(%)= 0
SAND(%) = 22
SILT(%) = 78
CLAY(%) = 0

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL
MOISTURE(%)= --
SP. GR. = 2.65

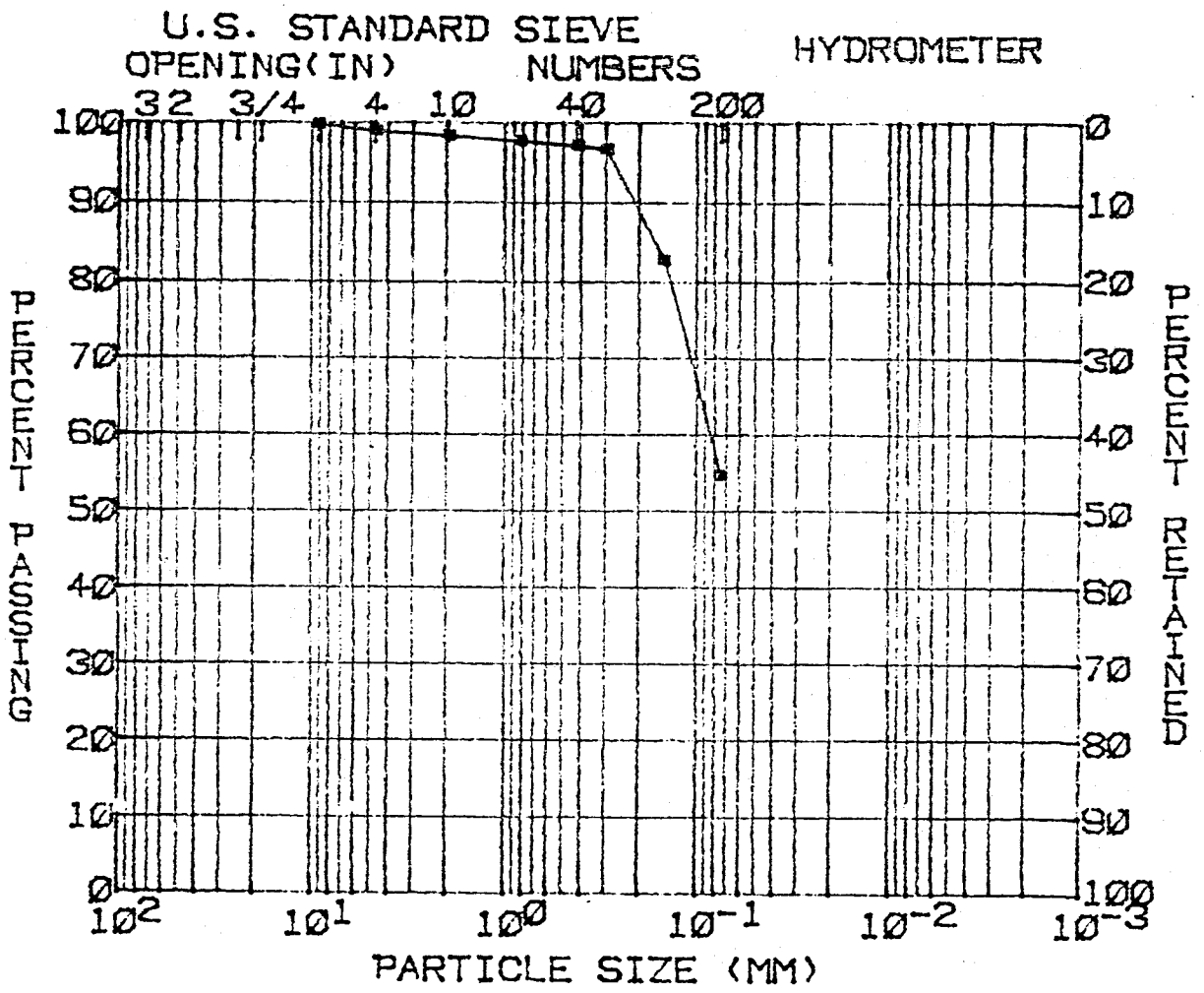
L.L.(%) = 37
P.I.(%) = 16

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-5
EL. :
SAMPLE:GR.24
DATE :12-18-84



GRAVEL(%)= 0
SAND(%) = 45
SILT(%) = 55
CLAY(%) = 0

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL
MOISTURE(%)= --
SP. GR. = 2.65

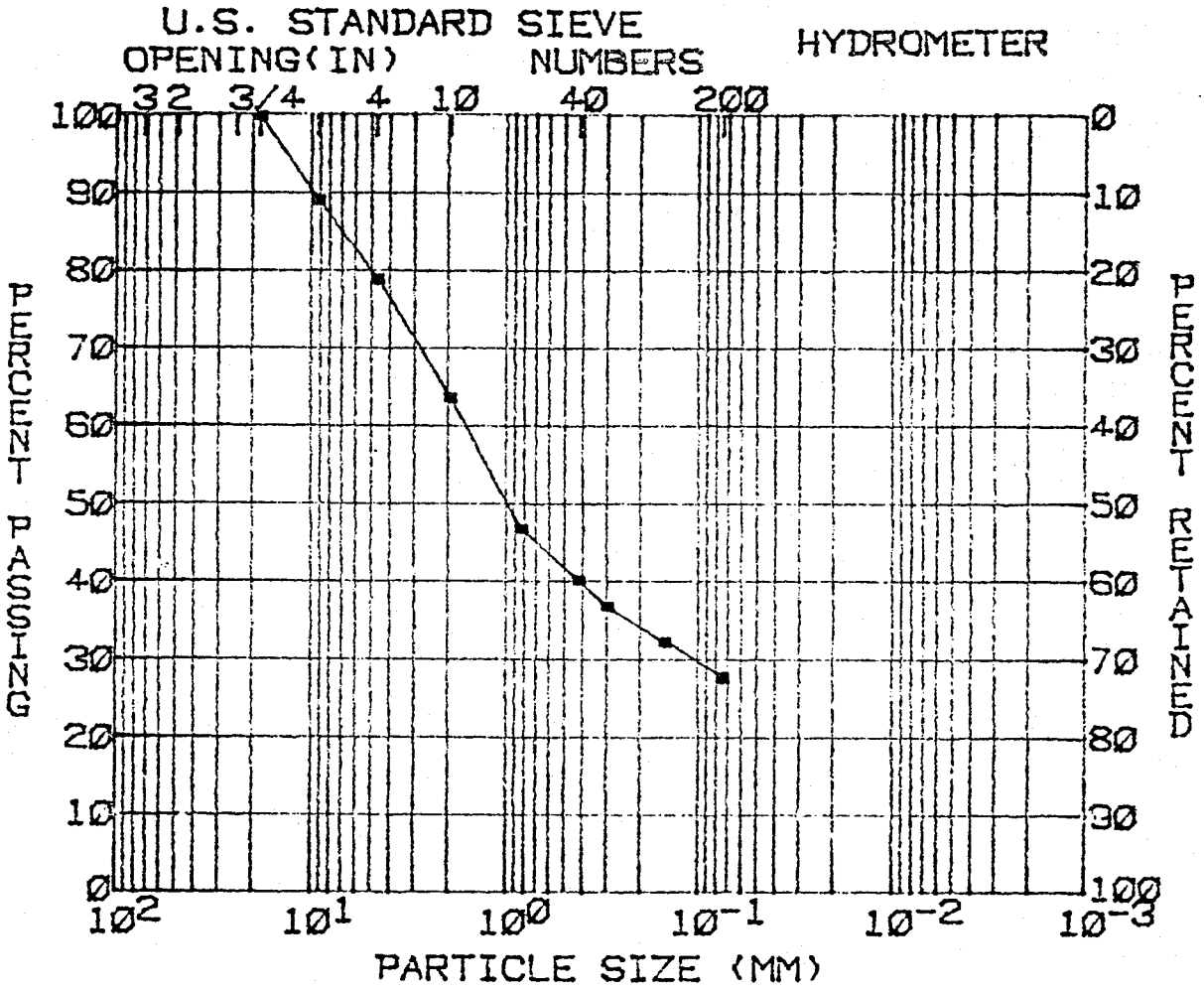
L.L.(%) = 30
P.I.(%) = 9

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-5P
EL. :
SAMPLE:GR.20
DATE :12-17-84



GRAVEL(%)= 21
SAND(%) = 52
SILT(%) = 27
CLAY(%) = 0

D10(MM) = 0.0060
D30(MM) = 0.1052
D60(MM) = 1.6155
COEF UNIF) 100

SOIL SYMBOL= SM-SC
MOISTURE(%)= --
SP. GR. = 2.65

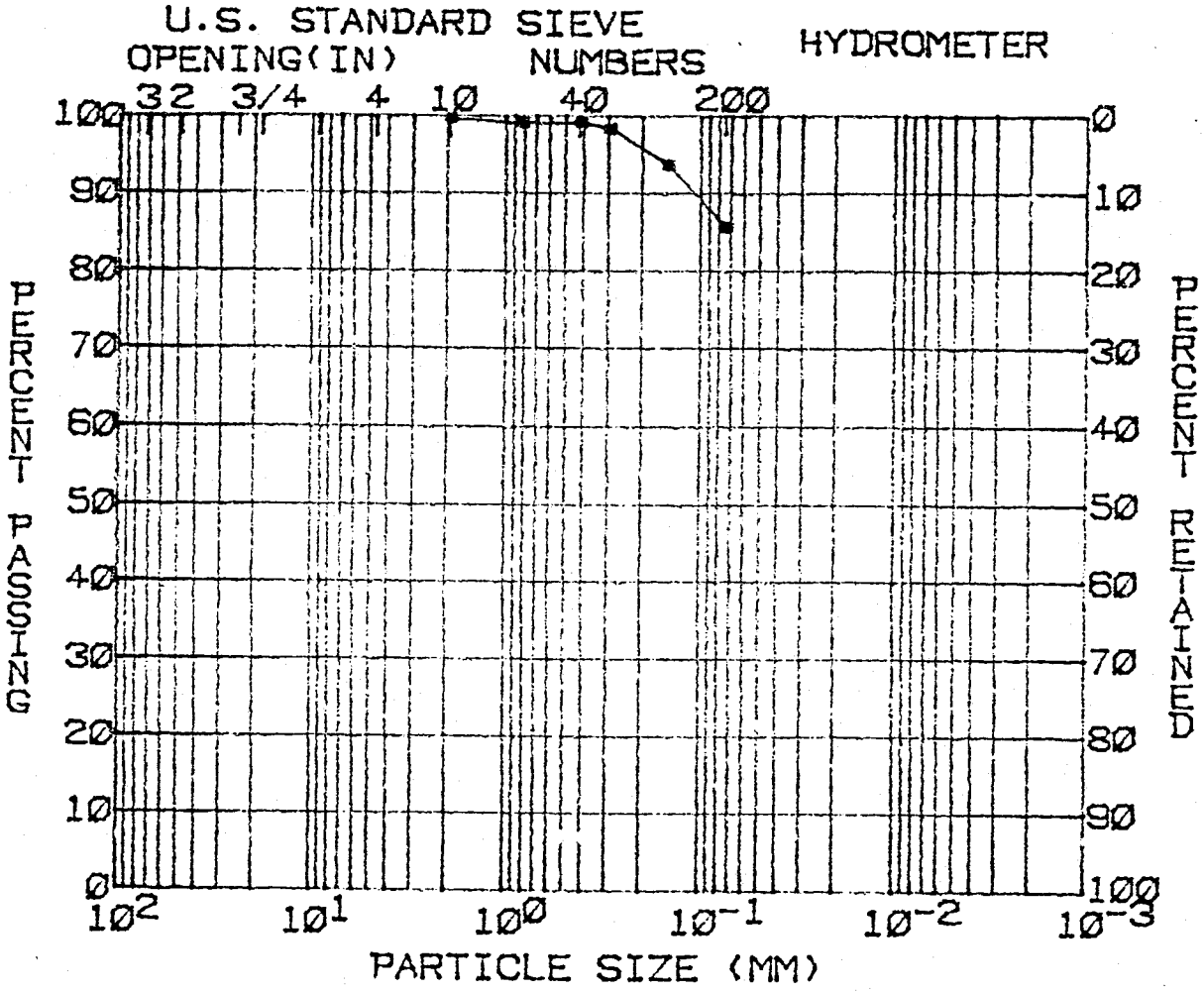
L.L.(%) = 36
P.I.(%) = 12

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-5P
EL. :
SAMPLE:GR.21
DATE :12-17-84



GRAVEL(%)= 0
SAND(%) = 14
SILT(%) = 86
CLAY(%) = 0

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL
MOISTURE(%)= --
SP. GR. = 2.65

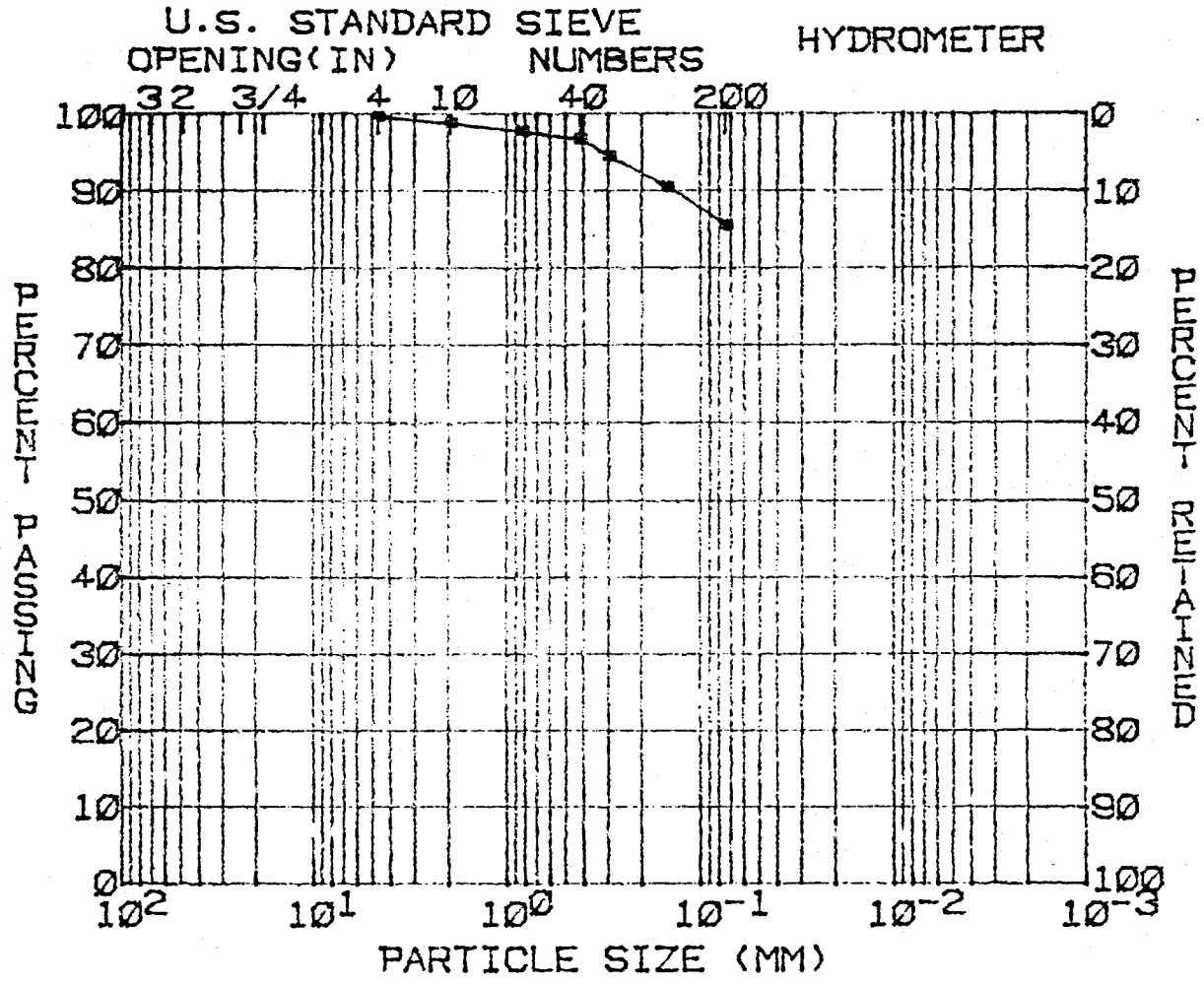
L.L.(%) = 40
P.I.(%) = 19

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-5P
EL. :
SAMPLE:GR.22
DATE :12-17-84



GRAVEL(%)= 0
SAND(%) = 14
SILT(%) = 86
CLAY(%) = 0

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL
MOISTURE(%)= --
SP. GR. = 2.65

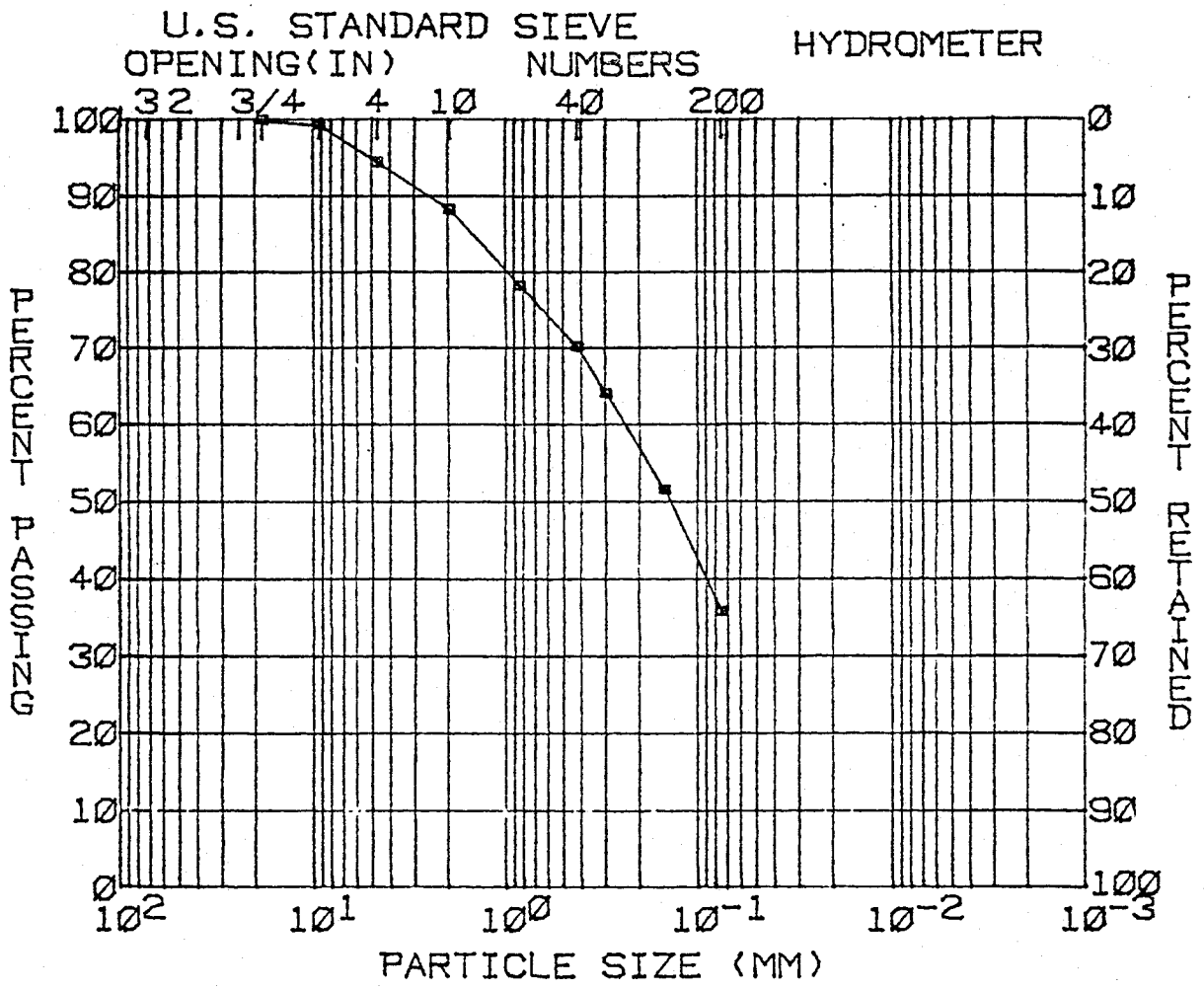
L.L.(%) = 45
P.I.(%) = 21

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-6
EL. :
SAMPLE:GR.1
DATE :12-14-84



GRAVEL(%)= 5
SAND(%) = 59
SILT(%) = 36
CLAY(%) = 0

D10(MM) = 0.0242
D30(MM) = 0.0582
D60(MM) = 0.2370
COEF UNIF= 9.8

SOIL SYMBOL= SM
MOISTURE(%)= --
SP. GR. = 2.65

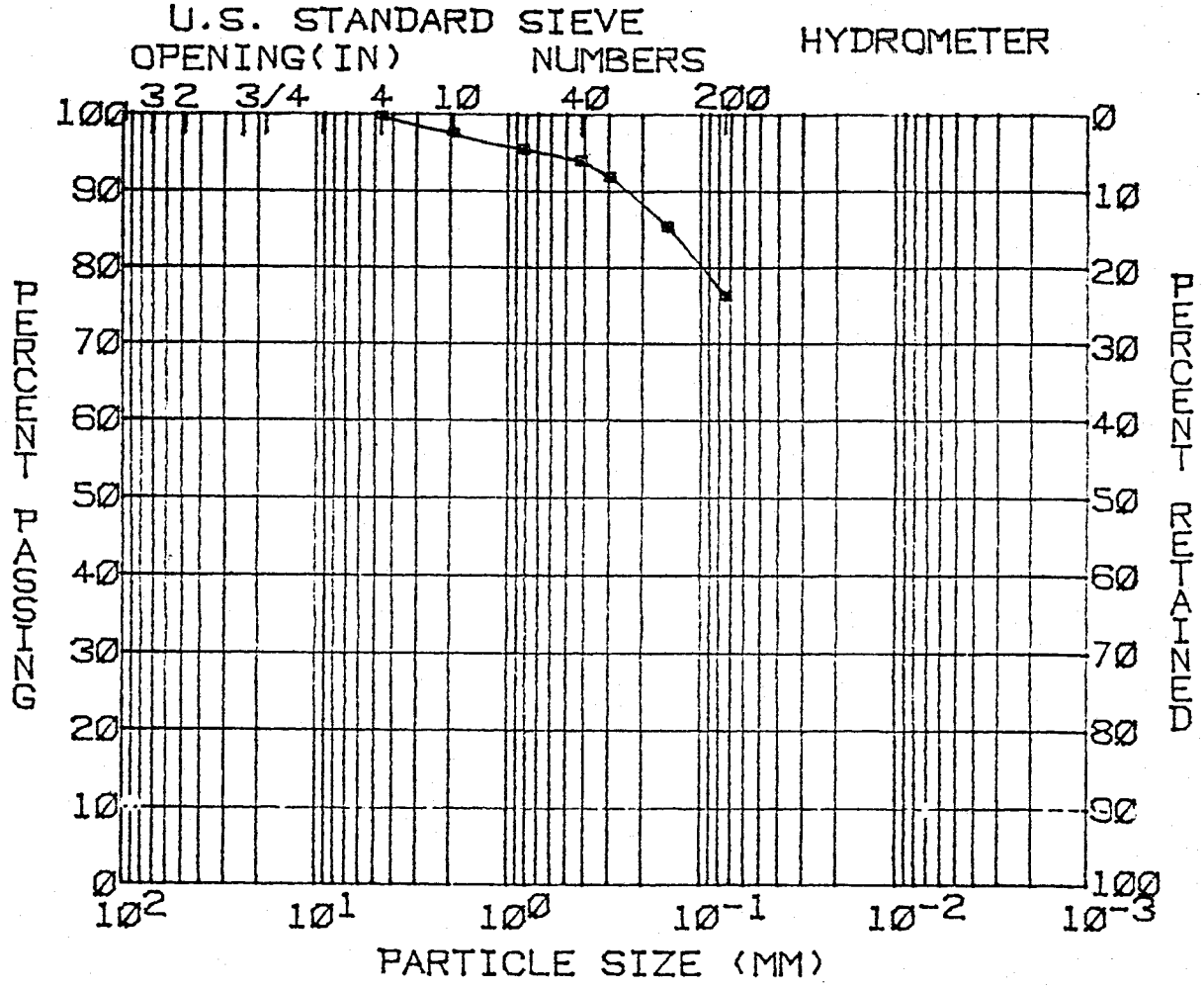
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING: SS-6
EL. :
SAMPLE:GR.2
DATE :12-14-84



GRAVEL(%)= 0
SAND(%) = 24
SILT(%) = 76
CLAY(%) = 0

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= ML
MOISTURE(%)= --
SP. GR. = 2.65

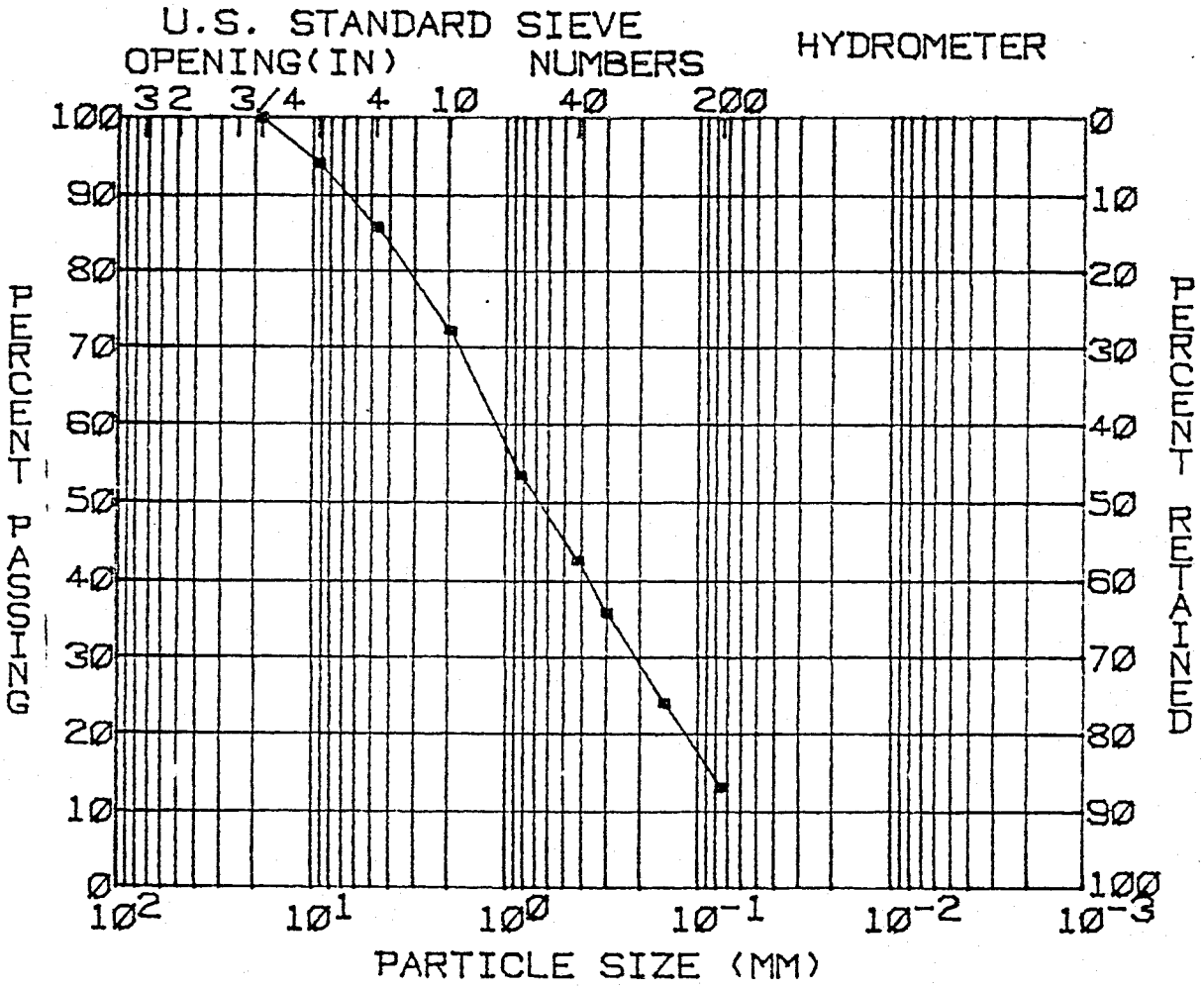
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING: SS-6
EL, :
SAMPLE:GR.3
DATE :12-14-84



GRAVEL(%)= 14
SAND(%) = 73
SILT(%) = 13
CLAY(%) = Ø

D1Ø(MM) = Ø.Ø614
D3Ø(MM) = Ø.2110
D6Ø(MM) = 1.1245
COEF UNIF=18.3

SOIL SYMBOL= SM
MOISTURE(%)= --
SP. GR. = 2.65

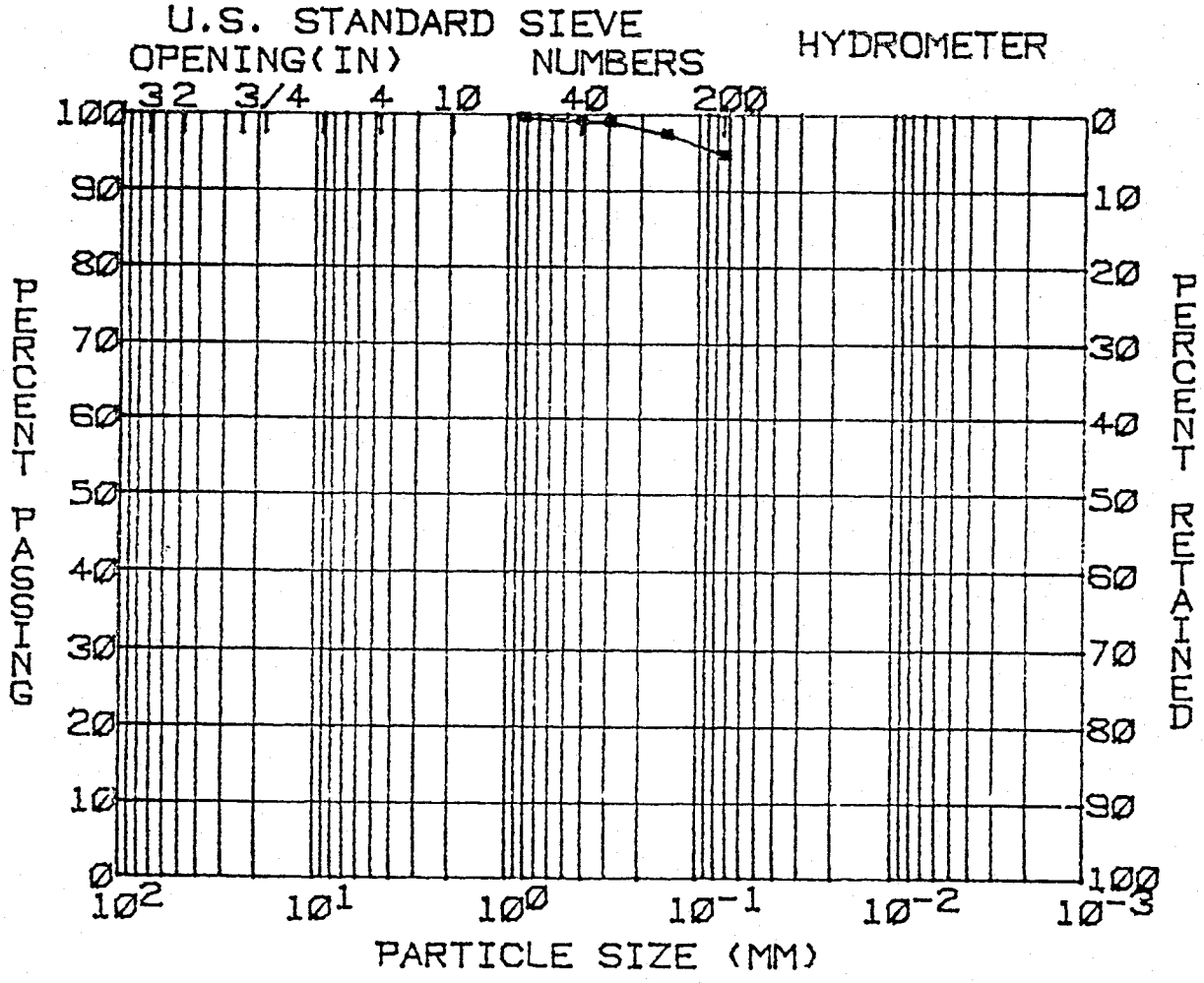
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT: BULL RUN S.P.
FEATURE: ASH POND 1
STATION:
RANGE :

BORING: SS-6
EL. :
SAMPLE: GR.4
DATE :12-14-84



GRAVEL(%) = 0
SAND(%) = 5
SILT(%) = 95
CLAY(%) = 0

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF = --

SOIL SYMBOL= CL
MOISTURE(%)= --
SP. GR. = 2.65

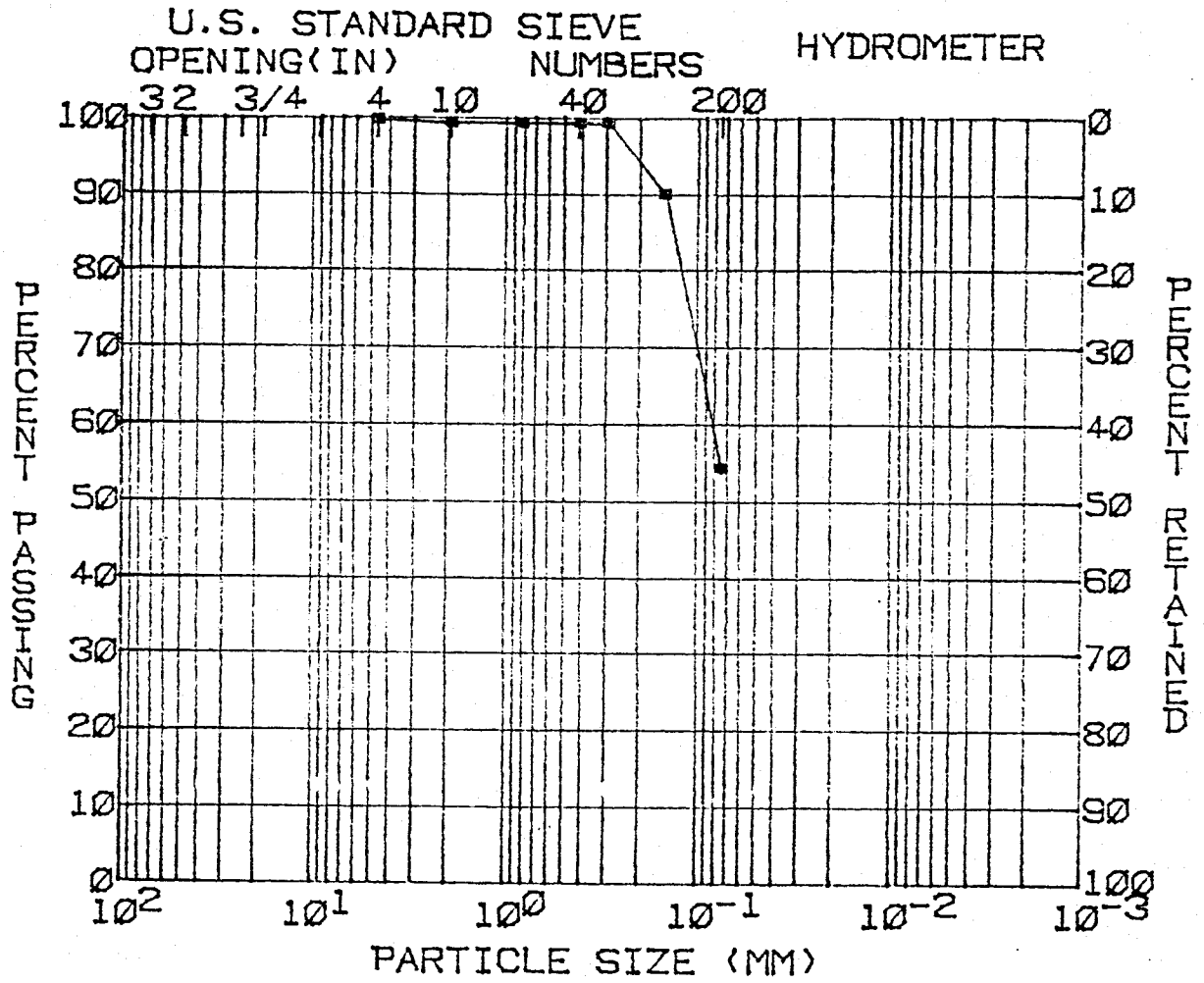
L.L.(%) = 46
P.I.(%) = 23

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-6
EL. :
SAMPLE:GR.5
DATE :12-14-84



GRAVEL(%)= 0
SAND(%) = 46
SILT(%) = 54
CLAY(%) = 0

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= ML
MOISTURE(%)= --
SP. GR. = 2.65

L.L.(%) = 24
P.I.(%) = 3

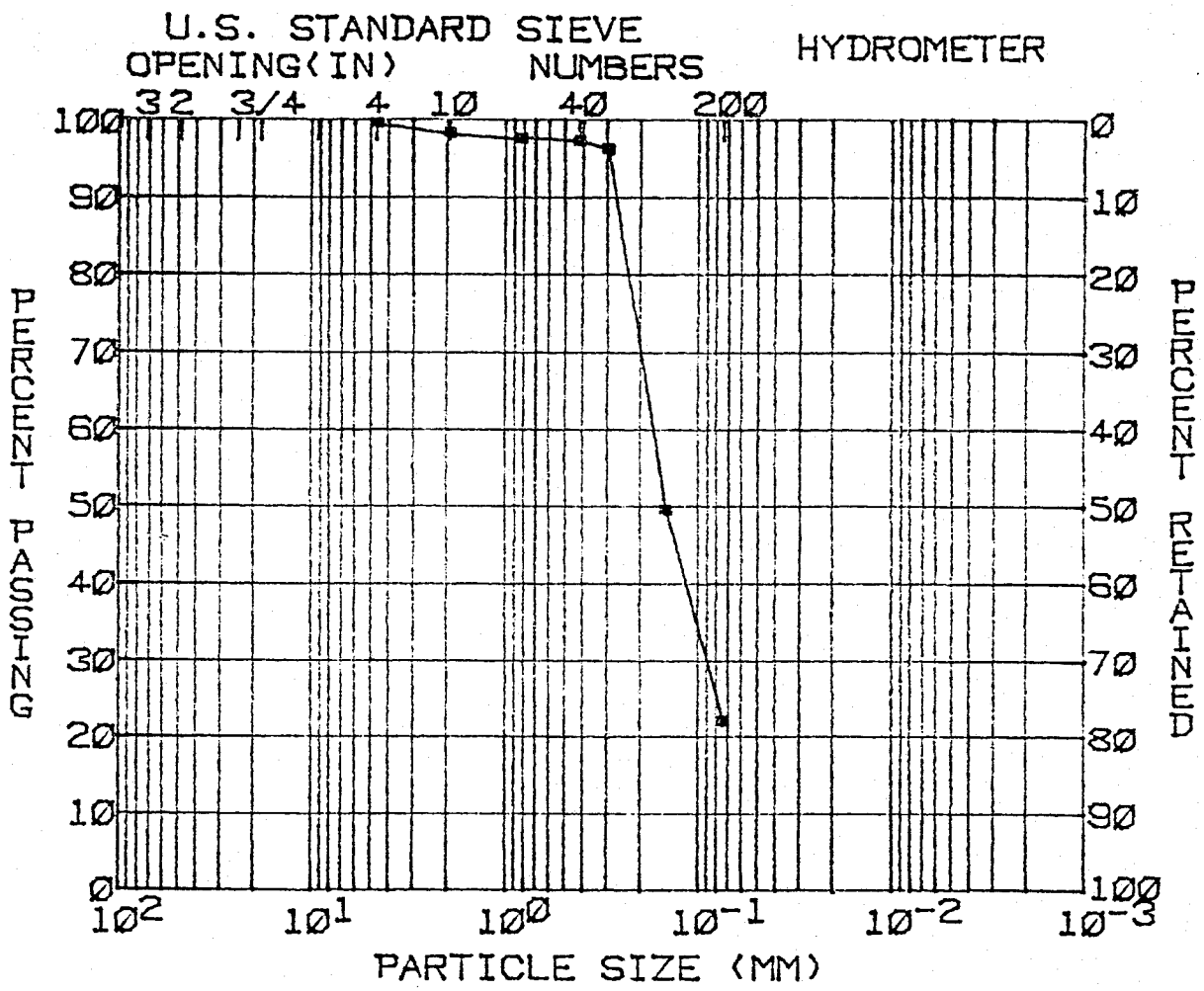
REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:SS-6
EL. :
SAMPLE:GR.6
DATE :12-14-84



GRAVEL(%)= 0
SAND(%) = 78
SILT(%) = 22
CLAY(%) = 0

D10(MM) = 0.0553
D30(MM) = 0.0914
D60(MM) = 0.1748
COEF UNIF= 3.2

SOIL SYMBOL= SM
MOISTURE(%)= --
SP. GR. = 2.65

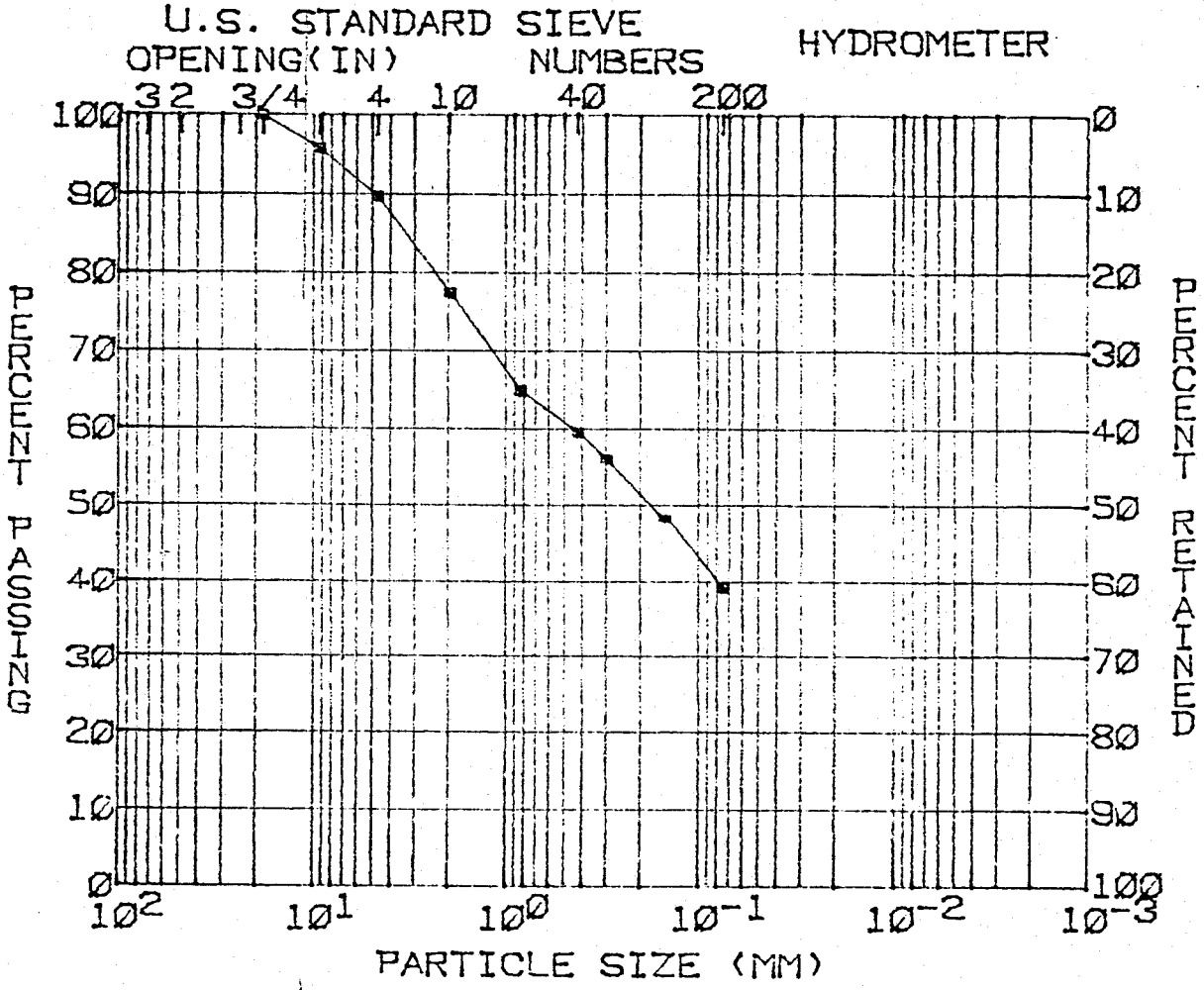
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND #1
STATION:
RANGE :

BORING:SS-14
EL. :
SAMPLE:GR.60
DATE :1-8-85



GRAVEL(%)= 10
SAND(%) = 51
SILT(%) = 39
CLAY(%) = 0

D10(MM) = 0.0090
D30(MM) = 0.0389
D60(MM) = 0.4283
COEF UNIF=47.6

SOIL SYMBOL= SM
MOISTURE(%)= --
SP. GR. = 2.65

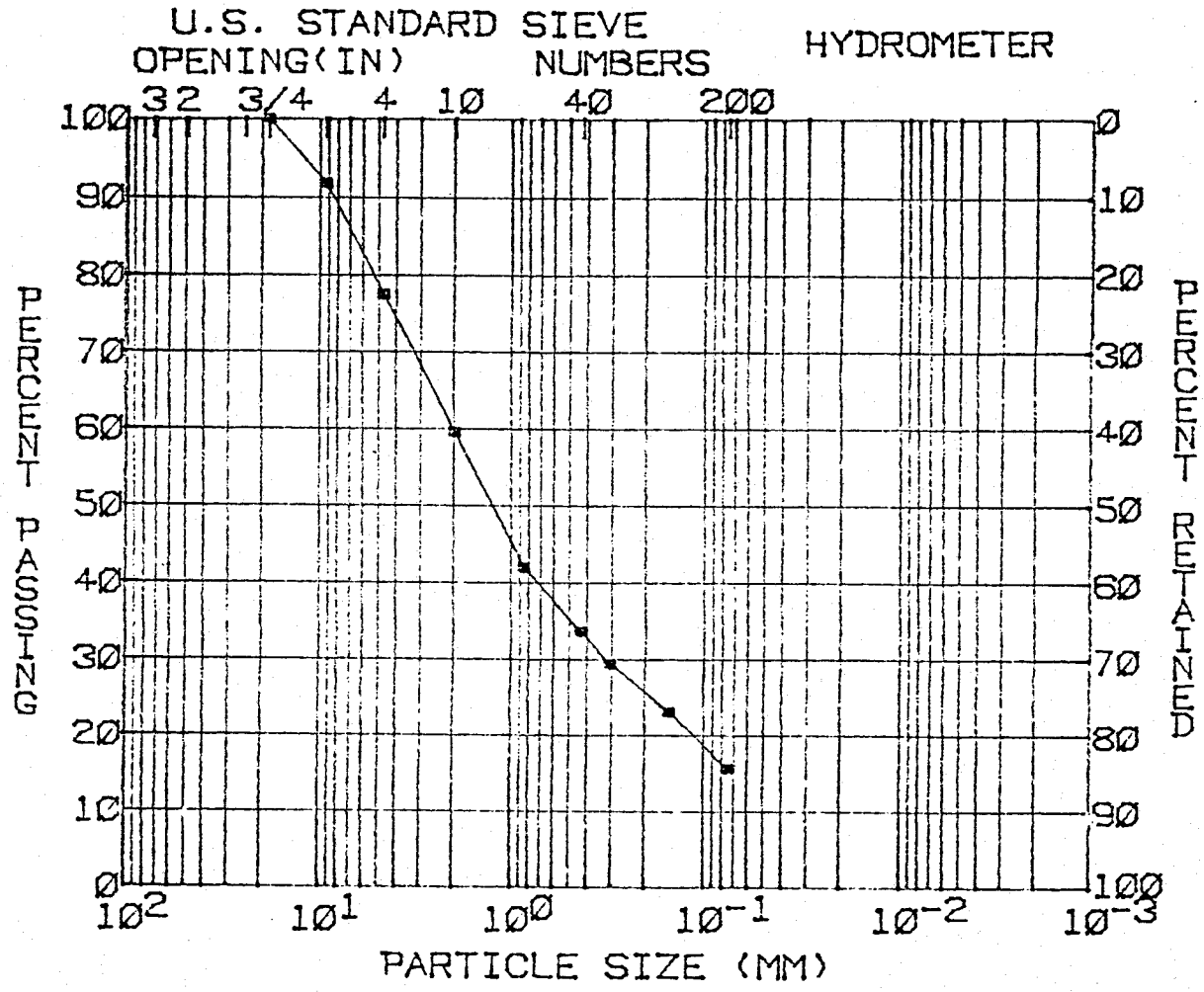
L.L.(%) = 37
P.I.(%) = 7

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND #1
STATION:
RANGE :

BORING:SS-14
EL. :
SAMPLE:GR.61
DATE :1-8-85



GRAVEL(%)= 22
SAND(%) = 62
SILT(%) = 16
CLAY(%) = 0

D10(MM) = 0.0443
D30(MM) = 0.3141
D60(MM) = 2.0198
COEF UNIF=45.6

SOIL SYMBOL= SM
MOISTURE(%)= --
SP. GR. = 2.65

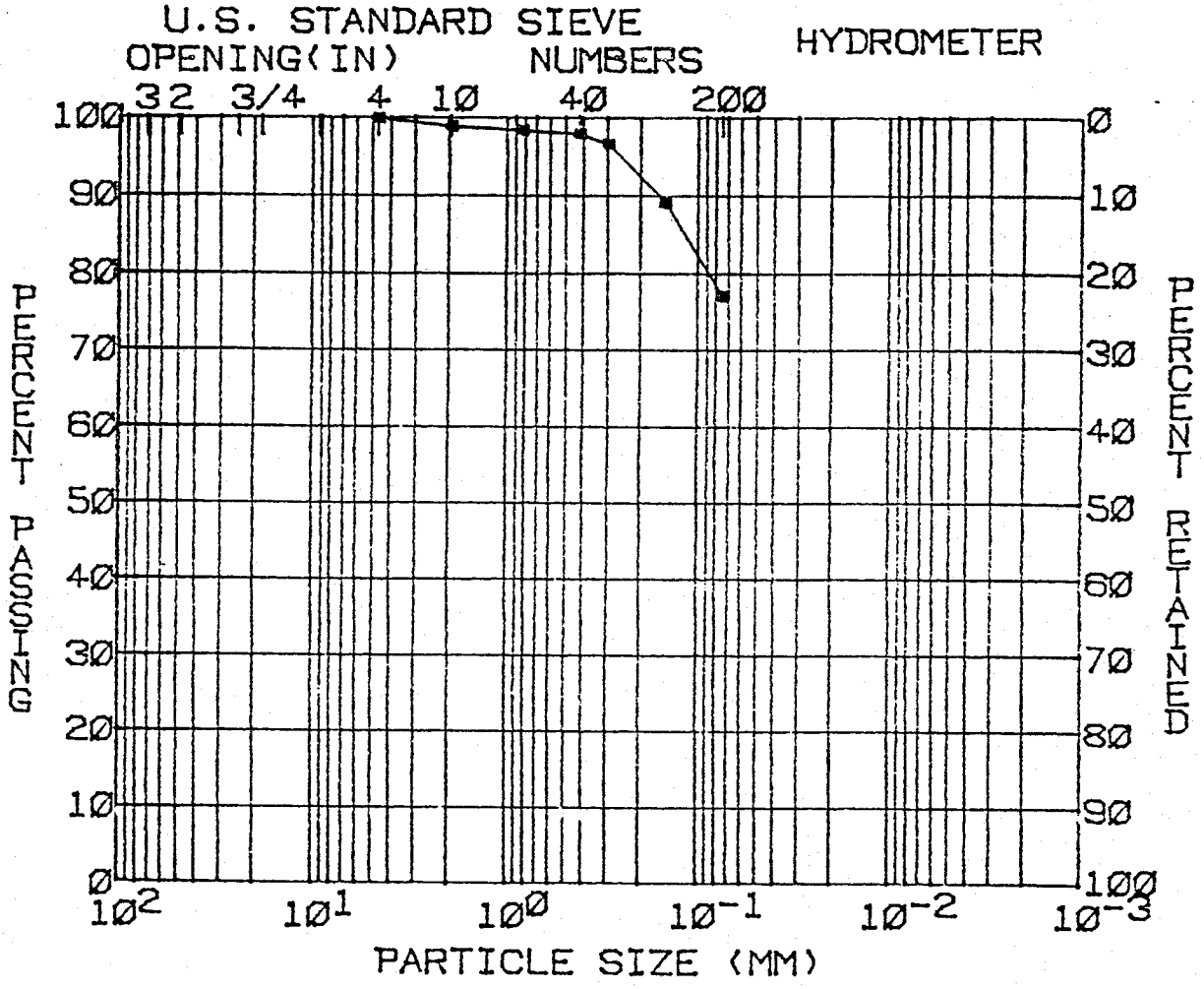
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND #1
STATION:
RANGE :

BORING:SS-14
EL. :
SAMPLE:GR.62
DATE :1-8-85



GRAVEL(%)= 0
SAND(%) = 23
SILT(%) = 77
CLAY(%) = 0

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL
MOISTURE(%)= --
SP. GR. = 2.65

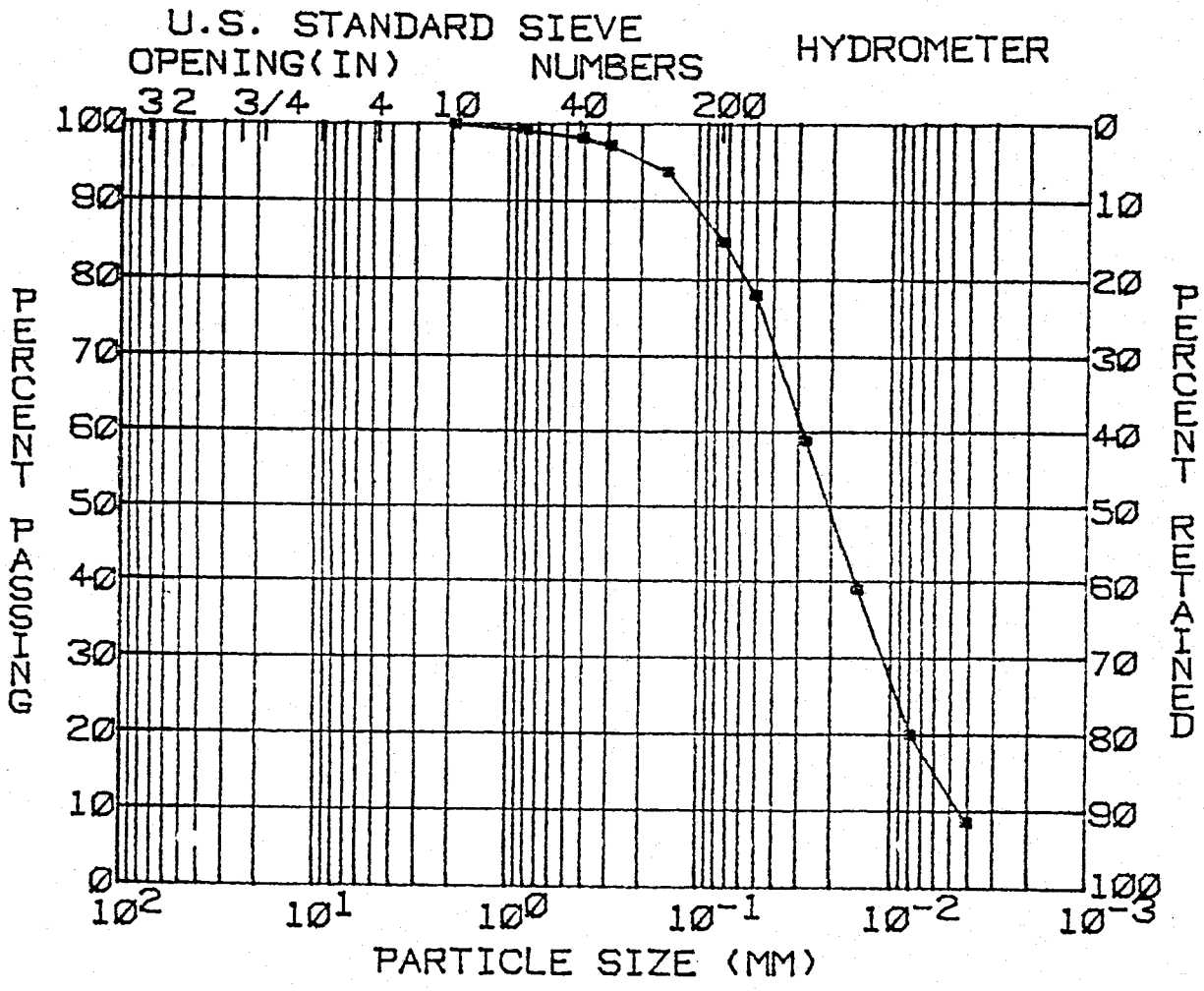
L.L.(%) = 31
P.I.(%) = 12

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:POND 1
STATION:STACKED FLY ASH
RANGE :

BORING:US-2AST
EL. :813.7 - 812.6
SAMPLE:1
DATE :1-11-85



GRAVEL(%)= 0
SAND(%) = 15
SILT(%) = 73
CLAY(%) = 12

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= ML
MOISTURE(%)= 27.0
SP. GR. = 2.19

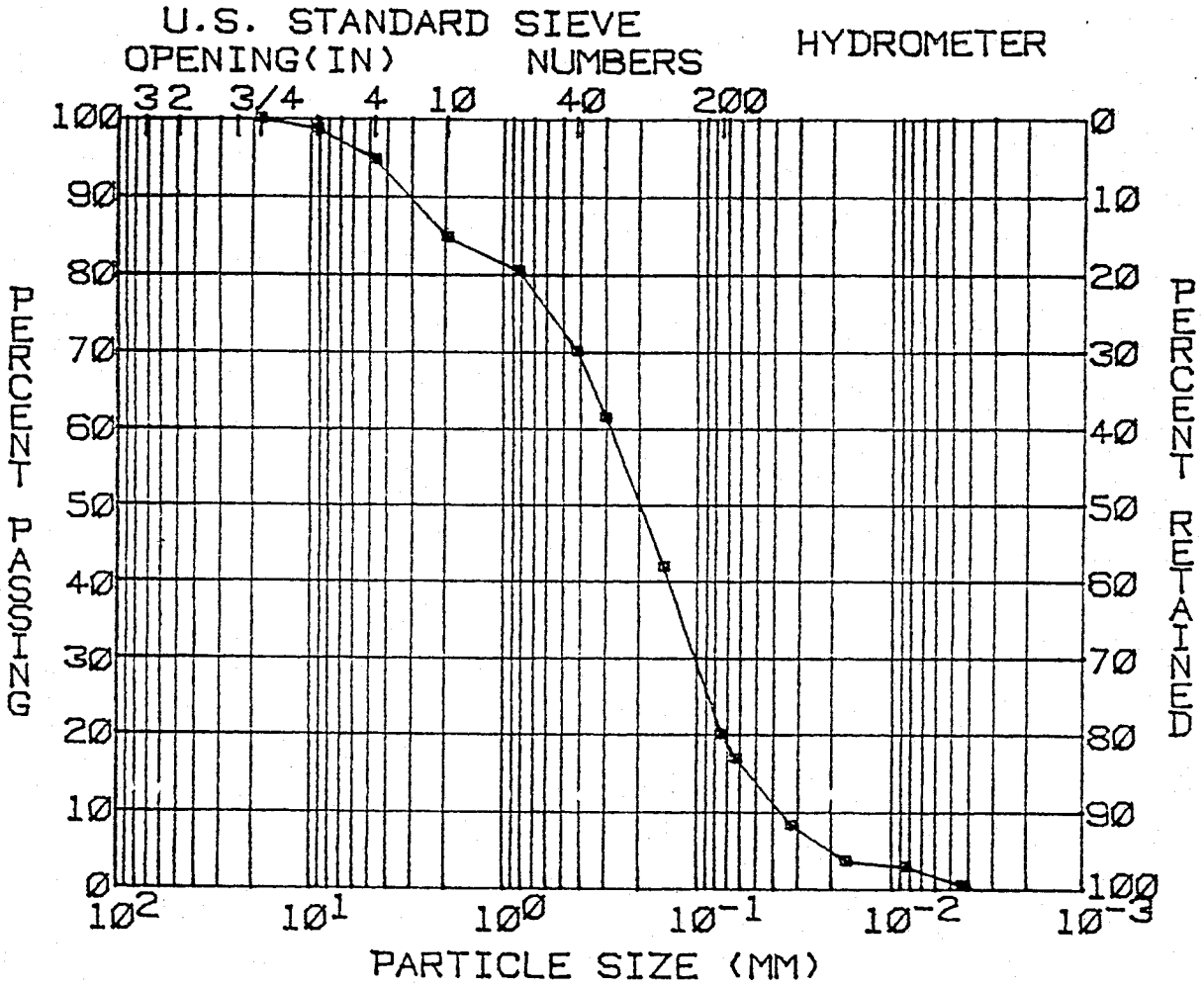
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:POND 1
STATION:STACKED FLY ASH
RANGE :

BORING:US-2ST
EL. :816.7 -814.3
SAMPLE:1
DATE :1-11-85



GRAVEL(%)= 4
SAND(%) = 75
SILT(%) = 19
CLAY(%) = 2

D10(MM) = 0.0359
D30(MM) = 0.1014
D60(MM) = 0.2777
COEF UNIF= 7.7

SOIL SYMBOL= SM
MOISTURE(%)= 14.7
SP. GR. = 2.12

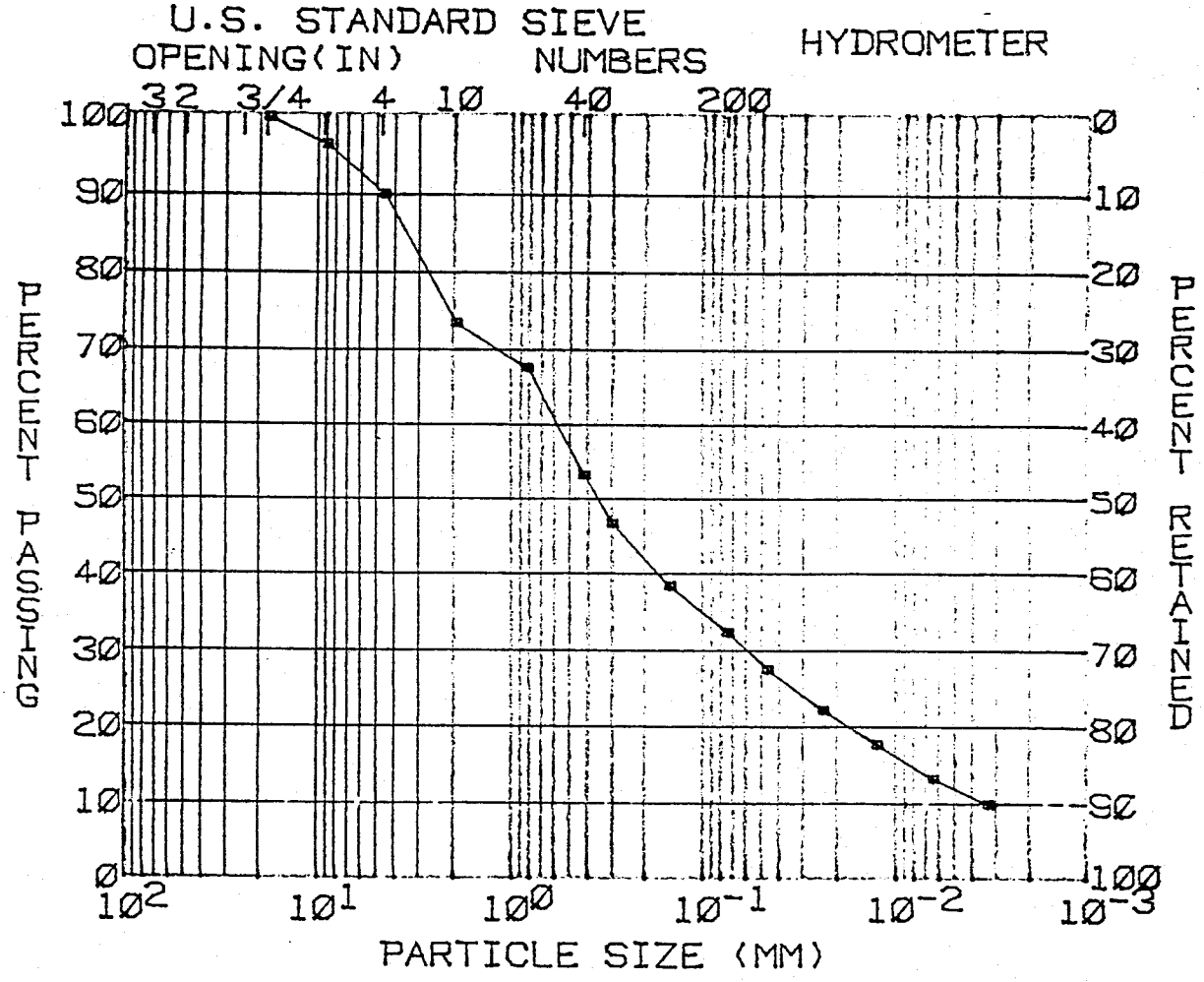
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:POND 1 DIKE #1
STATION:
RANGE :

BORING:US-2SS
EL. :805.2-803.4
SAMPLE:1
DATE :1-11-85



GRAVEL(%)= 9
SAND(%) = 58
SILT(%) = 21
CLAY(%) = 12

D10(MM) = 0.0033
D30(MM) = 0.0557
D60(MM) = 0.5678
COEF UNIF) 100

SOIL SYMBOL= SM-SC
MOISTURE(%)= 22.0
SP. GR. = 2.78

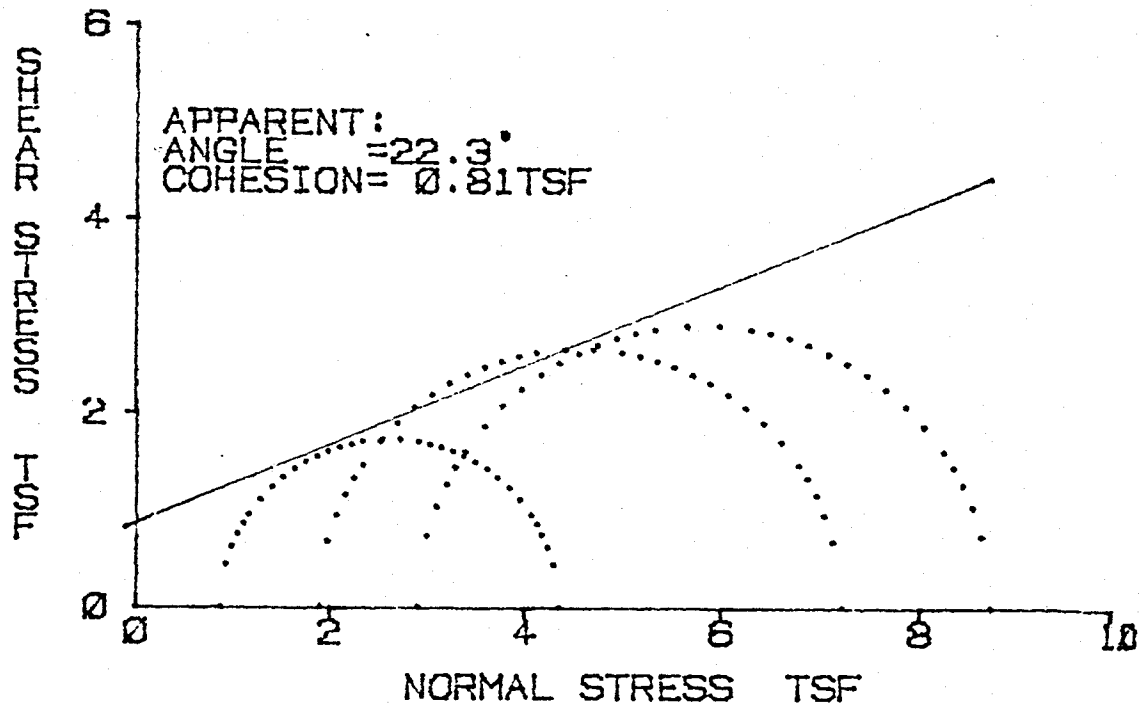
L.L.(%) = 37
P.I.(%) = 11

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION(R) TEST

PROJECT:BULL RUN S.P.	EL. :805.2-804.6
FEATURE:ASH POND 1	SAMPLE :1
STATION:	PART :1
RANGE :	SOIL SYM:SM-SC
BORING :US-2SS	DATE :2-20-85

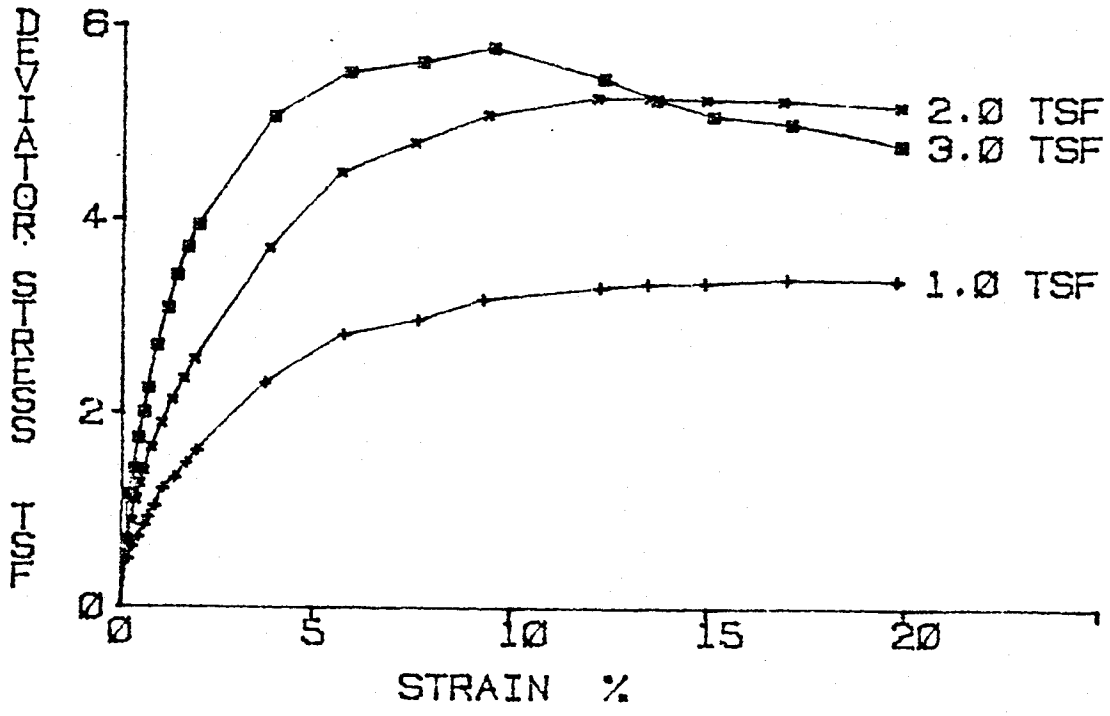


REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION(R) TEST

PROJECT:BULL RUN S.P.	EL. :805.2-804.6
FEATURE:ASH POND 1	SAMPLE :1
STATION:	PART :1
RANGE :	SOIL SYM:SM-SC
BORING :US-2SS	DATE :2-20-85



REMARKS:

Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Unconsolidated Undrained Triaxial Compression (R) Test

Project: BULL RUN S.P.
Feature: ASH POND 1
Station:
Range :
Boring : US-2SS

El. : 805.2-804.6
Sample: 1
Part : 1

Tested By : EL
Computed By: MHD
Checked By : CBC
Report Date: 2-20-85

Soil Symbol= SM-SC
Sp. Gr. = 2.78

L.L.(%)= 37
D10(mm)= .0033

P.I.(%)= 11

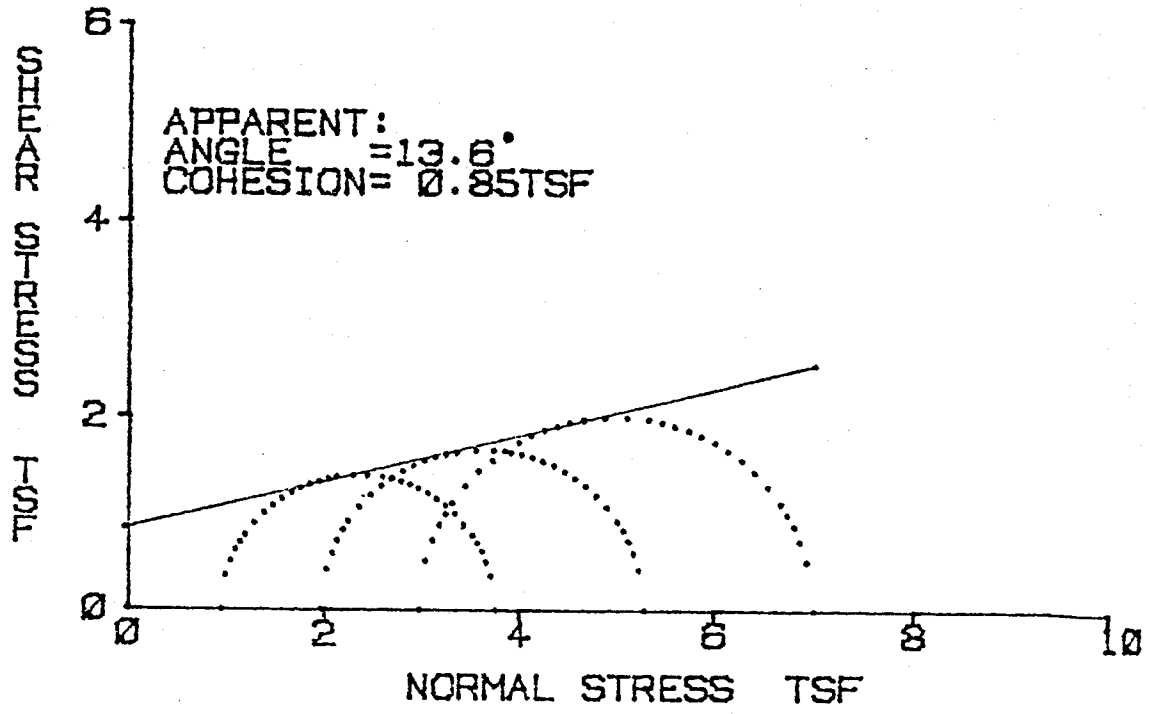
Specimen Number	1	2	3	4
Initial:				
Moisture Content(%)	19.8	18.7	18.0	0.0
Dry Density(pcf)	108.9	110.9	113.8	0.0
Void Ratio	0.594	0.565	0.525	0.000
Saturation(%)	92.8	92.1	95.2	0.0
Before Shearing:				
Moisture(%) (after satur.)	--	--	--	--
Saturation(%)	--	--	--	--
Moisture(%) (after cons.)	--	--	--	--
Void Ratio (after cons.)	--	--	--	--
Final Moisture Content(%)	19.2	18.0	17.0	0.0
Minor Principal Stress(tsf)	1.01	2.02	3.02	0.00
Major Principal Stress(tsf)	4.48	7.35	8.86	0.00
Eff. Minor Prin. Stress(tsf)	--	--	--	--
Eff. Major Prin. Stress(tsf)	--	--	--	--
Time to Failure(min.)	90	70	50	0
Rate of Strain(%/min.)	0.19	0.19	0.19	0.00
Specimen Height(in.)	3.27	3.27	3.27	3.27
Specimen Diameter(in.)	1.40	1.40	1.40	1.40

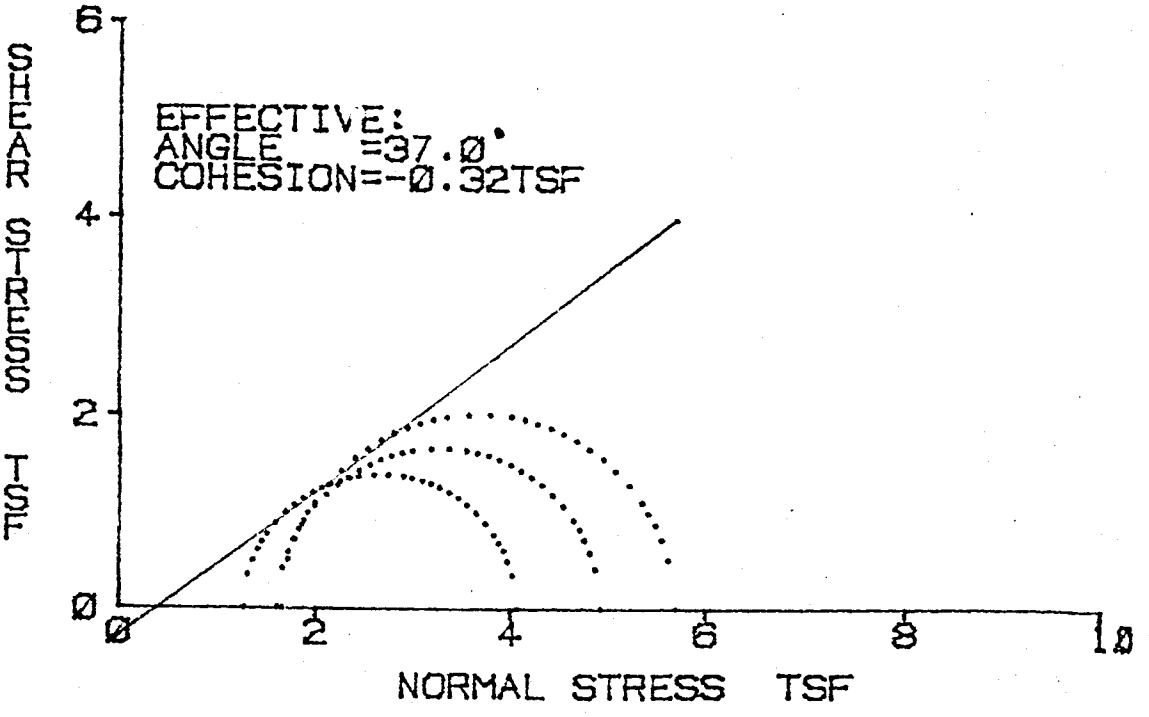
Shear Strength	Max Deviator Stress		Max Eff Stress Ratio	
	Deg.	c(tsf)	Deg.	c(tsf)
Apparent	22.3	0.81		
Effective	--	--		

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (R) TEST

PROJECT:BULL RUN S.P.	EL. :804.1-803.6
FEATURE:ASH POND 1	SAMPLE :1
STATION:	PART :3
RANGE :	SOIL SYM:SM-SC
BORING :US-2SS	DATE :2-28-85



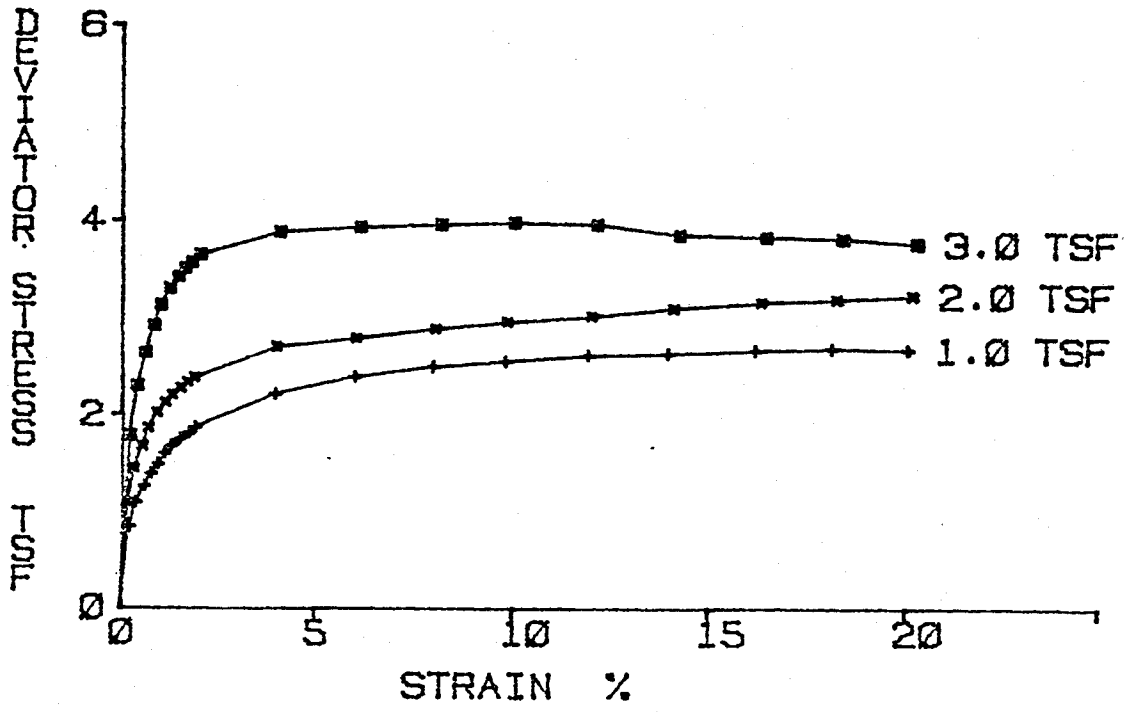


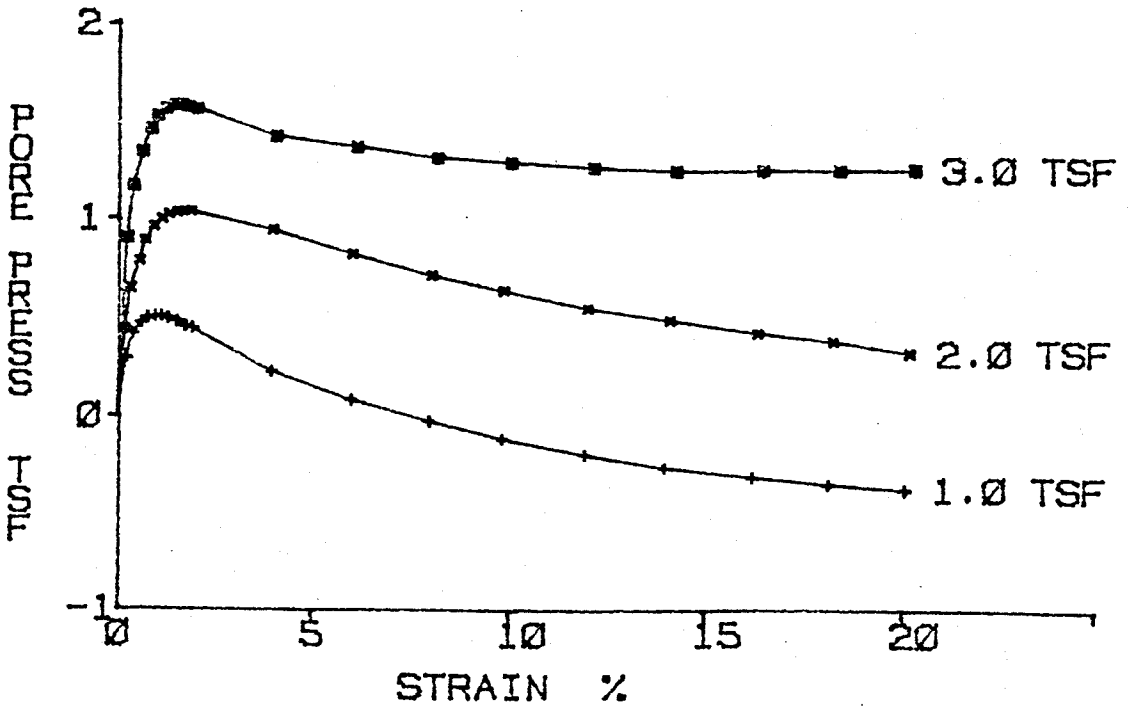
REMARKS: Analyzing the data by the method of least square in the form of $y = mx$, the effective friction angle is 31.4^{o} and the effective cohesion is 0.00 tsf for the failure criteria based on maximum deviator stress

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (R) TEST

PROJECT:	BULL RUN S.P.	EL.	:804.1-803.6
FEATURE:	ASH POND 1	SAMPLE	:1
STATION:		PART	:3
RANGE	:	SOIL SYM:	SM-SC
BORING	:US-2SS	DATE	:2-28-85





Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Consolidated Undrained Triaxial Compression (R) Test

Project: BULL RUN S.P.
Feature: ASH POND 1
Station:
Range :
Boring : US-2SS

El. : 804.1-803.6
Sample: 1
Part : 3

Tested By : TAL
Computed By: MHD
Checked By : CBG
Report Date: 2-28-85

Soil Sybmbol= SM-SC
Sp. Gr. = 2.78

L.L.(%)= 37
D10(mm)= .0033

P.I.(%)= 11

Specimen Number	1	2	3	4
Initial:				
Moisture Content(%)	28.3	26.5	26.9	0.0
Dry Density(pcf)	91.2	94.6	92.6	0.0
Void Ratio	0.904	0.835	0.873	0.000
Saturation(%)	87.1	88.2	85.8	0.0
Before Shearing:				
Moisture(%) (after satur.)	32.5	30.0	31.4	0.0
Saturation(%)	100.0	100.0	100.0	0.0
Moisture(%) (after cons.)	30.9	27.3	28.9	28.9
Void Ratio (after cons.)	0.859	0.758	0.803	0.000
Final Moisture Content(%)	31.4	28.5	29.5	0.0
Minor Principal Stress(tsf)	1.01(1.01)	2.02(2.02)	3.02(3.02)	0.00(0.00)
Major Principal Stress(tsf)	3.81(2.94)	5.35(4.77)	7.07(6.72)	0.00(0.00)
Eff. Minor Prin. Stress(tsf)	1.32(0.54)	1.66(1.04)	1.71(1.45)	0.00(0.00)
Eff. Major Prin. Stress(tsf)	4.12(2.48)	4.99(3.80)	5.75(5.15)	0.00(0.00)
Time to Failure(min.)	90	98	50	0
Rate of Strain(%/min.)	0.20	0.21	0.20	0.00
Specimen Height(in.)	3.13	3.13	3.13	3.13
Specimen Diameter(in.)	1.41	1.41	1.41	1.41

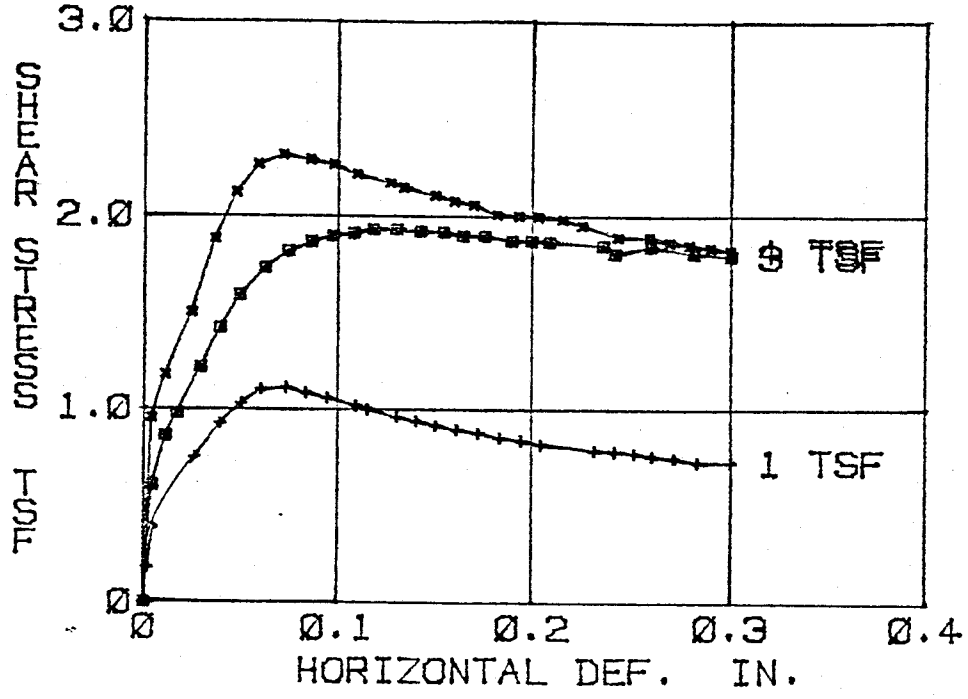
	Max Deviator Stress		Max Eff Stress Ratio	
Shear Strength	Deg.	c(tsf)	Deg.	c(tsf)
Apparent	13.6	0.85	17.7	0.38
Effective	37.0	-0.32	29.5	0.24

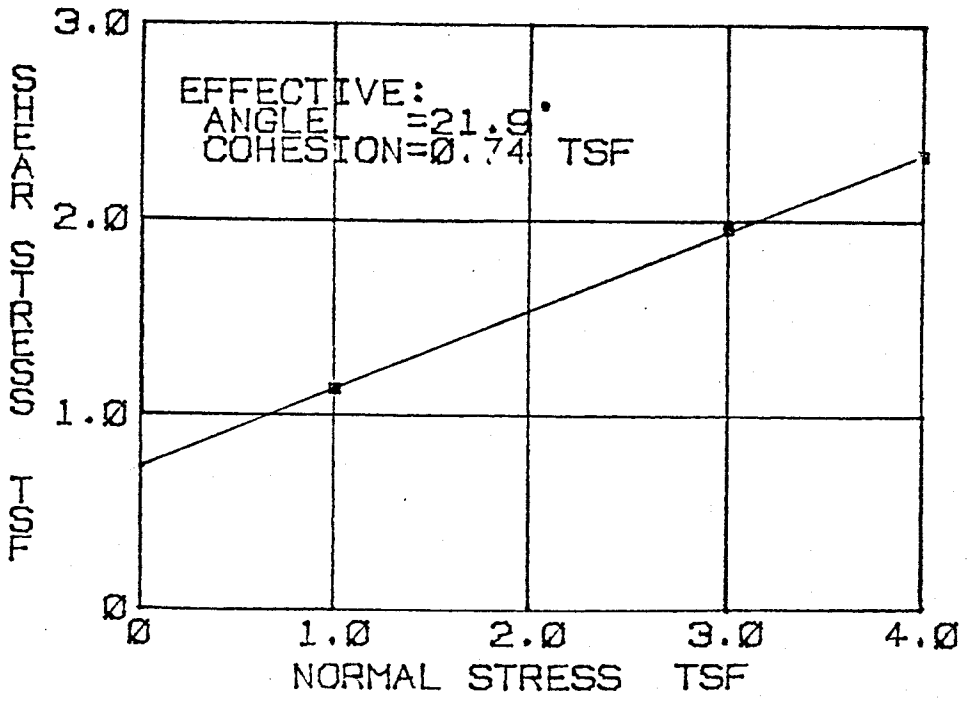
REMARKS: Analyzing the data by the method of least square in the form of y = mx, the effective friction angle is 31.4° and the effective cohesion is 0.00 tsf for the failure criteria based on maximum deviator stress.

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
DIRECT SHEAR TEST

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:US-2SS
EL. :804.6-804.1
SAMPLE:1
DATE :3-7-85





REMARKS: TESTED AT NATURAL MOISTURE CONTENT

Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Direct Shear Test

Project: BULL RUN S.P.
Feature: ASH POND 1
Station:
Range :
Boring : US-2SS

El. : 804.6-804.1
Sample: 1
Part : 2

Tested By : GMD
Computed By: MHD
Checked By : CBE
Report Date: 3-7-85

Type of Specimen=UNDISTURBED
Soil Symbol =SM-SC

L.L. (%) =37
P.I. (%) =11

Sp. Gr. =2.78

Test No.	1	2	3	4
Initial:				
Moisture Content (%)	33.7	31.2	21.6	0.0
Dry Density (pcf)	85.7	89.1	104.0	0.0
Void Ratio	1.025	0.948	0.668	0.000
Saturation (%)	91.4	91.6	90.8	0.0
Final:				
Moisture Content (%)	33.7	30.5	20.7	0.0
Saturation (%)	87.5	99.7	94.9	0.0
Normal Stress (tsf)	1.00	4.00	3.00	0.00
Max. Shear Stress (tsf)	1.13	2.33	1.95	0.00
Time to Failure (min.)	90	75	165	0
Rate of Shearing (in./min.)	0.0007	0.0008	0.0008	0.0000
Specimen Height (in.)	0.727	0.740	0.727	0.000
Specimen Diameter (in.)	2.502	2.499	2.502	0.000

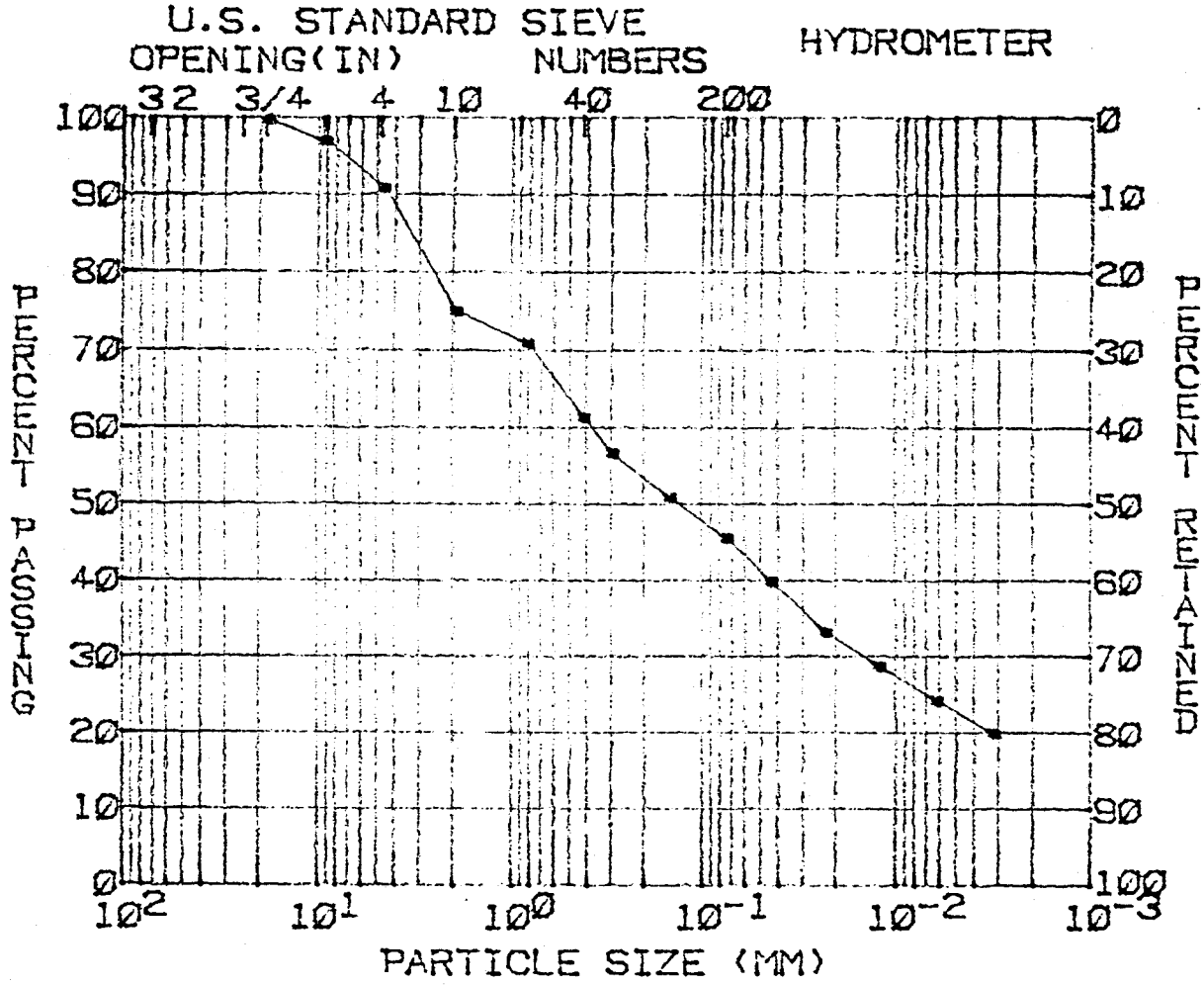
Shear Strength	Angle (deg.)	Cohesion (tsf)
Effective	21.9	0.74

Remarks: TESTED AT NATURAL MOISTURE CONTENT.

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:POND 1 DIKE #1
STATION:
RANGE :

BORING:US-2SS
EL. :801.2-799.4
SAMPLE:2
DATE :1-11-85



GRAVEL(%)= 8
SAND(%) = 46
SILT(%) = 23
CLAY(%) = 23

D10(MM) = 0.0007
D30(MM) = 0.0137
D60(MM) = 0.3624
COEF UNIF) 100

SOIL SYMBOL= SM-SC
MOISTURE(%)= 24.0
SP. GR. = 2.77

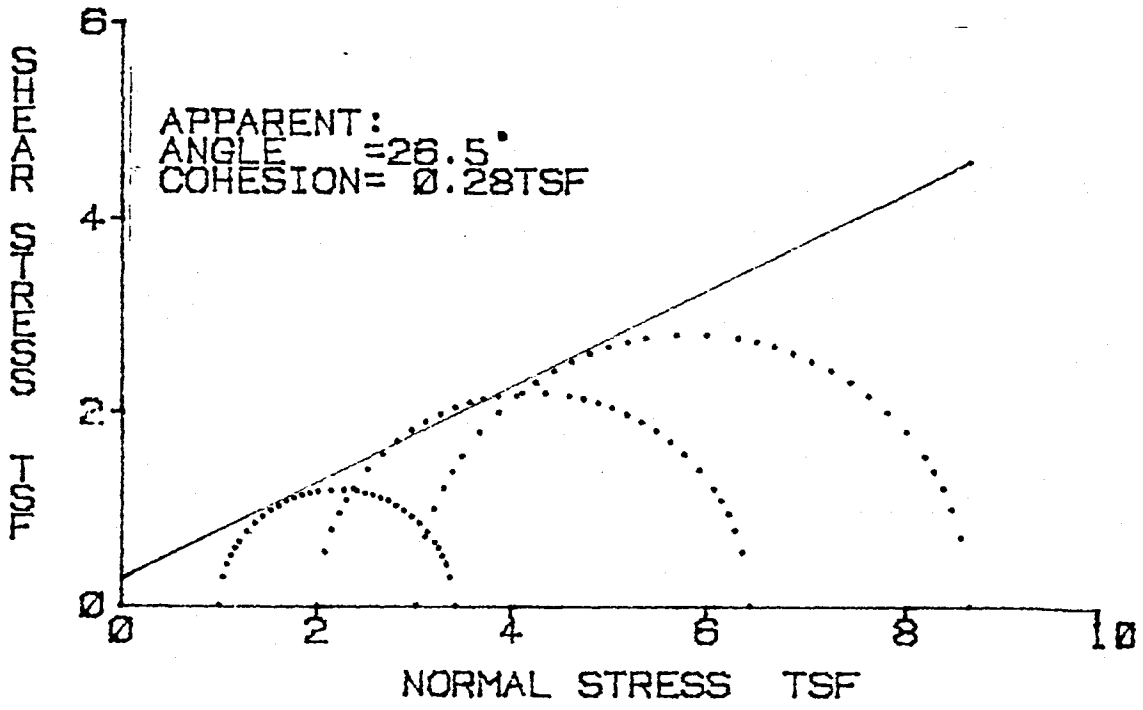
L.L.(%) = 45
P.I.(%) = 19

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION(R) TEST

PROJECT:BULL RUN S.P.	EL. :799.8-799.4
FEATURE:ASH POND 1	SAMPLE :2
STATION:	PART :3
RANGE :	SOIL SYM:SM-SC
BORING :US-2SS	DATE :2-20-85

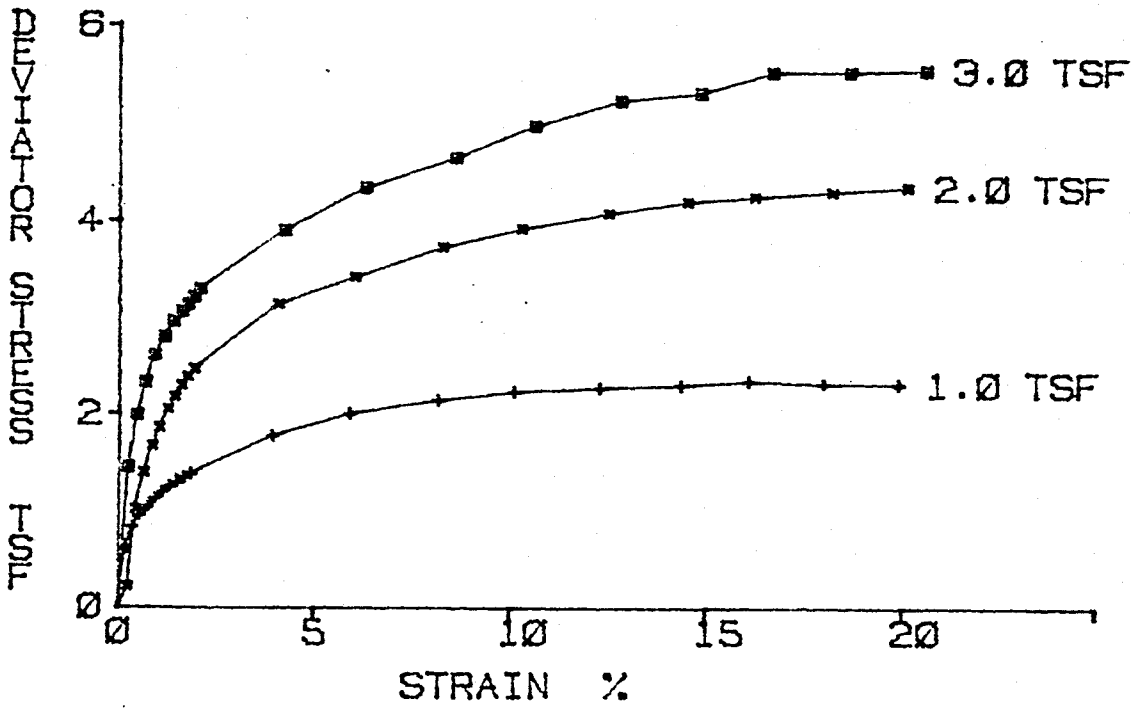


REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION(R) TEST

PROJECT:BULL RUN S.P.	EL. :799.8-799.4
FEATURE:ASH POND 1	SAMPLE :2
STATION:	PART :3
RANGE :	SOIL SYM:SM-SC
BORING :US-2SS	DATE :2-20-85



REMARKS:

Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Unconsolidated Undrained Triaxial Compression (R) Test

Project: BULL RUN S.P.
Feature: ASH POND 1
Station:
Range :
Boring : US-2SS

El. : 799.8-799.4
Sample: 2
Part : 3

Testec By : TAL
Computed By: MHD
Checked By : CBE
Report Date: 2-20-85

Soil Sybmbol= SM-SC
Sp. Gr. = 2.77

L.L.(%)= 45
D10(mm)= .0007

P.I.(%)= 19

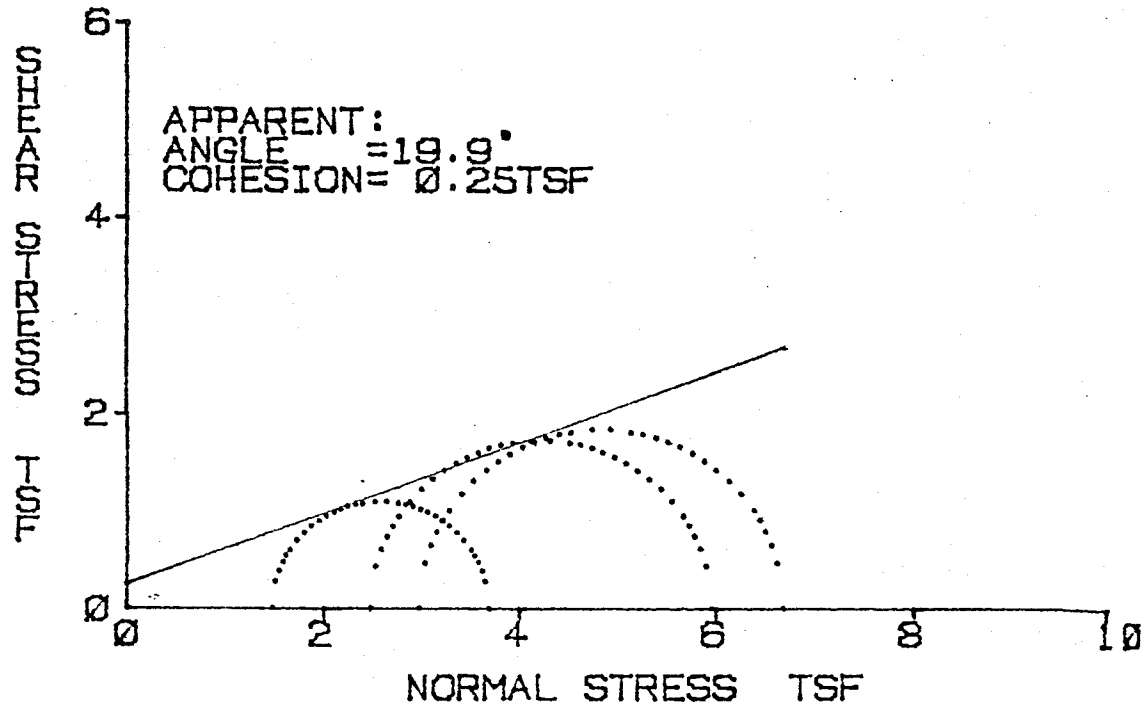
Specimen Number	1	2	3	4
Initial:				
Moisture Content(%)	23.6	20.2	22.7	0.0
Dry Density(pcf)	99.4	102.0	101.8	0.0
Void Ratio	0.739	0.695	0.699	0.000
Saturation(%)	88.5	80.4	89.9	0.0
Before Shearing:				
Moisture(%) (after satur.)	--	--	--	--
Saturation(%)	--	--	--	--
Moisture(%) (after cons.)	--	--	--	--
Void Ratio (after cons.)	--	--	--	--
Final Moisture Content(%)	23.3	19.6	20.8	0.0
Minor Principal Stress(tsf)	1.01	2.02	3.02	0.00
Major Principal Stress(tsf)	3.43	6.45	8.67	0.00
Eff. Minor Prin. Stress(tsf)	--	--	--	--
Eff. Major Prin. Stress(tsf)	--	--	--	--
Time to Failure(min.)	80	98	98	0
Rate of Strain(%/min.)	0.20	0.21	0.21	0.00
Specimen Height(in.)	3.13	3.13	3.13	3.13
Specimen Diameter(in.)	1.41	1.41	1.41	1.41

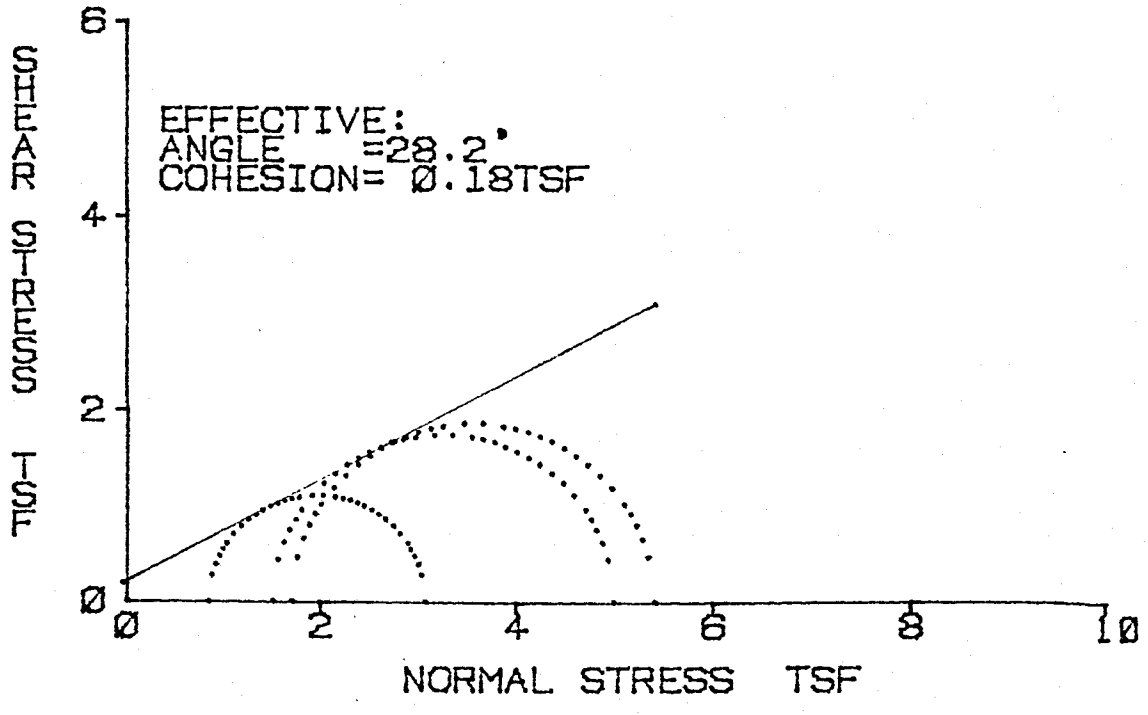
Shear Strength	Max Deviator Stress		Max Eff Stress Ratio	
	Deg.	c(tsf)	Deg.	c(tsf)
Apparent	26.5	0.28		
Effective	--	--		

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (R) TEST

PROJECT:BULL RUN S.P.	EL. 800.3:799.8
FEATURE:ASH POND 1	SAMPLE :2
STATION:	PART :2
RANGE :	SOIL SYM:SM-SC
BORING :US-2SS	DATE :3-6-85



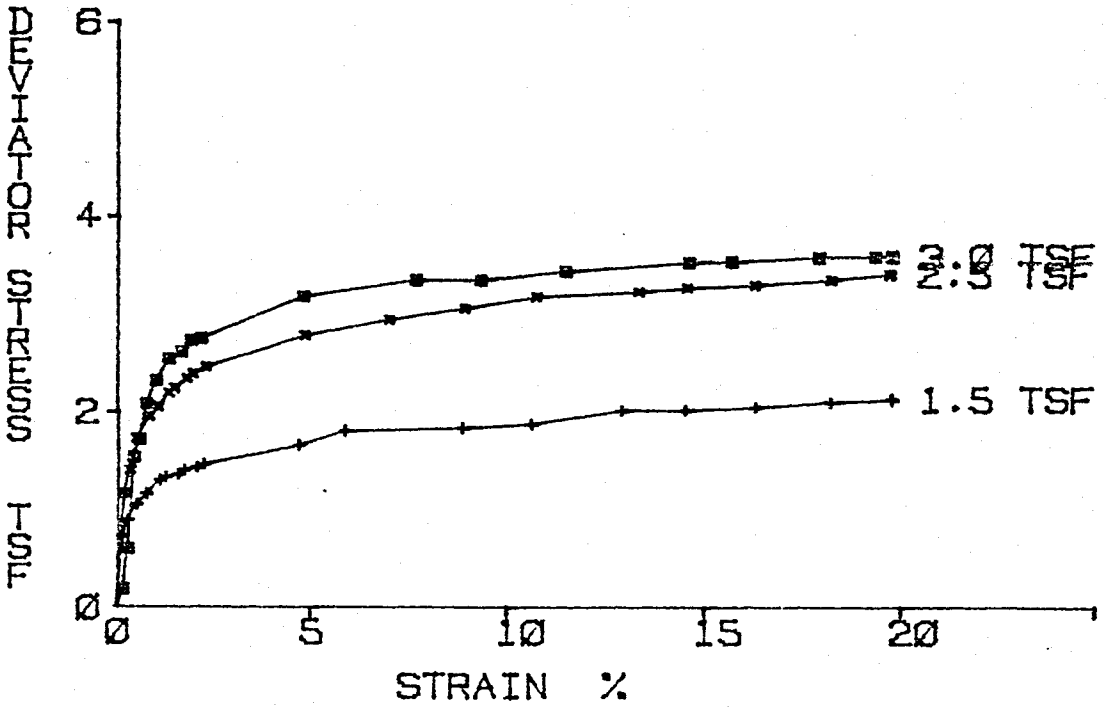


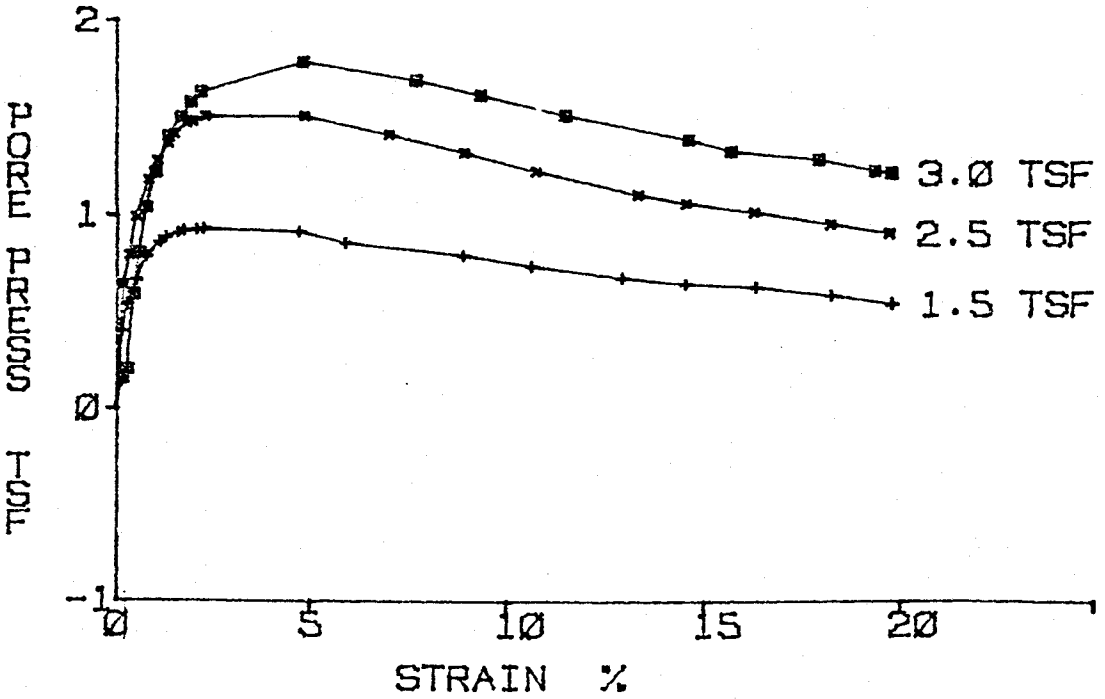
REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (R) TEST

PROJECT:BULL RUN S.P. EL.800.3 :799.8
FEATURE:ASH POND 1 SAMPLE :2
STATION: PART :2
RANGE : SOIL SYM:SM-SC
BORING :US-2SS DATE :3-6-85





Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Consolidated Undrained Triaxial Compression (R) Test

Project: BULL RUN S.P.
Feature: ASH POND 1
Station:
Range :
Boring : US-2SS

El. :800.3-799.8
Sample: 2
Part : 2

Tested by : EL
Computed By: MHD
Checked by : TAL
Report Date: 3-6-85

Soil Sybmbol= SM-SC
Sp. Gr. = 2.77

L.L.(%)= 45
D10(mm)= .0007

P.I.(%)= 19

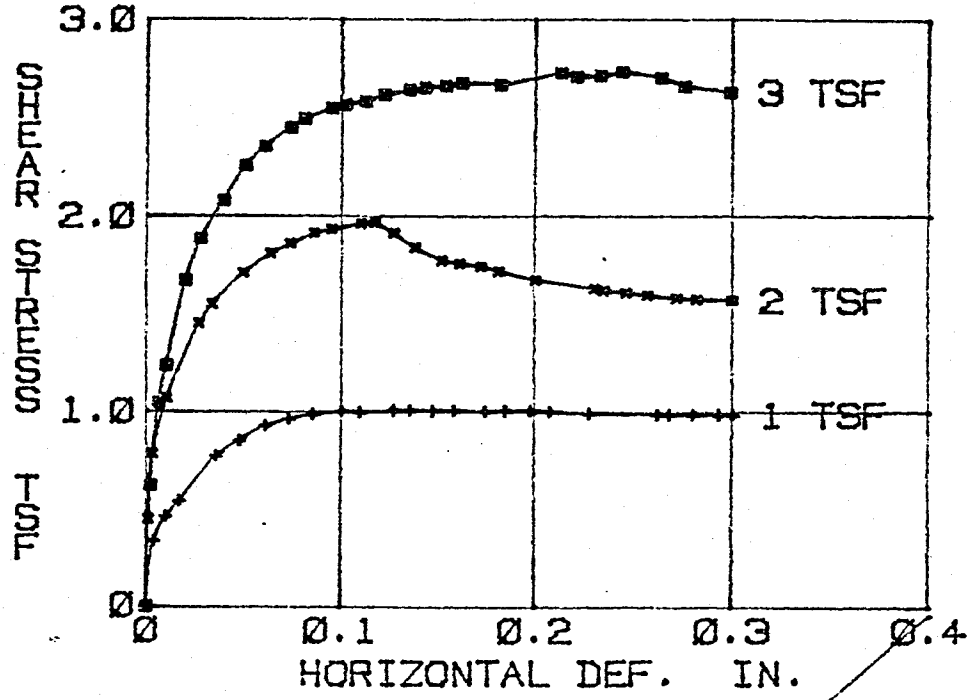
Specimen Number	1	2	3	4
Initial:				
Moisture Content(%)	24.5	23.7	25.3	0.0
Dry Density(pcf)	99.1	100.4	98.7	0.0
Void Ratio	0.746	0.723	0.751	0.000
Saturation(%)	91.1	90.6	93.4	0.0
Before Shearing:				
Moisture(%) (after satur.)	26.9	26.1	27.1	0.0
Saturation(%)	100.0	100.0	100.0	0.0
Moisture(%) (after cons.)	25.0	24.0	25.2	25.2
Void Ratio (after cons.)	0.692	0.665	0.699	0.000
Final Moisture Content(%)	25.4	23.7	24.7	0.0
Minor Principal Stress(tsf)	1.51(1.51)	2.52(2.52)	3.02(3.02)	0.00(0.00)
Major Principal Stress(tsf)	3.74(3.22)	6.00(5.34)	6.73(6.27)	0.00(0.00)
Eff. Minor Prin. Stress(tsf)	0.91(0.56)	1.57(0.99)	1.76(1.22)	0.00(0.00)
Eff. Major Prin. Stress(tsf)	3.13(2.27)	5.05(3.81)	5.47(4.46)	0.00(0.00)
Time to Failure(min.)	99	98	92	0
Rate of Strain(%/min.)	0.20	0.20	0.22	0.00
Specimen Height(in.)	3.08	3.08	3.08	3.09
Specimen Diameter(in.)	1.40	1.40	1.40	1.40

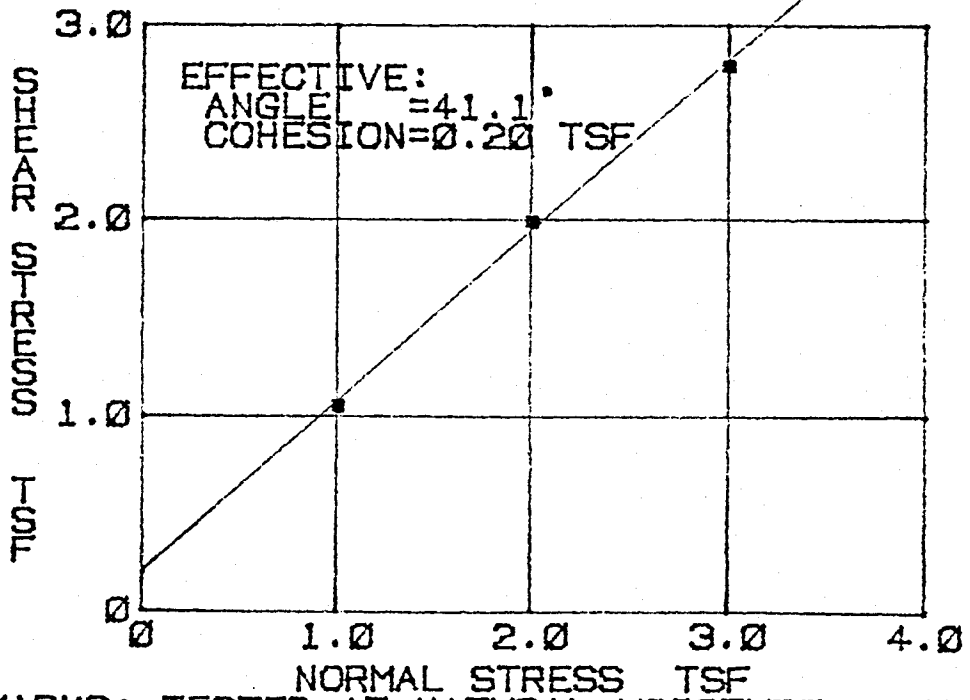
Shear Strength	Max Deviator Stress Deg.	Max Deviator Stress c(tsf)	Max Eff Stress Ratio Deg.	Max Eff Stress Ratio c(tsf)
Apparent	19.9	0.25	19.8	0.06
Effective	28.2	0.18	32.9	0.11

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
DIRECT SHEAR TEST

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:US-2SS
EL. :801.2-800.3
SAMPLE:2
DATE :2-21-85





REMARKS: TESTED AT NATURAL MOISTURE CONTENT

Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Direct Shear Test

Project: BULL RUN S.P.
Feature: ASH POND 1
Station:
Range :
Boring : US-2SS

El. :801.2-800.3
Sample: 2
Part : 1

Tested By : GMD
Computed By: MHD
Checked By : CBE
Report Date: 2-21-85

Type of Specimen=UNDISTURBED
Soil Symbol =SM-SC

L.L. (%) =45
P.I. (%) =19

Sp. Gr. =2.77

Test No.	1	2	3	4
Initial:				
Moisture Content (%)	22.3	20.2	20.7	0.0
Dry Density (pcf)	103.3	105.6	106.2	0.0
Void Ratio	0.674	0.637	0.629	0.000
Saturation (%)	91.6	87.7	91.1	0.0
Final:				
Moisture Content (%)	21.8	18.5	19.5	0.0
Saturation (%)	87.4	79.5	90.0	0.0
Normal Stress (tsf)	1.00	2.00	3.00	0.00
Max. Shear Stress (tsf)	1.05	1.99	2.80	0.00
Time to Failure (min.)	225	150	345	0
Rate of Shearing (in./min.)	0.0008	0.0007	0.0007	0.0000
Specimen Height (in.)	0.727	0.727	0.727	0.000
Specimen Diameter (in.)	2.502	2.502	2.502	0.000

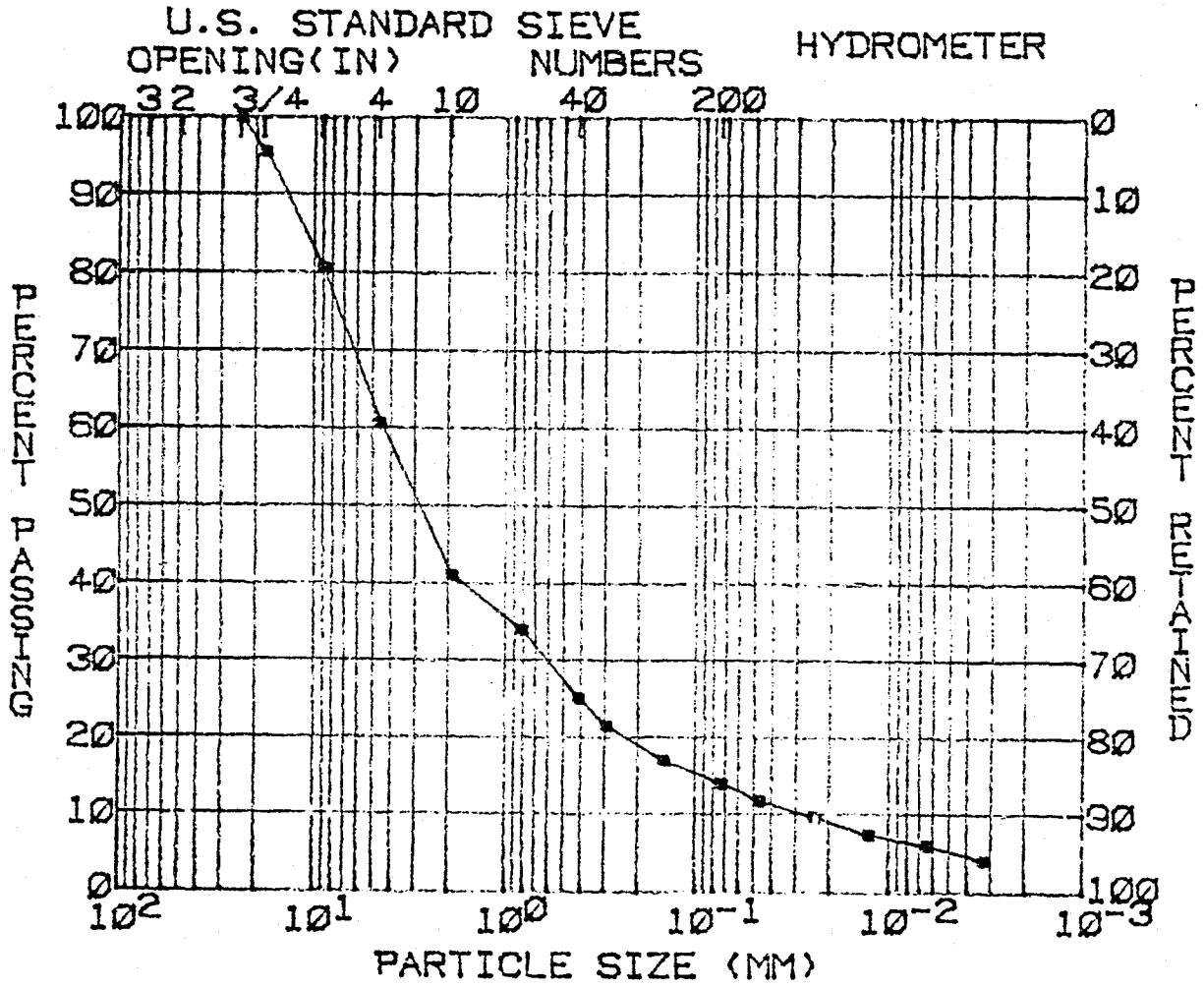
Shear Strength	Angle (deg.)	Cohesion (tsf)
Effective	41.1	0.20

Remarks: TESTED AT NATURAL MOISTURE CONTENT

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:POND 1 DIKE #2
STATION:
RANGE :

BORING:US-4
EL. :806.7 - 804.6
SAMPLE:1
DATE :1-10-85



GRAVEL(%)= 39
SAND(%) = 47
SILT(%) = 9
CLAY(%) = 5

D10(MM) = 0.0246
D30(MM) = 0.5884
D60(MM) = 4.4987
COEF UNIF) 100

SOIL SYMBOL= SM-SC
MOISTURE(%)= 14.1
SP. GR. = 2.80

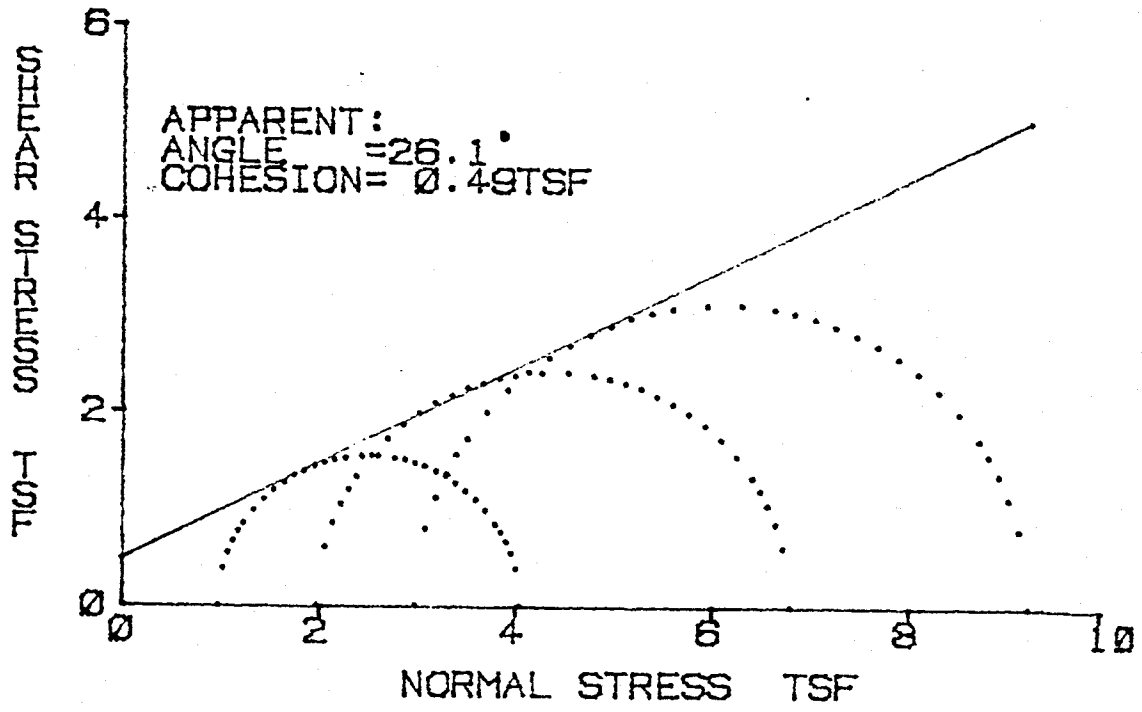
L.L.(%) = 33
P.I.(%) = 10

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION(R) TEST

PROJECT:BULL RUN S.P.	EL. :806.3-805.0
FEATURE:ASH POND 1	SAMPLE :1
STATION:US-4	PART :2,3,4 MIX
RANGE :	SOIL SYM:SM-SC
BORING :	DATE :2-28-85

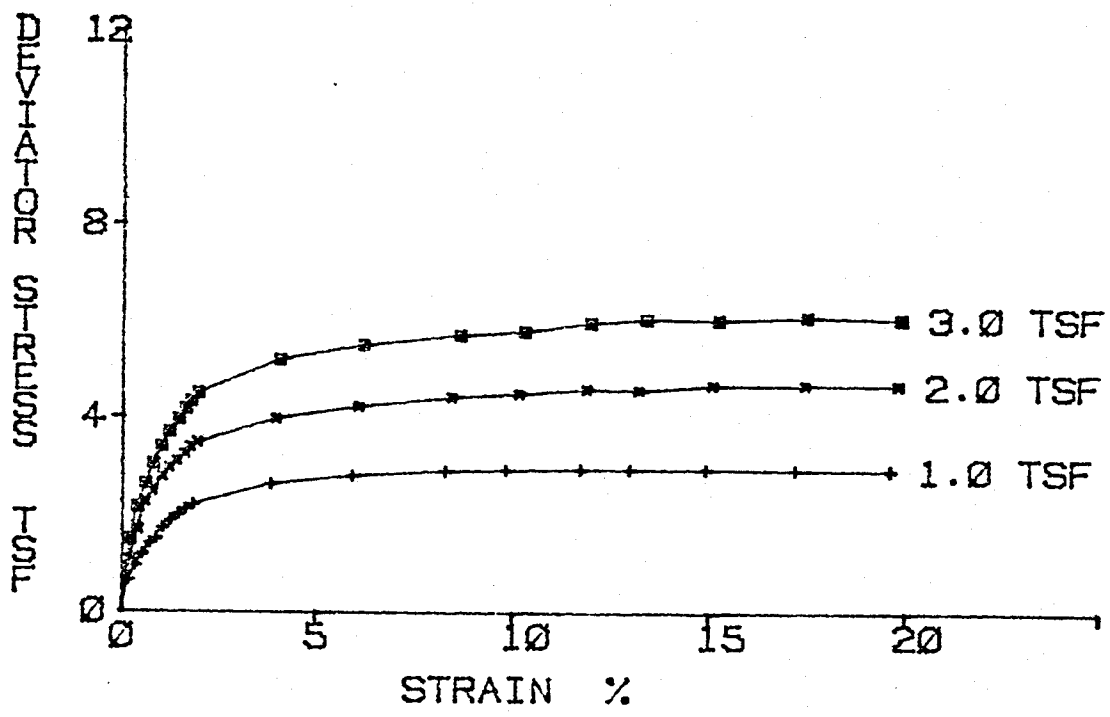


REMARKS: REMOLDED AT NATURAL MOISTURE AND DENSITY.

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION(R) TEST

PROJECT:	BULL RUN S.P.	EL.	:806.3-805.0
FEATURE:	ASH POND 1	SAMPLE	:1
STATION:	US-4	PART	:2, 3, 4 MIX
RANGE	:	SOIL SYM:	SM-SC
BORING	:	DATE	:2-28-85



REMARKS: REMOLDED AT NATURAL MOISTURE AND DENSITY.

Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Unconsolidated Undrained Triaxial Compression (R) Test

Project: BULL RUN S.P.
Feature: ASH POND 1
Station: US-4
Range :
Boring :

El. : 806.3-805.0
Sample: 1
Part : 2,3,4 MIX

Tested By : TAL
Computed By: MHD
Checked By : CBC
Report Date: 2-28-85

Soil Symbol= SM-SC
Sp. Gr. = 2.8

L.L.(%)= 33
D10(mm)= .0246

P.I.(%)= 10

Specimen Number	1	2	3	4
Initial:				
Moisture Content(%)	18.4	18.7	18.7	0.0
Dry Density(pcf)	109.5	109.3	109.3	0.0
Void Ratio	0.596	0.600	0.600	0.000
Saturation(%)	86.5	87.2	87.2	0.0
Before Shearing:				
Moisture(%) (after satur.)	--	--	--	--
Saturation(%)	--	--	--	--
Moisture(%) (after cons.)	--	--	--	--
Void Ratio (after cons.)	--	--	--	--
Final Moisture Content(%)	19.1	18.7	18.2	0.0
Minor Principal Stress(tsf)	1.01	2.02	3.02	0.00
Major Principal Stress(tsf)	4.11	6.85	9.28	0.00
Eff. Minor Prin. Stress(tsf)	--	--	--	--
Eff. Major Prin. Stress(tsf)	--	--	--	--
Time to Failure(min.)	80	100	90	0
Rate of Strain(%/min.)	0.19	0.20	0.20	0.00
Specimen Height(in.)	3.16	3.16	3.16	3.16
Specimen Diameter(in.)	1.40	1.40	1.40	1.40

Shear Strength	Max Deviator Stress		Max Eff Stress Ratio	
	Deg.	c(tsf)	Deg.	c(tsf)
Apparent	26.1	0.49		
Effective	--	--		

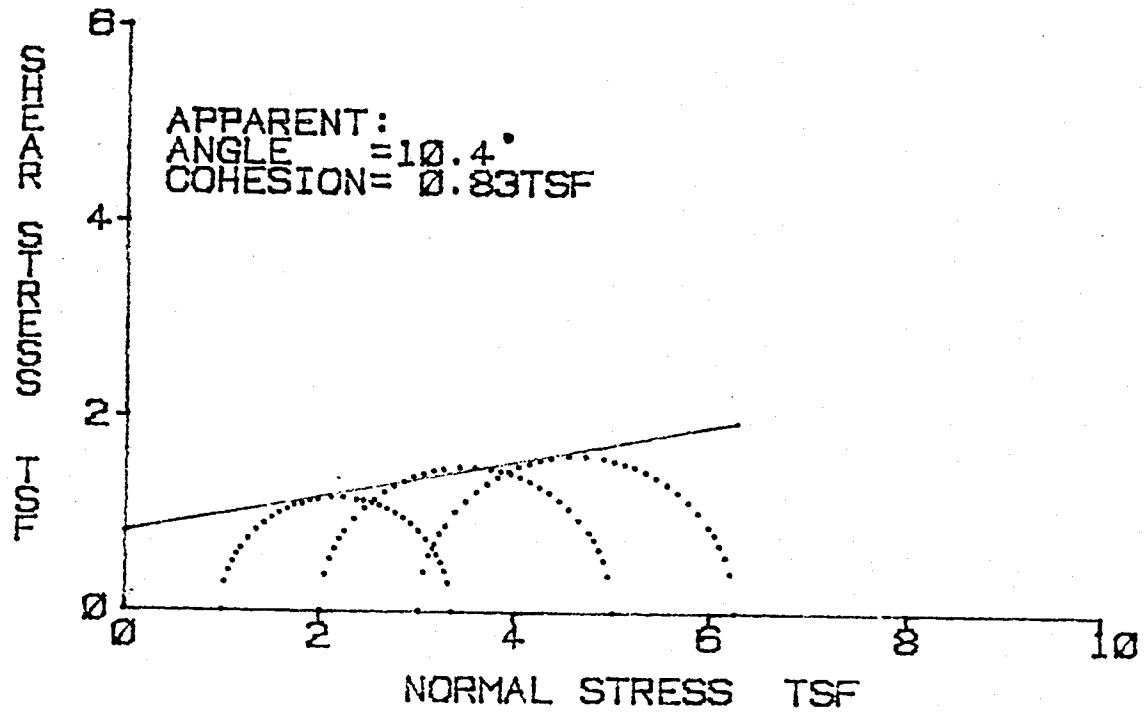
Remark: REMOLDED AT NATURAL MOISTURE AND DENSITY.

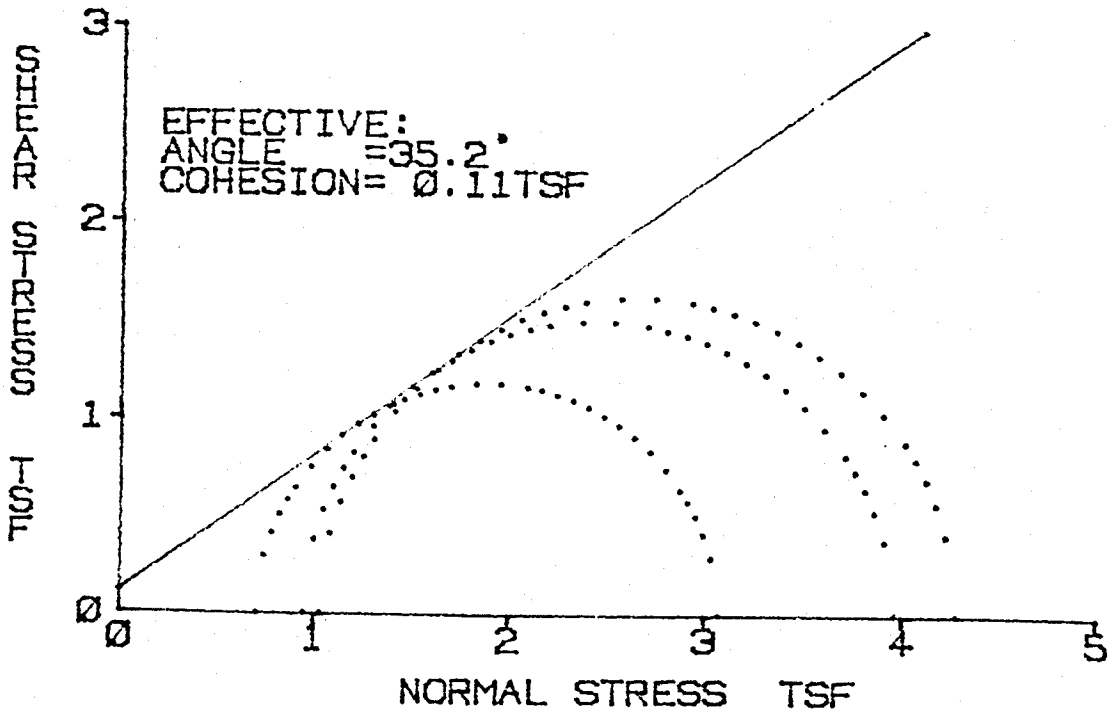
TVA SINGLETON MATERIALS ENGINEERING LABORATORY

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (R) TEST

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :
BORING :US-4

EL. :806.3-805.0
SAMPLE :1
PART :2, 3, 4 MIX
SOIL SYM:SM-SC
DATE :2-28-85



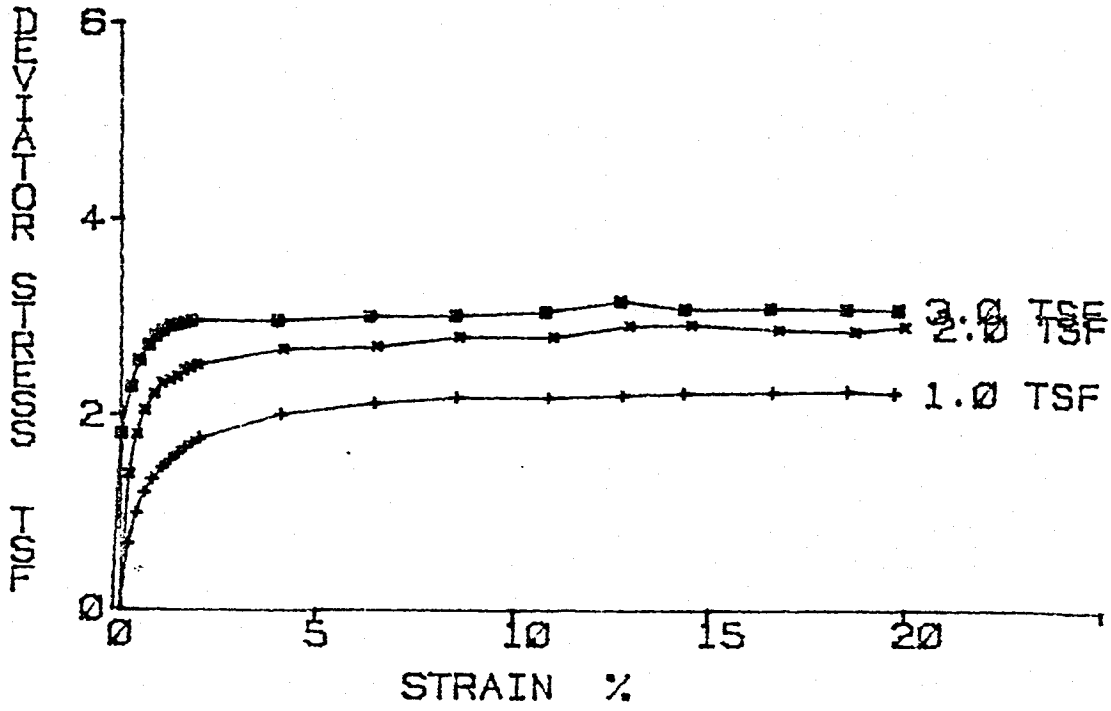


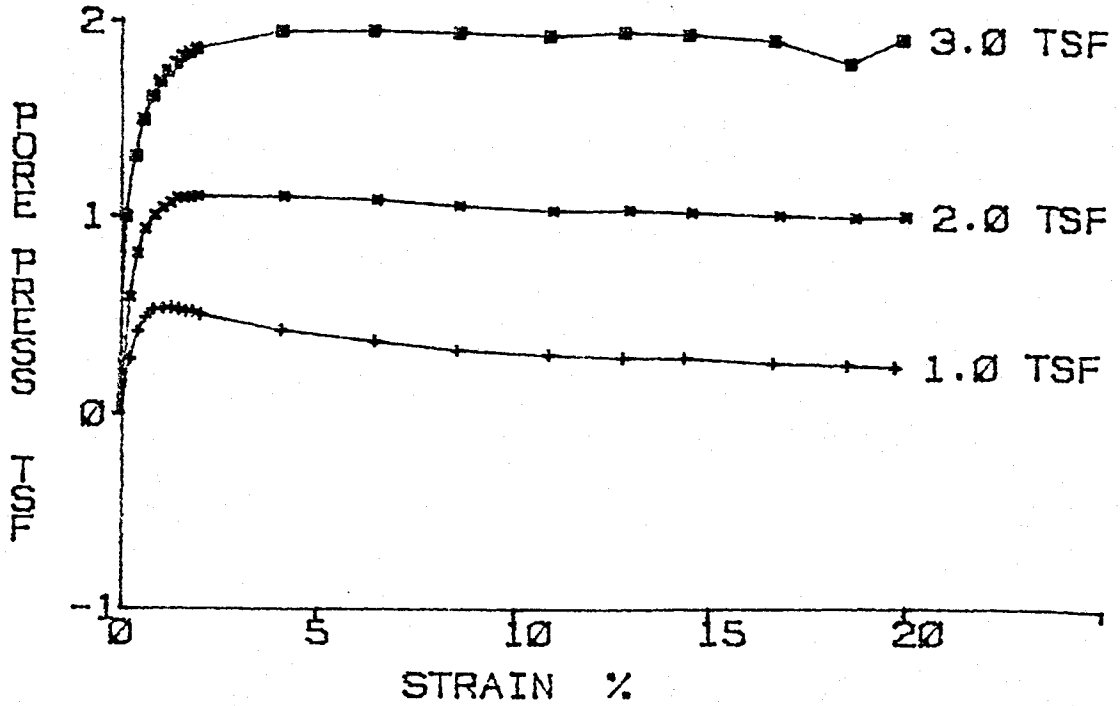
REMARKS:REMOLDED AT NATURAL MOISTURE & DENSITY

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (R) TEST

PROJECT:BULL RUN S.P. EL. :806.3-805.0
FEATURE:ASH POND 1 SAMPLE :1
STATION: PART :2,3,4 MIX
RANGE : SOIL SYM:SM-SC
BORING :US-4 DATE :2-28-85





REMOLDED AT NATURAL MOISTURE & DENSITY

Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Consolidated Undrained Triaxial Compression (R) Test

Project: BULL RUN S.P.
Feature: ASH POND 1
Station:
Range :
Boring : US-4

El. : 806.3-805.0
Sample: 1
Part : 2,3,4 MIX

Tested By : TAL
Computed By: MHD
Checked By : CBG
Report Date: 2-28-85

Soil Symbol= SM-SC
Sp. Gr. = 2.8

L.L.(%)= 33
D10(mm)= .0246

P.I.(%)= 10

Specimen Number	1	2	3	4
Initial:				
Moisture Content(%)	17.9	18.3	18.3	0.0
Dry Density(pcf)	110.0	109.6	109.6	0.0
Void Ratio	0.590	0.595	0.595	0.000
Saturation(%)	85.1	86.3	86.3	0.0
Before Shearing:				
Moisture(%) (after satur.)	21.1	21.3	21.3	0.0
Saturation(%)	100.0	100.0	100.0	0.0
Moisture(%) (after cons.)	20.3	18.8	18.9	18.9
Void Ratio (after cons.)	0.569	0.527	0.528	0.000
Final Moisture Content(%)	20.3	19.6	19.3	0.0
Minor Principal Stress(tsf)	1.01(1.01)	2.02(2.02)	3.02(3.02)	0.00(0.00)
Major Principal Stress(tsf)	3.37(2.83)	5.03(5.01)	6.27(6.27)	0.00(0.00)
Eff. Minor Prin. Stress(tsf)	0.71(0.48)	0.95(0.94)	1.04(1.04)	0.00(0.00)
Eff. Major Prin. Stress(tsf)	3.08(2.31)	3.96(3.94)	4.29(4.29)	0.00(0.00)
Time to Failure(min.)	90	70	60	0
Rate of Strain(%/min.)	0.21	0.21	0.22	0.00
Specimen Height(in.)	3.16	3.16	3.16	3.15
Specimen Diameter(in.)	1.40	1.40	1.40	1.40

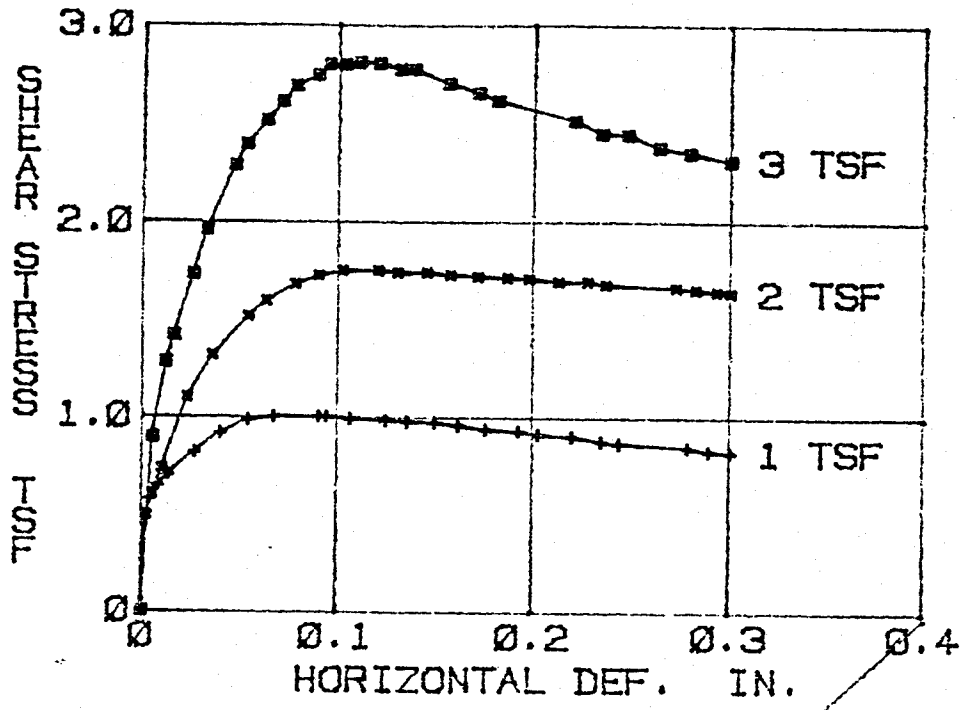
Shear Strength	Max Deviator Stress		Max Eff Stress Ratio	
	Deg.	c(tsf)	Deg.	c(tsf)
Apparent	10.4	0.83	15.5	0.46
Effective	35.2	0.11	34.2	0.16

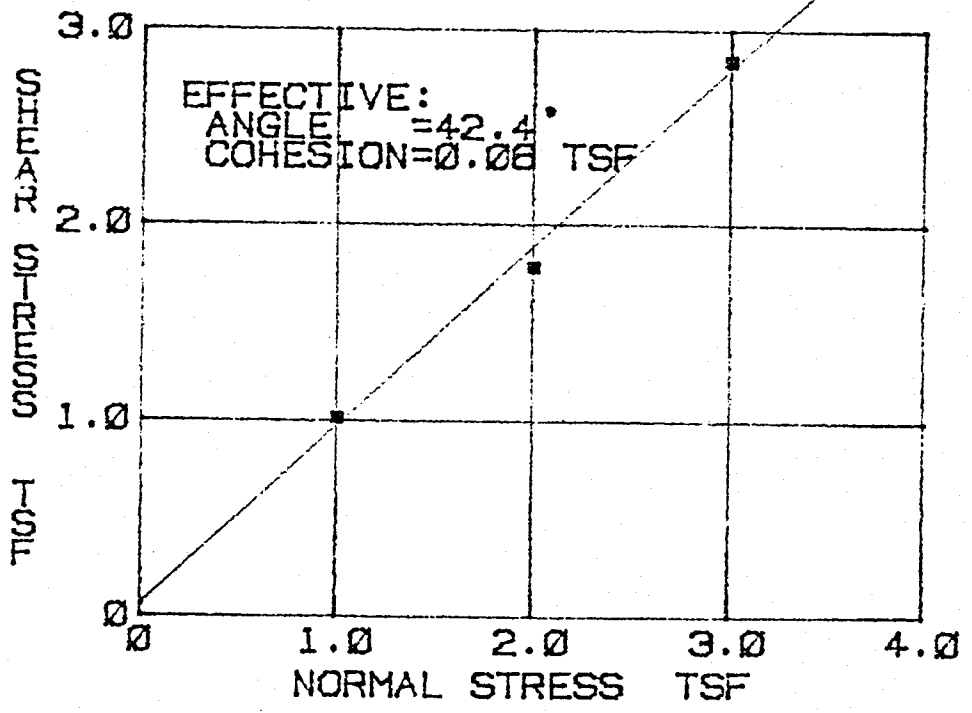
Remark:REMOLDED AT NATURAL MOISTURE & DENSITY

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
DIRECT SHEAR TEST

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:US-4
EL. :806.7-806.3
SAMPLE:1
DATE :2-21-85





REMARKS: TESTED AT NATURAL MOISTURE CONTENT

Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Direct Shear Test

Project: BULL RUN S.P.
Feature: ASH POND 1
Station:
Range :
Boring : US-4

El. : 806.7-806.3
Sample: 1
Part : 1

Tested By : GMD
Computed By: MHD
Checked By : [illegible]
Report Date: 2-21-85

Type of Specimen=UNDISTURBED
Soil Symbol =SM-SC

L.L. (%) =33
P.I. (%) =10

Sp. Gr. =2.80

Test No.	1	2	3	4
Initial:				
Moisture Content (%)	23.6	20.3	17.0	0.0
Dry Density (pcf)	102.3	107.6	114.0	0.0
Void Ratio	0.708	0.624	0.533	0.000
Saturation (%)	93.5	91.1	89.4	0.0
Final:				
Moisture Content (%)	22.1	18.6	15.5	0.0
Saturation (%)	85.6	85.4	82.4	0.0
Normal Stress (tsf)	1.00	2.00	3.00	0.00
Max. Shear Stress (tsf)	1.01	1.78	2.84	0.00
Time to Failure (min.)	75	135	180	0
Rate of Shearing (in./min.)	0.0009	0.0008	0.0008	0.0000
Specimen Height (in.)	0.727	0.727	0.727	0.000
Specimen Diameter (in.)	2.502	2.502	2.502	0.000

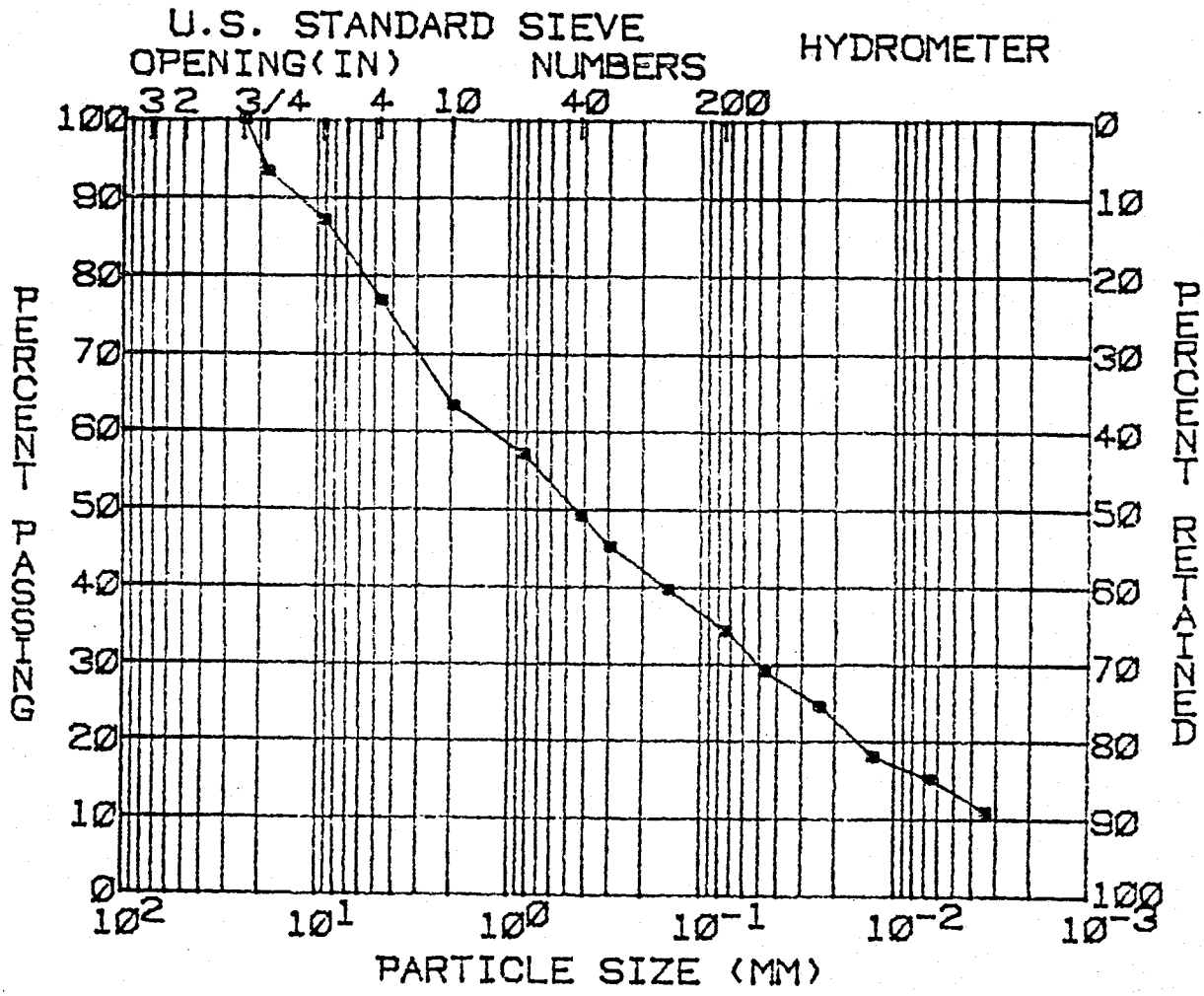
Shear Strength	Angle (deg.)	Cohesion (tsf)
Effective	42.4	0.06

Remarks: TESTED AT NATURAL MOISTURE CONTENT

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:POND 1 DIKE #2
STATION:
RANGE :

BORING:US-4A
EL. :802.9-801.2
SAMPLE:1
DATE :1-10-85



GRAVEL(%)= 22
SAND(%) = 43
SILT(%) = 21
CLAY(%) = 14

D10(MM) = 0.0028
D30(MM) = 0.0488
D60(MM) = 1.1725
COEF UNIF> 100

SOIL SYMBOL= SM
MOISTURE(%)= 22.3
SP. GR. = 2.62

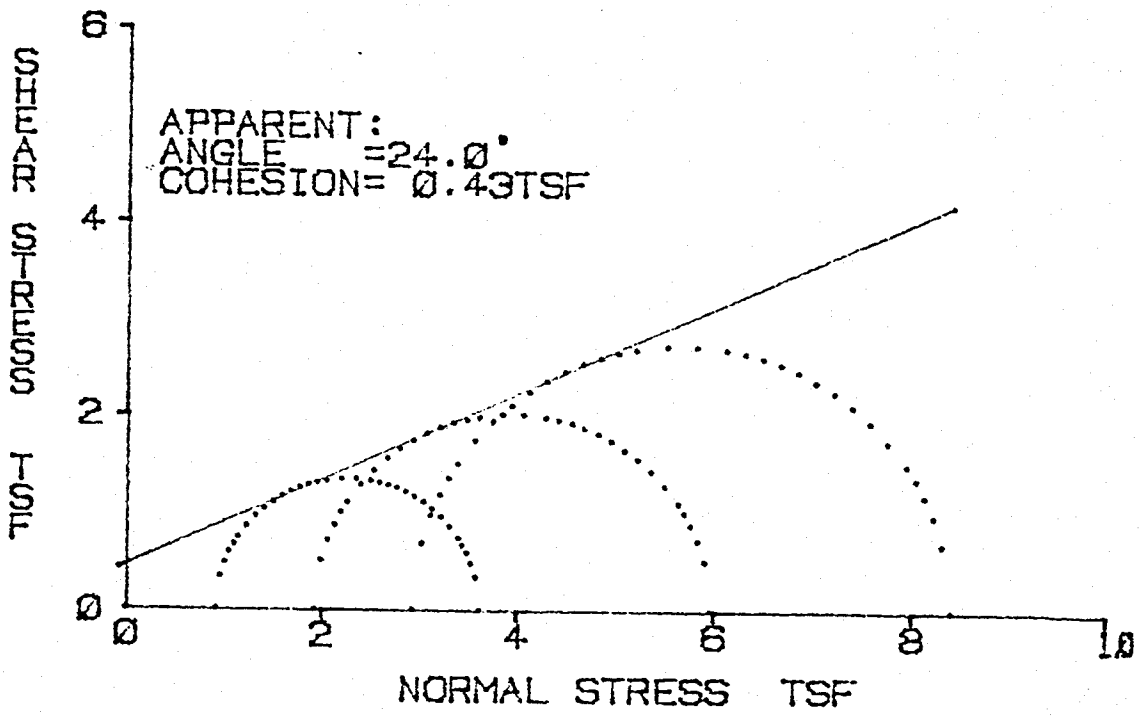
L.L.(%) = 30
P.I.(%) = 5

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION(R) TEST

PROJECT:BULL RUN S.P.	EL. :802.9-802.5
FEATURE:ASH POND 1	SAMPLE :1
STATION:	PART :1
RANGE :	SOIL SYM:SM
BORING :US-4A	DATE :2-28-85

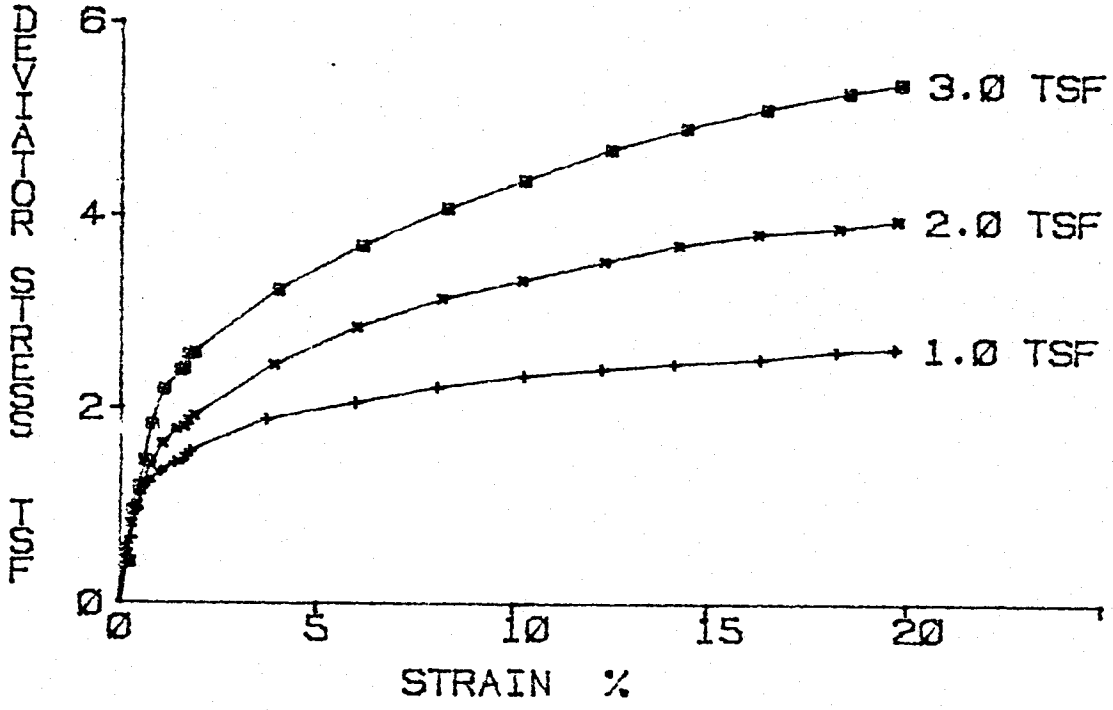


REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION(R) TEST

PROJECT:BULL RUN S.P.	EL. :802.9-802.5
FEATURE:ASH POND 1	SAMPLE :1
STATION:	PART :1
RANGE :	SOIL SYM:SM
BORING :US-4A	DATE :2-28-85



REMARKS:

Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Unconsolidated Undrained Triaxial Compression (R) Test

Project: BULL RUN S.P.
Feature: ASH POND 1
Station:
Range :
Boring : US-4A

El. : 802.9-802.5
Sample: 1
Part : 1

Tested By : EL
Computed By: MHD
Checked By : LEG
Report Date: 2-28-85

Soil Symbol= SM
Sp. Gr. = 2.62

L.L.(%)= 30
D10(mm)= .0028

P.I.(%)= 5

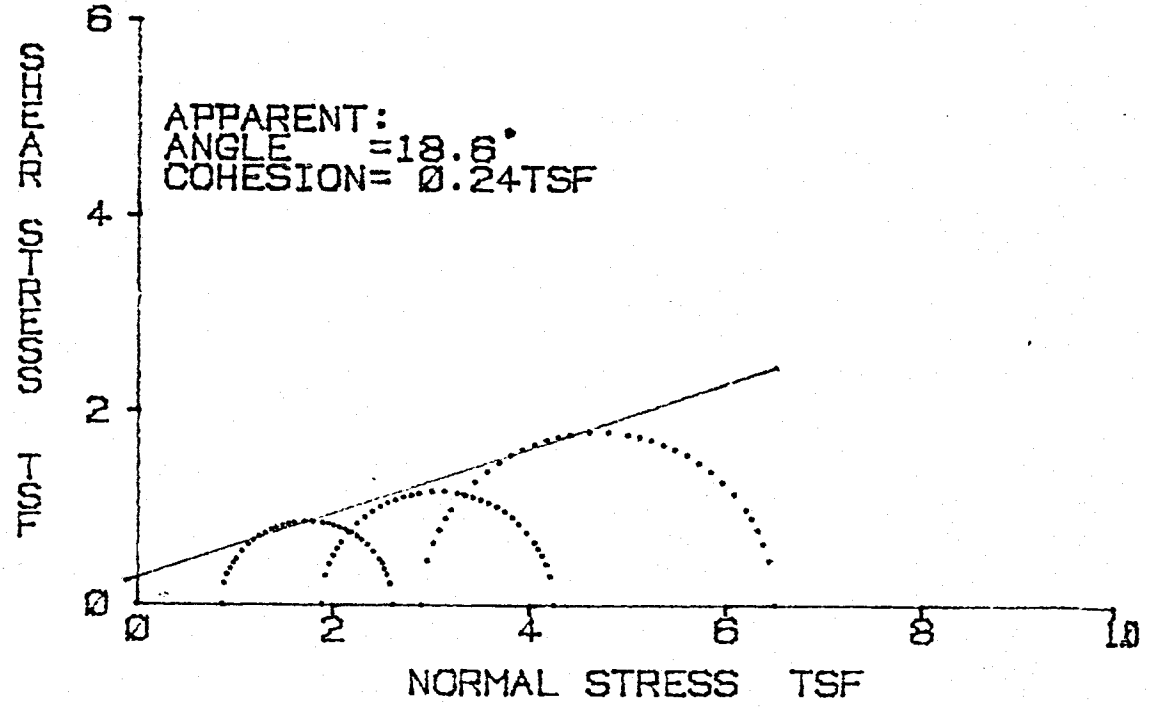
Specimen Number	1	2	3	4
Initial:				
Moisture Content(%)	20.8	21.4	22.1	0.0
Dry Density(pcf)	104.0	104.4	103.6	0.0
Void Ratio	0.573	0.566	0.579	0.000
Saturation(%)	95.2	99.0	99.9	0.0
Before Shearing:				
Moisture(%) (after satur.)	--	--	--	--
Saturation(%)	--	--	--	--
Moisture(%) (after cons.)	--	--	--	--
Void Ratio (after cons.)	--	--	--	--
Final Moisture Content(%)	19.6	19.4	19.7	0.0
Minor Principal Stress(tsf)	1.01	2.02	3.02	0.00
Major Principal Stress(tsf)	3.72	6.07	8.49	0.00
Eff. Minor Prin. Stress(tsf)	--	--	--	--
Eff. Major Prin. Stress(tsf)	--	--	--	--
Time to Failure(min.)	97	97	97	0
Rate of Strain(%/min.)	0.21	0.21	0.21	0.00
Specimen Height(in.)	3.27	3.27	3.27	3.27
Specimen Diameter(in.)	1.40	1.40	1.40	1.40

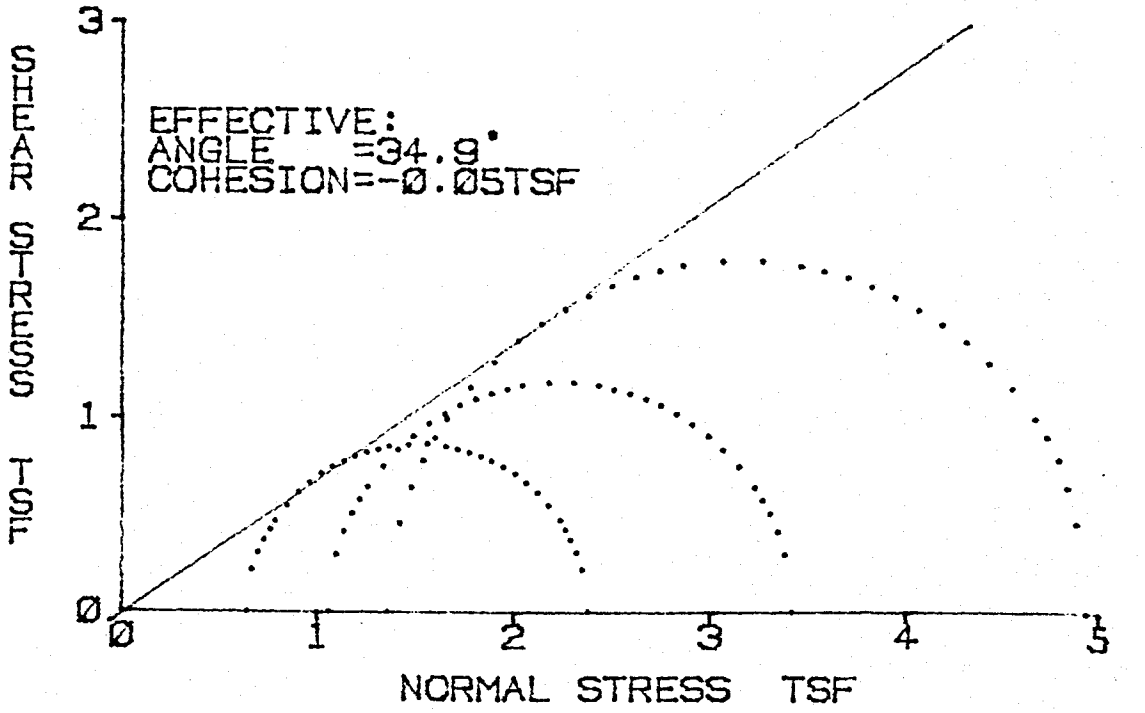
Shear Strength	Max Deviator Stress Deg.	Max Deviator Stress c(tsf)	Max Eff Stress Ratio Deg.	Max Eff Stress Ratio c(tsf)
Apparent	24.0	0.43		
Effective	--	--		

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (R) TEST

PROJECT:BULL RUN S.P.	EL: :802.5-802.0
FEATURE:ASH POND 1	SAMPLE :1
STATION:	PART :2
RANGE :	SOIL SYM:SM
BORING :US-4A	DATE :2-28-85



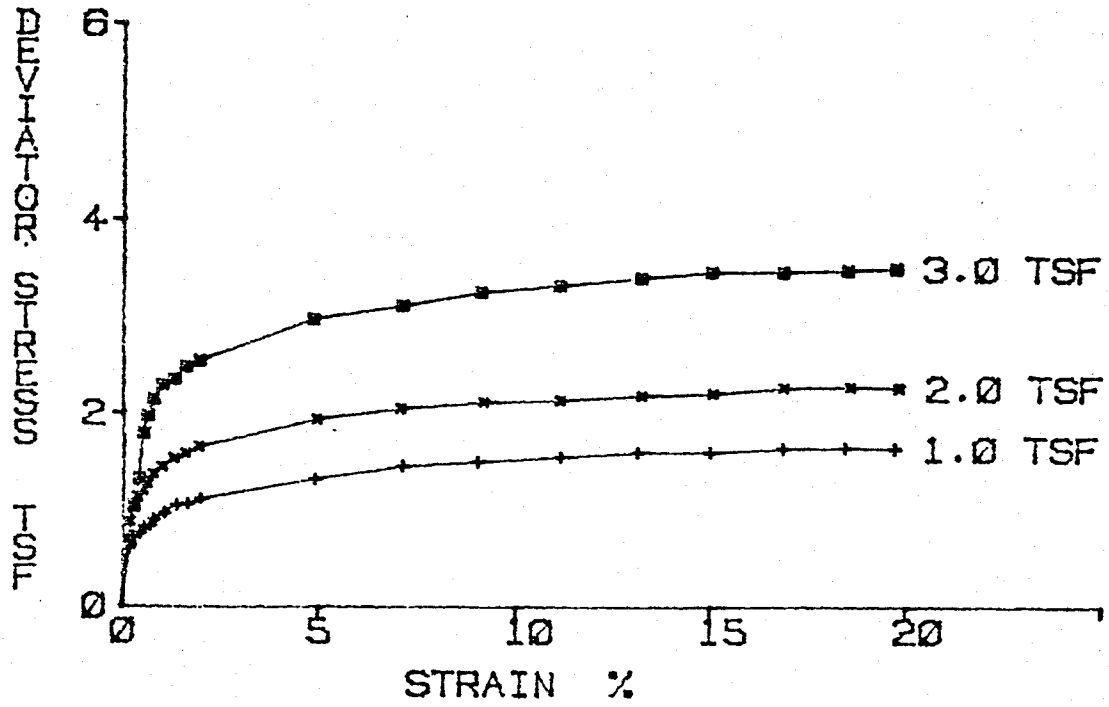


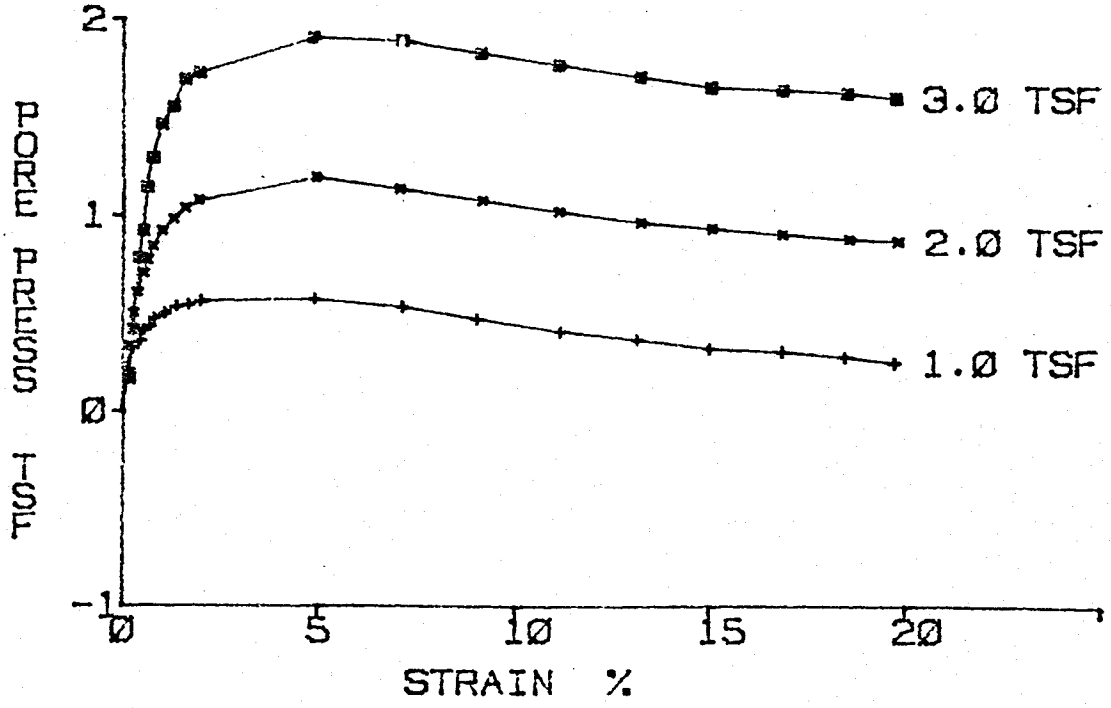
REMARKS: Analyzing the data by the method of least squares in the form of $y = mx$, the effective friction angle is 33.6° and the effective cohesion is 0.00 tsf.

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (R) TEST

PROJECT:	BULL RUN S.P.	EL.	:802.5-802.0
FEATURE:	ASH POND 1	SAMPLE	:1
STATION:		PART	:2
RANGE	:	SOIL SYM:	SM
BORING	:US-4A	DATE	:2-28-85





Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Consolidated Undrained Triaxial Compression (R) Test

Project: BULL RUN S.P.
Feature: ASH POND 1
Station:
Range :
Boring : US-4A

El. : 802.5-802.0
Sample: 1
Part : 2

Tested By : EL
Computed By: MHD
Checked By : CBG
Report Date: 2-28-85

Soil Sybmbol= SM
Sp. Gr. = 2.62

L.L.(%)= 30
D10(mm)= .0028

P.I.(%)= 5

Specimen Number	1	2	3	4
Initial:				
Moisture Content(%)	25.7	25.9	20.7	0.0
Dry Density(pcf)	100.5	100.5	109.2	0.0
Void Ratio	0.628	0.627	0.498	0.000
Saturation(%)	107.4	108.1	108.7	0.0
Before Shearing:				
Moisture(%) (after satur.)	24.0	23.9	19.0	0.0
Saturation(%)	100.0	100.0	100.0	0.0
Moisture(%) (after cons.)	21.2	21.5	16.7	16.7
Void Ratio (after cons.)	0.556	0.562	0.439	0.000
Final Moisture Content(%)	25.1	24.6	19.1	0.0
Minor Principal Stress(tsf)	1.01(1.01)	2.02(2.02)	3.02(3.02)	0.00(0.00)
Major Principal Stress(tsf)	2.74(2.51)	4.38(4.01)	6.63(6.19)	0.00(0.00)
Eff. Minor Prin. Stress(tsf)	0.67(0.43)	1.08(0.78)	1.38(1.10)	0.00(0.00)
Eff. Major Prin. Stress(tsf)	2.41(1.94)	3.44(2.78)	4.99(4.27)	0.00(0.00)
Time to Failure(min.)	90	90	97	0
Rate of Strain(%/min.)	0.21	0.21	0.21	0.00
Specimen Height(in.)	3.27	3.27	3.27	3.27
Specimen Diameter(in.)	1.40	1.40	1.40	1.40

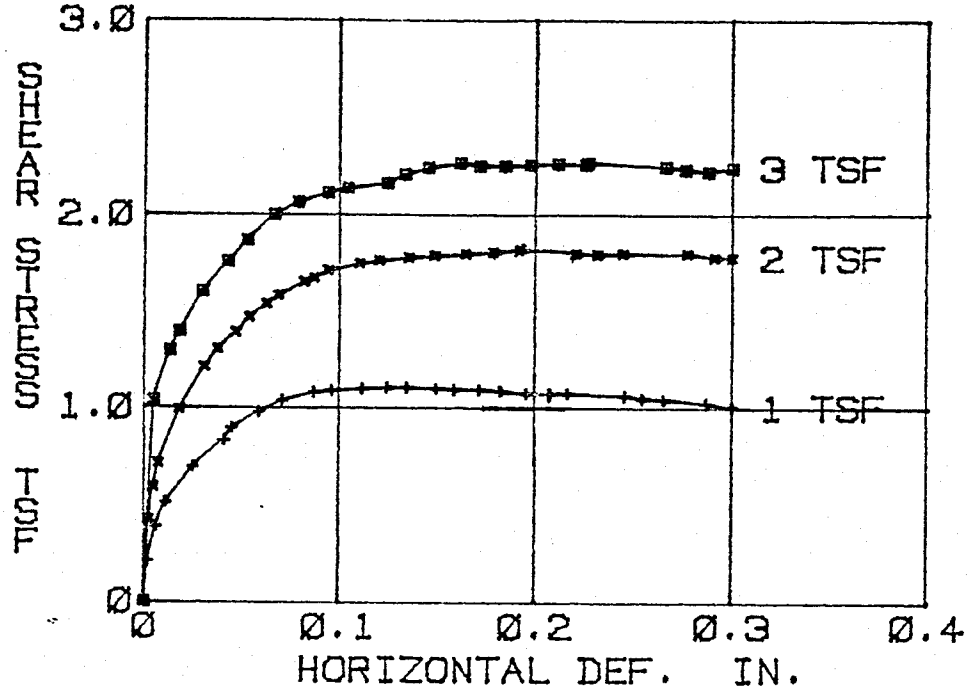
Shear Strength	Max Deviator Stress		Max Eff Stress Ratio	
	Deg.	c(tsf)	Deg.	c(tsf)
Apparent	18.6	0.24	17.2	0.20
Effective	34.9	-0.05	34.2	0.06

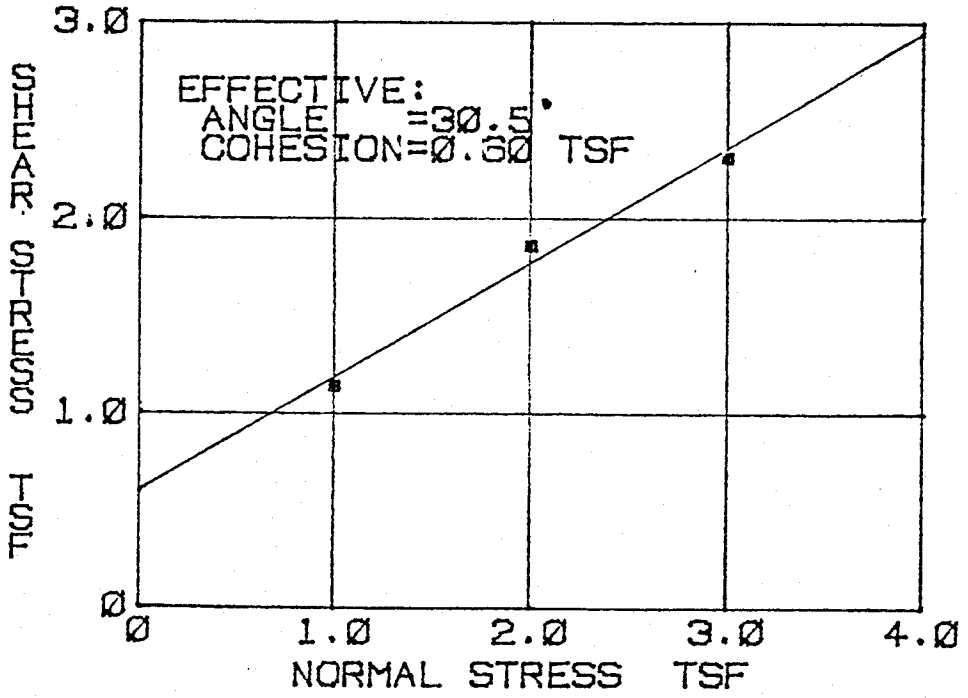
REMARKS: Analyzing the data by the method of least square in the form of $y = mx$, the effective friction angle is 33.6^{o} and the effective cohesion is 0.00 tsf.

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
DIRECT SHEAR TEST

PROJECT: BULL RUN S.P.
FEATURE: POND 1 DIKE 2
STATION:
RANGE :

BORING: US-4A
EL. : 802.9-802.5
SAMPLE: 1
DATE : 3-6-85





REMARKS: REMOLDED AT NATURAL MOISTURE CONTENT & DENSITY. TEST AT NATURAL MOISTURE

Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Direct Shear Test

Project: BULL RUN S.P.
Feature: POND 1 DIKE 2
Station:
Range :
Boring : US-4A

El. : 802.9-802.5
Sample: 1
Part : 1

Tested By : GMC
Computed By: MHD
Checked By : CRC
Report Date: 3-6-85

Type of Specimen=REMOLDED
Soil Symbol =SM

L.L. (%) =30
P.I. (%) = 5

Sp. Gr. =2.62

Test No.	1	2	3	4
Initial:				
Moisture Content (%)	21.1	21.0	20.9	0.0
Dry Density (pcf)	104.2	104.4	104.1	0.0
Void Ratio	0.570	0.567	0.572	0.000
Saturation (%)	96.8	97.1	95.9	0.0
Final:				
Moisture Content (%)	18.9	18.7	18.6	0.0
Saturation (%)	81.2	100.0	97.3	0.0
Normal Stress (tsf)	1.00	2.00	3.00	0.00
Max. Shear Stress (tsf)	1.14	1.86	2.32	0.00
Time to Failure (min.)	165	360	270	0
Rate of Shearing (in./min.)	0.0008	0.0007	0.0008	0.0000
Specimen Height (in.)	0.733	0.733	0.733	0.000
Specimen Diameter (in.)	2.499	2.499	2.501	0.000

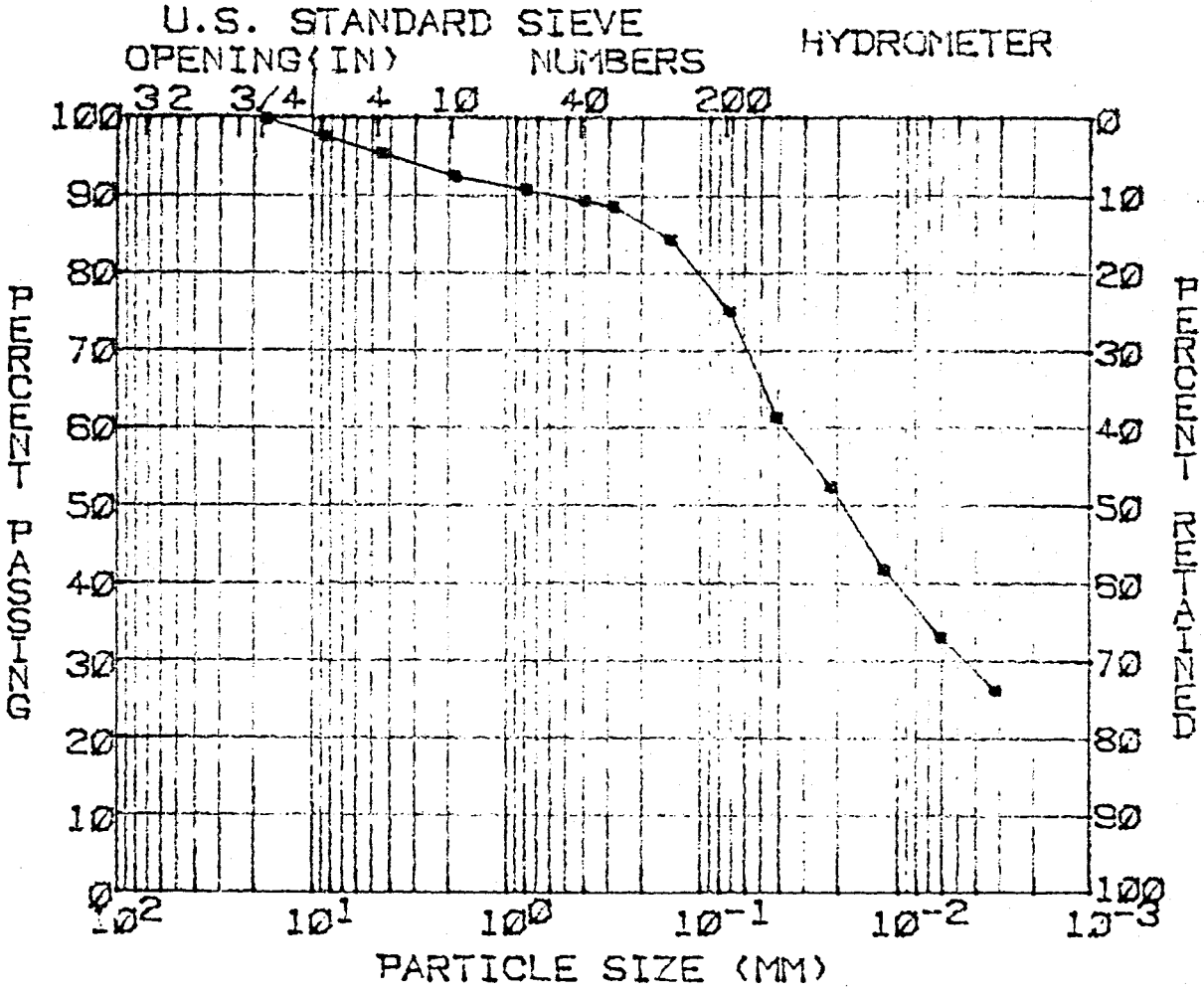
Shear Strength	Angle (deg.)	Cohesion (tsf)
Effective	30.5	0.60

Remarks: REMOLDED AT NATURAL MOISTURE CONTENT & DENSITY. TEST AT NATURAL MOISTURE

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:POND 1 DIKE #2
STATION:
RANGE :

BORING:US-4A
EL. :790.4 - 789.0
SAMPLE:2
DATE :1-10-85



GRAVEL(%)= 4
SAND(%) = 21
SILT(%) = 44
CLAY(%) = 31

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL
MOISTURE(%)= 21.6
SP. GR. = 2.69

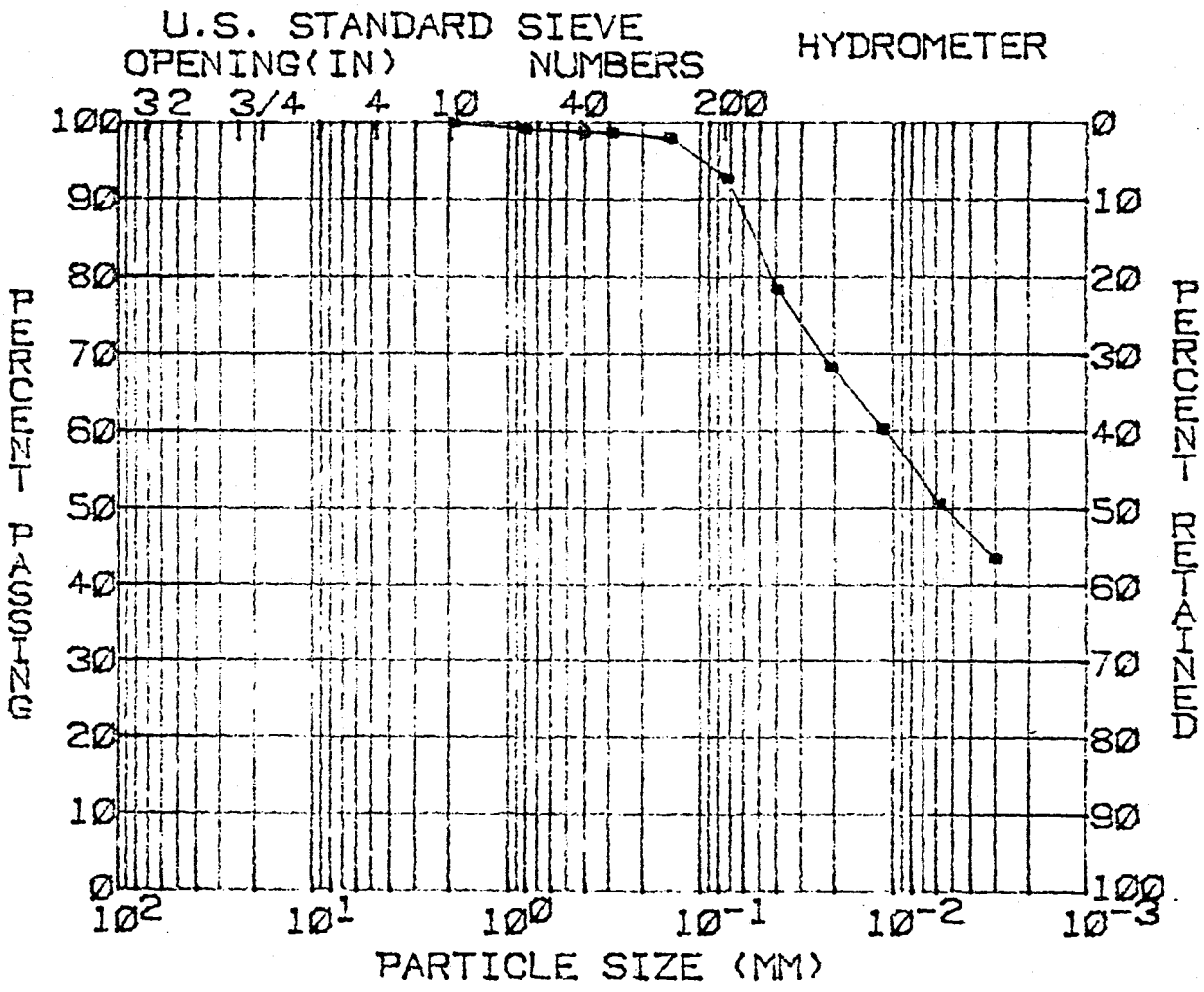
L.L.(%) = 33
P.I.(%) = 14

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:POND 1 DIKE #2
STATION:
RANGE :

BORING:US-4A
EL. :787.9 -786.1
SAMPLE:3
DATE :1-10-85



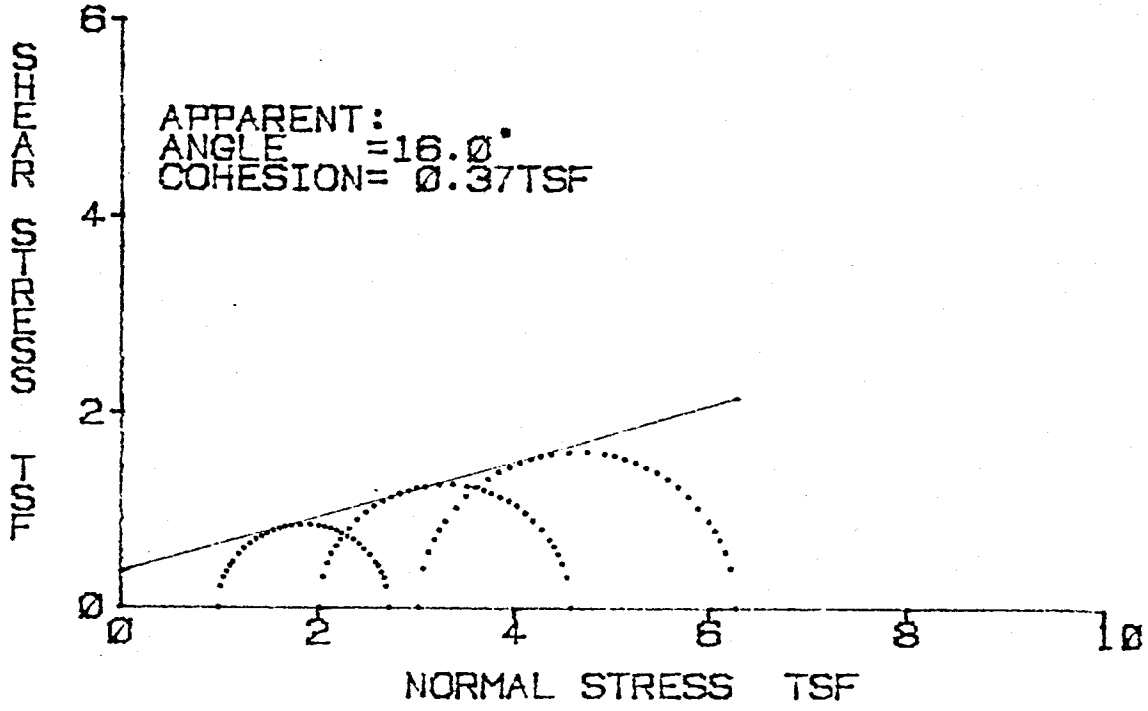
GRAVEL(%)	= 0	D10(MM)	= --
SAND(%)	= 7	D30(MM)	= --
SILT(%)	= 44	D60(MM)	= --
CLAY(%)	= 49	COEF UNIF	= --
SOIL SYMBOL	= CL	L.L.(%)	= 45
MOISTURE(%)	= 24.3	P.I.(%)	= 24
SP. GR.	= 2.70		

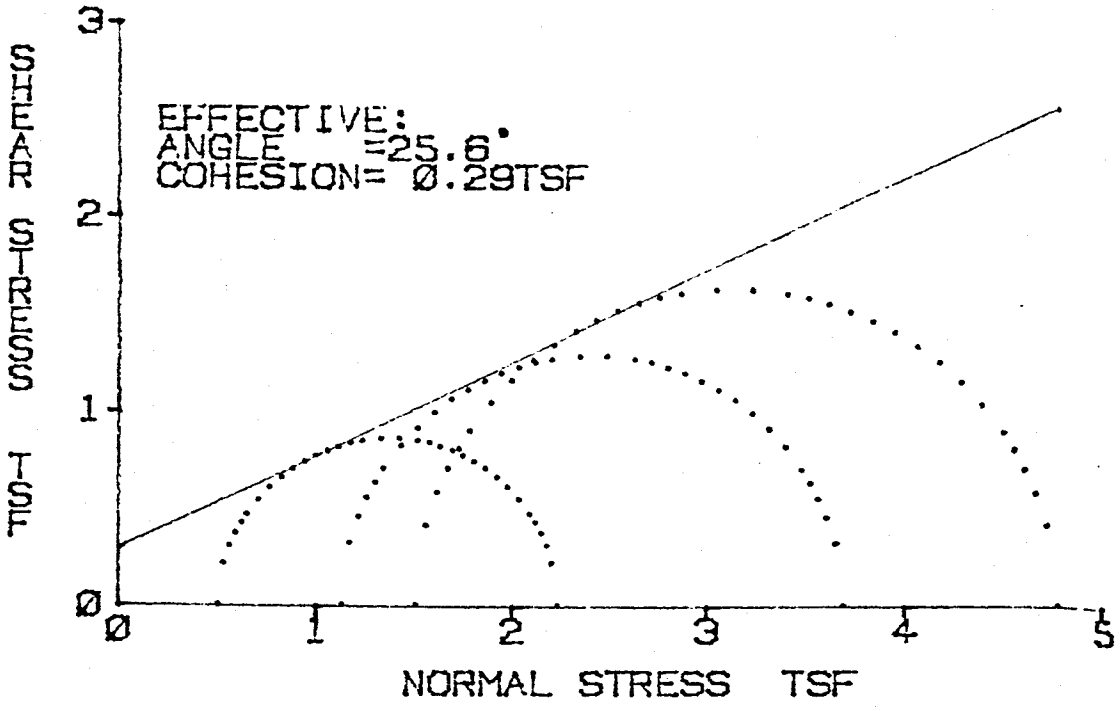
REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (R) TEST

PROJECT:BULL RUN S.P.	EL. :787.Ø-786.5
FEATURE:ASH POND 1	SAMPLE :3
STATION:	PART :3
RANGE :	SOIL SYM:CL
BORING :US-4A	DATE :3/12/85



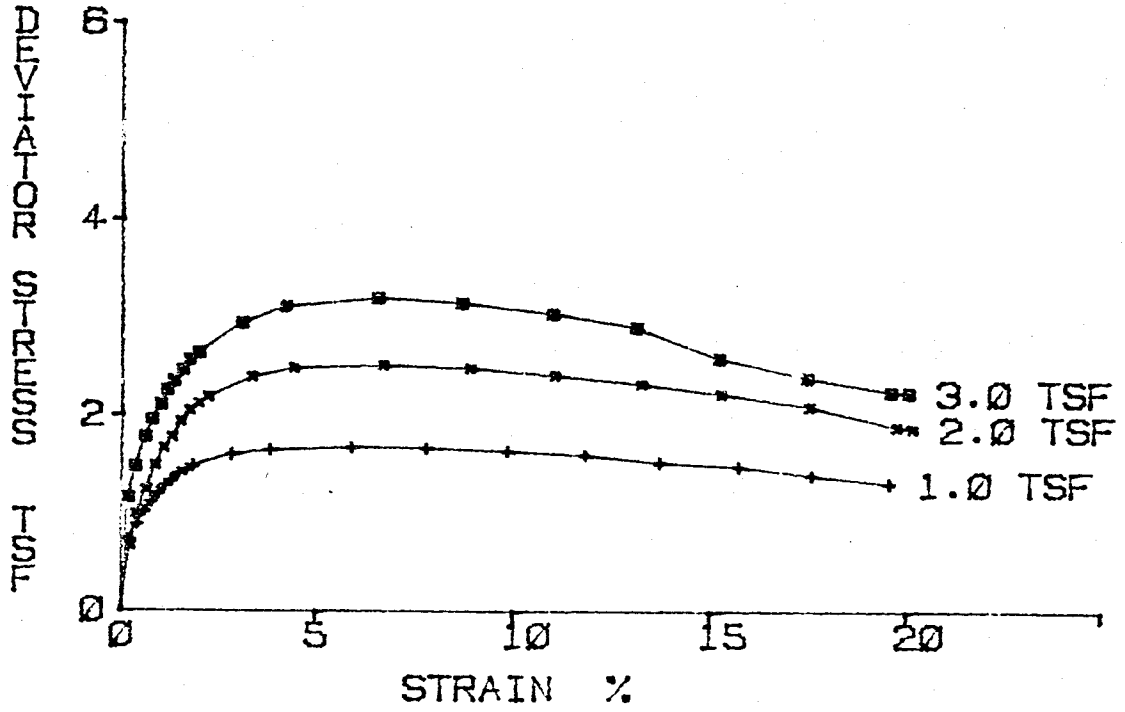


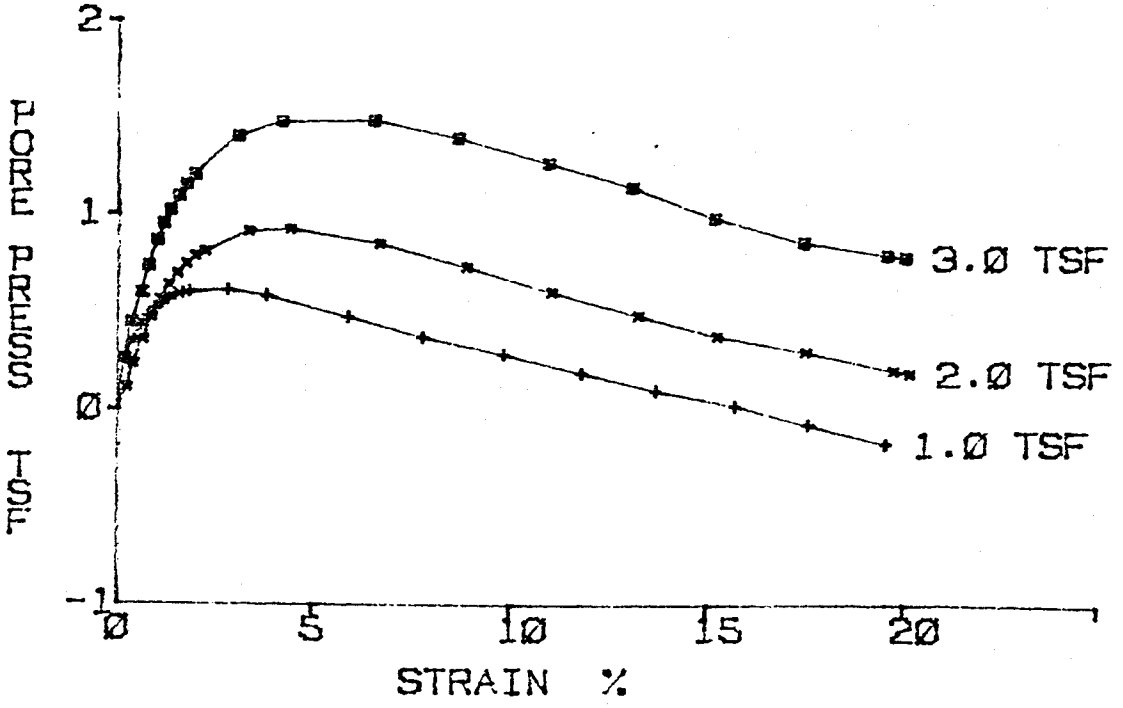
REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (R) TEST

PROJECT:BULL RUN S.P. EL. :787.Ø-786.5
FEATURE:ASH POND 1 SAMPLE :3
STATION: PART :3
RANGE : SOIL SYM:CL
BORING :US-4A DATE :3/12/85





REMARKS:

Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Consolidated Unrained Triaxial Compression (R) Test

Project: BULL RUN S.P.
Feature: ASH POND 1
Station:
Range :
Boring : US-4A

El. : 787.0-786.5
Sample: 3
Part : 3

Tested By : RLT
Computed By: TMM
Checked By : CBG
Report Date: 3/12/85

Soil Symbol= CL
Sp. Gr. = 2.7

L.L.(%)= 45
D10(mm)=

P.I.(%)= 24

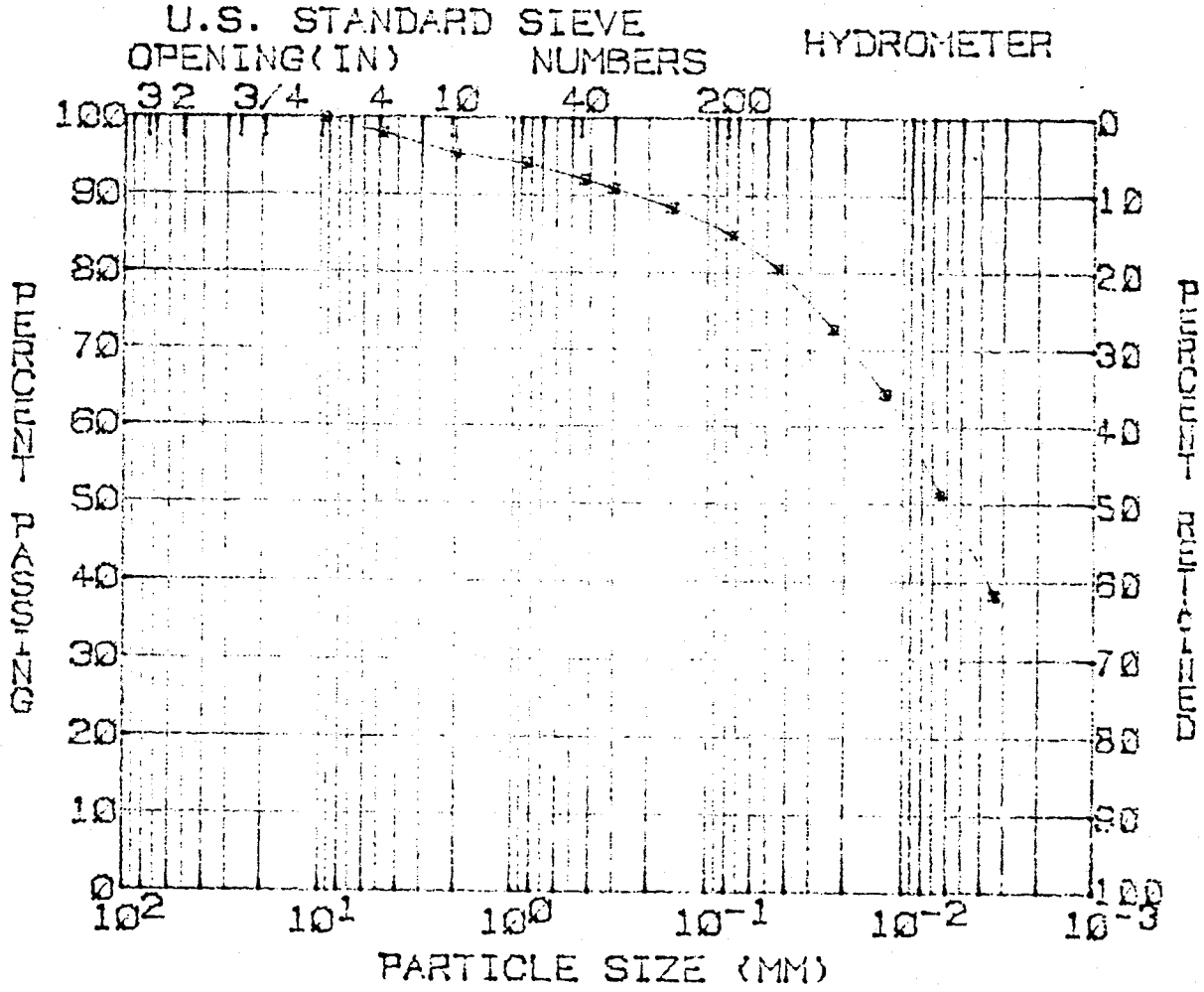
Specimen Number	1	2	3	4
Initial:				
Moisture Content(%)	25.2	25.6	25.0	0.0
Dry Density(pcf)	98.6	98.0	99.7	0.0
Void Ratio	0.709	0.720	0.690	0.000
Saturation(%)	95.9	95.9	97.7	0.0
Before Shearing:				
Moisture(%) (after satur.)	26.3	26.7	25.6	0.0
Saturation(%)	100.0	100.0	100.0	0.0
Moisture(%) (after cons.)	25.1	24.4	22.3	22.3
Void Ratio (after cons.)	0.676	0.658	0.601	0.000
Final Moisture Content(%)	26.1	26.9	25.2	0.0
Minor Principal Stress(tsf)	1.01(1.01)	2.02(2.02)	3.02(3.02)	0.00(0.00)
Major Principal Stress(tsf)	2.74(2.66)	4.59(4.55)	6.28(6.28)	0.00(0.00)
Eff. Minor Prin. Stress(tsf)	0.51(0.37)	1.13(1.06)	1.51(1.51)	0.00(0.00)
Eff. Major Prin. Stress(tsf)	2.24(2.03)	3.70(3.59)	4.77(4.77)	0.00(0.00)
Time to Failure(min.)	30	30	30	0
Rate of Strain(%/min.)	0.20	0.22	0.22	0.00
Specimen Height(in.)	3.15	3.15	3.15	3.15
Specimen Diameter(in.)	1.40	1.40	1.40	1.40

Shear Strength	Max Deviator Stress		Max Eff Stress Ratio	
	Deg.	c(tsf)	Deg.	c(tsf)
Apparent	16.0	0.37	16.5	0.33
Effective	25.6	0.29	24.3	0.36

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:US-5
EL. :813.Ø-812.1
SAMPLE:1
DATE :3-4-85



GRAVEL(%)= 1
SAND(%) = 13
SILT(%) = 39
CLAY(%) = 47

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL
MOISTURE(%)= --
SP. GR. = 2.62

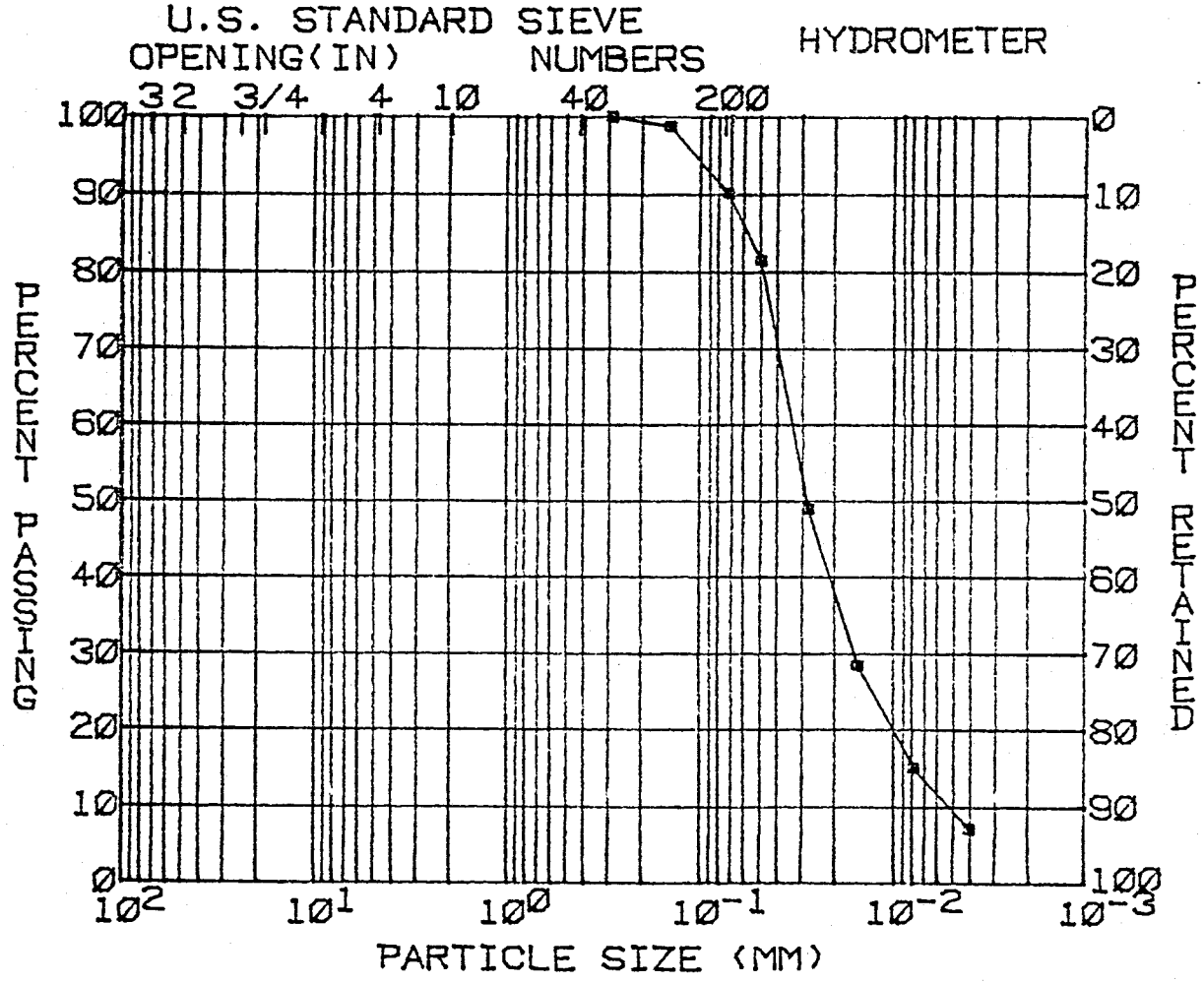
L.L.(%) = 42
P.I.(%) = 20

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:POND 1
STATION:STACKED FLY ASH
RANGE :

BORING:US-5
EL. :812.1-811.5
SAMPLE:1
DATE :1-11-85



GRAVEL(%)= 0
SAND(%) = 9
SILT(%) = 81
CLAY(%) = 10

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= ML
MOISTURE(%)= 36.5
SP. GR. = 2.18

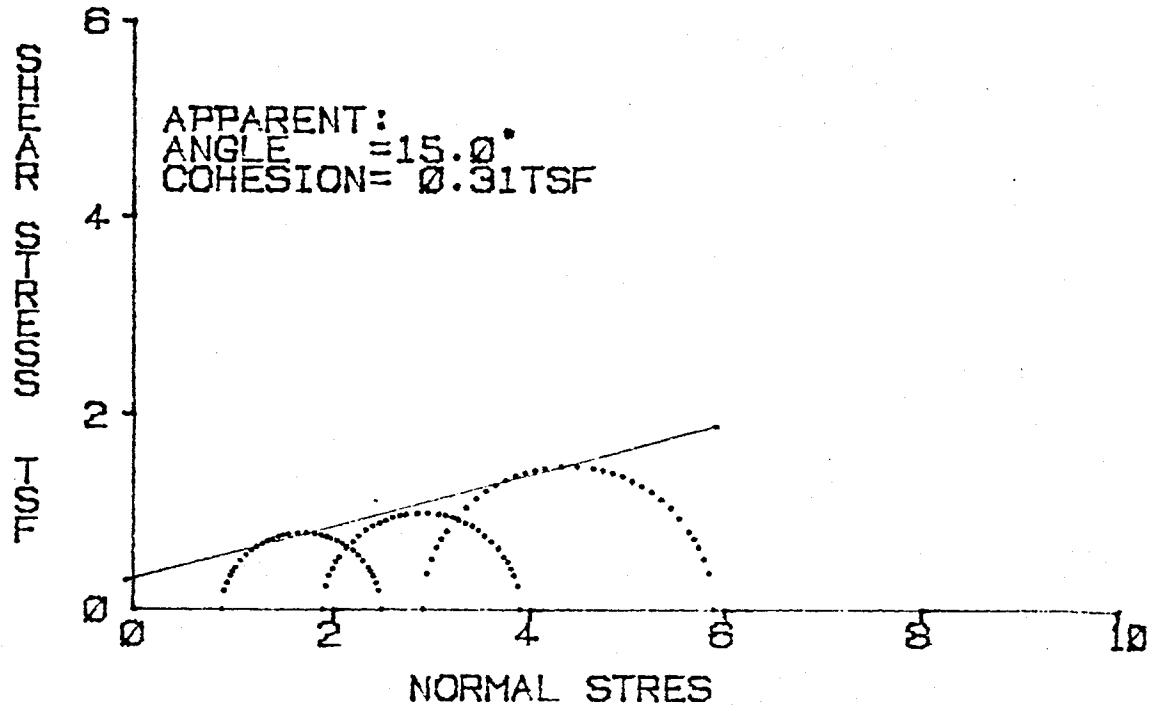
L.L.(%) = NP
P.I.(%) = NP

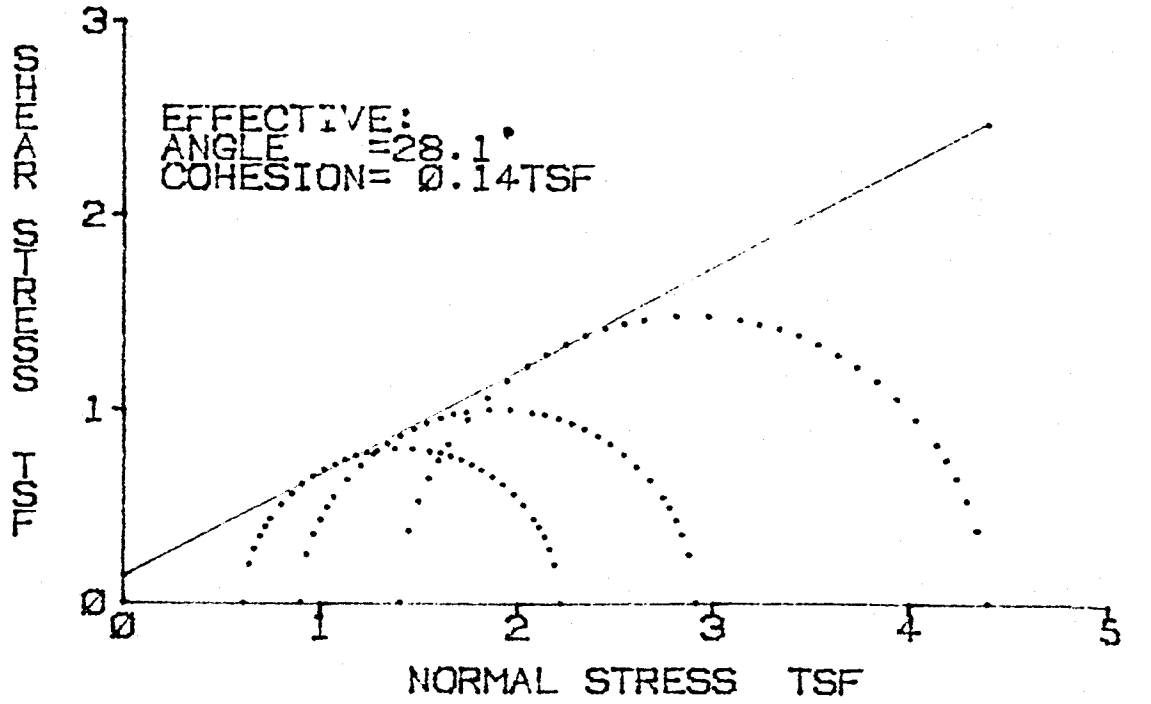
REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (R) TEST

PROJECT:BULL RUN S.P.	EL. :813.Ø-812.5
FEATURE:ASH POND 1	SAMPLE :1
STATION:	PART :1
RANGE :	SOIL SYM:CL
BORING :US-5	DATE :3-11-85



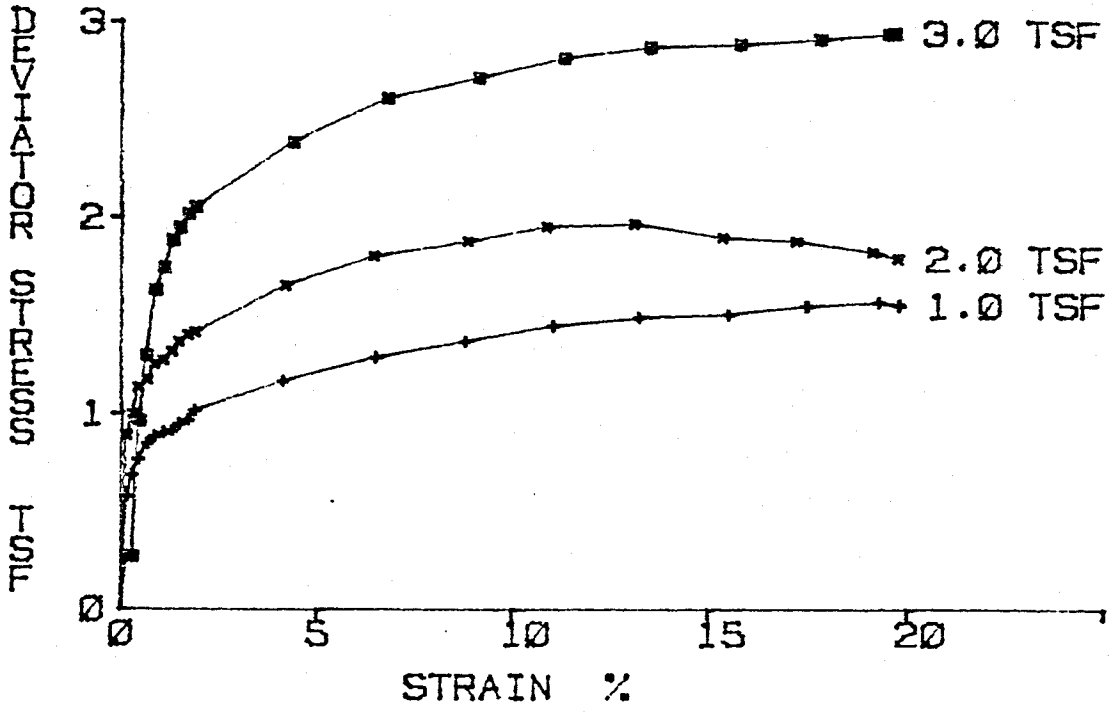


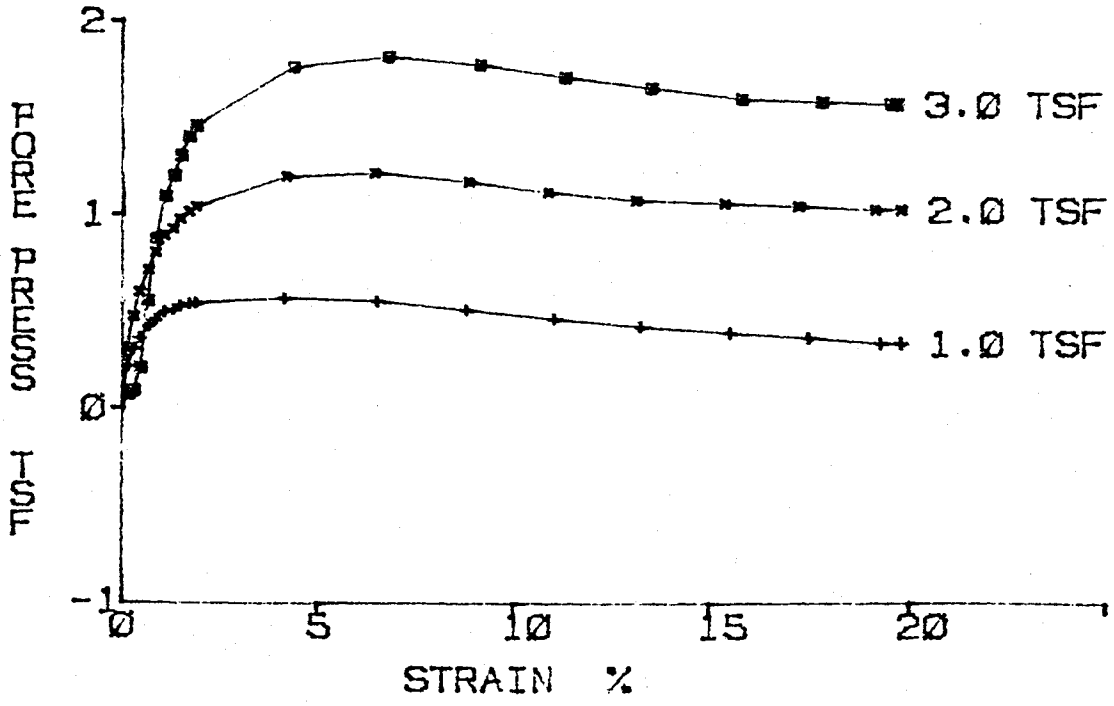
REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (R) TEST

PROJECT:BULL RUN S.P. EL. :813.Ø-812.5
FEATURE:ASH POND 1 SAMPLE :1
STATION: PART :1
RANGE : SOIL SYM:CL
BORING :US-5 DATE :3-11-85





REMARKS:

Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Consolidated Unbrained Triaxial Compression (R) Test

Project: BULL RUN S.P.
Feature: ASH POND 1
Station:
Range :
Boring : US-5

El. : 813.0-812.5
Sample: 1
Part : 1

Tested By : EL
Computed By: TNM
Checked By : CEG
Report Date: 3/12/85

Soil Symbol= CL
Sp. Gr. = 2.62

L.L.(%)= 42
D10(mm)=

P.I.(%)= 20

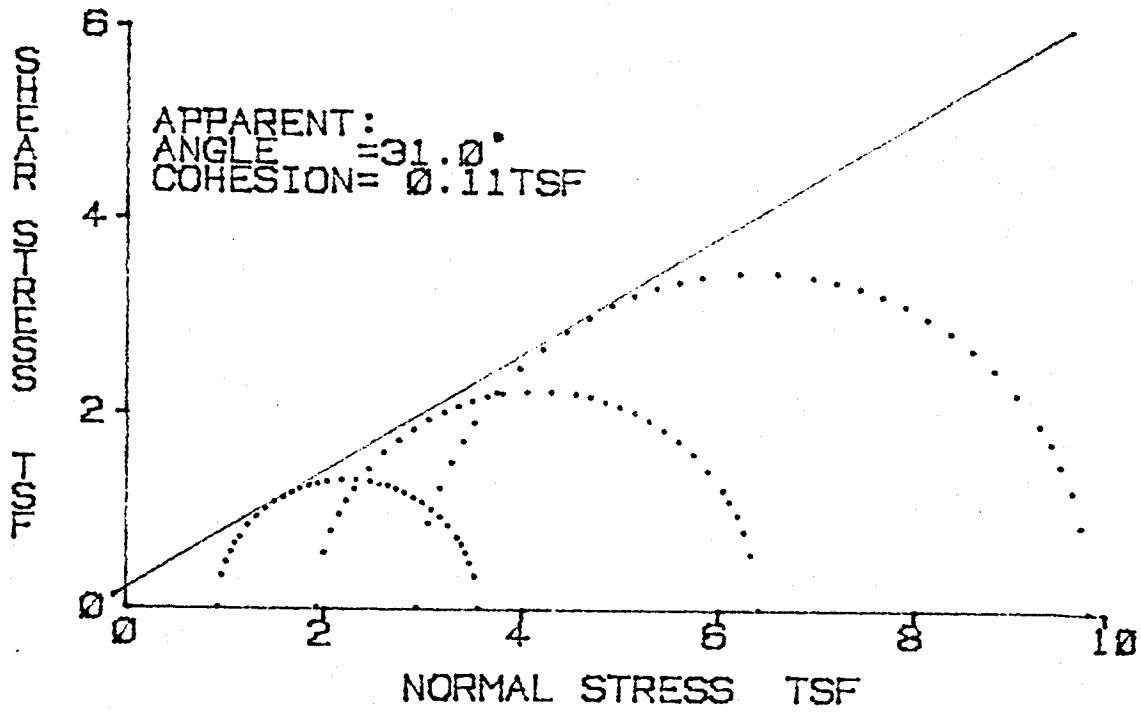
Specimen Number	1	2	3	4
Initial:				
Moisture Content(%)	24.6	23.0	29.2	0.0
Dry Density(pcf)	97.4	100.8	90.0	0.0
Void Ratio	0.680	0.622	0.818	0.000
Saturation(%)	94.9	96.8	93.4	0.0
Before Shearing:				
Moisture(%) (after satur.)	25.9	23.7	31.2	0.0
Saturation(%)	100.0	100.0	100.0	0.0
Moisture(%) (after cons.)	22.4	21.2	27.2	27.2
Void Ratio (after cons.)	0.587	0.557	0.712	0.000
Final Moisture Content(%)	23.0	20.5	24.5	0.0
Minor Principal Stress(tsf)	1.01(1.01)	2.02(2.02)	3.02(3.02)	0.00(0.00)
Major Principal Stress(tsf)	2.61(2.32)	4.03(3.86)	6.01(5.77)	0.00(0.00)
Eff. Minor Prin. Stress(tsf)	0.62(0.42)	0.90(0.77)	1.40(1.22)	0.00(0.00)
Eff. Major Prin. Stress(tsf)	2.23(1.74)	2.92(2.61)	4.39(3.96)	0.00(0.00)
Time to Failure(min.)	90	60	93	C
Rate of Strain(%/min.)	0.22	0.22	0.22	0.00
Specimen Height(in.)	3.08	3.08	3.08	3.08
Specimen Diameter(in.)	1.40	1.40	1.40	1.40

Shear Strength	Max Deviator Stress Deg.	Max Deviator Stress c(tsf)	Max Eff Stress Ratio Deg.	Max Eff Stress Ratio c(tsf)
Apparent	15.0	0.31	15.3	0.20
Effective	28.1	0.14	28.5	0.15

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION(R) TEST

PROJECT:BULL RUN S.P.	EL. :812.1 -811.5
FEATURE:ASH POND 1	SAMPLE :1
STATION:	PART :3
RANGE :	SOIL SYM:ML
BORING :US-5	DATE :2-28-85

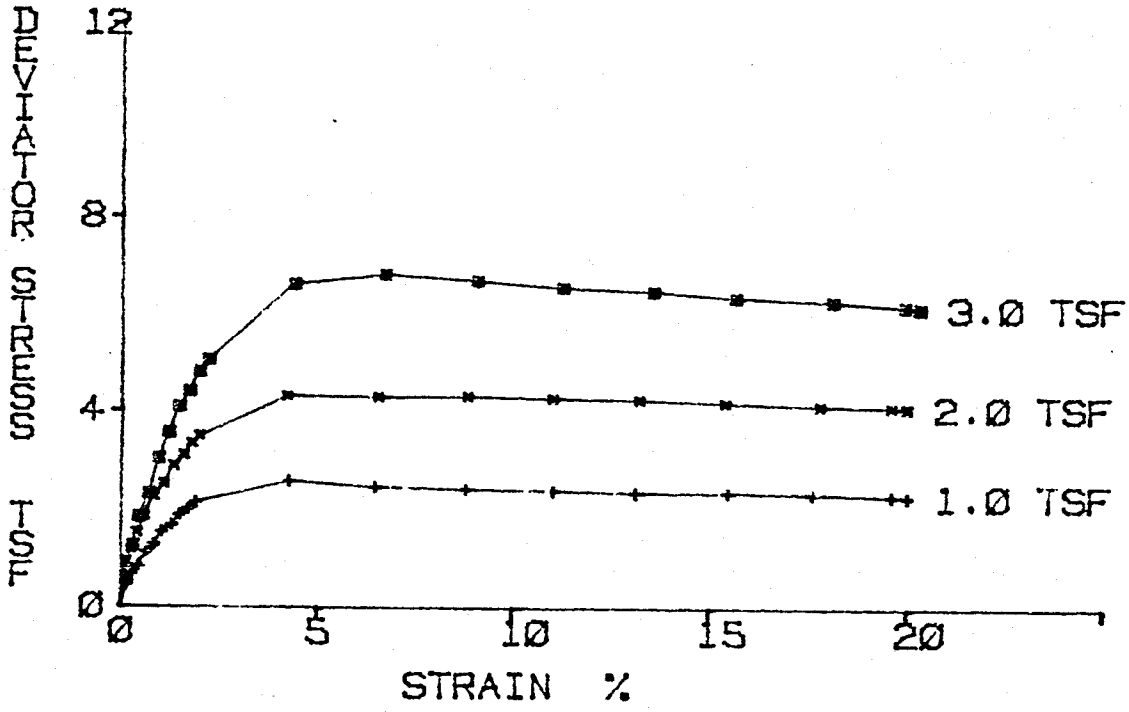


REMARKS: REMOLDED AT NATURAL MOISTURE & DENSITY

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION(R) TEST

PROJECT:BULL RUN S.P.	EL. :812.1 -811.5
FEATURE:ASH POND 1	SAMPLE :1
STATION:	PART :3
RANGE :	SOIL SYM:ML
BORING :US-5	DATE :2-28-85



REMARKS:REMOLDED AT NATURAL MOISTURE & DENSITY

Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Unconsolidated Undrained Triaxial Compression (R) Test

Project: BULL RUN S.P.
Feature: ASH POND 1
Station:
Range :
Boring : US-5

El. : 812.1-811.5
Sample: 1
Part : 3

Tested By : EL
Computed By: MHD
Checked By : CEE
Report Date: 2-28-85

Soil Sybmbol= ML
Sp. Gr. = 2.18

L.L.(%)= NP
D10(mm)= 0

P.I.(%)= NP

Specimen Number	1	2	3	4
Initial:				
Moisture Content(%)	30.3	29.4	29.8	0.0
Dry Density(pcf)	81.3	81.9	81.6	0.0
Void Ratio	0.673	0.662	0.667	0.000
Saturation(%)	98.1	96.9	97.4	0.0
Before Shearing:				
Moisture(%) (after satur.)	--	--	--	--
Saturation(%)	--	--	--	--
Moisture(%) (after cons.)	--	--	--	--
Void Ratio (after cons.)	--	--	--	--
Final Moisture Content(%)	27.5	26.6	27.1	0.0
Minor Principal Stress(tsf)	1.01	2.02	3.02	0.00
Major Principal Stress(tsf)	3.66	6.50	9.95	0.00
Eff. Minor Prin. Stress(tsf)	--	--	--	--
Eff. Major Prin. Stress(tsf)	--	--	--	--
Time to Failure(min.)	20	40	30	0
Rate of Strain(%/min.)	0.22	0.22	0.23	0.00
Specimen Height(in.)	3.16	3.16	3.16	3.16
Specimen Diameter(in.)	1.40	1.40	1.40	1.40

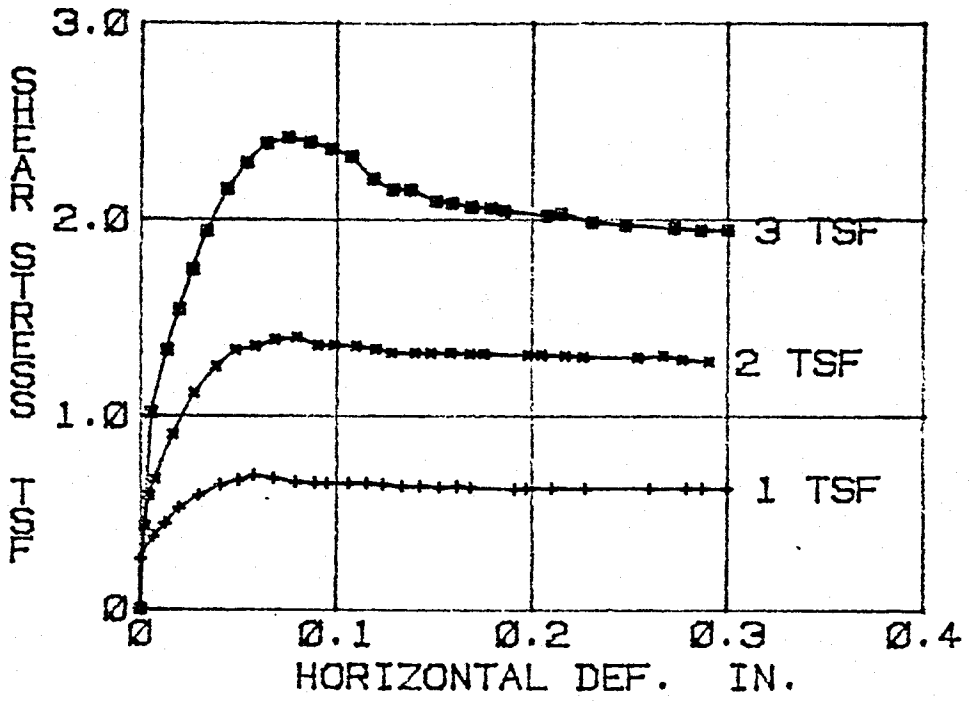
Shear Strength	Max Deviator Stress Deg.	Max Deviator Stress c(tsf)	Max Eff Stress Ratio Deg.	Max Eff Stress Ratio c(tsf)
Apparent	31.0	0.11		
Effective	--	--		

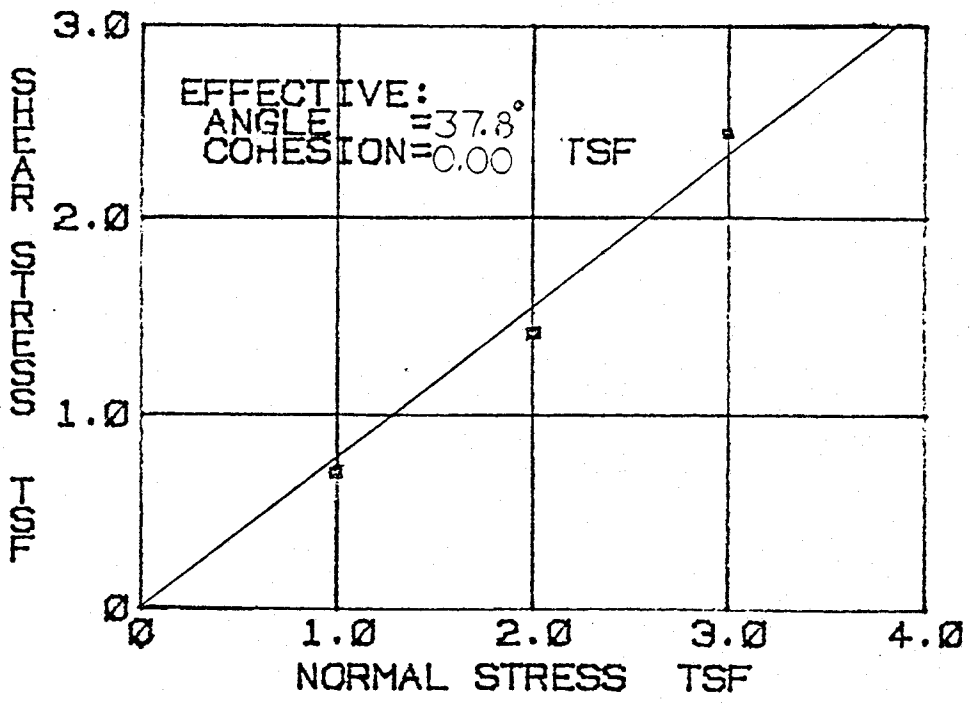
REMOLDED AT NATURAL MOISTURE AND DENSITY.

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
DIRECT SHEAR TEST

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:US-5
EL. :812.1-811.5
SAMPLE:1
DATE :2-28-85





REMARKS: TESTED AT NATURAL MOISTURE CONTENT

Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Direct Shear Test

Project: BULL RUN S.P.
Feature: ASH POND 1
Station:
Range :
Boring : US-5

El. : 812.1-811.5
Sample: 1
Part : 3

Tested By : GMD
Computed By: MHD
Checked By : CBG
Report Date: 2-28-85

Type of Specimen=UNDISTURBED
Soil Symbol =ML

L.L. (%) = 0
P.I. (%) = 0

Sp. Gr. =2.18

Test No.	1	2	3	4
Initial:				
Moisture Content (%)	31.1	32.6	32.2	0.0
Dry Density (pcf)	76.7	82.1	82.9	0.0
Void Ratio	0.773	0.657	0.641	0.000
Saturation (%)	87.7	100.0	100.0	0.0
Final:				
Moisture Content (%)	29.2	27.8	27.5	0.0
Saturation (%)	84.1	97.7	100.0	0.0
Normal Stress (tsf)	1.00	2.00	3.00	0.00
Max. Shear Stress (tsf)	0.71	1.42	2.44	0.00
Time to Failure (min.)	90	120	105	0
Rate of Shearing (in./min.)	0.0007	0.0007	0.0007	0.0000
Specimen Height (in.)	0.727	0.735	0.740	0.000
Specimen Diameter (in.)	2.502	2.508	2.499	0.000

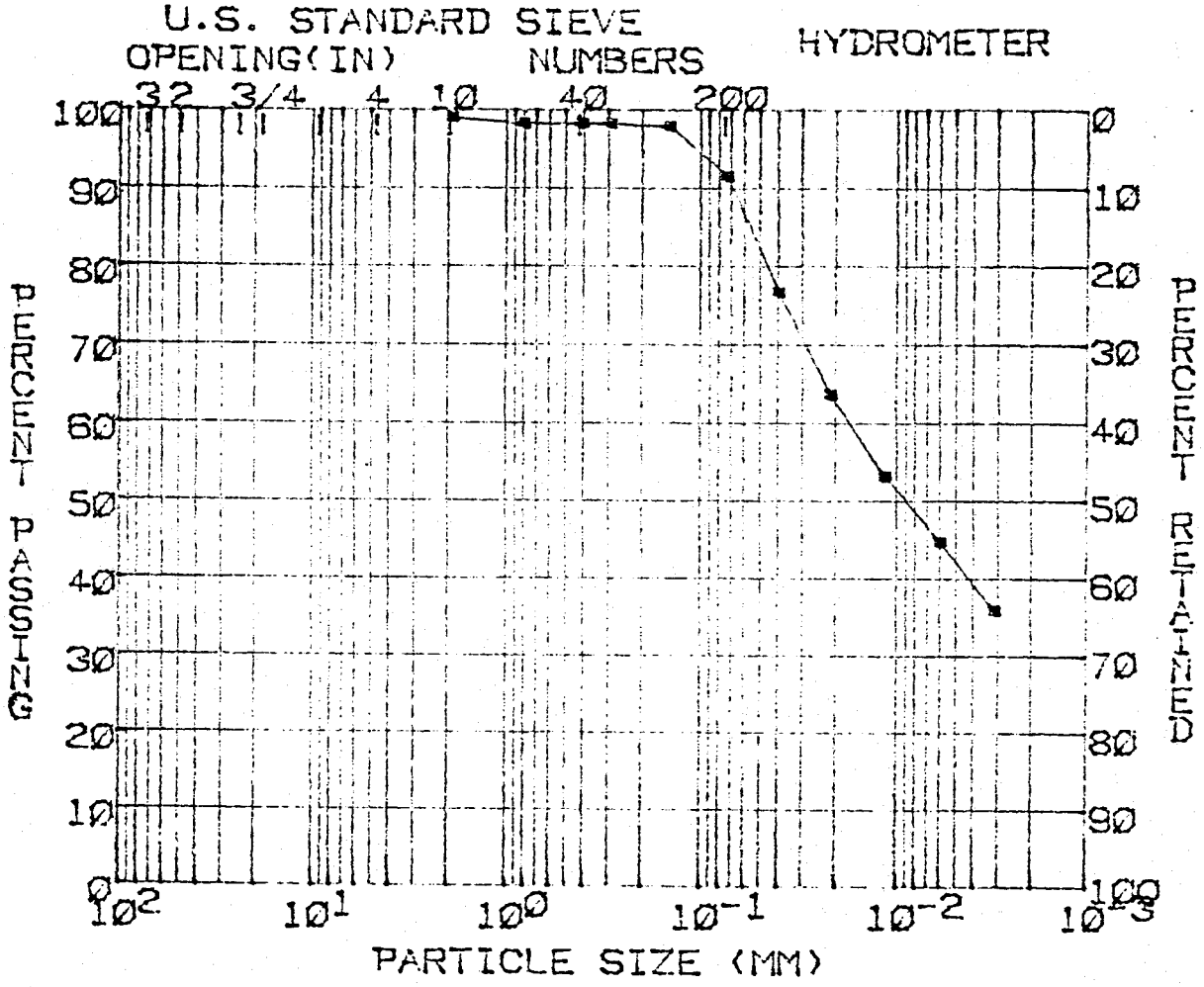
Shear Strength	Angle (deg.)	Cohesion (tsf)
Effective	37.8°	0.00

Remarks: TESTED AT NATURAL MOISTURE CONTENT

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:POND 1
STATION:
RANGE :

BORING:US-6
EL. :791.9 -789.8
SAMPLE:1
DATE :1-10-85



GRAVEL(%)= 0
SAND(%) = 7
SILT(%) = 49
CLAY(%) = 44

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL
MOISTURE(%)= 21.9
SP. GR. = 2.70

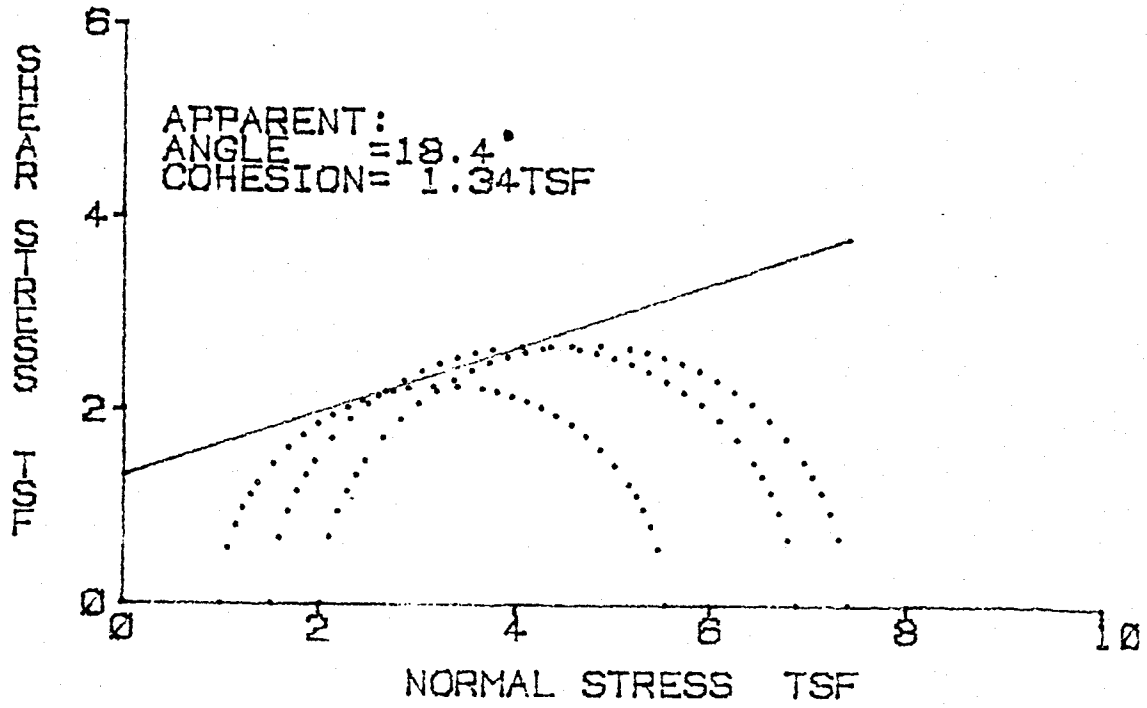
L.L.(%) = 46
P.I.(%) = 21

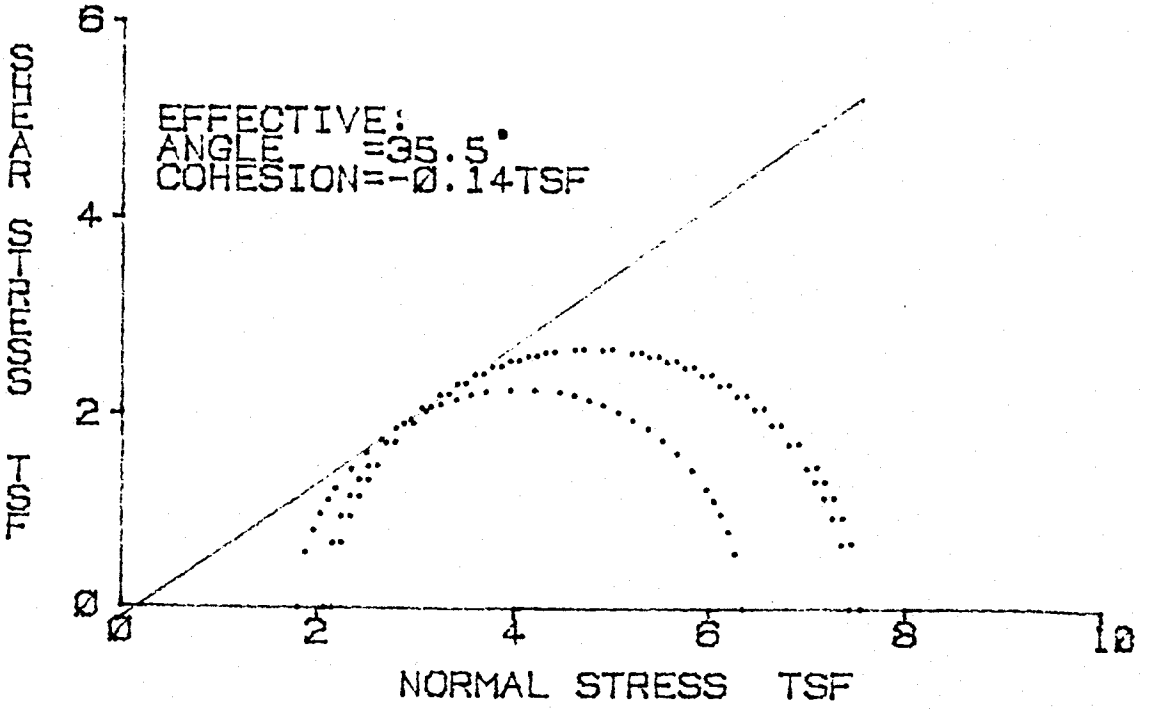
REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (R) TEST

PROJECT: BULL RUN S.P.	EL. :791.1-792.8
FEATURE: ASH POND 1	SAMPLE :1
STATION:	PART :4
RANGE :	SOIL SYM: CL
BORING : US-6	DATE :3-4-85



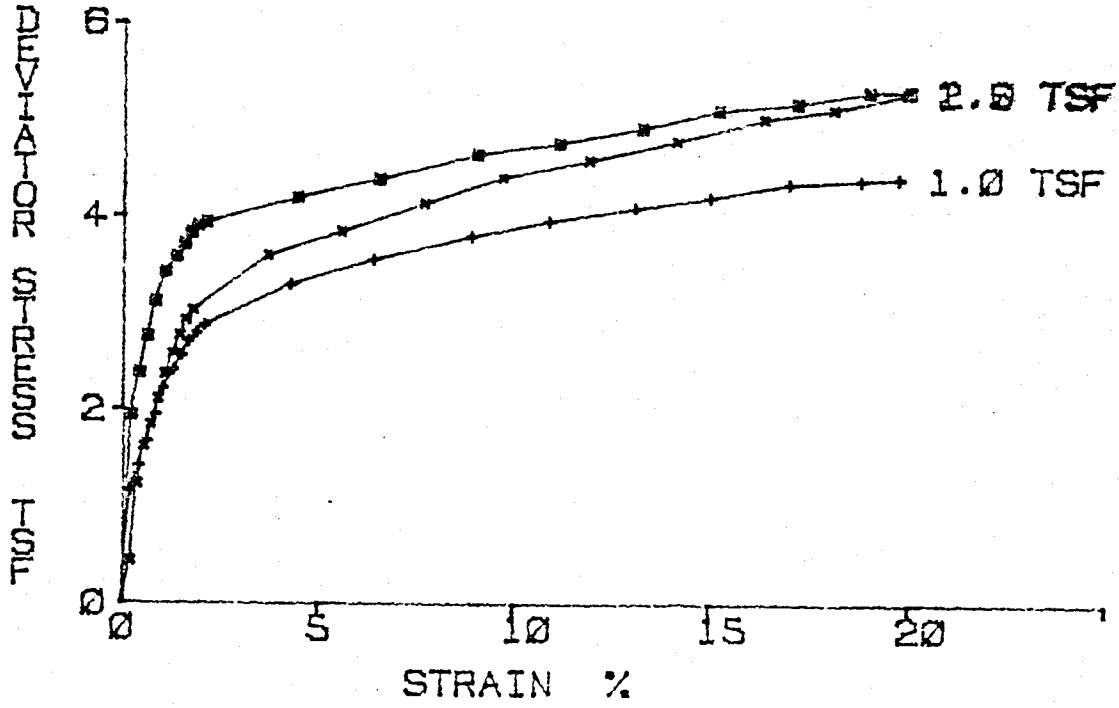


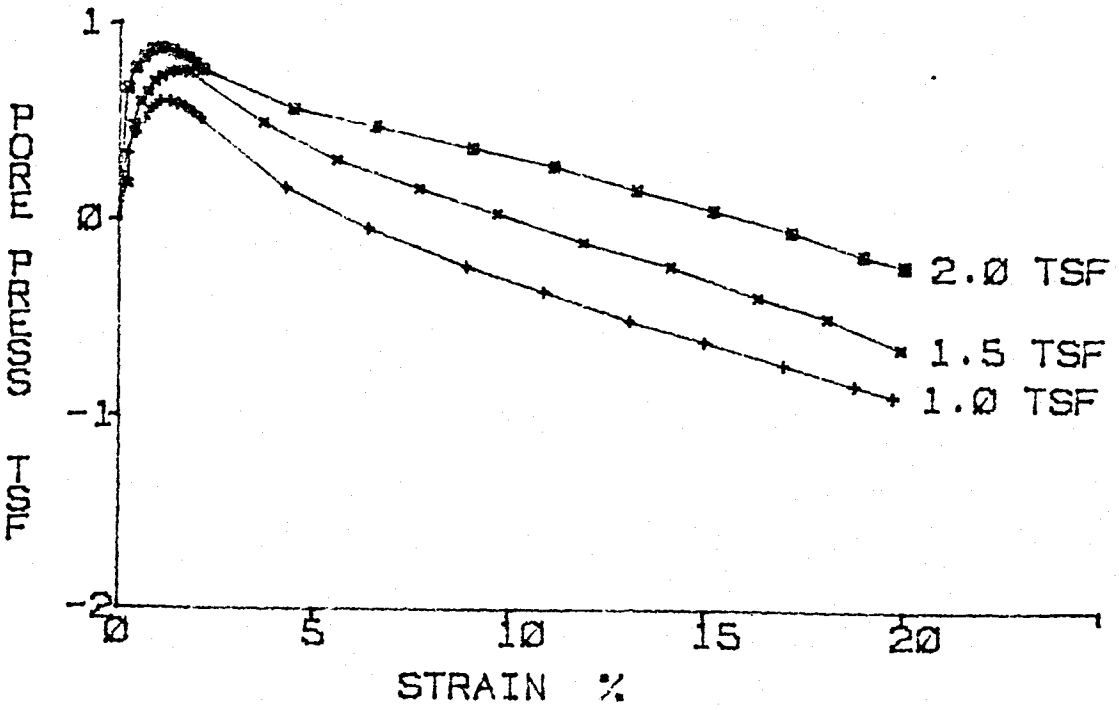
REMARKS: Analyzing the data by the method of least square in the form of $y = mx$, the effective friction angle is 33.6° and the effective cohesion is 0.00 tsf for the failure criteria based on maximum deviator stress.

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (R) TEST

PROJECT:	BULL RUN S.P.	EL.	:791.1-790.6
FEATURE:	ASH POND 1	SAMPLE	:1
STATION:		PART	:4
RANGE	:	SOIL SYM:	CL
BORING	:US-6	DATE	:3-4-85





REMARKS:

Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Consolidated Undrained Triaxial Compression (R) Test

Project: BULL RUN S.P.
Feature: ASH POND 1
Station:
Range :
Boring : US-6

El. : 791.1-790.6
Sample: 1
Part : 4

Tested By : TAL
Computed By: MHD
Checked By : CEE
Report Date: 3-4-85

Soil Sybmbol= CL
Sp. Gr. = 2.7

L.L.(%)= 46
D10(mm)= 0

P.I.(%)= 21

Specimen Number	1	2	3	4
Initial:				
Moisture Content(%)	21.3	21.4	21.6	0.0
Dry Density(pcf)	102.2	101.7	101.7	0.0
Void Ratio	0.649	0.658	0.657	0.000
Saturation(%)	88.8	87.8	88.8	0.0
Before Shearing:				
Moisture(%) (after satur.)	24.0	24.4	24.3	0.0
Saturation(%)	100.0	100.0	100.0	0.0
Moisture(%) (after cons.)	23.2	22.9	21.8	21.8
Void Ratio (after cons.)	0.627	0.619	0.588	0.000
Final Moisture Content(%)	22.6	22.3	22.4	0.0
Minor Principal Stress(tsf)	1.01(1.01)	1.51(1.51)	2.02(2.02)	0.00(0.00)
Major Principal Stress(tsf)	5.55(3.78)	6.89(4.59)	7.42(5.96)	0.00(0.00)
Eff. Minor Prin. Stress(tsf)	1.86(0.42)	2.12(0.75)	2.20(1.20)	0.00(0.00)
Eff. Major Prin. Stress(tsf)	6.40(3.19)	7.50(3.83)	7.60(5.15)	0.00(0.00)
Time to Failure(min.)	95	100	95	0
Rate of Strain(%/min.)	0.21	0.20	0.21	0.00
Specimen Height(in.)	3.16	3.16	3.16	3.16
Specimen Diameter(in.)	1.40	1.40	1.40	1.40

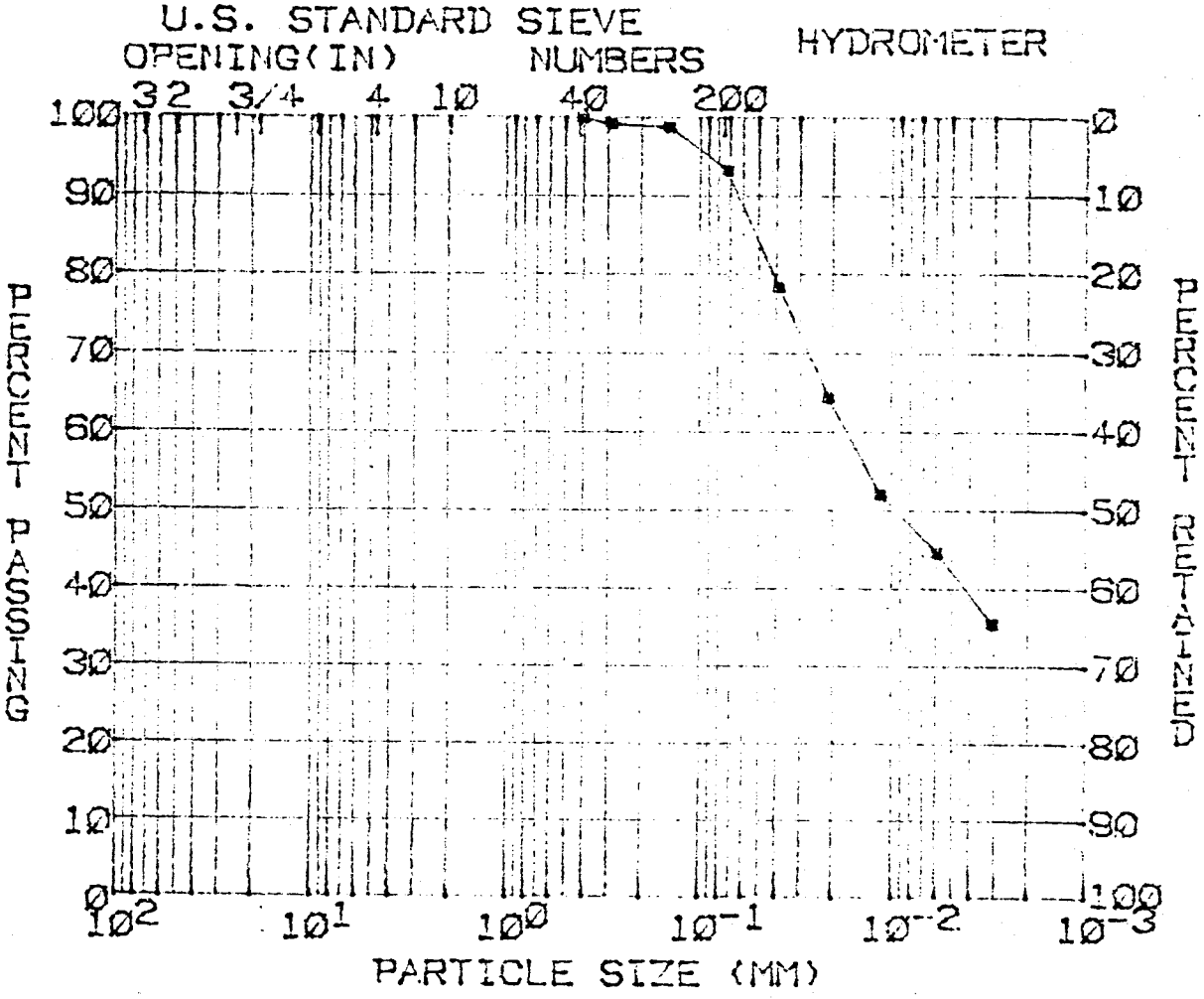
	Max Deviator Stress		Max Eff Stress Ratio	
Shear Strength	Deg.	c(tsf)	Deg.	c(tsf)
Apparent	18.4	1.34	22.0	0.49
Effective	35.5	-0.14	26.0	0.63

REMARKS: Analyzing the data by the method of least square in the form of y = mx, the effective friction angle is 33.6° and the effective cohesion is 0.00 tsf for the failure criteria based on maximum deviator stress.

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:POND 1
STATION:
RANGE :

BORING:US-6
EL. :787.9 -786.1
SAMPLE:2
DATE :1-10-85



GRAVEL(%)= 0
SAND(%) = 6
SILT(%) = 51
CLAY(%) = 43

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL
MOISTURE(%)= 21.6
SP. GR. = 2.71

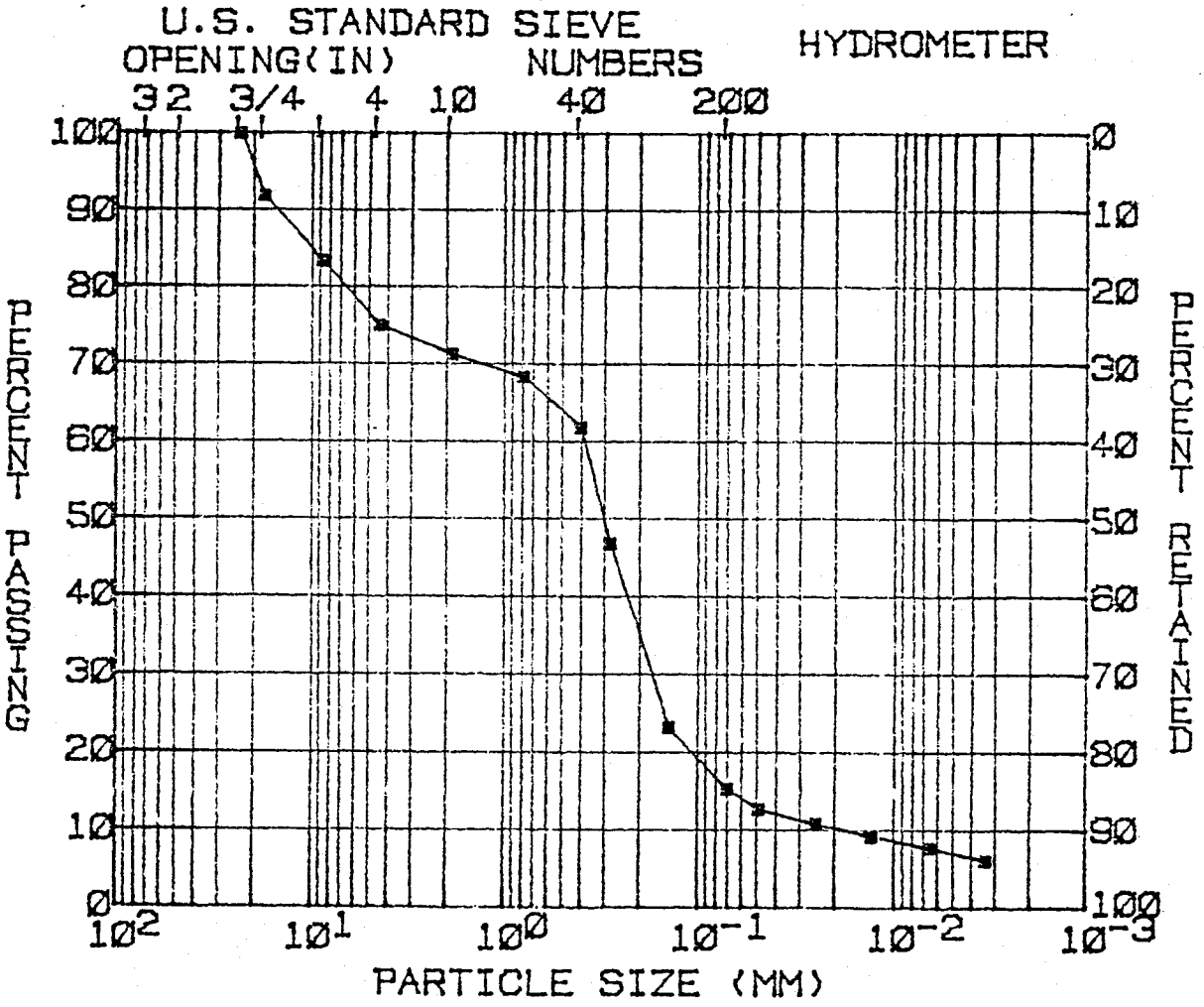
L.L.(%) = 41
P.I.(%) = 19

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :

BORING:US-2B
EL. :780.0-777.9
SAMPLE:1
DATE :2-6-85



GRAVEL(%)= 24
SAND(%) = 60
SILT(%) = 9
CLAY(%) = 7

D10(MM) = 0.0169
D30(MM) = 0.1802
D60(MM) = 0.4010
COEF UNIF=23.7

SOIL SYMBOL= SM
MOISTURE(%)= 16.8
SP. GR. = 2.67

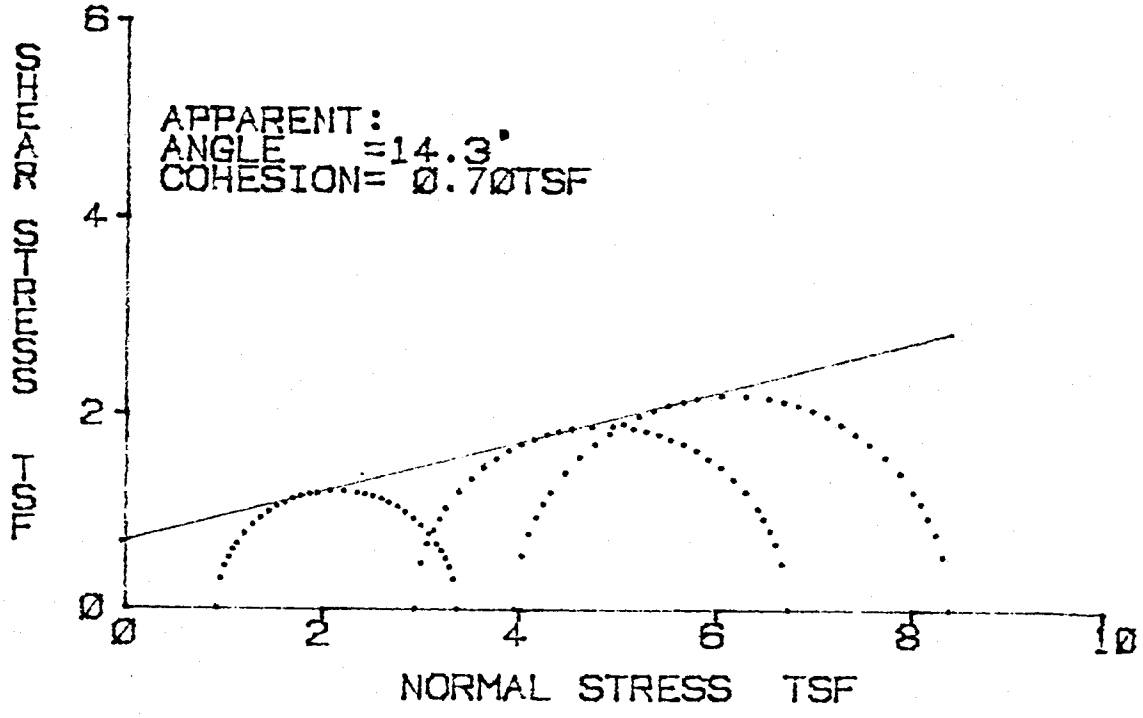
L.L.(%) = NP
P.I.(%) = NP

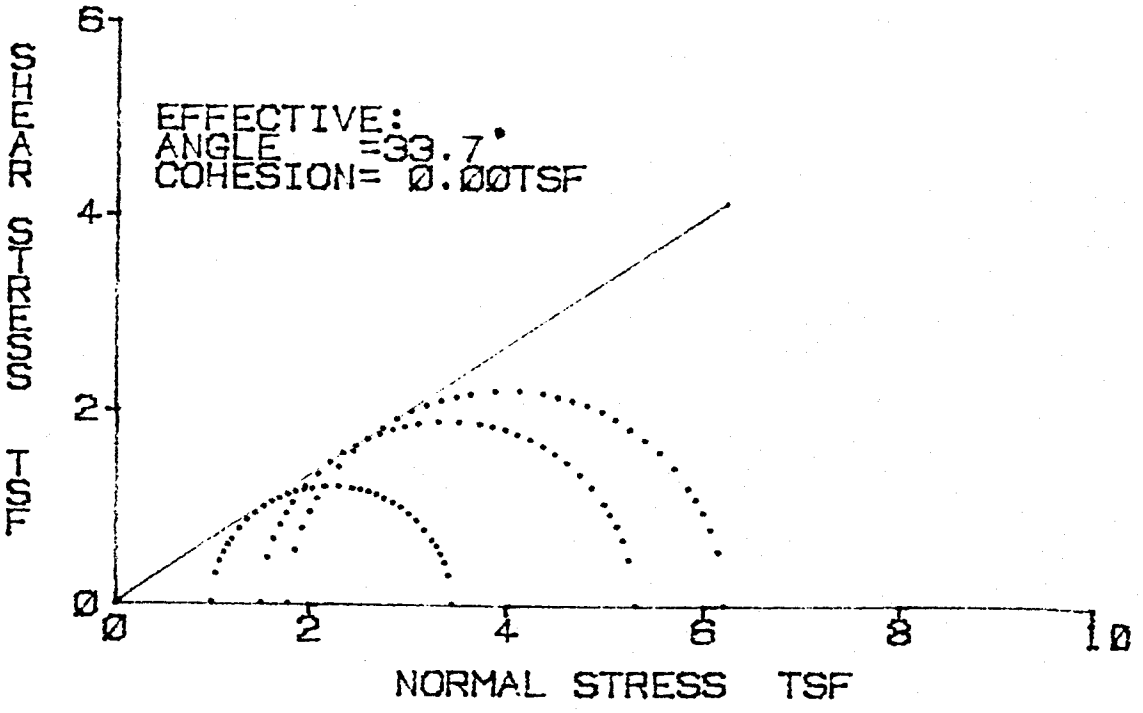
REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (R) TEST

PROJECT:BULL RUN S.P.	EL. :779.2-778.1
FEATURE:ASH POND 1	SAMPLE :1
STATION:	PART :4
RANGE :	SOIL SYM:SM
BORING :US-2B	DATE :3-11-85





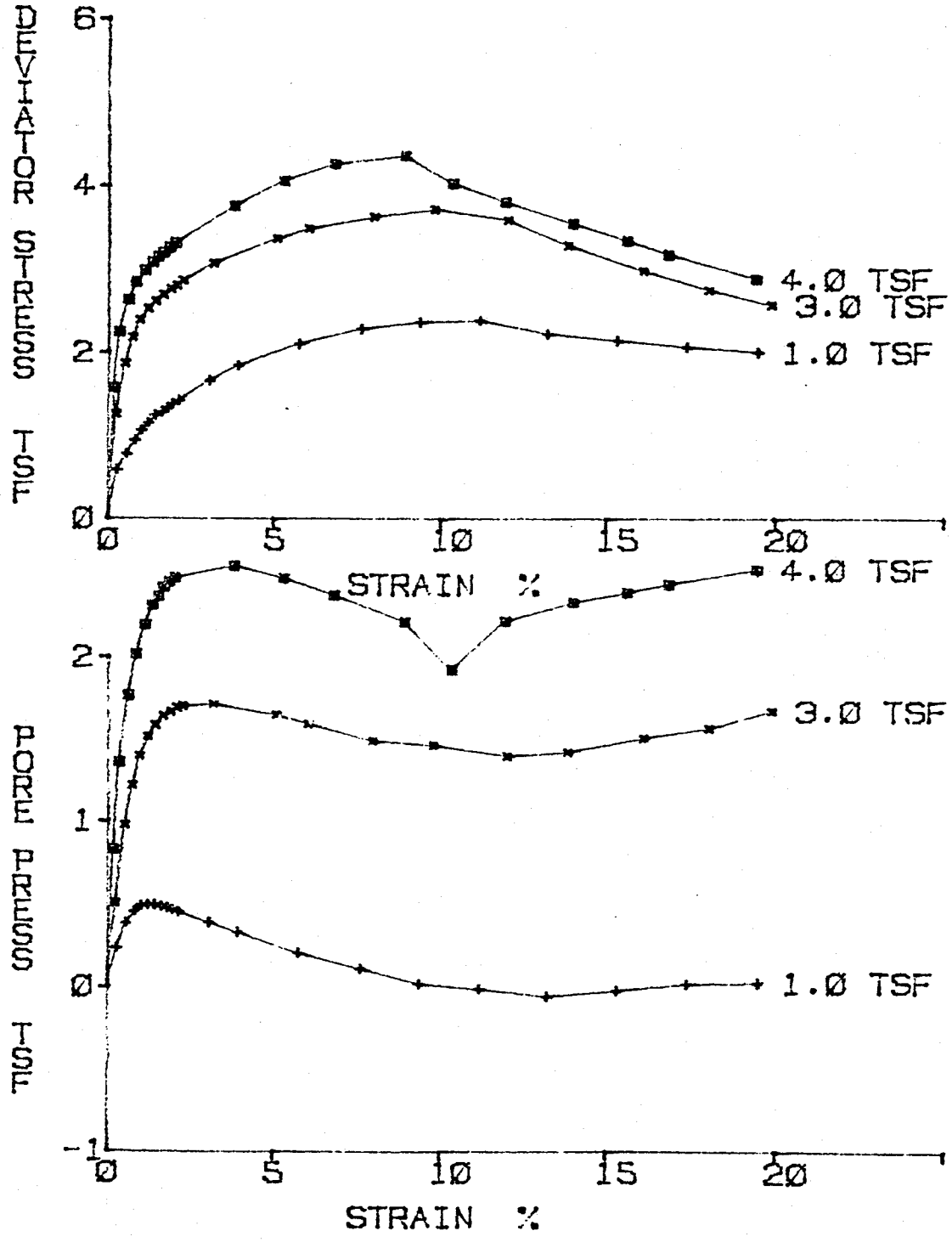
REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (R) TEST

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 1
STATION:
RANGE :
BORING :US-2B

EL. :779.2-778.1
SAMPLE :1
PART :4
SOIL SYM:SM
DATE :3-11-85



REMARKS:

Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Consolidated Undrained Triaxial Compression (R) Test

Project: BULL RUN S.P.
Feature: ASH POND 1
Station:
Range :
Boring : US-2B

El. : 779.2-778.1
Sample: 1
Part : 4

Tested By : RLT
Computed By: TMM
Checked By : CBE
Report Date: 3-11-85

Soil Symbol= SM
Sp. Gr. = 2.67

L.L.(%)= NP
D10(mm)= .0169

P.I.(%)= NP

Specimen Number	1	2	3	4
Initial:				
Moisture Content(%)	17.8	17.6	18.8	0.0
Dry Density(pcf)	106.0	105.1	106.6	0.0
Void Ratio	0.572	0.586	0.564	0.000
Saturation(%)	83.0	80.3	89.0	0.0
Before Shearing:				
Moisture(%) (after satur.)	21.4	21.9	21.1	0.0
Saturation(%)	100.0	100.0	100.0	0.0
Moisture(%) (after cons.)	19.9	19.3	18.2	18.2
Void Ratio (after cons.)	0.530	0.515	0.486	0.000
Final Moisture Content(%).	19.5	19.2	17.8	0.0
Minor Principal Stress(tsf)	1.01(1.01)	3.02(3.02)	4.03(4.03)	0.00(0.00)
Major Principal Stress(tsf)	3.46(2.90)	6.83(6.46)	8.47(8.16)	0.00(0.00)
Eff. Minor Prin. Stress(tsf)	1.00(0.67)	1.52(1.35)	1.79(1.53)	0.00(0.00)
Eff. Major Prin. Stress(tsf)	3.45(2.57)	5.32(4.78)	6.23(5.65)	0.00(0.00)
Time to Failure(min.)	60	50	50	0
Rate of Strain(%/min.)	0.19	0.20	0.18	0.00
Specimen Height(in.)	3.15	3.15	3.15	3.15
Specimen Diameter(in.)	1.40	1.40	1.40	1.40

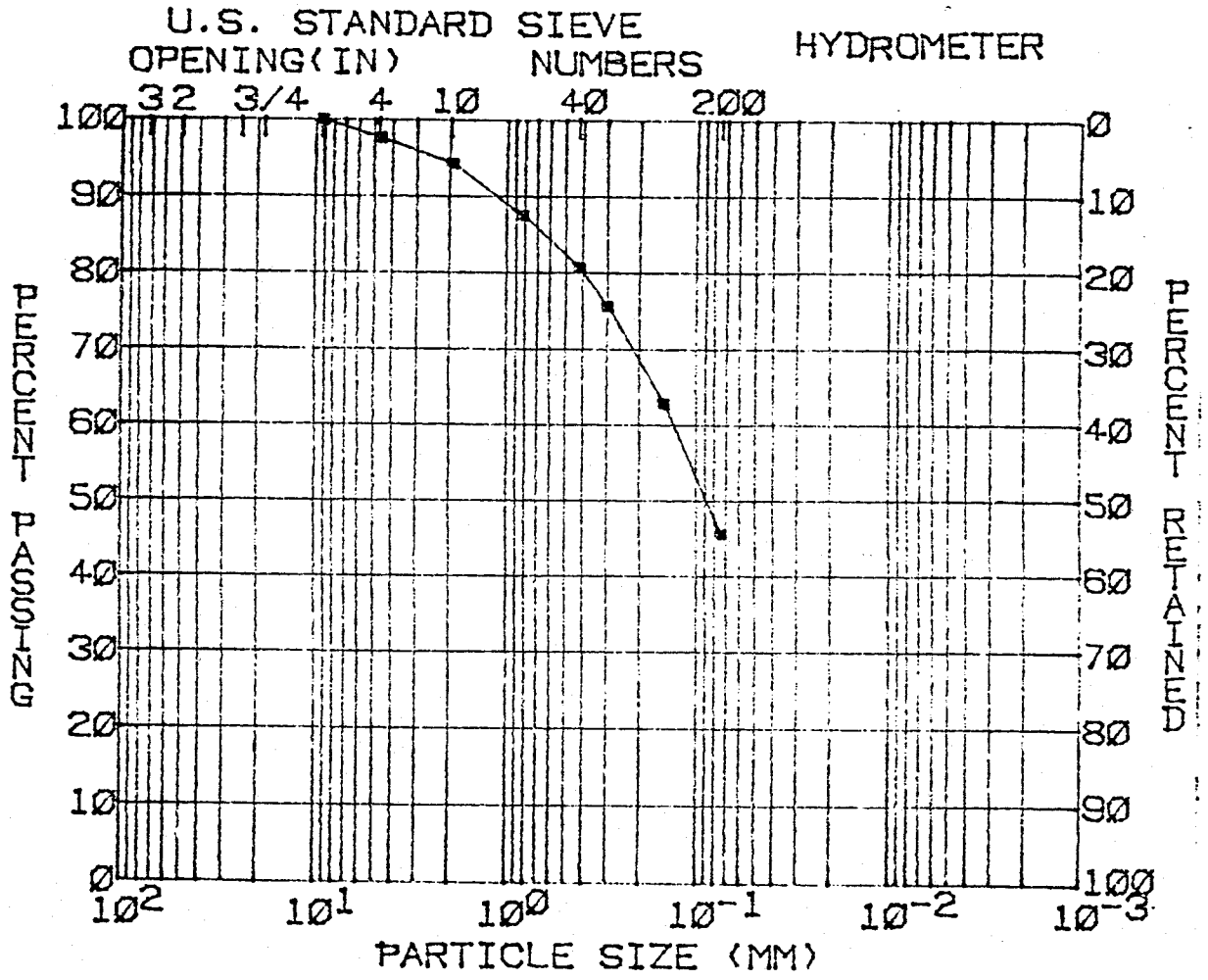
	Max Deviator Stress		Max Eff Stress Ratio	
Shear Strength	Deg.	c(tsf)	Deg.	c(tsf)
Apparent	14.5	0.70	15.7	0.44
Effective	33.7	0.00	33.9	0.04

ASH POND 2A

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:SS-7
EL. :
SAMPLE:GR.32
DATE :1-9-85



GRAVEL(%)= 2
SAND(%) = 52
SILT(%) = 46
CLAY(%) = 0

D10(MM) = 0.0179
D30(MM) = 0.0399
D60(MM) = 0.1330
COEF UNIF= 7.4

SOIL SYMBOL= SM
MOISTURE(%)= --
SP. GR. = 2.65

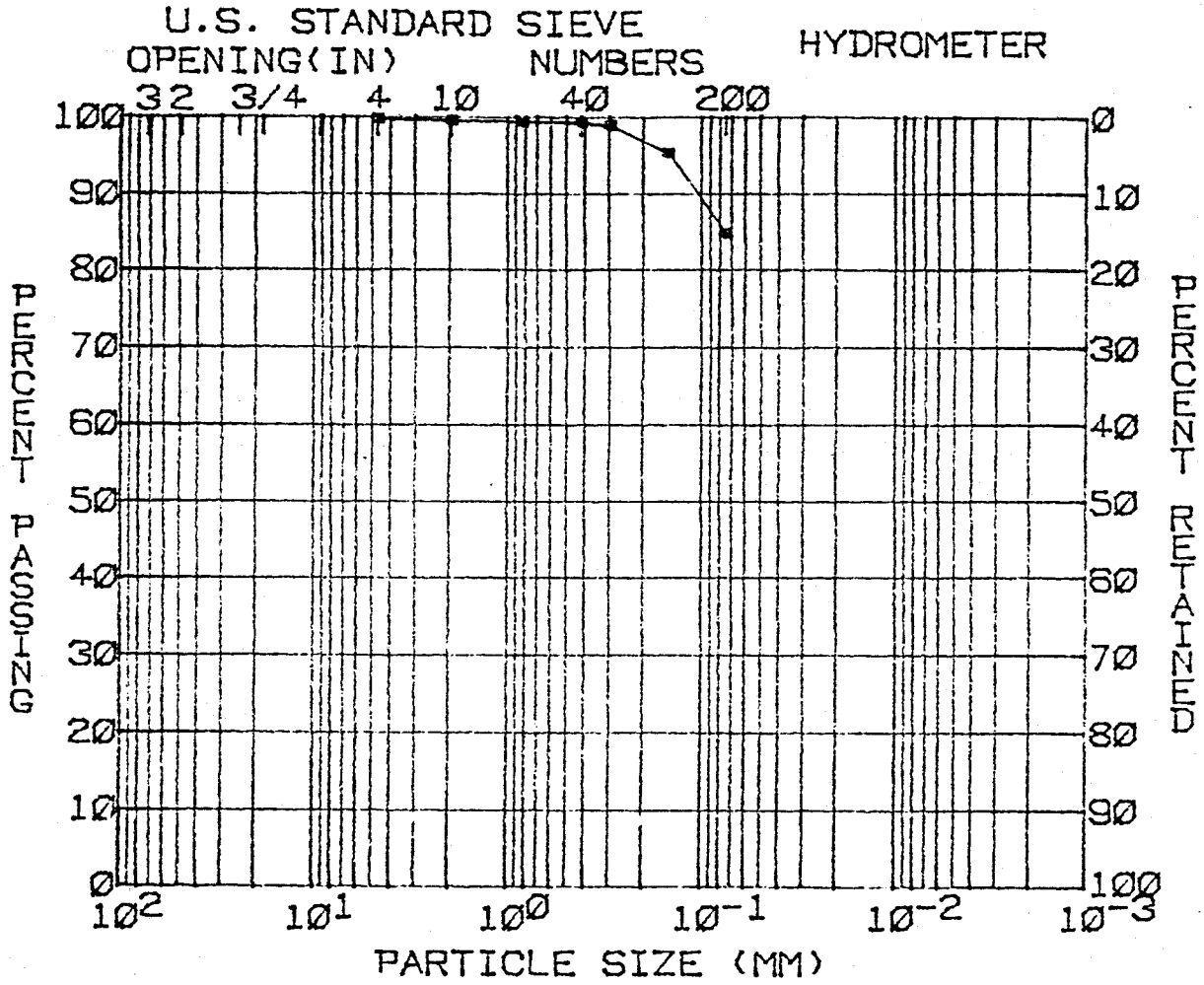
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:SS-7
EL. :
SAMPLE:GR.33
DATE :1-9-85



GRAVEL(%)= 0
SAND(%) = 15
SILT(%) = 85
CLAY(%) = 0

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL=
MOISTURE(%)= --
SP. GR. = 2.65

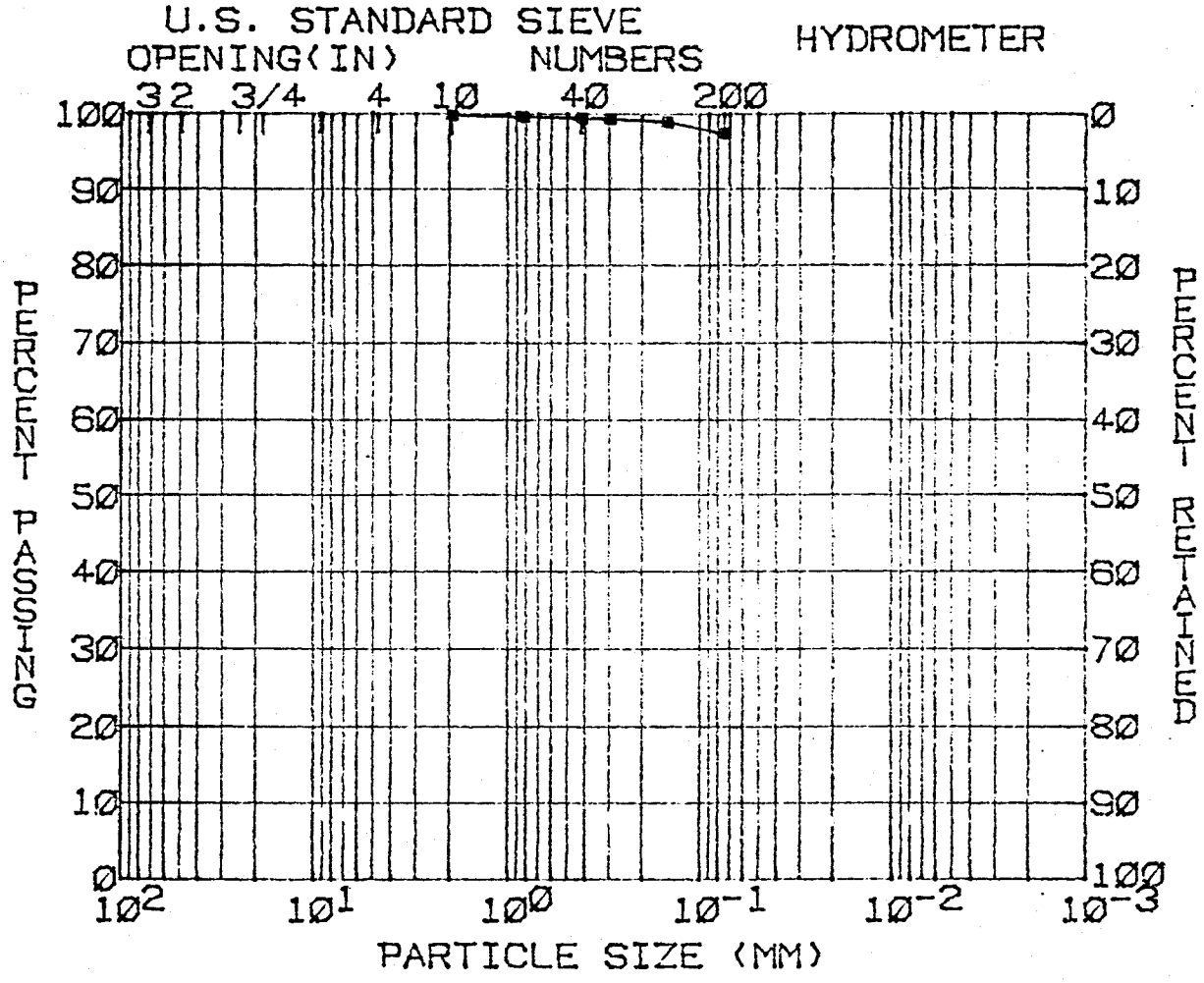
L.L.(%) = 0
P.I.(%) = 0

REMARKS:VISUAL ML

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:SS-7
EL. :
SAMPLE:GR.34
DATE :1-9-85



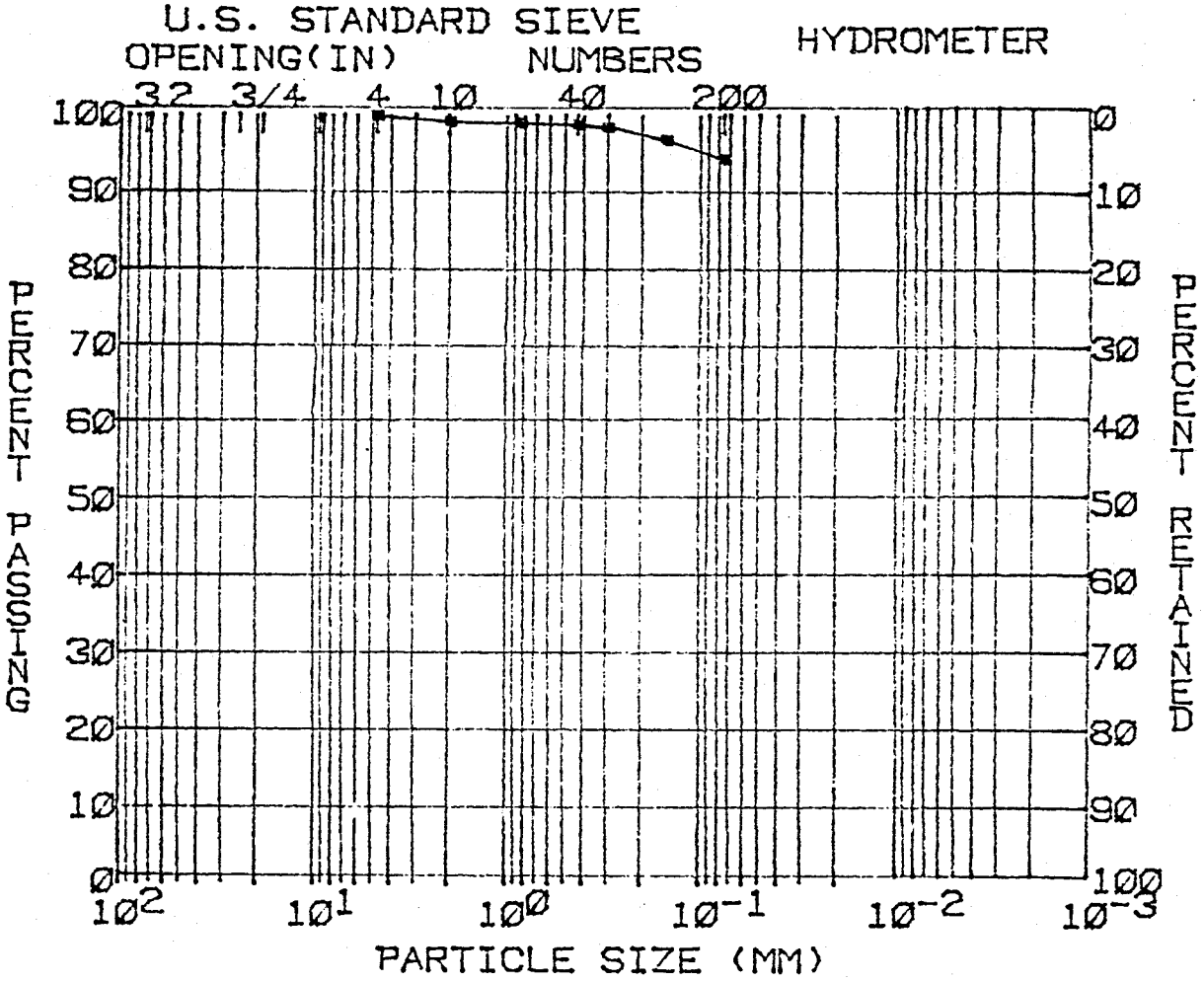
GRAVEL(%)	= 0	D10(MM)	= --
SAND(%)	= 2	D30(MM)	= --
SILT(%)	= 98	D60(MM)	= --
CLAY(%)	= 0	COEF UNIF	= --
SOIL SYMBOL	= ML	L.L.(%)	= NP
MOISTURE(%)	= --	P.I.(%)	= NP
SP. GR.	= 2.65		

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:SS-7
EL. :
SAMPLE:GR.35
DATE :1-9-85



GRAVEL(%)= 0
SAND(%) = 6
SILT(%) = 94
CLAY(%) = 0

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= ML
MOISTURE(%)= --
SP. GR. = 2.65

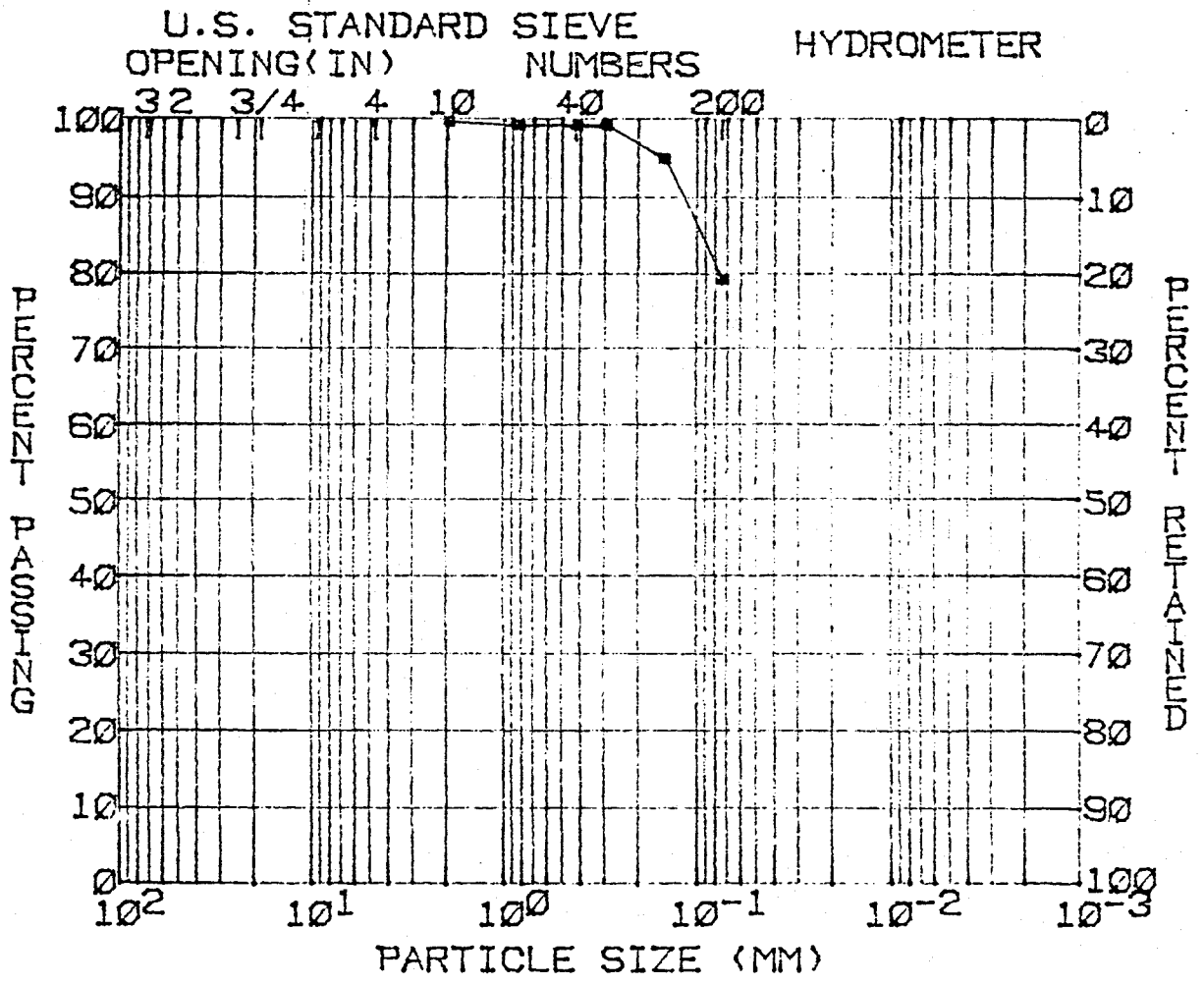
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:SS-7
EL. :
SAMPLE:GR.36
DATE :1-9-85



GRAVEL(%)= 0
SAND(%) = 21
SILT(%) = 79
CLAY(%) = 0

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL
MOISTURE(%)= --
SP. GR. = 2.65

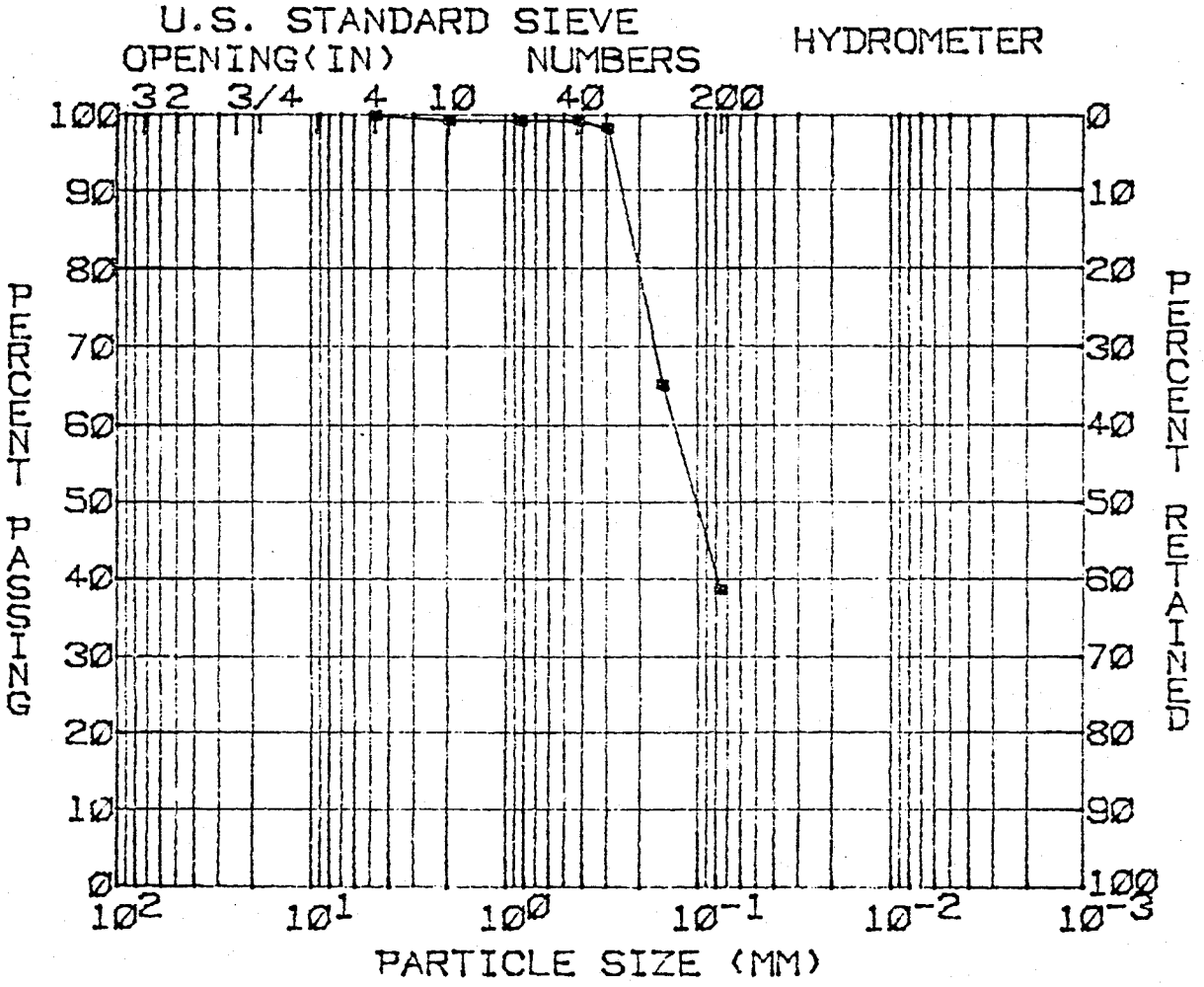
L.L.(%) = 31
P.I.(%) = 12

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:SS-7
EL. :
SAMPLE:GR.37
DATE :1-9-85



GRAVEL(%)= 0
SAND(%) = 61
SILT(%) = 39
CLAY(%) = 0

D10(MM) = 0.0355
D30(MM) = 0.0599
D60(MM) = 0.1311
COEF UNIF= 3.7

SOIL SYMBOL= SM
MOISTURE(%)= --
SP. GR. = 2.65

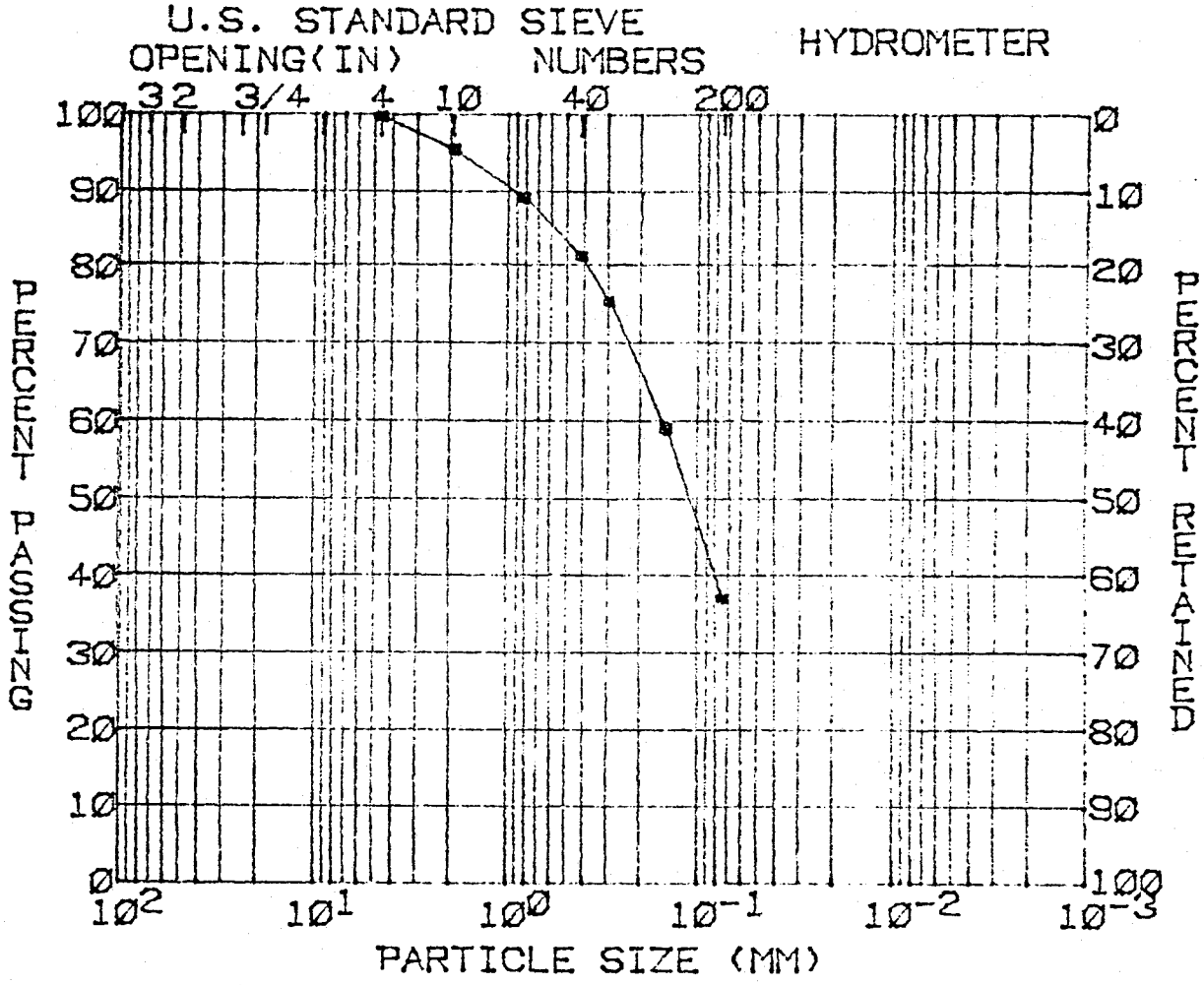
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:SS-8
EL. :
SAMPLE:GR.38
DATE :1-9-85



GRAVEL(%)= 0
SAND(%) = 63
SILT(%) = 37
CLAY(%) = 0

D10(MM) = 0.0316
D30(MM) = 0.0595
D60(MM) = 0.1549
COEF UNIF= 4.9

SOIL SYMBOL= SM
MOISTURE(%)= --
SP. GR. = 2.65

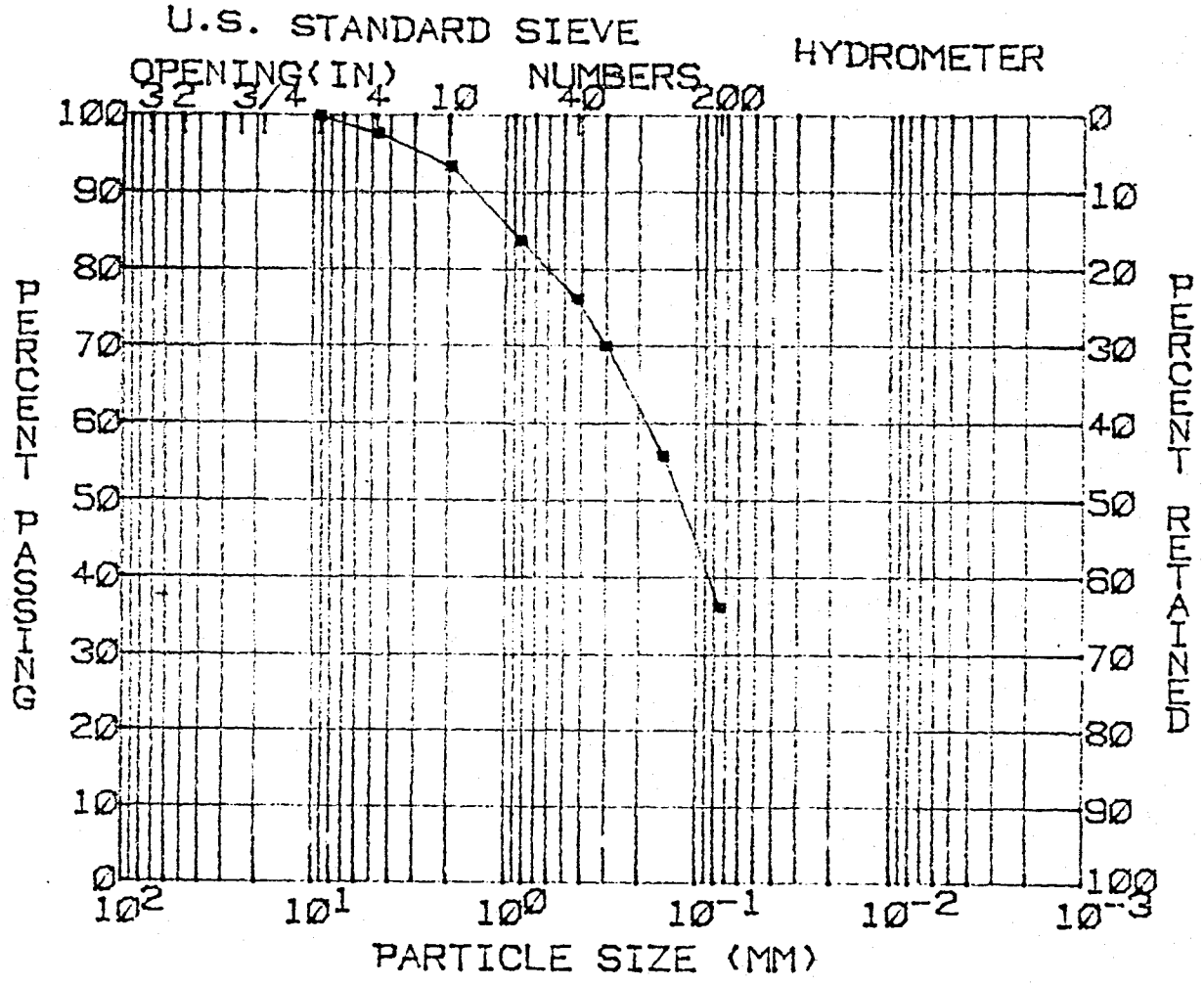
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:SS-8
EL. :
SAMPLE:GR.39
DATE :1-10-85



GRAVEL(%)= 2
SAND(%) = 62
SILT(%) = 36
CLAY(%) = 0

D10(MM) = 0.0304
D30(MM) = 0.0608
D60(MM) = 0.1822
COEF UNIF= 6.0

SOIL SYMBOL= SM
MOISTURE(%)= --
SP. GR. = 2.65

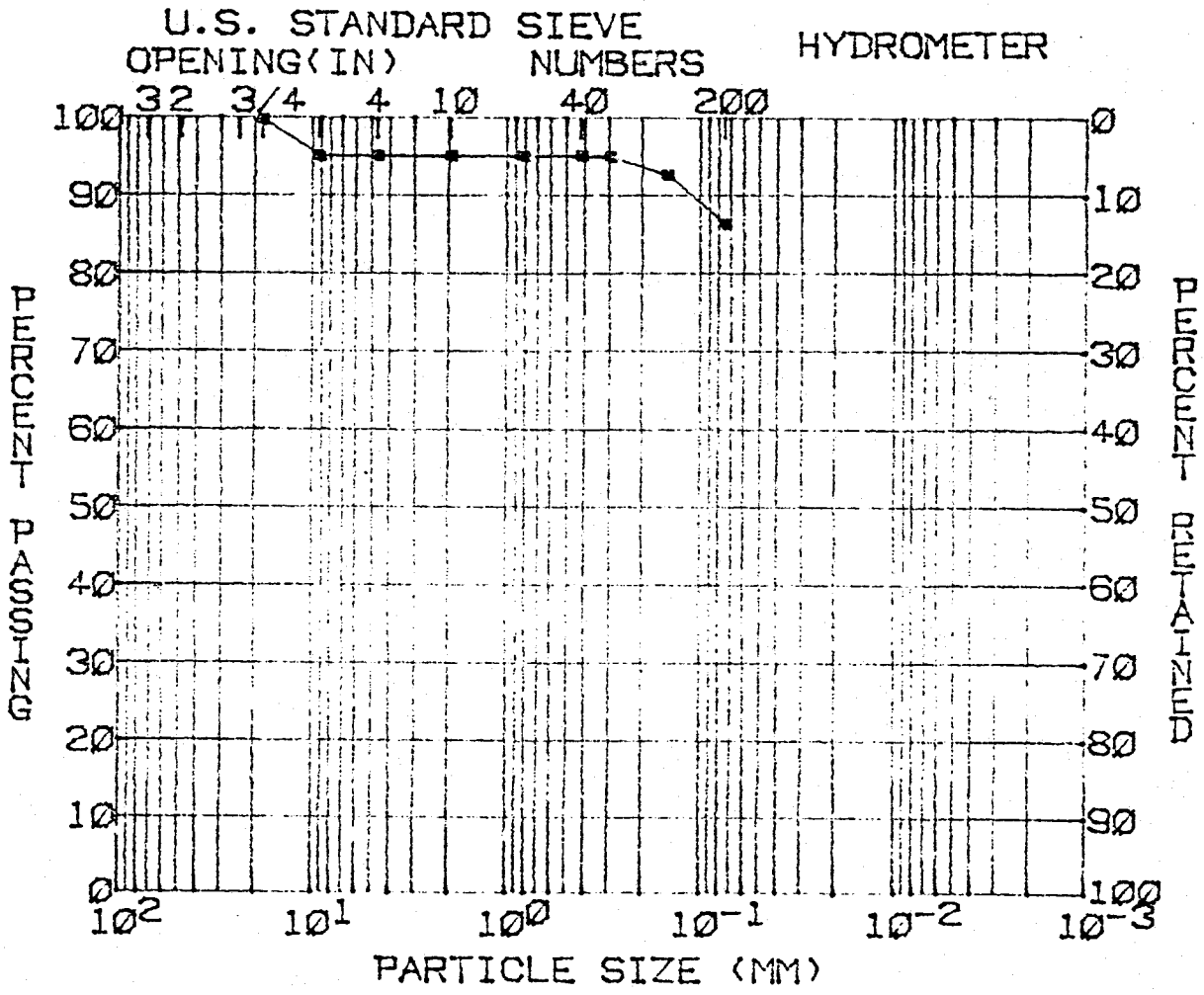
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:SS-8
EL. :
SAMPLE:GR.40
DATE :1-10-85



GRAVEL(%)= 4
SAND(%) = 9
SILT(%) = 87
CLAY(%) = 0

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= ML
MOISTURE(%)= --
SP. GR. = 2.65

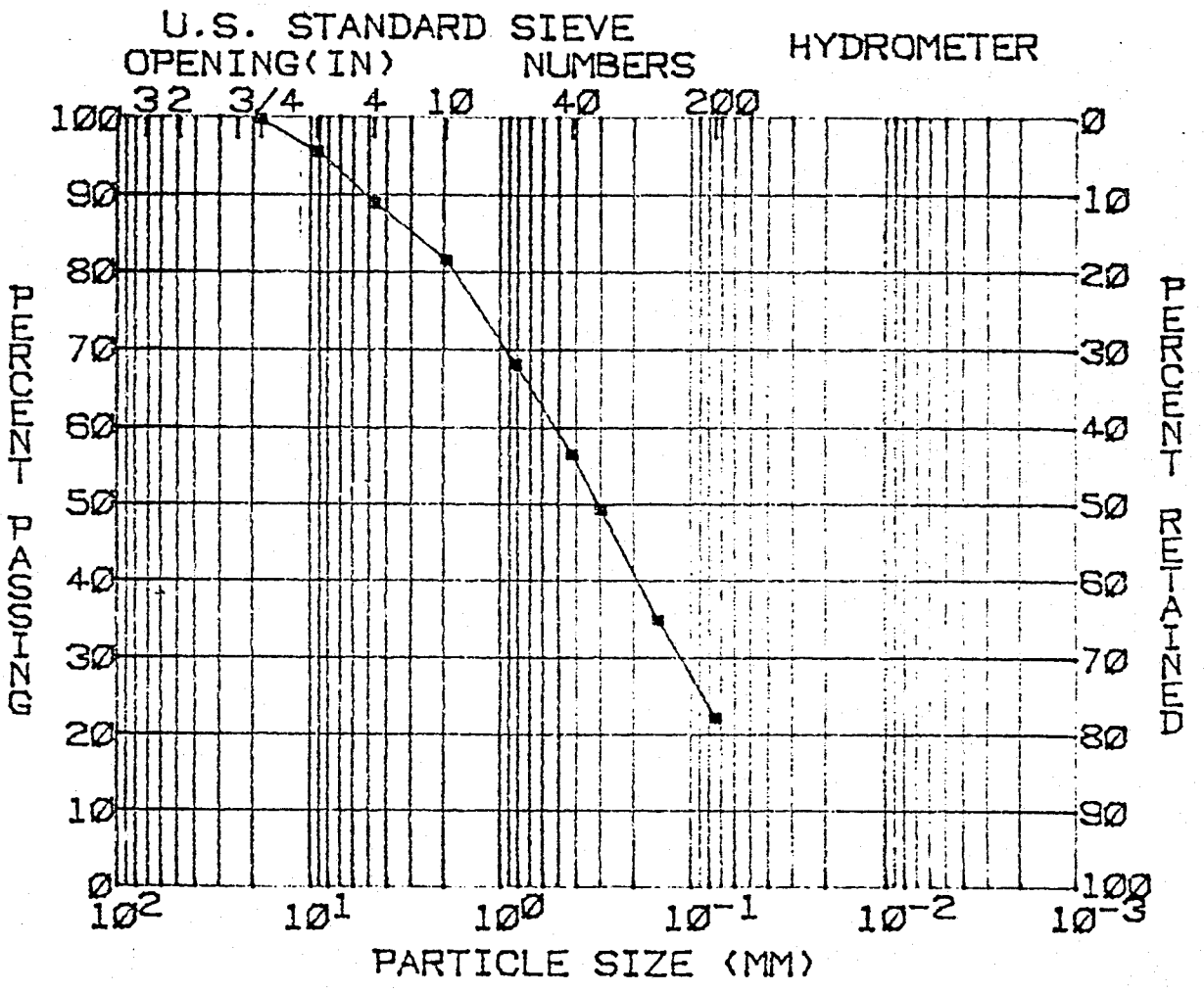
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:SS-8
EL. :
SAMPLE:GR.42
DATE :1-10-85



GRAVEL(%)= 11
SAND(%) = 67
SILT(%) = 22
CLAY(%) = 0

D10(MM) = 0.0392
D30(MM) = 0.1141
D60(MM) = 0.5175
COEF UNIF=13.2

SOIL SYMBOL= SM
MOISTURE(%)= --
SP. GR. = 2.65

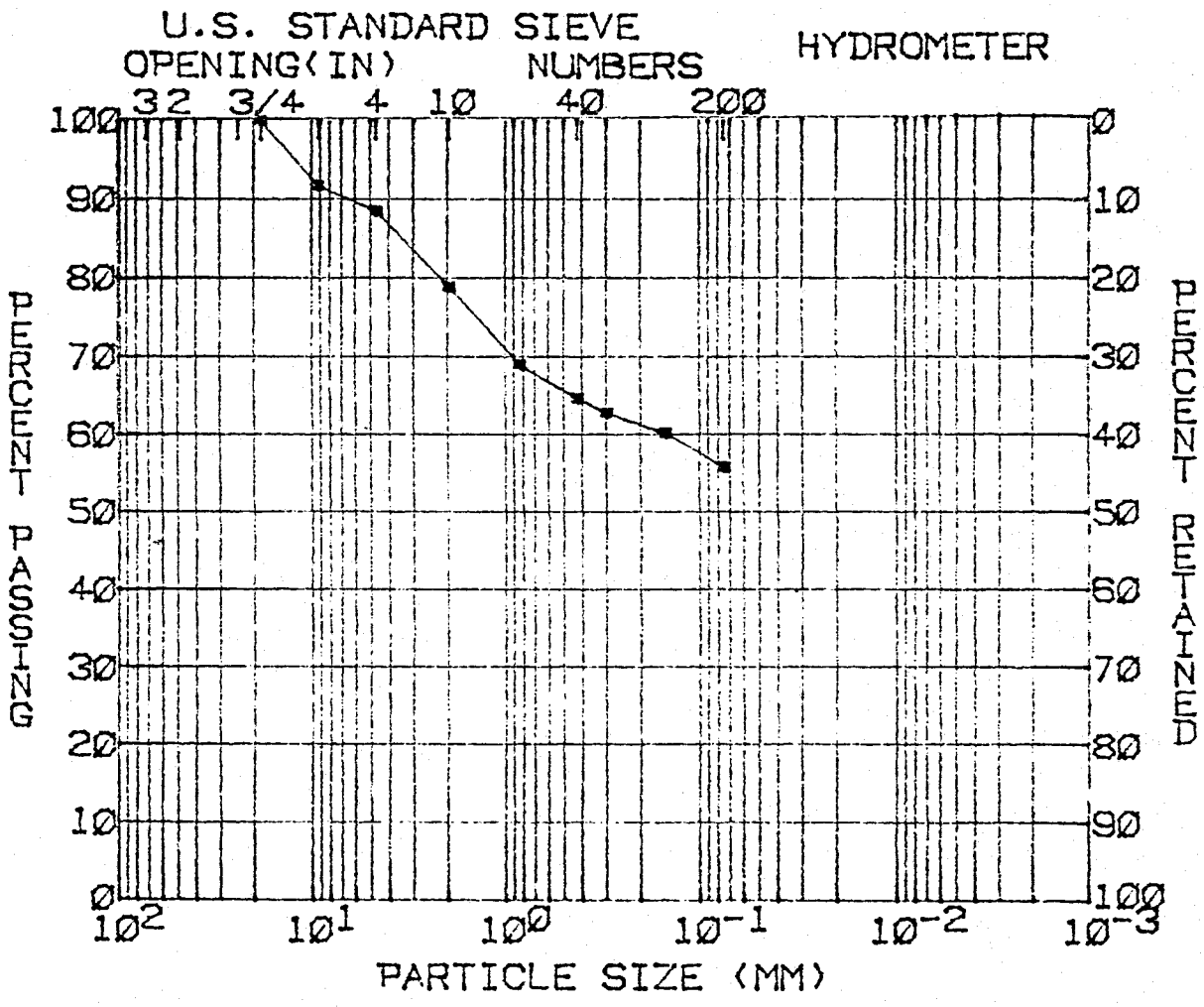
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:SS-9
EL. :
SAMPLE:GR.41
DATE :1-10-85



GRAVEL(%)= 11
SAND(%) = 33
SILT(%) = 56
CLAY(%) = 0

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= ML
MOISTURE(%)= --
SP. GR. = 2.65

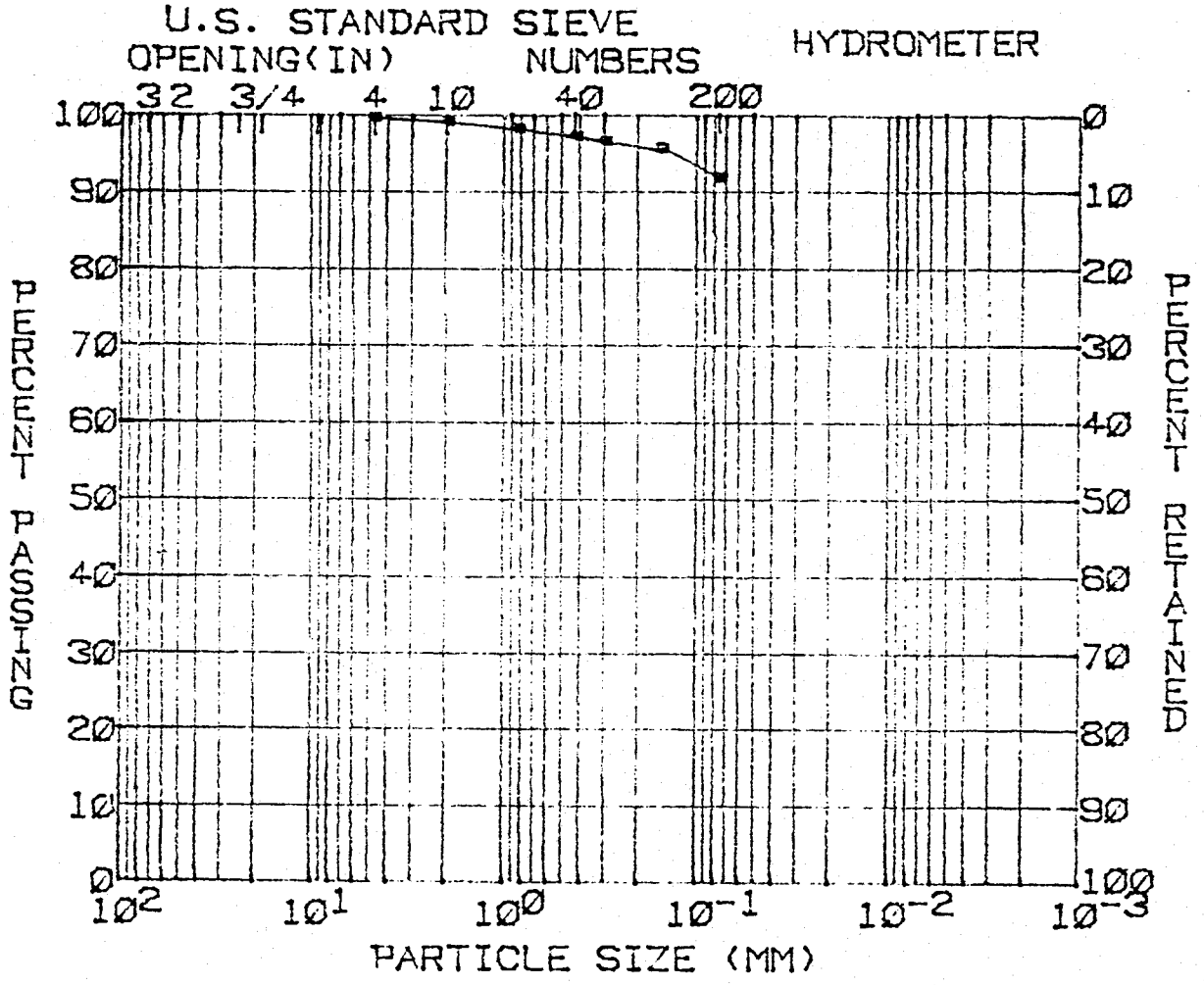
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:SS-9
EL. :
SAMPLE:GR.43
DATE :1-10-85



GRAVEL(%)= 0
SAND(%) = 8
SILT(%) = 92
CLAY(%) = 0

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL
MOISTURE(%)= --
SP. GR. = 2.65

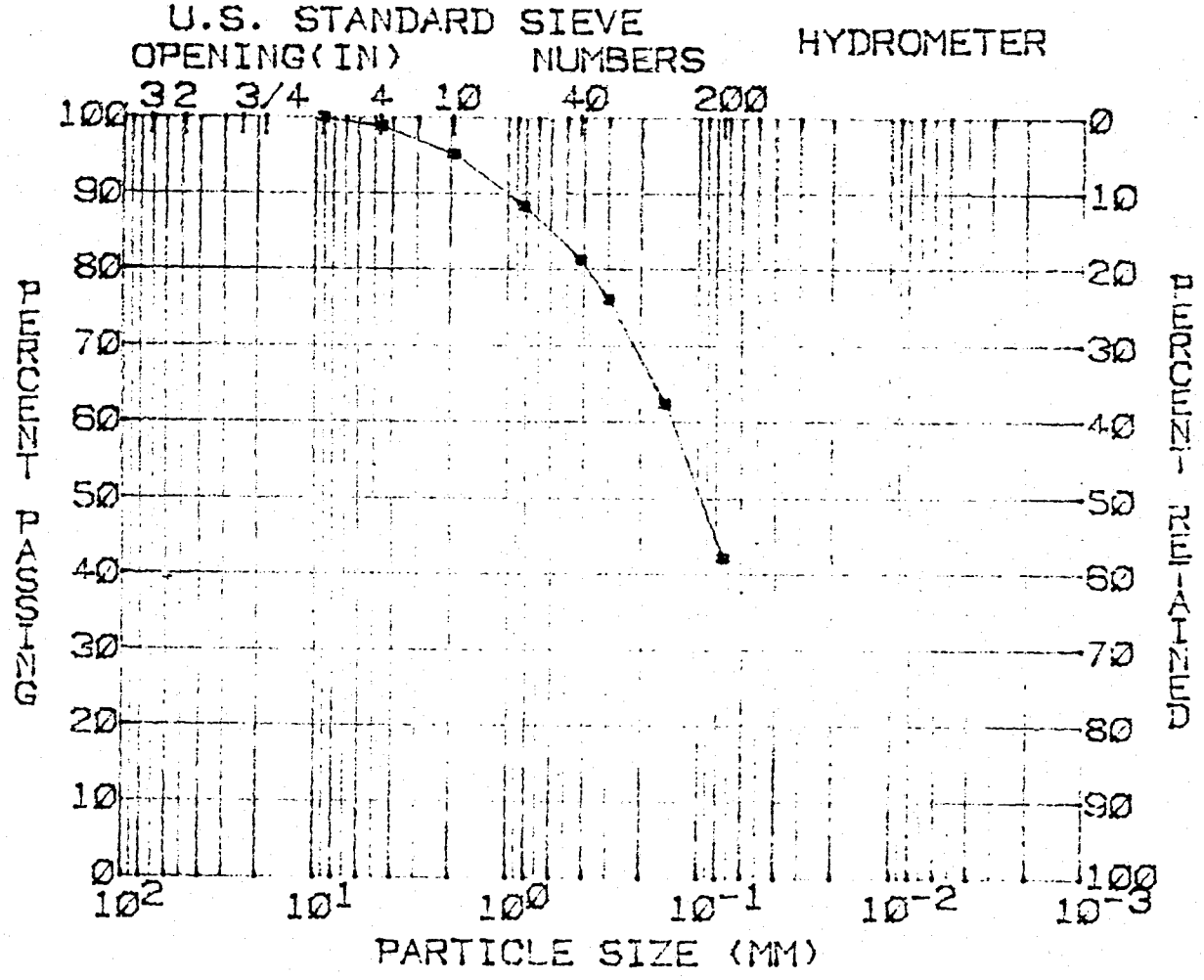
L.L.(%) = 47
P.I.(%) = 23

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:SS-9
EL. :
SAMPLE:GR.51
DATE :1-8-85



GRAVEL(%)= 1
SAND(%) = 57
SILT(%) = 42
CLAY(%) = 0

D10(MM) = 0.0000
D30(MM) = 0.0000
D60(MM) = 0.0000
COEF UNIF= 0.0

SOIL SYMBOL=S M
MOISTURE(%)= --
SP. GR. = 2.65

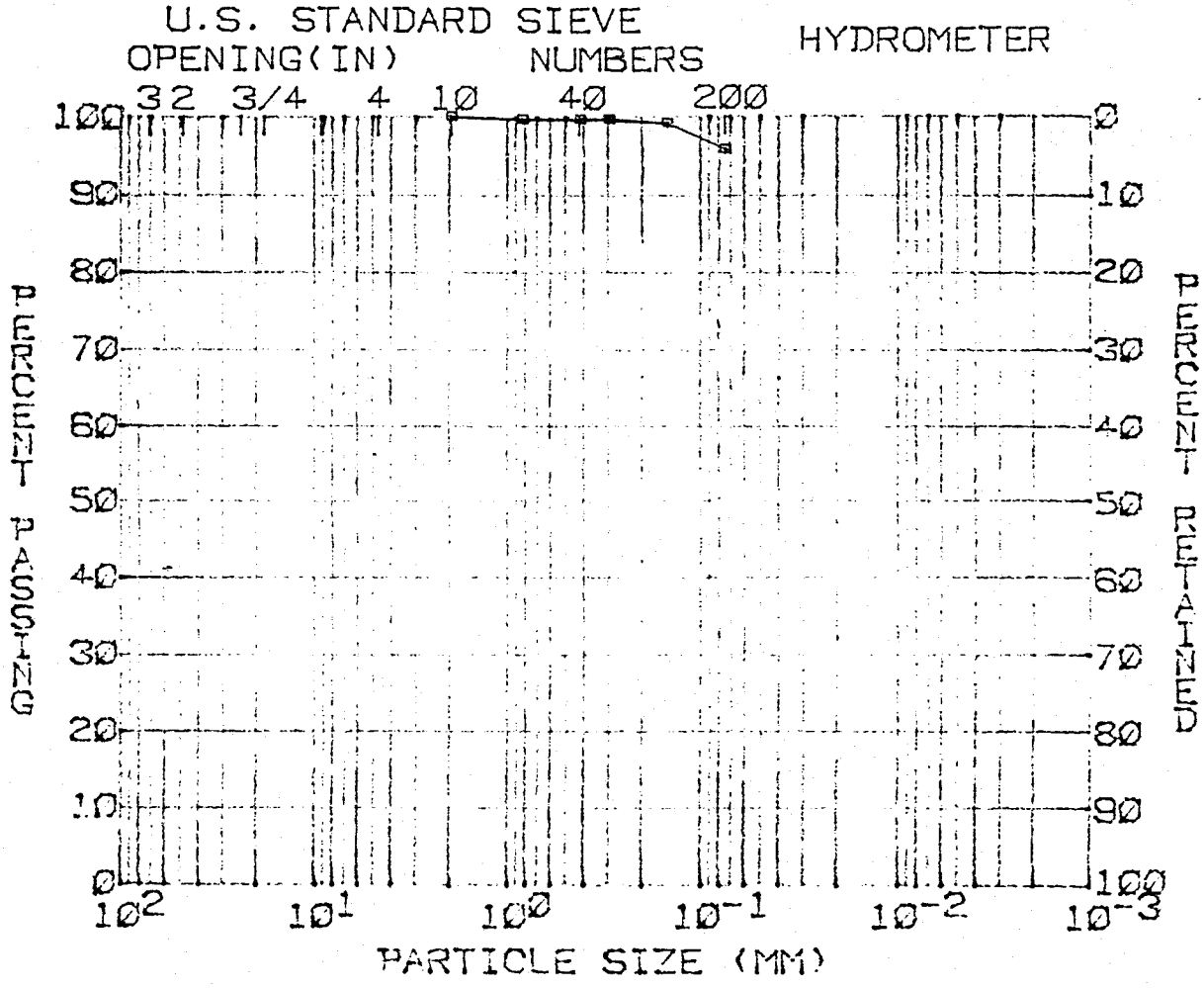
L.L.(%) =NP
P.I.(%) =NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:SS-9
EL. :
SAMPLE:GR.52
DATE :1-8-85



GRAVEL(%)	= Ø	D1Ø(MM)	= --
SAND(%)	= 4	D3Ø(MM)	= --
SILT(%)	= 96	D6Ø(MM)	= --
CLAY(%)	= Ø	COEF UNIF	= --

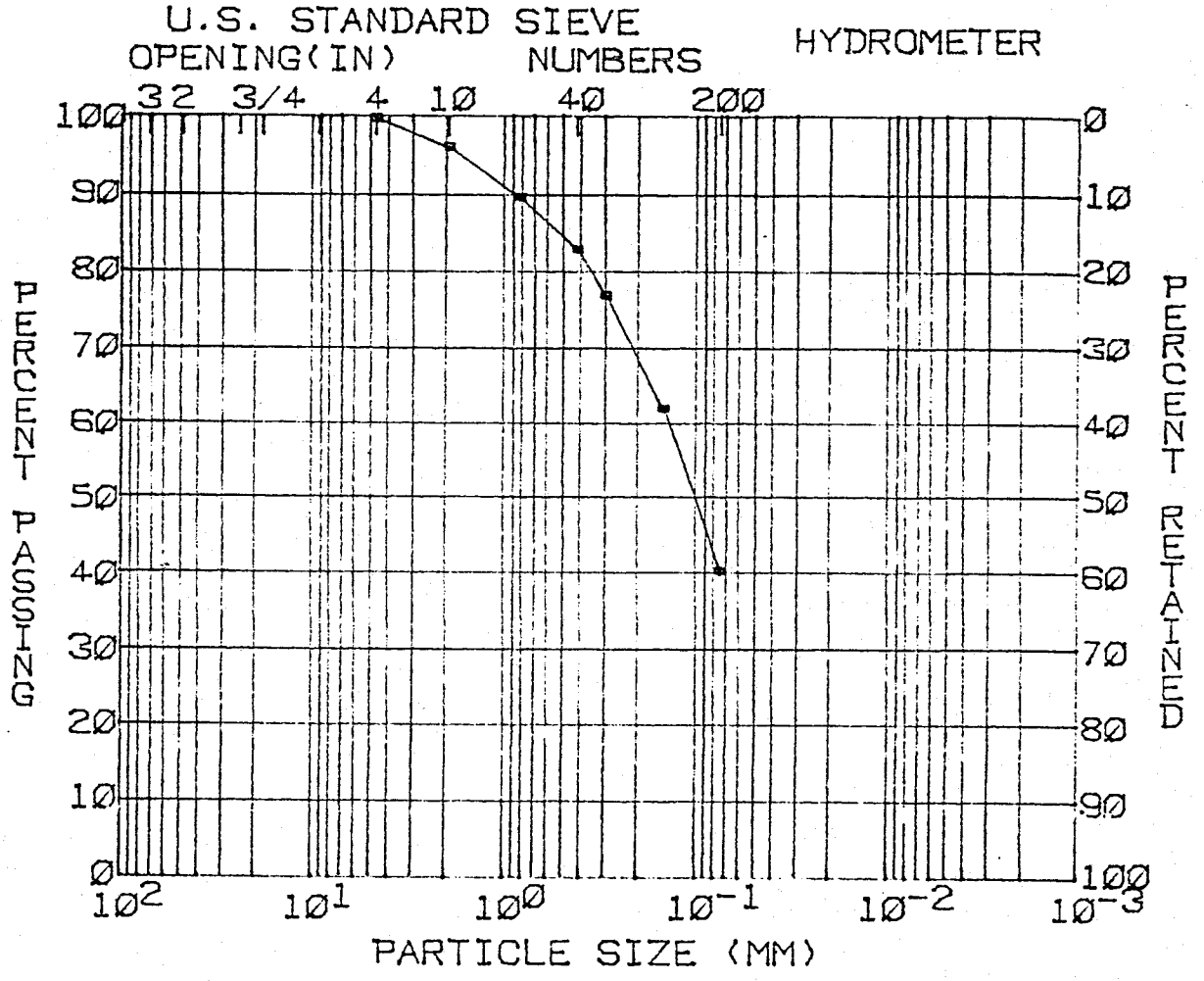
SOIL SYMBOL	= ML	L.L.(%)	= NP
MOISTURE(%)	= --	P.I.(%)	= NP
SP. GR.	= 2.65		

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT: BULL RUN S.P.
FEATURE: ASH POND 2A
STATION:
RANGE :

BORING: SS-9
EL. :
SAMPLE: GR.53
DATE :1-8-85



GRAVEL(%)= 0
SAND(%) = 59
SILT(%) = 41
CLAY(%) = 0

D10(MM) = 0.0281
D30(MM) = 0.0535
D60(MM) = 0.1404
COEF UNIF= 5.0

SOIL SYMBOL= SM
MOISTURE(%)= --
SP. GR. = 2.65

L.L.(%) = NP
P.I.(%) = NP

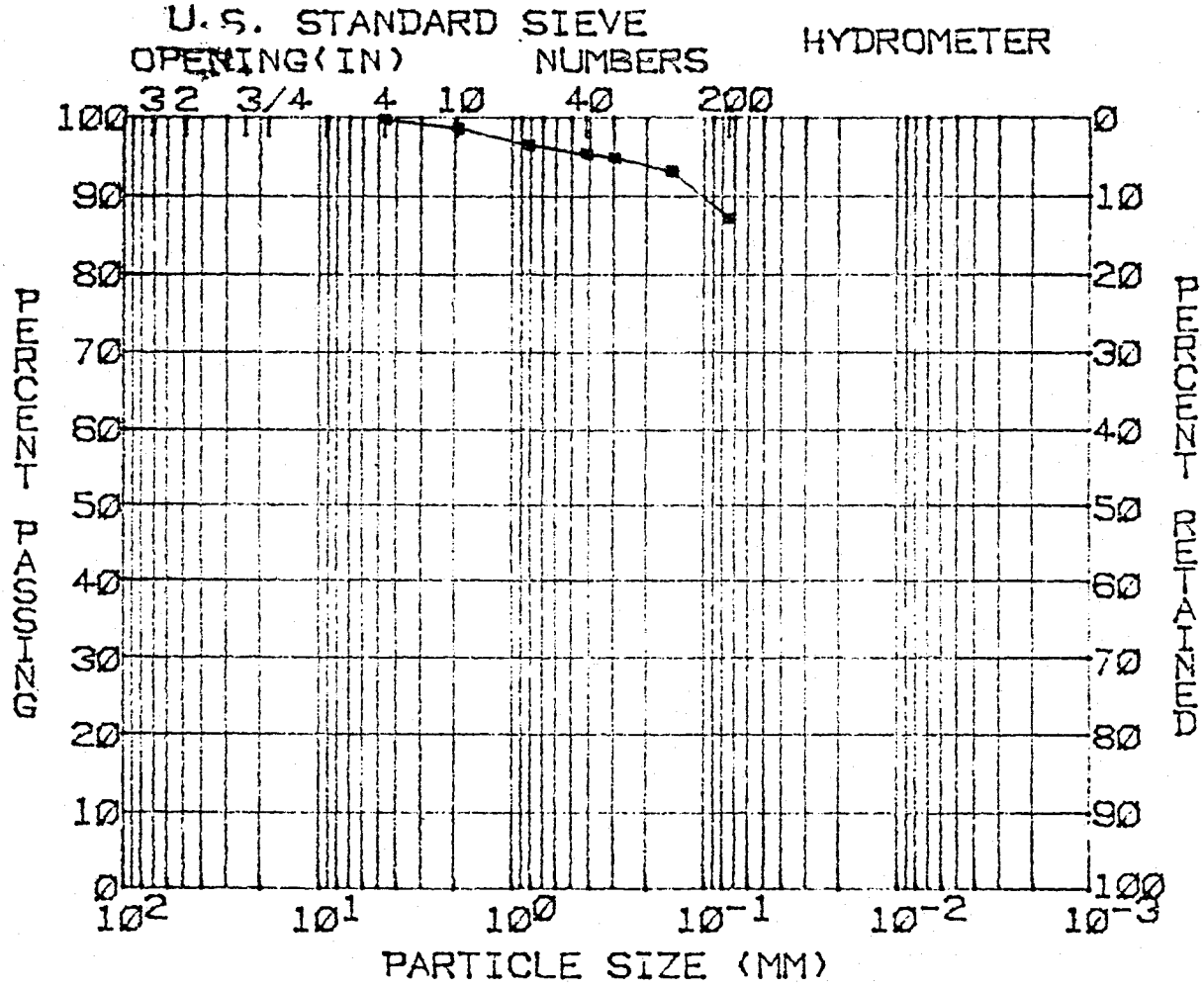
REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

PARTICLE SIZE ANALYSIS

PROJECT: BULL RUN S.P.
FEATURE: ASH POND 2A
STATION:
RANGE :

BORING: SS-9A
EL. :
SAMPLE: GR.44
DATE : 1-7-85



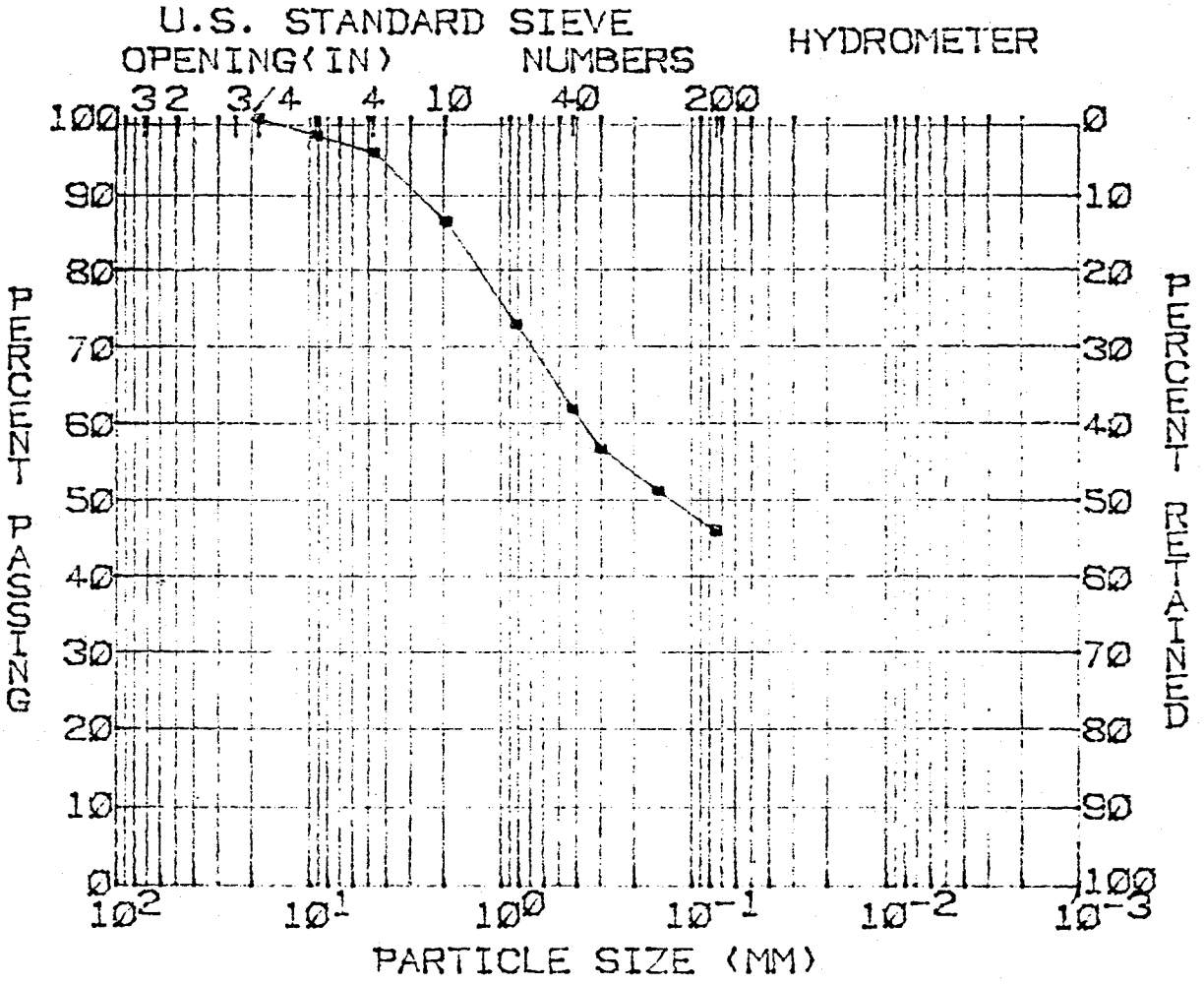
GRAVEL(%)	= 0	D10(MM)	= --
SAND(%)	= 13	D30(MM)	= --
SILT(%)	= 87	D60(MM)	= --
CLAY(%)	= 0	COEF UNIF	= --
SOIL SYMBOL	= CL	L.L.(%)	= 37
MOISTURE(%)	= --	P.I.(%)	= 14
SP. GR.	= 2.65		

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND #2A
STATION:
RANGE :

BORING:SS-9B
EL. :
SAMPLE:GR.45
DATE :1-7-85



GRAVEL(%)= 4
SAND(%) = 50
SILT(%) = 46
CLAY(%) = 0

D10(MM) = 0.0009
D30(MM) = 0.0103
D60(MM) = 0.3584
COEF UNIF) 100

SOIL SYMBOL= SM
MOISTURE(%)= --
SP. GR. = 2.65

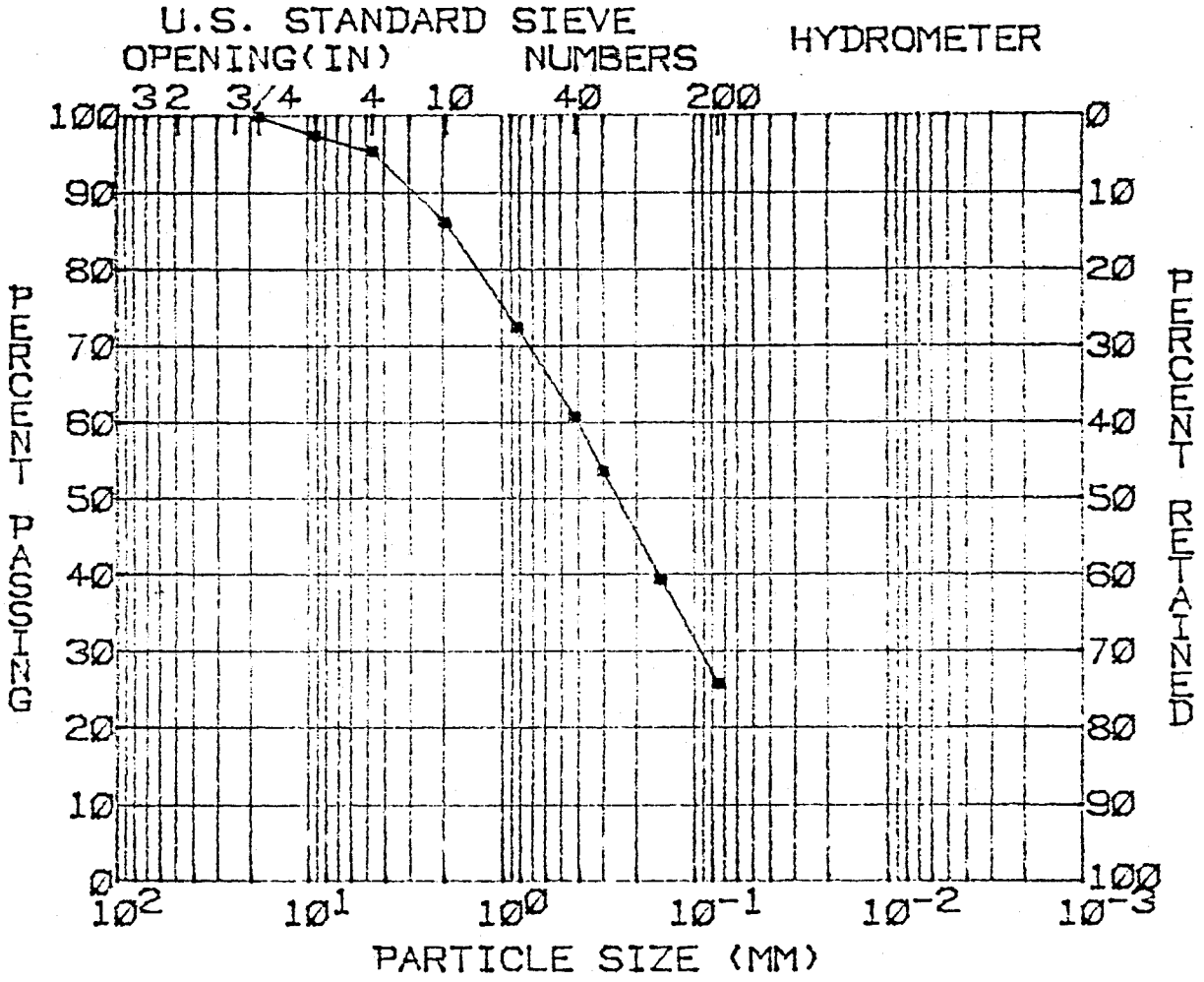
L.L.(%) = 47
P.I.(%) = 16

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND #2A
STATION:
RANGE :

BORING:SS-9B
EL. :
SAMPLE:GR.46
DATE :1-7-85



GRAVEL(%)= 4
SAND(%) = 70
SILT(%) = 26
CLAY(%) = 0

D10(MM) = 0.0337
D30(MM) = 0.0930
D60(MM) = 0.4023
COEF UNIF=11.9

SOIL SYMBOL= SM
MOISTURE(%)= --
SP. GR. = 2.65

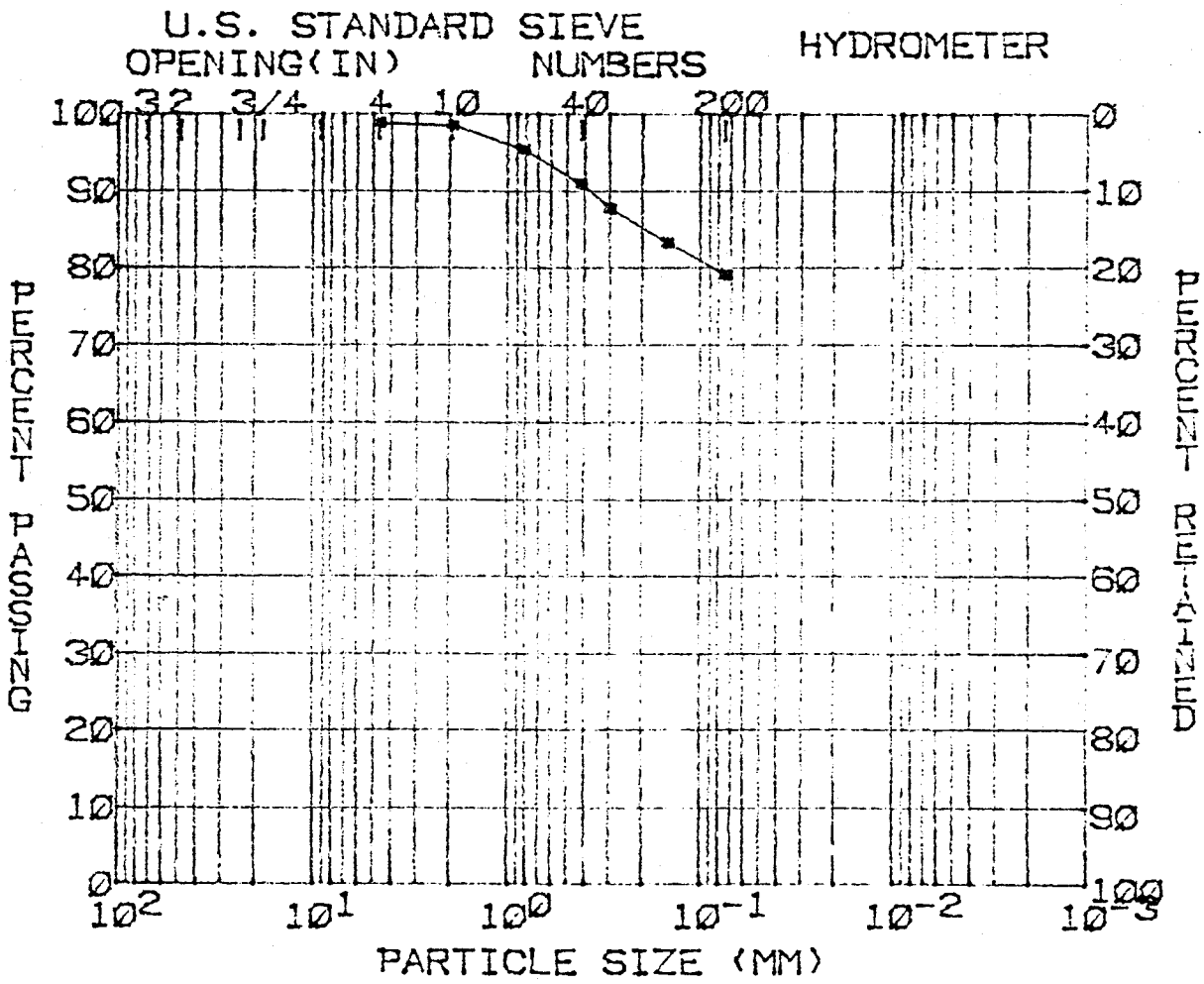
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:SS-9B
EL. :
SAMPLE:GR.47
DATE :1-7-85



GRAVEL(%)= 0
SAND(%) = 20
SILT(%) = 80
CLAY(%) = 0

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL-CH
MOISTURE(%)= --
SP. GR. = 2.65

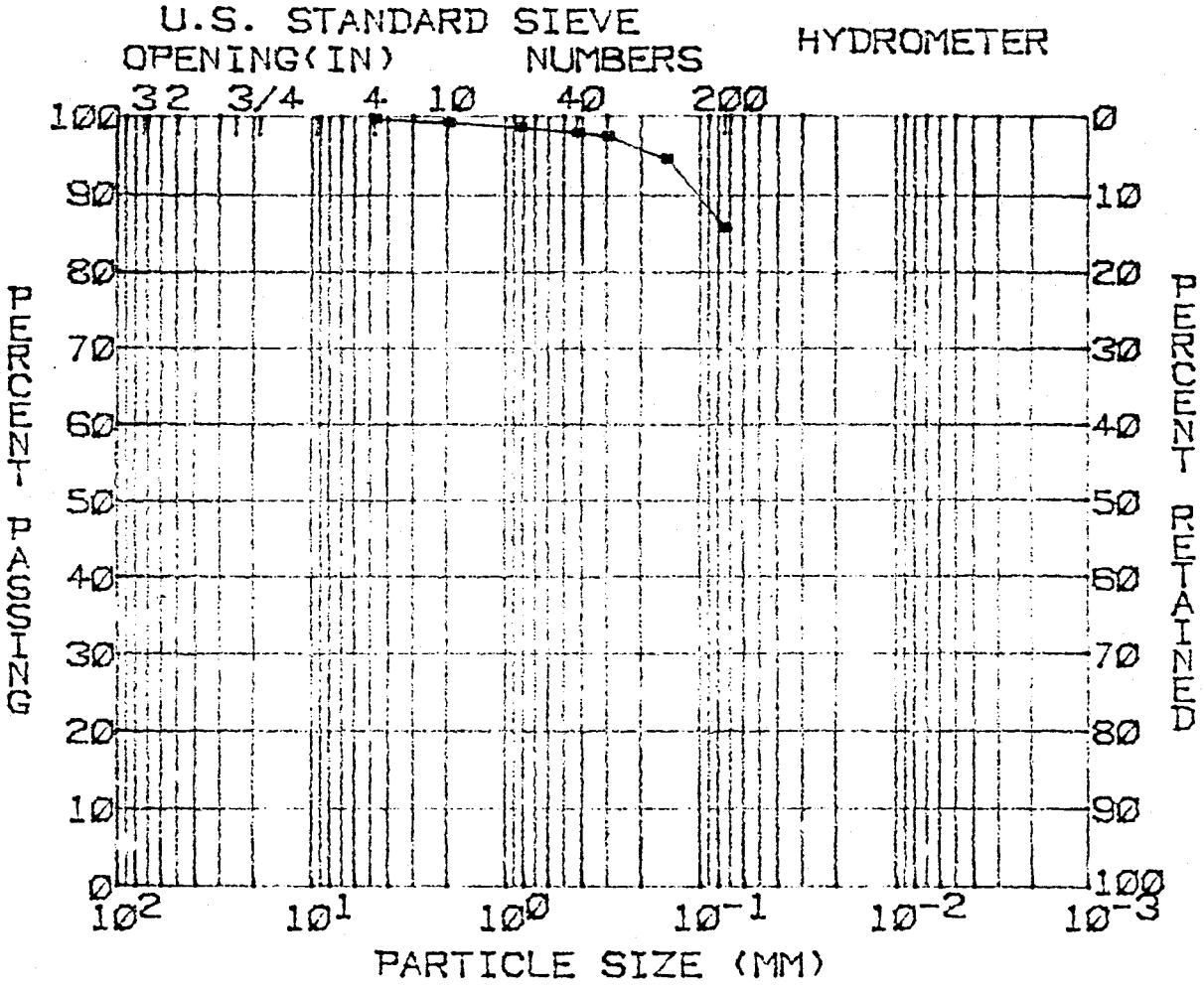
L.L.(%) = 49
P.I.(%) = 25

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:SS-9B
EL. :
SAMPLE:GR.48
DATE :1-7-85



GRAVEL(%)= 0
SAND(%) = 14
SILT(%) = 86
CLAY(%) = 0

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL
MOISTURE(%)= --
SP. GR. = 2.65

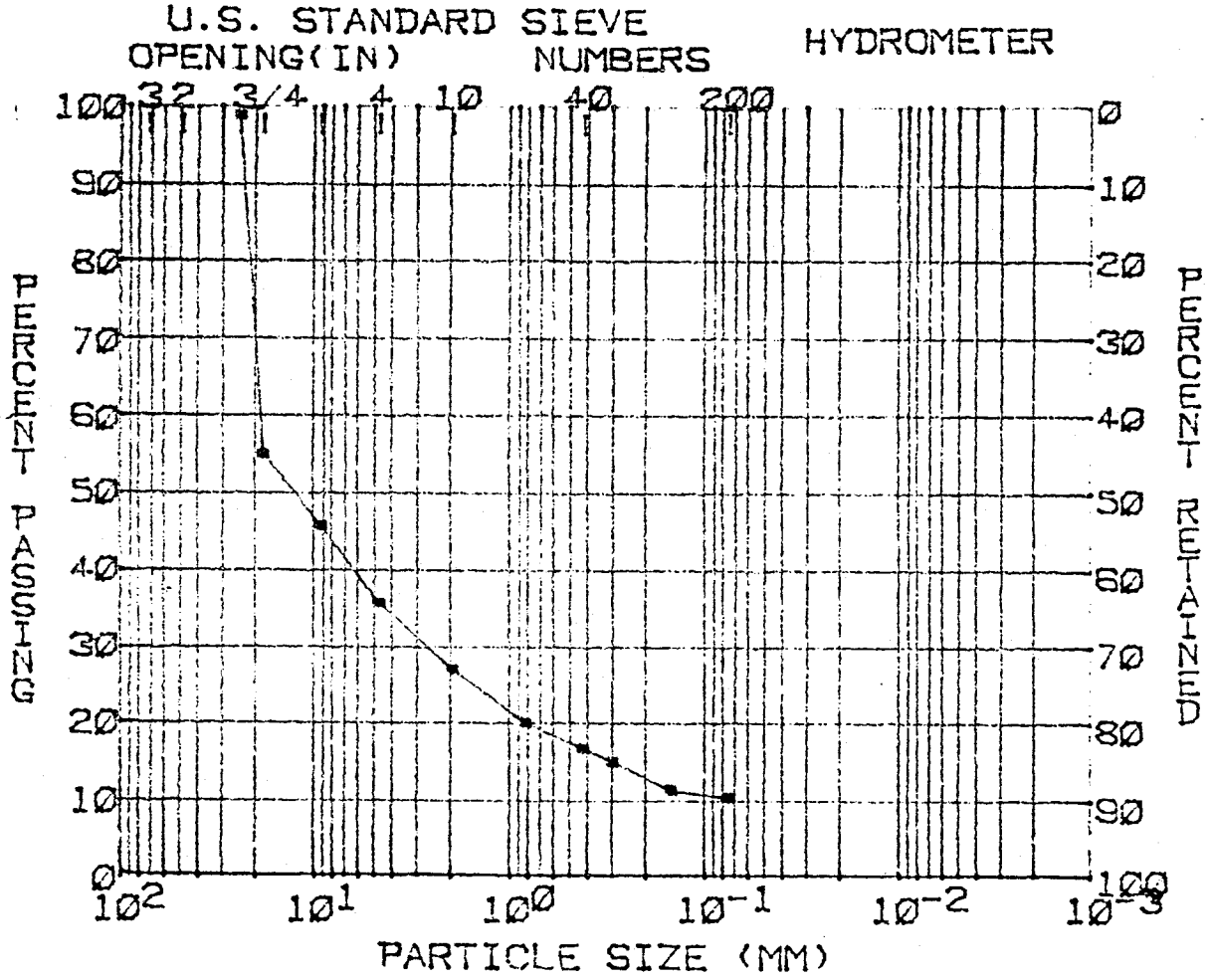
L.L.(%) = 43
P.I.(%) = 20

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:SS-9C
EL. :
SAMPLE:GR.49
DATE :1-8-85



GRAVEL(%)= 63
SAND(%) = 26
SILT(%) = 11
CLAY(%) = 0

D10(MM) = 0.0290
D30(MM) = 2.3125
D60(MM) =19.4815
COEF UNIF) 100

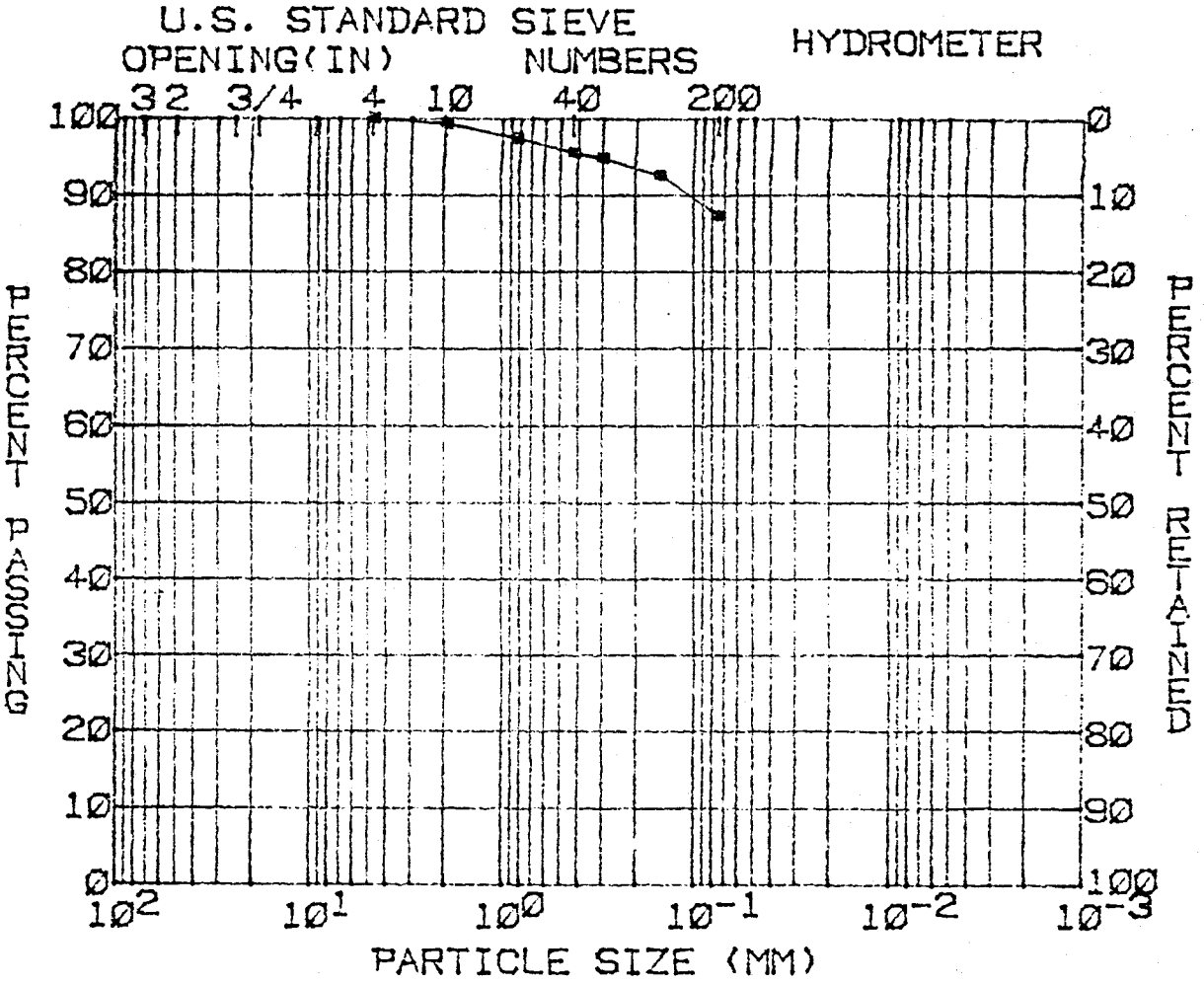
SOIL SYMBOL= GP-GM
MOISTURE(%)= --
SP. GR. = 2.65

L.L.(%) = NP
P.I.(%) = NP

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:SS-9C
EL. :
SAMPLE:GR.5Ø
DATE :1-8-85



GRAVEL(%)= Ø
SAND(%) = 13
SILT(%) = 87
CLAY(%) = Ø

D1Ø(MM) = --
D3Ø(MM) = --
D6Ø(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL
MOISTURE(%)= --
SP. GR. = 2.65

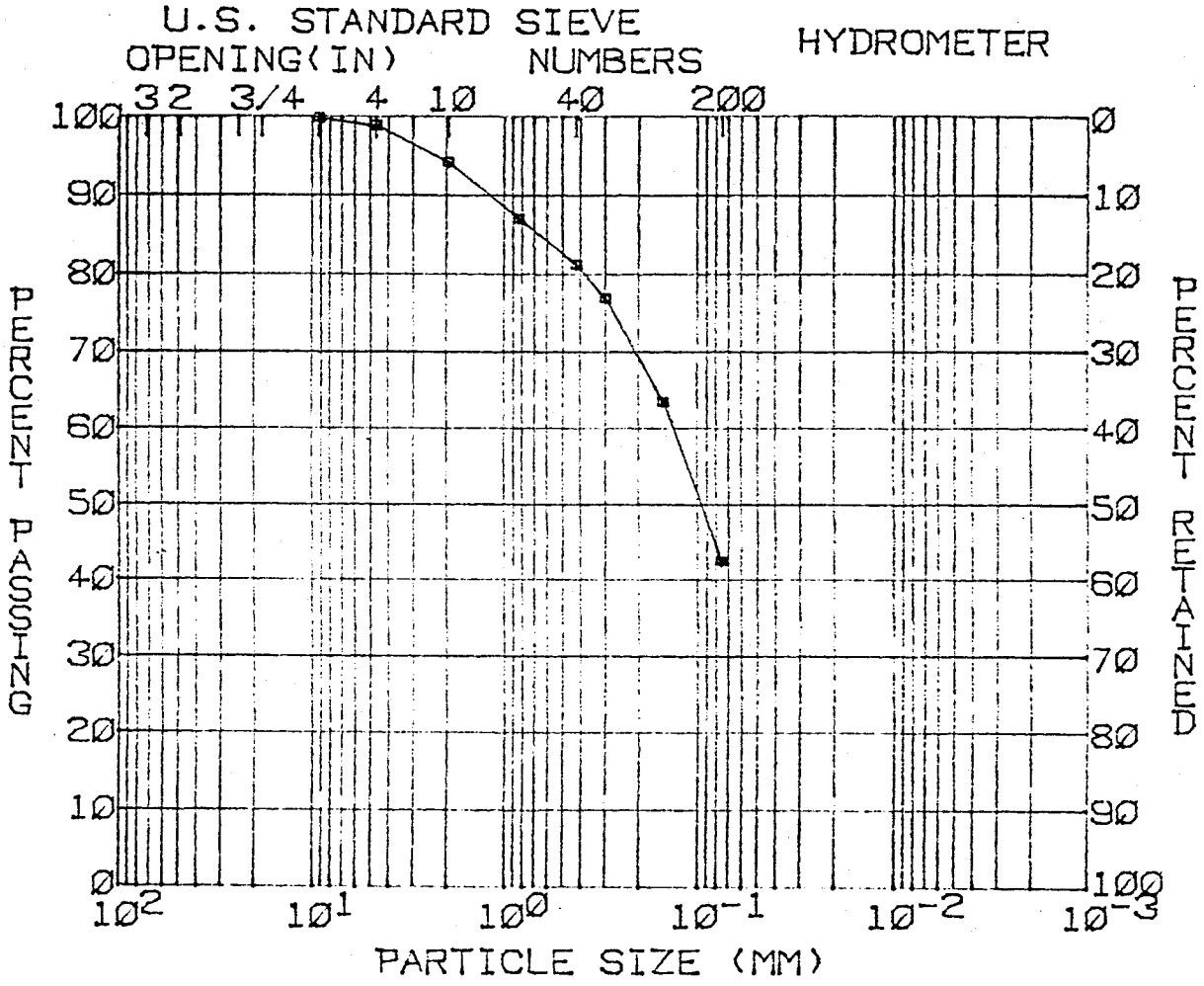
L.L.(%) = 46
P.I.(%) = 22

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:SS-11
EL. :
SAMPLE:GR.54
DATE :1-8-85



GRAVEL(%)= 1
SAND(%) = 57
SILT(%) = 42
CLAY(%) = 0

D10(MM) = 0.0255
D30(MM) = 0.0494
D60(MM) = 0.1332
COEF UNIF= 5.2

SOIL SYMBOL= SM
MOISTURE(%)= --
SP. GR. = 2.65

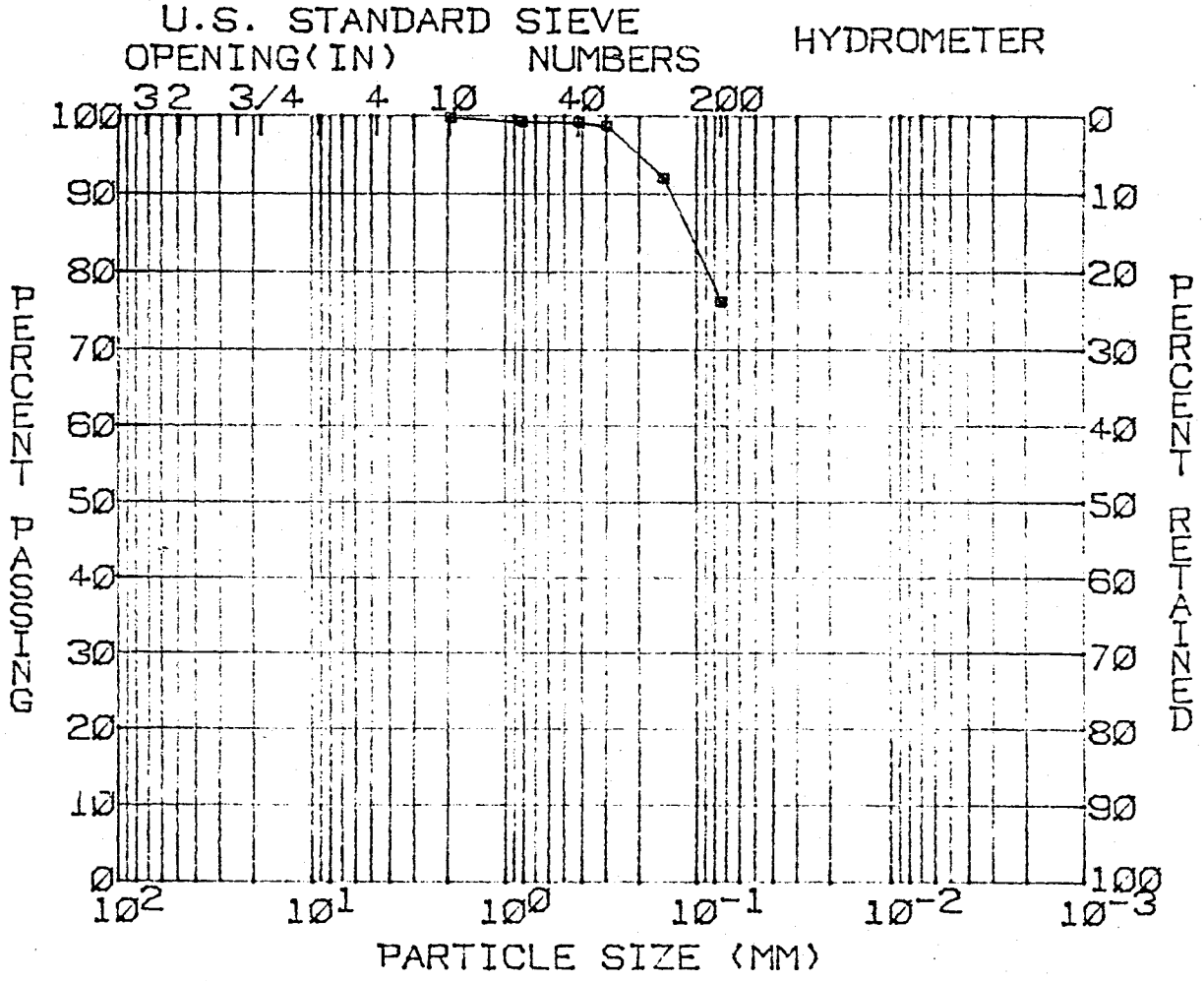
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:SS-11
EL. :
SAMPLE:GR.55
DATE :1-8-85



GRAVEL(%)= 0
SAND(%) = 24
SILT(%) = 76
CLAY(%) = 0

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= ML
MOISTURE(%)= --
SP. GR. = 2.65

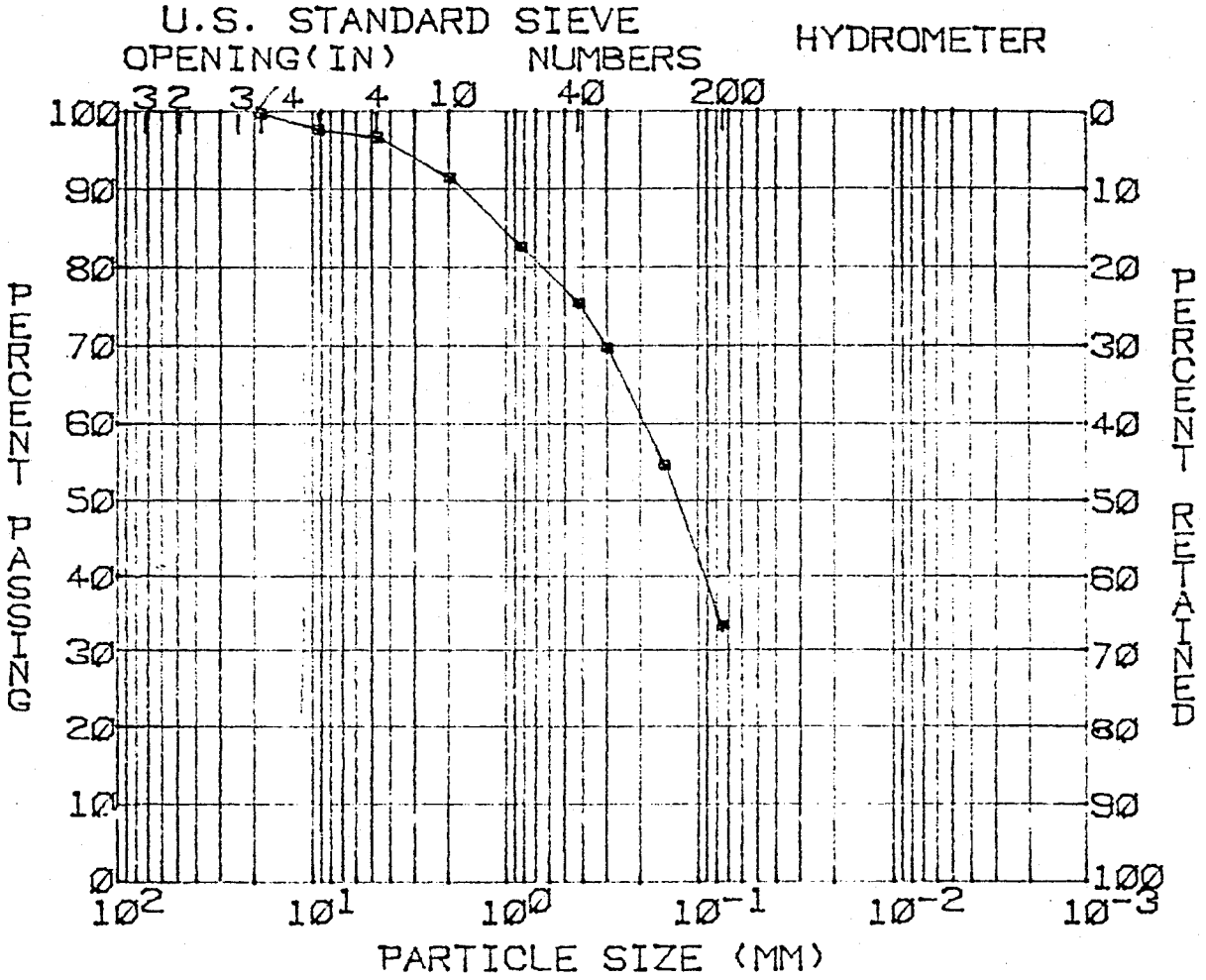
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT: BULL RUN S.P.
FEATURE: ASH POND #2A
STATION:
RANGE :

BORING: SS-12
EL. :
SAMPLE: GR.56
DATE :1-8-85



GRAVEL(%)= 3
SAND(%) = 64
SILT(%) = 33
CLAY(%) = 0

D10(MM) = 0.0357
D30(MM) = 0.0677
D60(MM) = 0.1898
COEF UNIF= 5.3

SOIL SYMBOL= SM
MOISTURE(%)= --
SP. GR. = 2.65

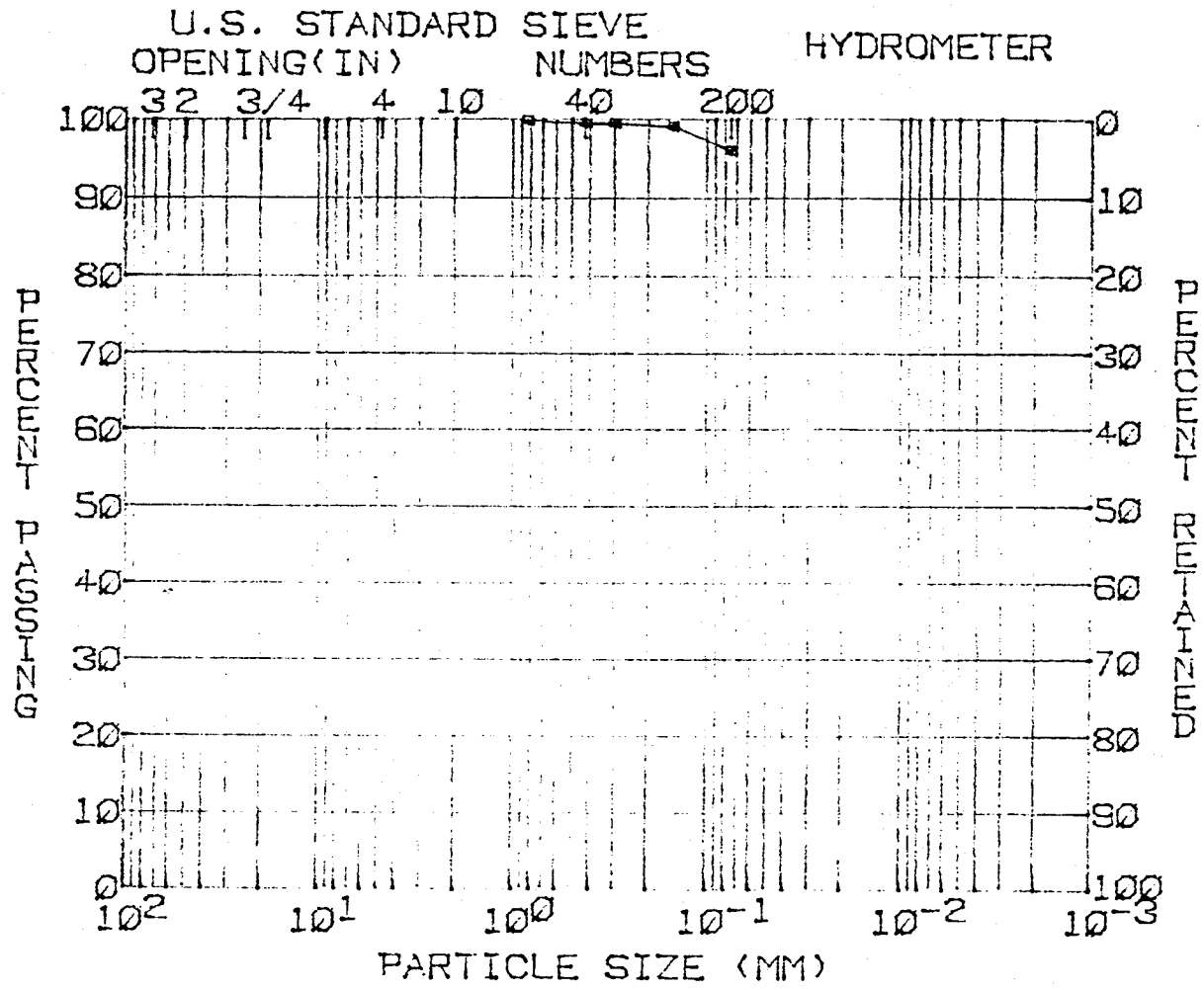
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:SS-12
EL. :
SAMPLE:GR.57
DATE :1-8-85



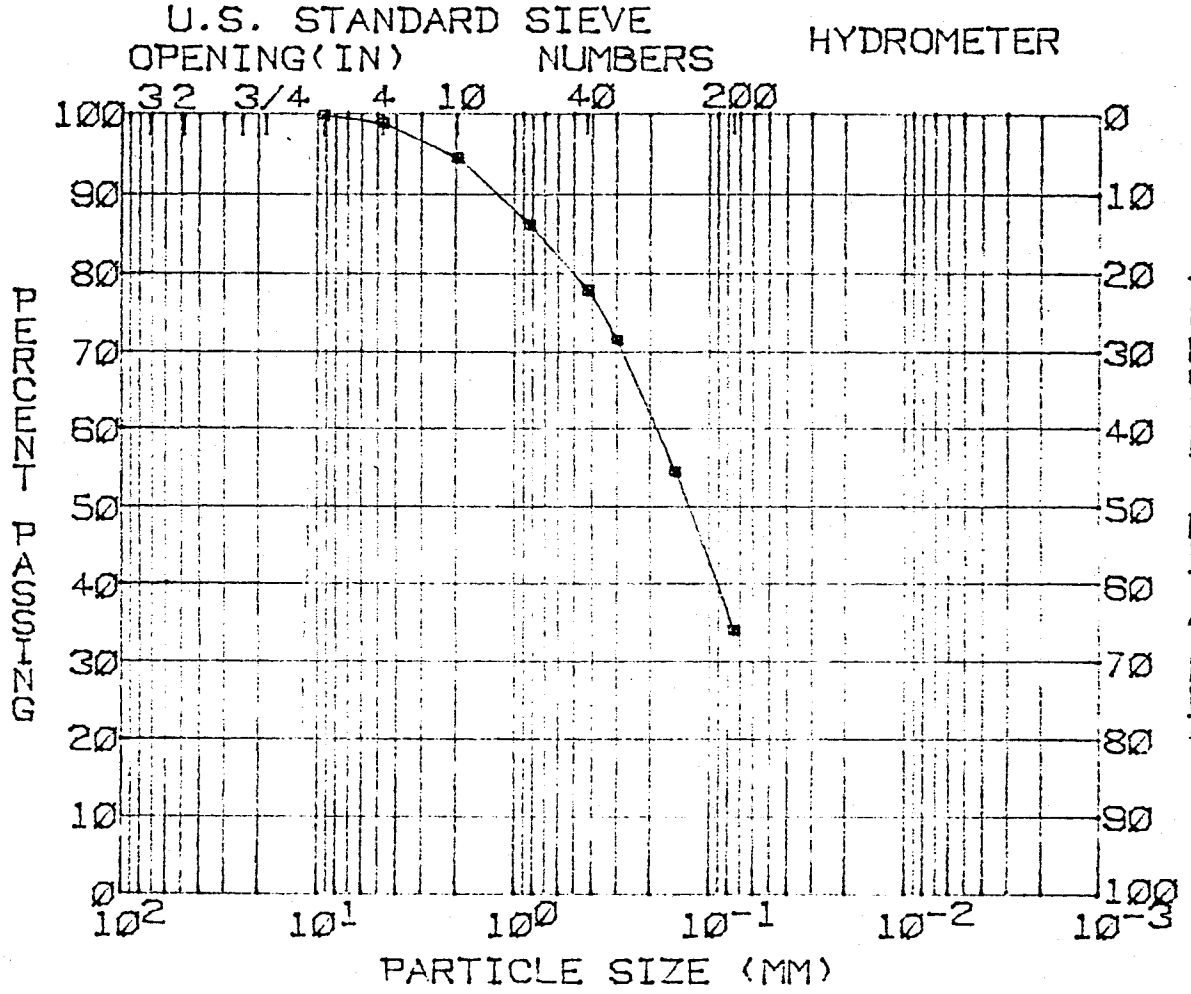
GRAVEL(%)	= 0	D10(MM)	= --
SAND(%)	= 4	D30(MM)	= --
SILT(%)	= 96	D60(MM)	= --
CLAY(%)	= 0	COEF UNIF	= --
SOIL SYMBOL	= ML	L.L.(%)	= NP
MOISTURE(%)	= --	P.I.(%)	= NP
SP. GR.	= 2.65		

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:SS-13
EL: :
SAMPLE:GR.58
DATE :1-8-85



GRAVEL(%)= 1
SAND(%) = 65
SILT(%) = 34
CLAY(%) = Ø

D1Ø(MM) = Ø.Ø331
D3Ø(MM) = Ø.Ø65Ø
D6Ø(MM) = Ø.1856
COEF UNIF= 5.6

SOIL SYMBOL= SM
MOISTURE(%)= --
SP. GR. = 2.65

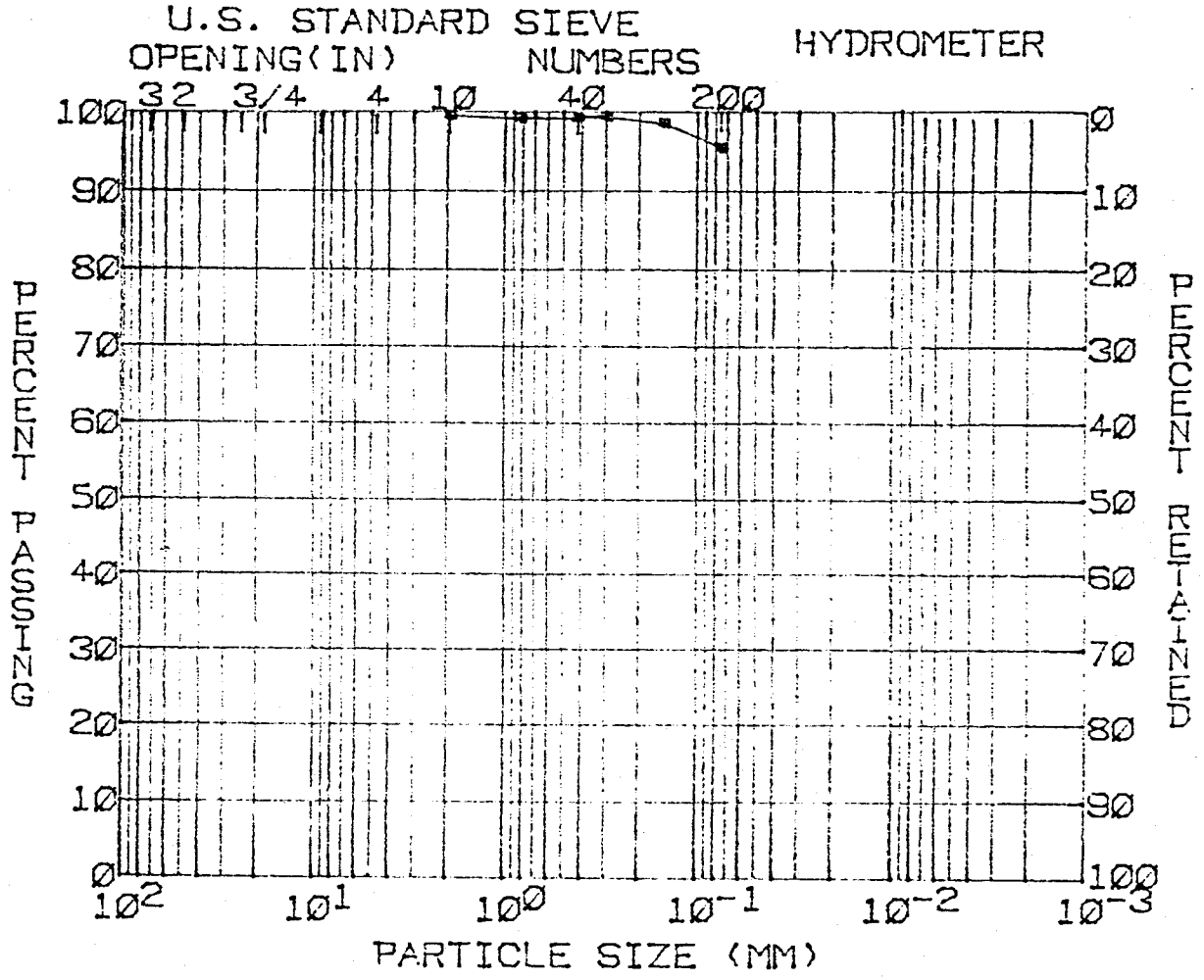
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT: BULL RUN S.P.
FEATURE: ASH POND 2A
STATION:
RANGE :

BORING: SS-13
EL. :
SAMPLE: GR.59
DATE :1-8-85



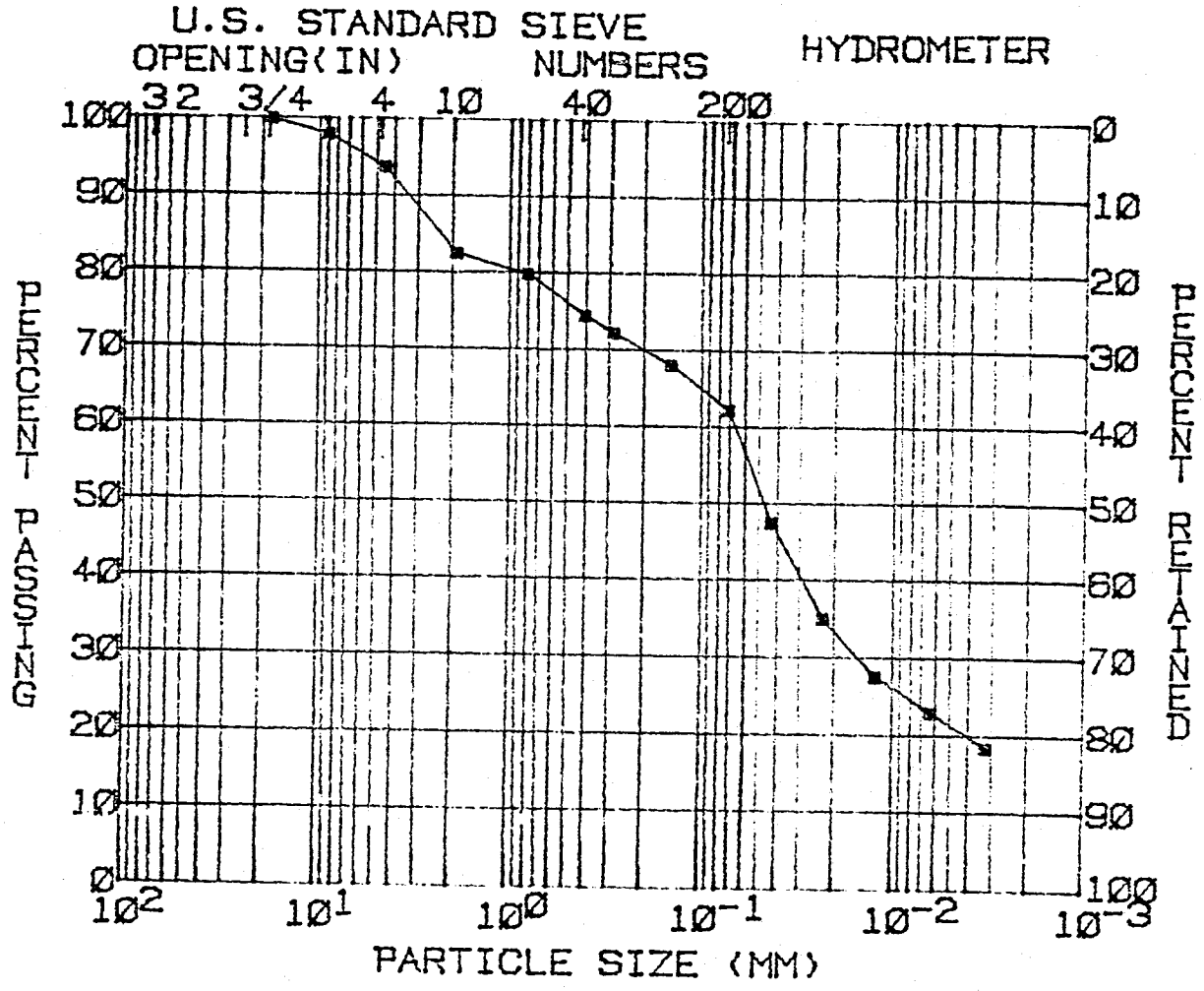
GRAVEL(%)	= 0	D10(MM)	= --
SAND(%)	= 4	D30(MM)	= --
SILT(%)	= 96	D60(MM)	= --
CLAY(%)	= 0	COEF UNIF	= --
SOIL SYMBOL	= ML	L.L.(%)	= NP
MOISTURE(%)	= --	P.I.(%)	= NP
SP. GR.	= 2.65		

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:US-9A
EL. :803.9-801.4
SAMPLE:1
DATE :2-6-85



GRAVEL(%)= 6
SAND(%) = 32
SILT(%) = 41
CLAY(%) = 21

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= ML
MOISTURE(%)= 21.2
SP. GR. = 2.70

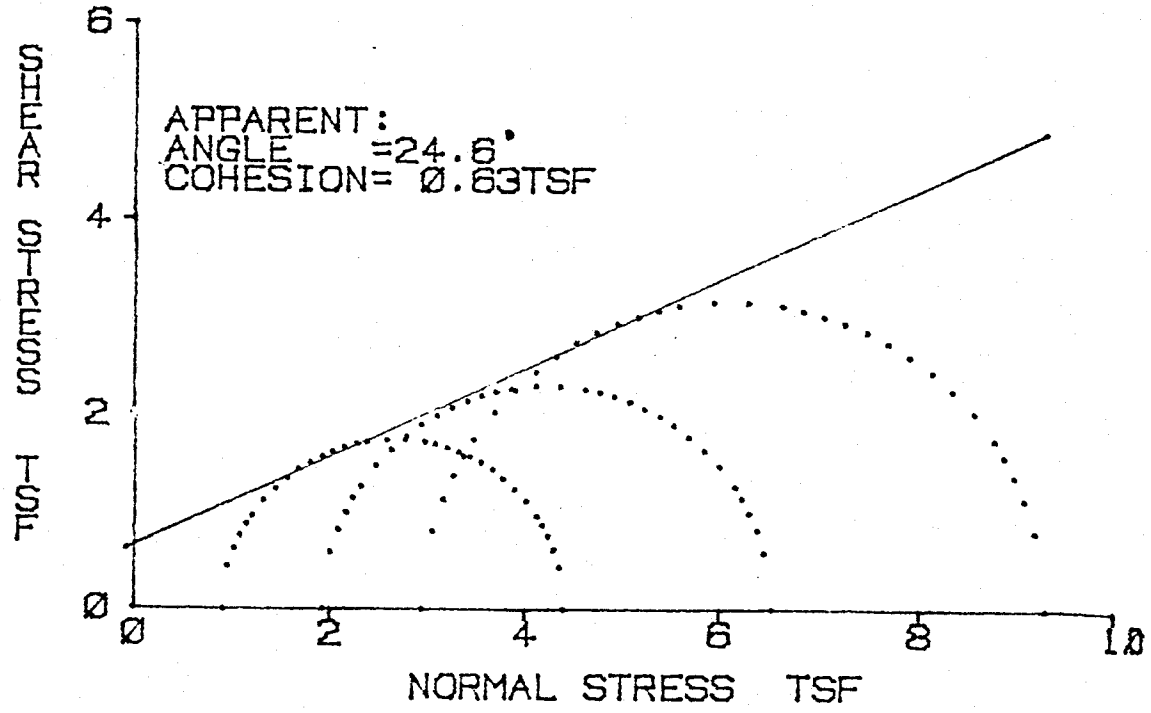
L.L.(%) = 39
P.I.(%) = 12

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION(R) TEST

PROJECT:	BULL RUN S.P.	EL.:	:798:Ø-797.5
FEATURE:	ASH POND 2A	SAMPLE	:2
STATION:		PART	:2
RANGE	:	SOIL SYM:	ML
BORING	:US-9A	DATE	:2-14-85

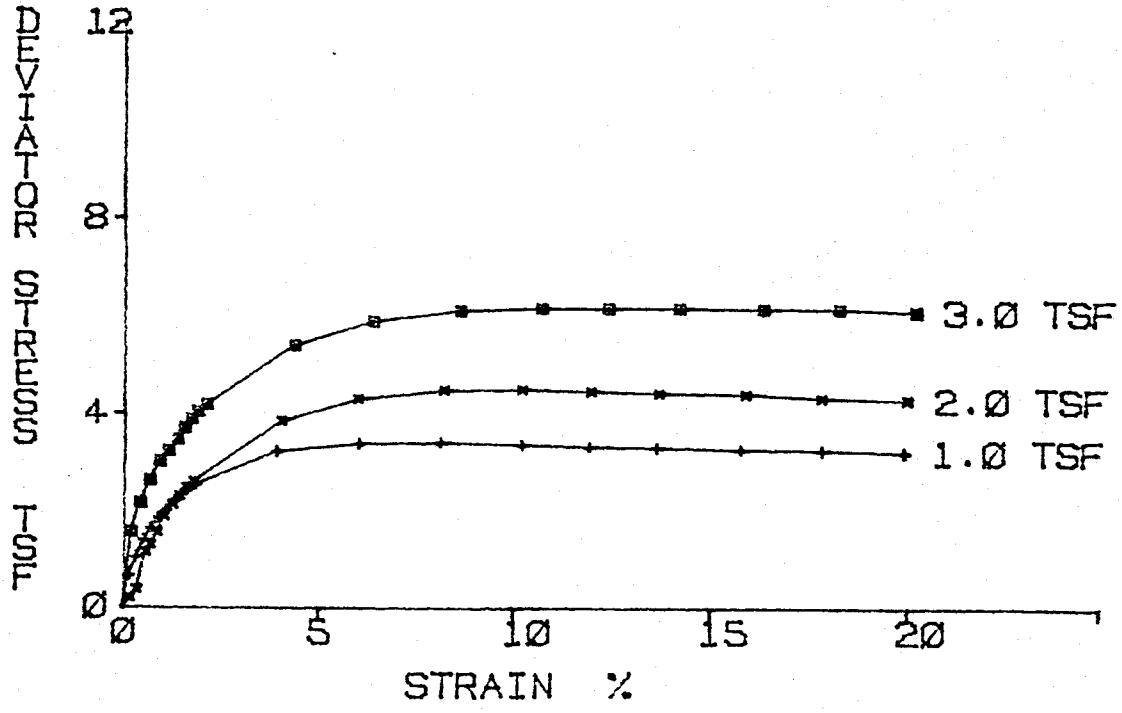


REMARKS:

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION(R) TEST

PROJECT:	BULL RUN S.P.	EL.	:798.Ø-797.5
FEATURE:	ASH POND 2A	SAMPLE	:2
STATION:		PART	:2
RANGE	:	SOIL SYM:	ML
BORING	:US-9A	DATE	:2-14-85



REMARKS:

Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Unconsolidated Undrained Triaxial Compression (R) Test

Project: BULL RUN S.P.
Feature: ASH POND 2A
Station:
Range :
Boring : US-9A

El. : 798.0-797.5
Sample: 2
Part : 2

Tested By : TAL
Computed By: MHD
Checked By : CEC
Report Date: 2-14-85

Soil Symbol= ML
Sp. Gr. = 2.7

L.L.(%)= 42
D10(mm)= 0

P.I.(%)= 13

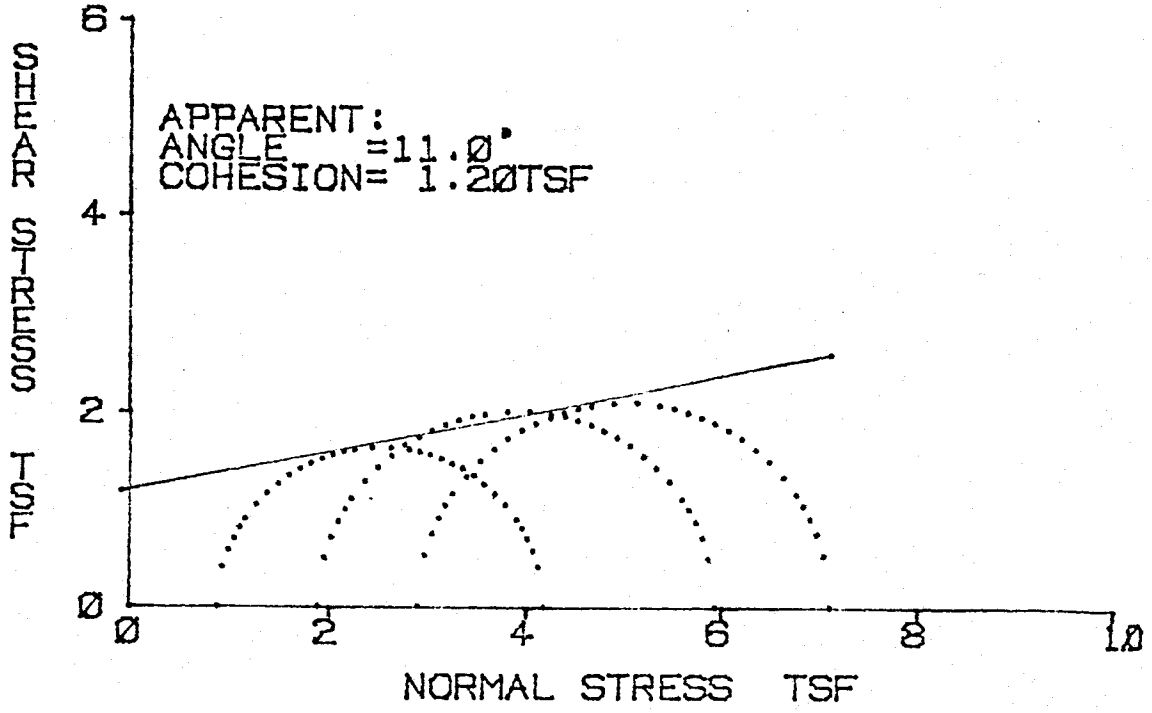
Specimen Number	1	2	3	4
Initial:				
Moisture Content(%)	30.7	31.9	32.0	0.0
Dry Density(pcf)	87.6	86.3	86.8	0.0
Void Ratio	0.923	0.953	0.943	0.000
Saturation(%)	89.8	90.4	91.7	0.0
Before Shearing:				
Moisture(%) (after satur.)	--	--	--	--
Saturation(%)	--	--	--	--
Moisture(%) (after cons.)	--	--	--	--
Void Ratio (after cons.)	--	--	--	--
Final Moisture Content(%)	31.9	31.7	30.9	0.0
Minor Principal Stress(tsf)	1.01	2.02	3.02	0.00
Major Principal Stress(tsf)	4.51	6.63	9.38	0.00
Eff. Minor Prin. Stress(tsf)	--	--	--	--
Eff. Major Prin. Stress(tsf)	--	--	--	--
Time to Failure(min.)	40	50	70	0
Rate of Strain(%/min.)	0.21	0.21	0.20	0.00
Specimen Height(in.)	3.13	3.13	3.13	3.13
Specimen Diameter(in.)	1.41	1.41	1.41	1.41

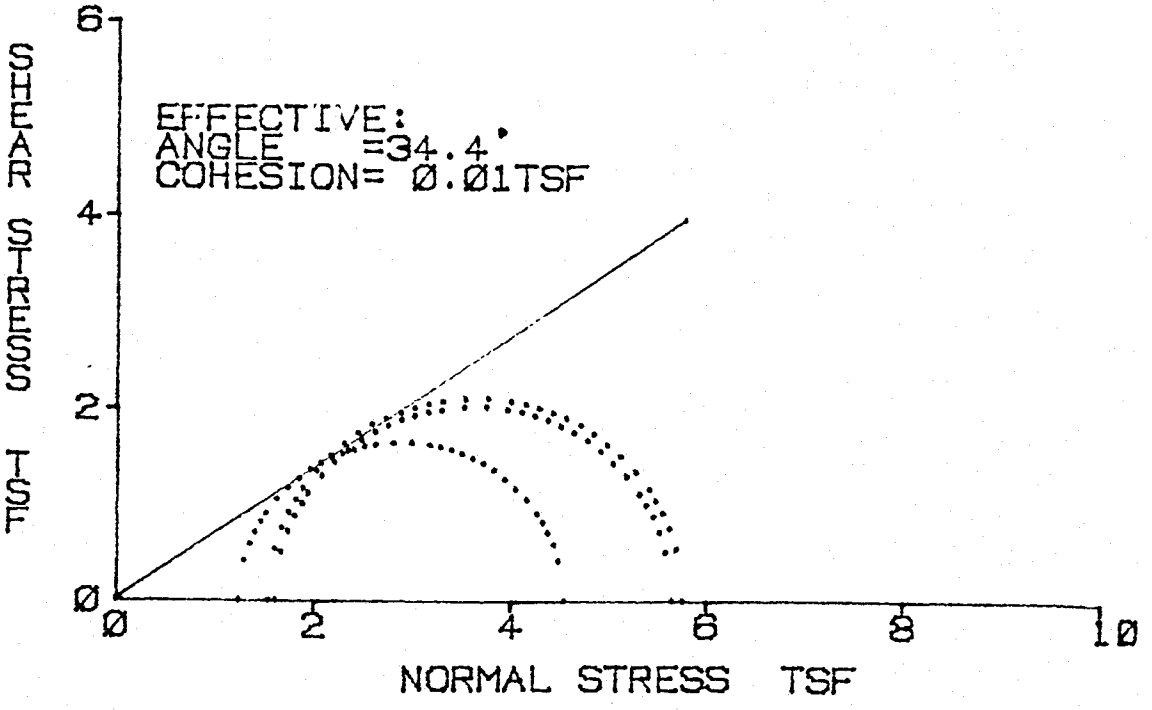
Shear Strength	Max Deviator Stress Deg.	Max Deviator Stress c(tsf)	Max Eff Stress Ratio Deg.	Max Eff Stress Ratio c(tsf)
Apparent	24.6	0.63		
Effective	--	--		

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (R) TEST

PROJECT:BULL RUN S.P.	EL. :798.Ø-797.5
FEATURE:ASH POND 2A	SAMPLE :2
STATION:	PART :3
RANGE :	SOIL SYM:ML
BORING :US-9A	DATE :2-14-85



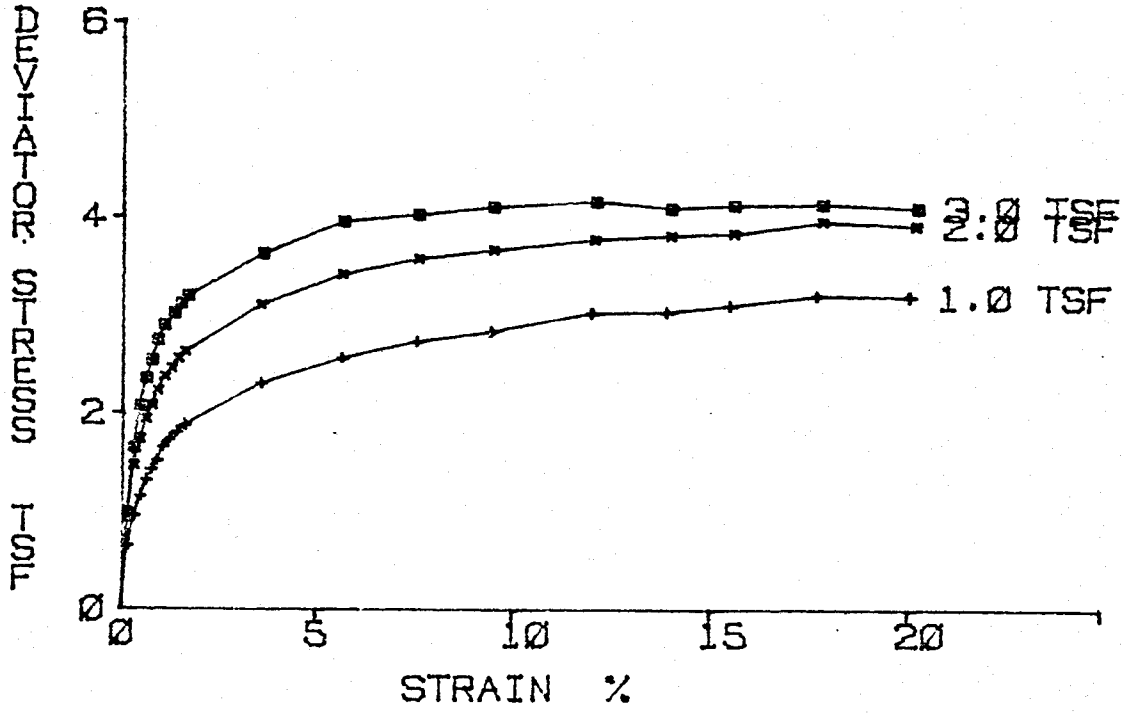


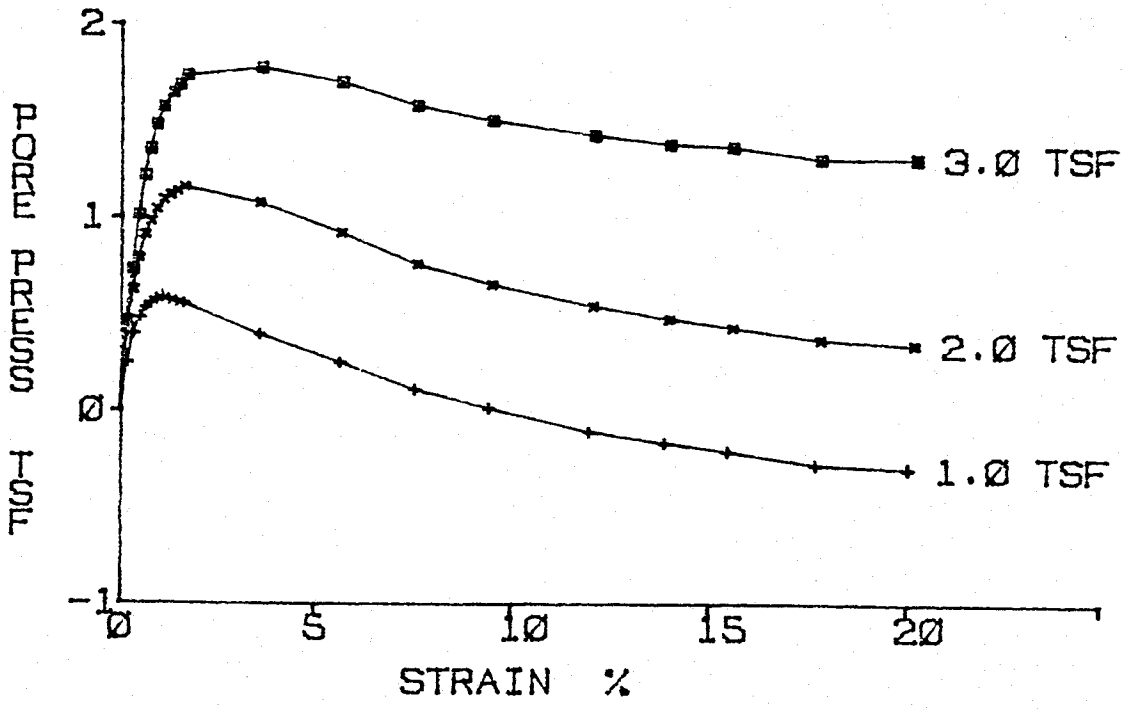
REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (R) TEST

PROJECT:	BULL RUN S.P.	EL.	:798.Ø-797.5
FEATURE:	ASH POND 2A	SAMPLE	:2
STATION:		PART	:3
RANGE	:	SOIL SYM:	ML
BORING	:US-9A	DATE	:2-14-85





Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Consolidated Undrained Triaxial Compression (R) Test

Project: BULL RUN S.P.
Feature: ASH POND 2A
Station:
Range :
Boring : US-9A

El. : 798.0-797.5
Sample: 2
Part : 3

Tested By : TAL
Computed By: MHD
Checked By : [illegible]
Report Date: 2-14-85

Soil Sybmbol= ML
Sp. Gr. = 2.7

L.L.(%)= 42
D10(mm)= 0

P.I.(%)= 13

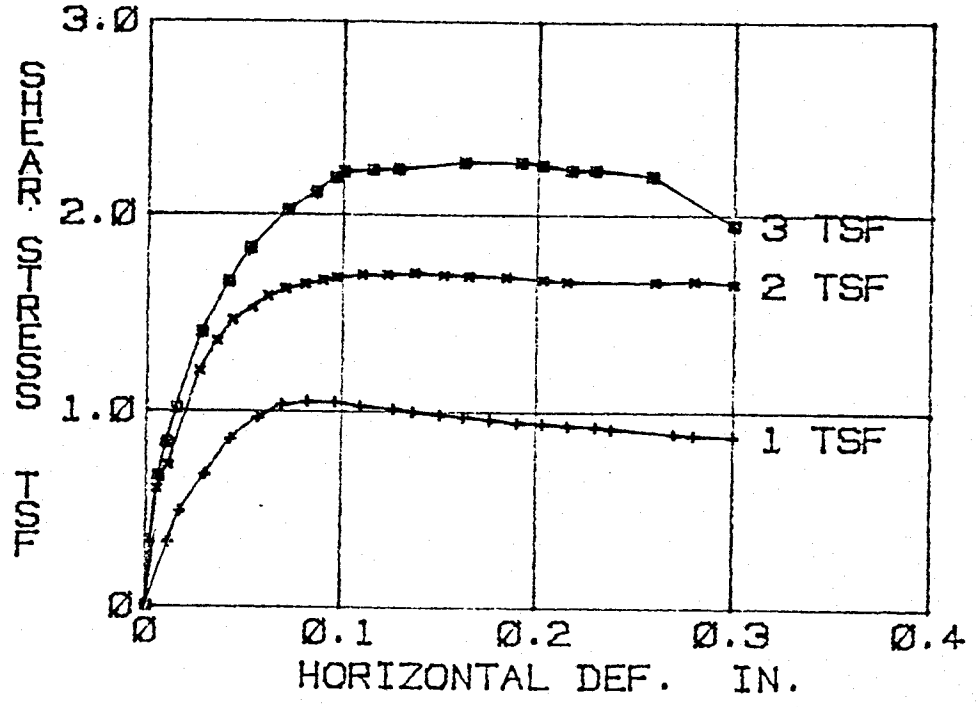
Specimen Number	1	2	3	4
Initial:				
Moisture Content(%)	32.1	32.7	33.0	0.0
Dry Density(pcf)	86.8	86.5	85.9	0.0
Void Ratio	0.943	0.948	0.962	0.000
Saturation(%)	92.0	93.2	92.5	0.0
Before Shearing:				
Moisture(%) (after satur.)	34.9	35.1	35.6	0.0
Saturation(%)	100.0	100.0	100.0	0.0
Moisture(%) (after cons.)	34.2	32.1	33.6	33.6
Void Ratio (after cons.)	0.922	0.867	0.906	0.000
Final Moisture Content(%)	33.0	32.9	32.8	0.0
Minor Principal Stress(tsf)	1.01(1.01)	2.02(2.02)	3.02(3.02)	0.00(0.00)
Major Principal Stress(tsf)	4.31(2.94)	6.07(5.18)	7.26(7.03)	0.00(0.00)
Eff. Minor Prin. Stress(tsf)	1.25(0.43)	1.61(0.92)	1.55(1.29)	0.00(0.00)
Eff. Major Prin. Stress(tsf)	4.56(2.37)	5.67(4.09)	5.78(5.30)	0.00(0.00)
Time to Failure(min.)	90	90	60	0
Rate of Strain(%/min.)	0.20	0.20	0.20	0.00
Specimen Height(in.)	3.13	3.13	3.13	3.13
Specimen Diameter(in.)	1.41	1.41	1.41	1.41

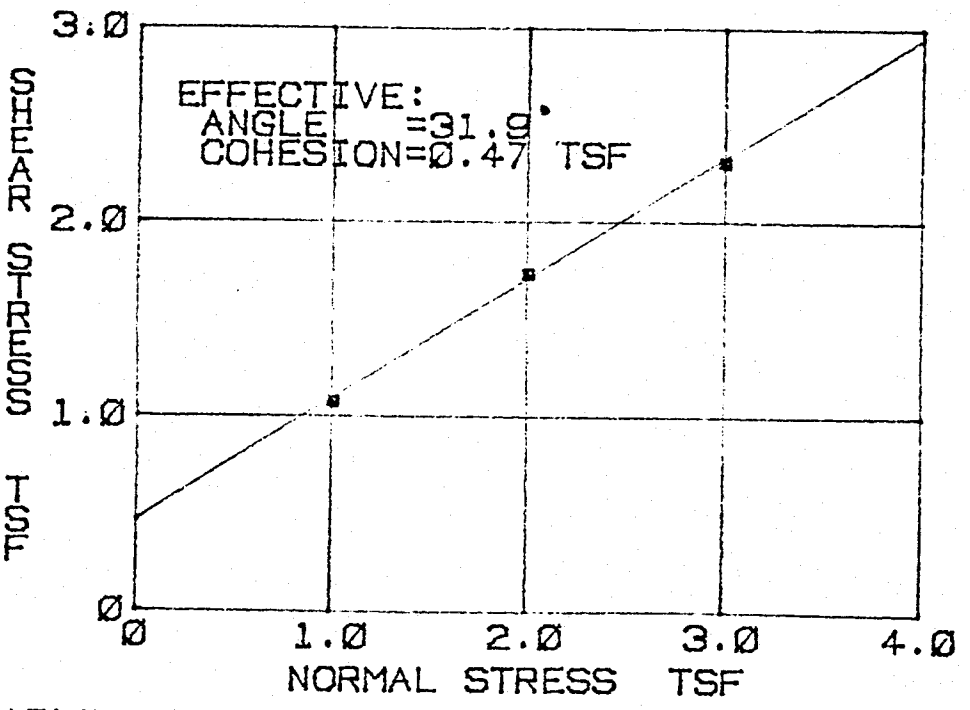
Shear Strength	Max Deviator Stress		Max Eff Stress Ratio	
	Deg.	c(tsf)	Deg.	c(tsf)
Apparent	11.0	1.20	19.9	0.33
Effective	34.4	0.01	33.2	0.24

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
DIRECT SHEAR TEST

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :,

BORING:US-9A
EL. :798.5-798.0
SAMPLE:2
DATE :2-24-85





REMARKS: TESTED AT NATURAL MOISTURE CONTENT

Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Direct Shear Test

Project: BULL RUN S.P.
Feature: ASH POND 2A
Station:
Range :
Boring : US-9A

El. :798.5-798.0
Sample: 2
Part : 1

Tested By : CBE GMD
Computed By: MHD
Checked By : EL
Report Date: 2-24-85

Type of Specimen=UNDISTURBED
Soil Symbol =ML

L.L. (%) =13
P.I. (%) =42

Sp. Gr. =2.70

Test No.	1	2	3	4
Initial:				
Moisture Content (%)	31.4	29.7	29.2	0.0
Dry Density (pcf)	88.4	91.0	92.8	0.0
Void Ratio	0.908	0.852	0.817	0.000
Saturation (%)	93.3	94.2	96.5	0.0
Final:				
Moisture Content (%)	29.9	26.7	27.0	0.0
Saturation (%)	99.0	89.5	97.3	0.0
Normal Stress (tsf)	1.00	2.00	3.00	0.00
Max. Shear Stress (tsf)	1.07	1.74	2.32	0.00
Time to Failure (min.)	105	195	210	0
Rate of Shearing (in./min.)	0.0008	0.0008	0.0009	0.0000
Specimen Height (in.)	0.727	0.735	0.740	0.000
Specimen Diameter (in.)	2.502	2.508	2.499	0.000

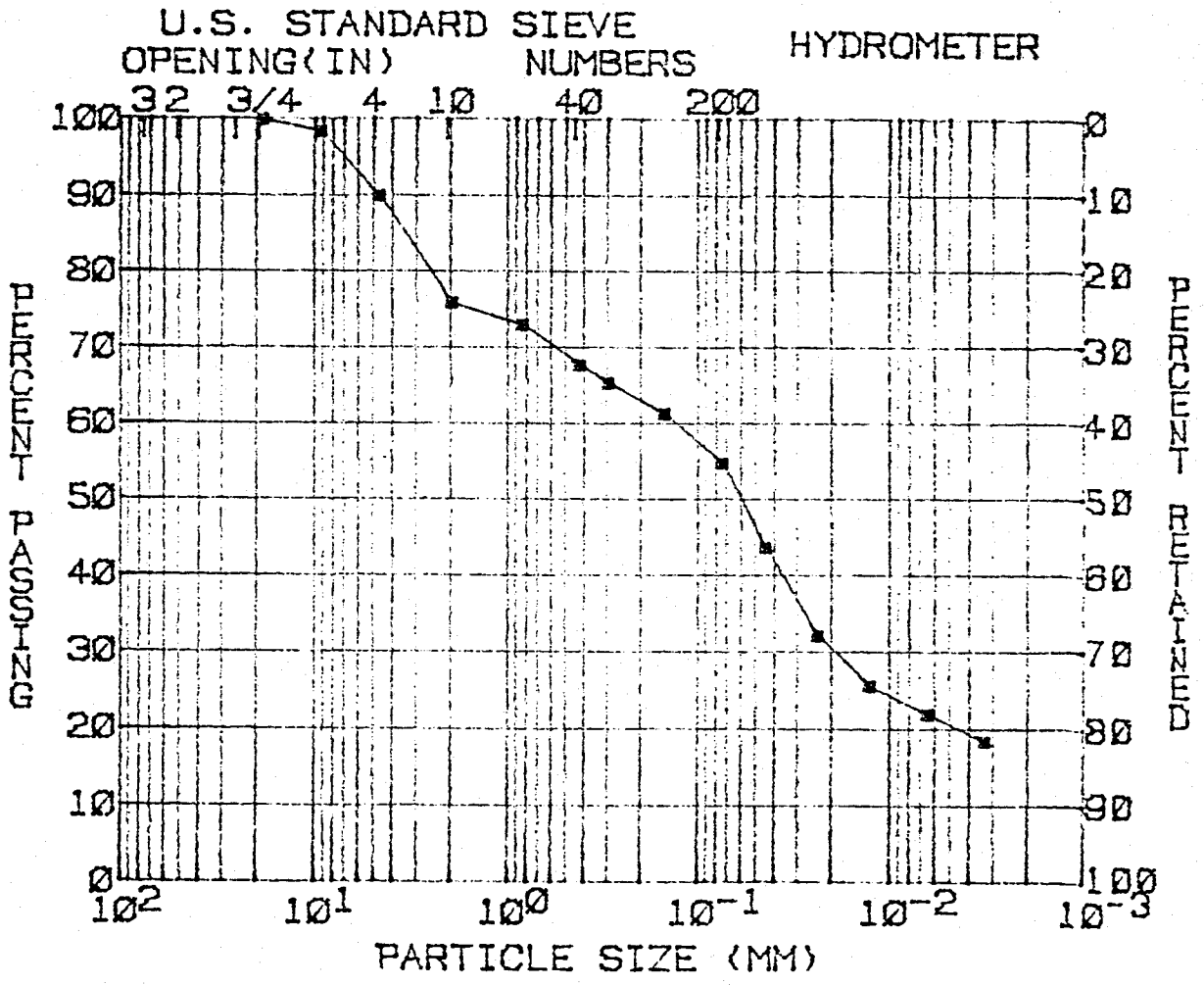
Shear Strength	Angle (deg.)	Cohesion (tsf)
Effective	31.9	0.47

Remarks: TESTED AT NATURAL MOISTURE CONTENT

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT: BULL RUN S.P.
FEATURE: ASH POND 2A
STATION:
RANGE :

BORING: US-9A
EL. : 798.9-796.9
SAMPLE: 2
DATE : 2-6-85



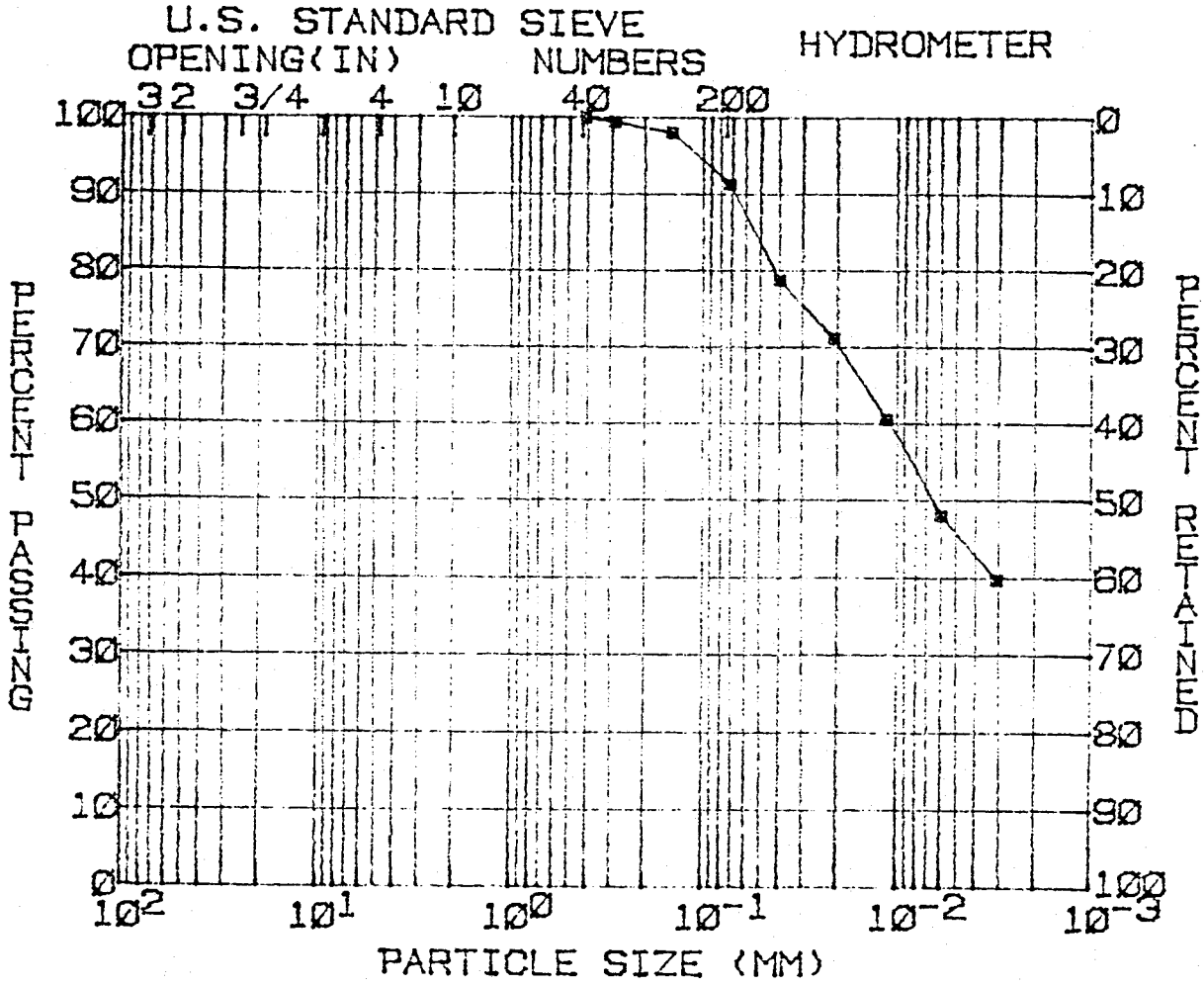
GRAVEL(%)	= 9	D10(MM)	= --
SAND(%)	= 36	D30(MM)	= --
SILT(%)	= 34	D60(MM)	= --
CLAY(%)	= 21	COEF UNIF	= --
SOIL SYMBOL	= ML	L.L.(%)	= 42
MOISTURE(%)	= 25.1	P.I.(%)	= 13
SP. GR.	= 2.70		

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:US-9B
EL. :791.4-790.0
SAMPLE:1
DATE :2-6-85



GRAVEL(%)= 0
SAND(%) = 8
SILT(%) = 46
CLAY(%) = 46

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL
MOISTURE(%)= 27.1
SP. GR. = 2.70

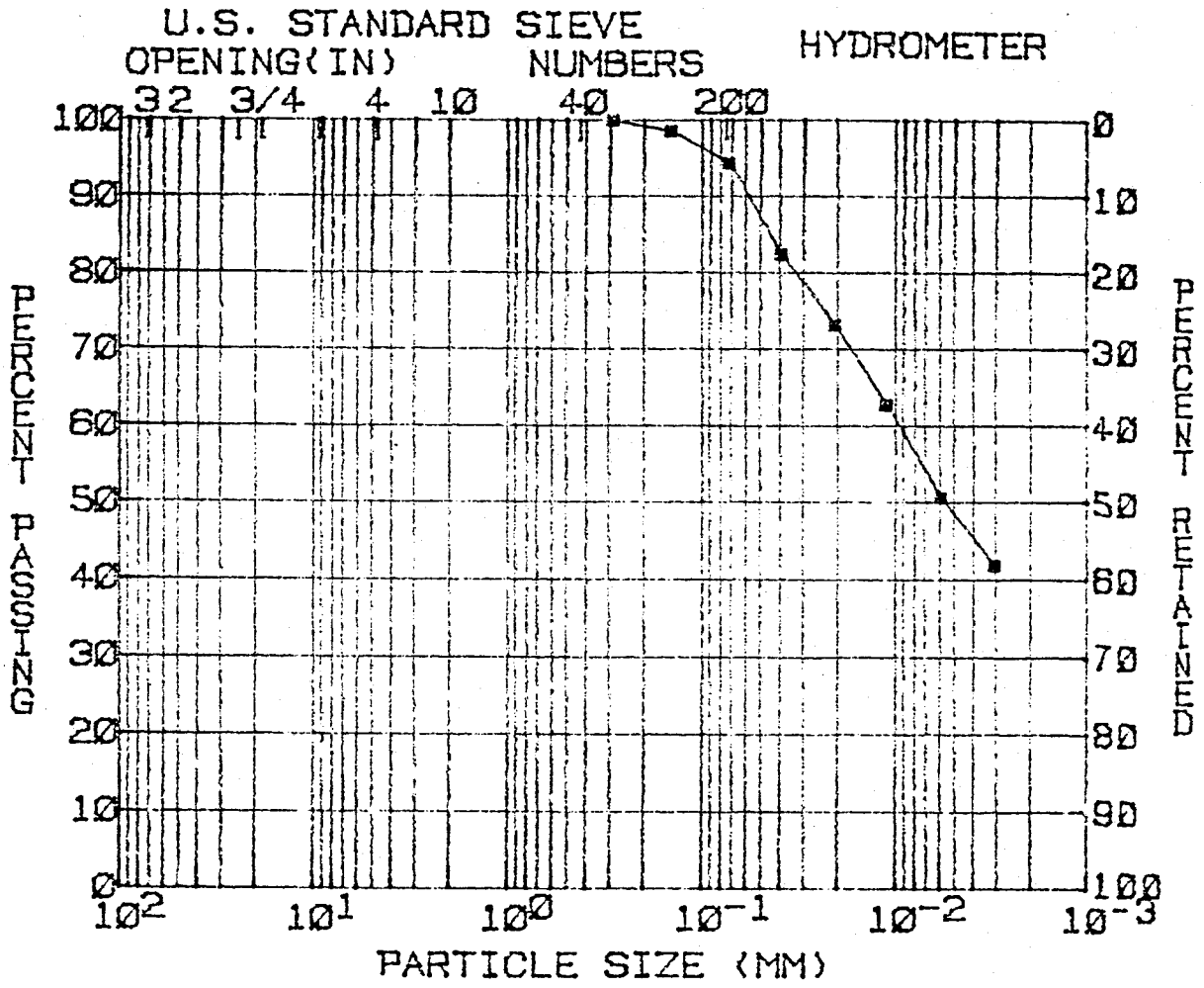
L.L.(%) = 44
P.I.(%) = 22

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:US-9B
EL. :783.9-782.6
SAMPLE:2
DATE :2-7-85



GRAVEL(%)= 0
SAND(%) = 5
SILT(%) = 46
CLAY(%) = 49

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL
MOISTURE(%)= 25.7
SP. GR. = 2.69

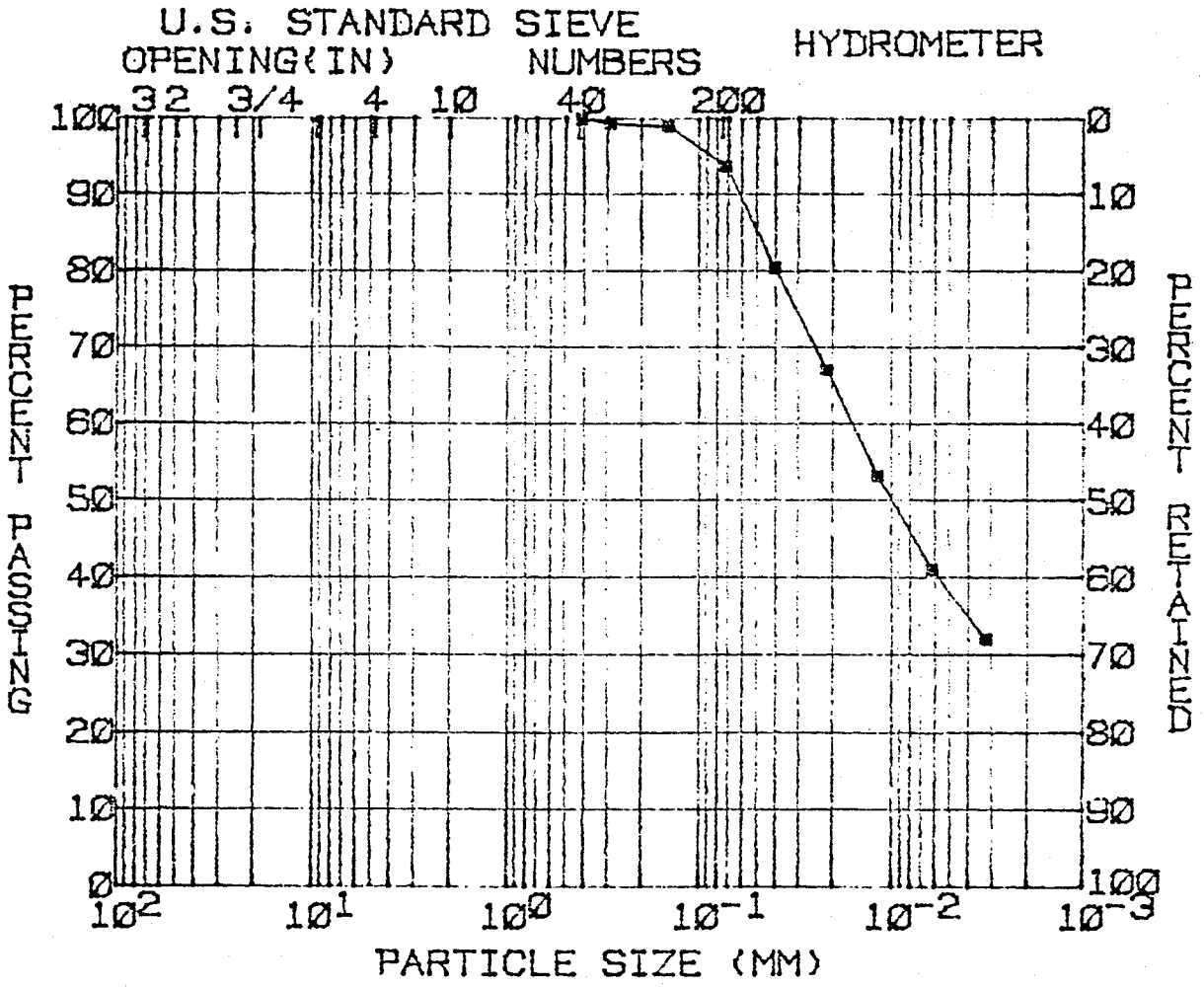
L.L.(%) = 47
P.I.(%) = 24

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:US-9B
EL. :778.9-777.3
SAMPLE:3
DATE :2-7-85



GRAVEL(%)= 0
SAND(%) = 6
SILT(%) = 56
CLAY(%) = 38

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL
MOISTURE(%)= 23.0
SP. GR. = 2.66

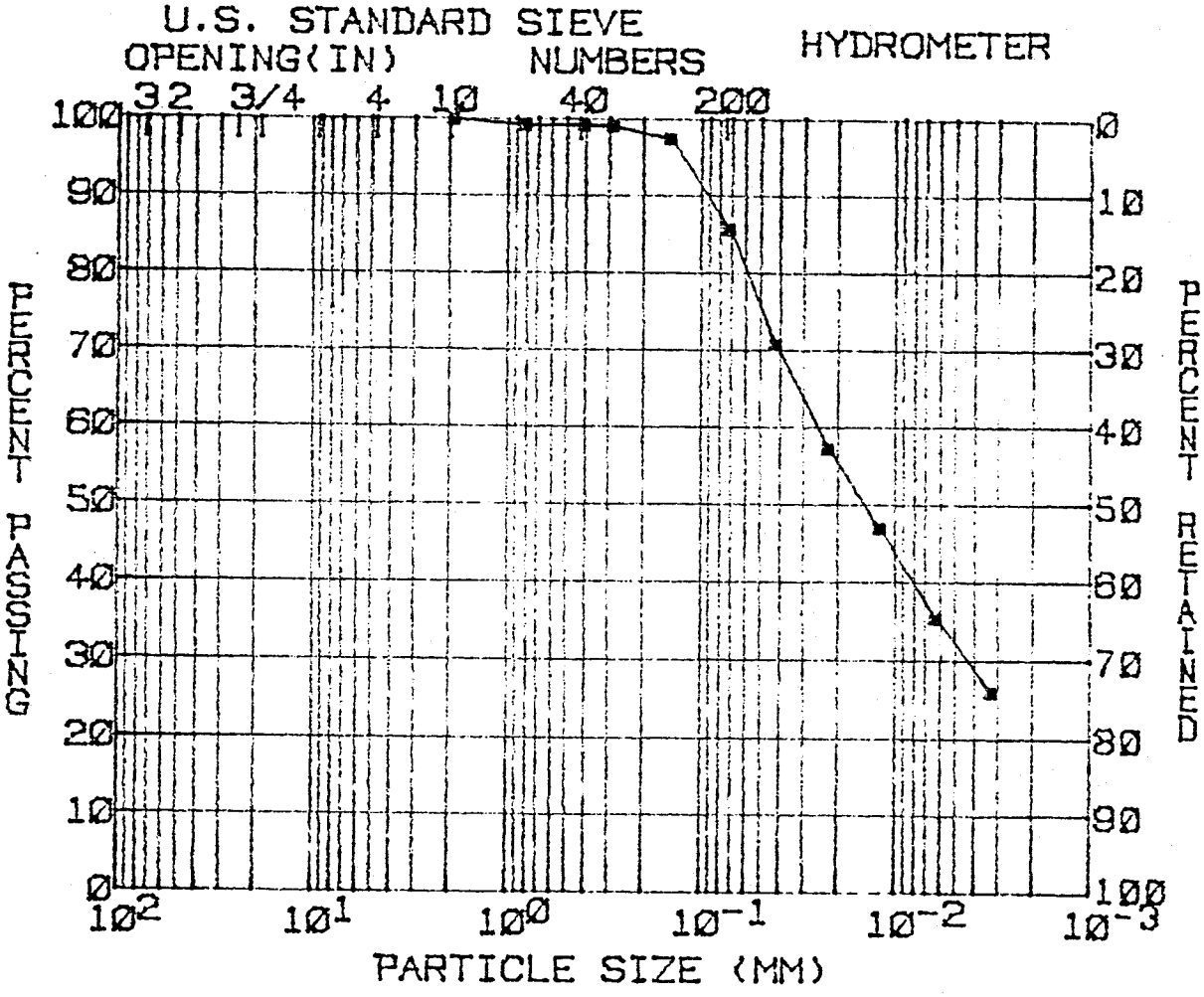
L.L.(%) = 37
P.I.(%) = 15

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:US-9B
EL.768.9:[illegible]
SAMPLE:4
DATE :2-7-85



GRAVEL(%)= 0
SAND(%) = 14
SILT(%) = 54
CLAY(%) = 32

D10(MM) = --
D30(MM) = --
D60(MM) = --
COEF UNIF= --

SOIL SYMBOL= CL
MOISTURE(%)= 33.2
SP. GR. = 2.64

L.L.(%) = 44
P.I.(%) = 20

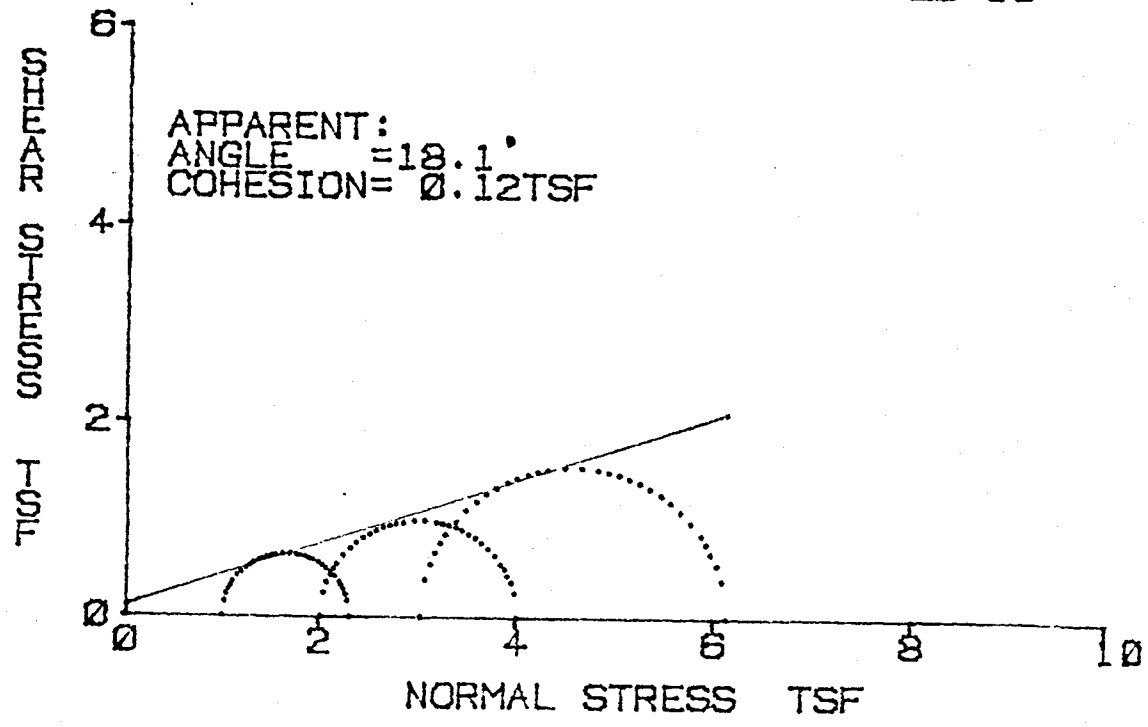
REMARKS:

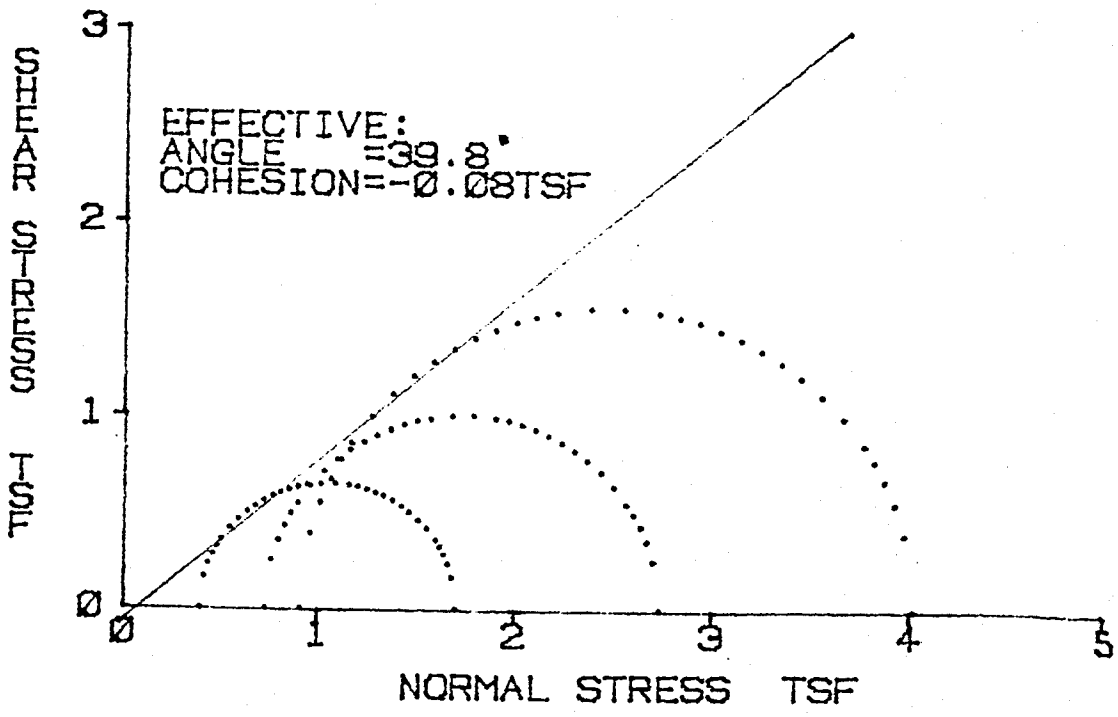
TVA SINGLETON MATERIALS ENGINEERING LABORATORY

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (R) TEST

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :
BORING :US-9B

EL. :768.0-767.5
SAMPLE :4
PART :3
SOIL SYM:CL
DATE :2-20-85



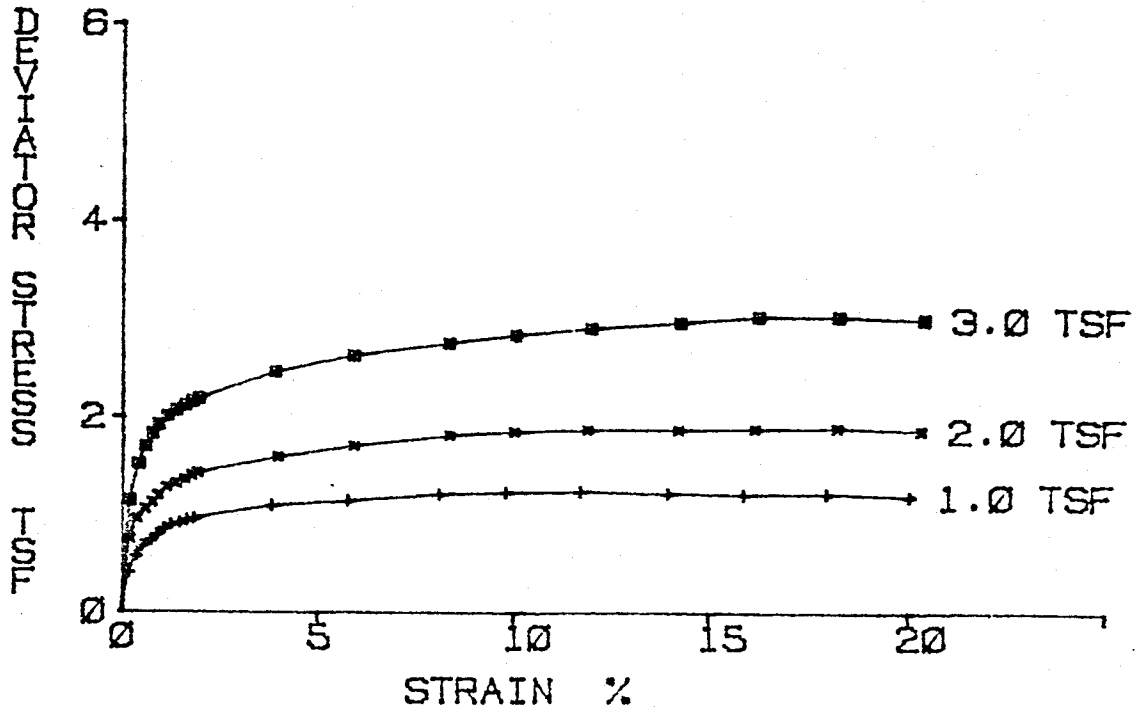


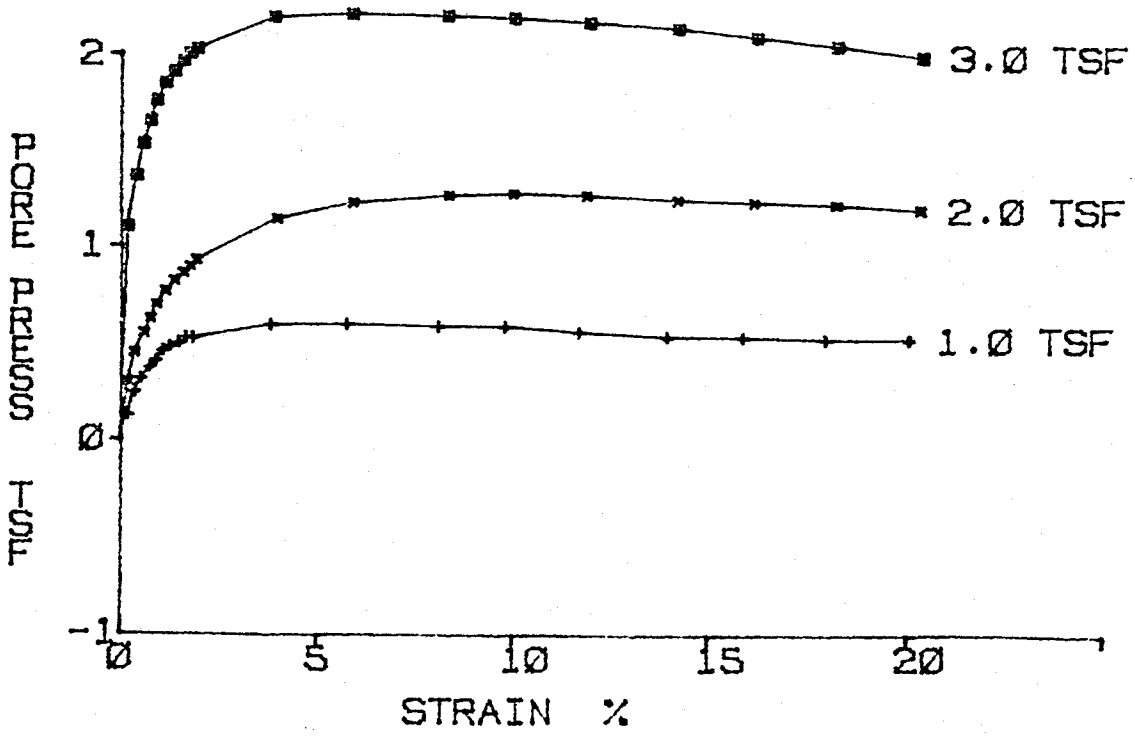
REMARKS: Analyzing the data by the method of least square in the form of y = mx, the effective friction angle is 37.3° and the effective cohesion is 0.00 tsf for the failure criteria based on maximum deviator stress ~~and the effective friction angle is 38.1° and the effective cohesion~~ is 0.00 tsf for the failure criteria based on maximum effective stress ratio.

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (R) TEST

PROJECT:	BULL RUN S.P.	EL.	:768.0-767.5
FEATURE:	ASH POND 2A	SAMPLE	:4
STATION:		PART	:3
RANGE :		SOIL SYM:	CL
BORING :	US-9B	DATE	:2-20-85





REMARKS:

Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Consolidated Undrained Triaxial Compression (R) Test

Project: BULL RUN S.P.
Feature: ASH POND 2A
Station:
Range :
Boring : US-9B

El. : 768.0-767.5
Sample: 4
Part : 3

Tested By : TAL
Computed By: MHD
Checked By : CBF
Report Date: 2-20-85

Soil Symbol= CL
Sp. Gr. = 2.64

L.L.(%)= 44
D10(mm)= 0

P.I.(%)= 20

Specimen Number	1	2	3	4
Initial:				
Moisture Content(%)	31.2	32.3	25.5	0.0
Dry Density(pcf)	86.1	85.9	92.9	0.0
Void Ratio	0.913	0.918	0.775	0.000
Saturation(%)	90.3	92.9	87.0	0.0
Before Shearing:				
Moisture(%) (after satur.)	34.6	34.8	29.3	0.0
Saturation(%)	100.0	100.0	100.0	0.0
Moisture(%) (after cons.)	32.8	30.4	25.1	25.1
Void Ratio (after cons.)	0.866	0.803	0.663	0.000
Final Moisture Content(%)	30.7	28.9	23.8	0.0
Minor Principal Stress(tsf)	1.01(1.01)	2.02(2.02)	3.02(3.02)	0.00(0.00)
Major Principal Stress(tsf)	2.32(2.30)	4.02(3.98)	6.14(5.93)	0.00(0.00)
Eff. Minor Prin. Stress(tsf)	0.42(0.40)	0.76(0.72)	0.94(0.80)	0.00(0.00)
Eff. Major Prin. Stress(tsf)	1.73(1.69)	2.76(2.69)	4.05(3.70)	0.00(0.00)
Time to Failure(min.)	60	90	90	0
Rate of Strain(%/min.)	0.20	0.20	0.21	0.00
Specimen Height(in.)	3.13	3.13	3.13	3.13
Specimen Diameter(in.)	1.41	1.41	1.41	1.41

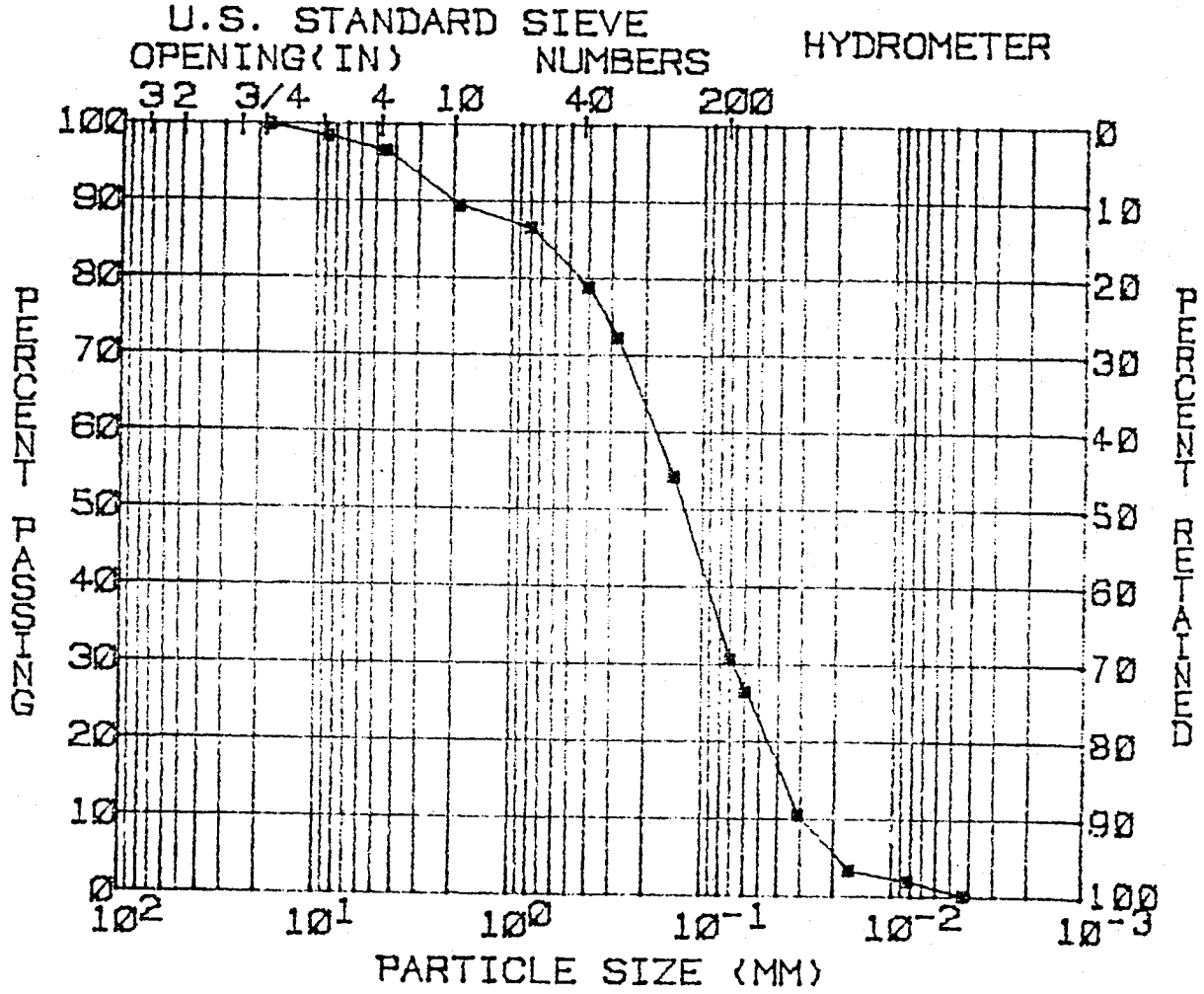
Shear Strength	Max Deviator Stress		Max Eff Stress Ratio	
	Deg.	c(tsf)	Deg.	c(tsf)
Apparent	18.1	0.12	16.6	0.16
Effective	39.8	-0.08	41.4	-0.09

REMARKS: Analyzing the data by the method of least square in the form of y = mx, the effective friction angle is 37.3° and the effective cohesion is 0.00 tsf for the failure criteria based on maximum deviator stress and the effective friction angle is 38.1° and the effective cohesion is 0.00 tsf for the failure criteria based on maximum effective stress rat

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:US-11
EL. :825.0-822.8
SAMPLE:1
DATE :2-6-85



GRAVEL(%)= 3
SAND(%) = 66
SILT(%) = 31
CLAY(%) = 0

D10(MM) = 0.0303
D30(MM) = 0.0719
D60(MM) = 0.1845
COEF UNIF= 6.1

SOIL SYMBOL= SM
MOISTURE(%)= 19.5
SP. GR. = 2.11

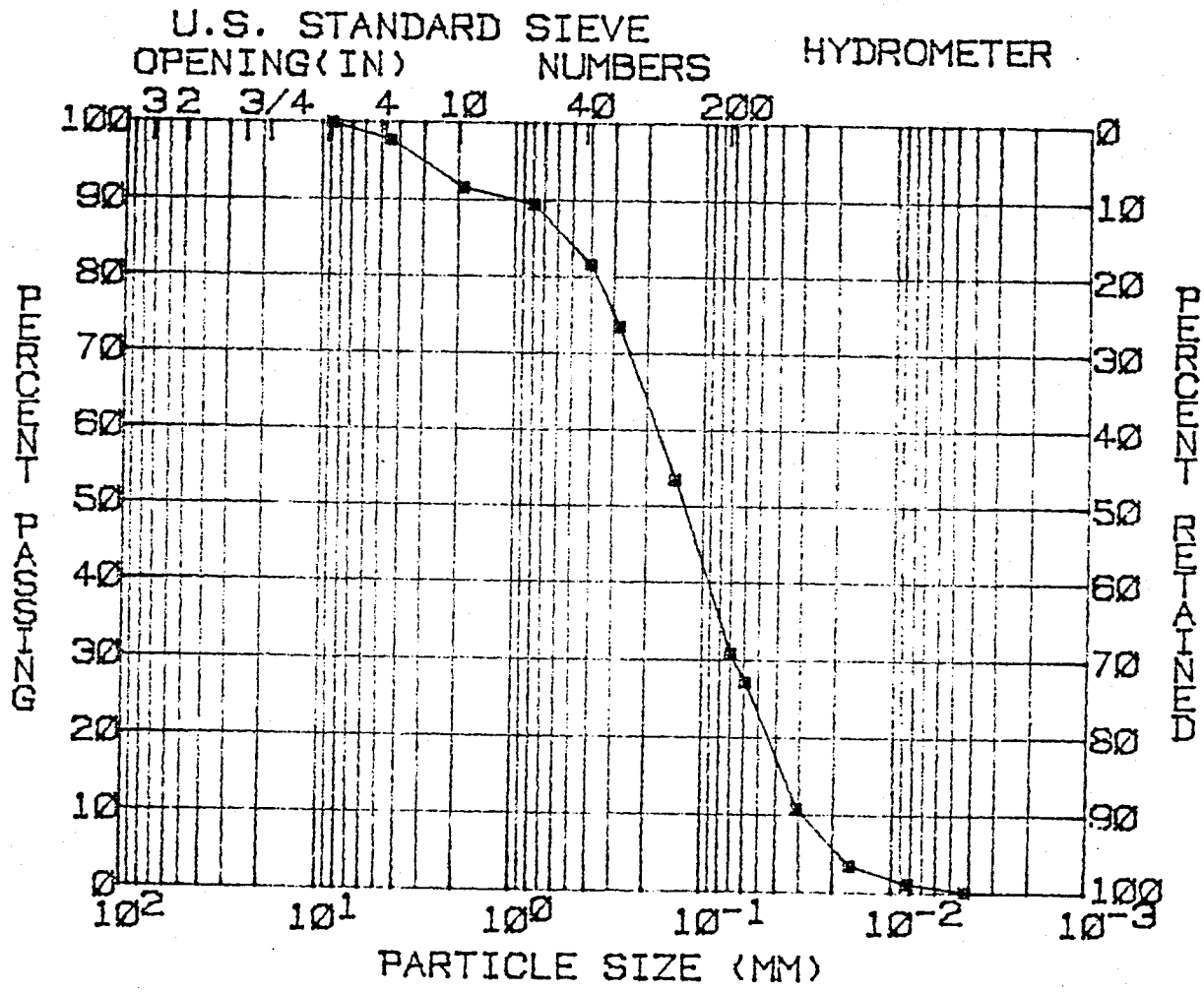
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:US-11
EL. :821.Ø-818.8
SAMPLE:2
DATE :2-6-85



GRAVEL(%)= 2
SAND(%) = 67
SILT(%) = 31
CLAY(%) = Ø

D1Ø(MM) = Ø.Ø297
D3Ø(MM) = Ø.Ø7Ø7
D6Ø(MM) = Ø.1852
COEF UNIF= 6.2

SOIL SYMBOL= SM
MOISTURE(%)= 19.7
SP. GR. = 2.11

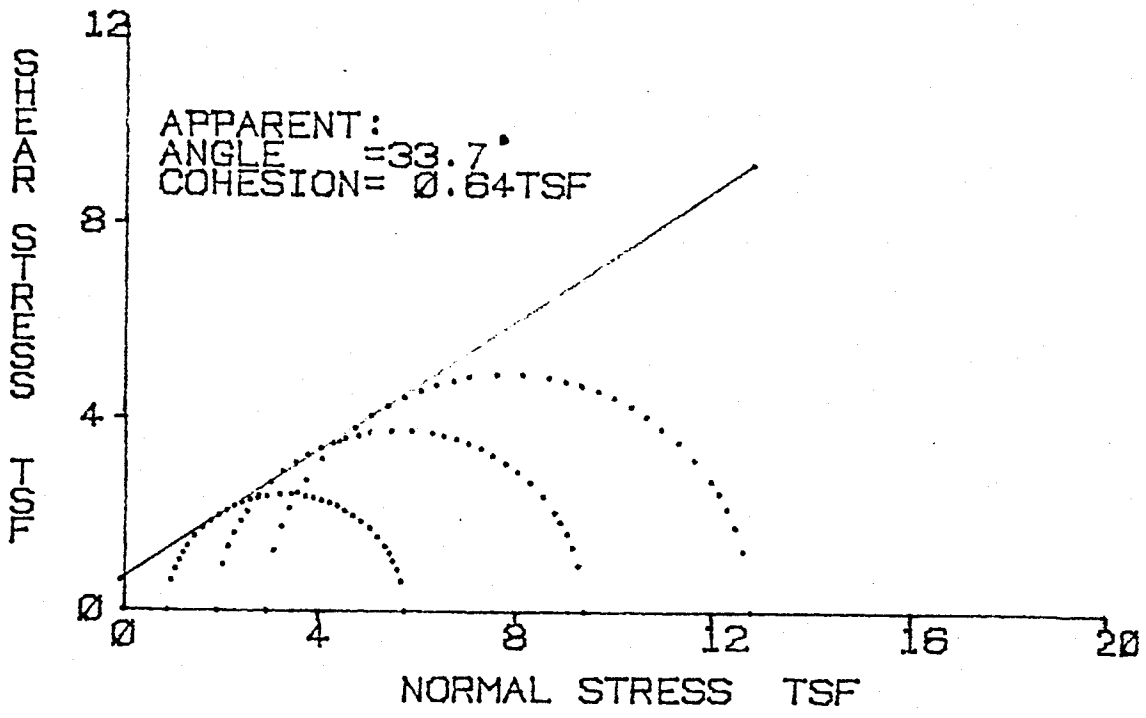
L.L.(%) = NP
P.I.(%) = NP

REMARKS:

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION(R) TEST

PROJECT:BULL RUN S.P.	EL. 825.0:814.0
FEATURE:ASH POND 2A	SAMPLE :1,2,3
STATION:	PART :
RANGE :	SOIL SYM:SM
BORING :US-11	DATE :2-14-85

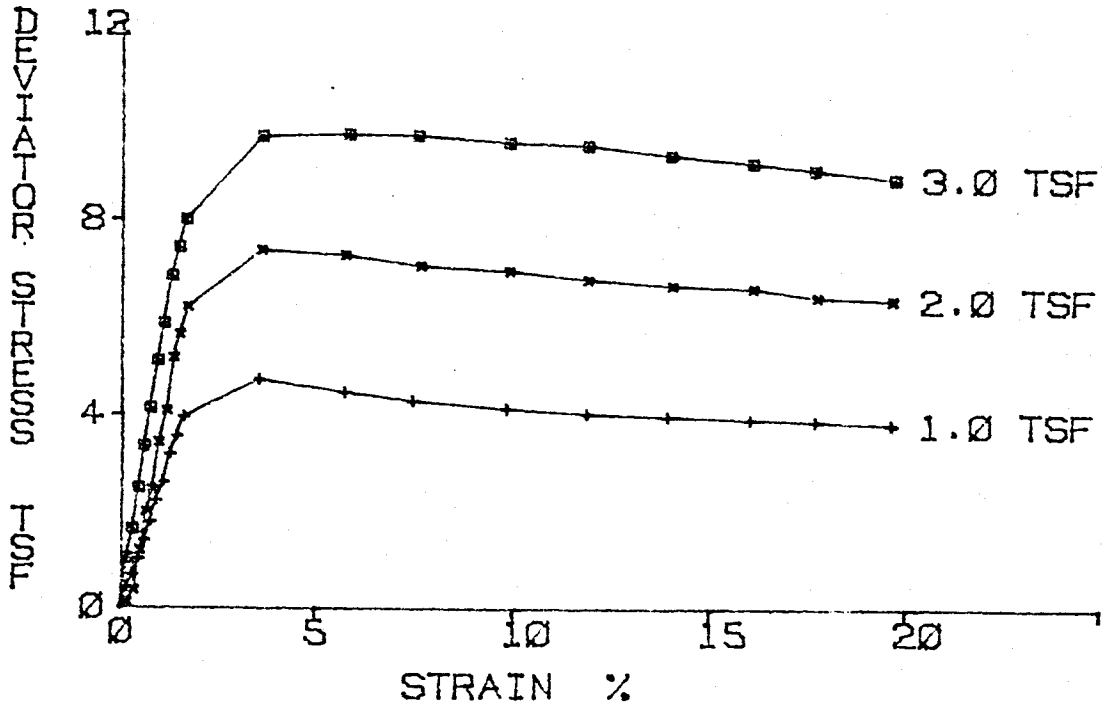


REMARKS: Remolded at natural moisture and density.

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION(R) TEST

PROJECT:	BULL RUN S.P.	EL.	825.0 : 814.0
FEATURE:	ASH POND 2A	SAMPLE	: 1,2,3
STATION:		PART	:
RANGE :		SOIL SYM:	SM
BORING :	US-11	DATE	: 2-14-85



REMARKS: Remolded at natural moisture and density.

Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Unconsolidated Undrained Triaxial Compression (R) Test

Project: BULL RUN S.P.
Feature: ASH POND 2A
Station:
Range :
Boring : US-11

El. :825.0-814.0
Sample: 1,2,3
Part :

Tested By : TAL
Computed By: MHD
Checked By : CEG
Report Date: 2-14-85

Soil Sybmbol= SM
Sp. Gr. = 2.11

L.L.(%)= 0
D10(mm)= .0303

P.I.(%)= 0

Specimen Number	1	2	3	4
Initial:				
Moisture Content(%)	19.5	19.5	18.7	0.0
Dry Density(pcf)	59.4	59.4	59.8	0.0
Void Ratio	1.216	1.216	1.202	0.000
Saturation(%)	33.8	33.8	32.8	0.0
Before Shearing:				
Moisture(%) (after satur.)	--	--	--	--
Saturation(%)	--	--	--	--
Moisture(%) (after cons.)	--	--	--	--
Void Ratio (after cons.)	--	--	--	--
Final Moisture Content(%)	19.6	19.6	18.7	0.0
Minor Principal Stress(tsf)	1.01	2.02	3.02	0.00
Major Principal Stress(tsf)	5.86	9.53	12.89	0.00
Eff. Minor Prin. Stress(tsf)	--	--	--	--
Eff. Major Prin. Stress(tsf)	--	--	--	--
Time to Failure(min.)	20	20	30	0
Rate of Strain(%/min.)	0.18	0.19	0.20	0.00
Specimen Height(in.)	3.16	3.16	3.16	3.16
Specimen Diameter(in.)	1.40	1.40	1.40	1.40

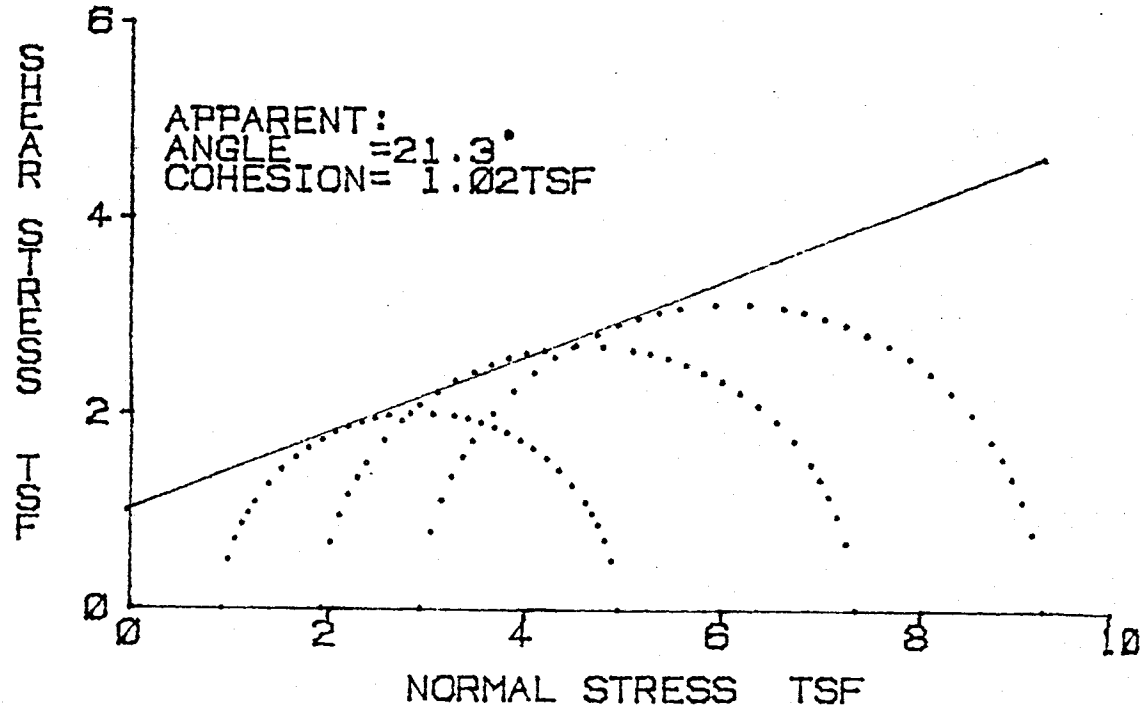
Shear Strength	Max Deviator Stress		Max Eff Stress Ratio	
	Deg.	c(tsf)	Deg.	c(tsf)
Apparent	33.7	0.64		
Effective	--	--		

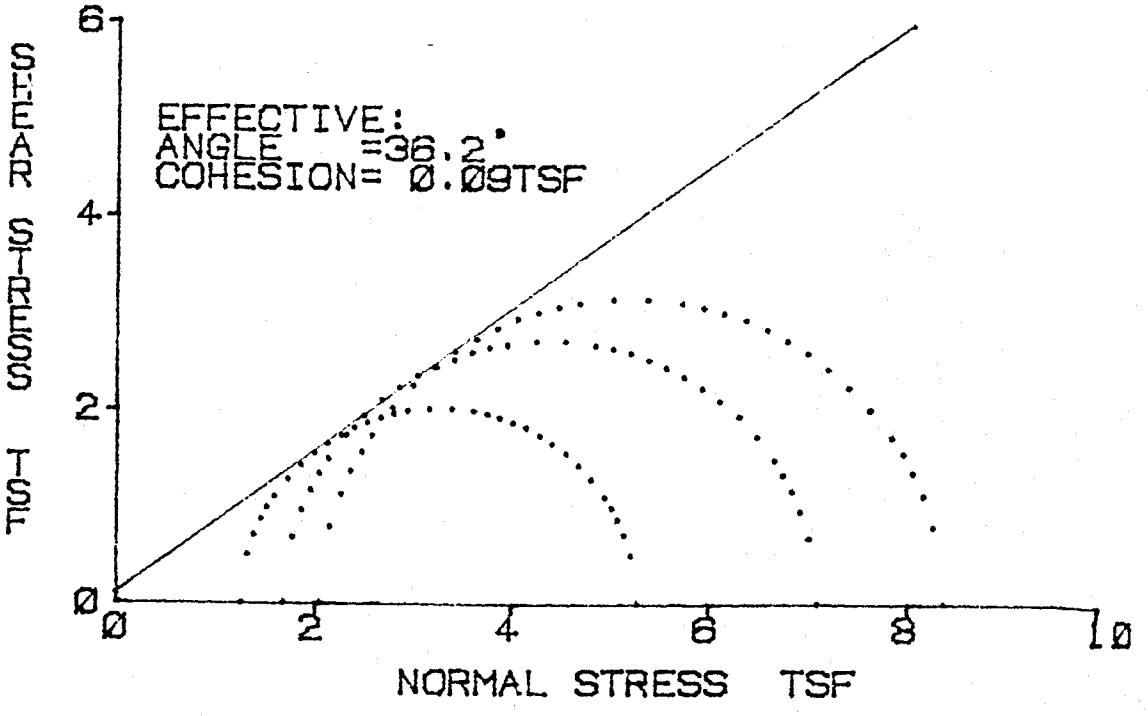
REMARKS: Remolded at natural moisture and density.

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (R) TEST

PROJECT:	BULL RUN S.P.	EL.	:825.0-814.0
FEATURE:	ASH POND 2A	SAMPLE	:1,2,3
STATION:		PART	:
RANGE	:	SOIL SYM:	SM
BORING	:US-11	DATE	:2-15-85



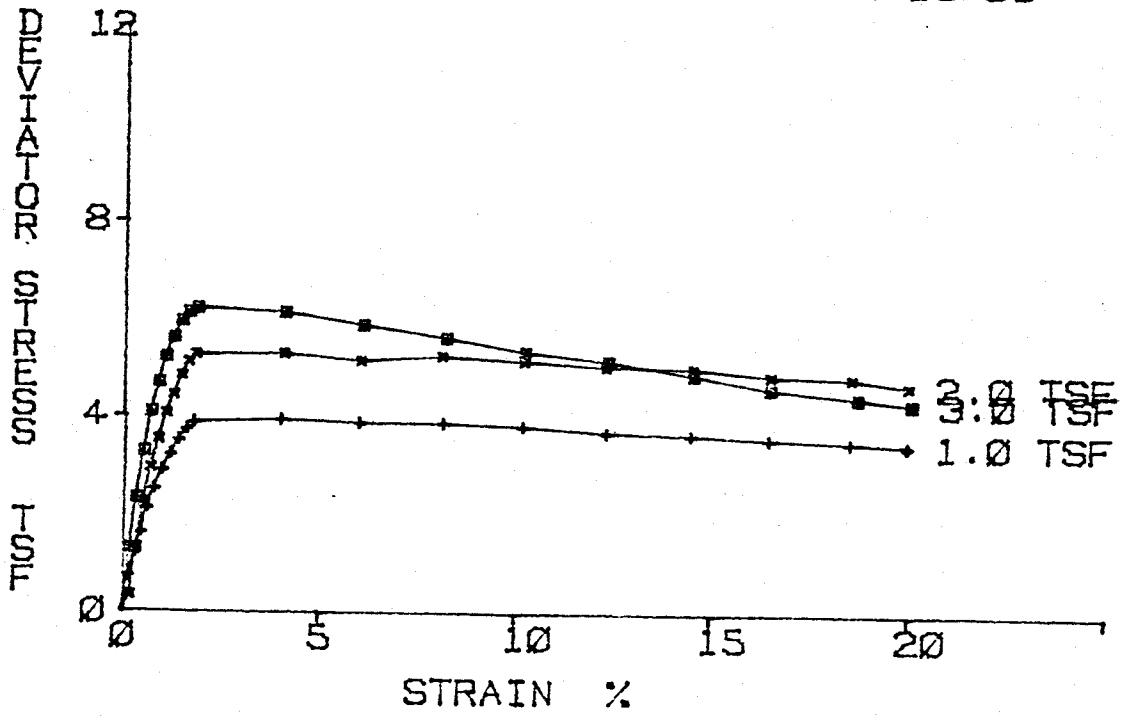


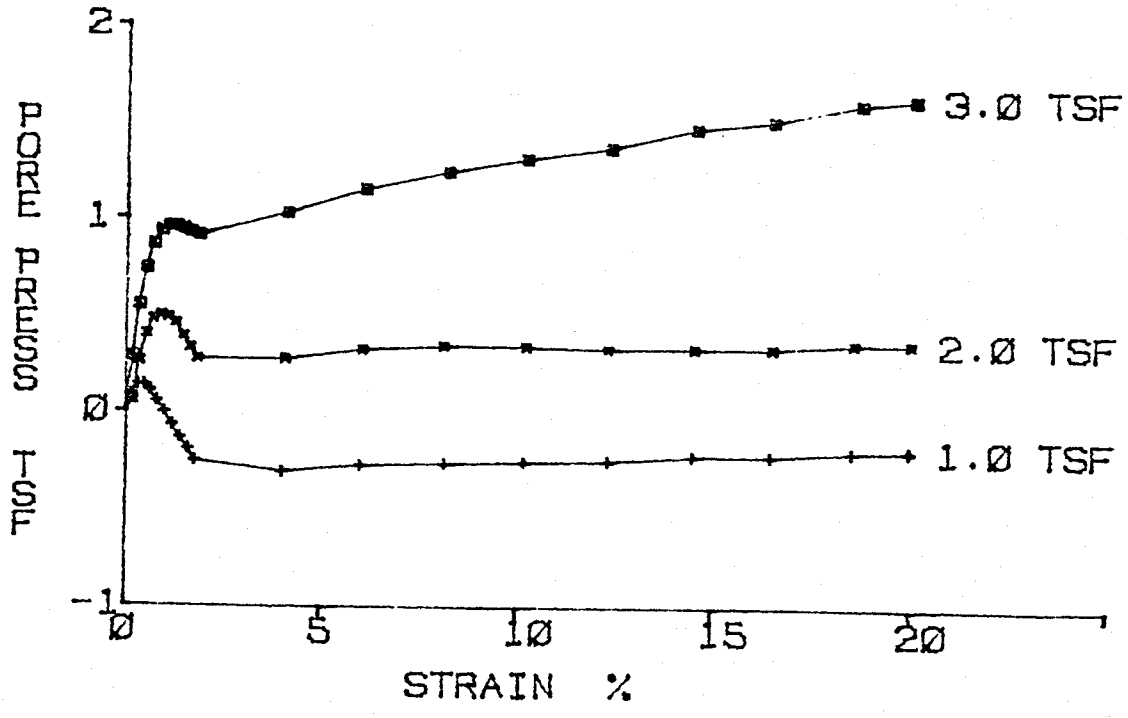
REMARKS: Remolded at natural moisture and density.

TVA SINGLETON MATERIALS ENGINEERING LABORATORY

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION (R) TEST

PROJECT: BULL RUN S.P. EL. : 825.0-814.0
FEATURE: ASH POND 2A SAMPLE : 1,2,3
STATION: PART :
RANGE : SOIL SYM: SM
BORING : US-11 DATE : 2-15-85





REMARKS: Remolded at natural moisture and density.

Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Consolidated Unrained Triaxial Compression (R) Test

Project: BULL RUN S.P.
Feature: ASH POND 2A
Station:
Range :
Boring : US-11

El. :825.0-814.0
Sample: 1,2,3
Part :

Tested By : TAL
Computed By: MHD
Checked By : CEG
Report Date: 2-15-85

Soil Symbol= SM
Sp. Gr. = 2.11

L.L.(%)= 0
D10(mm)= .0303

P.I.(%)= 0

Specimen Number	1	2	3	4
Initial:				
Moisture Content(%)	20.4	20.4	20.4	0.0
Dry Density(pcf)	59.0	59.0	59.0	0.0
Void Ratio	1.234	1.234	1.234	0.000
Saturation(%)	34.9	34.9	34.9	0.0
Before Shearing:				
Moisture(%) (after satur.)	58.5	58.5	58.5	0.0
Saturation(%)	100.0	100.0	100.0	0.0
Moisture(%) (after cons.)	56.1	55.8	55.5	55.5
Void Ratio (after cons.)	1.183	1.177	1.171	0.000
Final Moisture Content(%)	60.5	60.8	59.0	0.0
Minor Principal Stress(tsf)	1.01(1.01)	2.02(2.02)	3.02(3.02)	0.00(0.00)
Major Principal Stress(tsf)	5.05(4.83)	7.45(7.42)	9.35(7.63)	0.00(0.00)
Eff. Minor Prin. Stress(tsf)	1.30(1.19)	1.72(1.65)	2.10(1.38)	0.00(0.00)
Eff. Major Prin. Stress(tsf)	5.34(5.01)	7.16(7.05)	8.42(5.98)	0.00(0.00)
Time to Failure(min.)	20	20	10	0
Rate of Strain(%/min.)	0.21	0.21	0.20	0.00
Specimen Height(in.)	3.16	3.16	3.16	3.16
Specimen Diameter(in.)	1.40	1.40	1.40	1.40

Shear Strength	Max Deviator Stress		Max Eff Stress Ratio	
	Deg.	c(tsf)	Deg.	c(tsf)
Apparent	21.3	1.02	13.0	1.37
Effective	36.2	0.09	39.1	-0.04

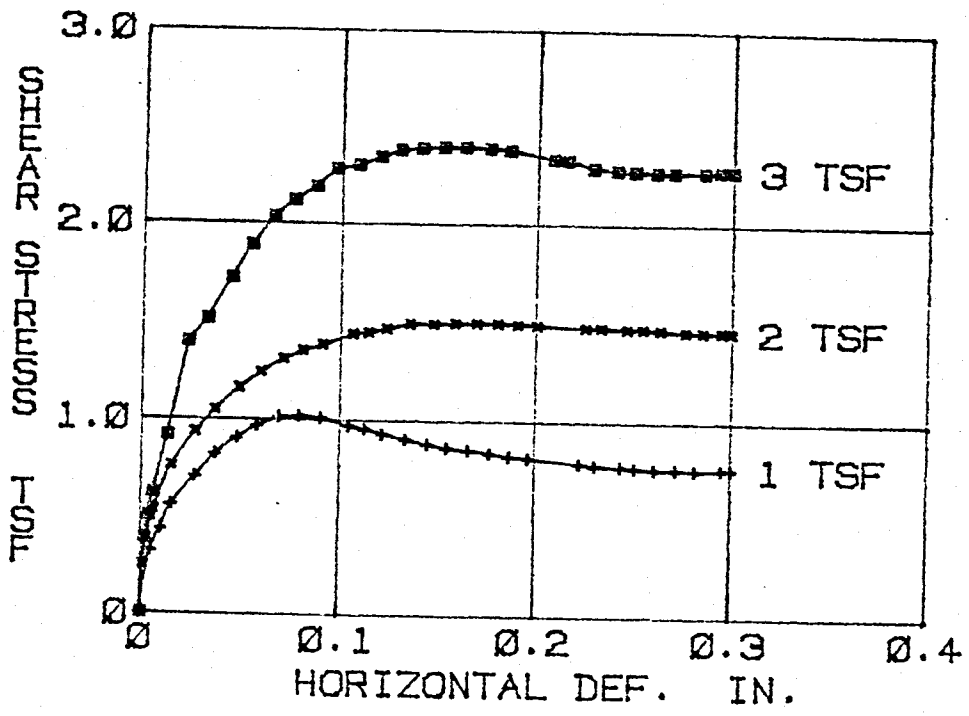
REMARKS: Analyzing the data by the method of least square in the form of y = mx, the effective friction angle is 38.4 and the effective cohesion is 0.00 tsf for the failure criteria based on maximum effective stress ratio.

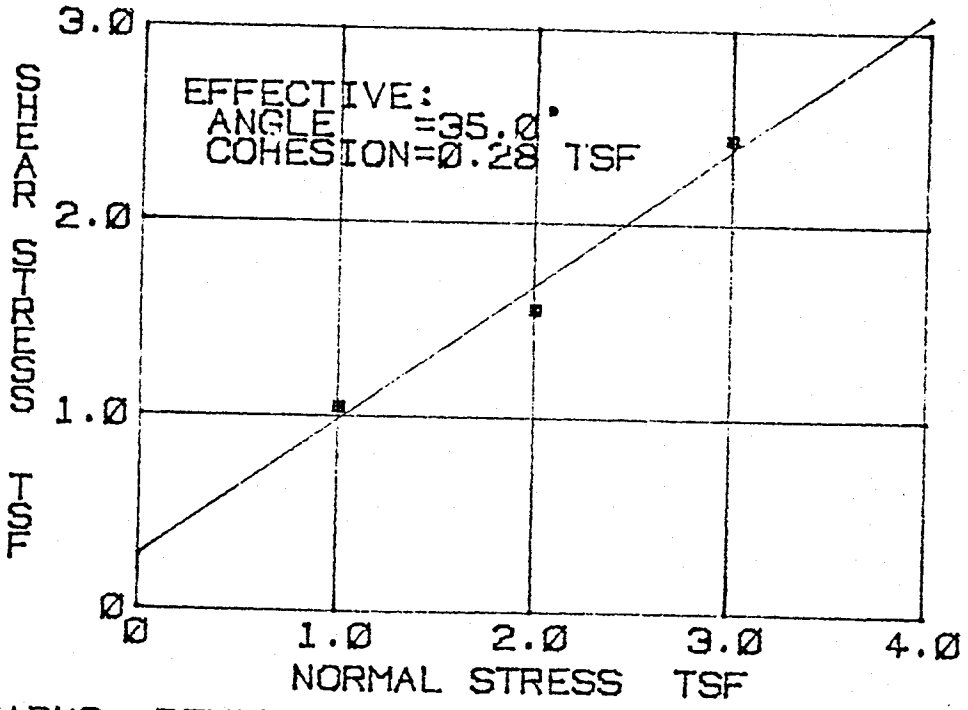
Remolded at natural moisture and density.

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
DIRECT SHEAR TEST

PROJECT: BULL RUN S.P.
FEATURE: ASH POND 2A
STATION:
RANGE :

BORING: US-11
EL. :825.0-814.0
SAMPLE: 1,2,3
DATE :2-14-85





REMARKS: REMOLDED AT NATURAL MOISTURE CONTENT AND DENSITY.

Tennessee Valley Authority
Singleton Materials Engineering Laboratory
Direct Shear Test

Project: BULL RUN S.P.
Feature: ASH POND 2A
Station:
Range :
Boring : US-11

El. :825.0-814.0
Sample: 1, 2, 3
Part :

Tested By : GMD
Computed By: MHD
Checked By : CRE
Report Date: 2-14-85

Type of Specimen=REMOLDED
Soil Symbol =SM

L.L. (%) = 0
P.I. (%) = 0

Sp. Gr. =2.11

Test No.	1	2	3	4
Initial:				
Moisture Content (%)	19.6	20.5	20.5	0.0
Dry Density (pcf)	59.3	58.8	58.9	0.0
Void Ratio	1.220	1.240	1.236	0.000
Saturation (%)	34.0	35.0	35.0	0.0
Final:				
Moisture Content (%)	18.9	18.2	18.5	0.0
Saturation (%)	30.8	33.3	33.4	0.0
Normal Stress (tsf)	1.00	2.00	3.00	0.00
Max. Shear Stress (tsf)	1.04	1.55	2.44	0.00
Time to Failure (min.)	105	240	240	0
Rate of Shearing (in./min.)	0.0007	0.0007	0.0006	0.0000
Specimen Height (in.)	0.733	0.733	0.733	0.000
Specimen Diameter (in.)	2.499	2.499	2.499	0.000

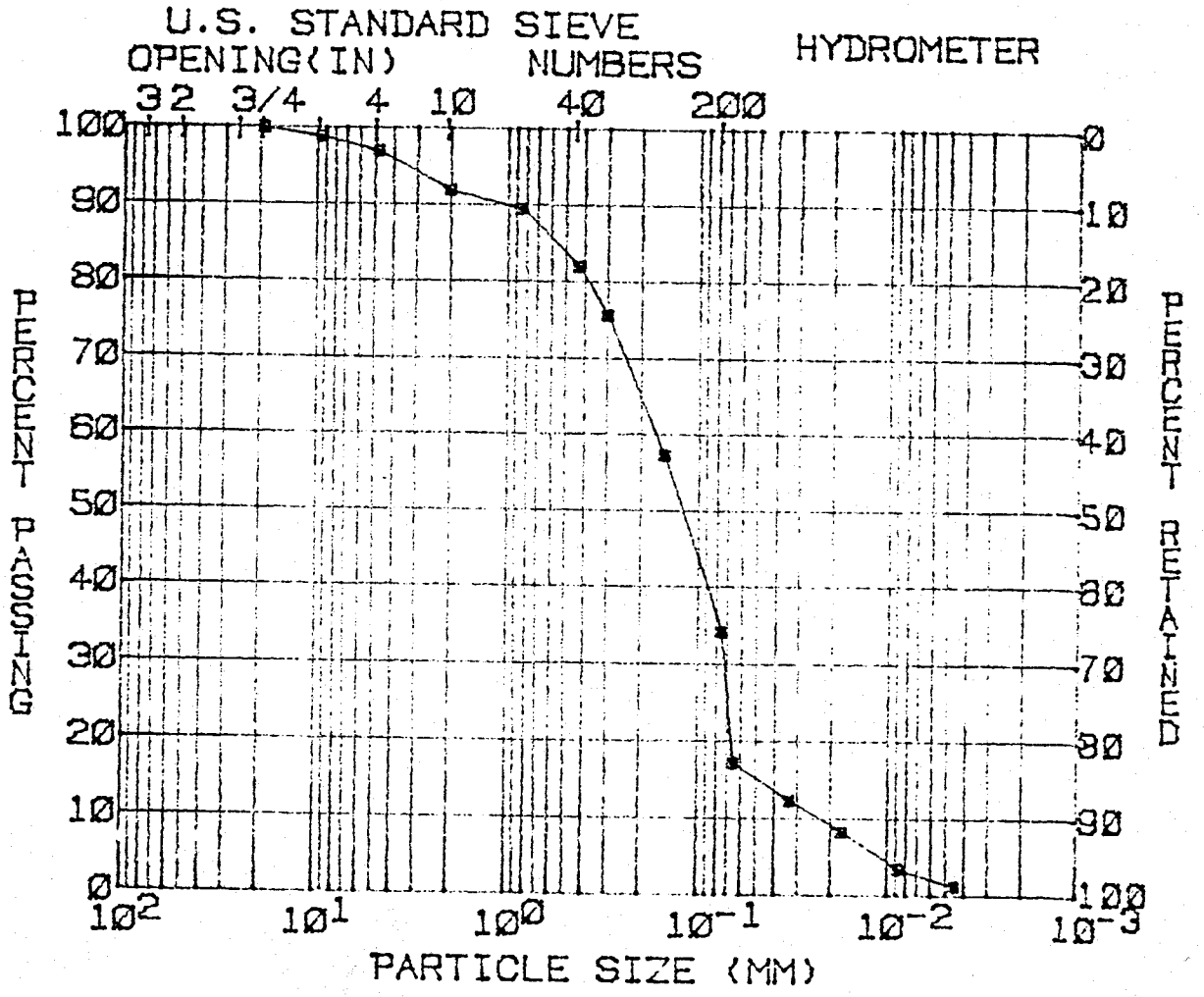
Shear Strength	Angle (deg.)	Cohesion (tsf)
Effective	35.0	0.28

Remarks: REMOLDED AT NATURAL MOISTURE CONTENT AND DENSITY.

TVA SINGLETON MATERIALS ENGINEERING LABORATORY
PARTICLE SIZE ANALYSIS

PROJECT:BULL RUN S.P.
FEATURE:ASH POND 2A
STATION:
RANGE :

BORING:US-11
EL. :816.0-814.0
SAMPLE:3
DATE :2-6-85



GRAVEL(%)= 2
SAND(%) = 63
SILT(%) = 33
CLAY(%) = 2

D10(MM) = 0.0221
D30(MM) = 0.0720
D60(MM) = 0.1638
COEF UNIF= 7.4

SOIL SYMBOL= SM
MOISTURE(%)= 24.9
SP. GR. = 2.09

L.L.(%) = NP
P.I.(%) = NP

REMARKS:

Reference No. 12

TRI-STATE TESTING & DRILLING
Geotechnical Engineering
Soil and Materials Testing, and Drilling

REPORT OF A GEOTECHNICAL EXPLORATION

DISPOSAL POND DIKES - BULL RUN
BULL RUN STEAM PLANT
CLINTON, TENNESSEE

FOR

TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE

TRI-STATE TESTING & DRILLING PROJECT NO.: TS-740
MARCH, 1989

2103 Tinsley Place • P.O. Box 72596 • Chattanooga, TN 37407
(615) 622-1217

Tri-State Testing & Drilling

March 21, 1989

Project No. TS-740

Tennessee Valley Authority
Division of Fossil and Hydro Power
Technical Services - Waste Planning and Disposal
25 100B Blue Ridge Place
1101 Market Street
Chattanooga, Tennessee 37402-2801

Attention: Darlene Clifford

Reference: Disposal Pond Dikes - Bull Run
Bull Run Steam Plant
Clinton, Tennessee

Gentlemen:

Tri-State Testing & Drilling has completed field and laboratory analysis necessary to develop assessment and recommendations regarding slope stability of disposal pond dikes at the Bull Run Power Plant near Clinton, Tennessee. Drilling commenced on January 4, 1989.

SCOPE OF WORK

For the purposes of evaluating the present condition of the dikes, ten (10) Standard Penetration Test (SPT) borings were drilled at the locations shown on the Boring Plan. Boring locations were determined in the field by measuring from existing reference points. All borings were drilled to refusal, at which point a machine-driven auger can advance no further because of the hardness and/or thickness of rock. During initial site reconnaissance, depth to bedrock was estimated as 40 ft. Boring depth was generally between 42 ft and 44 ft, except along the north end of the effluent discharge channel, where rock depths in the range of 26 ft to 31 ft were encountered. All ten locations were sampled every 1.5 ft (continuously) from the surface to the depth of boring termination. Soil samples were placed in airtight containers and delivered to the laboratory for examination and testing. Because of the nature of the soil/rock interface, the originally planned diamond core drilling of rock was not performed. Originally, the investigation was to define the nature of seepage through the dikes, and to present recommendations of how to correct these problems in the most economical, yet effective, manner. Along with drilling and SPT sampling, packer testing was to have been performed. However, during initial packer testing, it became apparent that the nature of subsurface materials (including ash) was such that packer testing could have been detrimental to the stability of the

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slopes. No further packer testing was attempted. At this point (late January, 1989) the focus of the investigation shifted to the present stability of the slopes. "Undisturbed" (thin wall) samples representative of both the softer and "average" soils were secured and sent to the laboratory for triaxial testing. These results were used to perform slope stability analyses. The results of analyses were shared verbally with TVA personnel in a meeting March 6, 1989. Field and laboratory work are the basis for the engineering analyses on which our recommendations are made.

SITE DESCRIPTION

The general vicinity of the project is the ash disposal area of the TVA Bull Run Steam Plant near Clinton, Tennessee. Specifically, the area of interest is located in the vicinity of the offset near the north end of the effluent discharge channel between ash disposal area #1 and ash disposal area #2. Original dikes constructed adjacent to the channel were, at some time past used as the base for constructing additions to the dikes, allowing additional vertical storage of ash. The toe of the dike addition was constructed near the inside shoulder of the original dike. The dike additions were to have been compacted, and ash being retained by the original dike was to have been removed from the toe area of the new dike. Near the north end of the channel is an offset on the west side. This area was the site of discharge pipes, which have since been plugged. Slopes in the offset area approach 1.5 horizontal : 1 vertical. All other slopes appear to be 2 horizontal : 1 vertical. Most of the 2:1 slopes include a horizontal section at the point where the new dike toe was built on the old dike shoulder.

Both original and new dike slopes are heavily vegetated with a combination of grasses which provide good protection against erosion. The toe of the slope at the offset includes several large trees very near the water line. The top of the new dike, which served as access for drill equipment, does not appear to be graded to drain. For this reason, especially during periods of heavy rain the upper surface becomes soft and muddy.

Boring locations were chosen in an attempt to determine the soil conditions where "red water" seepage to the surface through the dike is readily apparent. Several seeps (near the toe of the slope in the offset area) have been noted by others below the usual water level in the discharge channel. Adjacent areas were drilled to allow comparison of areas where seepage is not presently visible and areas where it is.

SUBSURFACE CONDITIONS

Soil conditions on-site are fairly uniform with respect to constituent materials, penetration resistance ("N" on the boring logs) , and pocket penetrometer reading (PPR). Minor variations, especially in penetration resistance can be a significant indication of variation in soil strength, in combination with triaxial test results. "Typical" borings include:

1. Brown clayey topsoil. Thickness: 4 to 6 inches. This layer was found only in Borings 1, 3, and 4, indicating that it has developed slowly after seeding subsequent to placement of fill. Note that in Borings 9 and 10 soil at the surface included noticeable amounts of ash.

2. Brown, yellow, gray, yellowish brown, brownish yellow, and reddish brown shaley clay and clayey shale. (Materials encountered on the east side of the channel - Borings 8, 9, and 10 - are more shaley in appearance than those on the west side). Consistency: stiff to very stiff. Thickness: 7.5 ft to 20.5 ft. This soil is primarily fill material used to construct the dikes. It is similar to in-place soils immediately above bedrock. In some areas, there appear to be soft zones of this material, indicating either poor compaction originally, or compaction well below optimum. Soils compacted dry of optimum have a tendency to lose moisture and crack rapidly, opening the way for downward and lateral migration of surface water and clay fines. The result can be loss of strength, and eventually, a significant reduction in density/compaction.

3. Gray ash, sometimes including gravel and/or bottom ash. Consistency: medium dense to dense. Thickness: 2 ft to 8.5 ft where encountered (Borings 1 through 6). This material was deposited behind the original dikes. Construction plans called for removal of a wedge of ash in the area which would support the toe of the dike addition. Obviously, this removal was not complete in the area investigated.

4. Brown, yellow, gray, yellowish brown, and reddish brown clay and silty clay, often including shale, sometimes with sand and some traces of gravel. Consistency: soft to stiff. Thickness: about 20 ft to 30 ft in most areas. (Note that Borings 6 and 7 were terminated on hard, dry shale at a depth of 22.5 ft. It appears likely that this rock is rip-rap or random boulders

placed on an old fill surface. This soil often extends to bedrock, though it is not too unusual to find a thin layer of sand and/or gravel immediately above auger refusal.

5. Brown, yellowish brown, and grayish brown sand and gravel, sometimes including lenses with very little clay. Thickness: where encountered, 1.3 ft to 4.5 ft.

6. Limey shale of sufficient hardness and/or thickness to resist penetration with a machine-driven auger. Such materials, were encountered in every boring, at depths ranging from 42.8 ft to 44 ft in 7 of 10 borings, with refusal occurring between 22.5 ft and 28.5 ft in the remaining locations.

Groundwater depths were somewhat variable, and are tabulated below. They reflect both levels encountered at the time of drilling and levels measured after stabilization subsequent to drilling:

Boring No.	Water Encountered	Stabilized Water
1	9.5 ft	4.0 ft
2	10.5	7.5
3	11.0	10.0
4	10.5	9.5
5	10.5	10.0
6	9.5	7.2
7	16.5	14.6
8	16.5	14.5
9	15.0	nr
10	18.0	nr

nr - not recorded

Descriptions of materials encountered in each boring may be found in the individual boring logs. Logs also include sample depths, strata boundaries, standard penetration resistance ("N" value, or blowcount), and pocket penetrometer reading (PPR), a quick field test which provides useful information about relative strength for cohesive soils. The variable nature of PPR results indicates both differences in moisture content and gravel concentration. Where PPR results are low and "N" values remain high, the compaction is probably low. Where PPR and "N" values are both lower, soils are moist and contain lower concentrations of gravel.

FIELD TESTING

Originally, it was our intention to perform borehole pressure tests, commonly referred to as packer tests, for the purpose of evaluating in-place permeability of soils. A packer is an inflatable ring installed around a section of pipe. The pipe is open on the bottom end and connected to a water pump on the top. The packer is set at a particular depth by inflation with compressed gas, sealing the borehole below the packer. Water is then introduced into the borehole under pressure, and guages indicate the volume of water which escapes through the borehole walls at a selected pressure. Because of a combination of difficulty in getting a good seal between the packer and the borehole wall, and unusually high water takes during intial testing, packer testing was cancelled. In our opinion, the value of any results was outweighed by the threat to the stability of the dikes. In adjacent locations, thin wall tube samples were secured for laboratory testing.

LABORATORY EXAMINATION & TESTING

All samples were transported to the laboratory for examination by a soil engineer. Laboratory tests were then assigned as follows: 104 samples for moisture content determination, 5 samples for Atterberg Limits (a measure of plasticity), and 3 thin wall tube samples for consolidated-undrained (CU) triaxial compression testing. These tests were run in general accordance with the applicable ASTM standards. Results are tabulated in the Appendix.

Atterberg limits results indicate that the clay soils found on the site are classified as CL, low plasticity clays, using the Unified Soil Classification System (USCS). This means that the soils have a low to moderate potential for shrinkage and swelling as the moisture content fluctuates. This also means that the permeability of these soils, if they were properly kneaded during compaction at or above optimum moisture content, should be low. However, if soils were compacted below optimum moisture content, the resulting soil "fabric" could have a somewhat "open" structure, lending itself to a higher permeability and a tendency toward developing open fissures upon drying. The results also indicate the clay has an appreciable silt content, a factor which would also lend itself to higher permeability than a "pure" clay. Note that samples selected for Atterberg limits included materials with lower blowcounts as well as those with apparent high strength characteristics. Thus, results should be representative of both fill and natural soils found in the dikes (except for ash).

Triaxial tests were performed on two thin wall tube ("undisturbed") samples. Representative samples selected on the basis of boring log information were from Boring 3, depth 18.5-21.5 ft and Boring 9, depth 13.5-15.5 ft. A third sample submitted contained so much shale that a suitable sample could not be extruded from the tube. With the two samples tested, shale fragments were present in sufficient quantity to require special trimming procedures prior to testing. The top portion of the sample from Boring 3 had a much higher moisture content than the rest of the sample and may have been disturbed during the drilling process, yielding an inconsistent point. In interpreting the results, we did not eliminate that point, but did not give it the same weight as the other two points.

The test procedure for performing these triaxial tests was the consolidated undrained triaxial shear test with pore pressure measurements. Prior to shearing, each of three specimens is encased in a rubber membrane and saturated by back pressure until 100 percent saturation is achieved. A selected confining pressure is chosen for each specimen. For both samples, confining pressures of 1.4 ksf, 2.9 ksf, and 4.3 ksf were chosen. During application of the confining pressure, drainage was permitted, allowing the sample to consolidate. After consolidation, a vertical axial load was applied at a slow, constant rate of strain, allowing pore water pressure to be measured with an electrical transducer. Drainage from the sample was not permitted during application of the axial load. As the load was increased, both load and deformation readings were recorded.

Triaxial results indicate the following strength parameters to be appropriate for slope stability analysis:

Boring 3, depth 18.5-21.5 ft
- Total cohesion (c) = 800 psf
- Effective cohesion (c') = 400 psf
- Total friction angle (Ø) = 23.5 degrees
- Effective friction angle (Ø') = 29 degrees

Boring 9, depth 13.5-15.5 ft
- Total cohesion (c) = 900 psf
- Effective cohesion (c') = 500 psf
- Total friction angle (Ø) = 28 degrees
- Effective friction angle (Ø') = 30.5 degrees

Graphical representation of these results is presented along with specific data for each specimen in the Appendix. These results are in general agreement with information supplied from TVA files regarding

strength of dike soils.

STABILITY ANALYSES

Slope stability analyses were performed for numerous slope configurations as found along the discharge channel. The most common situation is a slope of 2 horizontal : 1 vertical. Typically, this slope is interrupted about 10 ft below the top of the existing dike with a horizontal bench some 10 ft wide (the top of the original dike). Below this, the slope continues at 2:1 to the bottom of the channel. The other configuration considered was a continuous slope of 1.5 horizontal : 1 vertical, as is found at the offset near the north end of the channel. This slope was apparently most critical. State-of-the-art analysis was not utilized, since these methods are generally applied in an effort to reduce the degree of conservatism found in more traditional means of analysis. At every juncture in the analysis, conservatism was applied to strength results and other parameters. For example, tension cracks in the upper surface of the dike were analyzed for full hydrostatic pressure in the cracks. Initial critical slope configurations were estimated using slope stability charts developed by Duncan and Buchignani (1975). Further iterations were performed to check these results. On the basis of our analyses, the minimum factor of safety for the 1.5:1 slope is 1.2. The critical failure surface is a toe circle.

Additional analyses indicate a minimum factor of safety of 2.0 for slopes of 2:1 under conditions similar to those described above. Clearly, the steeper section is the primary area of concern.

RECOMMENDATIONS

On the basis of soil borings, field observations, and supplementary laboratory tests, we believe that seepage through the disposal dikes is primarily the result of three kinds of flow:

1. Water from the ash diposal area seeps into the dike via ash which was not removed from the base of the new dike (behind the inner shoulder of the original dike).

2. Because soils in the dike are primarily clay soils with shale fragments, they tend to crack when dry. During extended drought periods like the previous summer, cracks may extend well into the embankment. Such cracks provide a channel for water seepage. Initially, such a crack is very small, even to the point of hardly being visible. But when such soil is exposed to water, before

swelling occurs water may migrate along the cracks. During this process, it is possible for clay fines to be eroded from one area and redeposited in another. In this way, the crack can "heal," but the soil will be neither as strong or as low in permeability as prior to cracking. Obviously, as clay erodes, the width of cracks is subject to increase. Such an increase in width is likely to produce a much higher permeability. If allowed to continue unabated, erosion of a crack can become a channel of flow which could lead to signifcant seepage, erosion, and possible damage to the embankment.

3. The third type of flow is not a function of natural phenomena, but occurs in areas where abandoned structures once breached the dike. The conduits through which flow occurred have been plugged, but the bedding material around those pipes is suspect. In our opinion, the seeps noted at the toe of the slope in the offset area are very likely the result of flow through bedding material around those plugged pipes.

At the present time, the slopes along the effluent discharge channel are stable. We see no reason to believe that the 2:1 slopes which predominate are in any tangible danger of failure. However, we would recommend that regular monitoring of slope appearance continue. Slope vegetation should be maintained at the present level. Any visible change in these slopes should be investigated thoroughly. The steeper slopes (1.5:1) at the offset are also stable, but marginally so. They are not in danger of imminent failure, but bear careful monitoring because of a combination of present seepage, steeper slopes, and the area being the "weak link" in the dikes adjacent to the channel. Any visible change in the upper surface of the dike, or increase in seepage through the dike should be noted. Especially critical is presence of soil fines in seepage water. This may indicate that seepage channels are becoming significant erosion channels. Such observations warrant immediate investigation. Commonly accepted standards for minimum factor of safety are 1.25 for areas where the cost of repair is comparable to the cost of construction and there is no danger to human life or other property in the event of failure. Where cost of repair is much greater than the cost of construction, or there is danger to human life or other property if the slope fails, a more common factor of safety is 1.5. In our opinion, present slope conditions do not warrant immediate action to increase the factor of safety. However, the long-term stability of the structure would be enhanced by one, or more of the following stabilization techniques:

* During a site visit in early March, 1989, butressing the toe of the steeper slopes was discussed. Such butressing could be done

effectively with rip-rap if the horizontal and sloping surfaces on which rip-rap is placed are first covered with a geotextile fabric designed to prevent migration of clay fines. The fabric should extend out at least 15 ft beyond the present toe of slope, and should be held in place with wire "staples" (they are the approximate size and shape of a croquet wicket). The purpose of the fabric is to decrease the tendency for fines to migrate through the large voids between rocks. Prior to placement of fabric and rip-rap, existing trees should be cut level with the existing surface. Removal of these trees could lead to unnecessary destabilization of the toe of the slope. (While on-site, the writer indicated that trees could be pulled out using a crane. In retrospect, this would probably not be the best approach).

* An alternative not previously discussed would not preclude placement of rip-rap, but could eliminate seepage through the dike in critical sections. A continuous subdrain trench could be constructed along the top of the dike in the offset area. Such a trench should be at least 7 ft deep in the northwest corner of the channel, dropping to about 10 ft deep just beyond the south end of the offset. The trench should be uniformly sloped to drain. The trench should be lined with a filter fabric and fabric-wrapped perforated pipe laid in the bottom, tapped with an outlet pipe to the channel. The fabric-lined trench should then be filled with sand to within 2 ft of the surface. Fabric should be lapped to prevent fines plugging from the top. The remaining 2 ft of the trench should be backfilled with compacted clayey soil (using clay excavated from the trench would be acceptable). Suggested dimensions: trench width - 15 to 18 inches; pipe diameter - 4 inches.

If any questions arise, or if we may be of further service, please feel free to contact us.

Respectfully submitted,

TRI-STATE TESTING & DRILLING

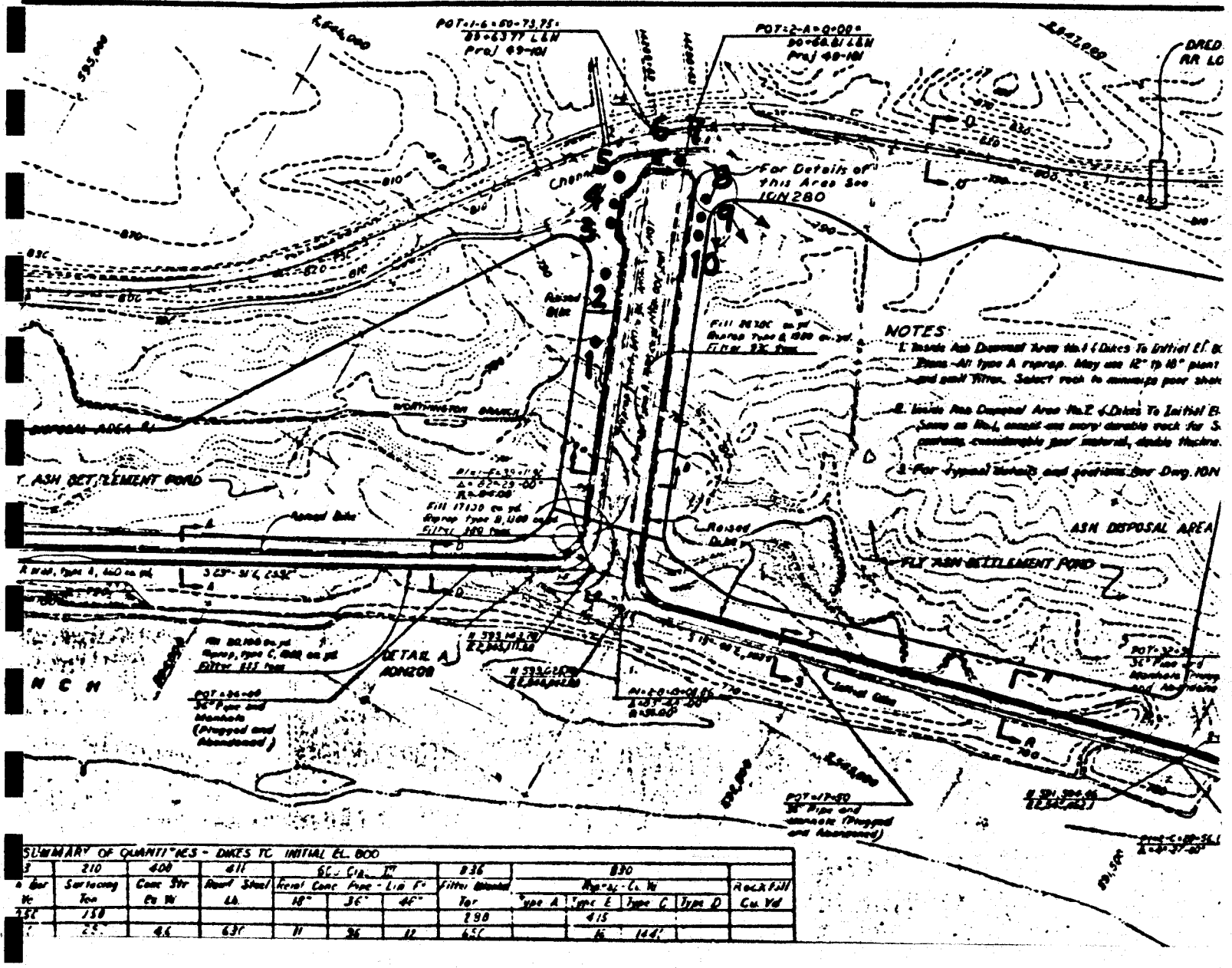
Q.T. Morphis
President

John D. Cannon, P.E.
Soil Engineer

SITE PLAN

No. KB-89564A

ATTACHMENT NO. 1



SUMMARY OF QUANTITIES - DIKES TO INITIAL EL. 800

Bor No.	210 Surveying Lin Ft	400 Conc Str Cu Yd	411 Reinf Steel Lb	836 Gravel Conc Pipe - Lin Ft 18"	36"	48"	836 Filter Material Ton	830 Rprap - Cu Yd Type A	Type B	Type C	Type D	Rock Fill Cu Yd
2-A	750						198		415			
2-B	25	46	6300	11	36	12	650		46	1441		

BORING PLAN
SCALE : 1" = 400'

TENNESSEE VALLEY AUTHORITY
STABILITY OF ASH POND DIKES
BULL RUN POWER STATION
CLINTON, TENNESSEE

TRI-STATE TESTING & DRILLING
PROJECT NO. TS-740

BORING LOGS

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE 1/4/89 WEATHER Clear

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL 4.0 AT Completion DRILLER H.Rogers

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
			0.0	0.5	Topsoil				
			0.5						
1	0.0	1.5			Brown & yellow clay with shale fragments	16			3.5
2	1.5	3.0				14			3.0
3	3.0	4.5				17			3.0
4	4.5	6.0				20			3.5
				6.0					
			6.0						
5	6.0	7.5			Brown & yellow clay with shale ash	24			3.0
				7.5					
			7.5	8.0	Brown clay, wet				
			8.0						
6	7.5	9.0			Brown & yellow clay and shale dry	22			3.5
				9.5					
			9.5						
7	9.0	10.5			Ash, wet	21			
8	10.5	12.0				12			
9	12.0	13.5				22			
				14.0					

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: _____

TEST BORING RECORD

BORING NO. 1 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE 1/4/89 WEATHER Clear

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL _____ AT _____ DRILLER _____

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
			14.0						
10	13.5	15.0			Ash crushed stone	50			
11	15.0	16.5				7			
				17.5					
			17.5						
12	16.5	18.0			Brown silty clay, moist	7			1.5
				18.0					
			18.0						
13	18.0	19.5			Brown & gray clay	18			2.5
14	19.5	21.0				10			1.7
15	21.0	22.5				14			2.5
16	22.5	24.0				16			3.0
				24.0					
			24.0						
17	24.0	25.5			Gray brownish yellow clay	20			3.7
18	25.5	27.0				20			3.7
				27.0					
			27.0						
19	27.0	28.5			Yellowish brown clay	12			2.5
				28.5					
			28.5						
20	28.5	30.0			Gray silty clay	13			2.5
21	30.0	31.5				20			3.0

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REMARKS: _____

TEST BORING RECORD

BORING NO. 1 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE 1/4/89 WEATHER _____

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL _____ AT _____ DRILLER _____

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
22	31.5	33.0				12			
				33.0					
			33.0						
23	33.0	34.5			Dark gray clay with roots	12			
				34.5					
			34.5						
24	34.5	36.0			Dark gray clay	10			
25	36.0	37.5				6			
				37.5					
			37.5						
26	37.5	39.0			Gray clay & silt & wood	8			
				39.0	pieces				
			39.0						
27	39.0	40.5			Dark gray sandy clay with	6			
					gravel				
28	40.5	42.0				23			
				43.0					
			43.0						
29	42.0	43.5			Weathered rock	24			
				43.5					
			43.5		Boring terminated				

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: _____

TEST BORING RECORD

BORING NO. 1 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE 1/5/89 WEATHER _____

WATER LEVEL 7.5 AT Completion FIELD ENGINEER _____

WATER LEVEL _____ AT _____ DRILLER _____

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
			0.0		Yellowish brown shale & clay				
1	0.0	1.5				22			
2	1.5	3.0				29			
3	3.0	4.5				25			
4	4.5	6.0				30			
5	6.0	7.5				16			
				7.5					
			7.5						
6	7.5	9.0			Yellowish brown & gray shale	12			
				9.5	& clay				
			9.5						
7	9.0	10.5			Moist ash	44			
				10.5					
			10.5						
8	10.5	12.0			Wet ash	48			
				12.5					
			12.5						
9	12.0	13.5			Yellowish brown clay	11			
				13.5					
			13.5						
10	13.5	15.0			Gray & yellow clay	14			
				15.0					
			15.0						
11	15.0	16.5			Gray clay	8			
				16.5					

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REMARKS: _____

TEST BORING RECORD

BORING NO. 2 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE _____ WEATHER _____

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL _____ AT _____ DRILLER _____

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
				16.5					
			16.5						
12	16.5	18.0			Yellow & gray clay	7			
				18.0					
			18.0						
13	18.0	19.5			Yellow & gray clay	10			
14	19.5	21.0				5			
15	21.0	22.5				7			
16	22.5	24.0				8			
				24.0					
			24.0						
17	24.0	25.5			Gray & yellow clay	12			
18	25.5	27.0				10			
19	27.0	28.5				12			
				28.5					
			28.5						
20	28.5	30.0			Gray clay, grass roots	10			
21	30.0	31.5				14			
22	31.5	33.0				11			
				33.0					
			33.0						
23	33.0	34.5			Gray & yellow clay	16			
				34.5					

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: _____

TEST BORING RECORD

BORING NO. 2 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA-Bull Run

ELEVATION _____ DATE _____ WEATHER _____

WATER LEVEL 7.5 AT Completion FIELD ENGINEER _____

WATER LEVEL _____ AT _____ DRILLER _____

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
				34.5					
			34.5						
24	34.5	36.0			Yellow & gray clay & gravel	20			
25	36.0	37.5				30			
				37.5					
			37.5						
26	37.5	39.0			Yellow clay with gravel	25			
27	39.0	40.5				19			
				41.5					
			41.5						
28	40.5	42.0			Gray clay	16			
				43.0					
			43.0						
20	42.0	43.5				37			
				44.0					
			44.0		Weathered Rock	50±			
			44.0		Auger Refusal				

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: _____

TEST BORING RECORD

BORING NO. 2 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE 1/6/89 WEATHER Cloudy, drizzle

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL 10.0 AT Completion DRILLER H.Rogers

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
			0.0	0.3	Topsoil				
			0.3						
1	0.0	1.5			Yellowish brown shale & clay	28			
2	1.5	3.0				56			
3	3.0	4.5				34			
4	4.5	6.0				38			
5	6.0	7.5				25			
6	7.5	9.0				21			
				9.0					
			9.0						
7	9.0	10.5			Yellow & gray clay & shale	11			
				11.0	fragments, moist				
			11.0						
8	10.5	12.0			Wet ash	30			
				13.0					
			13.0						
9	12.0	13.5			Yellowish brown clay	8			
				13.5					
			13.5						
10	13.5	15.0			Red clay	7			
11	15.0	16.5				7			
				16.5					

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: _____

TEST BORING RECORD

BORING NO. 3 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE _____ WEATHER _____

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL _____ AT _____ DRILLER _____

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
			16.5						
12	16.5	18.0			Red & gray clay	14			
				18.0					
			18.0						
13	18.0	19.5			Gray & yellow clay	6			
14	19.5	21.0				11			
				21.0					
			21.0						
15	21.0	22.0			Reddish brown & gray clay	30			
16	22.0	23.5				22			
17	23.5	25.0				32			
18	25.0	26.5				25			
19	26.5	28.0				20			
				28.0					
			28.0						
20	28.0	29.5			Reddish brown gray silty	16			
					sandy clay				
21	29.5	30.5				19			
22	30.5	32.0				16			
23	32.0	33.5				10			
				33.5					

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: _____

TEST BORING RECORD

BORING NO. 3 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation PAGE 5

FOR TVA - BullRun

ELEVATION DATE WEATHER

WATER LEVEL AT FIELD ENGINEER

WATER LEVEL AT DRILLER

WATER LEVEL AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
			33.5						
24	33.5	35.0			Reddish brown sandy clay	10			
25	35.0	36.5				7			
26	36.5	38.0				9			
				38.0					
			38.0						
27	38.0	39.5			Sand gravel	20			
28	39.5	41.0				40			
29	41.0	42.5				42			
				42.9	Boring terminated				

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS:

TEST BORING RECORD

BORING NO. 3 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE 1/9/89 WEATHER Cloudy

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL 9.5 AT Completion DRILLER H.Rogers

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
			0.0	0.3"	Topsoil				
			0.3						
1	0.0	1.5			Yellowish brown shale & clay	24			
2	1.5	3.0				48			
3	3.0	4.5				37			
4	4.5	6.0				40			
5	6.0	7.5				34			
				7.5					
			7.5						
6	7.5	9.0			Yellowish brown clay, topsoil	34			
				9.0					
			9.0						
7	9.0	10.5			Ash	90			
				10.5					
			10.5						
8	10.5	12.0			Wet ash	31			
9	12.0	13.5				14			
				14.0					
			14.0						
10	13.5	15.0			Yellow & brown clay with shale fragments	24			
11	15.0	16.5				16			
				16.5					

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: _____

TEST BORING RECORD

BORING NO. 4 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE _____ WEATHER _____

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL _____ AT _____ DRILLER _____

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
			16.5						
12	16.5	18.0			Gray & brown clay	15			
13	18.0	19.5				28			
				19.5					
			19.5						
14	19.5	21.0			Reddish brown & gray clay	32			
15	21.0	22.5				38			
16	22.5	24.0				58			
17	24.0	25.5				59			
				25.5					
			25.5						
18	23.5	27.0			Brownish red clay	32			
19	27.0	28.5				44			
20	28.5	30.0				31			
21	30.0	31.5				30			
22	31.5	33.0				28			
				33.0					
			33.0						
23	33.0	34.5			Brown & gray silty sandy	24			
				34.5	clay				
			34.5						
24	34.5	36.0			Brown silt & sandy with clay	9			

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: _____

TEST BORING RECORD

BORING NO. 4 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE _____ WEATHER _____

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL _____ AT _____ DRILLER _____

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
25	36.0	37.5				10			
26	37.5	39.0				9			
				39.0					
			39.0						
27	39.0	41.5				30			
				41.5					
			41.5						
28	41.5	42.8			Large gravel				
				42.8					
			42.8		Auger Refusal				

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: _____

TEST BORING RECORD

BORING NO. 4 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE 1/10/89 WEATHER Cloudy

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL 10.0 AT Completion DRILLER H.Rogers

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
			0.0						
1	0.0	1.5			Yellowish brown shale & clay	33			
2	1.5	3.0				48			
3	3.0	4.5				50			
4	4.5	6.0				63			
5	6.0	7.5				37			
				7.5					
			7.5						
6	7.5	9.0			Ash	50+			
7	9.0	10.5				56			
				10.5					
			10.5						
8	10.5	12.0			Wet ash, limestone, gravel	50+			
9	12.0	13.5				45			
				13.5					
			13.5						
10	13.5	15.0			Brown & gray clay	10			
11	15.0	16.5				14			
				16.5					
			16.5						
12	16.5	18.0			Gray & brown clay	8			
				18.0					

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: _____

TEST BORING RECORD

BORING NO. 5 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE _____ WEATHER _____

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL _____ AT _____ DRILLER _____

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
			18.0						
13	18.0	19.5			Yellowish brown clay	14			
				19.5					
			19.5						
14	19.5	21.0			Brown, gray & red sandy clay	43			
15	21.0	22.5				60			
				22.5					
			22.5						
16	22.5	24.0			Brown clay	67			
				24.0					
			24.0						
17	24.0	25.5			Brownish red & gray clay	49			
18	25.5	27.0				51			
19	27.0	28.5				40			
20	28.5	30.0				38			
21	30.5	31.5				33			
22	31.5	33.0				33			
				33.5					
			33.5						
23	33.0	34.5			Brown & gray clay	34			
24	34.5	36.0				21			

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: _____

TEST BORING RECORD

BORING NO. 5 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE _____ WEATHER _____

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL _____ AT _____ DRILLER _____

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
25	36.0	37.5				23			
				37.5					
			37.5						
26	37.5	39.0			Brown & gray silt with some	20			
				39.0	clay				
			39.0						
27	39.0	40.5			Dark gray silt with clay	22			
				40.5					
			40.5						
28	40.5	42.0			Sand & gravel	50+			
				42.8					
			42.8		Auger Refusal				

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: _____

TEST BORING RECORD

BORING NO. 5 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE 1/11/89 WEATHER Cloudy, drizzle

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL 7.2 AT Completion DRILLER H.Rogers

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
			0.0						
1	0.0	1.5			Brownish yellow shaley clay	41			
2	1.5	3.0				33			
3	3.0	4.5				50			
4	4.5	6.0				75			
				6.0					
			6.0						
5	6.0	7.5			Brownish yellow shale & ash	40			
				7.5					
			7.5						
6	7.5	9.0			Moist ash	40			
				9.0					
			9.0						
7	9.0	10.5			Wet ash	35			
				12.5					
			12.5						
8	10.5	12.0			Yellowish brown clay with shale	32			
9	12.0	13.5				46			
				13.5					
			13.5						
10	13.5	15.0			Clay & ash	10			
				16.0					
			16.0						
11	15.0	16.5				7			

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: _____

TEST BORING RECORD

BORING NO. 6 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE _____ WEATHER _____

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL _____ AT _____ DRILLER _____

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
12	16.5	18.0			Red & yellow clay	26			
				18.0					
			18.0						
13	18.0	19.5			Gray & red clay	22			
				19.0					
			19.0						
14	19.5	21.0			Red clay	37			
15	21.0	22.5				22			
				22.5					
			22.5						
16	22.5	24.0			Hard dry shale	50+			
17	24.0	25.5				50+			
18	25.5	26.4				50+			
				26.4					
			26.4		Auger Refusal				

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: _____

TEST BORING RECORD

BORING NO. 6 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE 1/11/89 WEATHER Cloudy

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL 14.8 AT Completion DRILLER H.Rogers

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
1	0.0	1.5			Brown shale & clay	26			
2	1.5	3.0				12			
				3.0					
			3.0						
3	3.0	4.5			Brown & red clay, shale fragments	20			
4	4.5	6.0				28			
				6.0					
			6.0						
5	6.0	7.5			Boulders, refusal				
				7.5					
			7.5						
6	7.5	9.0			Brown shale clay, limestone pebbles	29			
				9.0					
			9.0						
7	9.0	10.5			Gray, brown & yellow shale & clay	37			
8	10.5	12.0				31			
				12.0					
			12.0						
9	12.0	13.5			Yellowish brown & red shale & clay	37			
				13.5					
			13.5						
10	13.5	15.0			Gray & yellow clay	14			
			15.0						
11	15.0	16.5			Dark gray clay, moist	8			

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: Water encountered 16.5

TEST BORING RECORD

BORING NO. 7 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE 1/12/89 WEATHER _____

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL 14.8 AT Completion DRILLER _____

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
12	16.5	18.0				12			
				19.0					
			19.0						
13	18.0	19.5			Reddish brown clay	22			
14	19.5	21.0				36			
				20.5					
			20.5						
15	21.0	22.5			Yellowish brown & red shale,	50+			
				22.5	dry				
			22.5						
16	22.5	24.0			Brown shale, hard, dry	50+			
17	24.0	25.5				50+			
18	25.5	27.0				50+			
19	27.0	28.5				84+			
				28.5					
			28.5		Auger Refusal				

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: Water encountered 16.5

TEST BORING RECORD

BORING NO. 7 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE 1/13/89 WEATHER Clear

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL _____ AT _____ DRILLER H.Rogers

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
			0.0						
1	0.0	1.5			Brown shale	26			
2	1.5	3.0				22			
				3.0					
			3.0						
3	3.0	4.5			Small Boulders, clay				
				4.5					
			4.5						
4	4.5	6.0				50+			
				6.0					
			6.0						
5	6.0	7.5			Brown shale	41			
6	7.5	9.0				16			
7	9.0	10.5				22			
				10.5					
			10.5						
8	10.5	12.0			Yellowish brown shale, lime-	50			
				12.0	stone boulders				
			12.0						
9	12.0	13.5			Yellowish brown, red & gray	36			
					shale & clay				
10	13.5	15.0				18			
11	15.0	16.5				14			
				16.5					
			16.5						
12	16.5	18.0			Gray topsoil, wet	9			

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: _____

TEST BORING RECORD

BORING NO. 8 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE _____ WEATHER _____

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL _____ AT _____ DRILLER _____

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
				19.0					
			19.0						
13	18.0	19.5			Yellowish brown & red shale	22			
				19.5	& clay				
			19.5						
14	19.5	21.0			Brownish yellow clay	40			
				22.0					
			22.0						
15	21.0	22.5			Gray topsoil, grass, roots	13			
				23.0					
			23.0						
16	22.5	24.0			Yellowish brown clay	22			
				24.0					
			24.0						
17	24.0	25.5			Reddish brown & gray clay	37			
18	25.5	27.0				25			
				27.0					
			27.0						
19	27.0	28.5			Brown & gray clay	32			
				28.5					
			28.5						
20	28.5	30.0			Brown clay with shale, hard	83±			
21	30.0	30.4				50+			

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: Water encountered 16.5

TEST BORING RECORD

BORING NO. 8 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE 1/13/89 WEATHER _____

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL _____ AT _____ DRILLER H.Rogers

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
			0.0	0.5	Ash				
			0.5						
1	0.0	1.5			Brownish yellow shale	25			
2	1.5	3.0				24			
3	3.0	4.5				20			
				4.5					
			4.5						
4	4.5	6.0			Yellowish brown & red shale	25			
5	6.0	7.5				21			
6	7.5	9.0				19			
7	9.0	10.5				29			
8	10.5	12.0				22			
9	12.0	13.5				25			
10	13.5	15.0				6			
				15.0					
			15.0						
11	15.0	16.5			Gray clay & shale, wet	4			
12	16.5	18.0				3			

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: _____

TEST BORING RECORD

BORING NO. 9 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE _____ WEATHER _____

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL _____ AT _____ DRILLER _____

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
13	18.0	19.5				4			
14	19.5	21.0				8			
				20.5					
			20.5						
15	21.0	22.5			Brown & gray clay	36			
16	22.5	24.0				22			
17	24.0	25.5				42			
18	25.5	27.0				37			
19	27.0	28.5				24			
20	28.5	30.0				22			
21	30.0	31.5				18			
22	31.5	33.0				17			
23	33.0	34.5				11			
24	34.5	36.0				10			
				36.0					
			36.0						
25	36.0	37.5			Gray & brown silty sandy clay	7			

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: _____

TEST BORING RECORD

BORING NO. 9 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE 1/16/89 WEATHER _____

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL _____ AT _____ DRILLER _____

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
26	37.5	39.0				7			
				40.0					
			40.0						
27	39.0	40.5			Gray sand gravel	16			
28	40.5	42.0				42			
				42.0					
			42.0	43.6	Large gravel, boulders				
			43.6		Auger Refusal				

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: _____

TEST BORING RECORD

BORING NO. 9 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE 1/16/89 WEATHER Clear

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL _____ AT _____ DRILLER H.Rogers

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
			0.0	1.0	Ash, crushed stone				
			1.0						
1	0.0	1.5			Brown & yellow shale	23			
2	1.5	3.0				22			
3	3.0	4.5				26			
				4.5					
			4.5						
4	4.5	6.0			Brown, yellow & red shale & clay	22			
5	6.0	7.5				20			
6	7.5	9.0				34			
7	9.0	10.5				40			
8	10.5	12.0				28			
9	12.0	13.5				32			
10	13.5	15.0				14			
				15.5					
			15.5						
11	15.0	16.5				14			
12	16.5	18.0				12			
				18.0					

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: _____

TEST BORING RECORD

BORING NO. 10 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE _____ WEATHER _____

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL _____ AT _____ DRILLER _____

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
			18.0						
13	18.0	19.5			Brown & gray clay, moist	6			
				19.5					
			19.5						
14	19.5	21.0			Gray clay	6			
15	21.0	22.5				9			
16	22.5	24.0				13			
				24.5					
			24.5						
17	24.0	25.5			Yellowish brown clay	25			
18	25.5	27.0				26			
19	27.0	28.5				34			
				28.5					
			28.5						
20	28.5	30.0			Brown & gray silty clay	40			
21	30.0	31.5				34			
22	31.5	33.0				35			
23	33.0	34.5				19			
24	34.5	36.0				14			
25	36.0	37.5				14			
				37.5					

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: _____

TEST BORING RECORD

BORING NO. 10 JOB NO. TS-740

Tri-State Testing & Drilling

PROJECT Ash Dike Evaluation

FOR TVA - Bull Run

ELEVATION _____ DATE _____ WEATHER _____

WATER LEVEL _____ AT _____ FIELD ENGINEER _____

WATER LEVEL _____ AT _____ DRILLER _____

WATER LEVEL _____ AT 24 HOURS

Sample No.	Sample Depth Feet From	To	Stratum Depth Feet From	To	Soil Classification	N	W	Qu	PPR
			37.5						
26	37.5	39.0			Gray sandy silty clay	12			
				39.0					
			39.0						
27	39.0	40.5			Gravel & sand	43			
28	40.5	42.0			Gravel & sand	41			
				43.5					
			43.5		Auger Refusal				

ALL SYMBOLS AND ABBREVIATIONS USED ARE DESCRIBED IN THE STANDARD LEGEND SHEET

REMARKS: _____

TEST BORING RECORD

BORING NO. 10 JOB NO. TS-740

Tri-State Testing & Drilling

LABORATORY RESULTS

SUMMARY OF LABORATORY TEST RESULTS

Tennessee Valley Authority
Ash Disposal Dikes - Bull Run Steam Plant
Clinton, Tennessee

TRI-STATE TESTING & DRILLING
Project No. TS-740

Boring No.	Sample No.	Depth ft	Natural Moisture %	Percent Passing No. 200	Atterberg Limits LL %	PL %	PI %	USCS Class
1	1	1.0	22.7	.	-	-	-	-
	2	2.5	25.0	.	-	-	-	-
	3	4.0	21.1	.	-	-	-	-
	4	5.5	20.3	.	-	-	-	-
	5	7.0	20.5	.	-	-	-	-
	6	8.5	22.6	.	-	-	-	-
	7	10.0	23.6	.	-	-	-	-
	8	11.5	16.4	.	-	-	-	-
	9	13.0	20.1	.	-	-	-	-
	10	14.5	14.6	.	-	-	-	-
	11	16.0	9.3	.	-	-	-	-
	12	17.5	19.1	.	-	-	-	-
	13	19.0	18.1	.	40	24	16	CL
	14	20.5	17.9	.	-	-	-	-
	15	22.0	15.6	.	-	-	-	-
	16	23.5	18.6	.	-	-	-	-
	17	25.0	17.2	.	-	-	-	-
	18	26.5	17.4	.	-	-	-	-
	19	28.0	20.5	.	-	-	-	-
	20	29.5	19.1	.	-	-	-	-
	21	31.0	21.1	.	-	-	-	-
	22	32.5	21.1	.	-	-	-	-
	23	34.0	23.3	.	-	-	-	-
	24	35.5	23.3	.	-	-	-	-
	25	37.0	24.0	.	-	-	-	-
	26	38.5	25.8	.	-	-	-	-
	27	40.0	19.8	.	-	-	-	-
	28	41.5	21.2	.	-	-	-	-
	29	43.0	21.1	.	-	-	-	-
5	1	1.0	21.9	.	-	-	-	-
	2	2.5	17.2	.	-	-	-	-
	3	4.0	22.9	.	-	-	-	-
	4	5.5	20.9	.	-	-	-	-
	5	7.0	23.3	.	-	-	-	-
	6	8.5	11.4	.	-	-	-	-
	7	10.0	18.3	.	-	-	-	-
	8	11.5	6.9	.	-	-	-	-
	9	13.0	5.2	.	-	-	-	-
	10	14.5	22.6	.	-	-	-	-

Tri-State Testing & Drilling

Summary of Laboratory Test Results
TVA - Bull Run Steam Plant
Ash Disposal Dikes
Page 2

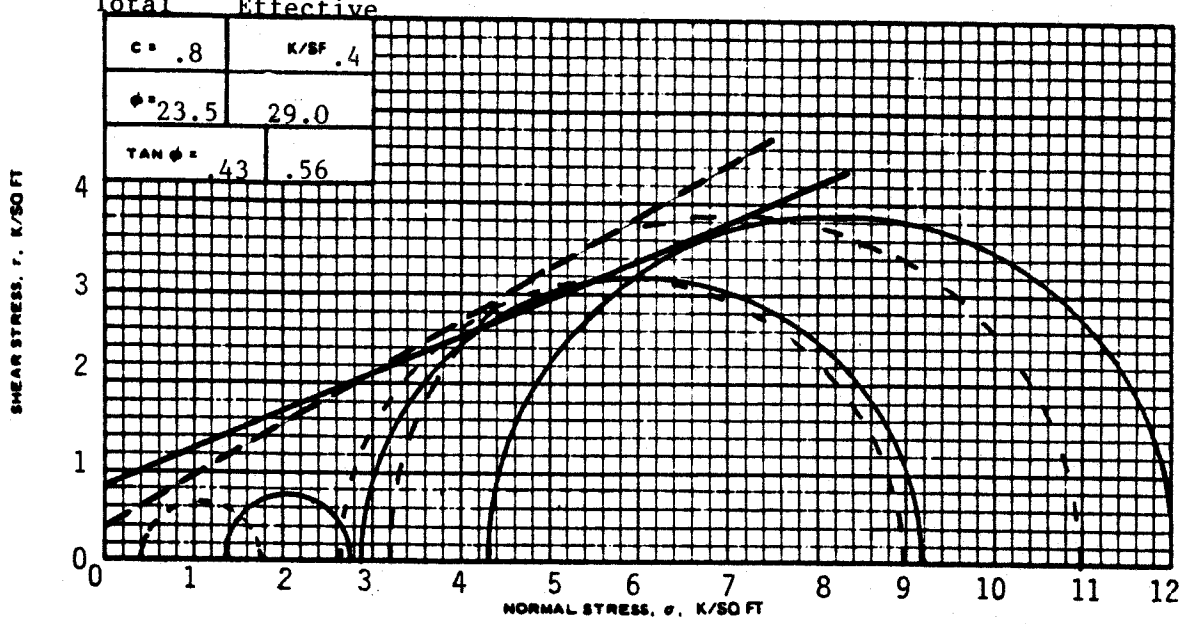
Boring No.	Sample No.	Depth ft	Natural Moisture %	Percent Passing No. 200	Atterberg Limits LL %	PL %	PI %	USCS Class
5	11	16.0	21.7	.	34	21	13	CL
	12	17.5	22.6	.	-	-	-	-
	13	19.0	23.2	.	-	-	-	-
	14	20.5	22.4	.	-	-	-	-
	15	22.0	17.4	.	-	-	-	-
	16	23.5	18.8	.	-	-	-	-
	17	25.0	18.5	.	-	-	-	-
	18	26.5	18.9	.	-	-	-	-
	19	28.0	18.4	.	-	-	-	-
	20	29.5	18.5	.	-	-	-	-
	21	31.0	18.4	.	-	-	-	-
	22	32.5	18.3	.	-	-	-	-
	23	34.0	20.2	.	-	-	-	-
	24	35.5	20.8	.	-	-	-	-
	25	37.0	21.1	.	-	-	-	-
	26	38.5	18.9	.	-	-	-	-
	27	40.0	29.5	.	-	-	-	-
	28	41.5	15.0	.	-	-	-	-
7	1	1.0	8.6	.	-	-	-	-
	2	2.5	13.1	.	-	-	-	-
	3	4.0	17.0	.	-	-	-	-
	4	5.5	17.4	.	-	-	-	-
	5	7.0	-	.	(ROCK)		-	-
	6	8.5	15.2	.	-	-	-	-
	7	10.0	12.5	.	-	-	-	-
	8	11.5	11.8	.	-	-	-	-
	9	13.0	14.7	.	32	16	16	CL
	10	14.5	20.1	.	36	20	16	CL
	11	16.0	23.3	.	-	-	-	-
	12	17.5	21.5	.	-	-	-	-
	13	19.0	18.5	.	-	-	-	-
	14	20.5	17.7	.	-	-	-	-
	15	22.0	17.2	.	-	-	-	-
	16	23.5	13.3	.	-	-	-	-
	17	25.0	13.0	.	-	-	-	-
	18	26.5	20.8	.	-	-	-	-
	19	28.0	22.1	.	-	-	-	-
9	1	1.0	18.1	.	-	-	-	-
	2	2.5	19.4	.	-	-	-	-
	3	4.0	18.1	.	-	-	-	-
	4	5.5	21.8	.	-	-	-	-
	5	7.0	28.8	.	-	-	-	-

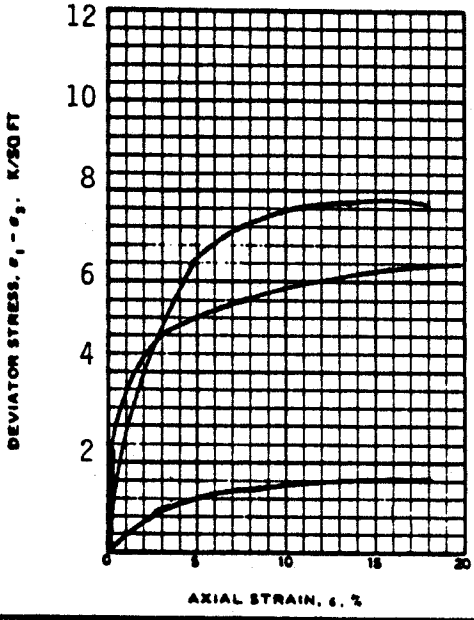
Tri-State Testing & Drilling

Summary of Laboratory Test Results
TVA - Bull Run Steam Plant
Ash Disposal Dikes
Page 3

Boring No.	Sample No.	Depth ft	Natural Moisture %	Percent Passing No. 200	Atterberg Limits LL %	PL %	PI %	USCS Class
9	6	8.5	25.8	.	-	-	-	-
	7	10.0	17.8	.	-	-	-	-
	8	11.5	20.2	.	-	-	-	-
	9	13.0	19.1	.	-	-	-	-
	10	14.5	23.0	.	-	-	-	-
	11	16.0	28.5	.	-	-	-	-
	12	17.5	25.3	.	-	-	-	-
	13	19.0	25.6	.	-	-	-	-
	14	20.5	23.7	.	28	18	10	CL
	15	22.0	18.4	.	-	-	-	-
	16	23.5	17.2	.	-	-	-	-
	17	25.0	18.4	.	-	-	-	-
	18	26.5	16.3	.	-	-	-	-
	19	28.0	15.3	.	-	-	-	-
	20	29.5	18.5	.	-	-	-	-
	21	31.0	16.3	.	-	-	-	-
	22	32.5	19.1	.	-	-	-	-
	23	34.0	18.9	.	-	-	-	-
	24	35.5	20.3	.	-	-	-	-
	25	37.0	21.2	.	-	-	-	-
	26	38.5	21.1	.	-	-	-	-
	27	40.0	21.8	.	-	-	-	-
	28	41.5	9.7	.	-	-	-	-

	Total	Effective
c =	.8 K/SF	.4
ϕ =	23.5	29.0
TAN ϕ =	.43	.56





SPECIMEN NO.			I	II	III
INITIAL	WATER CONTENT, %	w_o	27.6	18.4	16.4
	DRY DENSITY LB/ CU FT	γ_{d_o}	96.3	109.6	112.1
	SATURATION, %	s_o	96.8	87.7	84.4
	VOID RATIO	e_o	.8006	.5827	.5470
BEFORE SHEAR	WATER CONTENT, %	w_c	27.6	26.8	26.5
	DRY DENSITY LB/CU FT	γ_{d_c}	99.7	111.2	115.1
	SATURATION, %	s_c	100.0	100.0	100.0
	VOID RATIO	e_c	.7393	.5607	.5066
	FINAL BACK PRESSURE, K/SQ FT	u_o	5.9	5.9	5.8
MINOR PRINCIPAL STRESS, K/SQ FT		σ_3	1.4	2.9	4.3
MAXIMUM DEVIATOR STRESS, K/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.4	6.3	7.8
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	110	115	115
ULTIMATE DEVIATOR STRESS, K/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$	1.3	6.3	7.7
INITIAL DIAMETER, IN.		D_o	2.8	2.8	2.8
INITIAL HEIGHT, IN.		H_o	5.3	5.6	5.6

CONTROLLED- Strain .008 in/min.

DESCRIPTION OF SPECIMENS Brown Medium to Fine Sandy Silty CLAY with Rock Fragments

LL	PL	PI	Gs 2.78	TYPE OF SPECIMEN Undisturbed	TYPE OF TEST R

SOIL & MATERIAL ENGINEERS INC.

PROJECT Tri-State Testing

PROJECT NO. 1178-89-080

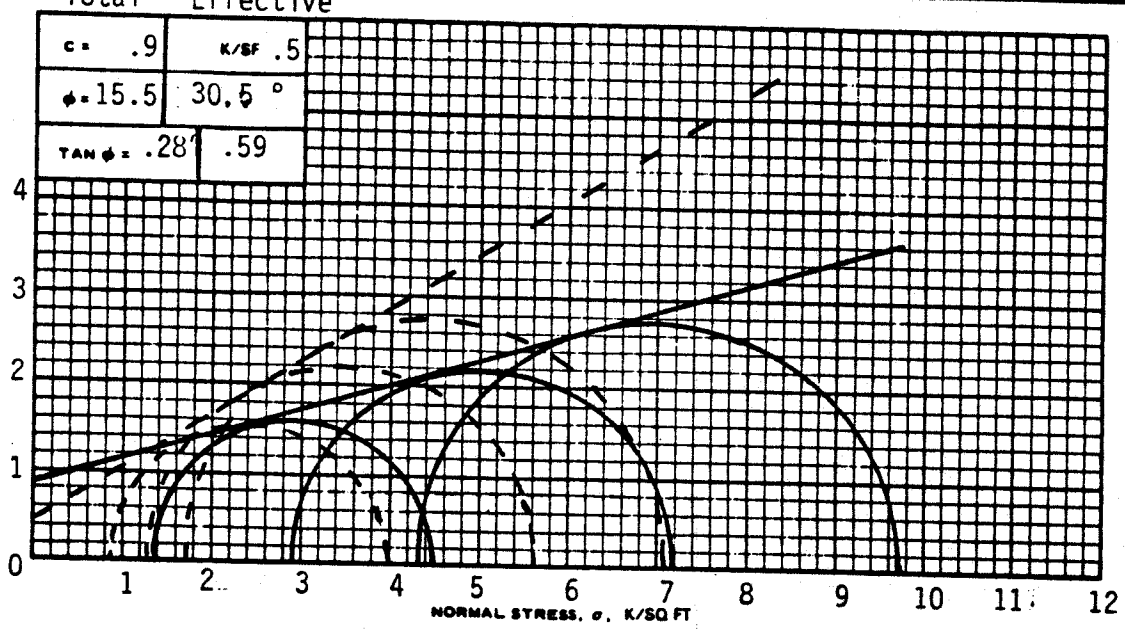
BORING NO. B-3 SAMPLE NO.

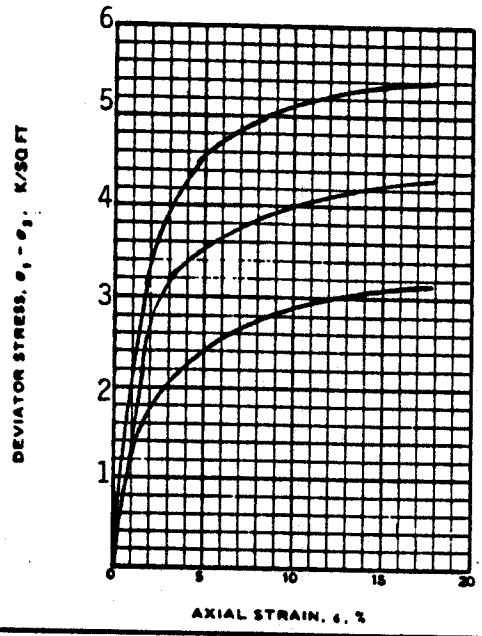
DEPTH/ELEV 18.5-21.5

DATE 3-2-89

TRIAXIAL COMPRESSION TEST REPORT

	Total	Effective
c =	.9 K/SF	.5
ϕ =	15.5	30.5 °
TAN ϕ =	.28	.59





SPECIMEN NO.			I	II	III
INITIAL	WATER CONTENT, %	w_o	22.1	20.5	19.8
	DRY DENSITY LB/ CU FT	γ_{d_o}	106.6	108.7	110.9
	SATURATION, %	S_o	98.0	95.7	97.6
	VOID RATIO	e_o	.6273	.5954	.5641
BEFORE SHEAR	WATER CONTENT, %	w_c	22.4	21.6	20.4
	DRY DENSITY LB/CU FT	γ_{d_c}	107.3	110.0	113.0
	SATURATION, %	S_c	100.0	100.0	100.0
	VOID RATIO	e_c	.6168	.5774	.5357
	FINAL BACK PRESSURE, K/SQ FT	u_o	5.8	5.9	7.2
MINOR PRINCIPAL STRESS, K/SQ FT		σ_3	1.4	2.9	4.3
MAXIMUM DEVIATOR STRESS, K/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	3.1	4.3	5.4
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	120	120	110
ULTIMATE DEVIATOR STRESS, K/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$	3.1	4.3	5.4
INITIAL DIAMETER, IN.		D_o	2.8	2.8	2.8
INITIAL HEIGHT, IN.		H_o	5.6	5.6	5.6

CONTROLLED- Strain .008in/min.

DESCRIPTION OF SPECIMENS Tan & Green Medium to Fine Sandy Silty CLAY with Shale Pieces

LL	PL	PI	Gs 2.78

TYPE OF SPECIMEN Undisturbed TYPE OF TEST CU

SOIL & MATERIAL ENGINEERS INC.

PROJECT Tri-State Testing

PROJECT NO. 1178-89-080

BORING NO. B-9 SAMPLE NO.

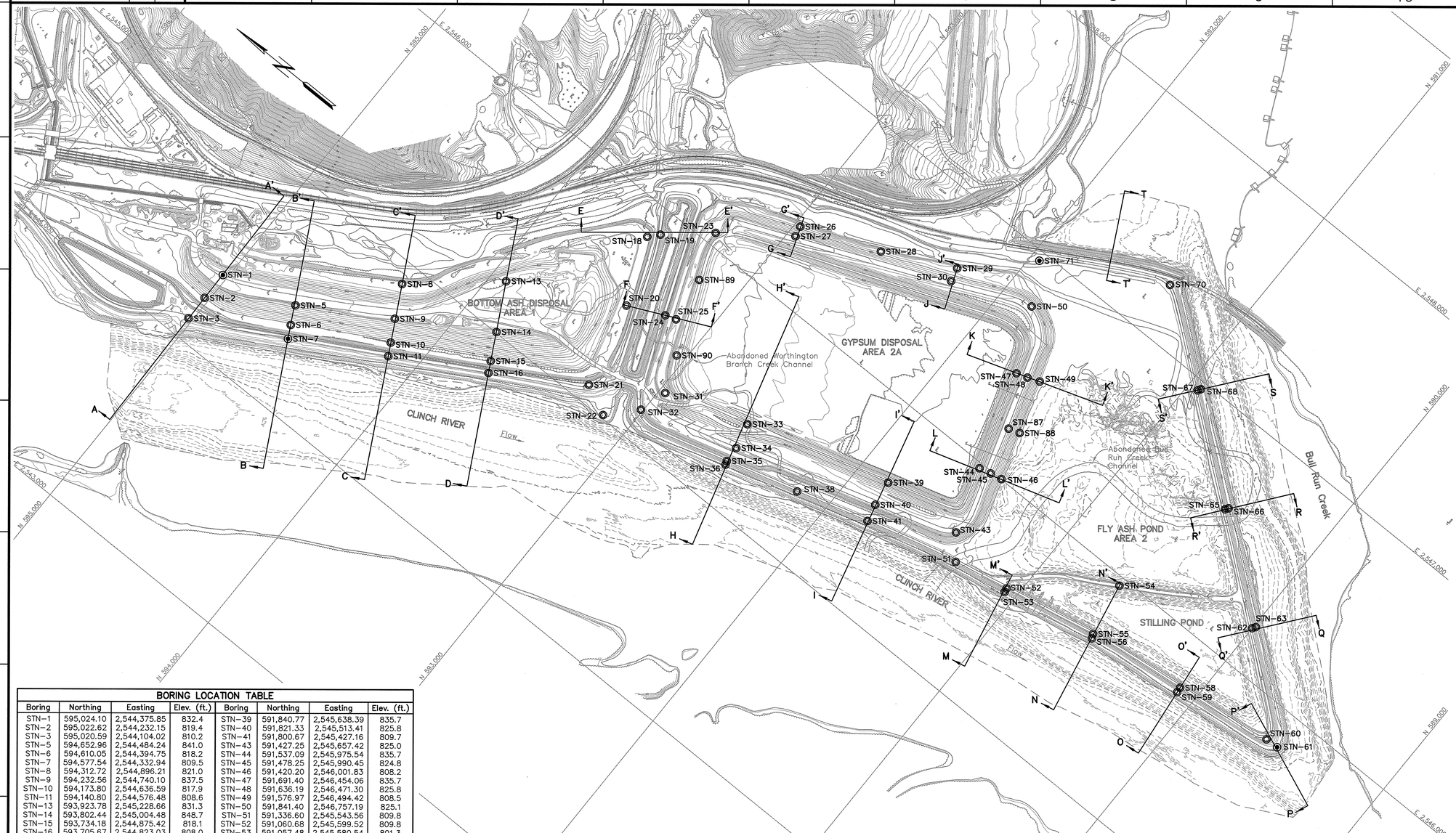
DEPTH/ELEV 13.5'-15.5'

DATE 3-2-89

TRIAXIAL COMPRESSION TEST REPORT

Appendix B

Geotechnical Drawings



GRAPHIC SCALE: 1"=200'
CONTOUR INTERVAL = 2'
100 0 200 400 FEET

LEGEND

- Soil Boring with Undisturbed (Shelby) Tube Samples and/or Standard Penetration Tests
- Soil Boring with Undisturbed (Shelby) Tube Samples and/or Standard Penetration Tests and Rock Core

NOTES:

1. The topographic mapping presented on this drawing was developed by TVA Surveying and Project Services, in April, 2009. This plan view was prepared to support development of the geotechnical exploration program and should not be used for construction.
2. A hydrographic survey was performed on the Clinch River in September, 2009 and on the Area 2 ponds in February, 2006.
3. The geotechnical information and data furnished herein are not intended as representation or warranties but are furnished for information only. It shall be distinctly understood that the Owner or Engineer will not be responsible for any deduction, interpretation or conclusion drawn therefrom. The information is made available in order that the Contractor may have ready access to the same information available to the Owner and the Engineer and is not part of this contract.

BORING LOCATION TABLE

Boring	Northing	Easting	Elev. (ft.)	Boring	Northing	Easting	Elev. (ft.)
STN-1	595,024.10	2,544,375.85	832.4	STN-39	591,840.77	2,545,638.39	835.7
STN-2	595,022.62	2,544,232.15	819.4	STN-40	591,821.33	2,545,513.41	825.8
STN-3	595,020.59	2,544,104.02	810.2	STN-41	591,800.67	2,545,427.16	809.7
STN-5	594,652.96	2,544,484.24	841.0	STN-43	591,427.25	2,545,657.42	825.0
STN-6	594,610.05	2,544,394.75	818.2	STN-44	591,537.09	2,545,975.54	835.7
STN-7	594,577.54	2,544,332.94	809.5	STN-45	591,478.25	2,545,990.45	824.8
STN-8	594,312.72	2,544,896.21	821.0	STN-46	591,420.20	2,546,001.83	808.2
STN-9	594,232.56	2,544,740.10	837.5	STN-47	591,691.40	2,546,454.06	835.7
STN-10	594,173.80	2,544,636.59	817.9	STN-48	591,636.19	2,546,471.30	825.8
STN-11	594,140.80	2,544,576.48	808.6	STN-49	591,576.97	2,546,494.42	808.5
STN-13	593,923.78	2,545,228.66	831.3	STN-50	591,841.40	2,546,757.19	825.1
STN-14	593,802.44	2,545,004.48	848.7	STN-51	591,336.60	2,545,543.56	809.8
STN-15	593,734.18	2,544,875.42	818.1	STN-52	591,060.68	2,545,599.52	809.8
STN-16	593,705.67	2,544,823.03	808.0	STN-53	591,057.48	2,545,580.54	801.3
STN-18	593,524.13	2,545,835.46	821.7	STN-54	590,638.72	2,545,959.39	810.1
STN-19	593,480.64	2,545,884.32	810.2	STN-55	590,589.87	2,545,693.73	810.1
STN-20	593,389.26	2,545,507.73	819.6	STN-56	590,580.44	2,545,673.06	800.2
STN-21	593,286.66	2,545,087.68	808.0	STN-58	590,091.97	2,545,756.90	810.3
STN-22	593,138.35	2,545,015.84	799.0	STN-59	590,089.21	2,545,731.11	800.0
STN-23	593,275.52	2,546,061.35	835.0	STN-60	589,601.84	2,545,827.99	810.2
STN-24	593,211.79	2,545,589.93	809.9	STN-61	589,536.98	2,545,830.43	799.9
STN-25	593,158.33	2,545,607.45	826.2	STN-62	590,000.07	2,546,208.94	809.4
STN-26	592,971.96	2,546,347.19	817.3	STN-63	589,989.70	2,546,223.76	801.2
STN-27	592,960.52	2,546,295.43	831.3	STN-65	590,472.00	2,546,579.19	809.1
STN-28	592,587.48	2,546,501.20	816.8	STN-66	590,462.23	2,546,593.73	799.8
STN-29	592,243.83	2,546,673.33	816.8	STN-67	590,946.92	2,546,949.33	809.5
STN-30	592,227.12	2,546,605.60	826.2	STN-68	590,938.03	2,546,963.83	800.8
STN-31	592,969.83	2,545,291.84	823.8	STN-70	591,380.61	2,547,267.77	809.4
STN-32	593,010.17	2,545,153.51	808.2	STN-71	591,954.22	2,546,956.25	809.1
STN-33	592,559.31	2,545,426.43	836.1	STN-87	591,549.15	2,546,217.62	825.3
STN-34	592,527.95	2,545,300.77	825.6	STN-88	591,493.79	2,546,234.83	808.6
STN-35	592,523.92	2,545,221.40	808.9	STN-89	593,192.06	2,545,830.78	836.1
STN-36	592,517.47	2,545,204.09	800.5	STN-90	593,043.65	2,545,471.40	838.4
STN-38	592,160.74	2,545,322.53	808.6				

Northing, Easting and Ground Surface Elevations were provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27 (Tennessee Lambert)
Vertical Datum: NGVD29

RECORD DRAWING

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — No. 119981 — STATE OF TENNESSEE

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ENG	AS CONST	DISCIPLINE/ INTERFACE
R –	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–
RECORD DRAWING											

SCALE: 1"=200' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
BORING LAYOUT

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
Brentwood, Tennessee
37027-5044
Tel. 615.885.1144
Fax 616.885.1102
www.stantec.com

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

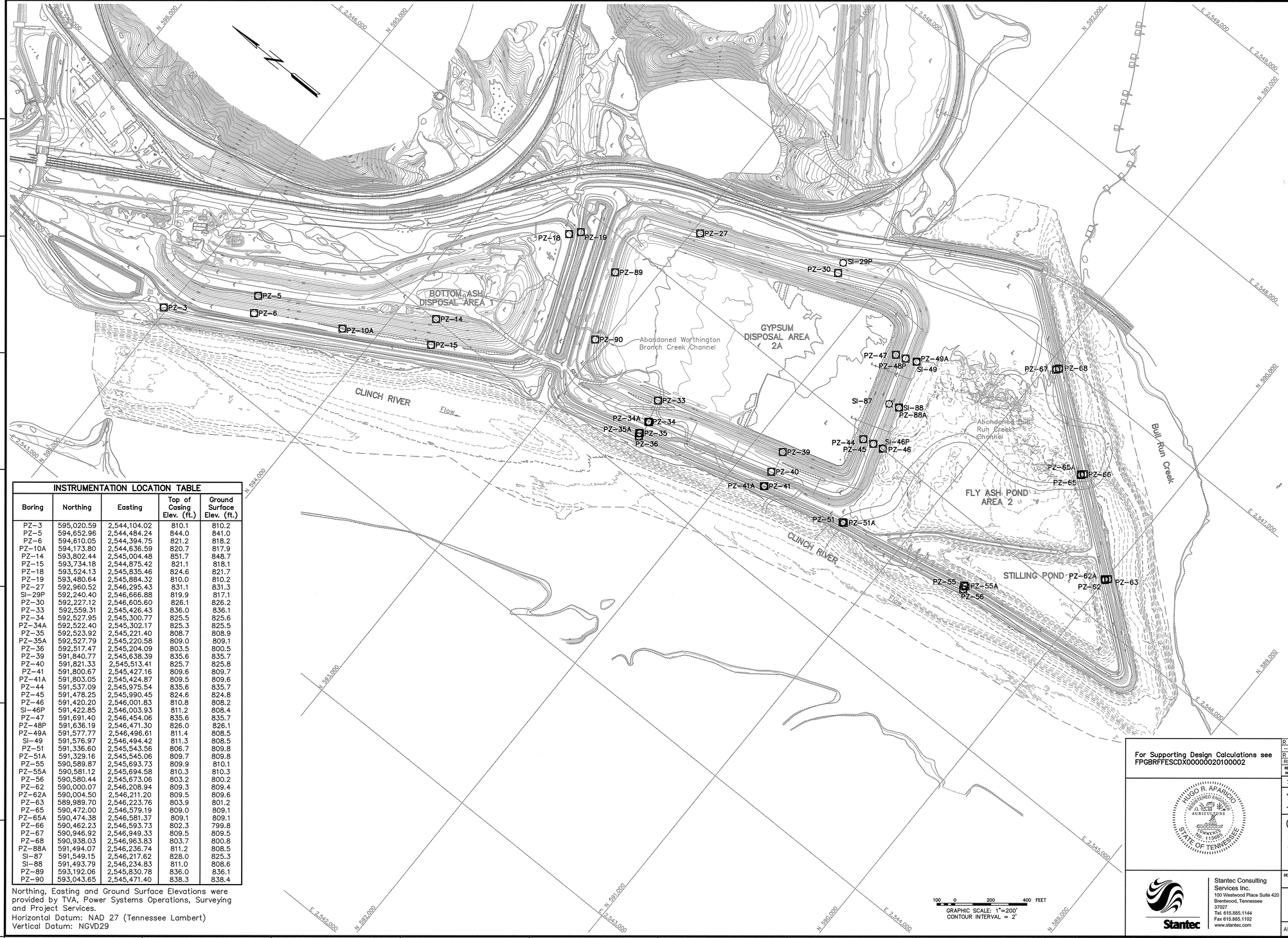
AUTOCAD R 2000	DATE 04/09/10	49	C	10W507-01	R 0

STANTEC | 0
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

PLOT DATE: 04/09/2010 USER: BOND, PJ
X:\TVA\WOTNE\SYS\485818\ENVIRONMENTAL\DRAWINGS\BFP GEOTECH\VIEWS_RECORD\10W507-01.DWG



INSTRUMENTATION LOCATION TABLE

Boring	Northing	Easting	Top of Casing Elev. (ft.)	Ground Surface Elev. (ft.)
PZ-3	595,020.59	2,544,104.02	810.1	810.2
PZ-5	594,652.96	2,544,484.24	844.0	841.0
PZ-6	594,610.05	2,544,394.75	821.2	818.2
PZ-10A	594,173.80	2,544,636.59	820.7	817.9
PZ-14	593,802.44	2,545,004.48	851.7	848.7
PZ-15	593,734.18	2,544,875.42	821.1	818.1
PZ-18	593,524.13	2,545,835.46	824.6	821.7
PZ-19	593,480.64	2,545,884.32	810.0	810.2
PZ-27	592,960.52	2,546,295.43	831.1	831.3
SI-29P	592,240.40	2,546,666.88	819.9	817.1
PZ-30	592,227.12	2,546,605.60	826.1	826.2
PZ-33	592,559.31	2,545,426.43	836.0	836.1
PZ-34	592,527.95	2,545,300.77	825.5	825.6
PZ-34A	592,522.40	2,545,302.17	825.3	825.5
PZ-35	592,523.92	2,545,221.40	808.7	808.9
PZ-35A	592,527.79	2,545,220.58	809.0	809.1
PZ-36	592,517.47	2,545,204.09	803.5	800.5
PZ-39	591,840.77	2,545,638.39	835.6	835.7
PZ-40	591,821.33	2,545,513.41	825.7	825.8
PZ-41	591,800.67	2,545,427.16	809.6	809.7
PZ-41A	591,803.05	2,545,424.87	809.5	809.6
PZ-44	591,537.09	2,545,975.54	835.6	835.7
PZ-45	591,478.25	2,545,990.45	824.6	824.8
PZ-46	591,420.20	2,546,001.83	810.8	808.2
SI-46P	591,422.85	2,546,003.93	811.2	808.4
PZ-47	591,691.40	2,546,454.06	835.6	835.7
PZ-48P	591,636.19	2,546,471.30	826.0	826.1
PZ-49A	591,577.77	2,546,496.61	811.4	808.5
SI-49	591,576.97	2,546,494.42	811.3	808.5
PZ-51	591,336.60	2,545,543.56	806.7	809.8
PZ-51A	591,329.16	2,545,545.06	809.7	809.8
PZ-55	590,589.87	2,545,693.73	809.9	810.1
PZ-55A	590,581.12	2,545,694.58	810.3	810.3
PZ-56	590,580.44	2,545,673.06	803.2	800.2
PZ-62	590,000.07	2,546,208.94	809.3	809.4
PZ-62A	590,004.50	2,546,211.20	809.5	809.6
PZ-63	589,989.70	2,546,223.76	803.9	801.2
PZ-65	590,472.00	2,546,579.19	809.0	809.1
PZ-65A	590,474.38	2,546,581.37	809.1	809.1
PZ-66	590,462.23	2,546,593.73	802.3	799.8
PZ-67	590,946.92	2,546,949.33	809.5	809.5
PZ-68	590,938.03	2,546,963.83	803.7	800.8
PZ-88A	591,494.07	2,546,236.74	811.2	808.5
SI-87	591,549.15	2,546,217.62	828.0	825.3
SI-88	591,493.79	2,546,234.83	811.0	808.6
PZ-89	593,192.06	2,545,830.78	836.0	836.1
PZ-90	593,043.65	2,545,471.40	838.3	838.4

Northing, Easting and Ground Surface Elevations were provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27 (Tennessee Lambert)
Vertical Datum: NGVD29

NOTES:

1. The topographic mapping presented on this drawing was provided to Stantec by TVA Surveying and Project Services. This plan view was prepared to support development of the geotechnical exploration program and should not be used for construction.
2. The geotechnical information and data furnished herein are not intended as representation or warranties but are furnished for information only. It shall be distinctly understood that the Owner or Engineer will not be responsible for any deduction, interpretation or conclusion drawn therefrom. The information is made available in order that the Contractor may have ready access to the same information available to the Owner and the Engineer and is not part of this contract.

LEGEND

PZ-63 Piezometer
SI-49 Slope Inclinometer

RECORD DRAWING

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. BY
R –	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	PVK	PS	PVK	SF	PVK	PVK	TJ	–	–	–
RECORD DRAWING											DISCIPLINE INTERFACE

SCALE: 1"=200' EXCEPT AS NOTED

YARD
–

GEOTECHNICAL EXPLORATION INSTRUMENTATION PLAN

HUGO R. APARICIO REGISTERED ENGINEER AGRICULTURE No. 113885 STATE OF TENNESSEE

Stantec Consulting Services Inc.
100 Westwood Place Suite 420
Brentwood, Tennessee 37027
Tel. 615.885.1144
Fax 615.885.1102
www.stantec.com

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
P. KISER	P. SILPACHARN	P. KISER	S. FIELD	P. KISER	P. KISER	T. JOHNSON

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

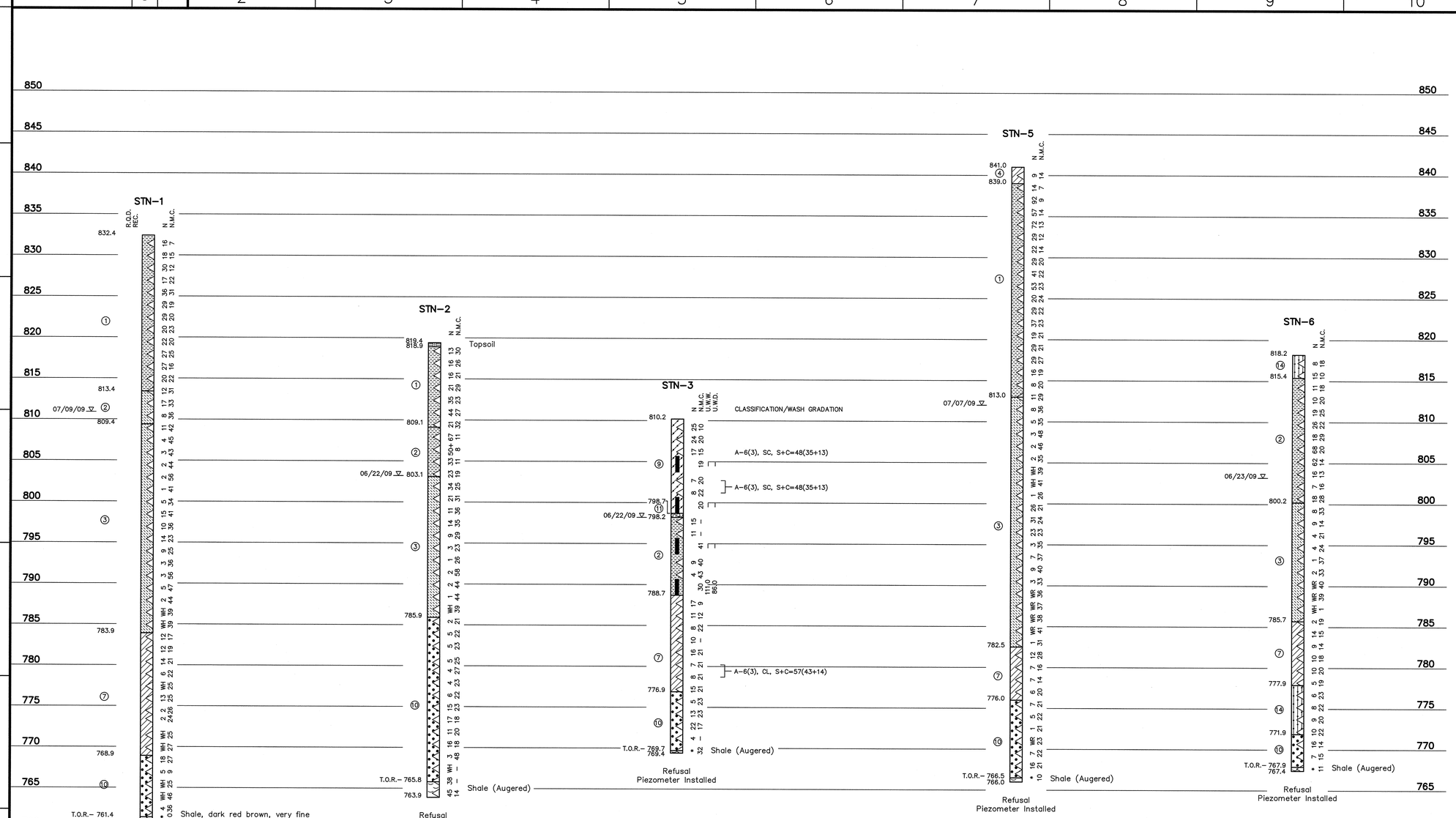
AUTOCAD R 2008	DATE: 04/09/10	49	C	10W507-02	R 0

STANTEC | 0
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

PLOT DATE: 04/09/2010 - USER: BOND, PJ
K:\TVA\ACTIVE\TVA0801B\ENGINEERING\TN_YBA\MXD\BFP\GEOTECH\REVD_RECORD\10W507-02-R0.DWG



LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
△	Standard Penetration Test Interval
■	Undisturbed Thin-Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock-like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.–	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide-tipped tooth auger bit
No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586-99. Refer to typed boring log.

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RECORD DRAWING

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

HUGO R. APARICIO — REGISTERED ENGINEER — STATE OF TENNESSEE — AGRICULTURE — COMMERCE — No. 113887

Stantec Consulting Services Inc.
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37027-6044
Tel. 615.885.1144
Fax 616.885.1102
www.stantec.com

R–	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–

RECORD DRAWING

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV

DISCIPLINE INTERFACE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
LOGS OF BORING

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

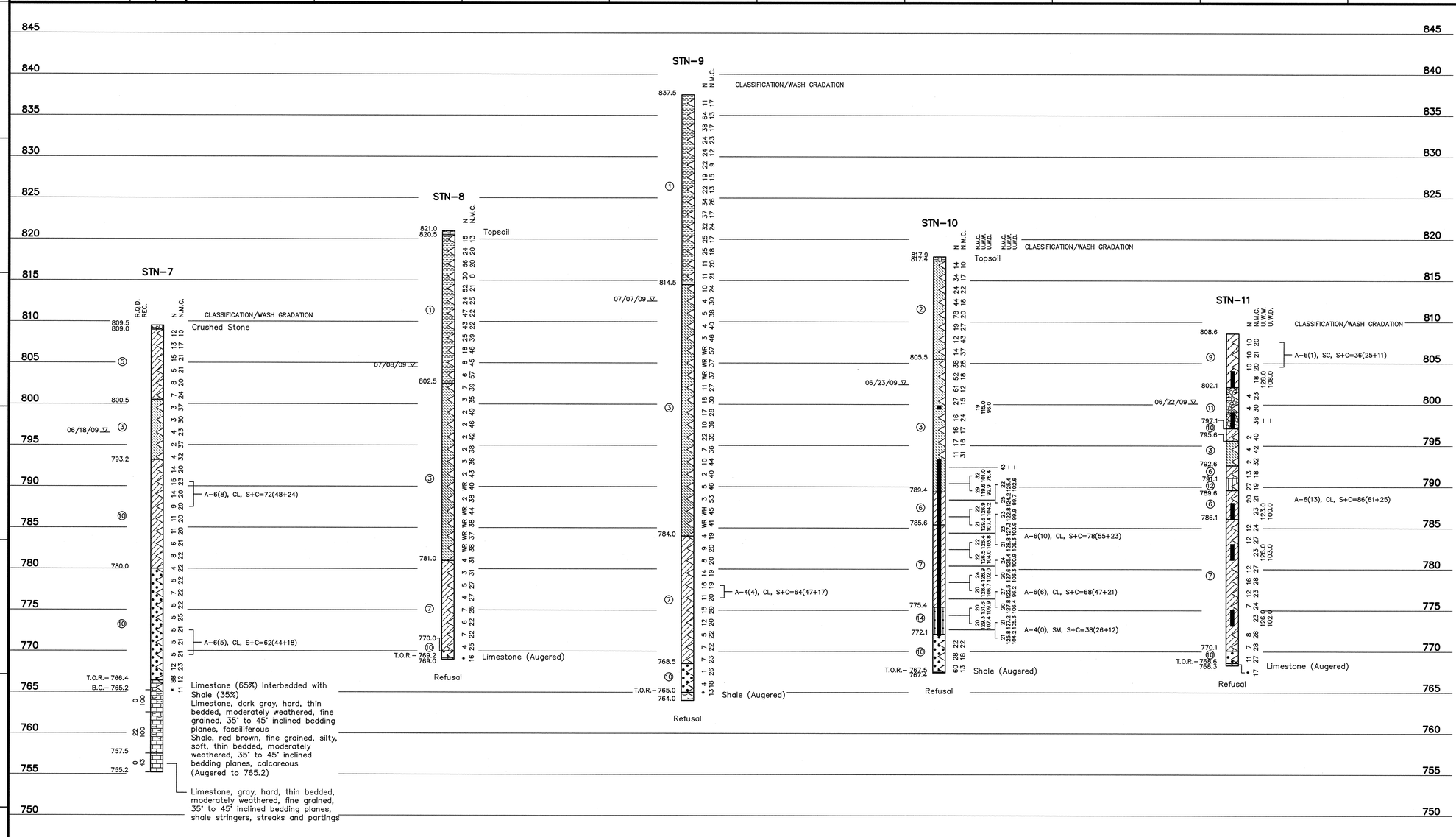
AUTOCAD R 2000	DATE: 04/09/10	49	C	10W507-03	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

PLOT DATE: 04/09/2010 USER: RDRO, PJ
N:\ACTIVE\10W507-03\GEOTECH\REVS_RECORD\10W507-03-REC.DWG



LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
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⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
△	Standard Penetration Test Interval
■	Undisturbed Thin–Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock–like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.–	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide–tipped tooth auger bit
No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586–99. Refer to typed boring log.

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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BDND, TJ
S:\TVA\Active\TVA0018\Engineering\Drawings\Dwg\Geotech\Revit_Records\10W507-04-RD.DWG

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

HUGO R. APARICIO — REGISTERED ENGINEER — 115892 — AGRICULTURE — STATE OF TENNESSEE

Stantec

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
Brentwood, Tennessee 37027-5044
Tel. 615.885.1144
Fax 616.885.1102
www.stantec.com

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–
RECORD DRAWING										

DISCIPLINE INTERFACE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
LOGS OF BORING

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

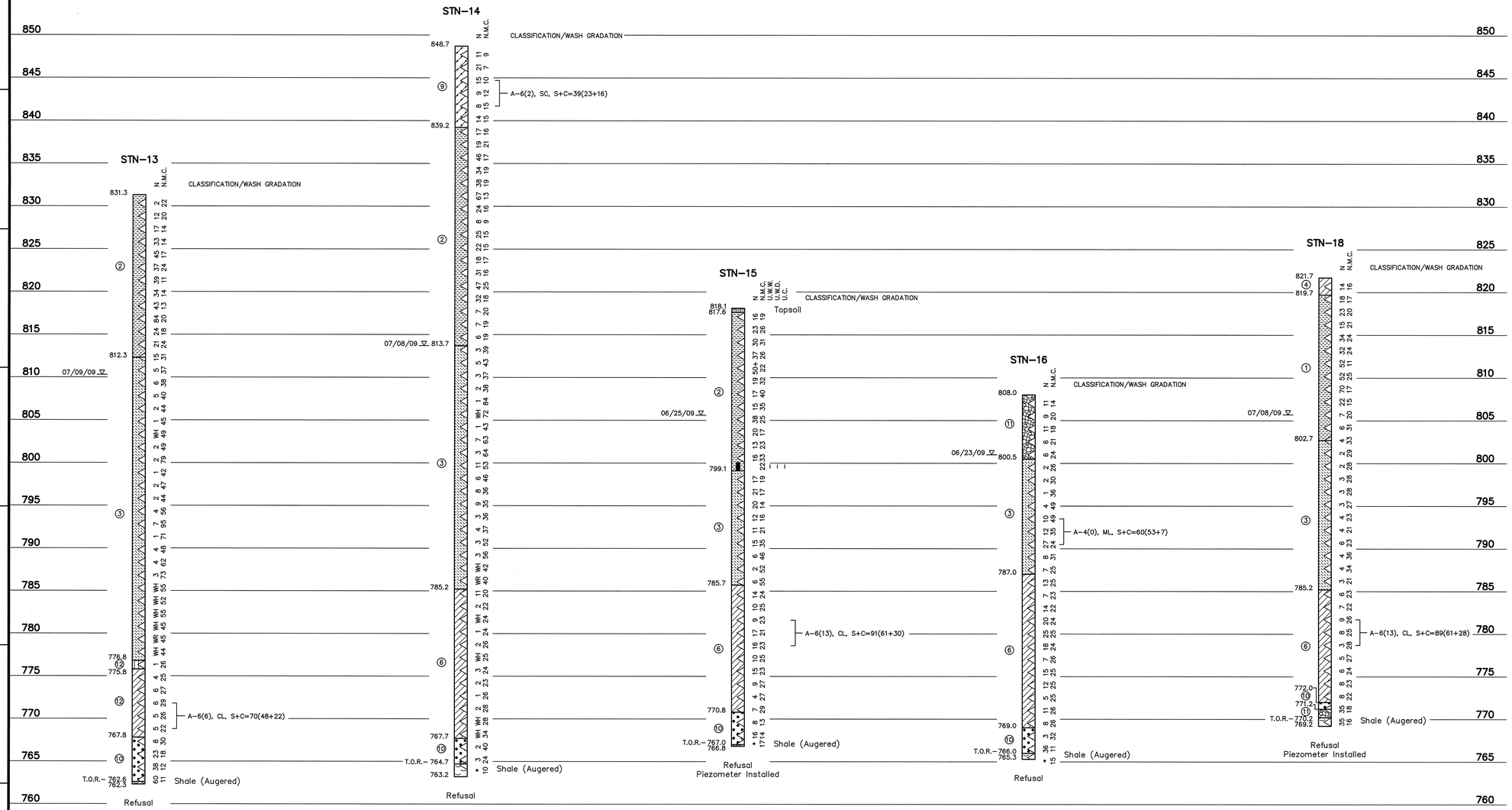
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507–04	R 0

STANTEC | 0
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
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⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
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⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
△	Standard Penetration Test Interval
■	Undisturbed Thin-Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock–like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
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No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586–99. Refer to typed boring log.

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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BOND, PJ
N:\TVA\BRFF\ENGINEERING\CIVIL\DRAWINGS\BRFFGEOTECH\SVG_RECORDS\10W507-05-R0.DWG

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

HUGO R. APARICIO REGISTERED ENGINEER AGRICULTURE COMMERCE No. 113995 STATE OF TENNESSEE

R–	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–
RECORD DRAWING											

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT 10	AS CONST	REV. NO.
											1
											2
											3
											4

DISCIPLINE INTERFACE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION LOGS OF BORING

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
Brentwood, Tennessee
37027-5044
Tel. 615.885.1144
Fax 616.885.1102
www.stantec.com

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

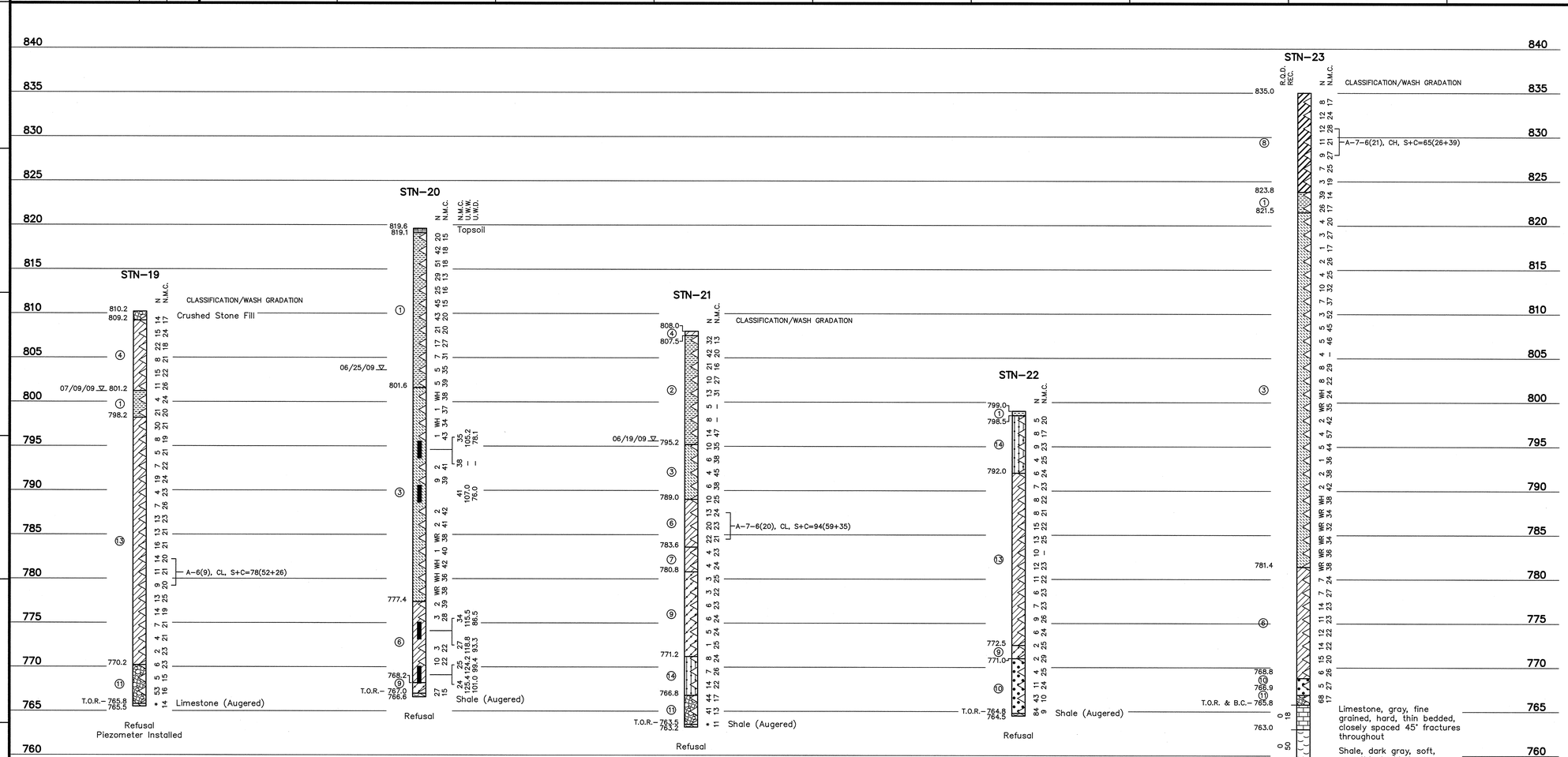
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507-05	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
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⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
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WR	Weight of Rods
△	Standard Penetration Test Interval
■	Undisturbed Thin-Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock-like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: RDMD, PJ
S:\TVA\AGENCY\FINISH\ENGINEERING\FINAL\DRAWINGS\MPF\GEOTECH\REVISED\RECORD\10W507-06-R0.DWG

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

R –	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–
RECORD DRAWING											
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT 10	AS CONST	REV. NO.

DISCIPLINE INTERFACE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION LOGS OF BORING

HUGO R. APARICIO REGISTERED ENGINEER AGRICULTURE 113985 STATE OF TENNESSEE

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
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Fax 616.885.1102
www.stantec.com

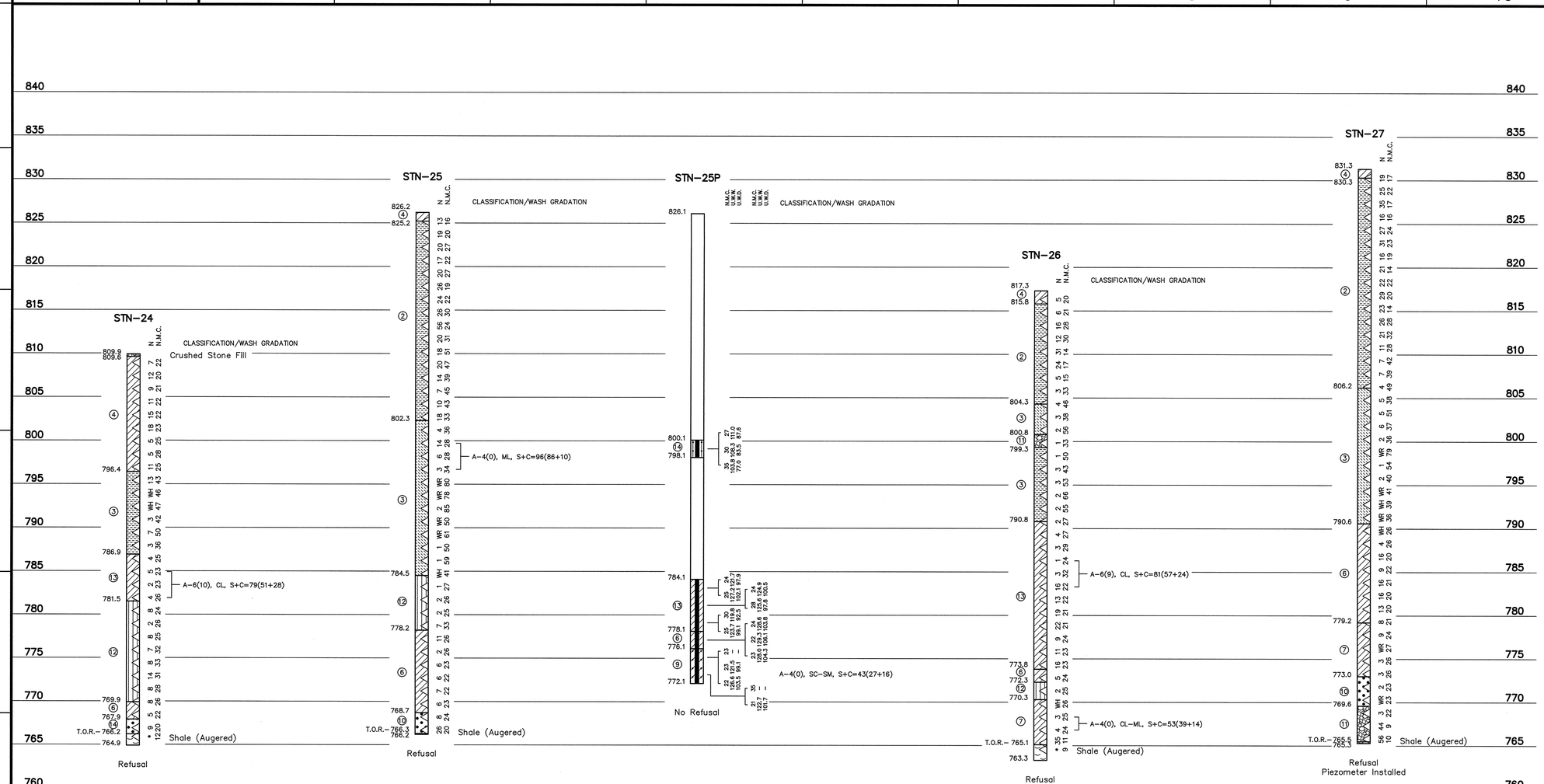
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507-06	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
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⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
△	Standard Penetration Test Interval
■	Undisturbed Thin–Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock–like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.–	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide–tipped tooth auger bit
No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586–99. Refer to typed boring log.

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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BOARD, PJ
N:\TVA\FOSSIL\SHARED\GEOTECH\DRAWINGS\BRF\GEOTECH\BRGD_BEDGEN\10W507-07-R0.DWG

For Supporting Design Calculations see FPGBRFFESCDX000000020100002

R –	–	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–	DISCIPLINE INTERFACE
RECORD DRAWING												

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV BY

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION LOGS OF BORING

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — 23 OCT 08 — COMMERCE NO. 113885 — STATE OF TENNESSEE

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
Brentwood, Tennessee
37027-5044
Tel. 615.885.1144
Fax 616.885.1102
www.stantec.com

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

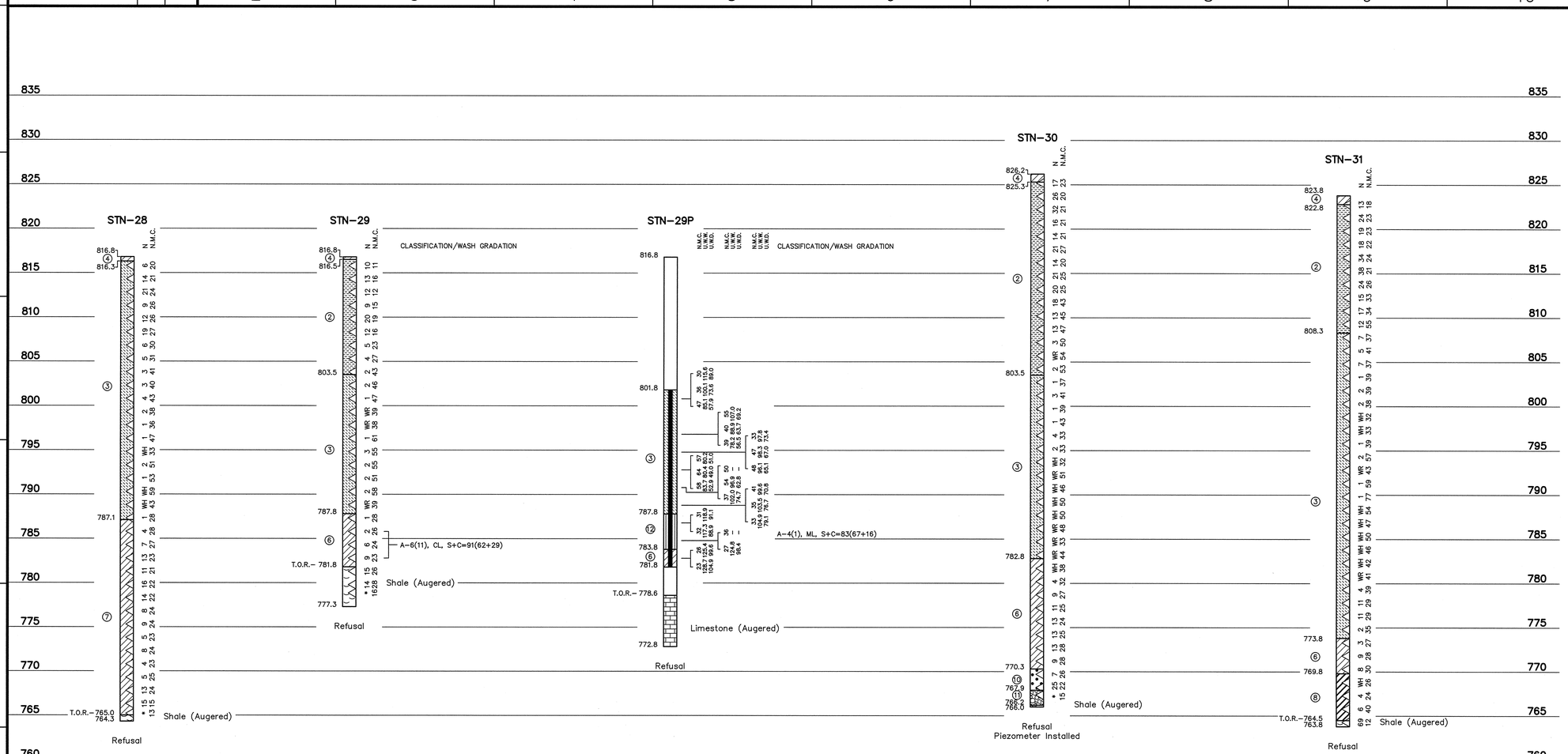
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507-07	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
△	Standard Penetration Test Interval
■	Undisturbed Thin-Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock-like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.–	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide-tipped tooth auger bit
No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586-99. Refer to typed boring log.

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RECORD DRAWING

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — No. 119885 — STATE OF TENNESSEE

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
Brentwood, Tennessee
37027-5044
Tel. 615.885.1144
Fax 616.885.1102
www.stantec.com

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. NO.
R –	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10 RECORD DRAWING	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
LOGS OF BORING

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

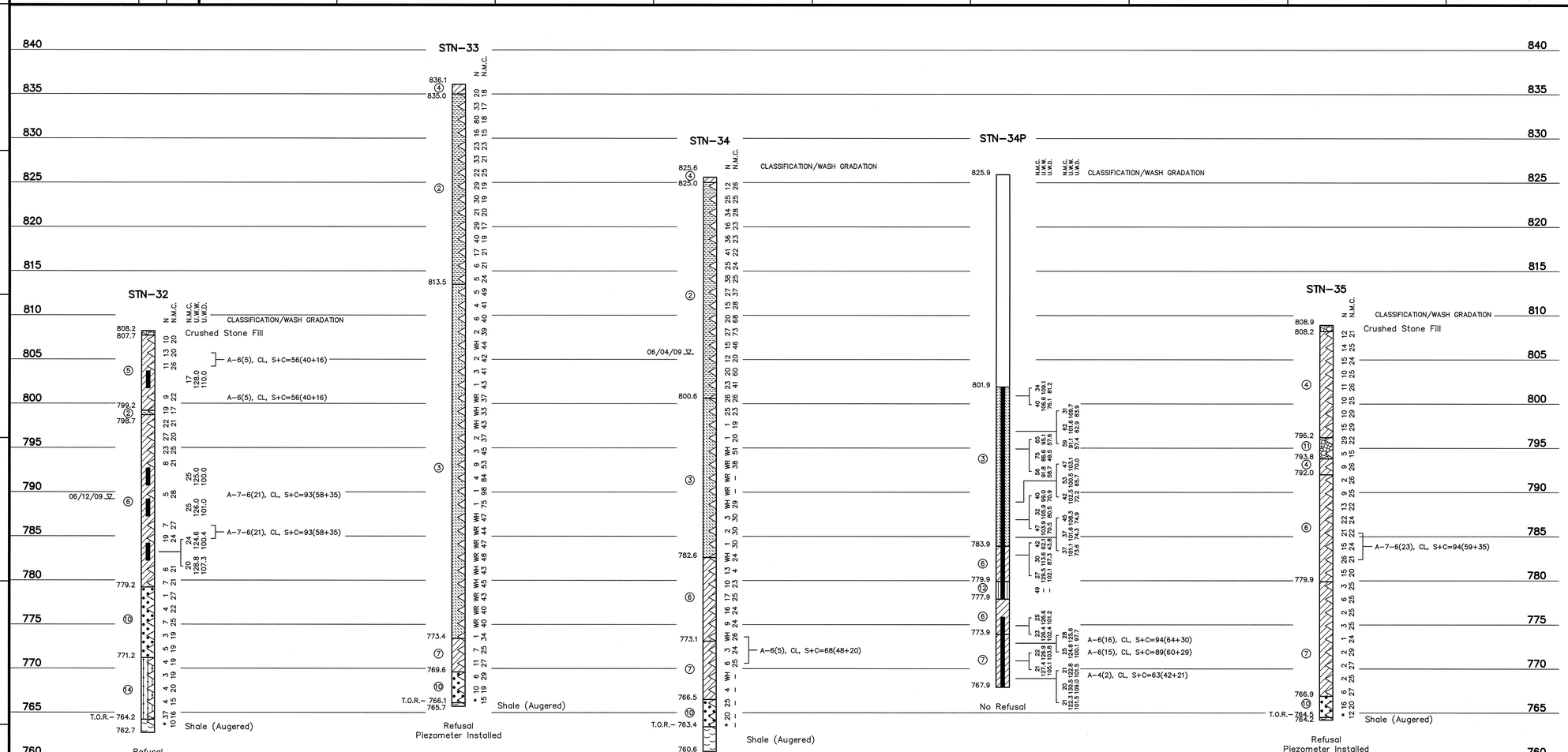
AUTOCAD R 2000	DATE 04/09/10	49	C	10W507-08	R 0

STANTEC | 0
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:XX W_TVA

C.A.D. DRAWING DO NOT ALTER MANUALLY

PLOT DATE: 04/09/2010 USER: RDRD, PJ
N:\TVA\WRS\TJ\10W507\DGN\BRIDGE\TAL_GEAMINGS\SHPT\GEOTECH\REPS_BDG\R01\10W507-08-BDG.DWG



LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
△	Standard Penetration Test Interval
■	Undisturbed Thin–Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock–like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.–	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide–tipped tooth auger bit
No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586–99. Refer to typed boring log.

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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: RKING, PJ
N:\TVA\CAD\GEOTECH\DRAWINGS\ALL\GRAWINGS\BRF\GEOTECH\REVS_BEFORE\10W507-09-R0.DWG

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — 115991 — STATE OF TENNESSEE

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Fax 616.885.1102
www.stantec.com

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT IS	AS CONST	REV. SYM.
R –	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10 RECORD DRAWING	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–

DISCIPLINE INTERFACE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
LOGS OF BORING

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

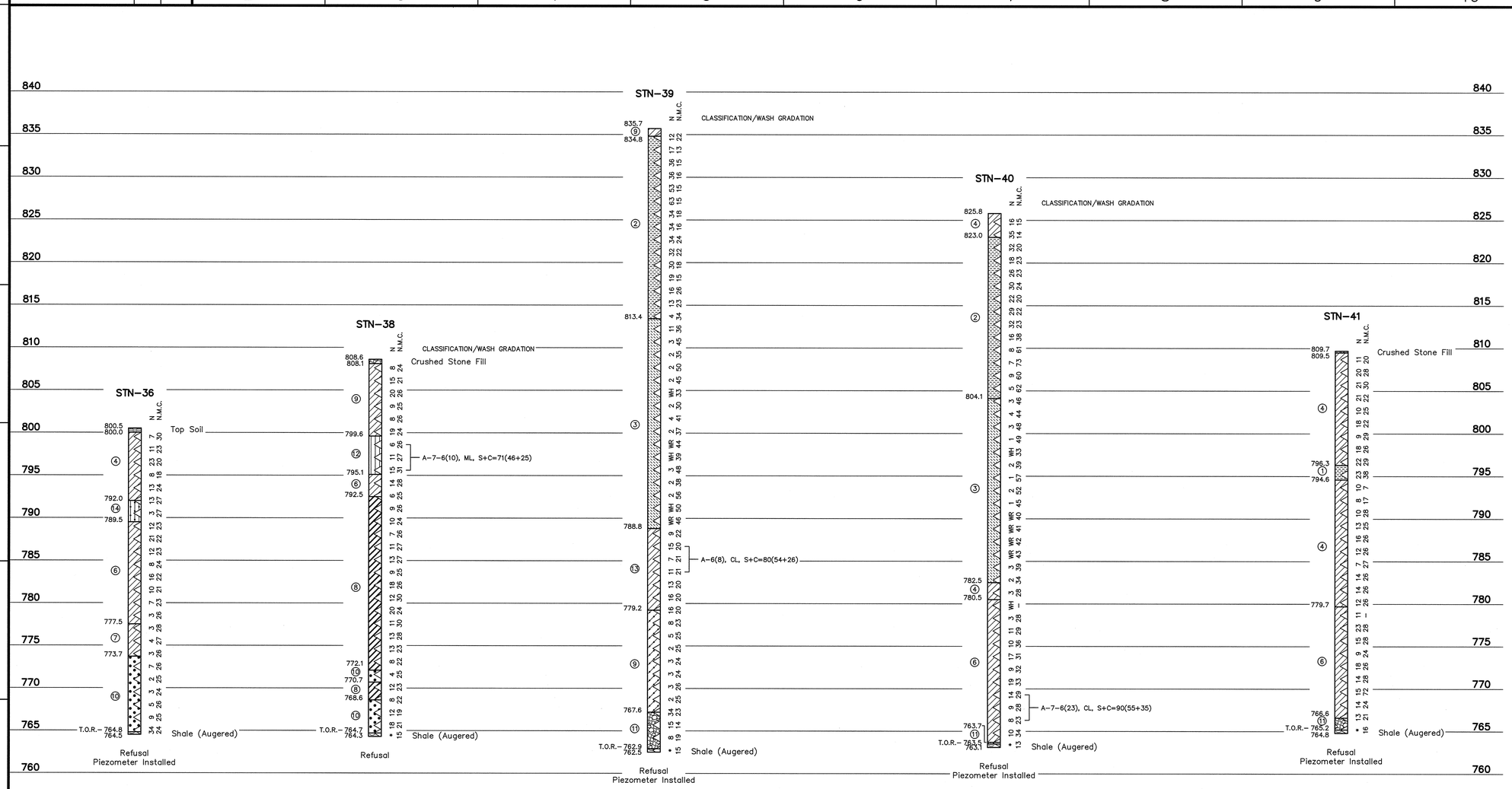
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507–09	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
△	Standard Penetration Test Interval
■	Undisturbed Thin-Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock–like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.–	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide–tipped tooth auger bit
No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586–99. Refer to typed boring log.

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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BSMO PW
S:\TVA\SHARE\CIVIL\DRAWINGS\MECHANICAL\SAMMIS\DRP\GEOTECH\MISC\BC2001\10W507-10-R0.DWG

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	DISCIPLINE INTERFACE
R–	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–
RECORD DRAWING											

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
LOGS OF BORING

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — COMMERCE — No. 113080 — STATE OF TENNESSEE

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
Brentwood, Tennessee
37027-5044
Tel. 615.885.1144
Fax 616.885.1102
www.stantec.com

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

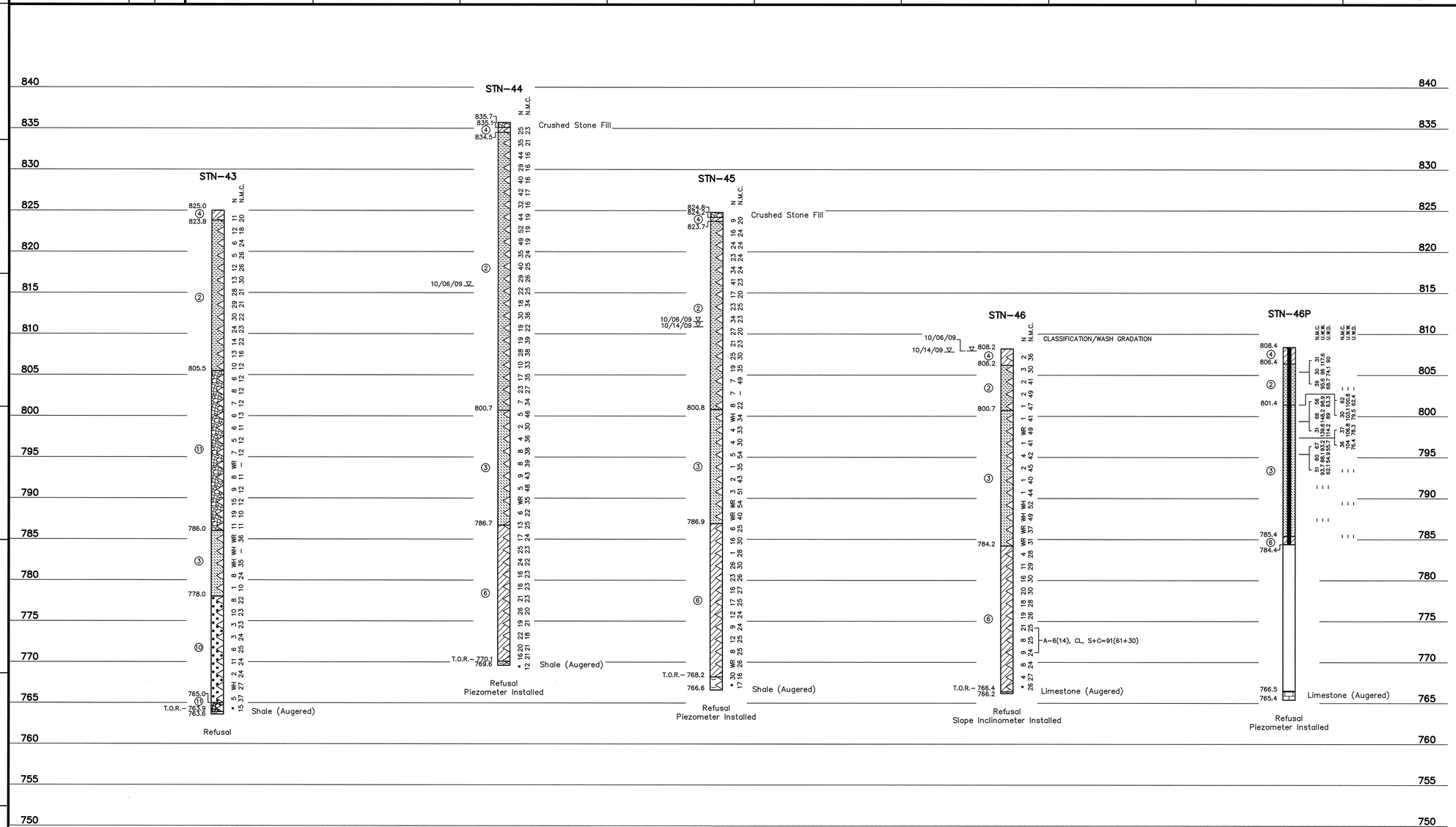
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507-10	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
◁	Standard Penetration Test Interval
■	Undisturbed Thin-Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09▽	Water Level and Date Recorded
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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BOND, PJ
N:\TVA\CAD\CIVIL\TVA0910\DRAWINGS\ALL\BAMMOS\SHT\GEOTECH\REVA_BFCFDBO\10W507-11-BR.DWG

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. SET
R –	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–
RECORD DRAWING											DISCIPLINE INTERFACE

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — COMMERCE — No. 113685 — STATE OF TENNESSEE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
LOGS OF BORING

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
Brentwood, Tennessee
37027-5044
Tel. 615.885.1144
Fax 616.885.1102
www.stantec.com

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

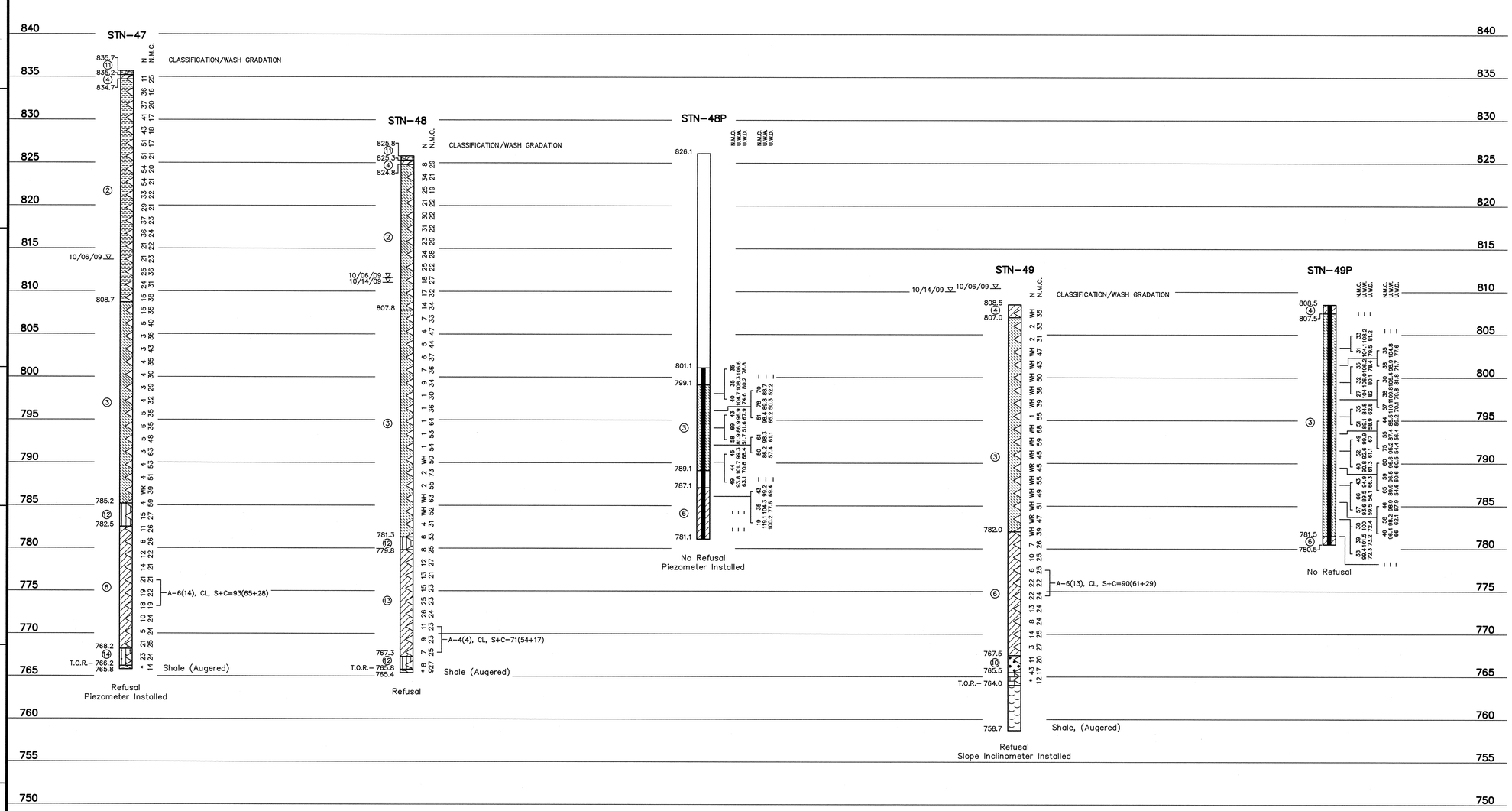
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507-11	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
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⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
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⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
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WR	Weight of Rods
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N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock-like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.–	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide-tipped tooth auger bit
No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586-99. Refer to typed boring log.

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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: RDRD, PJ
N:\TVA\ALAWS\TVA0810\DRAWINGS\BFP\GEOTECH\REPORT_REVISION\10W507-12-R0.DWG

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — NO. 113695 — STATE OF TENNESSEE

R–	–	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–	
RECORD DRAWING												
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV'D	DISCIPLINE INTERFACE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
LOGS OF BORING

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
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Fax 616.885.1102
www.stantec.com

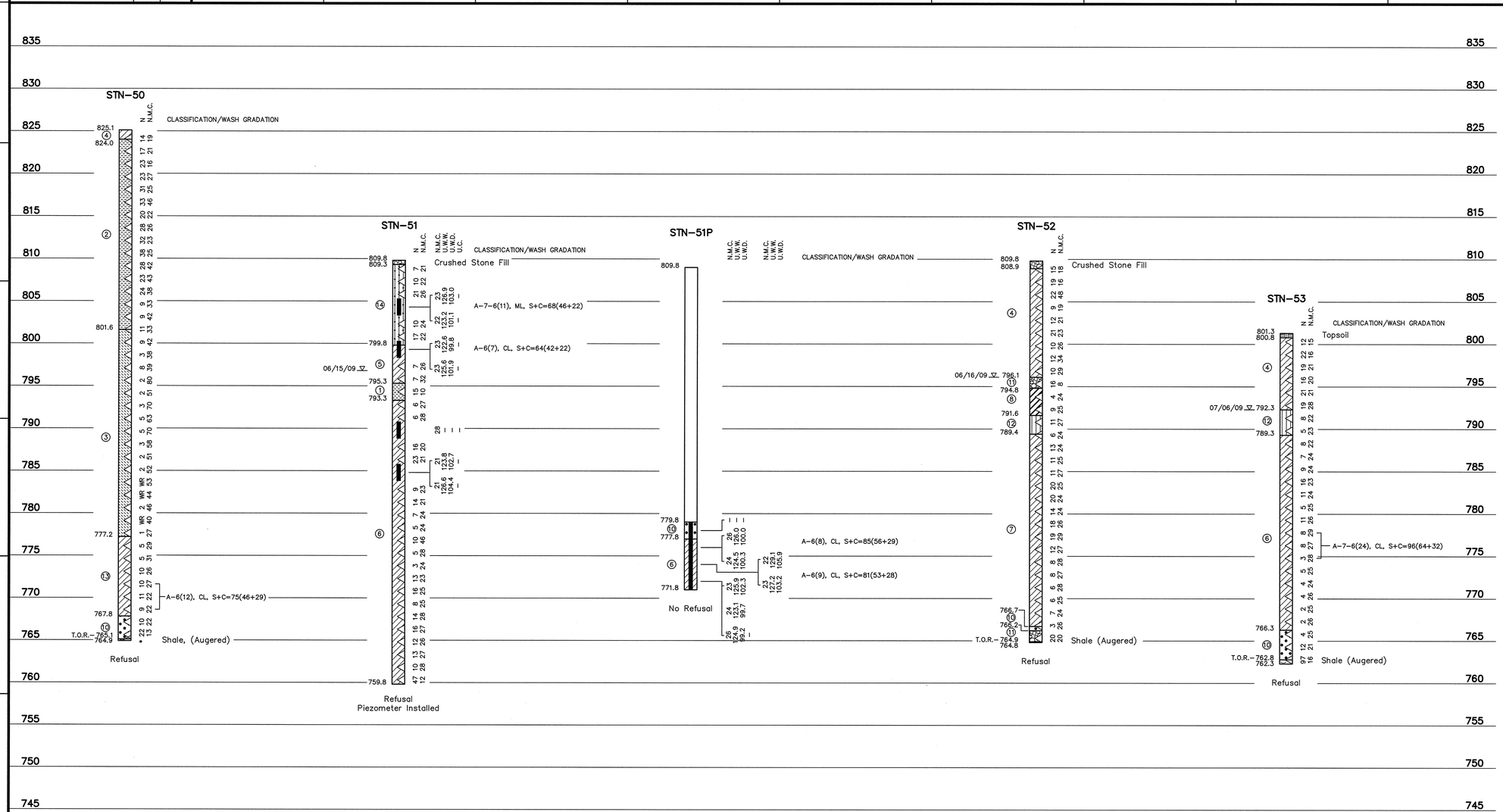
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507-12	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
◁	Standard Penetration Test Interval
■	Undisturbed Thin-Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock–like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.–	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide–tipped tooth auger bit
No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586–99. Refer to typed boring log.

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RECORD DRAWING

For Supporting Design Calculations see FPGBRFFESCDX0000002010002

HUGO R. APARICIO — REGISTERED ENGINEER — W. STATE OF AGRICULTURE — TENNESSEE — No. 113080 — STATE OF TENNESSEE

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. NO.
R –	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–
RECORD DRAWING											

DISCIPLINE INTERFACE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
LOGS OF BORING

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

Stantec Consulting Services Inc.
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Fax 616.885.1102
www.stantec.com

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507-13	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

PLOT DATE: 04/09/2010 USER: BORG_TJ
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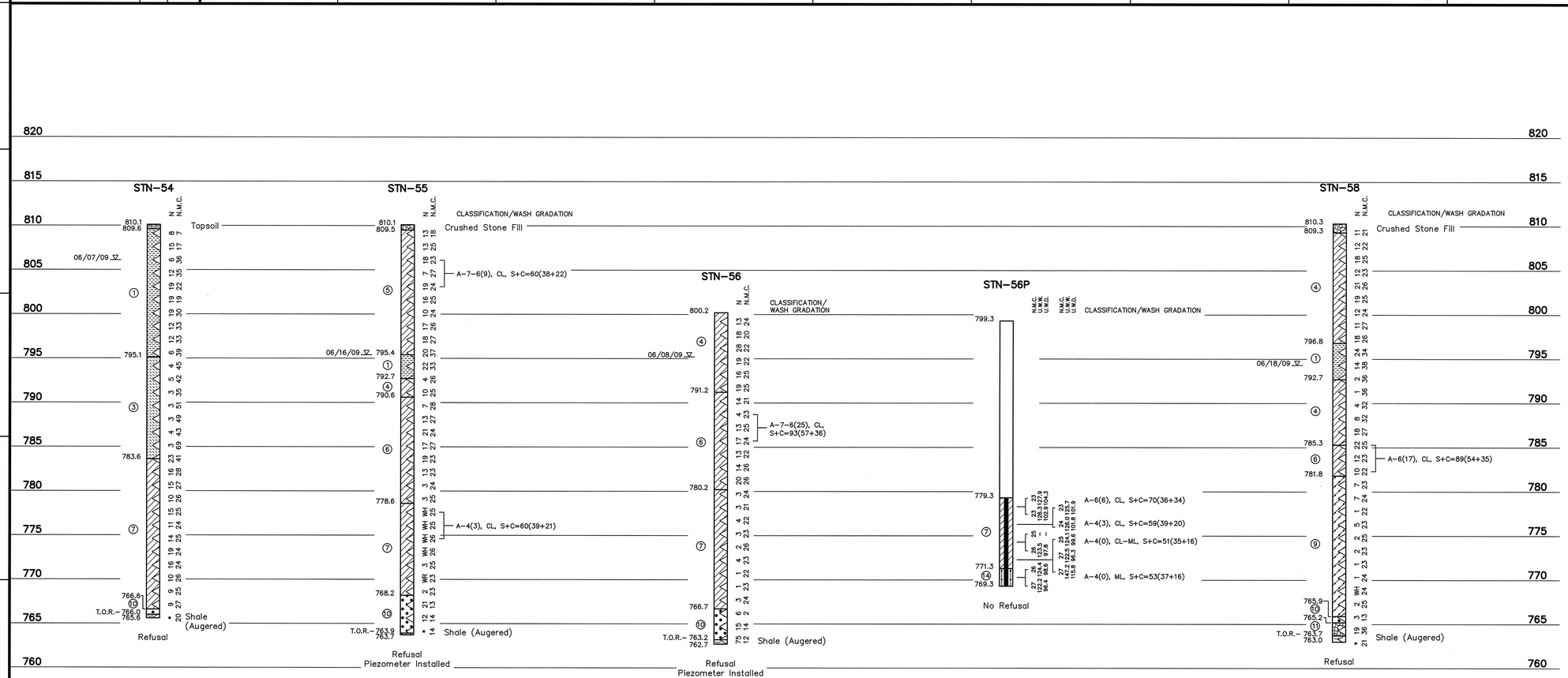

LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
△	Standard Penetration Test Interval
■	Undisturbed Thin-Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock-like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.–	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide-tipped tooth auger bit
No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586-99. Refer to typed boring log.

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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BOND, PJ
N:\TVA\VARIOUS\T10W507\GEOTECH\REVISIONS\DRAWINGS\BRP_GEOTECH_REVISION_RECORDS\10W507-14-REV.DWG

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

HUGO R. APARICIO — REGISTERED ENGINEER — 113995 — STATE OF TENNESSEE

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
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www.stantec.com

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT 10	AS CONST	DISCIPLINE INTERFACE
R –	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–

RECORD DRAWING

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
LOGS OF BORING

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

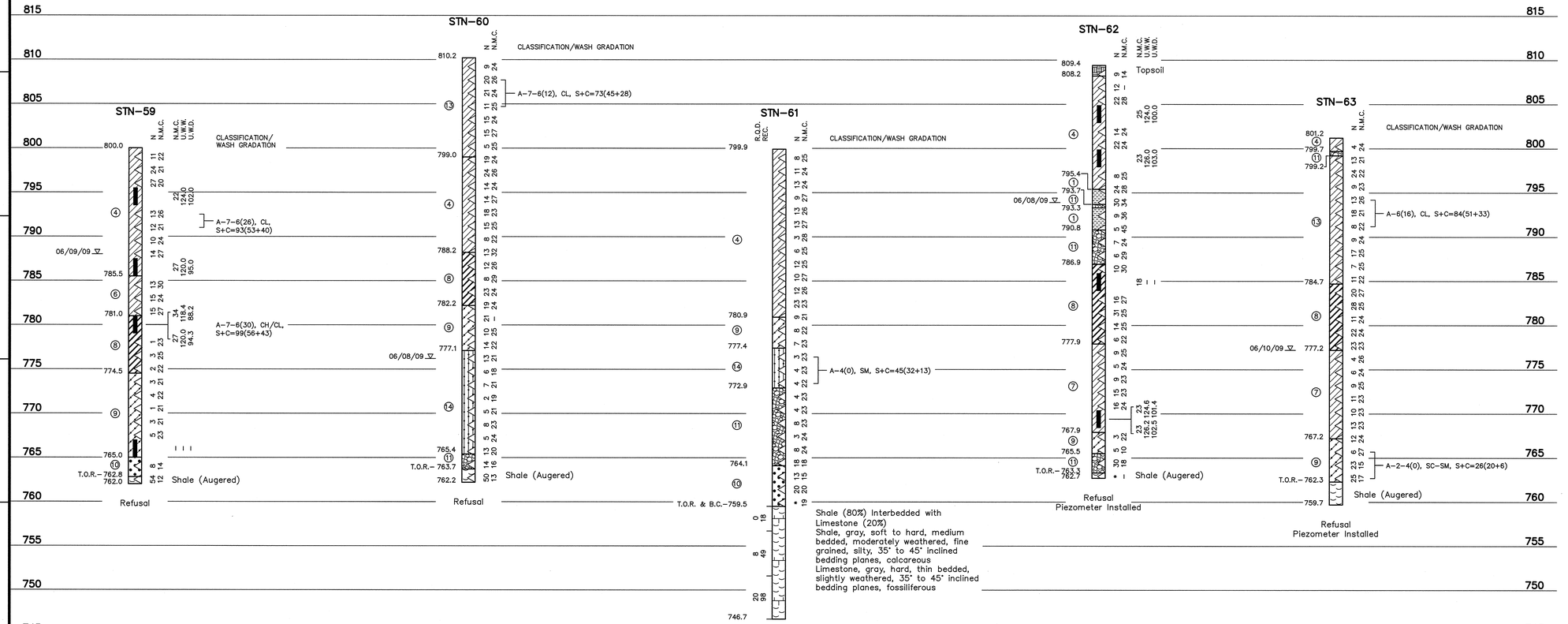
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000 | DATE: 04/09/10 | 49 | C | 10W507-14 | R 0

STANTEC | 0
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
△	Standard Penetration Test Interval
■	Undisturbed Thin-Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09▽	Water Level and Date Recorded
T.O.R.-	Top of Rock (Indicates the beginning of rock-like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.-	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide-tipped tooth auger bit
No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586-99. Refer to typed boring log.

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RECORD DRAWING

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — No. 113895 — STATE OF TENNESSEE

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. NO.
R -	-	-	-	-	-	-	-	-	-	-	-
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	-	-	-

RECORD DRAWING

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION LOGS OF BORING

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

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www.stantec.com

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507-15	R 0

STANTEC | 0
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

PLOT DATE: 04/09/2010 USER: BOND, PJ
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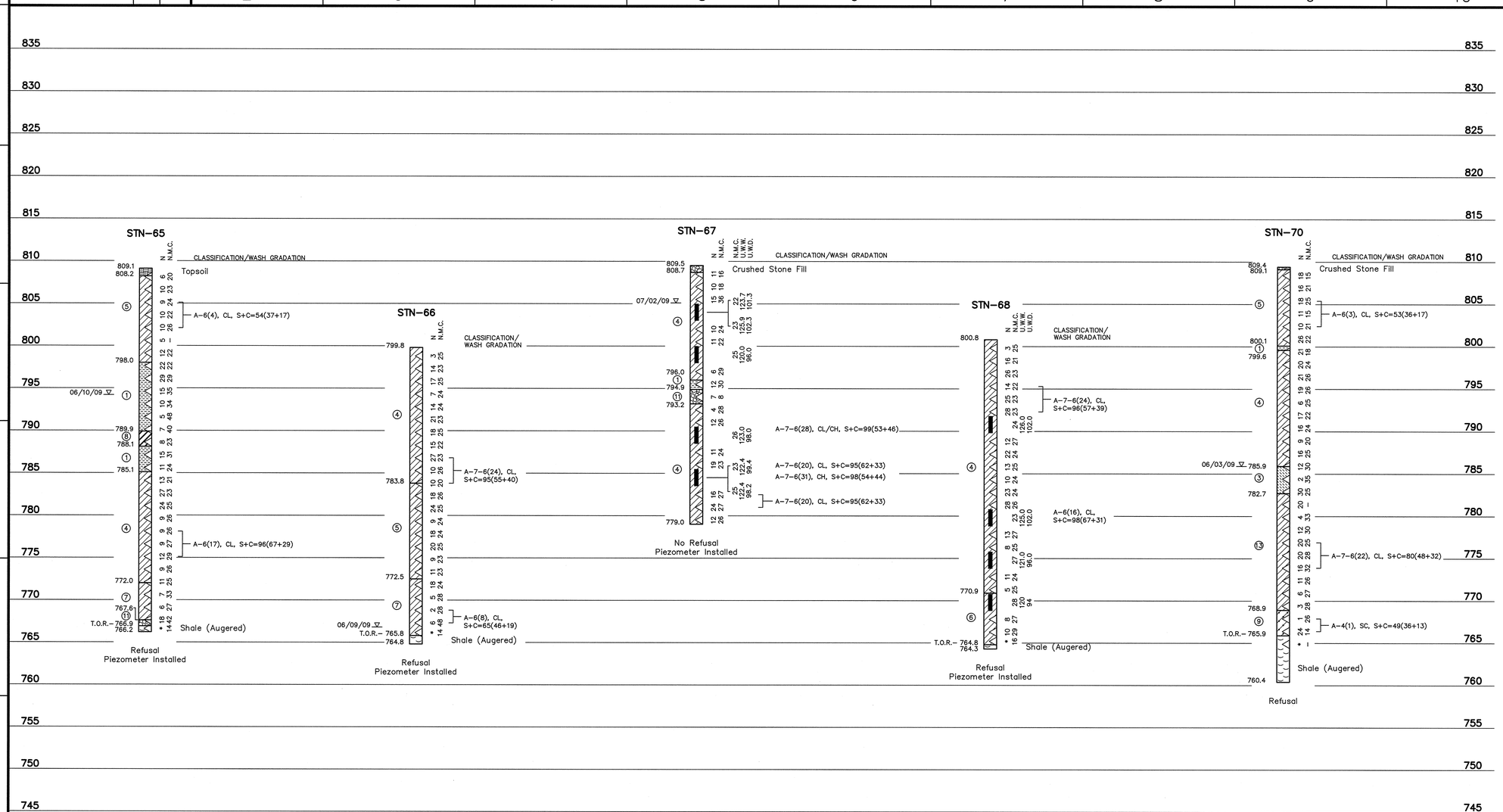

LEGEND

① Fill: Bottom Ash, gray to black, moist to wet, loose to very dense

② Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense

③ Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash

④ Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics

⑤ Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels

⑥ Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands

⑦ Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics

⑧ Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt

⑨ Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay

⑩ Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt

⑪ Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands

⑫ Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay

⑬ Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics

⑭ Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels

WH Weight of Hammer
WR Weight of Rods
△ Standard Penetration Test Interval
■ Undisturbed Thin-Walled (Shelby) Tube Sample
N.M.C. Natural Moisture Content (%)
U.W.W. Unit Weight Wet (lbs./cu.ft.)
U.W.D. Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽ Water Level and Date Recorded
T.O.R.– Top of Rock (Indicates the beginning of rock–like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.– Begin Rock Core
R.Q.D. Rock Quality Designation (%)
REC. Recovery (%)
Refusal Auger Refusal using a carbide–tipped tooth auger bit
No Refusal No Refusal Encountered
* Standard Penetration Test (SPT) terminated per ASTM D 1586–99. Refer to typed boring log.

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RECORD DRAWING

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — STATE OF TENNESSEE

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R –	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–

RECORD DRAWING

DISCIPLINE INTERFACE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
LOGS OF BORING

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
Brentwood, Tennessee
37027-5044
Tel. 615.885.1144
Fax 616.885.1102
www.stantec.com

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

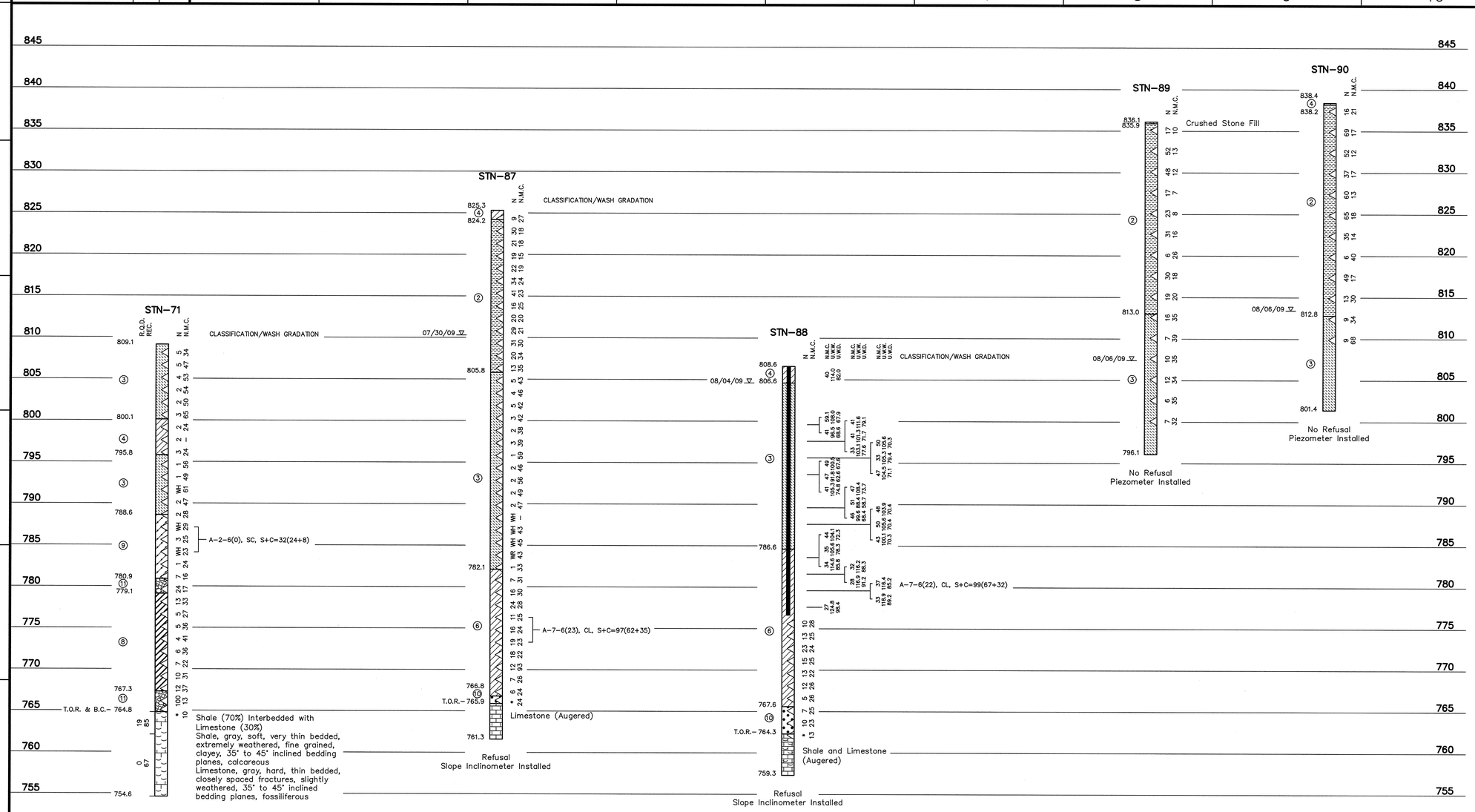
AUTOCAD R 2000	DATE 04/09/10	49	C	10W507-16	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

PLOT DATE: 04/09/2010 USER: BOND, PJ
K:\TVA\DWGS\CURRENT\GEOTECH\DRAWINGS\BRP\GEOTECH\EXCEL\RECORD\10W507-16-R0.DWG



LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
◁	Standard Penetration Test Interval
■	Undisturbed Thin-Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock-like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.–	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide-tipped tooth auger bit
No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586-99. Refer to typed boring log.

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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BOND, PJ
K:\TVA\BRFF\ENGINEERING\CAD_USA\MINGS\SHP\GEOTECH\REVD_RECORD\10W507-17-RD.DWG

For Supporting Design Calculations see FPGBRFFESCDX000000020100002

HUGO R. APARICIO REGISTERED ENGINEER AGRICULTURE COMMERCE No. 113895 STATE OF TENNESSEE

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT SD	AS CONST	REV AT
R –	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–

RECORD DRAWING

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION LOGS OF BORING

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
Brentwood, Tennessee
37027-5044
Tel. 615.885.1144
Fax 616.885.1102
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DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

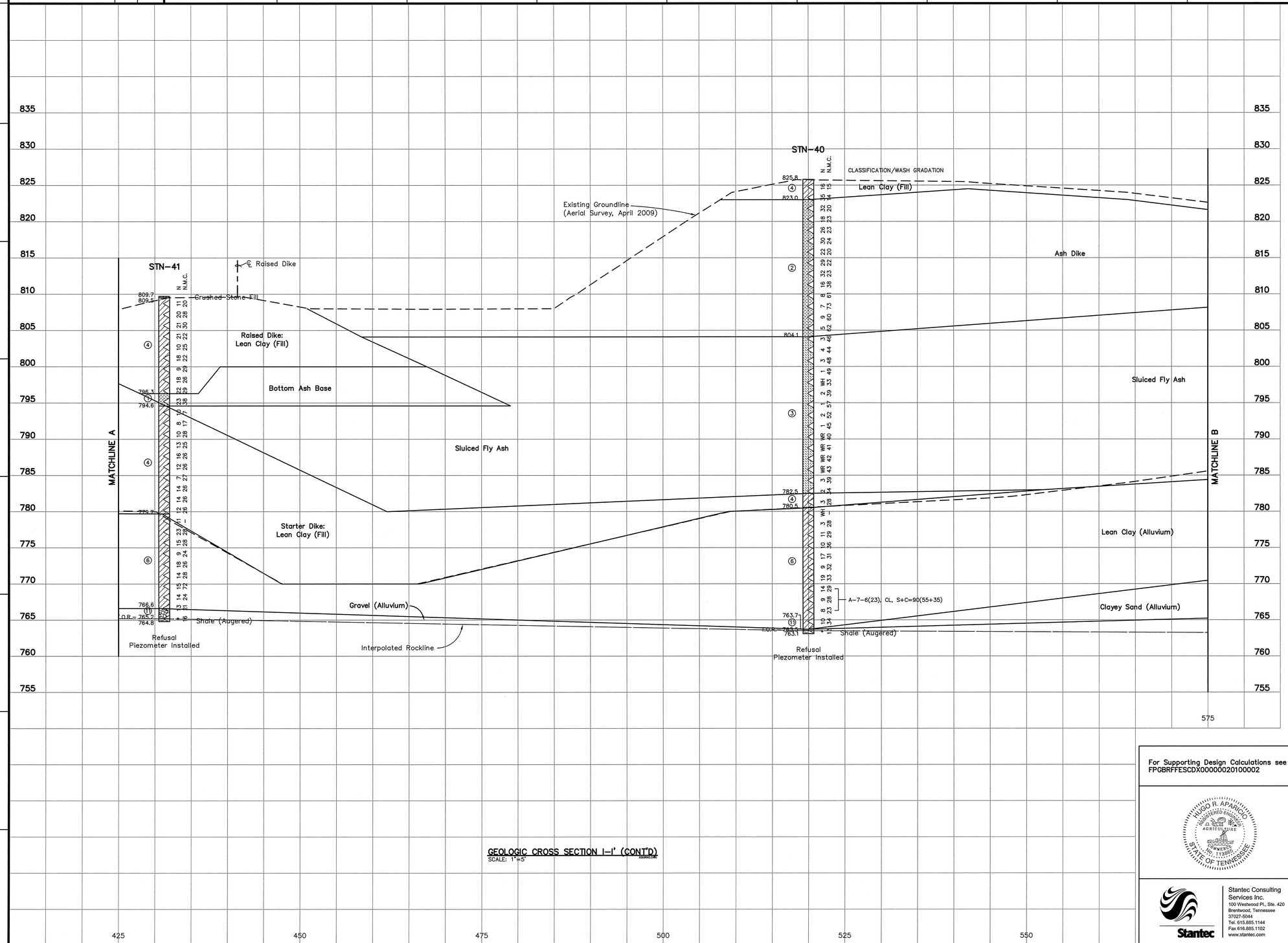
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000 | DATE 04/09/10 | 49 | C | 10W507-17 | R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX W_TVA

C.A.D. DRAWING DO NOT ALTER MANUALLY



GEOLOGIC CROSS SECTION I–I' (CONT'D)
SCALE: 1"=5'

LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
△	Standard Penetration Test Interval
■	Undisturbed Thin-Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock-like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.–	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide-tipped tooth auger bit
No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586-99. Refer to typed boring log.

NOTES:

1. The Tennessee Valley authority Surveying and Project services performed an aerial survey of the Bull Run Fossil Plant in April 2009, a land survey in September 2009, a hydrographic survey of the Fly Ash Disposal Area 2 in February 2006 and a hydrographic survey of the Clinch River in September 2009.
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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BRWD, PJ
W:\1714\ACTIVE\171465118\DRAWINGS\ARCHITECTURAL\DRAWINGS\GBF\GEOTECH\REVD_RECORD\10W507-18-R0.DWG

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R –	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–

RECORD DRAWING

DISCIPLINE INTERFACE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
GEOLOGIC CROSS SECTION I–I'

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — No. 113885 — STATE OF TENNESSEE

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W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

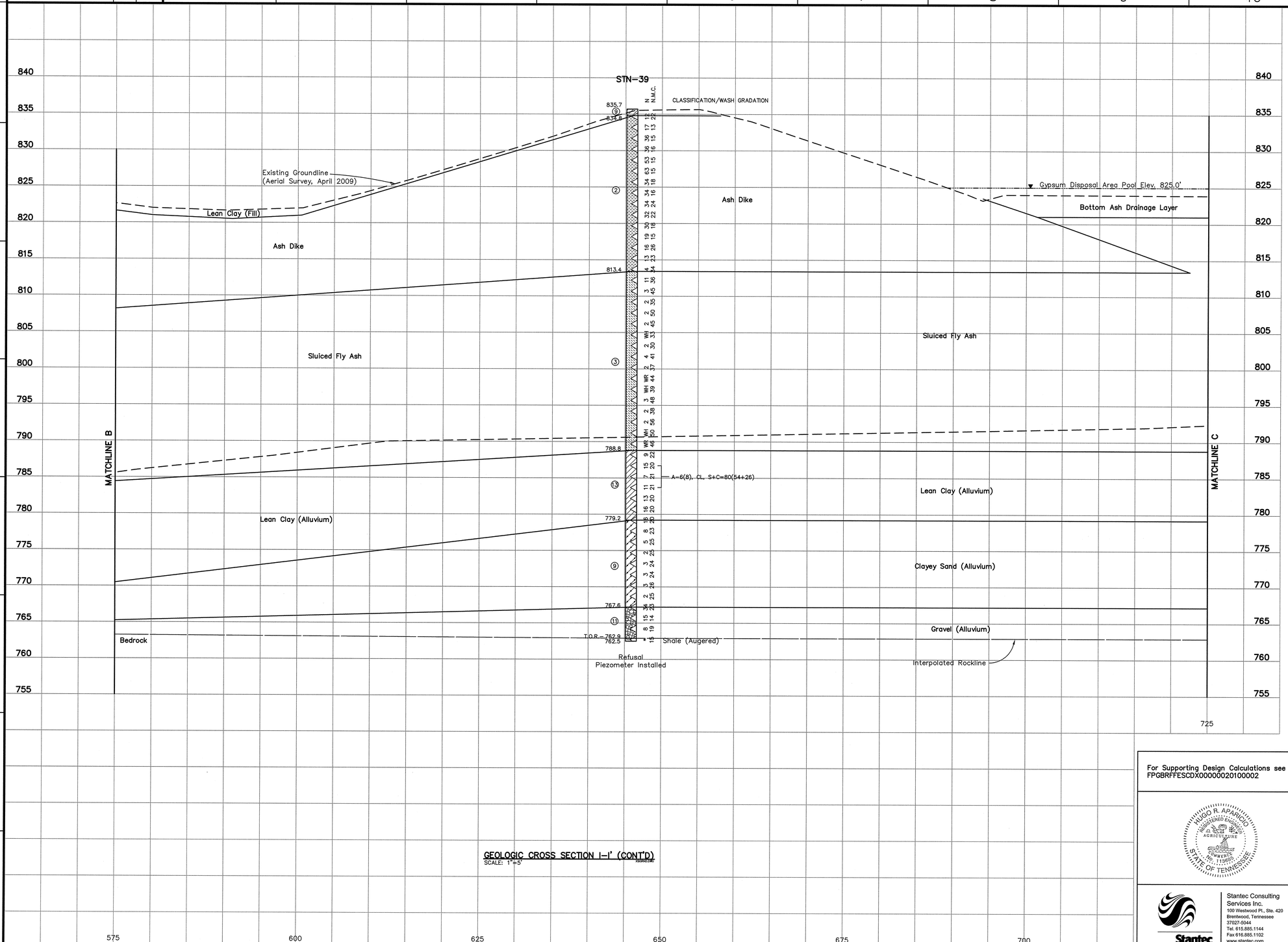
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507-18	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
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⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
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⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
◁	Standard Penetration Test Interval
■	Undisturbed Thin-Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09▽	Water Level and Date Recorded
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B.C.–	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide-tipped tooth auger bit
No Refusal	No Refusal Encountered
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GEOLOGIC CROSS SECTION I-I' (CONT'D)
SCALE: 1"=5'

RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BOND, PJ
V:\1714\ACTIVE\171449819\ENVIRONMENTAL\DRAWINGS\BRF\GEOTECH\REVD_RECORD\10W507-19-R0.DWG

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. NO.
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	R 0
RECORD DRAWING											

DISCIPLINE INTERFACE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
GEOLOGIC CROSS SECTION I-I'

HUGO R. APARICIO — REGISTERED ENGINEER — DEPARTMENT OF AGRICULTURE — COMMERCE — No. 113980 — STATE OF TENNESSEE

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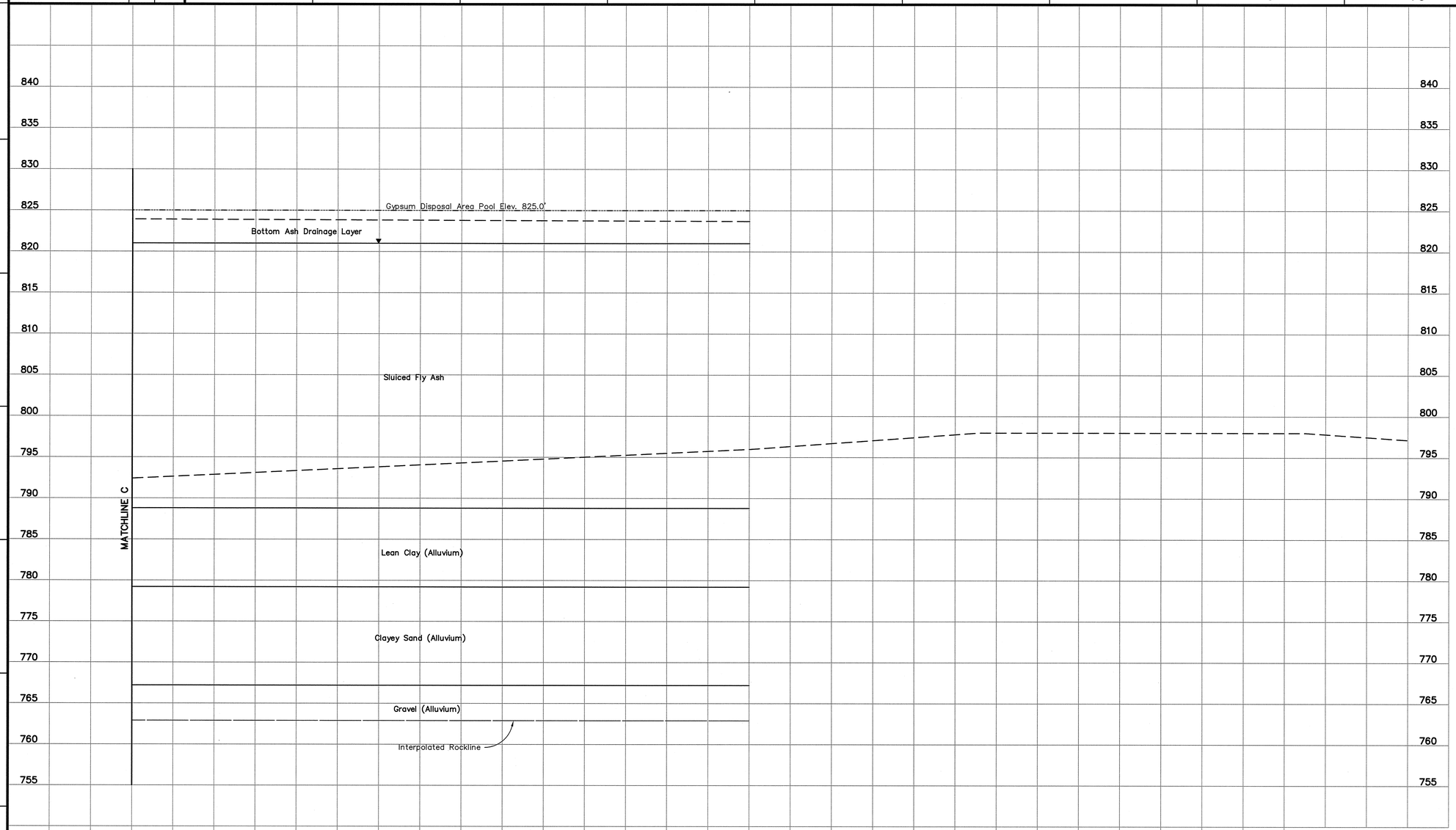
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507-19	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



GEOLOGIC CROSS SECTION I–I' (CONT'D)
SCALE: 1"=5'

LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
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⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
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⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
◁	Standard Penetration Test Interval
■	Undisturbed Thin–Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
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REC.	Recovery (%)
Refusal	Auger Refusal using a carbide–tipped tooth auger bit
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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BOND, PJ
N:\1714\ACTIVE\171446818\ENVIRONMENTAL\DRAWINGS\BRF\GEOTECH\REVD_RECORD\10W507-20-RG.DWG

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

R –	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–

RECORD DRAWING

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT EP	AS CONST	REV. SYM

DISCIPLINE INTERFACE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
GEOLOGIC CROSS SECTION I–I'

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — COMMERCE — STATE OF TENNESSEE

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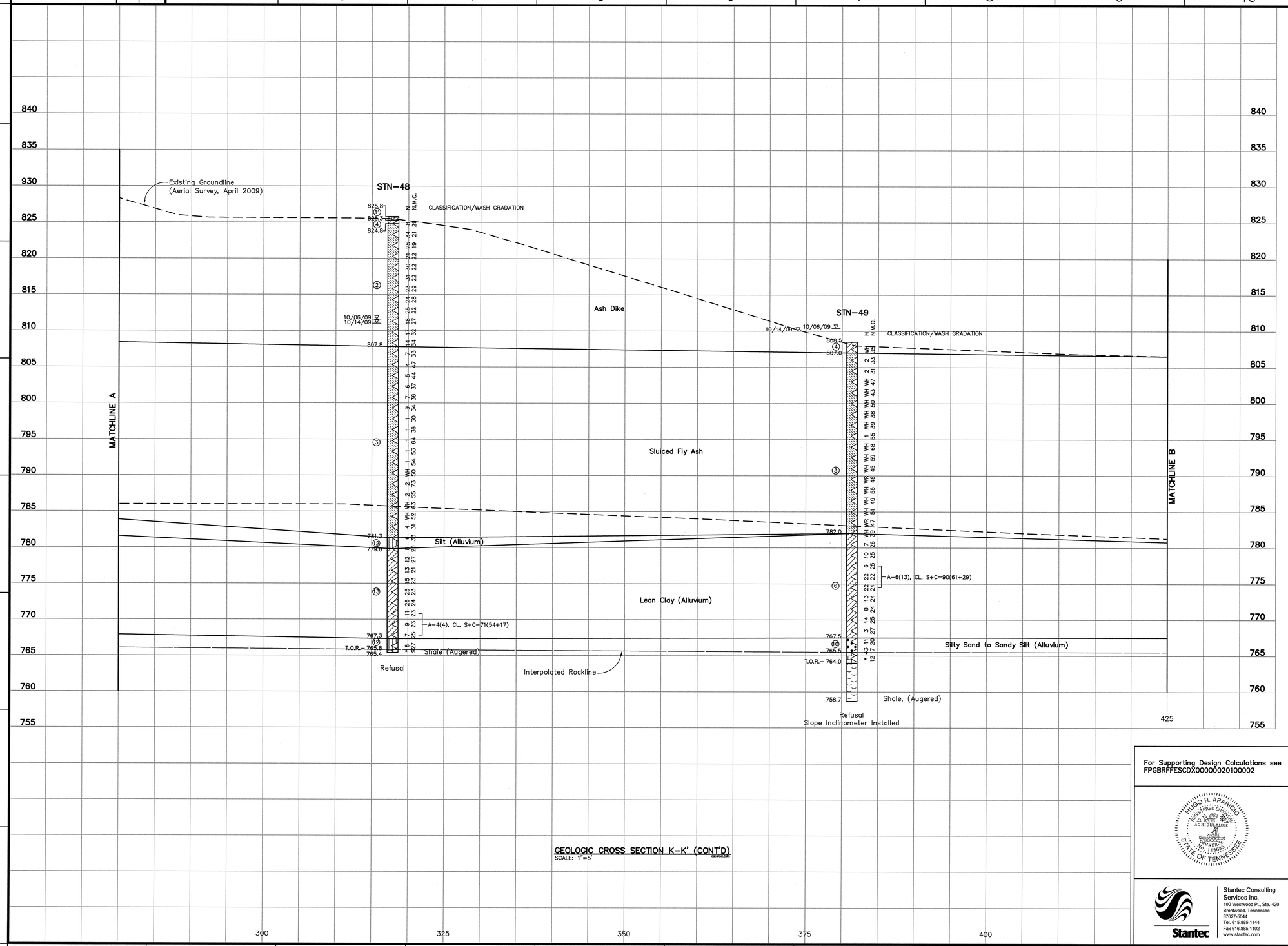
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507-20	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



GEOLOGIC CROSS SECTION K-K' (CONT'D)

SCALE: 1"=5'

LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
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⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
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WH	Weight of Hammer
WR	Weight of Rods
◁	Standard Penetration Test Interval
■	Undisturbed Thin-Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
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03/31/09 ▽	Water Level and Date Recorded
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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: RPHO PU
X:\17+A\ACTIVE\177468\ENVIRONMENTAL\DRAWINGS\BRF\GEOTECH\NEW\0_RECORD\10W507-21-RD.DWG

For Supporting Design Calculations see FPGBRFFESCDX0000002010002

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. DESCRIPTION
R-	-	-	-	-	-	-	-	-	-	-	-
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	-	-	DISCIPLINE INTERFACE
RECORD DRAWING											

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
GEOLOGIC CROSS SECTION K-K'

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — CERTIFICATE NO. 113085 — STATE OF TENNESSEE

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

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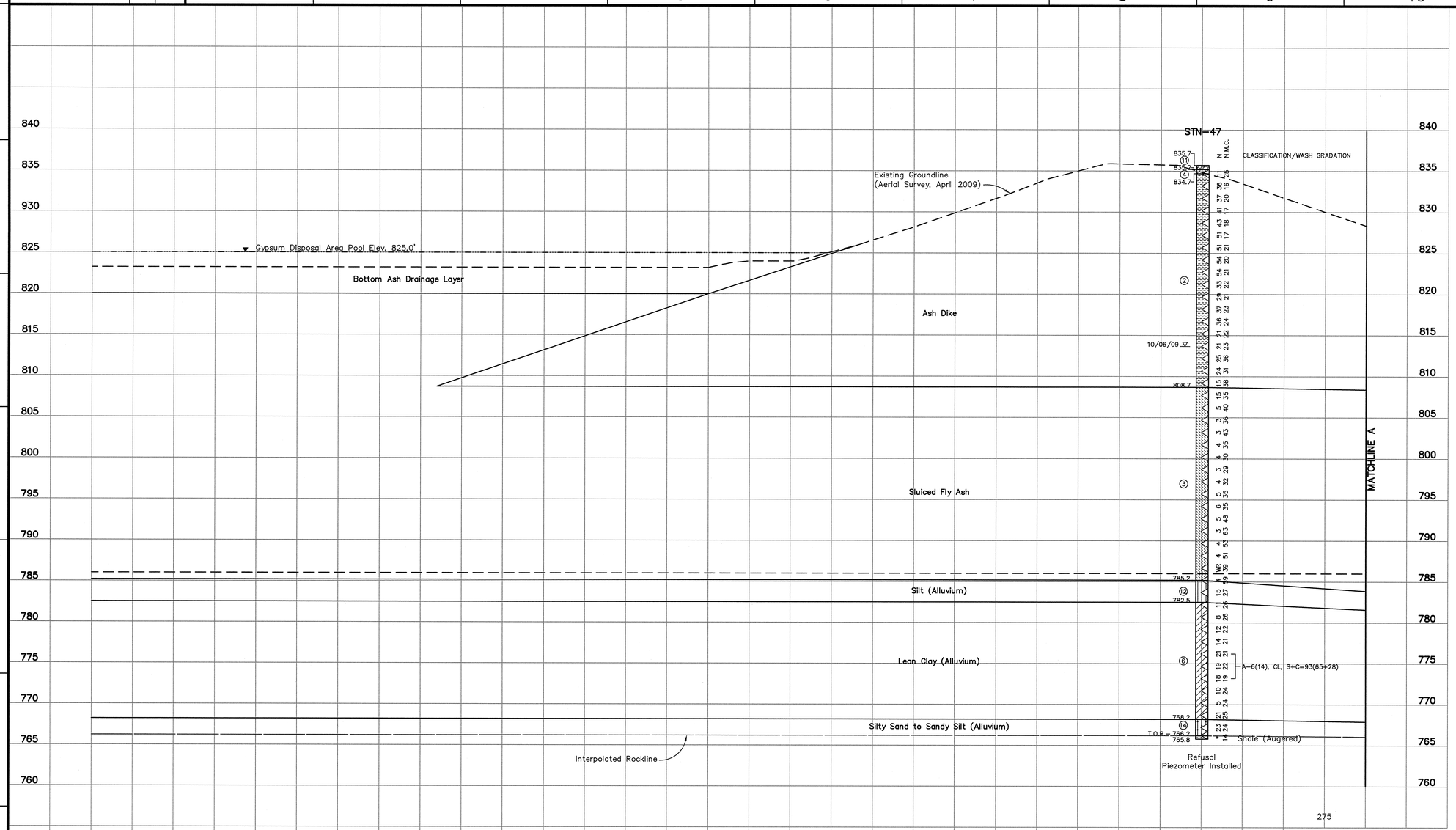
AUTOCAD R 2000	DATE 04/09/10	49	C	10W507-21	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



GEOLOGIC CROSS SECTION K-K'
SCALE: 1"=5'

LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
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WR	Weight of Rods
◁	Standard Penetration Test Interval
■	Undisturbed Thin-Walled (Shelby) Tube Sample
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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BKING_PJ
W:\1714\ACTIVE\171448818\ENVIRONMENTAL\DRAWINGS\BRF\GEOTECH\REVD_RECORD\10W507-22-R0.DWG

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R -	-	-	-	-	-	-	-	-	-	-
R 0	04/09/10 RECORD DRAWING	WRM	TJ	PVK	SF	HRA	HRA	TJ	-	-

DISCIPLINE INTERFACE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
GEOLOGIC CROSS SECTION K-K'

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — COMMERCE — NO. 119808 — STATE OF TENNESSEE

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
Brentwood, Tennessee
37027-5044
Tel. 615.885.1144
Fax 616.885.1102
www.stantec.com

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

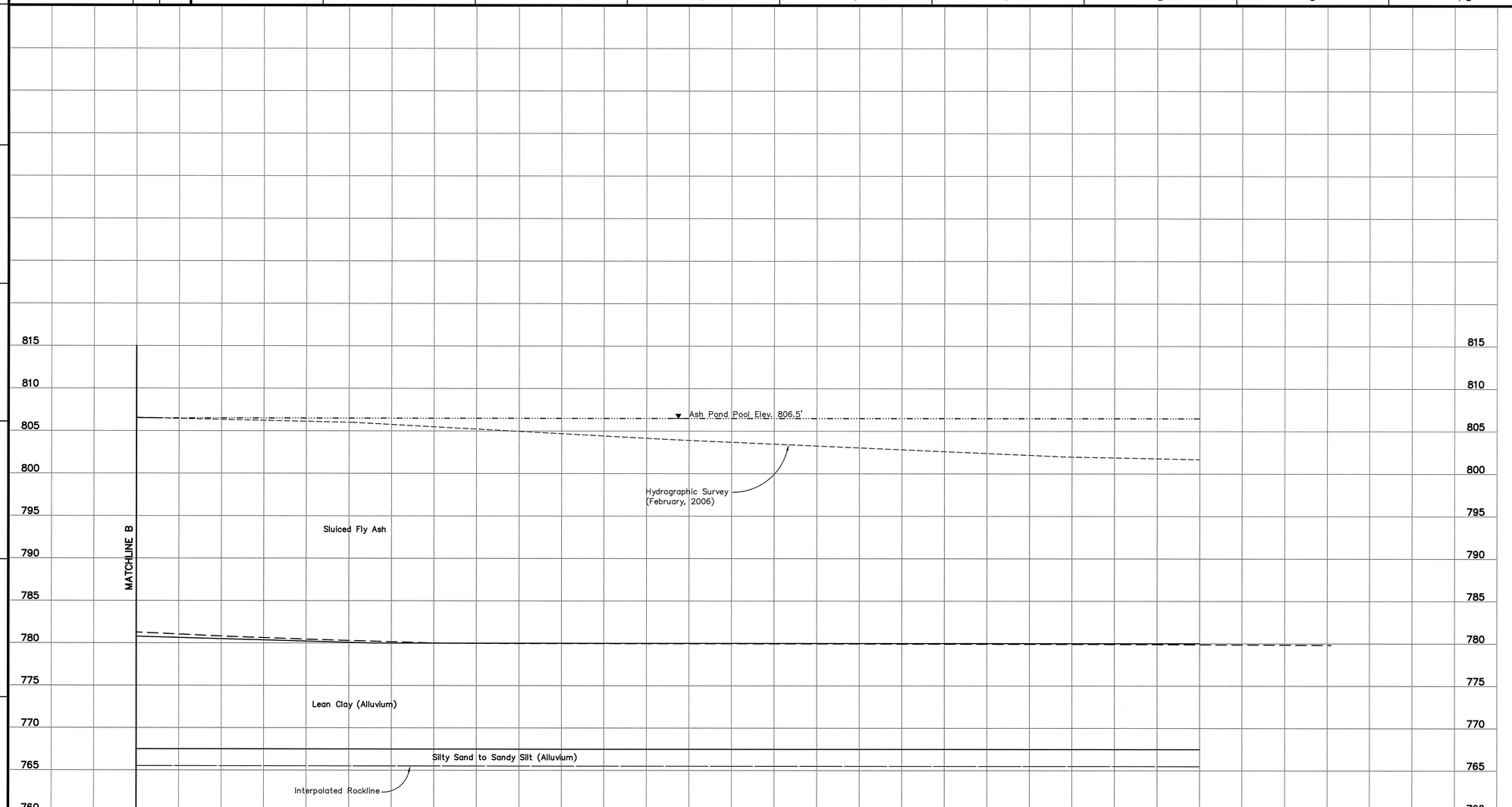
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507-22	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



GEOLOGIC CROSS SECTION K–K' (CONT'D)
SCALE: 1"=5'

LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
◁	Standard Penetration Test Interval
■	Undisturbed Thin–Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock–like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.–	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide–tipped tooth auger bit
No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586–99. Refer to typed boring log.

NOTES:

1. The Tennessee Valley authority Surveying and Project services performed an aerial survey of the Bull Run Fossil Plant in April 2009, a land survey in September 2009, a hydrographic survey of the Fly Ash Disposal Area 2 in February 2006 and a hydrographic survey of the Clinch River in September 2009.
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RECORD DRAWING

PLOTTED: 04/09/2010 (WEDN. BOARD, FL)
by TVA, WRM, C:\DOCUMENTS AND SETTINGS\WRMARTIN\DESKTOP\DRAWINGS.DIR\GEOTECH\REVISED_RECORD\10W507-23-REV.DWG

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — TENNESSEE — 113 — STATE OF TENNESSEE

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. OR
R –	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–

RECORD DRAWING

DISCIPLINE INTERFACE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
GEOLOGIC CROSS SECTION K–K'

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

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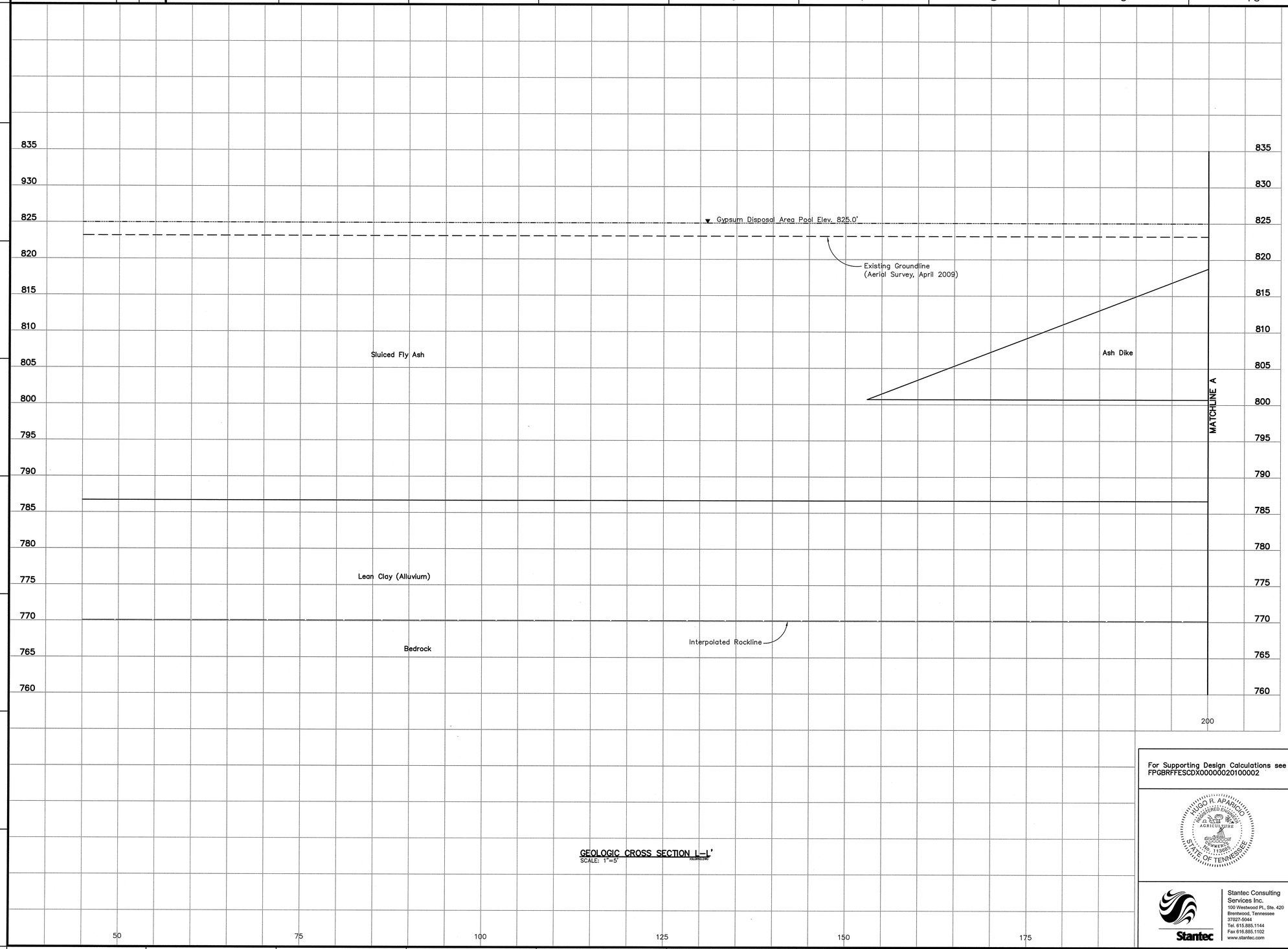
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000 | DATE 04/09/10 | 49 | C | 10W507–23 | R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



GEOLOGIC CROSS SECTION L–L'
SCALE: 1"=5'

LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
◁	Standard Penetration Test Interval
■	Undisturbed Thin–Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock–like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.–	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide–tipped tooth auger bit
No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586–99. Refer to typed boring log.

NOTES:

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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BDRO, PJ
S:\TVA\ACAD\STDARDS\ENGINEERING\DRAWINGS\SRF\GEOTECH\PROFILES\CROSS\10W507-24-RD.DWG

For Supporting Design Calculations see FPGBRFFESCDX0000020100002

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — NUMBER 113005 — STATE OF TENNESSEE

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Fax 616.885.1102
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REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. NO.
R –	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–
RECORD DRAWING											

DISCIPLINE: INTERFACE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
GEOLOGIC CROSS SECTION L–L'

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

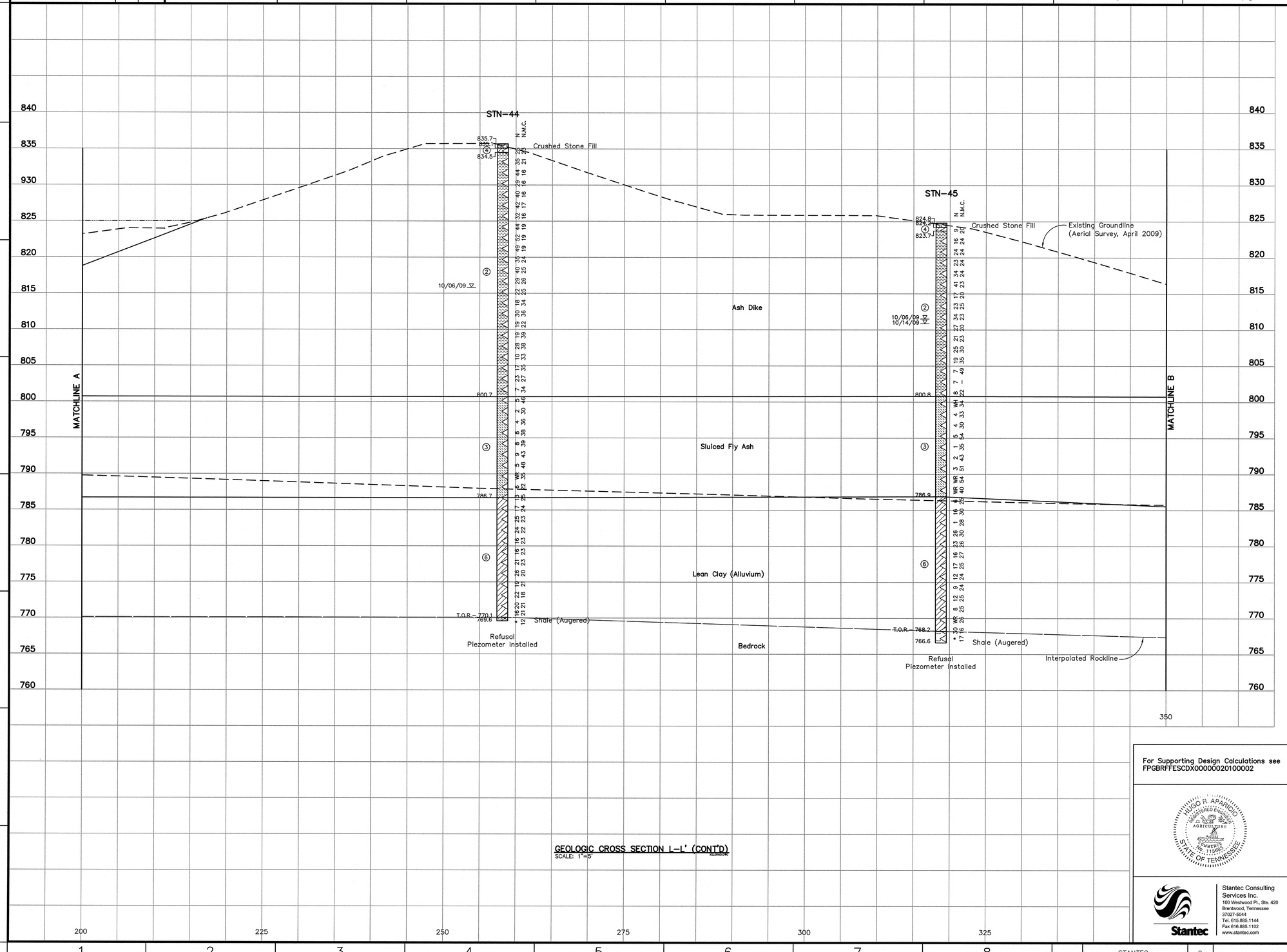
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507–24	R 0

STANTEC | 0
TASK COMPLETED BY: | REV. NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



GEOLOGIC CROSS SECTION L-L' (CONT'D)
SCALE: 1"=5'

LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
◁	Standard Penetration Test Interval
■	Undisturbed Thin-Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.-	Top of Rock (Indicates the beginning of rock-like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.-	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide-tipped tooth auger bit
No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586-99. Refer to typed boring log.

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RECORD DRAWING

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	DISCIPLINE INTERFACE
R –	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–
RECORD DRAWING											

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
GEOLOGIC CROSS SECTION L-L'

HUGO R. APARICIO — REGISTERED ENGINEER — No. 113685 — STATE OF TENNESSEE

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DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507-25	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

PLOT DATE: 04/09/2010 USER: BDAO, FJ
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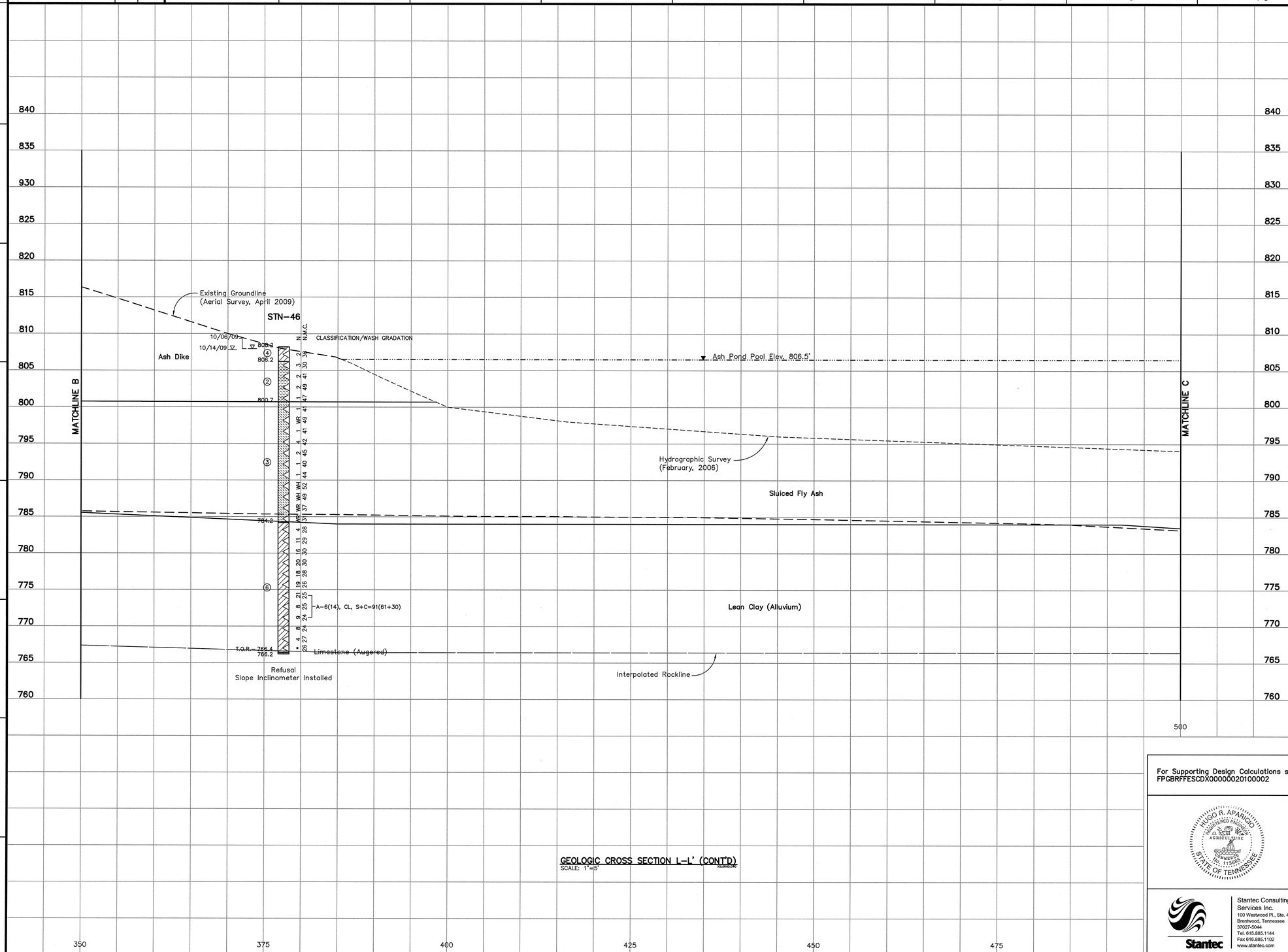

GEOLOGIC CROSS SECTION L-L' (CONT'D)
SCALE: 1"=5'

LEGEND

① Fill: Bottom Ash, gray to black, moist to wet, loose to very dense

② Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense

③ Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash

④ Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics

⑤ Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels

⑥ Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands

⑦ Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics

⑧ Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt

⑨ Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay

⑩ Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt

⑪ Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands

⑫ Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay

⑬ Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics

⑭ Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels

WH Weight of Hammer
WR Weight of Rods
◁ Standard Penetration Test Interval
■ Undisturbed Thin-Walled (Shelby) Tube Sample
N.M.C. Natural Moisture Content (%)
U.W.W. Unit Weight Wet (lbs./cu.ft.)
U.W.D. Unit Weight Dry (lbs./cu.ft.)
03/31/09▽ Water Level and Date Recorded
T.O.R.– Top of Rock (Indicates the beginning of rock-like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.– Begin Rock Core
R.Q.D. Rock Quality Designation (%)
REC. Recovery (%)
Refusal Auger Refusal using a carbide-tipped tooth auger bit
No Refusal No Refusal Encountered
* Standard Penetration Test (SPT) terminated per ASTM D 1586-99. Refer to typed boring log.

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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: RDAD, PJ
N:\TVA\ACAD\GEOTECH\BRF\ENVIRONMENTAL\DRAWINGS\BRF\GEOTECH\REVS_ISSUED\10W507-26-R0.DWG

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

R –	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	DISCIPLINE INTERFACE
RECORD DRAWING											
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. ID

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
GEOLOGIC CROSS SECTION L-L'

HUGO R. APARICIO REGISTERED ENGINEER AGRICULTURE STATE OF TENNESSEE

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DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
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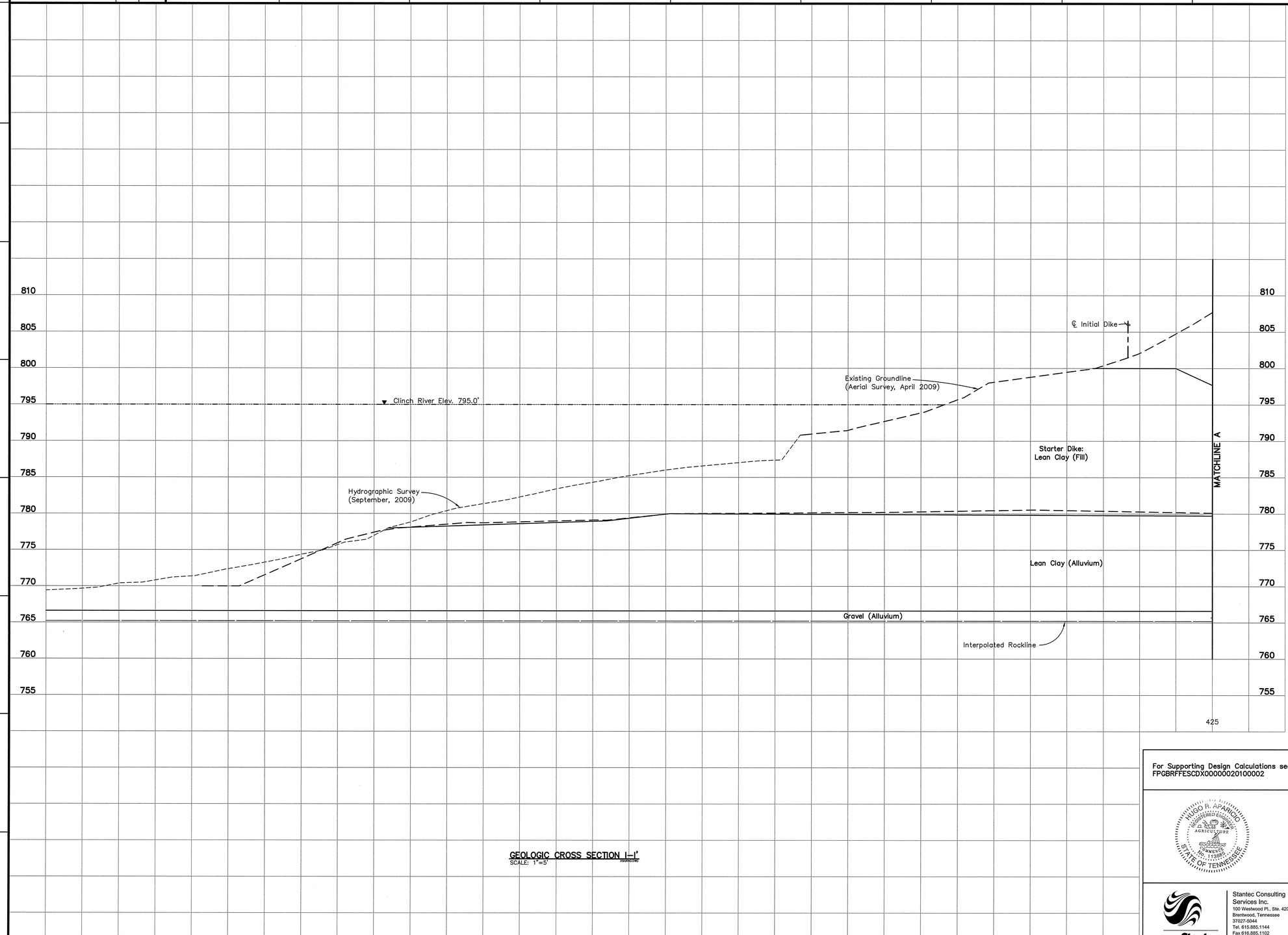
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507-26	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



GEOLOGIC CROSS SECTION I–I'
SCALE: 1"=5'

LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
◁	Standard Penetration Test Interval
■	Undisturbed Thin–Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock–like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.–	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
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No Refusal	No Refusal Encountered
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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BWHS, PJ
W:\17-HA\ACTIVE\177448\18 ENVIRONMENTAL\DRAWINGS\BRF\GEOTECH\REVD_RECORD\10W507-27-R0.DWG

For Supporting Design Calculations see FPGBRFFESCDX0000002010002

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — No. 113985 — STATE OF TENNESSEE

R –	–	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–	DISCIPLINE INTERFACE
RECORD DRAWING												
REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. NO.	

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
GEOLOGIC CROSS SECTION I–I'

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
Brentwood, Tennessee
37027-5044
Tel. 615.885.1144
Fax 616.885.1102
www.stantec.com

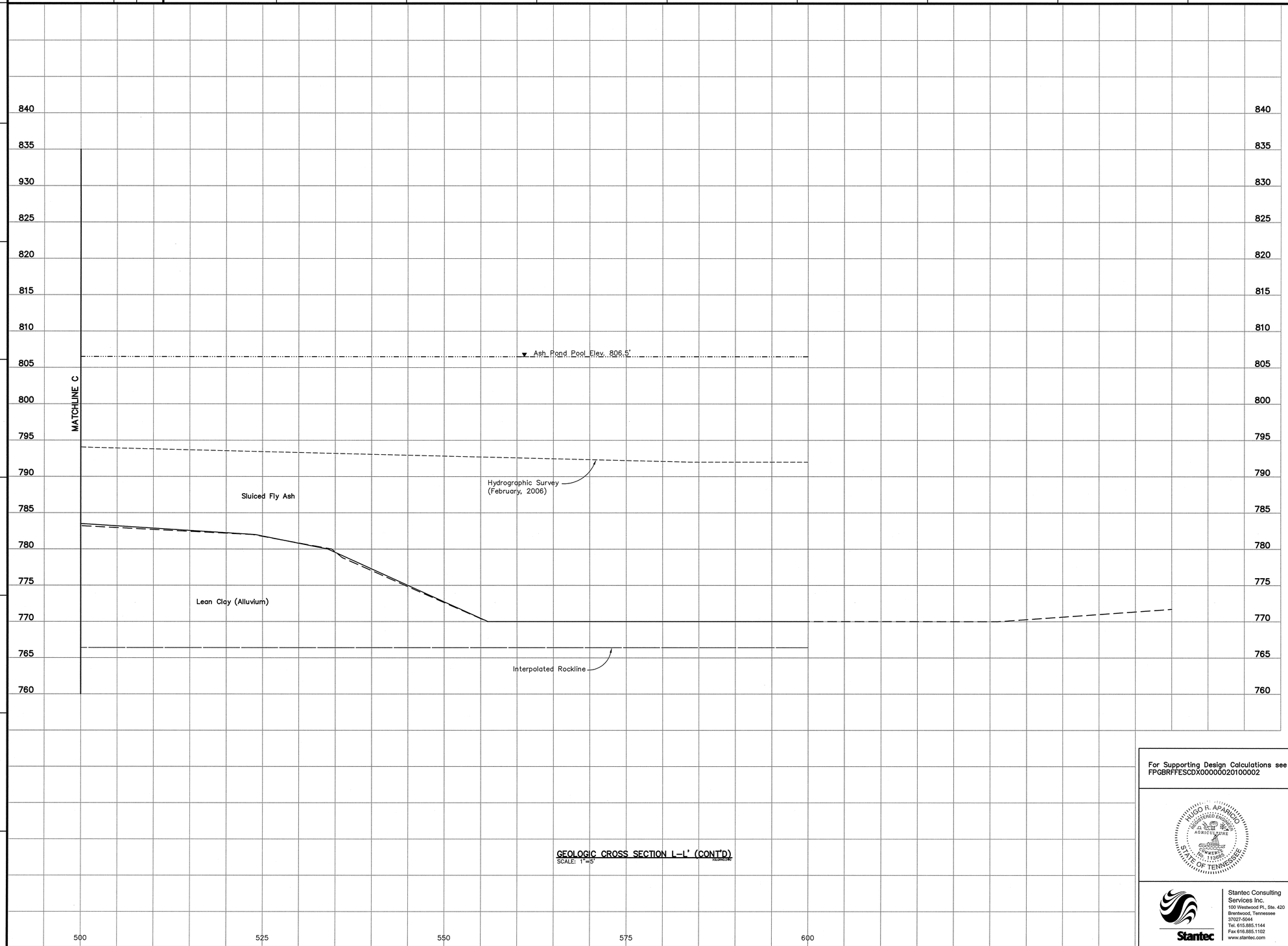
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507–27	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



GEOLOGIC CROSS SECTION L–L' (CONT'D)
SCALE: 1"=5'

LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
◁	Standard Penetration Test Interval
■	Undisturbed Thin–Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock–like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.–	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide–tipped tooth auger bit
No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586–99. Refer to typed boring log.

NOTES:

1. The Tennessee Valley authority Surveying and Project services performed an aerial survey of the Bull Run Fossil Plant in April 2009, a land survey in September 2009, a hydrographic survey of the Fly Ash Disposal Area 2 in February 2006 and a hydrographic survey of the Clinch River in September 2009.
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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BOND, PJ
K:\TVA\ARCHITECTURE\BFS\ENVIRONMENTAL\GRAPHICS\BFS_GEOTECH_ENGR_REC\DWG\10W507-28-RD.DWG

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV ID
R–	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–
RECORD DRAWING											

DISCIPLINE INTERFACE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
GEOLOGIC CROSS SECTION L–L'

HUGO R. APARICIO REGISTERED ENGINEER AGRICULTURE STATE OF TENNESSEE 113951

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W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

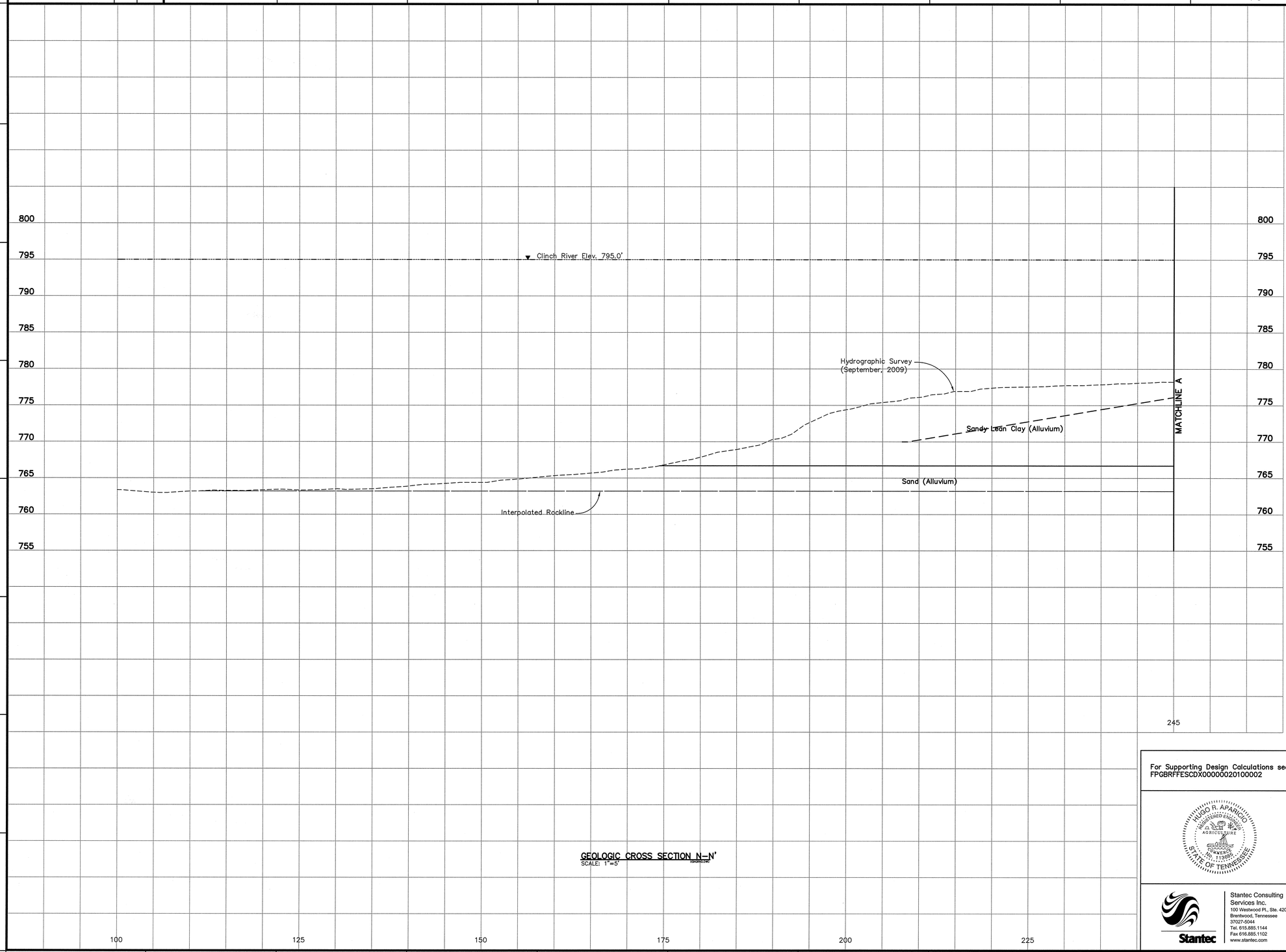
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507–28	R 0

STANTEC | 0
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



GEOLOGIC CROSS SECTION N–N'
SCALE: 1"=5'

LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
◁	Standard Penetration Test Interval
■	Undisturbed Thin–Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock–like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.–	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide–tipped tooth auger bit
No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586–99. Refer to typed boring log.

NOTES:

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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BOND, PJ
N:\TVA\ACAD\TVAWIDE\ENGINEERING\ALL\DRAWINGS\SURFLIQ\SECTION\NEW_SECS\10W507-29-RR.DWG

For Supporting Design Calculations see FPGBRFFESCDX0000002010000 2

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. ID
R–	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–
RECORD DRAWING											

DISCIPLINE INTERFACE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
GEOLOGIC CROSS SECTION N–N'

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — 113955 — STATE OF TENNESSEE

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DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

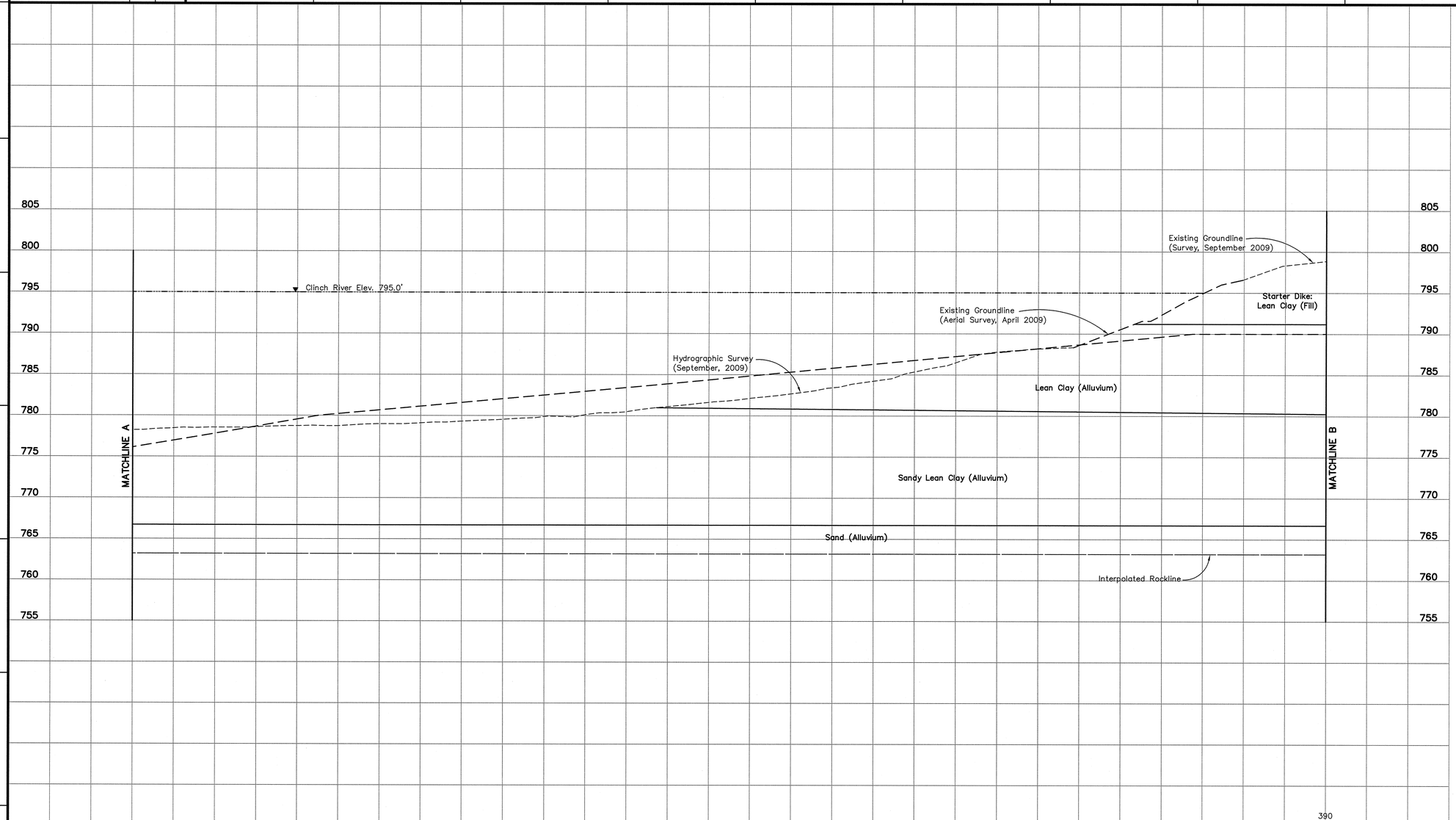
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507–29	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



GEOLOGIC CROSS SECTION N–N' (CONT'D)
SCALE: 1"=5'

LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
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④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
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⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
◁	Standard Penetration Test Interval
■	Undisturbed Thin–Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock–like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
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REC.	Recovery (%)
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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BSNG, PJ
N:\TVA\ACAD\TVAWIDE\ENGINEERING\ALL\DRAWINGS\BFF\GEOTECH\MEWL_BEC0901\10W507-30-RD.DWG

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. ID
R–	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–
RECORD DRAWING											

DISCIPLINE INTERFACE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
GEOLOGIC CROSS SECTION N–N'

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — NO. 113955 — STATE OF TENNESSEE

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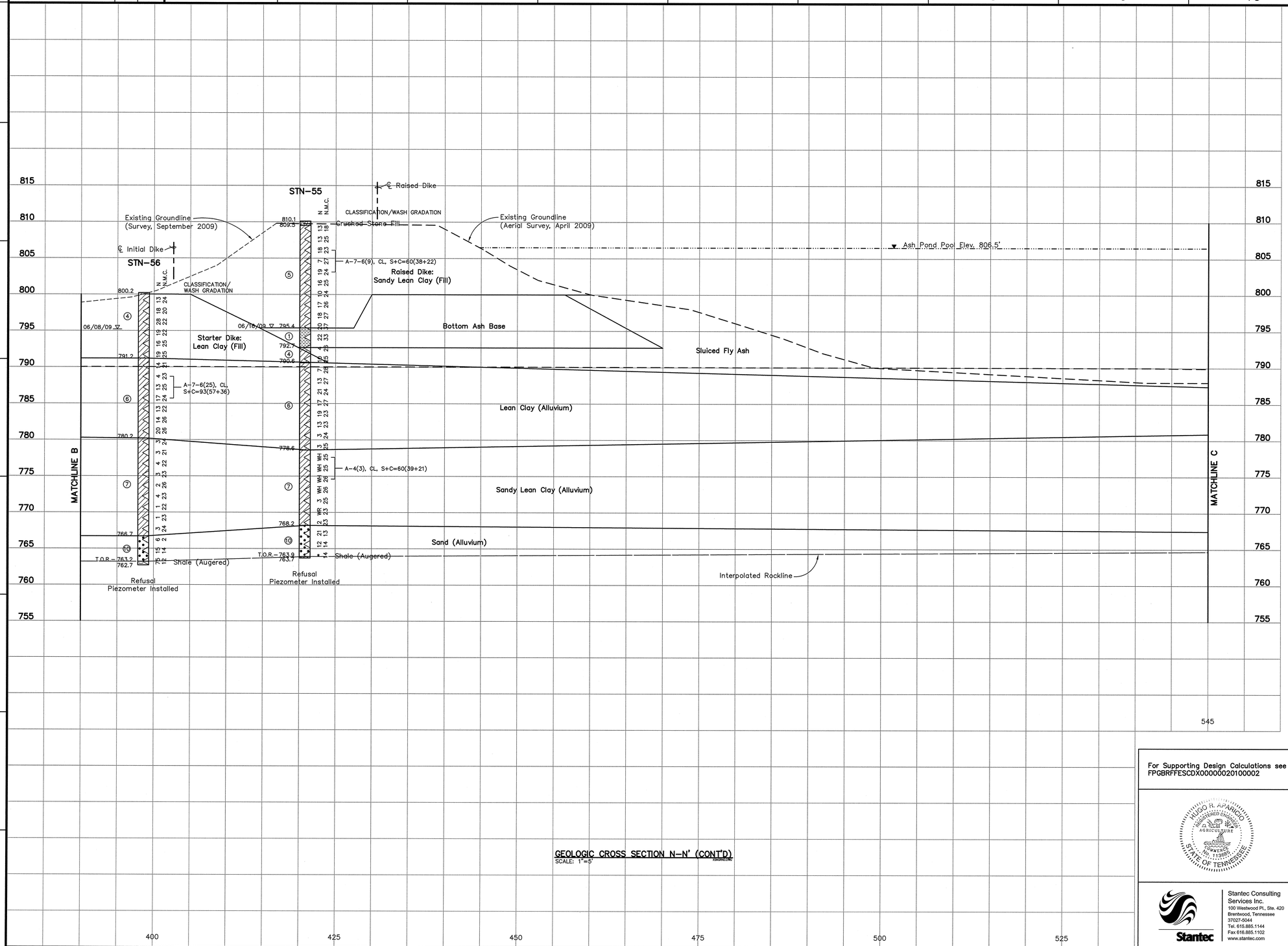
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507–30	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



GEOLOGIC CROSS SECTION N-N' (CONT'D)
SCALE: 1"=5'

LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
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⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
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WH	Weight of Hammer
WR	Weight of Rods
◁	Standard Penetration Test Interval
■	Undisturbed Thin-Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock-like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
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R.Q.D.	Rock Quality Designation (%)
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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BDND, TJ
N:\TVA\CIVIL\GEOTECH\DRAWINGS\FINAL\10AWMXD\SWF\GEOTECH\MXDS_REC\R0\10W507-31-R0.DWG

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV SYM
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–
RECORD DRAWING											

DISCIPLINE INTERFACE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
GEOLOGIC CROSS SECTION N-N'

HUGO R. APARICIO REGISTERED ENGINEER U.S. DEPARTMENT OF AGRICULTURE No. 113993 STATE OF TENNESSEE

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DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
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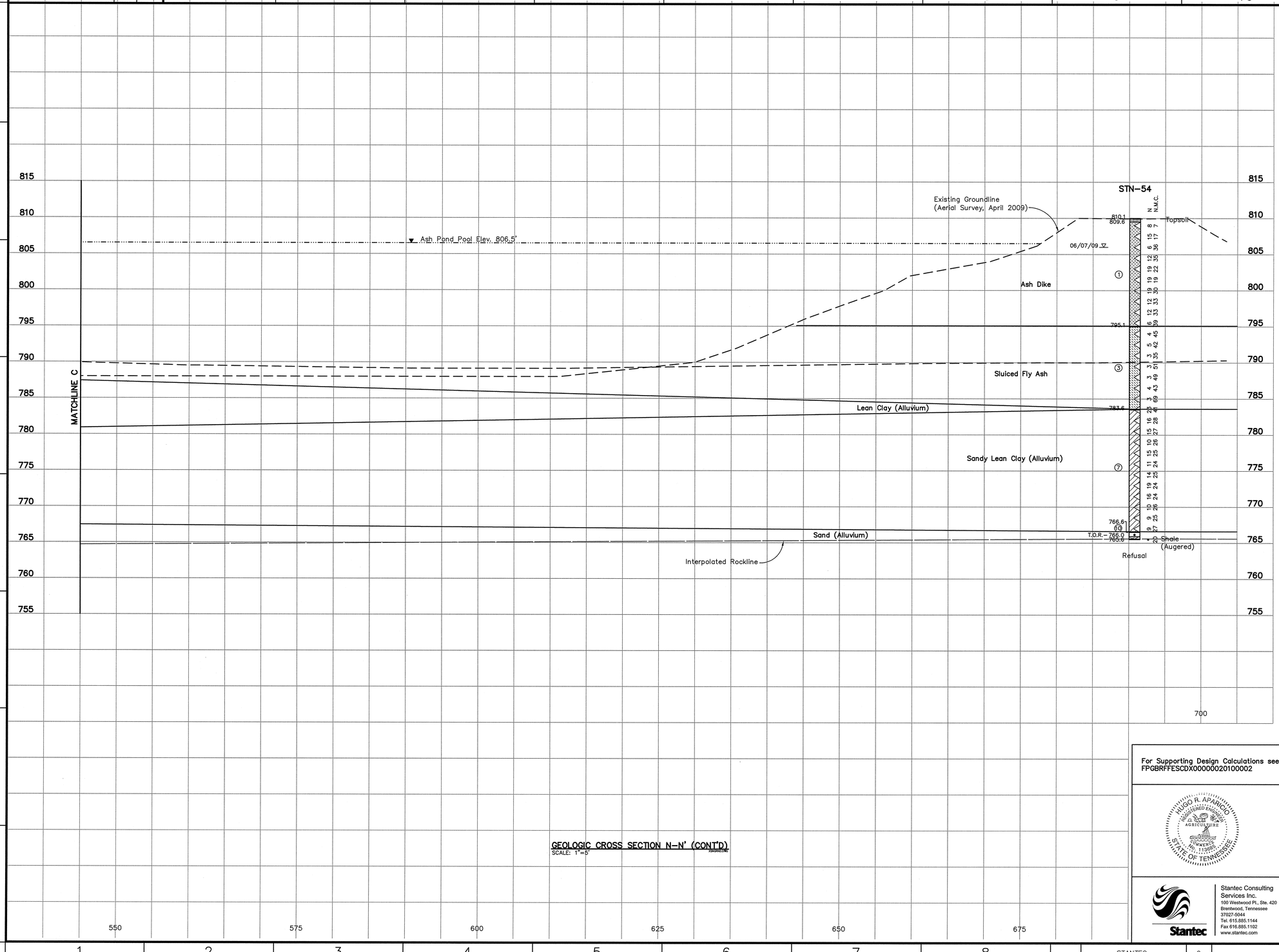
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507-31	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



GEOLOGIC CROSS SECTION N-N' (CONT'D)
SCALE: 1"=5'

LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
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WH	Weight of Hammer
WR	Weight of Rods
◁	Standard Penetration Test Interval
■	Undisturbed Thin-Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BOWDL.PJ
N:\TVA\ACAD\ECT\10W510\GDR\10W510_LGA.MMCS.DWG (GEOTECH\NEW_SECTION\10W507-32-RD.DWG

For Supporting Design Calculations see FPGBRFFESCDX0000002010000002

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. ID
R-	-	-	-	-	-	-	-	-	-	-	-
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	-	-	-
RECORD DRAWING											

DISCIPLINE INTERFACE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
GEOLOGIC CROSS SECTION N-N'

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — NUMBER 113695 — STATE OF TENNESSEE

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DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

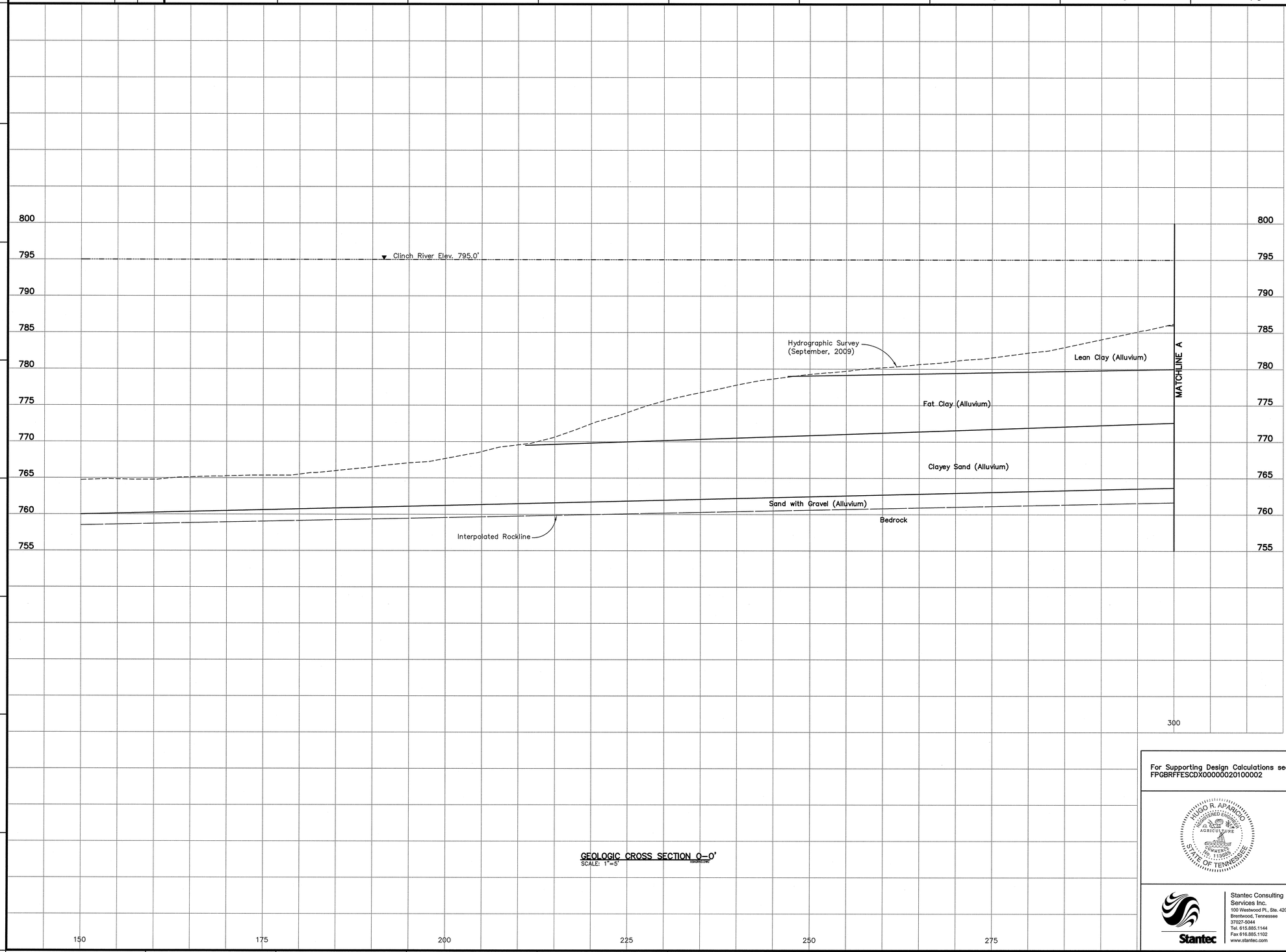
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507-32	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



GEOLOGIC CROSS SECTION O–O'
SCALE: 1"=5'

LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
◁	Standard Penetration Test Interval
■	Undisturbed Thin–Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock–like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.–	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide–tipped tooth auger bit
No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586–99. Refer to typed boring log.

NOTES:

1. The Tennessee Valley authority Surveying and Project services performed an aerial survey of the Bull Run Fossil Plant in April 2009, a land survey in September 2009, a hydrographic survey of the Fly Ash Disposal Area 2 in February 2006 and a hydrographic survey of the Clinch River in September 2009.
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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BNRO, PJ
K:\TVA\ACAD\STDARFB\ENGINEERING\GRAPHICS\BRP\GEOTECH\MICRO_BSC\D0\10W507-33-RD.DWG

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. SYM
R –	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–
RECORD DRAWING											

DISCIPLINE: INTERFACE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
GEOLOGIC CROSS SECTION O–O'

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — No. 113885 — STATE OF TENNESSEE

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DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

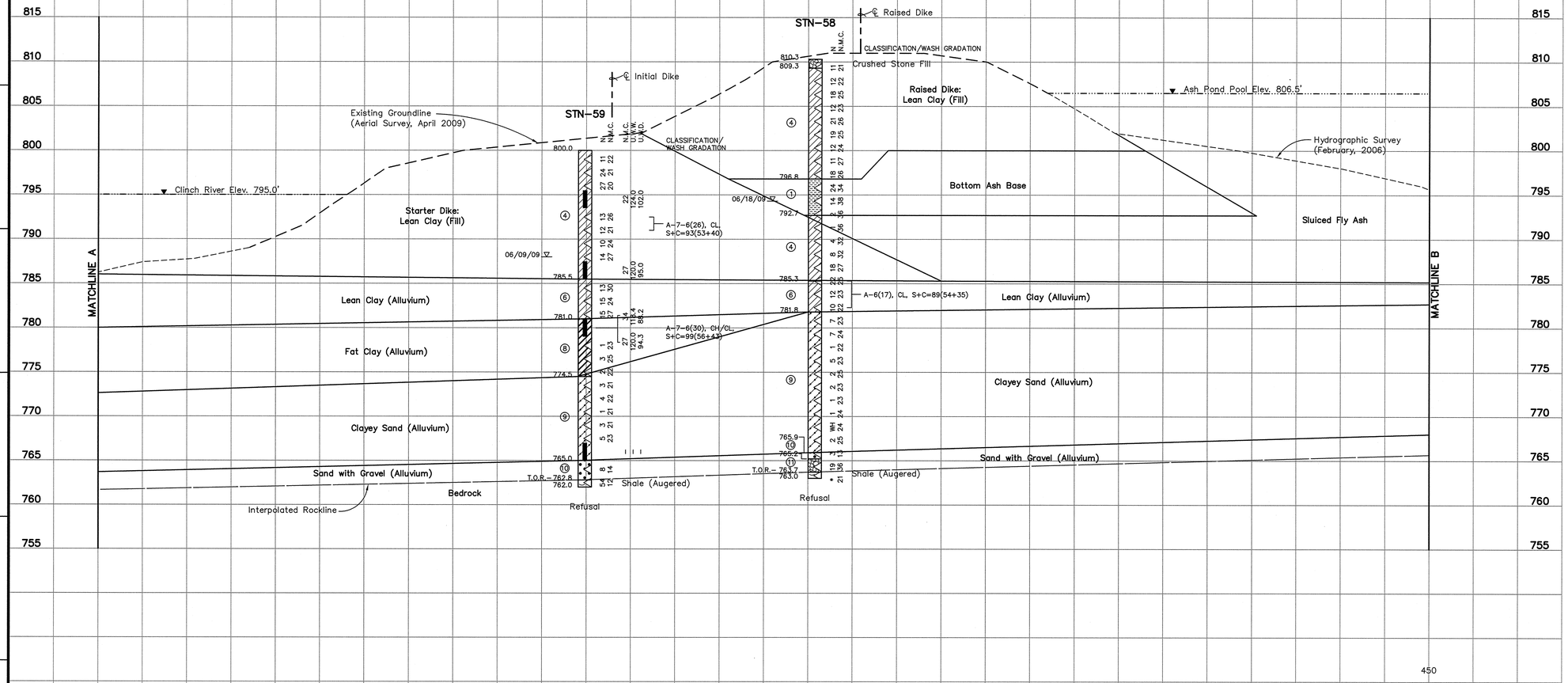
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507-33	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



GEOLOGIC CROSS SECTION O-O' (CONT'D)
SCALE: 1"=5'

LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
◁	Standard Penetration Test Interval
■	Undisturbed Thin-Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.-	Top of Rock (Indicates the beginning of rock-like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.-	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide-tipped tooth auger bit
No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586-99. Refer to typed boring log.

NOTES:

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RECORD DRAWING

For Supporting Design Calculations see FPGBRFFESCDX0000002010002

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. NO.
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	-	-	-

RECORD DRAWING

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
GEOLOGIC CROSS SECTION O-O'

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — No. 113695 — STATE OF TENNESSEE

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DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

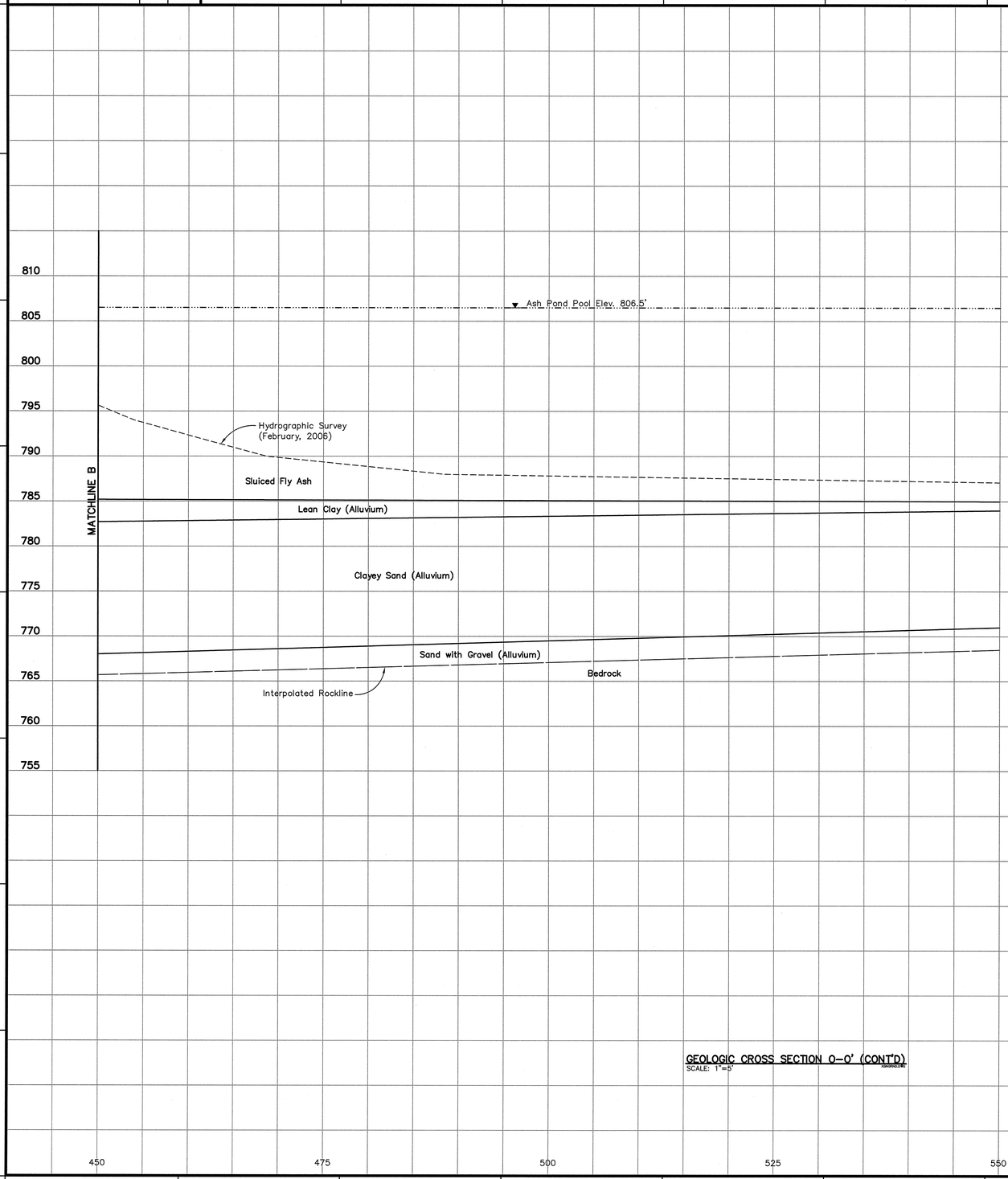
AUTOCAD R 2000	DATE 04/09/10	49	C	10W507-34	R 0

STANTEC | 0
TASK COMPLETED BY: | REV. NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

PLOT DATE: 04/09/2010 USER: BNOEL, PJ
N:\CAD\Active\10W507\ENVIRONMENTAL\DRAWINGS\SHP\GEOTECH\PROFILE\10W507-34-RD.DWG



GEOLOGIC CROSS SECTION O–O' (CONT'D)
SCALE: 1"=5'

LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
◁	Standard Penetration Test Interval
■	Undisturbed Thin–Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock–like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.–	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide–tipped tooth auger bit
No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586–99. Refer to typed boring log.

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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BOND, PJ
P:\TVA\GEOTECH\PROJECTS\BRANCH\DRAWINGS\BRP\GEOTECH\REVIS_RECORD\10W507-35-REV.DWG

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	DISCIPLINE INTERFACE
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–
RECORD DRAWING											

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — 113685 — STATE OF TENNESSEE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
GEOLOGIC CROSS SECTION O–O'

Stantec Consulting Services Inc.
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Brentwood, Tennessee
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DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

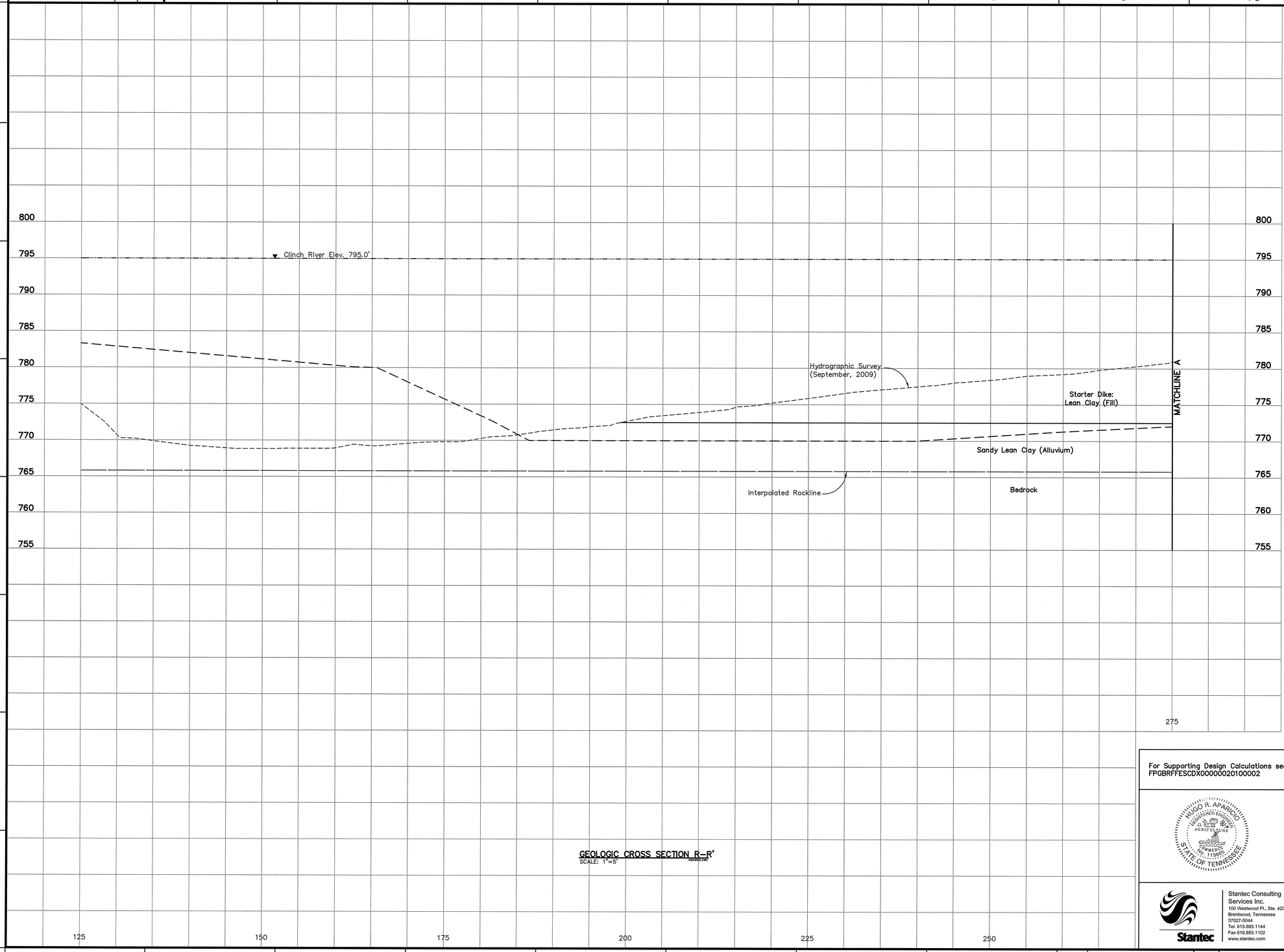
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000 | DATE: 04/09/10 | 49 | C | 10W507-35 | R 0

STANTEC | 0
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



GEOLOGIC CROSS SECTION R–R'
SCALE: 1"=5'

LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
◁	Standard Penetration Test Interval
■	Undisturbed Thin–Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock–like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.–	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide–tipped tooth auger bit
No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586–99. Refer to typed boring log.

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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BDNOL, PJ
S:\TVA\ALWAYS\OTHER\10W507-36\DRAWINGS\BRP_GEOTECH_MECH_SECS\10W507-36-R0.DWG

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. ID
R–	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–
RECORD DRAWING											DISCIPLINE INTERFACE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
GEOLOGIC CROSS SECTION R–R'

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — No. 113885 — STATE OF TENNESSEE

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DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

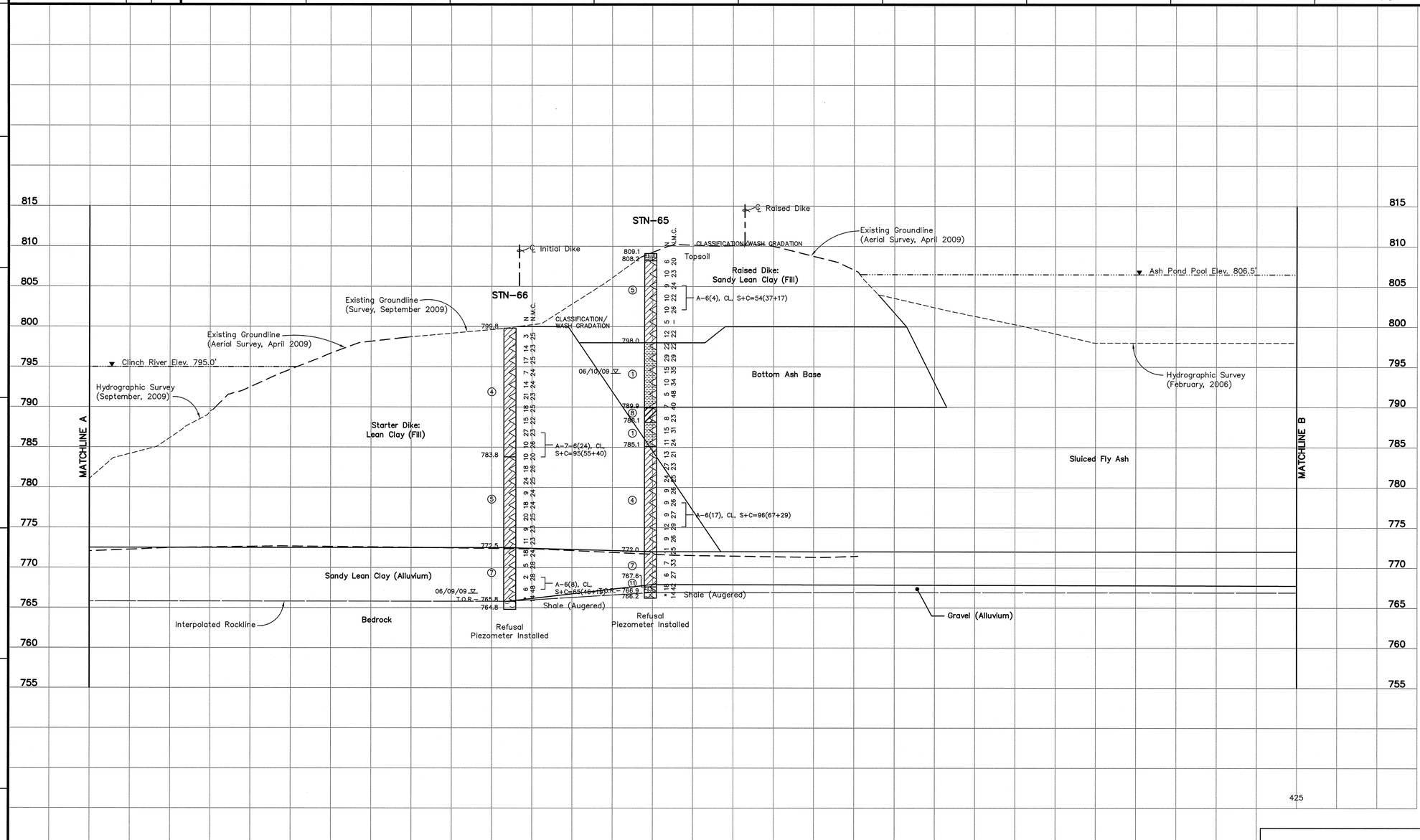
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507–36	R 0

STANTEC | 0
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



GEOLOGIC CROSS SECTION R-R' (CONT'D)

SCALE: 1"=5'

LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
⑤	Fill: Sandy Lean Clay, light brown to brown, moist to wet, medium stiff to stiff, with some fine gravels
⑥	Lean Clay, light brown to brown to red brown, moist, very soft to stiff, occasional silt and maganese concretions and trace sands
⑦	Sandy Lean Clay, light brown to brown to tan, moist, very soft to stiff, with fine to medium sand and occasional sands, silt and organics
⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
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⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
◁	Standard Penetration Test Interval
■	Undisturbed Thin-Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.-	Top of Rock (Indicates the beginning of rock-like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
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R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide-tipped tooth auger bit
No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586-99. Refer to typed boring log.

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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: RHOG, PJ
N:\TVA\ACTIVITY\49110\ENVIRONMENTAL\GRAPHICS\DRY\GEOTECH\RYDS_GEOTECH_CROSS_SECTIONS_R-R'.DWG

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. NO.
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	-	-	DISCIPLINE INTERFACE
RECORD DRAWING											

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
GEOLOGIC CROSS SECTION R-R'

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — CERTIFICATE NO. 115885 — STATE OF TENNESSEE

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
Brentwood, Tennessee
37027-5044
Tel. 615.885.1144
Fax 616.885.1102
www.stantec.com

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

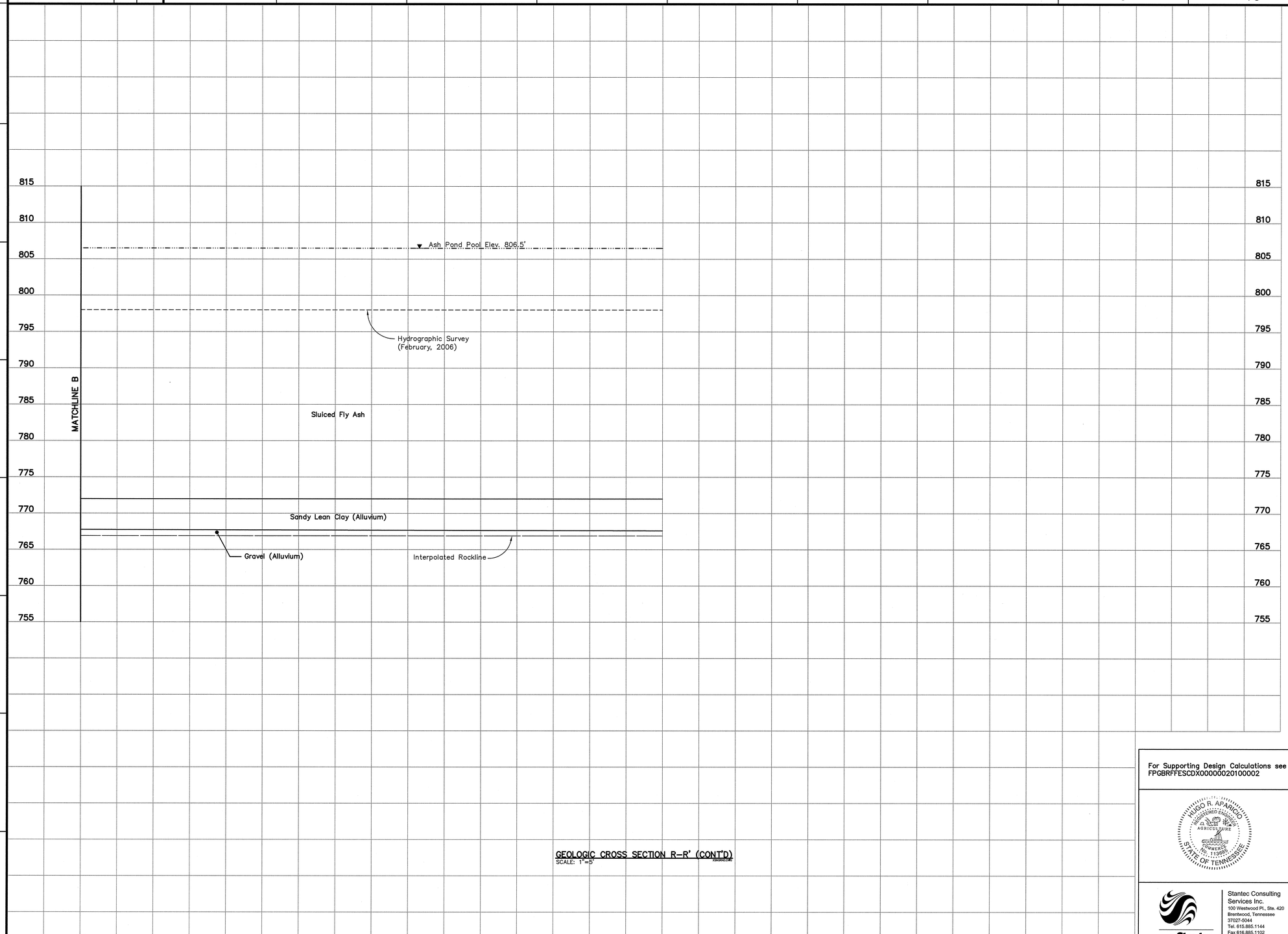
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507-37	R 0

STANTEC | 0
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



GEOLOGIC CROSS SECTION R–R' (CONT'D)
SCALE: 1"=5'

LEGEND

①	Fill: Bottom Ash, gray to black, moist to wet, loose to very dense
②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
③	Sluiced Fly Ash, light gray to gray, moist to wet, very soft to medium stiff, with occasional bottom ash
④	Fill: Lean Clay, light brown to reddish brown to tan, moist, soft to very stiff with some fine to medium gravels and occasional organics
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⑧	Fat Clay, reddish brown to brown to gray, moist, very soft to stiff, with occasional gravel in fill and trace sands and silt
⑨	Clayey Sand, light brown to tan brown to gray, moist to wet, loose to medium dense, fine to medium grained, well graded with occasional clay
⑩	Sand, light brown to brown, moist to wet, very loose to dense, fine to coarse grained, well graded, occasional gravels and silt
⑪	Gravel, brown, wet, loose to dense, medium to coarse grained, rounded, with occasional sands
⑫	Silt, dark brown to brown, moist to wet, very soft to stiff with occasional organic matter and clay
⑬	Lean Clay with Sand, light brown to gray brown, moist to wet, very soft to stiff, with occasional silt, gravels and organics
⑭	Silty Sand, tan to brown, moist to wet, loose to dense, fine to coarse grained, well graded with occasional gravels
WH	Weight of Hammer
WR	Weight of Rods
◁	Standard Penetration Test Interval
■	Undisturbed Thin–Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
U.W.D.	Unit Weight Dry (lbs./cu.ft.)
03/31/09 ▽	Water Level and Date Recorded
T.O.R.–	Top of Rock (Indicates the beginning of rock–like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.)
B.C.–	Begin Rock Core
R.Q.D.	Rock Quality Designation (%)
REC.	Recovery (%)
Refusal	Auger Refusal using a carbide–tipped tooth auger bit
No Refusal	No Refusal Encountered
*	Standard Penetration Test (SPT) terminated per ASTM D 1586–99. Refer to typed boring log.

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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BKING, FJ
N:\TVA\FOSSIL\BULL RUN\GEOTECH\DRAWINGS\BRF\GEOTECH\REVS_RECORD\10W507-38-R0.DWG

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV. SYM
R –	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–
RECORD DRAWING											

DISCIPLINE INTERFACE

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
GEOLOGIC CROSS SECTION R–R'

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — No. 119865 — STATE OF TENNESSEE

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W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

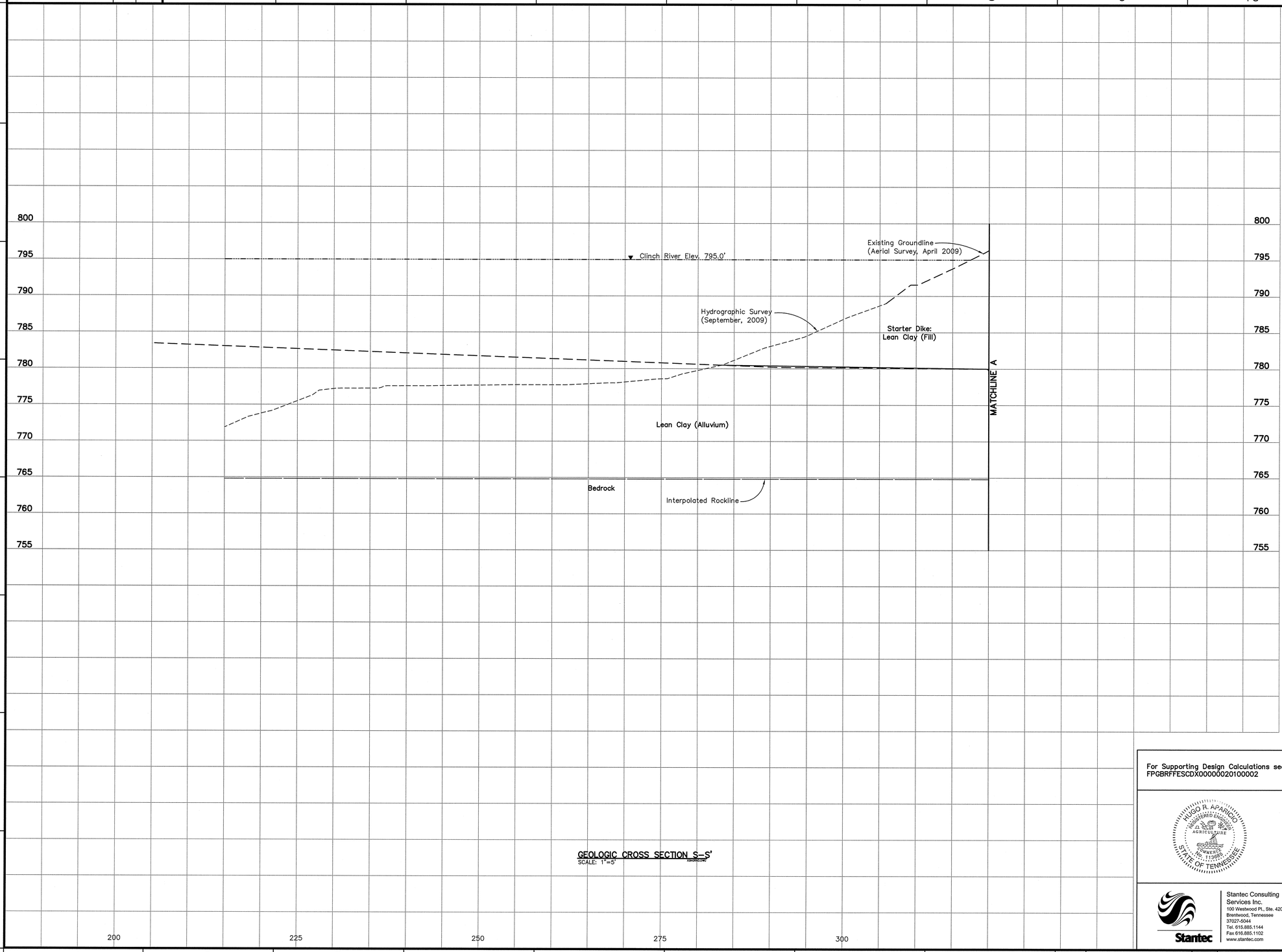
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507–38	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



GEOLOGIC CROSS SECTION S–S'
SCALE: 1"=5'

LEGEND

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②	Fill: Bottom Ash/Fly Ash mixture, gray to black gray, moist to wet, loose to very dense
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WR	Weight of Rods
◁	Standard Penetration Test Interval
■	Undisturbed Thin–Walled (Shelby) Tube Sample
N.M.C.	Natural Moisture Content (%)
U.W.W.	Unit Weight Wet (lbs./cu.ft.)
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03/31/09 ▽	Water Level and Date Recorded
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No Refusal	No Refusal Encountered
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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BOND, RJ
X:\TVA\ENGINEERING\WORKING\BULLRUN\MISC\BRP\GEOTECH\REVISED\10W507-39-RD.DWG

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

HUGO R. APARICIO — REGISTERED ENGINEER — STATE OF TENNESSEE — No. 113665

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–

RECORD DRAWING

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
GEOLOGIC CROSS SECTION S–S'

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100 Westwood Pl., Ste. 420
Brentwood, Tennessee
37027-5044
Tel. 615.885.1144
Fax 616.885.1102
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DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

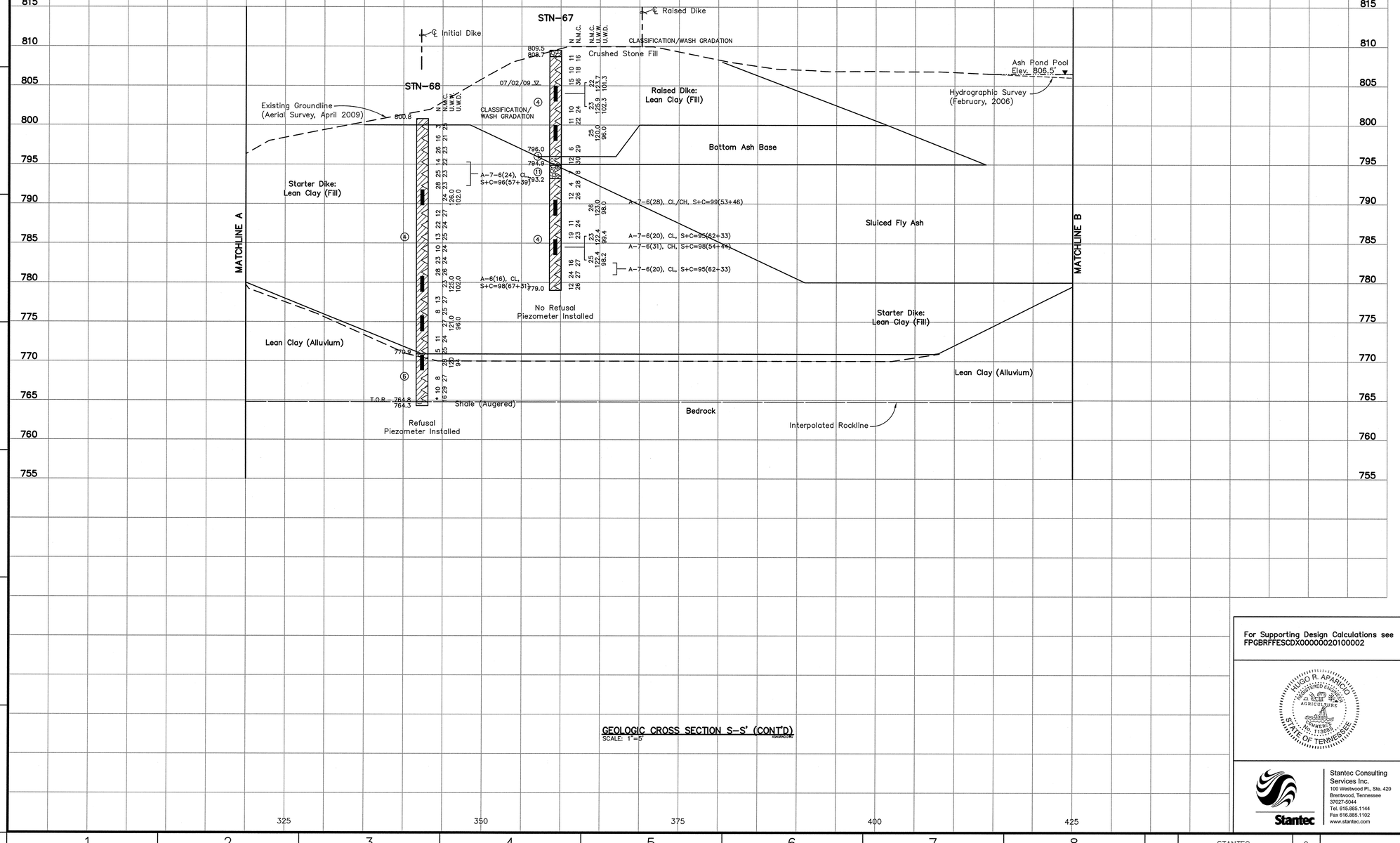
BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000 | DATE: 04/09/10 | 49 | C | 10W507–39 | R 0

STANTEC | 0
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY



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RECORD DRAWING

For Supporting Design Calculations see FPGBRFFESCDX00000020100002

HUGO R. APARICIO — REGISTERED ENGINEER — No. 113685 — STATE OF TENNESSEE

REV NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–
RECORD DRAWING										

SCALE: 1"=5' EXCEPT AS NOTED

YARD

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GEOLOGIC CROSS SECTION S-S'

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DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
W. MATTINGLY	T. JOHNSON	P. KISER	S. FIELD	H. APARICIO	H. APARICIO	T. JOHNSON

BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

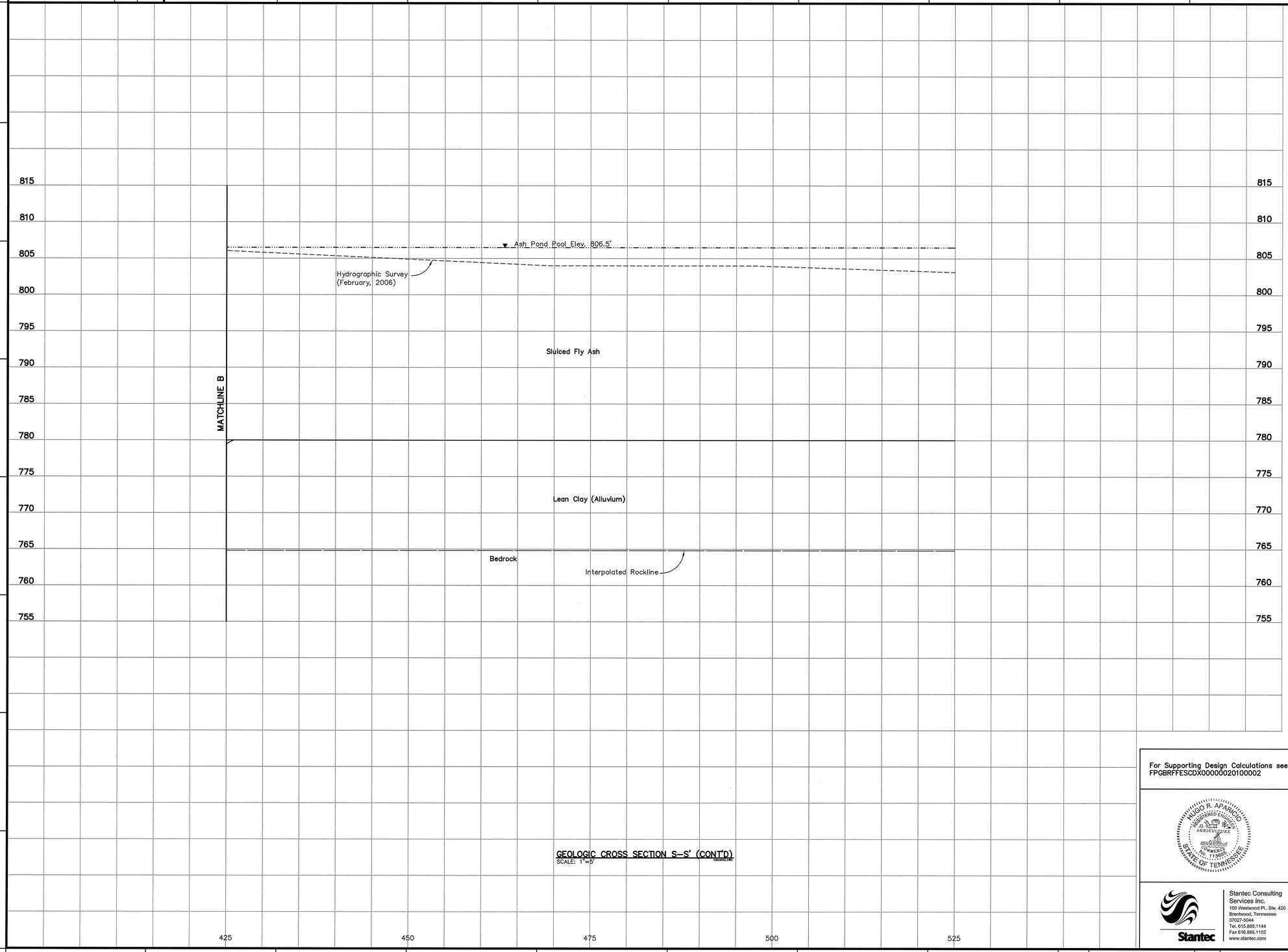
AUTOCAD R 2000 | DATE 04/09/10 | 49 | C | 10W507-40 | R 0

STANTEC | 0
TASK COMPLETED BY: | REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

PLOT DATE: 04/09/2010 USER: BOND, PJ
X:\TVA\WORKSITE\10489\GEOENVIRONMENTAL\DRAWINGS\MXD\GEOTECH\MEGA_SECS001\GWS01-40-RS.MXD



GEOLOGIC CROSS SECTION S–S' (CONT'D)
SCALE: 1"=5'

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RECORD DRAWING

PLOT DATE: 04/09/2010 USER: BNOEL PJ
N:\TVA\ACAD\GEOTECH\DRAWINGS\ALL\GA4MWO\SHT\GEOTECH_MEVOL_SECXSN\10W507-41-RD.DWG

For Supporting Design Calculations see FPGBRFFESCDX0000020100002

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	DISCIPLINE INTERFACE
R –	–	–	–	–	–	–	–	–	–	–	–
R 0	04/09/10	WRM	TJ	PVK	SF	HRA	HRA	TJ	–	–	–
RECORD DRAWING											

SCALE: 1"=5' EXCEPT AS NOTED

YARD

GEOTECHNICAL EXPLORATION
GEOLOGIC CROSS SECTION S–S'

HUGO R. APARICIO — REGISTERED ENGINEER — AGRICULTURE — STATE OF TENNESSEE

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BULL RUN FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R 2000	DATE 04/09/10	49	C	10W507–41	R 0

STANTEC	0
TASK COMPLETED BY:	REV NO.

PLOT FACTOR:XX
W_TVA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

Appendix C

Boring Logs

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 595024.10, E 2544375.85 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-1** Total Depth 82.0 ft
Location	Clinton, Tennessee	Surface Elevation	832.4 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/9/09 Completed 7/10/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	21.5 ft Date/Time 7/9/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
832.4'	0.0'	Top of Hole							
		SOIL 1: FILL - BOTTOM ASH, gray, moist, dense		SPT-1	0.0 - 1.5	1.1	3-7-9	7	Boring advanced using 3 1/4" Hollow Stem Augers
				SPT-2	1.5 - 3.0	1.2	7-8-10	15	
				SPT-3	3.0 - 4.5	1.1	13-14-16	12	
				SPT-4	4.5 - 6.0	1.1	13-9-8	22	
				SPT-5	6.0 - 7.5	1.4	11-16-20	31	
				SPT-6	7.5 - 9.0	1.4	12-16-13	19	
				SPT-7	9.0 - 10.5	1.3	9-14-15	20	SPT-6: clay in sample, >0.2'
				SPT-8	10.5 - 12.0	1.1	11-9-11	23	
				SPT-9	12.0 - 13.5	1.2	10-11-11	20	
				SPT-10	13.5 - 15.0	1.5	10-13-14	25	
				SPT-11	15.0 - 16.5	1.3	8-11-16	16	
				SPT-12	16.5 - 18.0	1.1	6-9-11	22	
813.4'	19.0'			SPT-13	18.0 - 19.5	1.3	4-5-7	31	
		SOIL 2: FILL - BOTTOM ASH/ FLY ASH MIXTURE, gray, moist to saturated, medium stiff		SPT-14	19.5 - 21.0	1.5	17-9-8	33	
				SPT-15	21.0 - 22.5	1.4	4-4-4	36	
809.4'	23.0'			SPT-16	22.5 - 24.0	1.5	3-5-6	42	
		SOIL 3: SLUICED FLY ASH, gray, saturated, very soft to medium dense, with varying percentages of bottom ash		SPT-17	24.0 - 25.5	1.4	7-1-3	45	
				SPT-18	25.5 - 27.0	1.3	3-1-2	43	
				SPT-19	27.0 - 28.5	1.5	1-1-1	44	
				SPT-20	28.5 - 30.0	1.5	1-1-1	56	
				SPT-21	30.0 - 31.5	1.4	WOH-WOH-1	41	
				SPT-22	31.5 - 33.0	1.5	WOH-1-4	34	
				SPT-23	33.0 - 34.5	1.3	4-7-8	41	
				SPT-24	34.5 - 36.0	1.1	3-4-6	36	
				SPT-25	36.0 - 37.5	1.3	4-7-7	23	
				SPT-26	37.5 - 39.0	1.1	4-4-5	25	
				SPT-27	39.0 - 40.5	1.0	1-1-2	36	
				SPT-28	40.5 - 42.0	0.3	1-1-2	56	
				SPT-29	42.0 - 43.5	1.4	1-2-3	47	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 595024.10, E 2544375.85 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-1**
		Total Depth	82.0 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
		SOIL 3: SLUICED FLY ASH, gray, saturated, very soft to medium dense, with varying percentages of bottom ash *(Continued)*		SPT-30	43.5 - 45.0	0.7	2-1-1	44	
				SPT-31	45.0 - 46.5	1.3	WOR-WOR-WOH	39	
				SPT-32	46.5 - 48.0	1.1	WOH-WOH-WOH	39	
783.9'	48.5'			SPT-33	48.0 - 49.5	1.0	4-5-7	17	
		SOIL 7: SANDY LEAN CLAY, light brown, moist, stiff to very soft, some fine sand		SPT-34	49.5 - 51.0	1.3	4-7-5	19	
				SPT-35	51.0 - 52.5	1.3	6-7-7	21	
				SPT-36	52.5 - 54.0	1.1	4-3-3	22	
				SPT-37	54.0 - 55.5	1.4	WOR-WOR-WOH	25	
				SPT-38	55.5 - 57.0	1.1	3-5-8	25	
				SPT-39	57.0 - 58.5	1.3	WOR-WOH-2	26	
				SPT-40	58.5 - 60.0	1.4	WOH-1-1	24	
				SPT-41	60.0 - 61.5	1.3	WOH-WOH-WOH	25	
768.9'	63.5'			SPT-42	61.5 - 63.0	1.1	WOH-WOH-WOH	27	
		SOIL 10: SAND, light brown to brown, saturated, medium dense to very loose, fine to medium grained, some medium to coarse gravel		SPT-43	63.0 - 64.5	1.1	2-4-14	27	
				SPT-44	64.5 - 66.0	0.5	2-3-2	9	
				SPT-45	66.0 - 67.5	1.3	WOH-WOH-WOH	25	
				SPT-46	67.5 - 69.0	1.1	WOR-WOR-WOH	46	
				SPT-47	69.0 - 70.5	0.4	WOH-WOH-4	36	
761.4'	71.0'			SPT-48	70.5 - 71.5	0.7	36-50/0.3	10	
760.0'	72.4'								Began Core
		Shale, dark red brown, very fine grained, soft, thin bedded, silty, 35° to 45° inclined bedding planes, calcareous		32%	5.0	3.5	70	77.0	Weathered shale/clay from 72.0'-72.4', 73.5'-74.0', 75.2'-75.8' 41 degree water stained fracture at 72.6'
752.5'	79.9'	Limestone, gray, fine grained, hard, thin bedded, closely spaced fractures, 35° to 45° inclined bedding planes, fossiliferous		64%	5.0	5.0	100	82.0	
750.4'	82.0'								
		Shale, brown, very fine grained, soft, thin bedded, silty, 35° to 45° inclined bedding planes, calcareous, limestone parting throughout							
		Bottom of Hole							
		Base of Weathered Rock = 77.0'							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 595024.10, E 2544375.85 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-1**
		Total Depth	82.0 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
		Top of Rock = 71.0' Elevation (761.4')							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 595022.62, E 2544232.15 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-2** Total Depth 55.5 ft
Location	Clinton, Tennessee	Surface Elevation	819.4 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/22/09 Completed 6/23/09
Supervisor	Patrick Kiser Driller Kent Clements	Depth to Water	16.2 ft Date/Time 6/22/09
Logged By	Briggs Evans	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
819.4'	0.0'	Top of Hole							
818.9'	0.5'	FILL - TOPSOIL, damp		SPT-1	0.0 - 1.5	1.5	3-5-8	30	Boring advanced using 3-1/4 inch hollow stem augers.
		SOIL 1: FILL - BOTTOM ASH, gray black, damp, medium dense to dense		SPT-2	1.5 - 3.0	1.5	3-7-9	26	
				SPT-3	3.0 - 4.5	1.2	5-7-9	21	
				SPT-4	4.5 - 6.0	1.5	7-9-12	29	
				SPT-5	6.0 - 7.5	1.5	17-18-17	23	
				SPT-6	7.5 - 9.0	1.1	16-23-21	27	
809.1'	10.3'			SPT-7	9.0 - 10.5	1.5	11-10-11	32	
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, gray black to dark gray, damp to moist, dense to very dense		SPT-8	10.5 - 12.0	1.0	13-19-48	11	
				SPT-9	12.0 - 13.5	1.5	48-49-50+	8	
				SPT-10	13.5 - 15.0	1.4	13-16-17	11	
803.1'	16.3'			SPT-11	15.0 - 16.5	1.3	8-11-12	19	
		SOIL 3: SLUICED FLY ASH, gray to gray black, wet to saturated, stiff to very soft, with varying percentages of bottom ash		SPT-12	16.5 - 18.0	1.5	14-16-18	25	
				SPT-13	18.0 - 19.5	1.0	5-10-11	31	
				SPT-14	19.5 - 21.0	1.2	3-5-6	36	Added Revert to control blow-back
				SPT-15	21.0 - 22.5	1.2	6-8-6	35	
				SPT-16	22.5 - 24.0	1.5	3-5-4	29	
				SPT-17	24.0 - 25.5	1.5	3-1-2	23	
				SPT-18	25.5 - 27.0	1.3	WOH-WOH-1	26	
				SPT-19	27.0 - 28.5	1.5	WOH-1-1	58	
				SPT-20	28.5 - 30.0	1.0	WOH-1-1	44	
				SPT-21	30.0 - 31.5	1.5	WOR-WOH-1	44	
				SPT-22	31.5 - 33.0	1.5	WOR-WOH-WOH	39	
785.9'	33.5'			SPT-23	33.0 - 34.5	1.0	WOR-WOH-2	21	
		SOIL 7: SANDY LEAN CLAY, light brown, saturated, soft to very soft, with fine to medium sand		SPT-24	34.5 - 36.0	1.5	3-3-2	22	
				SPT-25	36.0 - 37.5	1.5	1-2-3	23	
				SPT-26	37.5 - 39.0	0.8	2-2-3	25	
				SPT-27	39.0 - 40.5	1.5	1-2-2	27	
				SPT-28	40.5 - 42.0	1.5	1-1-3	23	
				SPT-29	42.0 - 43.5	1.5	1-3-3	22	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 595022.62, E 2544232.15 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-2**
		Total Depth	55.5 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
774.5'	44.9'			SPT-30	43.5 - 45.0	1.0	2-4-11	23	
		SOIL 10: SAND, tan, saturated, very loose to medium dense, coarse grained, some fine gravel, cayey sand lenses		SPT-31	45.0 - 46.5	1.2	5-8-9	18	
				SPT-32	46.5 - 48.0	1.5	5-4-7	20	
				SPT-33	48.0 - 49.5	1.0	3-11-5	18	
				SPT-34	49.5 - 51.0	1.0	1-1-2	48	
				SPT-35	51.0 - 52.5	0.0	WOH-WOH-WOH	--	
765.8'	53.6'			SPT-36	52.5 - 54.0	1.0	11-16-22	--	
763.9'	55.5'			SPT-37	54.0 - 55.5	1.0	22-12-33	14	
		Shale, dark red brown, (augered)							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 595020.59, E 2544104.02 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-3** Total Depth 40.8 ft
Location	Clinton, Tennessee	Surface Elevation	810.2 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/22/09 Completed 6/23/09
Supervisor	Patrick Kiser Driller Kent Clements	Depth to Water	12.0 ft Date/Time 6/22/09
Logged By	Briggs Evans	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
810.2'	0.0'	Top of Hole							
		SOIL 9: FILL - CLAYEY SAND, brown tan, damp, medium stiff to stiff, blocky		SPT-1	0.0 - 1.5	1.0	6-9-16	10	Boring advanced using 3-1/4 inch hollow stem augers.
				SPT-2	1.5 - 3.0	1.3	7-11-13	20	
				SPT-3	3.0 - 4.5	1.1	6-10-7	15	
				ST-1	4.5 - 6.5	2.0		19	Slotted screen piezometer installed, tip depth 39 ft bgs. See peizometer installation logs for details.
				SPT-4	6.5 - 8.0	0.8	2-3-4	20	
				SPT-5	8.0 - 9.5	0.8	2-3-5	22	
				ST-2	9.5 - 11.5	2.0		20	
798.7'	11.5'								
798.2'	12.0'	SOIL 11: FILL - CLAYEY GRAVEL, gray, moist, dense, medium to coarse grained, angular		SPT-6	11.5 - 13.0	0.0	6-7-8	--	
				SPT-7	13.0 - 14.5	0.0	6-5-6	--	
				ST-3	14.5 - 16.5	2.0		41	
		SOIL 2: BOTTOM ASH/FLY ASH MIXTURE, dark gray, wet to saturated, loose to medium dense		SPT-8	16.5 - 18.0	1.5	4-4-5	40	
				SPT-9	18.0 - 19.5	1.0	1-2-2	43	Add revert to control blow-back
				ST-4	19.5 - 21.5	2.0		30	
788.7'	21.5'								
		SOIL 7: SANDY LEAN CLAY, brown gray, medium stiff to stiff, fine sand, mottled		SPT-10	21.5 - 23.0	0.5	22-11-6	9	
				SPT-11	23.0 - 24.5	0.5	6-5-6	12	
				SPT-12	24.5 - 26.0	1.3	2-3-5	22	
				SPT-13	26.0 - 27.5	0.0	4-5-5	--	
				SPT-14	27.5 - 29.0	1.0	5-7-9	21	
				SPT-15	29.0 - 30.5	1.5	2-3-4	21	
				SPT-16	30.5 - 32.0	1.5	2-3-5	21	
776.9'	33.3'			SPT-17	32.0 - 33.5	1.5	4-7-8	21	
		SOIL 10: SAND, brown, wet, loose to medium dense, fine to medium grained, well graded, trace clay		SPT-18	33.5 - 35.0	0.8	2-2-3	23	
				SPT-19	35.0 - 36.5	1.5	3-6-7	23	
				SPT-20	36.5 - 38.0	1.5	9-10-12	17	
				SPT-21	38.0 - 39.5	0.0	2-2-2	--	
769.7'	40.5'			SPT-22	39.5 - 40.8	1.3	9-21-50/0.3	32	
769.4'	40.8'	Shale, gray brown, (augered)							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 595020.59, E 2544104.02 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-3**
		Total Depth	40.8 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 594652.96, E 2544484.24 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-5** Total Depth 75.0 ft
Location	Clinton, Tennessee	Surface Elevation	841.0 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/7/09 Completed 7/7/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	29.0 ft Date/Time 7/7/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
841.0'	0.0'	Top of Hole							
839.0'	2.0'	SOIL 4: FILL - LEAN CLAY, light brown, moist, stiff, some gravel		SPT-1	0.0 - 1.5	0.9	2-4-5	14	Boring advanced using 3 1/4" Hollow Stem Augers
				SPT-2	1.5 - 3.0	1.0	5-7-7	7	
		SOIL 1: FILL - BOTTOM ASH, dark gray to black, moist, dense to very dense		SPT-3	3.0 - 4.5	1.3	18-42-50	9	
				SPT-4	4.5 - 6.0	1.3	12-27-30	14	
				SPT-5	6.0 - 7.5	1.3	30-34-38	13	Slotted screen piezometer installed. Tip depth at 34.6 ft. See piezometer installation log for details.
				SPT-6	7.5 - 9.0	1.4	8-12-17	12	
				SPT-7	9.0 - 10.5	1.3	10-11-11	14	
				SPT-8	10.5 - 12.0	1.5	12-14-15	20	
				SPT-9	12.0 - 13.5	1.4	18-20-21	22	
				SPT-10	13.5 - 15.0	1.1	22-27-26	23	
				SPT-11	15.0 - 16.5	1.5	9-10-10	24	
				SPT-12	16.5 - 18.0	1.4	12-14-15	22	
				SPT-13	18.0 - 19.5	1.3	15-18-19	23	
				SPT-14	19.5 - 21.0	1.5	8-8-11	21	
				SPT-15	21.0 - 22.5	1.3	10-14-15	21	
				SPT-16	22.5 - 24.0	1.3	11-13-16	27	
				SPT-17	24.0 - 25.5	1.5	9-8-8	19	
				SPT-18	25.5 - 27.0	1.5	2-4-4	20	
813.0'	28.0'			SPT-19	27.0 - 28.5	1.3	3-5-6	29	
		SOIL 3: SLUICED FLY ASH, light gray to gray black, saturated, medium to very soft, with varying percentages of bottom ash		SPT-20	28.5 - 30.0	1.5	3-4-4	36	
				SPT-21	30.0 - 31.5	1.3	3-2-3	35	
				SPT-22	31.5 - 33.0	1.4	1-2-1	48	
				SPT-23	33.0 - 34.5	1.3	1-1-1	46	
				SPT-24	34.5 - 36.0	1.1	2-1-1	35	
				SPT-25	36.0 - 37.5	1.5	WOR-WOH-WOH	39	
				SPT-26	37.5 - 39.0	1.5	WOR-WOH-WOH	41	
				SPT-27	39.0 - 40.5	1.1	WOR-WOH-1	26	SPT-27: organics present in sample
				SPT-28	40.5 - 42.0	1.0	10-11-15	21	
				SPT-29	42.0 - 43.5	1.1	13-15-16	24	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 594652.96, E 2544484.24 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-5**
		Total Depth	75.0 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
		SOIL 3: SLUICED FLY ASH, light gray to gray black, saturated, medium to very soft, with varying percentages of bottom ash *(Continued)*		SPT-30	43.5 - 45.0	1.1	8-11-12	23	
				SPT-31	45.0 - 46.5	0.2	WOH-1-2	35	
				SPT-32	46.5 - 48.0	0.9	3-3-4	37	
				SPT-33	48.0 - 49.5	1.0	5-4-5	40	
				SPT-34	49.5 - 51.0	1.1	2-2-1	33	
				SPT-35	51.0 - 52.5	1.0	WOR	36	
				SPT-36	52.5 - 54.0	0.3	WOR	37	
				SPT-37	54.0 - 55.5	1.2	WOR	38	
				SPT-38	55.5 - 57.0	0.9	WOR	41	
782.5'	58.5'			SPT-39	57.0 - 58.5	1.3	WOR-WOH-1	31	SPT-39: clay in tip of spoon
		SOIL 7: SANDY LEAN CLAY, red brown to brown, moist, stiff to medium stiff, some fine sand		SPT-40	58.5 - 60.0	1.0	6-5-7	28	
				SPT-41	60.0 - 61.5	1.1	4-4-3	16	
				SPT-42	61.5 - 63.0	1.0	2-3-4	14	
				SPT-43	63.0 - 64.5	0.9	3-3-3	20	
776.0'	65.0'			SPT-44	64.5 - 66.0	1.1	1-3-4	21	
		SOIL 10: SAND, light brown and gray, saturated, loose, fine to medium grained, some clay		SPT-45	66.0 - 67.5	1.5	1-1-4	22	
				SPT-46	67.5 - 69.0	1.4	WOH-WOH-1	21	
				SPT-47	69.0 - 70.5	1.0	WOR	23	SPT-49: angular coarse gravel in sample
				SPT-48	70.5 - 72.0	1.1	1-2-5	22	
				SPT-49	72.0 - 73.5	0.9	6-7-9	21	
766.5'	74.5'			SPT-50	73.5 - 74.4	0.5	18-50/0.4	10	
766.0'	75.0'	Shale (Augered)							
		Auger Refusal / Bottom of Hole							

FMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 594610.05, E 2544394.75 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-6** Total Depth 50.8 ft
Location	Clinton, Tennessee	Surface Elevation	818.2 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/23/09 Completed 6/23/09
Supervisor	Patrick Kiser Driller Kent Clements	Depth to Water	15.0 ft Date/Time 6/23/09
Logged By	Briggs Evans	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
818.2'	0.0'	Top of Hole							
		SOIL 14: FILL - SANDY SILT, tan brown, damp, stiff, fine sand, mottled		SPT-1	0.0 - 1.5	1.5	2-3-5	18	Fly ash layer 0.5 - 0.8
815.4'	2.8'			SPT-2	1.5 - 3.0	1.5	4-7-8	10	Fly ash layer 1.7 - 2.0
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, light gray to dark gray, damp to wet, medium stiff to stiff		SPT-3	3.0 - 4.5	1.2	3-5-6	18	Gravel layer 2.3 - 2.5
				SPT-4	4.5 - 6.0	1.5	2-4-6	20	
				SPT-5	6.0 - 7.5	1.5	5-8-11	25	Slotted screen piezometer installed, tip depth 49 ft bgs. See peizometer installation logs for details.
				SPT-6	7.5 - 9.0	1.5	12-12-14	22	
				SPT-7	9.0 - 10.5	1.5	8-8-10	29	Wet layer 10.6 - 10.9
				SPT-8	10.5 - 12.0	1.5	12-26-42	20	
				SPT-9	12.0 - 13.5	1.5	36-32-30	14	
				SPT-10	13.5 - 15.0	1.0	5-7-9	13	
				SPT-11	15.0 - 16.5	1.3	3-5-2	16	Added Revert to control blow-back Saturated at 15 feet bgs
800.2'	18.0'			SPT-12	16.5 - 18.0	1.5	7-9-9	28	
		SOIL 3: SLUICED FLY ASH, gray to gray black, saturated to wet, medium to very soft, stratified, with varying percentages of bottom ash		SPT-13	18.0 - 19.5	1.0	3-4-4	33	
				SPT-14	19.5 - 21.0	1.0	3-4-5	14	
				SPT-15	21.0 - 22.5	1.5	2-2-2	21	
				SPT-16	22.5 - 24.0	1.3	2-2-2	24	
				SPT-17	24.0 - 25.5	1.0	1-WOH-1	37	
				SPT-18	25.5 - 27.0	1.5	1-1-1	33	
				SPT-19	27.0 - 28.5	1.0	WOR-WOR-WOR	40	
				SPT-20	28.5 - 30.0	1.5	WOR-WOR-WOR	39	
				SPT-21	30.0 - 31.5	0.0	WOR-WOR-WOH	--	
785.7'	32.5'			SPT-22	31.5 - 33.0	0.5	WOH-WOH-2	19	
		SOIL 7: SANDY LEAN CLAY, tan, wet to moist, soft to stiff, with fine to medium sand		SPT-23	33.0 - 34.5	1.5	5-6-8	15	
				SPT-24	34.5 - 36.0	1.2	2-4-5	14	
				SPT-25	36.0 - 37.5	1.5	3-4-6	18	
				SPT-26	37.5 - 39.0	1.5	3-4-6	20	
777.9'	40.3'			SPT-27	39.0 - 40.5	1.5	2-2-3	19	
		SOIL 14: SILTY SAND, tan, wet, loose, fine to medium grained, well graded, trace clay		SPT-28	40.5 - 42.0	0.8	1-2-4	23	
				SPT-29	42.0 - 43.5	1.2	3-4-4	22	

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 594610.05, E 2544394.75 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-6**
		Total Depth	50.8 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
				SPT-30	43.5 - 45.0	1.0	3-4-5	20	
771.9'	46.3'			SPT-31	45.0 - 46.5	1.2	3-4-6	22	
		SOIL 10: SAND with Gravel, tan, saturated, loose to medium dense, fine grained, rounded, well graded, with fine to coarse sand		SPT-32	46.5 - 48.0	0.8	7-8-8	14	
				SPT-33	48.0 - 49.5	1.0	7-4-3	15	
767.9'	50.3'			SPT-34	49.5 - 50.8	1.3	4-18-50/0.3	11	
767.4'	50.8'								
		Shale, red brown, (augered)							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 594577.54, E 2544332.94 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-7** Total Depth 54.3 ft
Location	Clinton, Tennessee	Surface Elevation	809.5 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/18/09 Completed 6/18/09
Supervisor	Briggs Evans Driller Kent Clements	Depth to Water	13.0 ft Date/Time 6/18/09
Logged By	Briggs Evans	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
809.5'	0.0'	Top of Hole							
809.0'	0.5'	FILL - CRUSHED STONE		SPT-1	0.0 - 1.5	1.0	4-6-6	10	Boring advanced using 3 and 1/4 inch hollow stem augers.
		SOIL 5: FILL - SANDY LEAN CLAY, light brown, moist to wet, soft to medium stiff, some organics		SPT-2	1.5 - 3.0	1.0	7-6-7	17	
				SPT-3	3.0 - 4.5	0.8	7-7-8	21	
				SPT-4	4.5 - 6.0	1.0	4-2-3	21	
				SPT-5	6.0 - 7.5	1.0	4-4-4	20	
800.5'	9.0'			SPT-6	7.5 - 9.0	1.5	3-3-4	24	
		SOIL 3: SLUICED FLY ASH, dark gray and black, saturated, very soft to soft, with varying percentages of bottom ash		SPT-7	9.0 - 10.5	0.5	woh-1-2	37	
				SPT-8	10.5 - 12.0	0.6	1-2-1	30	
				SPT-9	12.0 - 13.5	1.0	1-2-2	23	
795.0'	14.5'			SPT-10	13.5 - 15.0	1.5	1-1-1	37	
		SOIL 7: SANDY LEAN CLAY, dark brown, moist, stiff		SPT-11	15.0 - 16.5	1.0	1-1-3	32	
				SPT-12	16.5 - 18.0	1.0	3-6-8	20	
				SPT-13	18.0 - 19.5	1.0	6-8-7	23	
				SPT-14	19.5 - 21.0	1.3	4-5-9	20	
				SPT-15	21.0 - 22.5	0.8	4-4-5	20	
				SPT-16	22.5 - 24.0	1.2	4-5-6	20	
				SPT-17	24.0 - 25.5	1.5	3-5-6	20	
				SPT-18	25.5 - 27.0	1.5	2-2-4	21	
				SPT-19	27.0 - 28.5	1.5	3-3-5	22	
780.0'	29.5'			SPT-20	28.5 - 30.0	1.2	1-2-2	22	
		SOIL 10: SAND with Gravel, light brown, wet, loose to medium dense		SPT-21	30.0 - 31.5	1.5	1-1-4	22	
				SPT-22	31.5 - 33.0	1.5	4-3-4	22	
				SPT-23	33.0 - 34.5	1.0	1-2-3	22	
				SPT-24	34.5 - 36.0	1.5	1-2-3	25	
				SPT-25	36.0 - 37.5	0.5	1-2-3	21	
				SPT-26	37.5 - 39.0	0.5	1-2-3	21	
				SPT-27	39.0 - 40.5	1.5	1-2-3	21	
				SPT-28	40.5 - 42.0	1.5	2-5-7	23	
766.4'	43.1'			SPT-29	42.0 - 43.5	1.5	9-33-55	12	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 594577.54, E 2544332.94 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-7**
		Total Depth	54.3 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
				~~SPT-30~~	~~43.5 - 44.3~~	~~0.8~~	~~12-50/0.3~~	~~11~~	Began Core
		Limestone (65%) Interbedded With Shale (35%):		0%	2.7	2.7	100	47.0	
757.5'	52.0'	Limestone, dark gray, hard, thin bedded, moderaterly weathered, fine grained, 35° to 45° inclined bedding planes, fossiliferous		22%	5.0	5.0	100	52.0	
755.2'	54.3'	Shale, red brown, fine grained, silty, soft, thin bedded, moderately weathered, 35° to 45° inclined bedding planes, calcareous		0%	2.3	1.0	43	54.3	
		Limestone, gray, hard, thin bedded, moderaterly weathered, fine grained, 35° to 45° inclined bedding planes, shale stringers, streaks and partings							
		Bottom of Hole							
		Base of Weathered Rock = 47.0'							
		Top of Rock = 43.1' Elevation (766.4')							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 594312.72, E 2544896.21 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-8** Total Depth 52.0 ft
Location	Clinton, Tennessee	Surface Elevation	821.0 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/7/09 Completed 7/8/09
Supervisor	Patrick White Driller Sam Wilks	Depth to Water	16.5 ft Date/Time 7/8/09
Logged By	Greg Budd	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
821.0'	0.0'	Top of Hole							
820.5'	0.5'	FILL - TOPSOIL		SPT-1	0.0 - 1.5	1.2	3-6-9	13	Boring advanced using 3 and 1/4 inch hollow stem augers.
		SOIL 1: FILL - BOTTOM ASH, gray and black, moist to wet, dense, some coal refuse		SPT-2	1.5 - 3.0	1.4	11-12-12	20	
				SPT-3	3.0 - 4.5	1.1	24-24-32	20	
				SPT-4	4.5 - 6.0	1.0	9-10-20	8	
				SPT-5	6.0 - 7.5	1.3	24-22-30	21	
				SPT-6	7.5 - 9.0	1.1	15-12-12	25	
				SPT-7	9.0 - 10.5	1.1	10-23-24	22	
				SPT-8	10.5 - 12.0	1.3	26-22-21	22	
				SPT-9	12.0 - 13.5	1.2	10-12-13	39	Wet zone between 12 and 12.5 feet.
				SPT-10	13.5 - 15.0	12.0	8-9-9	46	
				SPT-11	15.0 - 16.5	1.0	3-3-5	45	Fly ash between 14.5 and 15 feet.
				SPT-12	16.5 - 18.0	12.0	3-3-3	57	
802.5'	18.5'			SPT-13	18.0 - 19.5	12.0	3-4-3	39	
		SOIL 3: SLUICED FLY ASH, gray to black, saturated to wet, very soft to medium stiff, with varying percentages of bottom ash		SPT-14	19.5 - 21.0	1.0	2-1-2	35	
				SPT-15	21.0 - 22.5	1.5	1-1-1	49	
				SPT-16	22.5 - 24.0	1.0	1-1-1	46	
				SPT-17	24.0 - 25.5	1.5	1-1-1	42	
				SPT-18	25.5 - 27.0	0.5	1-1-1	38	
				SPT-19	27.0 - 28.5	1.5	1-1-2	36	
				SPT-20	28.5 - 30.0	1.5	1-1-1	43	Saturated begining at 41.5 feet.
				SPT-21	30.0 - 31.5	0.7	wor-wor-wor	40	
				SPT-22	31.5 - 33.0	1.5	woh-1-1	38	
				SPT-23	33.0 - 34.5	1.0	woh-wor-wor	44	
				SPT-24	34.5 - 36.0	1.5	wor-wor-wor	38	
				SPT-25	36.0 - 37.5	1.1	woh-wor-wor	37	
				SPT-26	37.5 - 39.0	1.0	woh-wor-wor	38	
781.0'	40.0'			SPT-27	39.0 - 40.5	1.2	1-2-2	31	
		SOIL 7: SANDY LEAN CLAY, brown, wet, soft to medium stiff, some silt, trace sand		SPT-28	40.5 - 42.0	1.0	1-1-2	31	Organics present at 41 feet.
				SPT-29	42.0 - 43.5	1.5	2-2-3	27	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 594312.72, E 2544896.21 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-8**
		Total Depth	52.0 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
		SOIL 7: SANDY LEAN CLAY, brown, wet, soft to medium stiff, some silt, trace sand *(Continued)*		SPT-30	43.5 - 45.0	1.1	1-2-2	27	
				SPT-31	45.0 - 46.5	1.0	3-3-4	25	
				SPT-32	46.5 - 48.0	1.5	2-3-3	22	
				SPT-33	48.0 - 49.5	1.0	3-3-4	22	
				SPT-34	49.5 - 51.0	0.9	2-2-2	25	
770.0'	51.0'								
769.2'	51.8'	SOIL 10: SAND with Gravel, wet, medium dense		SPT-35	51.0 - 51.9	0.9	20-50/0.4	16	
769.0'	52.0'	Limestone (augered)							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 594232.56, E 2544740.10 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-9** Total Depth 73.5 ft
Location	Clinton, Tennessee	Surface Elevation	837.5 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/6/09 Completed 7/7/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	25.0 ft Date/Time 7/7/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
837.5'	0.0'	Top of Hole							
		SOIL 1: FILL - BOTTOM ASH, dark gray to black, moist, dense		SPT-1	0.0 - 1.5	1.0	1-4-7	17	Boring advanced using 3 1/4" Hollow Stem Augers
				SPT-2	1.5 - 3.0	1.2	8-31-33	13	
				SPT-3	3.0 - 4.5	1.3	9-19-19	17	
				SPT-4	4.5 - 6.0	1.4	7-11-13	23	
				SPT-5	6.0 - 7.5	1.2	10-11-13	12	
				SPT-6	7.5 - 9.0	1.0	9-11-11	9	
				SPT-7	9.0 - 10.5	1.3	4-7-12	15	
				SPT-8	10.5 - 12.0	1.1	4-9-13	13	
				SPT-9	12.0 - 13.5	1.3	15-16-18	26	SPT-9: fly ash
				SPT-10	13.5 - 15.0	1.1	16-18-19	17	
				SPT-11	15.0 - 16.5	1.3	11-13-19	24	
				SPT-12	16.5 - 18.0	1.2	11-13-12	17	
				SPT-13	18.0 - 19.5	1.1	15-12-13	18	
				SPT-14	19.5 - 21.0	1.4	3-4-7	20	
				SPT-15	21.0 - 22.5	1.0	5-5-6	21	
814.5'	23.0'								
		SOIL 3: SLUICED FLY ASH, gray to dark gray, moist to saturated, very soft to stiff, with varying percentages of bottom ash		SPT-16	22.5 - 24.0	1.3	6-5-5	24	
				SPT-17	24.0 - 25.5	1.3	4-2-2	30	Saturated at 25.0 ft
				SPT-18	25.5 - 27.0	1.4	2-2-3	38	
				SPT-19	27.0 - 28.5	1.3	1-1-3	40	
				SPT-20	28.5 - 30.0	0.9	1-1-2	46	
				SPT-21	30.0 - 31.5	1.5	WOR	57	
				SPT-22	31.5 - 33.0	1.3	WOR	37	
				SPT-23	33.0 - 34.5	0.1	WOR	37	
				SPT-24	34.5 - 36.0	1.3	1-4-7	27	
				SPT-25	36.0 - 37.5	1.3	7-9-9	30	
				SPT-26	37.5 - 39.0	1.3	6-8-9	28	
				SPT-27	39.0 - 40.5	1.3	3-5-5	36	
				SPT-28	40.5 - 42.0	1.1	4-8-14	35	
				SPT-29	42.0 - 43.5	1.5	3-3-4	36	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 594232.56, E 2544740.10 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-9**
		Total Depth	73.5 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
		SOIL 3: SLUICED FLY ASH, gray to dark gray, moist to saturated, very soft to stiff, with varying percentages of bottom ash *(Continued)*		SPT-30	43.5 - 45.0	1.2	3-4-6	44	
				SPT-31	45.0 - 46.5	1.3	WOH-1-1	40	
				SPT-32	46.5 - 48.0	1.2	1-2-3	46	
				SPT-33	48.0 - 49.5	1.1	1-1-2	53	
				SPT-34	49.5 - 51.0	1.4	WOR-WOR-WOH	45	
				SPT-35	51.0 - 52.5	1.3	WOR	41	
784.0'	53.5'			SPT-36	52.5 - 54.0	1.1	WOR-WOH-4	19	
		SOIL 7: SANDY LEAN CLAY, brown, moist, stiff to medium stiff, some silt		SPT-37	54.0 - 55.5	1.0	2-4-5	20	
				SPT-38	55.5 - 57.0	1.4	2-3-5	20	
				SPT-39	57.0 - 58.5	1.1	5-7-7	19	
				SPT-40	58.5 - 60.0	1.3	4-7-9	19	
				SPT-41	60.0 - 61.5	1.3	2-4-7	20	
				SPT-42	61.5 - 63.0	1.4	6-7-8	20	
				SPT-43	63.0 - 64.5	1.3	5-6-6	20	
				SPT-44	64.5 - 66.0	1.5	1-1-4	22	
				SPT-45	66.0 - 67.5	1.3	2-3-4	22	
768.5'	69.0'			SPT-46	67.5 - 69.0	1.4	2-4-3	23	
		SOIL 10: SAND, brown, saturated, very loose, fine to coarse grained, some fine gravel		SPT-47	69.0 - 70.5	0.1	WOR-WOH-1	26	
				SPT-48	70.5 - 72.0	1.1	3-2-2	18	
765.0'	72.5'			SPT-49	72.0 - 72.9	0.9	6-50/0.4	13	
764.0'	73.5'	Shale (Augered)							
		Auger Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 594173.80, E 2544636.59 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-10** Total Depth 50.5 ft
Location	Clinton, Tennessee	Surface Elevation	817.9 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/23/09 Completed 6/24/09
Supervisor	Patrick Kiser Driller Kent Clements	Depth to Water	15.5 ft Date/Time 6/23/09
Logged By	Briggs Evans	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
817.9'	0.0'	Top of Hole							
817.4'	0.5'	FILL - TOPSOIL, damp		SPT-1	0.0 - 1.5	0.8	3-5-9	10	
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, gray black, damp, medium stiff to stiff		SPT-2	1.5 - 3.0	1.5	10-15-19	17	
				SPT-3	3.0 - 4.5	1.0	5-11-13	22	
				SPT-4	4.5 - 6.0	1.5	10-19-25	18	
				SPT-5	6.0 - 7.5	1.5	32-35-43	20	
				SPT-6	7.5 - 9.0	1.5	10-9-10	27	
				SPT-7	9.0 - 10.5	1.5	5-6-6	43	
				SPT-8	10.5 - 12.0	1.5	6-7-7	37	
805.5'	12.4'								Wet from 12.0 - 12.2
		SOIL 3: SLUICED FLY ASH, gray black to gray, damp to saturated, very stiff to soft		SPT-9	12.0 - 13.5	1.5	16-17-21	28	Clayey bottom ash layer 12.0 - 12.2
				SPT-10	13.5 - 15.0	1.5	17-21-31	18	
				SPT-11	15.0 - 16.5	1.0	10-31-30	12	
				SPT-12	16.5 - 18.0	1.3	17-13-14	15	
				ST-1	18.0 - 18.5	0.5		19	
				SPT-13	18.5 - 20.0	1.5	4-6-10	24	Added Revert drilling mud to control blow-back
				SPT-14	20.0 - 21.5	1.0	4-7-9	17	
				SPT-15	21.5 - 23.0	1.5	2-8-9	16	
				SPT-16	23.0 - 24.5	1.2	3-7-4	31	
				ST-2	24.5 - 26.5	2.0		43	
				ST-3	26.5 - 28.5	2.0		32	
789.4'	28.5'								
		SOIL 6: LEAN CLAY, brown, moist, medium		ST-4	28.5 - 30.5	2.0		23	
				ST-5	30.5 - 32.5	2.0		21	
785.6'	32.3'								
		SOIL 7: SANDY LEAN CLAY, brown tan, moist, medium, fine sand, mottled		ST-6	32.5 - 34.5	2.0		22	
				ST-7	34.5 - 36.5	2.0		22	
				ST-8	36.5 - 38.5	2.0		22	
				ST-9	38.5 - 40.5	2.0		22	
				ST-10	40.5 - 42.5	2.0		24	
775.4'	42.5'								
				ST-11	42.5 - 44.5	2.0		20	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 594173.80, E 2544636.59 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-10** Total Depth 50.5 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
772.1'	45.8'	SOIL 14: SILTY SAND, tan, moist to wet, medium dense, fine to medium grained, well graded *(Continued)*		ST-12	44.5 - 46.0	1.5		21	
				SPT-17	46.0 - 47.5	1.5	7-10-12	22	
				SPT-18	47.5 - 49.0	1.5	9-13-15	18	
767.5'	50.4'	SOIL 12: SAND with Gravel, brown tan, wet, very dense to dense, fine to coarse grained, subrounded, well graded, some fine to coarse sand and trace silt		SPT-19	49.0 - 50.5	1.5	4-15-45	13	
767.4'	50.5'	Shale (augered), red brown							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 594173.80, E 2544636.59 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-10A** Total Depth 35.0 ft
Location	Clinton, Tennessee	Surface Elevation	817.9 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/13/09 Completed 7/13/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	N/A Date/Time N/A
Logged By	Ben Halada	Automatic Hammer ☐	Safety Hammer ☐ Other ☐

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
817.9'	0.0'	Top of Hole							Boring advanced using 3 1/4" Hollow Stem Augers No samples taken, augered for peizometer installation only. Slotted screen piezometer installed. Tip depth at 32.0 ft. See piezometer installation log for details.

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 594140.80, E 2544576.48 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-11** Total Depth 40.3 ft
Location	Clinton, Tennessee	Surface Elevation	808.6 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/22/09 Completed 6/22/09
Supervisor	Tony Speer Driller Steve Bradford	Depth to Water	8.5 ft Date/Time 6/22/09
Logged By	Tony Speer	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
808.6'	0.0'	Top of Hole							
		SOIL 9: FILL - CLAYEY SAND with Gravel, light yellow brown, dry, stiff, Low to medium plasticity		SPT-1	0.0 - 1.5	1.0	5-5-5	20	Boring advanced using 4 and 1/4 inch hollow stem augers
				SPT-2	1.5 - 3.0	1.1	4-5-5	21	
				SPT-3	3.0 - 4.5	1.0	5-4-6	20	
802.1'	6.5'			ST-1	4.5 - 6.5	1.6		18	0.5 ft ash layer near top
		SOIL 11: FILL - CLAYEY GRAVEL, red, moist, soft to medium stiff		SPT-4	6.5 - 8.0	1.5	1-2-2	23	
				SPT-5	8.0 - 9.5	1.0	1-2-2	30	0.5 ft ash layer near 9'
797.1'	11.5'			ST-2	9.5 - 11.5	1.6		36	
795.6'	13.0'	SOIL 10: FILL - SAND, brown, moist, loose to medium dense		SPT-6	11.5 - 13.0	0.5	1-1-1	40	
		SOIL 3: SLUICED FLY ASH, gray, saturated, soft to medium stiff, with varying percentages of bottom ash		SPT-7	13.0 - 14.5	1.5	1-2-2	42	
792.6'	16.0'			SPT-8	14.5 - 16.0	0.9	1-1-1	32	
791.1'	17.5'			SPT-9	16.0 - 17.5	0.8	1-4-9	18	
789.6'	19.0'	SOIL 6: LEAN CLAY, red brown, moist, stiff		SPT-10	17.5 - 19.0	1.5	11-12-15	19	
		SOIL 12: SILT, dark brown, moist, stiff, with organic matter		SPT-11	19.0 - 20.5	1.5	4-9-11	21	
786.1'	22.5'			ST-3	20.5 - 22.5	1.8		23	
		SOIL 6: LEAN CLAY, brown, moist, stiff		SPT-12	22.5 - 24.0	0.7	2-6-6	24	
		SOIL 7: SANDY LEAN CLAY, brown tan, moist, stiff to medium stiff, fine sand		SPT-13	24.0 - 25.5	0.9	5-6-6	27	
				ST-4	25.5 - 27.5	1.0		23	
				SPT-14	27.5 - 29.0	1.5	4-6-6	27	
				SPT-15	29.0 - 30.5	1.5	4-6-10	28	
				SPT-16	30.5 - 32.0	1.5	4-6-6	23	
				SPT-17	32.0 - 33.5	1.0	2-3-4	24	
				ST-5	33.5 - 35.5	1.8		23	
				SPT-18	35.5 - 37.0	1.5	3-4-4	28	
770.1'	38.5'			SPT-19	37.0 - 38.5	1.1	2-3-4	28	
768.6'	40.0'	SOIL 10: SAND, gray, loose to medium dense, fine		SPT-20	38.5 - 40.0	0.8	4-5-6	27	
768.3'	40.3'			SPT-21	40.0 - 40.3	0.3	50/0.3	17	
		Limestone (augered), gray							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 594140.80, E 2544576.48 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-11** Total Depth 40.3 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593923.78, E 2545228.66 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-13** Total Depth 69.0 ft
Location	Clinton, Tennessee	Surface Elevation	831.3 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/9/09 Completed 7/9/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	21.0 ft Date/Time 7/9/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
831.3'	0.0'	Top of Hole							
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, gray, moist, medium dense to very dense		SPT-1	0.0 - 1.5	1.0	WOH-WOH-2	22	Boring advanced using 3 1/4" Hollow Stem Augers
				SPT-2	1.5 - 3.0	1.1	3-6-6	20	
				SPT-3	3.0 - 4.5	1.3	4-8-9	14	
				SPT-4	4.5 - 6.0	1.3	4-12-21	14	SPT-3: organics present in sample
				SPT-5	6.0 - 7.5	1.1	20-22-23	17	
				SPT-6	7.5 - 9.0	1.2	15-17-20	24	
				SPT-7	9.0 - 10.5	1.3	2-10-29	11	
				SPT-8	10.5 - 12.0	1.1	7-15-19	14	
				SPT-9	12.0 - 13.5	1.1	10-20-23	13	
				SPT-10	13.5 - 15.0	1.0	30-44-40	20	
				SPT-11	15.0 - 16.5	1.4	9-11-13	18	
				SPT-12	16.5 - 18.0	1.0	7-9-12	24	
812.3'	19.0'			SPT-13	18.0 - 19.5	1.1	7-7-8	31	
		SOIL 3: SLUICED FLY ASH, gray, saturated, soft to very soft, with varying percentages of bottom ash		SPT-14	19.5 - 21.0	1.5	2-2-3	37	
				SPT-15	21.0 - 22.5	1.5	3-2-4	38	
				SPT-16	22.5 - 24.0	1.4	2-2-3	40	
				SPT-17	24.0 - 25.5	1.4	WOH-1-1	44	
				SPT-18	25.5 - 27.0	1.3	1-WOH-1	45	
				SPT-19	27.0 - 28.5	1.2	WOR-WOH-WOH	49	
				SPT-20	28.5 - 30.0	1.2	WOH-1-1	49	
				SPT-21	30.0 - 31.5	1.4	WOH-1-1	79	
				SPT-22	31.5 - 33.0	1.2	WOH-WOH-1	42	
				SPT-23	33.0 - 34.5	1.3	WOH-1-1	47	
				SPT-24	34.5 - 36.0	1.5	WOH-1-1	44	SPT-24: organics present in sample
				SPT-25	36.0 - 37.5	1.3	2-2-2	56	
				SPT-26	37.5 - 39.0	1.1	3-3-4	95	
				SPT-27	39.0 - 40.5	1.4	WOH-WOH-1	71	
				SPT-28	40.5 - 42.0	1.5	1-2-2	48	
				SPT-29	42.0 - 43.5	1.1	1-2-2	62	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593923.78, E 2545228.66 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-13** Total Depth 69.0 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
		SOIL 3: SLUICED FLY ASH, gray, saturated, soft to very soft, with varying percentages of bottom ash *(Continued)*		SPT-30	43.5 - 45.0	1.3	2-2-1	73	
				SPT-31	45.0 - 46.5	0.7	WOH	55	
				SPT-32	46.5 - 48.0	1.1	WOH	52	
				SPT-33	48.0 - 49.5	0.7	WOH	55	
				SPT-34	49.5 - 51.0	1.0	WOR	45	
				SPT-35	51.0 - 52.5	1.1	WOR	45	
				SPT-36	52.5 - 54.0	1.4	WOR-WOR-WOH	44	
776.8'	54.5'								
				SPT-37	54.0 - 55.5	1.1	WOH-WOH-1	26	SPT-37 and SPT-40: organics present in sample
775.8'	55.5'	SOIL 12: SILT, dark brown, moist, soft, some clay		SPT-38	55.5 - 57.0	1.5	WOH-1-3	25	
		SOIL 13: LEAN CLAY with Sand, light brown and gray, moist, soft, some silt		SPT-39	57.0 - 58.5	1.3	1-2-4	27	
				SPT-40	58.5 - 60.0	1.3	WOH-2-4	29	
				SPT-41	60.0 - 61.5	1.1	WOH-2-3	26	
				SPT-42	61.5 - 63.0	1.4	1-2-3	22	
767.8'	63.5'								
		SOIL 10: SAND with Gravel, gray, saturated, medium dense, fine to coarse grained, some fine to coarse gravel		SPT-43	63.0 - 64.5	1.0	2-3-5	30	
				SPT-44	64.5 - 66.0	1.2	8-11-12	18	
				SPT-45	66.0 - 67.5	1.5	11-18-20	12	
762.6'	68.7'			SPT-46	67.5 - 69.0	1.5	13-16-44	11	
762.3'	69.0'	Shale (Augered)							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593802.44, E 2545004.48 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-14** Total Depth 85.5 ft
Location	Clinton, Tennessee	Surface Elevation	848.7 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/8/09 Completed 7/8/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	35.0 ft Date/Time 7/8/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
848.7'	0.0'	Top of Hole							
		SOIL 9: FILL - CLAYEY SAND with Gravel, light brown, moist, medium stiff, some coarse gravel		SPT-1	0.0 - 1.5	0.8	5-5-6	9	Boring advanced using 3 1/4" Hollow Stem Augers
				SPT-2	1.5 - 3.0	0.5	11-16-5	7	SPT-2: geotextile fabric
				SPT-3	3.0 - 4.5	1.0	16-6-9	10	
				SPT-4	4.5 - 6.0	1.1	4-4-5	12	SPT-4: bottom ash in tip of spoon
				SPT-5	6.0 - 7.5	0.9	6-4-4	15	
				SPT-6	7.5 - 9.0	0.8	6-6-8	15	
839.2'	9.5'			SPT-7	9.0 - 10.5	1.1	6-8-9	16	Slotted screen piezometer installed. Tip depth at 48.0 ft. See piezometer installation log for details.
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, gray, moist, medium to very dense		SPT-8	10.5 - 12.0	1.1	4-6-13	21	
				SPT-9	12.0 - 13.5	1.3	16-21-25	17	
				SPT-10	13.5 - 15.0	1.1	6-15-19	19	
				SPT-11	15.0 - 16.5	1.5	9-18-20	19	
				SPT-12	16.5 - 18.0	1.3	27-31-36	13	
				SPT-13	18.0 - 19.5	1.2	6-11-13	16	
				SPT-14	19.5 - 21.0	1.2	5-4-4	9	
				SPT-15	21.0 - 22.5	1.3	6-11-14	15	
				SPT-16	22.5 - 24.0	1.2	9-9-13	15	
				SPT-17	24.0 - 25.5	1.1	4-8-10	17	
				SPT-18	25.5 - 27.0	1.3	8-12-19	16	SPT-18: 0.1' of clay/shale at 26.2 ft
				SPT-19	27.0 - 28.5	1.5	14-21-26	25	
				SPT-20	28.5 - 30.0	1.2	14-15-17	18	
				SPT-21	30.0 - 31.5	1.3	3-3-4	20	
				SPT-22	31.5 - 33.0	1.0	2-3-4	19	
				SPT-23	33.0 - 34.5	1.1	2-3-3	19	
813.7'	35.0'			SPT-24	34.5 - 36.0	1.1	3-2-1	39	
		SOIL 3: SLUICED FLY ASH, gray to black, saturated, soft to very soft		SPT-25	36.0 - 37.5	1.5	2-2-3	43	
				SPT-26	37.5 - 39.0	1.4	1-1-2	37	
				SPT-27	39.0 - 40.5	1.2	1-1-1	38	
				SPT-28	40.5 - 42.0	1.5	WOR-WOH-1	84	
				SPT-29	42.0 - 43.5	1.4	WOR-WOH-WOH	72	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593802.44, E 2545004.48 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-14**
		Total Depth	85.5 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
		SOIL 3: SLUICED FLY ASH, gray to black, saturated, soft to very soft *(Continued)*		SPT-30	43.5 - 45.0	1.3	WOH-WOH-1	43	
				SPT-31	45.0 - 46.5	1.1	WOH-2-5	63	
				SPT-32	46.5 - 48.0	1.3	WOH-1-2	64	
				SPT-33	48.0 - 49.5	1.2	5-5-6	53	SPT-33: silt in tip of spoon
				SPT-34	49.5 - 51.0	1.3	1-3-3	46	
				SPT-35	51.0 - 52.5	1.4	2-3-5	36	
				SPT-36	52.5 - 54.0	1.5	5-4-5	35	
				SPT-37	54.0 - 55.5	1.5	1-1-2	36	
				SPT-38	55.5 - 57.0	1.4	1-1-3	37	
				SPT-39	57.0 - 58.5	1.3	1-1-2	52	
				SPT-40	58.5 - 60.0	1.3	1-1-2	56	
				SPT-41	60.0 - 61.5	1.1	WOR-WOH-WOH	42	
				SPT-42	61.5 - 63.0	1.1	WOR	40	
785.2'	63.5'								
		SOIL 6: LEAN CLAY, brown and red brown, moist, very soft to soft, some fine to medium sand, some silt		SPT-43	63.0 - 64.5	1.1	WOR-5-6	20	
				SPT-44	64.5 - 66.0	1.3	WOH-1-1	22	
				SPT-45	66.0 - 67.5	1.3	WOR-WOH-WOH	24	
				SPT-46	67.5 - 69.0	1.0	WOH-WOH-1	24	
				SPT-47	69.0 - 70.5	1.5	WOH-1-1	26	
				SPT-48	70.5 - 72.0	1.4	WOH	25	
				SPT-49	72.0 - 73.5	1.3	WOH-1-2	24	
				SPT-50	73.5 - 75.0	1.5	WOH-1-1	23	
				SPT-51	75.0 - 76.5	1.4	WOR-WOH-1	26	
				SPT-52	76.5 - 78.0	1.5	WOH-WOH-2	28	
				SPT-53	78.0 - 79.5	1.5	WOH	28	
767.7'	81.0'			SPT-54	79.5 - 81.0	1.4	WOR-WOH-WOH	34	
		SOIL 10: SAND, dark gray, saturated, very loose, fine to medium grained, trace clay, some coarse gravel		SPT-55	81.0 - 82.5	1.1	3-1-1	40	
764.7'	84.0'			SPT-56	82.5 - 84.0	1.1	WOH-1-2	24	
				SPT-57	84.0 - 84.3	0.2	50/0.3	10	
763.2'	85.5'	Shale (Augered)							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593734.18, E 2544875.42 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-15** Total Depth 51.3 ft
Location	Clinton, Tennessee	Surface Elevation	818.1 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/25/09 Completed 6/25/09
Supervisor	Patrick Kiser Driller Kent Clements	Depth to Water	12.5 ft Date/Time 6/25/09
Logged By	Briggs Evans	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
818.1'	0.0'	Top of Hole							
817.6'	0.5'	TOPSOIL, damp		SPT-1	0.0 - 1.5	1.5	3-7-9	19	Boring advanced using 3-1/4 inch hollow stem augers.
		SOIL 2: BOTTOM ASH/FLY ASH MIXTURE, light gray to black, damp to saturated, medium dense to dense		SPT-2	1.5 - 3.0	1.4	5-10-13	26	
				SPT-3	3.0 - 4.5	1.5	13-13-17	31	
				SPT-4	4.5 - 6.0	1.5	8-15-22	26	
				SPT-5	6.0 - 7.5	1.5	38-49-50+	22	Slotted screen piezometer installed, tip depth 50 ft bgs. See peizometer installation logs for details.
				SPT-6	7.5 - 9.0	1.5	6-9-10	32	
				SPT-7	9.0 - 10.5	1.5	9-8-9	40	
				SPT-8	10.5 - 12.0	1.0	3-6-9	35	
				SPT-9	12.0 - 13.5	1.5	9-17-21	25	Wet at 12.5 feet
				SPT-10	13.5 - 15.0	1.0	4-9-11	17	Revert added at 13.5 feet to control blow-back
				SPT-11	15.0 - 16.5	1.0	2-5-8	23	
				SPT-12	16.5 - 18.0	1.2	5-7-9	33	
799.1'	19.0'			ST-1	18.0 - 19.0	1.0		22	
		SOIL 3: SLUICED FLY ASH, light gray with black gray, saturated to wet, soft to medium stiff, with varying percentages of bottom ash		SPT-13	19.0 - 20.5	1.5	4-8-9	19	
				SPT-14	20.5 - 22.0	1.5	10-10-11	17	
				SPT-15	22.0 - 23.5	1.5	12-9-11	14	
				SPT-16	23.5 - 25.0	1.0	12-6-6	16	
				SPT-17	25.0 - 26.5	1.0	4-4-7	21	
				SPT-18	26.5 - 28.0	1.0	10-8-7	35	
				SPT-19	28.0 - 29.5	1.5	1-2-4	46	
				SPT-20	29.5 - 31.0	1.5	1-1-1	52	
785.7'	32.4'			SPT-21	31.0 - 32.5	1.5	1-3-3	55	
		SOIL 6: LEAN CLAY, brown tan, moist, stiff, fine sand, mottled		SPT-22	32.5 - 34.0	1.5	3-6-8	24	
				SPT-23	34.0 - 35.5	1.3	1-4-6	25	
				SPT-24	35.5 - 37.0	1.5	3-4-5	23	
				SPT-25	37.0 - 38.5	1.0	5-7-10	21	
				SPT-26	38.5 - 40.0	1.5	5-7-9	23	
				SPT-27	40.0 - 41.5	1.5	3-4-6	25	
				SPT-28	41.5 - 43.0	1.5	4-7-8	23	
				SPT-29	43.0 - 44.5	1.5	3-4-5	27	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593734.18, E 2544875.42 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-15** Total Depth 51.3 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
		SOIL 6: LEAN CLAY, brown tan, moist, stiff, fine sand, mottled *(Continued)*		SPT-30	44.5 - 46.0	1.5	2-2-2	27	
770.8'	47.3'			SPT-31	46.0 - 47.5	1.5	2-4-3	29	
		SOIL 10: SAND, tan, wet, loose to medium dense, fine to medium grained, well graded, trace silt		SPT-32	47.5 - 49.0	0.2	2-3-5	13	
				SPT-33	49.0 - 50.5	0.8	2-6-10	14	
767.0'	51.1'			SPT-34	50.5 - 51.3	0.8	21-50/0.3	17	
766.8'	51.3'								
		Shale, gray, (augered)							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593705.67, E 2544823.03 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-16** Total Depth 42.7 ft
Location	Clinton, Tennessee	Surface Elevation	808.0 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/23/09 Completed 6/23/09
Supervisor	Tony Speer Driller Steve Bradford	Depth to Water	7.0 ft Date/Time 6/23/09
Logged By	Tony Speer	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
808.0'	0.0'	Top of Hole							
		SOIL 11: FILL - GRAVEL with Clay, reddish brown with gray, moist to wet, medium dense, mottled		SPT-1	0.0 - 1.5	1.1	3-5-6	14	Boring advanced using 4 and 1/4 inch hollow stem augers.
				SPT-2	1.5 - 3.0	1.5	6-5-4	20	
				SPT-3	3.0 - 4.5	1.1	6-5-6	18	
				SPT-4	4.5 - 6.0	1.2	3-3-3	21	
800.5'	7.5'			SPT-5	6.0 - 7.5	0.7	2-3-3	24	
		SOIL 3: SLUICED FLY ASH, gray to dark gray, moist to saturated, stiff to very soft, with varying percentages of bottom ash		SPT-6	7.5 - 9.0	0.7	1-1-1	26	
				SPT-7	9.0 - 10.5	0.8	1-1-1	30	
				SPT-8	10.5 - 12.0	0.9	1-1-woh	36	
				SPT-9	12.0 - 13.5	1.0	2-2-2	49	
				SPT-10	13.5 - 15.0	1.1	3-4-6	49	
				SPT-11	15.0 - 16.5	1.2	1-2-10	35	
				SPT-12	16.5 - 18.0	1.3	32-12-15	24	
				SPT-13	18.0 - 19.5	1.5	6-5-3	31	
787.0'	21.0'			SPT-14	19.5 - 21.0	1.2	2-3-4	25	
		SOIL 6: LEAN CLAY, reddish brown and gray, moist, medium stiff to stiff, with manganese concretions		SPT-15	21.0 - 22.5	1.1	5-6-7	25	
				SPT-16	22.5 - 24.0	0.8	3-3-4	23	
				SPT-17	24.0 - 25.5	1.5	5-6-8	22	
				SPT-18	25.5 - 27.0	1.1	6-8-12	24	
				SPT-19	27.0 - 28.5	1.1	10-11-14	25	
				SPT-20	28.5 - 30.0	1.2	9-8-10	24	
				SPT-21	30.0 - 31.5	1.0	3-3-4	26	
				SPT-22	31.5 - 33.0	1.1	6-8-7	25	
				SPT-23	33.0 - 34.5	1.1	4-5-7	25	
				SPT-24	34.5 - 36.0	1.5	woh-2-3	25	
				SPT-25	36.0 - 37.5	1.5	3-6-5	26	
769.0'	39.0'			SPT-26	37.5 - 39.0	1.0	3-4-4	26	
		SOIL 10: SAND, brown, moist, loose to medium dense, with organic matter		SPT-27	39.0 - 40.5	1.1	wor-wor-3	32	
766.0'	42.0'			SPT-28	40.5 - 42.0	0.8	10-17-19	11	
765.3'	42.7'			SPT-29	42.0 - 42.7	0.7	37-50/0.2	15	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593705.67, E 2544823.03 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-16** Total Depth 42.7 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
		Shale (augered), gray green							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593524.13, E 2545835.46 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-18** Total Depth 52.5 ft
Location	Clinton, Tennessee	Surface Elevation	821.7 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/8/09 Completed 7/8/09
Supervisor	Patrick White Driller Sam Wilks	Depth to Water	16.0 ft Date/Time 7/8/09
Logged By	Greg Budd	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
821.7'	0.0'	Top of Hole							
819.7'	2.0'	SOIL 4: FILL - LEAN CLAY, red brown, moist, stiff		SPT-1	0.0 - 1.5	1.0	5-7-7	16	Boring advanced using 3 and 1/4 inch hollow stem augers.
				SPT-2	1.5 - 3.0	1.4	7-8-10	17	
		SOIL 1: FILL - BOTTOM ASH, black and gray, moist to wet, dense, some coal refuse		SPT-3	3.0 - 4.5	1.2	10-11-12	20	
				SPT-4	4.5 - 6.0	0.9	4-7-8	21	
				SPT-5	6.0 - 7.5	1.3	8-12-22	24	Slotted screen piezometer installed, tip depth 24.5 ft. See peizometer installation log for details.
				SPT-6	7.5 - 9.0	1.5	15-15-17	24	
				SPT-7	9.0 - 10.5	1.5	9-25-27	11	
				SPT-8	10.5 - 12.0	1.5	22-25-27	25	
				SPT-9	12.0 - 13.5	1.5	24-34-36	17	
				SPT-10	13.5 - 15.0	1.4	8-12-10	15	
				SPT-11	15.0 - 16.5	1.5	4-3-4	20	
				SPT-12	16.5 - 18.0	1.5	2-2-4	31	
802.7'	19.0'			SPT-13	18.0 - 19.5	1.5	1-2-2	33	SPT-13 is saturated
		SOIL 3: SLUICED FLY ASH, gray and black, wet, very soft to soft, with varying percentages of bottom ash		SPT-14	19.5 - 21.0	0.5	1-1-1	29	
				SPT-15	21.0 - 22.5	1.5	1-1-1	28	
				SPT-16	22.5 - 24.0	1.5	1-1-2	28	
				SPT-17	24.0 - 25.5	1.5	1-2-1	28	
				SPT-18	25.5 - 27.0	0.5	1-1-2	27	
				SPT-19	27.0 - 28.5	0.5	1-2-2	23	
				SPT-20	28.5 - 30.0	1.0	3-2-2	21	
				SPT-21	30.0 - 31.5	1.0	2-3-3	23	SPT-21 is saturated
				SPT-22	31.5 - 33.0	0.6	2-2-2	36	
				SPT-23	33.0 - 34.5	0.9	2-2-2	34	
				SPT-24	34.5 - 36.0	0.4	4-2-1	21	
785.2'	36.5'			SPT-25	36.0 - 37.5	1.0	3-3-3	23	
		SOIL 6: LEAN CLAY, brown, moist, medium stiff to soft, trace silt, trace sand		SPT-26	37.5 - 39.0	1.0	2-3-4	22	
				SPT-27	39.0 - 40.5	1.5	4-4-5	26	
				SPT-28	40.5 - 42.0	1.2	3-4-4	25	
				SPT-29	42.0 - 43.5	0.9	3-2-1	28	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593524.13, E 2545835.46 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-18** Total Depth 52.5 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
		SOIL 6: LEAN CLAY, brown, moist, medium stiff to soft, trace silt, trace sand *(Continued)*		SPT-30	43.5 - 45.0	1.5	2-2-3	27	
				SPT-31	45.0 - 46.5	1.5	2-2-4	24	
				SPT-32	46.5 - 48.0	1.5	5-4-4	23	
				SPT-33	48.0 - 49.5	1.5	4-4-4	22	
772.0'	49.7'								
771.2'	50.5'	SOIL 10: SAND, brown, wet, medium dense, medium to coarse grained		SPT-34	49.5 - 51.0	1.5	13-17-18	18	
770.2'	51.5'								
769.2'	52.5'			SPT-35	51.0 - 52.5	1.5	10-17-18	16	
		SOIL 11: GRAVEL, brown, wet, medium dense, medium to coarse grained, some coarse sand							
		Shale (augered)							
		Auger Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593480.64, E 2545884.32 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-19** Total Depth 45.0 ft
Location	Clinton, Tennessee	Surface Elevation	810.2 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/9/09 Completed 7/9/09
Supervisor	Patrick White Driller Sam Wilks	Depth to Water	9.0 ft Date/Time 7/9/09
Logged By	Greg Budd	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
810.2'	0.0'	Top of Hole							
809.2'	1.0'	FILL - CRUSHED STONE		SPT-1	0.0 - 1.5	0.6	10-7-7	17	Boring advanced using 3 and 1/4 inch hollow stem augers.
		SOIL 4: FILL - LEAN CLAY, tan red, moist, stiff		SPT-2	1.5 - 3.0	0.8	10-7-8	24	
				SPT-3	3.0 - 4.5	1.1	12-12-10	18	
				SPT-4	4.5 - 6.0	1.0	12-4-4	21	
				SPT-5	6.0 - 7.5	1.2	3-7-8	22	Slotted screen piezometer installed, tip depth 20 ft. See peizometer installation log for details.
801.2'	9.0'			SPT-6	7.5 - 9.0	1.1	6-6-5	26	
		SOIL 1: FILL - BOTTOM ASH, gray, wet, dense, some silty clay		SPT-7	9.0 - 10.5	0.9	2-1-3	24	
798.2'	12.0'			SPT-8	10.5 - 12.0	1.0	8-9-12	20	
		SOIL 13: LEAN CLAY with Sand, red brown to gray brown, moist to wet, soft to stiff, some gravel, some silt		SPT-9	12.0 - 13.5	1.0	32-22-8	21	
				SPT-10	13.5 - 15.0	1.2	3-4-4	19	
				SPT-11	15.0 - 16.5	1.4	3-2-3	21	
				SPT-12	16.5 - 18.0	1.4	3-3-4	22	
				SPT-13	18.0 - 19.5	1.0	37-9-10	24	Limestone boulder at 18.0 feet
				SPT-14	19.5 - 21.0	1.0	1-2-2	23	
				SPT-15	21.0 - 22.5	1.0	3-3-4	26	
				SPT-16	22.5 - 24.0	1.3	5-5-8	23	
				SPT-17	24.0 - 25.5	1.5	4-6-7	21	
				SPT-18	25.5 - 27.0	1.5	6-8-8	21	
				SPT-19	27.0 - 28.5	1.0	7-7-7	20	
				SPT-20	28.5 - 30.0	1.5	3-4-7	21	
				SPT-21	30.0 - 31.5	1.5	3-4-5	20	
				SPT-22	31.5 - 33.0	1.0	6-6-7	25	
				SPT-23	33.0 - 34.5	1.5	6-8-6	19	
				SPT-24	34.5 - 36.0	1.5	3-4-3	21	
				SPT-25	36.0 - 37.5	1.5	2-2-2	21	
				SPT-26	37.5 - 39.0	1.5	1-1-1	23	
770.2'	40.0'			SPT-27	39.0 - 40.5	1.2	2-3-3	23	
		SOIL 11: GRAVEL, wet, loose to dense, rounded, some sand		SPT-28	40.5 - 42.0	0.3	4-1-4	15	
				SPT-29	42.0 - 43.5	0.6	7-11-42	16	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593480.64, E 2545884.32 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-19** Total Depth 45.0 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
765.8'	44.4'			SPT-30	43.5 - 44.8	0.8	22-26-50/0.3	14	
765.5'	44.7'	Limestone (augered) Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593389.26, E 2545507.73 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-20** Total Depth 53.0 ft
Location	Clinton, Tennessee	Surface Elevation	819.6 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/25/09 Completed 6/26/09
Supervisor	Patrick Kiser Driller Kent Clements	Depth to Water	16.0 ft Date/Time 6/25/09
Logged By	Briggs Evans	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
819.6'	0.0'	Top of Hole							
819.1'	0.5'	FILL - TOPSOIL, damp		SPT-1	0.0 - 1.5	1.0	6-8-12	15	Boring advanced using 3-1/4 inch hollow stem augers.
		SOIL 1: FILL - BOTTOM ASH, gray to green gray, moist to saturated, loose to dense		SPT-2	1.5 - 3.0	1.5	12-18-24	18	
				SPT-3	3.0 - 4.5	1.5	10-19-32	18	
				SPT-4	4.5 - 6.0	1.5	13-14-15	13	
				SPT-5	6.0 - 7.5	1.5	13-14-11	16	
				SPT-6	7.5 - 9.0	1.2	9-18-27	15	
				SPT-7	9.0 - 10.5	1.5	13-17-26	20	
				SPT-8	10.5 - 12.0	1.5	13-11-10	20	
				SPT-9	12.0 - 13.5	1.5	7-8-9	27	
				SPT-10	13.5 - 15.0	1.5	4-3-4	31	
				SPT-11	15.0 - 16.5	1.5	2-2-3	35	Wet at 15.0 feet
801.6'	18.0'			SPT-12	16.5 - 18.0	1.5	1-2-3	39	
		SOIL 3: SLUICED FLY ASH, light gray to gray, saturated, very soft to soft, stratified		SPT-13	18.0 - 19.5	1.5	WOR-WOH-WOH	38	
				SPT-14	19.5 - 21.0	1.5	WOR-WOH-1	37	
				SPT-15	21.0 - 22.5	1.5	WOR-WOH-WOH	34	Bottom ash from 21.0 to 21.5 feet
				SPT-16	22.5 - 24.0	1.5	WOR-WOH-1	43	
				ST-1	24.0 - 26.0	2.0		36	
				SPT-17	26.0 - 27.5	1.5	1-1-1	41	
				SPT-18	27.5 - 29.0	1.5	2-2-7	39	
				ST-2	29.0 - 31.0	2.0		41	
				SPT-19	31.0 - 32.5	1.5	1-1-1	42	Revert added to control blow-back
				SPT-20	32.5 - 34.0	1.5	WOH-1-1	41	
				SPT-21	34.0 - 35.5	1.5	WOR-WOR-WOR	38	
				SPT-22	35.5 - 37.0	1.5	WOR-WOH-1	40	
				SPT-23	37.0 - 38.5	1.5	WOH-WOH-WOH	42	
				SPT-24	38.5 - 40.0	1.5	WOH-WOH-WOH	36	
				SPT-25.	40.0 - 41.5	1.5	WOR-WOR-WOR	38	Extremely soft, augers sinking w/o support
777.4'	42.2'			SPT-26	41.5 - 43.0	1.5	WOH-1-1	39	
				SPT-27	43.0 - 44.5	1.0	WOH-1-2	28	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593389.26, E 2545507.73 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-20** Total Depth 53.0 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
		SOIL 6: LEAN CLAY, green gray, wet to saturated, soft, some fine sand, mottled *(Continued)*		ST-3	44.5 - 46.5	2.0		30	
				SPT-28	46.5 - 48.0	0.8	WOH-1-2	22	
				SPT-29	48.0 - 49.5	0.8	1-5-5	22	
768.2'	51.4'			ST-4	49.5 - 51.5	2.0		25	
767.0'	52.6'	SOIL 11: CLAYEY GRAVEL, tan, wet, medium dense		SPT-30	51.5 - 53.0	1.0	3-7-20	15	
766.6'	53.0'	Shale, red gray, (augered)							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593286.66, E 2545087.68 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-21** Total Depth 44.8 ft
Location	Clinton, Tennessee	Surface Elevation	808.0 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/19/09 Completed 6/19/09
Supervisor	Patrick Kiser Driller Steve Bradford	Depth to Water	12.4 ft Date/Time 6/19/09
Logged By	Briggs Evans	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
808.0'	0.0'	Top of Hole							
807.5'	0.5'	SOIL 4: FILL - LEAN CLAY, brown, moist, very soft, with fine gravel, and bottom ash		SPT-1	0.0 - 1.5	1.4	woh-6-26	13	Boring advanced using 3-1/4 inch hollow stem augers.
				SPT-2	1.5 - 3.0	1.5	36-23-19	20	
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, tan brown to gray black, moist to saturated, dense to medium dense		SPT-3	3.0 - 4.5	1.2	8-9-12	16	
				SPT-4	4.5 - 6.0	1.2	4-5-5	27	
				SPT-5	6.0 - 7.5	1.2	6-6-7	31	
				SPT-6	7.5 - 9.0	0.0	3-2-3	--	
				SPT-7	9.0 - 10.5	0.0	2-4-4	--	
				SPT-8	10.5 - 12.0	1.2	9-7-7	47	
795.2'	12.8'			SPT-9	12.0 - 13.5	1.5	4-5-5	35	
		SOIL 3: SLUICED FLY ASH, dark gray, saturated, medium stiff		SPT-10	13.5 - 15.0	1.5	1-3-3	38	
				SPT-11	15.0 - 16.5	1.5	1-2-2	45	
				SPT-12	16.5 - 18.0	0.5	2-3-3	38	
789.0'	19.0'			SPT-13	18.0 - 19.5	0.5	2-4-6	25	
		SOIL 6: LEAN CLAY, brown, moist, stiff to very stiff		SPT-14	19.5 - 21.0	0.8	5-6-7	24	Water added to control blow back
				SPT-15	21.0 - 22.5	1.0	6-10-10	23	
				SPT-16	22.5 - 24.0	1.0	10-11-11	21	
783.6'	24.4'			SPT-17	24.0 - 25.5	1.0	woh-2-2	23	
		SOIL 7: SANDY CLAY, tan brown, moist to wet, soft, fine to medium sand		SPT-18	25.5 - 27.0	1.5	1-1-3	24	
780.8'	27.2'			SPT-19	27.0 - 28.5	1.5	2-2-1	25	
		SOIL 9: CLAYEY SAND, tan brown, wet, loose to med, fine to medium grained, well graded		SPT-20	28.5 - 30.0	1.5	1-2-1	22	
				SPT-21	30.0 - 31.5	1.5	1-3-3	23	
				SPT-22	31.5 - 33.0	1.5	2-2-4	24	
				SPT-23	33.0 - 34.5	1.5	2-2-3	24	
				SPT-24	34.5 - 36.0	1.5	woh-woh-1	25	
771.2'	36.8'			SPT-25	36.0 - 37.5	1.5	1-3-5	24	
		SOIL 14: SILTY SAND, tan, saturated, medium dense, fine to medium grained, well graded, trace clay		SPT-26	37.5 - 39.0	1.5	3-3-4	26	
				SPT-27	39.0 - 40.5	1.5	3-5-9	22	
766.8'	41.2'			SPT-28	40.5 - 42.0	1.5	9-16-28	17	
				SPT-29	42.0 - 43.5	1.5	28-24-17	13	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593286.66, E 2545087.68 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-21** Total Depth 44.8 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
				SPT-30	43.5 - 44.8	1.3	21-50-50/0.3	11	
763.5' / 763.2'	44.5' / 44.8'	SOIL 11: GRAVEL, tan, wet, dense, fine to medium grained, rounded, well graded, with medium to coarse sand *(Continued)*							
		Shale, gray brown, (augered) Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593138.35, E 2545015.84 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-22** Total Depth 34.5 ft
Location	Clinton, Tennessee	Surface Elevation	799.0 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/16/09 Completed 6/16/09
Supervisor	Briggs Evans Driller Kent Clements	Depth to Water	N/A Date/Time N/A
Logged By	Briggs Evans	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
799.0'	0.0'	Top of Hole							
798.5'	0.5'	SOIL 1: FILL - BOTTOM ASH		SPT-1	0.0 - 1.5	1.0	1-2-3	20	Boring advanced using 3 and 1/4 inch hollow stem augers.
		SOIL 14: SANDY SILT with Gravel, reddish brown, moist, medium stiff		SPT-2	1.5 - 3.0	1.0	3-4-4	17	
				SPT-3	3.0 - 4.5	1.5	4-5-4	23	
				SPT-4	4.5 - 6.0	0.8	2-2-2	25	
792.0'	7.0'			SPT-5	6.0 - 7.5	1.5	2-3-3	24	
		SOIL 13: LEAN CLAY with Sand, dark olive brown to light brown, moist to wet, medium stiff to stiff, some sand		SPT-6	7.5 - 9.0	1.2	2-3-4	23	
				SPT-7	9.0 - 10.5	1.5	3-3-5	22	
				SPT-8	10.5 - 12.0	1.5	1-3-5	21	
				SPT-9	12.0 - 13.5	1.2	8-6-9	22	
				SPT-10	13.5 - 15.0	1.5	3-5-8	25	
				SPT-11	15.0 - 16.5	0.0	4-4-6	--	
				SPT-12	16.5 - 18.0	1.0	5-6-6	23	
				SPT-13	18.0 - 19.5	1.0	4-5-6	22	
				SPT-14	19.5 - 21.0	1.5	2-2-4	23	
				SPT-15	21.0 - 22.5	1.5	2-3-4	23	
				SPT-16	22.5 - 24.0	1.5	2-4-5	26	
				SPT-17	24.0 - 25.5	1.5	2-2-4	24	
772.5'	26.5'			SPT-18	25.5 - 27.0	1.5	woh-1-1	25	
771.0'	28.0'	SOIL 9: CLAYEY SAND, light brown, saturated, very loose		SPT-19	27.0 - 28.5	1.0	woh-1-1	29	
		SOIL 10: SAND with Gravel, light brown, saturated, dense to very dense		SPT-20	28.5 - 30.0	1.5	1-1-3	25	
				SPT-21	30.0 - 31.5	1.5	1-3-8	24	
				SPT-22	31.5 - 33.0	1.5	16-19-24	10	
764.8'	34.2'			SPT-23	33.0 - 34.5	1.5	18-22-62	9	
764.5'	34.5'	Shale							
		Auger Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593275.52, E 2546061.35 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-23** Total Depth 82.0 ft
Location	Clinton, Tennessee	Surface Elevation	835.0 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/1/09 Completed 7/1/09
Supervisor	Patrick White Driller Kent Clements	Depth to Water	30.1 ft Date/Time 7/1/09
Logged By	Patrick White	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
835.0'	0.0'	Top of Hole							
		SOIL 8: FILL - SANDY FAT CLAY, red brown, moist, soft to stiff, little fine to medium gravel		SPT-1	0.0 - 1.5	0.6	3-4-4	17	Boring advanced using 3 and 1/4 inch hollow stem augers.
				SPT-2	1.5 - 3.0	1.0	3-5-7	24	
				SPT-3	3.0 - 4.5	0.6	4-5-7	28	
				SPT-4	4.5 - 6.0	0.8	4-5-6	21	
				SPT-5	6.0 - 7.5	0.5	4-4-5	27	
				SPT-6	7.5 - 9.0	0.3	3-3-4	25	
				SPT-7	9.0 - 10.5	0.2	1-2-1	19	
823.8'	11.2'								
		SOIL 1: FILL - BOTTOM ASH, black to gray, moist, dense, some coal		SPT-8	10.5 - 12.0	0.4	8-15-24	14	
821.5'	13.5'			SPT-9	12.0 - 13.5	0.7	12-13-13	17	
		SOIL 4: SLUICED FLY ASH, gray to black, wet to saturated, very soft to medium stiff, with varying percentages of bottom ash		SPT-10	13.5 - 15.0	1.0	1-2-2	20	
				SPT-11	15.0 - 16.5	1.1	1-1-2	27	
				SPT-12	16.5 - 18.0	0.7	1-1-wor	17	
				SPT-13	18.0 - 19.5	0.6	1-1-1	26	
				SPT-14	19.5 - 21.0	1.1	1-1-3	25	
				SPT-15	21.0 - 22.5	1.2	3-4-6	32	
				SPT-16	22.5 - 24.0	1.3	2-4-3	37	
				SPT-17	24.0 - 25.5	1.3	1-2-1	52	
				SPT-18	25.5 - 27.0	1.2	1-2-3	45	
				SPT-19	27.0 - 28.5	1.1	2-2-3	46	
				SPT-20	28.5 - 30.0	0.0	1-1-3	--	
				SPT-21	30.0 - 31.5	1.0	1-3-5	29	
				SPT-22	31.5 - 33.0	1.2	2-3-5	22	
				SPT-23	33.0 - 34.5	1.0	woh-woh-woh	24	
				SPT-24	34.5 - 36.0	1.2	wor-wor-woh	35	
				SPT-25	36.0 - 37.5	0.8	woh-1-1	42	
				SPT-26	37.5 - 39.0	0.8	1-2-2	57	
				SPT-27	39.0 - 40.5	1.4	2-3-2	44	
				SPT-28	40.5 - 42.0	1.4	wor-woh-1	36	
				SPT-29	42.0 - 43.5	1.5	1-1-1	38	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593275.52, E 2546061.35 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-23** Total Depth 82.0 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
		SOIL 4: SLUICED FLY ASH, gray to black, wet to saturated, very soft to medium stiff, with varying percentages of bottom ash *(Continued)*		SPT-30	43.5 - 45.0	1.1	wor-1-1	42	
				SPT-31	45.0 - 46.5	1.2	woh-woh-woh	38	
				SPT-32	46.5 - 48.0	1.3	wor-wor-wor	34	
				SPT-33	48.0 - 49.5	1.1	wor-wor-wor	32	
				SPT-34	49.5 - 51.0	1.2	wor-wor-wor	34	
				SPT-35	51.0 - 52.5	1.0	wor-wor-wor	36	SPT-35 has organics present.
781.4'	53.6'			SPT-36	52.5 - 54.0	1.3	wor-wor-wor	38	
		SOIL 6: LEAN CLAY, brown to red brown, moist, medium stiff, trace silt, some sand		SPT-37	54.0 - 55.5	1.4	1-3-4	24	
				SPT-38	55.5 - 57.0	1.5	1-3-4	27	
				SPT-39	57.0 - 58.5	1.4	3-5-9	23	
				SPT-40	58.5 - 60.0	1.1	3-4-7	23	
				SPT-41	60.0 - 61.5	1.2	4-5-7	22	SPT-41 has fine to medium gravel.
				SPT-42	61.5 - 63.0	1.0	6-6-8	22	
				SPT-43	63.0 - 64.5	1.2	7-7-8	20	
768.8'	66.2'			SPT-44	64.5 - 66.0	1.3	woh-3-3	26	
				SPT-45	66.0 - 67.5	1.1	1-1-4	27	
766.9'	68.1'	SOIL 10: SAND, brown, wet, medium dense to loose, fine to medium grained, some clay							
765.8'	69.2'			SPT-46	67.5 - 69.0	1.4	7-26-42	17	Began Core
763.0'	72.0'	SOIL 11: GRAVEL, brown, wet, medium dense to dense, medium to coarse grained, rounded, some coarse sand		0%	2.8	0.5	18	72.0	
759.0'	76.0'	Limestone, dark gray, moderately hard, thin bedded, closely spaced fractures, moderately weathered, 35° to 45° inclined bedding planes		0%	4.0	2.0	50	76.0	
				0%	1.0	0.6	60	77.0	
753.0'	82.0'	Shale, dark gray, soft, very thin bedded, extremely weathered, clayey, 35° to 45° inclined bedding planes, calcareous		0%	5.0	3.2	64	82.0	
		Shale, dark gray to gray, soft to moderately hard, thin bedded, closely spaced fractures, extremely weathered, clayey, 35° to 45° inclined bedding planes, calcareous							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593275.52, E 2546061.35 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-23** Total Depth 82.0 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
		Bottom of Hole							
		Base of Weathered Rock = 76.0'							
		Top of Rock = 68.1' Elevation (766.9')							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593211.79, E 2545589.93 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-24** Total Depth 45.0 ft
Location	Clinton, Tennessee	Surface Elevation	809.9 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/13/09 Completed 7/13/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	13.5 ft Date/Time 7/13/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
809.9'	0.0'	Top of Hole							
809.6'	0.3'	FILL - CRUSHED STONE		SPT-1	0.0 - 1.5	1.3	1-3-4	22	Boring advanced using 3 1/4" Hollow Stem Augers
		SOIL 4: FILL - LEAN CLAY, light brown, moist, medium stiff to stiff, some fine gravel		SPT-2	1.5 - 3.0	1.1	3-5-7	20	
				SPT-3	3.0 - 4.5	1.5	1-4-5	21	
				SPT-4	4.5 - 6.0	1.3	2-5-6	22	
				SPT-5	6.0 - 7.5	1.3	7-7-8	22	
				SPT-6	7.5 - 9.0	1.2	8-9-9	23	
				SPT-7	9.0 - 10.5	1.1	1-2-3	25	
				SPT-8	10.5 - 12.0	1.3	1-1-4	28	
796.4'	13.5'			SPT-9	12.0 - 13.5	1.1	2-5-6	25	
		SOIL 3: SLUICED FLY ASH, gray, saturated, very loose to loose, with varying percentages of bottom ash		SPT-10	13.5 - 15.0	1.3	8-6-7	43	
				SPT-11	15.0 - 16.5	0.4	WOR-WOH-WOH	46	SPT-11: clay in tip of spoon
				SPT-12	16.5 - 18.0	0.7	WOR-WOH-WOH	47	
				SPT-13	18.0 - 19.5	1.2	1-1-2	42	
				SPT-14	19.5 - 21.0	1.1	1-4-3	50	
				SPT-15	21.0 - 22.5	0.3	WOH-1-2	36	SPT-15: silty clay in tip of spoon
786.9'	23.0'			SPT-16	22.5 - 24.0	1.1	2-2-2	25	
		SOIL 13: FILL - LEAN CLAY with Sand, light brown, moist, soft to medium stiff, trace fine sand, some silt		SPT-17	24.0 - 25.5	1.3	WOH-1-4	23	SPT-19: silt in tip of spoon
				SPT-18	25.5 - 27.0	1.0	WOR-WOH-2	23	
781.5'	28.4'			SPT-19	27.0 - 28.5	1.1	1-2-2	26	
		SOIL 12: SILT, dark gray, moist, soft to medium stiff, some clay		SPT-20	28.5 - 30.0	1.4	2-3-5	24	
				SPT-21	30.0 - 31.5	1.1	WOH-1-1	26	
				SPT-22	31.5 - 33.0	1.3	2-4-4	25	
				SPT-23	33.0 - 34.5	1.5	3-3-4	32	
				SPT-24	34.5 - 36.0	1.3	1-3-5	33	
				SPT-25	36.0 - 37.5	1.1	3-6-8	31	
				SPT-26	37.5 - 39.0	1.1	5-4-4	28	
769.9'	40.0'			SPT-27	39.0 - 40.5	1.1	3-3-5	26	
767.9'	42.0'	SOIL 6: LEAN CLAY, gray and brown, moist, medium stiff, trace fine sand, silt		SPT-28	40.5 - 42.0	1.1	2-2-3	22	
766.2'	43.7'	SOIL 10: SAND, gray, moist,		SPT-29	42.0 - 43.5	1.2	1-3-6	20	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593211.79, E 2545589.93 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-24** Total Depth 45.0 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
764.9'	45.0'	medium dense, fine to coarse grained, some medium to coarse gravel Shale (Augered) *(Continued)*		SPT-30	43.5 - 44.5	1.0	23-50/0.5	12	
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593158.33, E 2545607.45 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-25** Total Depth 60.0 ft
Location	Clinton, Tennessee	Surface Elevation	826.2 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/14/09 Completed 7/14/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	18.0 ft Date/Time 7/14/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
826.2'	0.0'	Top of Hole							
825.2'	1.0'	SOIL 4: FILL - LEAN CLAY, light brown, moist, stiff		SPT-1	0.0 - 1.5	1.4	2-4-9	16	Boring advanced using 3 1/4" Hollow Stem Augers
				SPT-2	1.5 - 3.0	1.3	6-9-10	20	
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, gray, moist to saturated, medium dense to dense		SPT-3	3.0 - 4.5	1.4	4-9-11	27	
				SPT-4	4.5 - 6.0	1.1	4-7-10	22	
				SPT-5	6.0 - 7.5	1.5	8-8-12	27	
				SPT-6	7.5 - 9.0	1.3	8-12-14	19	
				SPT-7	9.0 - 10.5	1.5	4-11-13	22	
				SPT-8	10.5 - 12.0	1.5	6-12-14	30	
				SPT-9	12.0 - 13.5	1.4	15-35-21	24	
				SPT-10	13.5 - 15.0	1.4	6-8-12	31	
				SPT-11	15.0 - 16.5	1.4	4-9-9	51	
				SPT-12	16.5 - 18.0	1.1	6-9-11	47	Saturated at 18.0 ft
				SPT-13	18.0 - 19.5	1.3	6-7-7	39	
				SPT-14	19.5 - 21.0	1.5	3-3-4	45	
				SPT-15	21.0 - 22.5	1.2	4-5-5	43	
802.3'	23.9'			SPT-16	22.5 - 24.0	1.5	7-8-10	33	SPT-16: fly ash in tip of spoon
		SOIL 3: SLUICED FLY ASH, gray, saturated, medium to very soft, with varying percentages of bottom ash		SPT-17	24.0 - 25.5	1.3	1-2-2	36	SPT-17: silt/clay in tip of spoon
				SPT-18	25.5 - 27.0	1.3	2-5-9	28	
				SPT-19	27.0 - 28.5	0.2	6-3-3	28	
				SPT-20	28.5 - 30.0	1.4	1-2-1	34	
				SPT-21	30.0 - 31.5	1.1	WOR	80	
				SPT-22	31.5 - 33.0	1.0	WOR	78	
				SPT-23	33.0 - 34.5	1.0	WOH-1-1	85	
				SPT-24	34.5 - 36.0	1.0	WOR	50	
				SPT-25	36.0 - 37.5	0.9	WOR	61	
				SPT-26	37.5 - 39.0	1.4	WOH-WOH-1	50	
				SPT-27	39.0 - 40.5	1.4	WOH-WOH-1	59	
784.5'	41.7'			SPT-28	40.5 - 42.0	1.3	WOH	41	
		SOIL 12: SILT, brown, saturated, very soft to soft, some clay		SPT-29	42.0 - 43.5	1.4	WOR-WOH-1	27	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593158.33, E 2545607.45 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-25** Total Depth 60.0 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
		SOIL 12: SILT, brown, saturated, very soft to soft, some clay *(Continued)*		SPT-30	43.5 - 45.0	0.5	WOR-1-1	26	
				SPT-31	45.0 - 46.5	1.5	WOH-WOH-2	25	
778.2'	48.0'			SPT-32	46.5 - 48.0	1.2	1-3-4	33	
		SOIL 6: LEAN CLAY, brown, saturated, soft to stiff, some silt, some sand		SPT-33	48.0 - 49.5	1.2	4-5-6	26	
				SPT-34	49.5 - 51.0	1.1	WOH-WOR-2	26	
				SPT-35	51.0 - 52.5	1.3	1-2-4	23	
				SPT-36	52.5 - 54.0	1.0	2-3-3	22	
				SPT-37	54.0 - 55.5	1.1	2-3-4	22	
				SPT-38	55.5 - 57.0	1.3	1-2-4	23	
768.7'	57.5'								
		SOIL 10: SAND, brown, saturated, medium dense, fine to medium grained, trace clay		SPT-39	57.0 - 58.5	1.4	1-3-5	24	
766.3'	59.9'			SPT-40	58.5 - 60.0	1.5	7-11-15	20	
766.2'	60.0'	Shale (Augered)							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593154.56, E 2545599.90 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-25P** Total Depth 54.0 ft
Location	Clinton, Tennessee	Surface Elevation	826.1 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/21/09 Completed 7/21/09
Supervisor	Ben Halada Driller Steve Bradford	Depth to Water	N/A Date/Time N/A
Logged By	Brad Smiley	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
826.1'	0.0'	Top of Hole							
		Advanced boring using mud rotary drilling without sampling							Boring advanced using Mud Rotary Drilling, 6" updraft bit Piston sampler and sucker rods were utilized to obtain recovery during Shelby Tube sampling
800.1'	26.0'								
798.1'	28.0'	SOIL 14: SILT with Sand, dark gray brown, saturated, soft		ST-1	26.0 - 28.0	2.0		30	
		Advanced boring using mud rotary drilling without sampling							
784.1'	42.0'								
		SOIL 13: LEAN CLAY with Sand, gray, moist, medium stiff		ST-2	42.0 - 44.0	1.9		25	

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593154.56, E 2545599.90 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-25P** Total Depth 54.0 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
		SOIL 13: LEAN CLAY with Sand, gray, moist, medium stiff *(Continued)*		ST-3	44.0 - 46.0	1.8		26	
				ST-4	46.0 - 48.0	1.5		27	
778.1'	48.0'								
		SOIL 6: LEAN CLAY, grayish brown, moist		ST-5	48.0 - 50.0	1.8		23	
776.1'	50.0'								
		SOIL 9: SILTY, CLAYEY SAND, light brown, moist, medium stiff		ST-6	50.0 - 52.0	1.8		23	
				ST-7	52.0 - 54.0	2.0		28	
772.1'	54.0'								
		No Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592971.96, E 2546347.19 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-26** Total Depth 54.0 ft
Location	Clinton, Tennessee	Surface Elevation	817.3 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/20/09 Completed 7/20/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	10.0 ft Date/Time 7/20/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
817.3'	0.0'	Top of Hole							
815.8'	1.5'	SOIL 4: FILL - LEAN CLAY, light brown, moist, medium stiff		SPT-1	0.0 - 1.5	0.7	2-2-3	20	Boring advanced using 3 1/4" Hollow Stem Augers
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, gray to black, moist to saturated, loose to medium dense		SPT-2	1.5 - 3.0	1.3	2-3-3	21	
				SPT-3	3.0 - 4.5	1.2	6-8-8	28	
				SPT-4	4.5 - 6.0	1.0	5-6-6	30	
				SPT-5	6.0 - 7.5	1.1	13-15-16	14	
				SPT-6	7.5 - 9.0	1.1	13-13-11	17	
				SPT-7	9.0 - 10.5	1.1	3-2-3	15	
				SPT-8	10.5 - 12.0	0.9	1-2-1	33	
804.3'	13.0'			SPT-9	12.0 - 13.5	1.5	1-1-3	46	SPT-9: organics in sample
		SOIL 3: SLUICED FLY ASH, gray, saturated, soft		SPT-10	13.5 - 15.0	1.0	1-1-2	38	
800.8'	16.5'			SPT-11	15.0 - 16.5	1.2	WOH-WOH-2	56	
799.3'	18.0'	SOIL 13: FILL - CLAYEY GRAVEL, dark gray brown, saturated, very soft, some silt		SPT-12	16.5 - 18.0	1.1	WOR-WOH-1	33	
				SPT-13	18.0 - 19.5	1.0	WOH-WOH-1	50	
		SOIL 3: SLUICED FLY ASH, gray, saturated, very soft, with varying percentages of bottom ash		SPT-14	19.5 - 21.0	1.0	WOH-1-2	43	
				SPT-15	21.0 - 22.5	1.0	1-1-2	53	
				SPT-16	22.5 - 24.0	1.5	WOH-1-1	66	
				SPT-17	24.0 - 25.5	0.4	1-1-1	55	
790.8'	26.5'			SPT-18	25.5 - 27.0	1.0	WOH-1-1	27	
		SOIL 13: LEAN CLAY with Sand, light gray to dark brown, moist, very soft to stiff, some organics		SPT-19	27.0 - 28.5	1.1	1-1-3	27	
				SPT-20	28.5 - 30.0	1.1	WOH-1-2	29	
				SPT-21	30.0 - 31.5	1.2	WOH-WOH-1	24	
				SPT-22	31.5 - 33.0	1.0	WOH-1-2	32	
				SPT-23	33.0 - 34.5	1.2	5-8-8	22	
				SPT-24	34.5 - 36.0	1.1	4-5-8	22	
				SPT-25	36.0 - 37.5	1.2	4-8-11	21	
				SPT-26	37.5 - 39.0	1.3	10-10-12	21	
				SPT-27	39.0 - 40.5	1.0	3-4-5	24	
				SPT-28	40.5 - 42.0	1.2	3-4-7	23	
773.8'	43.5'			SPT-29	42.0 - 43.5	1.5	7-8-8	23	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592971.96, E 2546347.19 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-26** Total Depth 54.0 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
772.3'	45.0'	SOIL 6: LEAN CLAY, light brown, moist, soft, silt, some fine sand *(Continued)*		SPT-30	43.5 - 45.0	1.4	1-2-3	24	
				SPT-31	45.0 - 46.5	1.5	WOH-1-1	25	
770.3'	47.0'	SOIL 12: SILT, gray, saturated, soft, some clay, some fine sand		SPT-32	46.5 - 48.0	1.5	WOH	26	
				SPT-33	48.0 - 49.5	1.5	WOH-1-2	25	
		SOIL 7: SANDY SILTY CLAY, gray, saturated, loose, fine to medium grained sand		SPT-34	49.5 - 51.0	1.1	1-1-3	24	
765.1'	52.2'			SPT-35	51.0 - 52.5	1.0	7-16-19	11	
				SPT-36	52.5 - 53.0	0.5	50/0.5	9	
763.3'	54.0'	Shale (Augered)							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592960.52, E 2546295.43 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-27** Total Depth 66.0 ft
Location	Clinton, Tennessee	Surface Elevation	831.3 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/9/09 Completed 7/10/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	25.0 ft Date/Time 7/10/09
Logged By	Patrick White	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
831.3'	0.0'	Top of Hole							
830.3'	1.0'	SOIL 4: FILL - LEAN CLAY, red brown, moist, stiff, some organics, some fine to medium gravel		SPT-1	0.0 - 1.5	1.1	4-7-12	17	Boring advanced using 4 and 1/4 inch hollow stem augers.
				SPT-2	1.5 - 3.0	1.2	11-11-14	22	
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, black and gray, moist, loose to dense		SPT-3	3.0 - 4.5	1.3	13-17-18	17	
				SPT-4	4.5 - 6.0	1.5	3-8-8	16	
				SPT-5	6.0 - 7.5	1.4	10-12-15	24	Slotted screen piezometer installed, tip depth 28 ft. See peizometer installation log for details.
				SPT-6	7.5 - 9.0	1.4	15-17-14	23	
				SPT-7	9.0 - 10.5	1.5	7-8-8	19	
				SPT-8	10.5 - 12.0	1.3	7-8-13	14	
				SPT-9	12.0 - 13.5	1.1	7-11-11	22	
				SPT-10	13.5 - 15.0	1.4	11-11-18	20	
				SPT-11	15.0 - 16.5	1.4	10-11-12	14	
				SPT-12	16.5 - 18.0	1.5	10-12-14	28	
				SPT-13	18.0 - 19.5	1.5	8-10-11	32	
				SPT-14	19.5 - 21.0	1.5	4-6-5	28	
				SPT-15	21.0 - 22.5	1.4	4-3-4	42	
				SPT-16	22.5 - 24.0	1.1	2-3-4	39	
806.2'	25.1'			SPT-17	24.0 - 25.5	1.4	1-2-2	49	
		SOIL 3: SLUICED FLY ASH, black and gray, wet to saturated, soft to very soft, with varying percentages of bottom ash		SPT-18	25.5 - 27.0	1.1	2-2-3	38	
				SPT-19	27.0 - 28.5	0.3	1-2-3	51	
				SPT-20	28.5 - 30.0	1.0	2-3-3	37	
				SPT-21	30.0 - 31.5	0.4	woh-1-1	36	Super gel-x added at 30 feet to prevent auger blowback.
				SPT-22	31.5 - 33.0	0.3	1-wor-wor	79	
				SPT-23	33.0 - 34.5	0.5	woh-woh-1	54	
				SPT-24	34.5 - 36.0	0.8	1-1-1	40	
				SPT-25	36.0 - 37.5	1.1	1-wor-wor	41	
				SPT-26	37.5 - 39.0	0.7		39	
790.6'	40.7'			SPT-27	39.0 - 40.5	1.0	wor	36	
		SOIL 6: LEAN CLAY, brown and red brown, wet to moist, soft to medium stiff, some sand		SPT-28	40.5 - 42.0	1.4	woh	26	
				SPT-29	42.0 - 43.5	1.2	woh-woh-4	26	

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592960.52, E 2546295.43 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-27** Total Depth 66.0 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
		SOIL 6: LEAN CLAY, brown and red brown, wet to moist, soft to medium stiff, some sand *(Continued)*		SPT-30	43.5 - 45.0	1.3	6-7-9	20	
				SPT-31	45.0 - 46.5	1.1	2-5-4	22	
				SPT-32	46.5 - 48.0	1.0	5-7-9	21	
				SPT-33	48.0 - 49.5	1.0	4-7-9	20	
				SPT-34	49.5 - 51.0	1.5	4-6-7	20	
779.2'	52.1'			SPT-35	51.0 - 52.5	1.4	4-4-4	21	
		SOIL 7: SANDY LEAN CLAY, brown to red brown, moist to wet, very loose to loose, fine to medium grained sand		SPT-36	52.5 - 54.0	1.4	4-5-4	24	
				SPT-37	54.0 - 55.5	0.4	wor	27	
				SPT-38	55.5 - 57.0	1.4	1-2-1	26	
773.0'	58.3'			SPT-39	57.0 - 58.5	1.4	woh-2-1	26	
		SOIL 10: SAND, gray, wet, very loose, medium to coarse grained, some fine to medium gravel		SPT-40	58.5 - 60.0	1.4	woh-1-1	23	
769.6'	61.7'			SPT-41	60.0 - 61.5	0.4	wor-wor-woh	23	
		SOIL 11: GRAVEL, red brown, wet, dense, medium to coarse grained, rounded, some coarse sand		SPT-42	61.5 - 63.0	1.2	1-1-2	22	
				SPT-43	63.0 - 64.5	1.1	8-18-26	9	
765.5'	65.8'			SPT-44	64.5 - 66.0	1.0	17-23-33	10	
765.3'	66.0'	Shale (augered)							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592587.48, E 2546501.20 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-28** Total Depth 52.5 ft
Location	Clinton, Tennessee	Surface Elevation	816.8 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/15/09 Completed 7/15/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	10.0 ft Date/Time 7/15/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
816.8'	0.0'	Top of Hole							
816.3'	0.5'	SOIL 4: FILL - LEAN CLAY, light brown, moist, soft		SPT-1	0.0 - 1.5	1.2	3-3-3	20	Boring advanced using 3 1/4" Hollow Stem Augers
				SPT-2	1.5 - 3.0	1.4	4-6-8	21	
		SOIL 3: SLUICED FLY ASH, gray to black, moist to saturated, stiff to very soft, with varying percentages of bottom ash		SPT-3	3.0 - 4.5	1.0	9-10-11	24	
				SPT-4	4.5 - 6.0	1.1	8-5-4	26	
				SPT-5	6.0 - 7.5	1.2	3-5-7	26	
				SPT-6	7.5 - 9.0	1.0	7-9-10	27	
				SPT-7	9.0 - 10.5	0.7	4-3-3	30	
				SPT-8	10.5 - 12.0	1.5	1-2-3	31	
				SPT-9	12.0 - 13.5	1.3	2-1-2	41	
				SPT-10	13.5 - 15.0	1.1	WOH-1-2	40	
				SPT-11	15.0 - 16.5	0.3	1-2-2	43	
				SPT-12	16.5 - 18.0	1.4	1-1-1	38	
				SPT-13	18.0 - 19.5	1.0	1-WOH-1	36	
				SPT-14	19.5 - 21.0	0.2	WOH-WOH-1	47	SPT-14: bottom ash in tip of spoon
				SPT-15	21.0 - 22.5	0.1	1-WOH-WOH	33	
				SPT-16	22.5 - 24.0	0.9	1-1-1	51	
				SPT-17	24.0 - 25.5	0.7	WOH-WOH-1	53	
				SPT-18	25.5 - 27.0	0.9	WOR-WOH-WOH	59	
				SPT-19	27.0 - 28.5	0.1	WOR-WOH-WOH	43	SPT-19: silt in tip of spoon
787.1'	29.7'			SPT-20	28.5 - 30.0	0.9	WOH-WOH-1	28	
		SOIL 7: SILTY SANDY CLAY, brown and gray, moist, soft to stiff, some fine sand		SPT-21	30.0 - 31.5	0.9	2-2-2	28	
				SPT-22	31.5 - 33.0	0.7	1-3-4	27	
				SPT-23	33.0 - 34.5	1.0	3-5-8	23	
				SPT-24	34.5 - 36.0	1.5	3-6-5	21	
				SPT-25	36.0 - 37.5	1.3	4-6-10	22	
				SPT-26	37.5 - 39.0	1.1	7-7-7	22	
				SPT-27	39.0 - 40.5	1.2	1-3-5	24	
				SPT-28	40.5 - 42.0	1.1	2-3-6	24	
				SPT-29	42.0 - 43.5	1.3	1-2-3	23	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592587.48, E 2546501.20 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-28** Total Depth 52.5 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
				SPT-30	43.5 - 45.0	1.5	2-3-5	24	
				SPT-31	45.0 - 46.5	1.4	1-1-3	23	SPT-33: shale fragments in tip of spoon
769.8'	47.0'								
		SOIL 6: LEAN CLAY, gray, saturated, soft, some silt, some fine sand		SPT-32	46.5 - 48.0	1.1	2-2-3	25	
				SPT-33	48.0 - 49.5	1.1	2-5-8	24	
				SPT-34	49.5 - 51.0	0.7	6-7-8	15	
765.0'	51.8'			SPT-35	51.0 - 52.2	1.1	5-17-50/0.2	13	
764.3'	52.5'	Shale (Augered)							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592243.83, E 2546673.33 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-29** Total Depth 39.5 ft
Location	Clinton, Tennessee	Surface Elevation	816.8 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/15/09 Completed 7/15/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	9.0 ft Date/Time 7/15/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
816.8'	0.0'	Top of Hole							
816.5'	0.3'	SOIL 4: FILL - LEAN CLAY, light brown, moist, soft		SPT-1	0.0 - 1.5	1.1	3-4-6	11	Boring advanced using 3 1/4" Hollow Stem Augers
				SPT-2	1.5 - 3.0	1.1	5-6-7	16	
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, gray, moist to saturated, medium dense to loose		SPT-3	3.0 - 4.5	1.3	3-5-7	12	
				SPT-4	4.5 - 6.0	1.0	4-4-5	15	
				SPT-5	6.0 - 7.5	1.5	4-8-12	19	SPT-5: organics in sample
				SPT-6	7.5 - 9.0	1.2	9-7-5	16	
				SPT-7	9.0 - 10.5	1.0	2-2-3	23	
				SPT-8	10.5 - 12.0	1.1	2-2-2	27	
803.5'	13.3'			SPT-9	12.0 - 13.5	1.0	1-1-1	43	
		SOIL 3: SLUICED FLY ASH, gray, saturated, very soft to soft, with varying percentages of bottom ash		SPT-10	13.5 - 15.0	1.4	1-1-1	46	
				SPT-11	15.0 - 16.5	1.3	1-WOH-1	47	SPT-11: silty clay in tip of spoon
				SPT-12	16.5 - 18.0	0.4	WOR-WOR-WOH	39	
				SPT-13	18.0 - 19.5	1.4	WOR	38	
				SPT-14	19.5 - 21.0	0.2	WOR-WOH-1	61	SPT-14: organics in sample
				SPT-15	21.0 - 22.5	1.3	1-1-2	55	
				SPT-16	22.5 - 24.0	0.7	2-1-1	55	
				SPT-17	24.0 - 25.5	1.5	2-1-1	51	
				SPT-18	25.5 - 27.0	0.2	1-1-1	58	
				SPT-19	27.0 - 28.5	1.0	WOR	39	
787.8'	29.0'			SPT-20	28.5 - 30.0	0.6	WOR-WOH-1	28	
		SOIL 6: LEAN CLAY, gray brown to brown, saturated, very soft to medium stiff		SPT-21	30.0 - 31.5	1.3	WOH-WOH-2	26	
				SPT-22	31.5 - 33.0	1.0	WOH-2-4	24	
				SPT-23	33.0 - 34.5	1.1	2-4-5	23	SPT-24: sample composed of very weak shale and clay
781.8'	35.0'			SPT-24	34.5 - 36.0	1.2	3-6-9	26	
		Shale (Augered)		SPT-25	36.0 - 37.5	0.4	8-6-8	28	
				SPT-26	37.5 - 38.4	0.8	18-50/0.4	16	
777.3'	39.5'								
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592243.83, E 2546673.33 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-29P** Total Depth 44.0 ft
Location	Clinton, Tennessee	Surface Elevation	816.8 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	8/3/09 Completed 8/3/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	N/A Date/Time N/A
Logged By	Ben Halada	Automatic Hammer ☐	Safety Hammer ☐ Other ☐

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
816.8'	0.0'	Top of Hole							
		Augered without sampling							Boring advanced using 4 1/4" Hollow Stem Augers Piston sampler and sucker rods were utilized to obtain recovery during Shelby Tube sampling Slope inclinometer installed, 47.0 ft of pipe.
801.8'	15.0'								
		SOIL 3: SLUICED FLY ASH, gray, saturated, soft to medium stiff, with varying percentages of bottom ash		ST-1	15.0 - 17.0	2.0		38	
				ST-2	17.0 - 19.0	0.5		--	
				ST-3	19.0 - 21.0	2.0		--	
				ST-4	21.0 - 23.0	2.0		--	
				ST-5	23.0 - 25.0	1.9		--	
				ST-6	25.0 - 27.0	2.0		--	
787.8'	29.0'			ST-7	27.0 - 29.0	1.9		--	
		SOIL 12: SILT, light gray brown, moist, medium stiff		ST-8	29.0 - 31.0	2.0		31	
783.8'	33.0'			ST-9	31.0 - 33.0	2.0		31	
781.8'	35.0'	SOIL 6: LEAN CLAY, grayish brown, moist		ST-10	33.0 - 35.0	2.0		24	
		Augered without sampling							
778.6'	38.2'								
		Limestone (Roller Bit)							
772.8'	44.0'								

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592243.83, E 2546673.33 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-29P** Total Depth 44.0 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592227.12, E 2546605.60 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-30** Total Depth 60.2 ft
Location	Clinton, Tennessee	Surface Elevation	826.2 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/8/09 Completed 7/9/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	19.0 ft Date/Time 7/8/09
Logged By	Patrick White	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
826.2'	0.0'	Top of Hole							
825.3'	0.9'	SOIL 4: FILL - LEAN CLAY, red brown, moist, stiff, some fine to medium gravel		SPT-1	0.0 - 1.5	1.1	4-5-12	23	Boring advanced using 4 and 1/4 inch hollow stem augers.
				SPT-2	1.5 - 3.0	1.0	8-10-16	20	
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, dark gray, moist, loose to medium dense		SPT-3	3.0 - 4.5	1.2	16-14-18	21	
				SPT-4	4.5 - 6.0	1.3	8-8-8	21	Slotted screen piezometer installed, tip depth 25 ft. See peizometer installation log for details.
				SPT-5	6.0 - 7.5	1.3	8-7-7	21	
				SPT-6	7.5 - 9.0	1.4	8-7-14	27	
				SPT-7	9.0 - 10.5	1.5	6-6-8	20	
				SPT-8	10.5 - 12.0	1.4	8-10-11	25	
				SPT-9	12.0 - 13.5	1.4	8-10-10	25	
				SPT-10	13.5 - 15.0	1.4	8-9-9	43	
				SPT-11	15.0 - 16.5	1.4	6-6-7	45	
				SPT-12	16.5 - 18.0	1.5	7-6-7	47	
				SPT-13	18.0 - 19.5	1.5	3-1-2	50	Wet to saturated begining at 19.0 feet. Added super gel-x to prevent auger blowback.
				SPT-14	19.5 - 21.0	0.7	wor	54	
803.5'	22.7'			SPT-15	21.0 - 22.5	1.1	1-1-1	53	
		SOIL 3: SLUICED FLY ASH, gray and black, wet to saturated, soft to very soft, with varying percentages of bottom ash		SPT-16	22.5 - 24.0	0.6	1-1-wor	37	
				SPT-17	24.0 - 25.5	0.7	1-2-1	41	
				SPT-18	25.5 - 27.0	0.9	woh-woh-1	39	Brown silty clay from 26.8 to 27.8 feet.
				SPT-19	27.0 - 28.5	0.9	woh-woh-1	43	
				SPT-20	28.5 - 30.0	1.1	3-2-2	33	
				SPT-21	30.0 - 31.5	1.5	woh-1-1	33	
				SPT-22	31.5 - 33.0	0.7	woh	32	
				SPT-23	33.0 - 34.5	1.4	1-wor-wor	51	
				SPT-24	34.5 - 36.0	0.8	woh	46	
				SPT-25	36.0 - 37.5	1.3	wor-woh-woh	50	
				SPT-26	37.5 - 39.0	1.4	woh	50	
				SPT-27	39.0 - 40.5	0.1	wor	48	
				SPT-28	40.5 - 42.0	1.5	wor	33	
782.8'	43.4'			SPT-29	42.0 - 43.5	1.5	wor	44	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592227.12, E 2546605.60 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-30** Total Depth 60.2 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
		SOIL 6: LEAN CLAY, brown to brown gray, moist, soft to medium stiff, some silt, trace sand *(Continued)*		SPT-30	43.5 - 45.0	1.1	wor-woh-woh	38	
				SPT-31	45.0 - 46.5	1.1	woh-woh-4	32	
				SPT-32	46.5 - 48.0	1.0	3-4-5	27	
				SPT-33	48.0 - 49.5	1.0	4-5-6	25	
				SPT-34	49.5 - 51.0	1.2	5-6-7	24	
				SPT-35	51.0 - 52.5	1.3	6-6-7	25	
				SPT-36	52.5 - 54.0	1.3	6-7-6	28	
				SPT-37	54.0 - 55.5	1.3	5-5-4	28	
770.3'	55.9'								
		SOIL 10: SAND, dark gray, moist to wet, loose to medium dense, fine to medium grained, some clay, trace silt		SPT-38	55.5 - 57.0	1.4	4-3-4	26	
767.9'	58.3'			SPT-39	57.0 - 58.5	1.5	4-8-17	22	
766.2'	60.0'			SPT-40	58.5 - 59.2	0.4	14-50/0.2	15	
766.0'	60.2'	SOIL 11: GRAVEL, red brown, wet, medium dense, medium to coarse grained, some coarse sand							
		Shale (augered)							
		Auger Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592969.83, E 2545291.84 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-31** Total Depth 60.0 ft
Location	Clinton, Tennessee	Surface Elevation	823.8 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/14/09 Completed 7/14/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	15.5 ft Date/Time 7/14/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
823.8'	0.0'	Top of Hole							
822.8'	1.0'	SOIL 4: FILL - LEAN CLAY, light brown, moist, stiff, some gravel		SPT-1	0.0 - 1.5	1.5	3-6-7	18	Boring advanced using 3 1/4" Hollow Stem Augers
				SPT-2	1.5 - 3.0	1.5	7-11-13	23	
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, gray, moist, medium dense to dense		SPT-3	3.0 - 4.5	1.1	6-8-11	23	
				SPT-4	4.5 - 6.0	1.4	7-8-10	22	
				SPT-5	6.0 - 7.5	1.5	10-15-19	24	
				SPT-6	7.5 - 9.0	1.3	15-18-20	21	
				SPT-7	9.0 - 10.5	1.3	8-11-13	26	
				SPT-8	10.5 - 12.0	1.3	6-7-8	33	
				SPT-9	12.0 - 13.5	1.1	6-8-9	34	
				SPT-10	13.5 - 15.0	1.2	5-6-6	55	
808.3'	15.5'								
		SOIL 3: SLUICED FLY ASH, gray, saturated, very soft to soft, with varying percentages of bottom ash		SPT-11	15.0 - 16.5	1.3	3-3-4	37	
				SPT-12	16.5 - 18.0	1.3	2-3-2	41	
				SPT-13	18.0 - 19.5	1.1	3-3-4	37	
				SPT-14	19.5 - 21.0	0.7	WOR-WOH-1	39	
				SPT-15	21.0 - 22.5	1.5	1-1-1	39	
				SPT-16	22.5 - 24.0	1.0	WOH-1-1	38	
				SPT-17	24.0 - 25.5	0.1	WOR-WOH-WOH	32	
				SPT-18	25.5 - 27.0	1.4	WOR-WOH-WOH	33	
				SPT-19	27.0 - 28.5	1.3	WOR-WOH-1	39	
				SPT-20	28.5 - 30.0	1.1	WOH-1-1	57	
				SPT-21	30.0 - 31.5	1.2	WOR	43	
				SPT-22	31.5 - 33.0	1.3	WOR-WOH-1	59	
				SPT-23	33.0 - 34.5	1.1	WOR-WOH-1	77	
				SPT-24	34.5 - 36.0	0.5	WOR-WOH-WOH	54	
				SPT-25	36.0 - 37.5	1.3	WOH	47	
				SPT-26	37.5 - 39.0	1.1	WOH	50	
				SPT-27	39.0 - 40.5	1.1	WOR-WOH-WOH	46	
				SPT-28	40.5 - 42.0	1.3	WOR-WOH-WOH	42	
				SPT-29	42.0 - 43.5	0.5	WOR-WOR-WOH	41	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

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SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592969.83, E 2545291.84 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-31** Total Depth 60.0 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
		SOIL 3: SLUICED FLY ASH, gray, saturated, very soft to soft, with varying percentages of bottom ash *(Continued)*		SPT-30	43.5 - 45.0	1.5	WOH-1-3	39	SPT-30: bottom ash in tip of spoon
				SPT-31	45.0 - 46.5	1.1	1-3-8	29	
				SPT-32	46.5 - 48.0	1.5	6-5-6	29	
				SPT-33	48.0 - 49.5	0.2	1-1-1	35	
773.8'	50.0'								
		SOIL 6: SILTY CLAY, gray brown, saturated, soft to stiff		SPT-34	49.5 - 51.0	1.1	1-1-2	27	SPT-34 and SPT-38: organics in sample
				SPT-35	51.0 - 52.5	1.0	2-4-5	28	
769.8'	54.0'			SPT-36	52.5 - 54.0	1.3	5-4-4	30	
		SOIL 8: SANDY FAT CLAY, brown, saturated, soft		SPT-37	54.0 - 55.5	1.5	WOH	26	
				SPT-38	55.5 - 57.0	1.2	1-1-3	24	
				SPT-39	57.0 - 58.5	1.4	1-3-3	40	
764.5'	59.3'			SPT-40	58.5 - 60.0	1.3	8-24-45	12	
763.8'	60.0'	Shale (Augered)							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593010.17, E 2545153.51 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-32** Total Depth 45.5 ft
Location	Clinton, Tennessee	Surface Elevation	808.2 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/12/09 Completed 6/12/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	19.0 ft Date/Time 6/12/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
808.2'	0.0'	Top of Hole							
807.7'	0.5'	FILL - CRUSHED STONE		SPT-1	0.0 - 1.5	1.0	3-4-6	20	Boring advanced using 3 1/4" Hollow Stem Augers
		SOIL 5: FILL - SANDY LEAN CLAY, light brown, moist, medium stiff, some fine gravel		SPT-2	1.5 - 3.0	0.7	5-6-7	20	
				SPT-3	3.0 - 4.5	1.2	6-5-6	26	
				ST-1	4.5 - 6.5	1.7		17	
				SPT-4	6.5 - 8.0	1.0	4-4-5	22	
799.2'	9.0'			SPT-5	8.0 - 9.5	1.3	6-8-11	17	
798.7'	9.5'	SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, black, saturated, medium dense		SPT-6	9.5 - 11.0	1.3	6-7-15	21	
				SPT-7	11.0 - 12.5	1.3	12-12-15	20	
		SOIL 8: LEAN CLAY, gray to light brown, moist to saturated, medium stiff, some organics, some sand		SPT-8	12.5 - 14.0	1.2	9-11-12	25	
				SPT-9	14.0 - 15.5	0.7	3-4-4	21	
				ST-2	15.5 - 17.5	1.5		25	
				SPT-10	17.5 - 19.0	1.0	1-2-3	28	
				ST-3	19.0 - 21.0	1.5		25	
				SPT-11	21.0 - 22.5	1.5	1-2-5	27	
				SPT-12	22.5 - 24.0	1.1	7-8-11	24	
				ST-4	24.0 - 26.0	2.0		22	
				SPT-13	26.0 - 27.5	1.0	1-2-4	21	
779.2'	29.0'			SPT-14	27.5 - 29.0	1.5	3-3-4	21	
		SOIL 10: SAND, brown, saturated, loose, fine to medium grained, clayey sand		SPT-15	29.0 - 30.5	1.0	WOH-WOH-1	27	
				SPT-16	30.5 - 32.0	1.2	WOH-1-3	22	
				SPT-17	32.0 - 33.5	1.4	2-3-4	25	
				SPT-18	33.5 - 35.0	0.8	WOH-2-1	19	
				SPT-19	35.0 - 36.5	1.5	2-2-3	19	
771.2'	37.0'			SPT-20	36.5 - 38.0	1.3	2-2-2	19	
		SOIL 14: SILTY SAND, brown to gray, saturated, loose to dense, fine to coarse grained, some fine to coarse gravel		SPT-21	38.0 - 39.5	1.5	2-2-1	19	
				SPT-22	39.5 - 41.0	1.4	2-2-2	20	
				SPT-23	41.0 - 42.5	1.5	WOH-2-2	15	
764.2'	44.0'			SPT-24	42.5 - 44.0	1.3	5-15-22	16	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593010.17, E 2545153.51 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-32** Total Depth 45.5 ft

Lithology		Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
Elevation	Depth								
762.7'	45.5'	Shale (Augered) *(Continued)*		SPT-25	44.0 - 44.5	0.5	50/0.5	10	
		Auger Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592559.31, E 2545426.43 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-33** Total Depth 70.4 ft
Location	Clinton, Tennessee	Surface Elevation	836.1 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/11/09 Completed 7/11/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	28.0 ft Date/Time 7/11/09
Logged By	Patrick White	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
836.1'	0.0'	Top of Hole							
835.0'	1.1'	SOIL 4: FILL - LEAN CLAY, red brown, moist, stiff, some fine to medium gravel		SPT-1	0.0 - 1.5	1.1	4-8-12	18	Boring advanced using 4 and 1/4 inch hollow stem augers.
				SPT-2	1.5 - 3.0	1.1	8-14-19	17	
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, gray black and brown, moist, dense to medium dense		SPT-3	3.0 - 4.5	1.3	29-38-42	18	
				SPT-4	4.5 - 6.0	1.2	4-8-8	15	
				SPT-5	6.0 - 7.5	1.3	8-11-12	23	Slotted screen piezometer installed, tip depth 22 ft. See peizometer installation log for details.
				SPT-6	7.5 - 9.0	1.4	9-13-20	21	
				SPT-7	9.0 - 10.5	1.3	4-9-13	25	
				SPT-8	10.5 - 12.0	1.1	9-13-16	19	
				SPT-9	12.0 - 13.5	1.1	8-14-16	19	
				SPT-10	13.5 - 15.0	1.4	11-11-10	20	
				SPT-11	15.0 - 16.5	1.3	6-12-17	17	
				SPT-12	16.5 - 18.0	1.3	18-19-21	19	
				SPT-13	18.0 - 19.5	1.3	12-9-8	21	
				SPT-14	19.5 - 21.0	1.4	4-4-2	21	
813.5'	22.6'			SPT-15	21.0 - 22.5	1.0	1-2-3	24	
		SOIL 3: SLUICED FLY ASH, gray and black, wet to saturated, medium stiff to very soft, with varying percentages of bottom ash		SPT-16	22.5 - 24.0	1.0	1-2-3	49	
				SPT-17	24.0 - 25.5	1.4	2-1-3	41	
				SPT-18	25.5 - 27.0	1.4	2-2-4	40	
				SPT-19	27.0 - 28.5	1.3	2-1-1	39	
				SPT-20	28.5 - 30.0	1.4	woh	44	
				SPT-21	30.0 - 31.5	1.3	woh-woh-2	42	Super gel-x added at 30 feet to prevent auger blowback.
				SPT-22	31.5 - 33.0	1.4	woh-1-2	41	
				SPT-23	33.0 - 34.5	1.1	1-1-woh	43	
				SPT-24	34.5 - 36.0	0.9	wor	37	
				SPT-25	36.0 - 37.5	1.1	woh	33	
				SPT-26	37.5 - 39.0	1.1	woh	43	
				SPT-27	39.0 - 40.5	1.2	woh-1-1	37	Brown silt layer from 39.0 to 40.2 feet.
				SPT-28	40.5 - 42.0	1.4	woh-1-2	45	
				SPT-29	42.0 - 43.5	1.1	3-4-5	53	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592559.31, E 2545426.43 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-33** Total Depth 70.4 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
		SOIL 3: SLUICED FLY ASH, gray and black, wet to saturated, medium stiff to very soft, with varying percentages of bottom ash *(Continued)*		SPT-30	43.5 - 45.0	1.2	3-2-2	84	
				SPT-31	45.0 - 46.5	1.2	1-woh-1	98	
				SPT-32	46.5 - 48.0	1.3	1-woh-1	75	
				SPT-33	48.0 - 49.5	1.0	woh	47	
				SPT-34	49.5 - 51.0	1.1	wor	44	
				SPT-35	51.0 - 52.5	1.0	wor	47	
				SPT-36	52.5 - 54.0	1.2	wor	48	
				SPT-37	54.0 - 55.5	1.4	woh	43	
				SPT-38	55.5 - 57.0	1.4	woh	45	
				SPT-39	57.0 - 58.5	1.4	wor	43	
				SPT-40	58.5 - 60.0	1.3	wor	40	
				SPT-41	60.0 - 61.5	1.3	wor-wor-woh	40	
773.4'	62.7'			SPT-42	61.5 - 63.0	1.5	woh-woh-1	34	
		SOIL 7: SANDY LEAN CLAY, brown, moist, medium stiff, trace sand, trace organics		SPT-43	63.0 - 64.5	0.9	woh-3-4	25	
				SPT-44	64.5 - 66.0	1.0	3-5-6	27	
769.6'	66.5'								
		SOIL 10: SAND, gray brown, wet, medium dense, fine to medium grained, some clay		SPT-45	66.0 - 67.5	1.5	3-3-3	29	
				SPT-46	67.5 - 69.0	1.0	6-4-6	19	
766.1'	70.0'			SPT-47	69.0 - 70.4	0.9	6-17-50/0.4	15	
765.7'	70.4'								
		Shale (augered)							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592527.95, E 2545300.77 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-34** Total Depth 65.0 ft
Location	Clinton, Tennessee	Surface Elevation	825.6 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/4/09 Completed 6/4/09
Supervisor	Ben Halada Driller Steve Bradford	Depth to Water	20.0 ft Date/Time 6/4/09
Logged By	Patrick White	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
825.6'	0.0'	Top of Hole							
825.0'	0.6'	SOIL 4: FILL - LEAN CLAY, red brown, moist, stiff		SPT-1	0.0 - 1.5	1.2	1-6-6	26	Boring advanced using 4 1/4" hollow stem augers.
				SPT-2	1.5 - 3.0	1.3	6-12-13	25	
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, black, moist, medium dense to dense		SPT-3	3.0 - 4.5	1.3	12-17-17	28	
				SPT-4	4.5 - 6.0	0.7	5-6-10	23	
				SPT-5	6.0 - 7.5	1.3	15-20-16	23	Slotted screen piezometer installed, tip depth 63 ft. See peizometer installation log for details.
				SPT-6	7.5 - 9.0	1.3	17-19-22	22	
				SPT-7	9.0 - 10.5	1.4	6-12-13	24	
				SPT-8	10.5 - 12.0	1.3	14-21-17	25	
				SPT-9	12.0 - 13.5	1.2	16-14-13	37	
				SPT-10	13.5 - 15.0	1.2	6-7-8	28	
				SPT-11	15.0 - 16.5	1.3	8-12-8	68	
				SPT-12	16.5 - 18.0	1.2	12-13-14	73	
				SPT-13	18.0 - 19.5	1.1	6-8-7	46	
				SPT-14	19.5 - 21.0	1.4	4-6-6	20	spt-14 wet; spt-15 moist
				SPT-15	21.0 - 22.5	1.5	6-9-11	60	
				SPT-16	22.5 - 24.0	1.5	8-11-12	41	
800.6'	25.0'			SPT-17	24.0 - 25.5	0.9	8-11-15	26	Added water at 24 ft to keep sand out of auger
		SOIL 4: SLUICED FLY ASH, gray to black, wet to saturated, stiff to very soft, with varying percentages of bottom ash		SPT-18	25.5 - 27.0	1.2	8-11-14	23	
				SPT-19	27.0 - 28.5	0.2	woh-woh-1	19	
				SPT-20	28.5 - 30.0	0.6	1-woh-1	120	
				SPT-21	30.0 - 31.5	1.3	1-woh-woh	51	
				SPT-22	31.5 - 33.0	1.5	wor-wor-wor	38	
				SPT-23	33.0 - 34.5	1.5	wor-wor-wor	--	
				SPT-24	34.5 - 36.0	0.0	wor-wor-wor	--	
				SPT-25	36.0 - 37.5	0.0	woh-woh-woh	29	
				SPT-26	37.5 - 39.0	1.3	1-1-2	30	
				SPT-27	39.0 - 40.5	1.5	2-2-woh	30	
				SPT-28	40.5 - 42.0	1.5	2-1-woh	30	
782.6'	43.0'			SPT-29	42.0 - 43.5	1.0	woh-woh-woh	24	

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592527.95, E 2545300.77 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-34** Total Depth 65.0 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
		SOIL 6: LEAN CLAY, brown to red brown, wet, soft to stiff *(Continued)*		SPT-30	43.5 - 45.0	1.1	woh-5-8	4	
				SPT-31	45.0 - 46.5	1.2	1-4-6	23	
				SPT-32	46.5 - 48.0	0.8	4-8-9	25	
				SPT-33	48.0 - 49.5	1.2	6-8-8	24	
				SPT-34	49.5 - 51.0	1.5	2-4-5	24	
773.1'	52.5'			SPT-35	51.0 - 52.5	1.5	woh-woh-woh	26	
		SOIL 7: SANDY LEAN CLAY, red brown, moist, soft, some fine sand		SPT-36	52.5 - 54.0	1.3	woh-woh-3	24	
				SPT-37	54.0 - 55.5	1.2	1-3-3	25	
				SPT-38	55.5 - 57.0	1.5	woh-woh-woh	--	
				SPT-39	57.0 - 58.5	1.1	wor-1-3	--	
766.5'	59.1'			SPT-40	58.5 - 60.0	1.5	8-8-17	--	
		SOIL 10: SAND, brown, damp, medium dense to dense, fine to coarse grained, some medium to coarse gravel		SPT-41	60.0 - 61.5	0.7	4-10-10	--	
763.4'	62.2'			SPT-42	61.5 - 62.5	0.6	17-50/0.5	--	
		Shale (Augered)							
760.6'	65.0'								
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592522.40, E 2545302.17 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-34A** Total Depth 28.0 ft
Location	Clinton, Tennessee	Surface Elevation	825.5 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/13/09 Completed 7/13/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	N/A Date/Time N/A
Logged By	Patrick White	Automatic Hammer ☐	Safety Hammer ☐ Other ☐

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
825.5'	0.0'	Top of Hole							
									Boring advanced using 4 and 1/4 inch hollow stem augers.
									No samples taken, augered only for peizometer installation.
									Slotted screen piezometer installed, tip depth 25.0 ft. See peizometer installation log for details.

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592529.46, E 2545337.09 (NAD27)		
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-34P**	Total Depth	58.0 ft
Location	Clinton, Tennessee	Surface Elevation	825.9 ft. (NGVD29)		
Project Type	Geotechnical Exploration	Date Started	7/22/09	Completed	7/23/09
Supervisor	Ben Halada	Driller	Steve Bradford	Depth to Water	N/A	Date/Time	N/A
Logged By	Brad Smiley	Automatic Hammer ☒	Safety Hammer ☐	Other ☐	

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
825.9'	0.0'	Top of Hole							
		Advanced boring using mud rotary drilling without sampling							Boring advanced using Mud Rotary Drilling, 6" updraft bit Piston sampler and sucker rods were utilized to obtain recovery during Shelby Tube sampling
801.9'	24.0'								
		SOIL 3: SLUICED FLY ASH, dark gray, saturated, very soft, with varying percentages of bottom ash		ST-1	24.0 - 26.0	1.3		--	
				ST-2	26.0 - 28.0	0.1		--	
				ST-3	28.0 - 30.0	2.0		--	
				ST-4	30.0 - 32.0	1.8		--	
				ST-5	32.0 - 34.0	0.0		--	
				ST-6	34.0 - 36.0	0.3		--	
				ST-7	36.0 - 38.0	1.7		--	
				ST-8	38.0 - 40.0	1.8		--	
783.9'	42.0'			ST-9	40.0 - 42.0	1.8		--	
		SOIL 6: LEAN CLAY, brown, moist, stiff		ST-10	42.0 - 44.0	2.0		--	

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592529.46, E 2545337.09 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-34P** Total Depth 58.0 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
779.9'	46.0'			ST-11	44.0 - 46.0	1.8		23	
777.9'	48.0'	SOIL 12: SILT, dark brown, Advanced boring using mud rotary drilling without sampling		ST-12	46.0 - 48.0	1.0		49	
773.9'	52.0'	SOIL 6: LEAN CLAY, brown, moist		ST-13	50.0 - 52.0	2.0		24	
		SOIL 7: SANDY LEAN CLAY, brown, moist		ST-14	52.0 - 54.0	2.0		27	
				ST-15	54.0 - 56.0	1.9		22	
767.9'	58.0'			ST-16	56.0 - 58.0	2.0		20	
		No Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592523.92, E 2545221.40 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-35** Total Depth 44.7 ft
Location	Clinton, Tennessee	Surface Elevation	808.9 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/15/09 Completed 6/15/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	12.7 ft Date/Time 6/15/09
Logged By	Patrick White	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
808.9'	0.0'	Top of Hole							
808.2'	0.7'	FILL - CRUSHED STONE		SPT-1	0.0 - 1.5	1.1	11-6-6	21	Boring advanced using 4 1/4" hollow stem augers.
		SOIL 4: FILL - LEAN CLAY, red brown, moist, stiff, some fine to medium gravel, trace silt		SPT-2	1.5 - 3.0	1.3	4-6-8	25	
				SPT-3	3.0 - 4.5	1.1	7-8-7	24	
				SPT-4	4.5 - 6.0	1.2	5-4-6	25	
				SPT-5	6.0 - 7.5	1.1	5-6-5	26	Slotted screen piezometer installed, tip depth 38 ft. See peizometer installation log for details.
				SPT-6	7.5 - 9.0	1.3	6-5-5	25	
				SPT-7	9.0 - 10.5	1.4	3-4-6	29	
				SPT-8	10.5 - 12.0	1.1	5-7-8	29	
796.2'	12.7'			SPT-9	12.0 - 13.5	1.3	13-14-15	22	
		SOIL 11: FILL - GRAVEL, black, wet, medium dense, medium to coarse grained, subangular		SPT-10	13.5 - 15.0	0.3	4-3-2	15	Added water at 13.5 feet to keep sand out of augers.
793.8'	15.1'			SPT-11	15.0 - 16.5	1.0	2-4-5	26	
792.0'	16.9'	SOIL 4: FILL - LEAN CLAY, dark gray, moist to wet, medium stiff, trace silt, trace organics		SPT-12	16.5 - 18.0	1.3	wor-1-1	26	
		SOIL 6: LEAN CLAY, dark brown, moist, stiff to very stiff, trace silt		SPT-13	18.0 - 19.5	1.2	3-5-4	25	
				SPT-14	19.5 - 21.0	0.9	3-5-8	22	
				SPT-15	21.0 - 22.5	1.1	8-10-12	24	
				SPT-16	22.5 - 24.0	0.9	9-10-11	22	
				SPT-17	24.0 - 25.5	1.4	4-7-8	24	
				SPT-18	25.5 - 27.0	1.2	9-12-14	21	
				SPT-19	27.0 - 28.5	0.7	5-8-7	20	
779.9'	29.0'			SPT-20	28.5 - 30.0	1.5	2-2-1	25	
		SOIL 7: SANDY LEAN CLAY, brown, wet, very loose to loose, fine to coarse grained, trace clay, trace silt		SPT-21	30.0 - 31.5	1.1	1-2-4	25	
				SPT-22	31.5 - 33.0	1.5	woh-woh-2	25	
				SPT-23	33.0 - 34.5	1.5	woh-1-2	25	
				SPT-24	34.5 - 36.0	0.4	wor-woh-l	24	
				SPT-25	36.0 - 37.5	1.4	1-1-1	29	
				SPT-26	37.5 - 39.0	1.5	1-1-1	27	
				SPT-27	39.0 - 40.5	0.9	4-1-1	25	SPT-27; 4 in. seam of light gray sand.
766.9'	42.0'			SPT-28	40.5 - 42.0	1.0	1-3-3	27	
				SPT-29	42.0 - 43.5	1.4	3-9-7	20	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592523.92, E 2545221.40 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-35** Total Depth 44.7 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
				SPT-30	43.5 - 44.7	1.0	9-29-50/0.2	12	
764.5' / 764.2'	44.4' / 44.7'	SOIL 10: SAND, brown to gray, wet, medium dense, medium to coarse grained, subrounded, some coarse sand *(Continued)*							
		Shale (augered)							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592527.79, E 2545220.58 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-35A** Total Depth 18.0 ft
Location	Clinton, Tennessee	Surface Elevation	809.1 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/13/09 Completed 7/13/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	N/A Date/Time N/A
Logged By	Patrick White	Automatic Hammer ☐	Safety Hammer ☐ Other ☐

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
809.1'	0.0'	Top of Hole							
									Boring advanced using 4 and 1/4 inch hollow stem augers.
									No samples taken, augered only for peizometer installation.
									Slotted screen piezometer installed, tip depth 15.0 ft. See peizometer installation log for details.

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592517.47, E 2545204.09 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-36** Total Depth 36.0 ft
Location	Clinton, Tennessee	Surface Elevation	800.5 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/16/09 Completed 6/16/09
Supervisor	Briggs Evans Driller Kent Clements	Depth to Water	N/A Date/Time N/A
Logged By	Briggs Evans	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
800.5'	0.0'	Top of Hole							
800.0'	0.5'	FILL - TOPSOIL		SPT-1	0.0 - 1.5	1.3	1-2-5	30	Boring advanced using 3 and 1/4 inch hollow stem augers.
		SOIL 4: FILL - LEAN CLAY, dark brown to red brown, moist, stiff, some silt		SPT-2	1.5 - 3.0	0.8	2-5-6	23	
				SPT-3	3.0 - 4.5	1.3	10-11-12	20	
				SPT-4	4.5 - 6.0	1.5	3-3-5	18	
				SPT-5	6.0 - 7.5	1.3	4-6-7	24	Slotted screen piezometer installed, tip depth 35 ft. See peizometer installation log for details.
792.0'	8.5'			SPT-6	7.5 - 9.0	1.0	7-6-7	27	
		SOIL 14: SANDY SILT, dark gray, saturated, medium stiff to soft		SPT-7	9.0 - 10.5	1.5	1-1-2	27	
789.5'	11.0'			SPT-8	10.5 - 12.0	1.5	5-5-7	23	
		SOIL 6: LEAN CLAY, dark gray to light brown, moist to wet, medium stiff, some sand		SPT-9	12.0 - 13.5	0.8	5-10-11	22	
				SPT-10	13.5 - 15.0	1.5	5-6-6	23	
				SPT-11	15.0 - 16.5	1.5	5-2-6	24	
				SPT-12	16.5 - 18.0	1.0	7-7-9	22	
				SPT-13	18.0 - 19.5	1.0	3-4-6	21	
				SPT-14	19.5 - 21.0	0.8	2-3-4	23	
				SPT-15	21.0 - 22.5	1.5	1-1-2	26	
777.5'	23.0'			SPT-16	22.5 - 24.0	1.5	1-1-2	28	
		SOIL 7: SANDY LEAN CLAY, light reddish brown, saturated, very loose		SPT-17	24.0 - 25.5	0.5	1-2-2	27	
773.7'	26.8'			SPT-18	25.5 - 27.0	0.8	1-1-2	26	
		SOIL 10: SAND, light brown and white, saturated, loose to very loose		SPT-19	27.0 - 28.5	1.5	3-4-3	26	
				SPT-20	28.5 - 30.0	1.5	woh-1-1	25	
				SPT-21	30.0 - 31.5	1.5	1-2-1	24	
				SPT-22	31.5 - 33.0	1.5	1-2-3	26	
				SPT-23	33.0 - 34.5	1.5	1-3-6	25	
764.8'	35.7'			SPT-24	34.5 - 36.0	1.5	4-8-26	24	
764.5'	36.0'	Shale (augered), gray							
		Auger Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592160.74, E 2545322.53 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-38** Total Depth 44.3 ft
Location	Clinton, Tennessee	Surface Elevation	808.6 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/11/09 Completed 6/11/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	31.8 ft Date/Time 6/11/09
Logged By	Patrick White	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
808.6'	0.0'	Top of Hole							
808.1'	0.5'	FILL - CRUSHED STONE		SPT-1	0.0 - 1.5	1.1	7-4-4	24	Boring advanced using 4 1/4" hollow stem augers.
		SOIL 4: FILL - LEAN CLAY, light red brown, moist, stiff, trace silt, some fine to medium gravel		SPT-2	1.5 - 3.0	0.2	6-7-8	21	
				SPT-3	3.0 - 4.5	1.1	6-9-11	26	
				SPT-4	4.5 - 6.0	1.0	6-5-4	25	
				SPT-5	6.0 - 7.5	1.4	4-4-4	26	
799.6'	9.0'			SPT-6	7.5 - 9.0	1.3	4-10-9	24	
		SOIL 12: SILT with Sand, gray, moist, medium stiff to stiff		SPT-7	9.0 - 10.5	1.1	2-2-4	26	
				SPT-8	10.5 - 12.0	1.1	2-4-7	27	
795.1'	13.5'			SPT-9	12.0 - 13.5	1.5	5-7-8	31	
		SOIL 6: LEAN CLAY, light red brown, moist, stiff, trace silt, some fine to medium gravel		SPT-10	13.5 - 15.0	1.3	7-7-7	28	
792.5'	16.1'			SPT-11	15.0 - 16.5	1.3	3-2-4	25	Added water at 34.5 feet to keep sand out of augers.
		SOIL 8: FAT CLAY, gray to dark brown, moist to wet, medium stiff to stiff, trace fine sand, trace silt		SPT-12	16.5 - 18.0	1.1	2-4-5	26	
				SPT-13	18.0 - 19.5	1.5	3-5-5	24	
				SPT-14	19.5 - 21.0	1.3	3-3-4	26	
				SPT-15	21.0 - 22.5	1.3	3-4-7	27	
				SPT-16	22.5 - 24.0	1.4	6-6-7	27	
				SPT-17	24.0 - 25.5	1.0	2-4-5	25	
				SPT-18	25.5 - 27.0	1.2	6-9-9	26	
				SPT-19	27.0 - 28.5	0.5	4-6-6	30	
				SPT-20	28.5 - 30.0	1.3	6-8-12	24	
				SPT-21	30.0 - 31.5	1.2	4-5-6	30	
				SPT-22	31.5 - 33.0	1.1	5-7-6	28	
				SPT-23	33.0 - 34.5	0.9	6-6-7	23	
				SPT-24	34.5 - 36.0	1.2	1-4-4	22	
772.1'	36.5'			SPT-25	36.0 - 37.5	1.2	1-2-2	25	
770.7'	37.9'	SOIL 10: SAND, brown, wet, medium dense, fine to medium grained, some silt		SPT-26	37.5 - 39.0	1.1	2-5-7	23	
768.6'	40.0'	SOIL 8: FAT CLAY, brown, wet, medium stiff, some fine to medium sand, trace silt		SPT-27	39.0 - 40.5	1.3	4-4-4	22	
				SPT-28	40.5 - 42.0	1.0	3-5-7	19	
				SPT-29	42.0 - 43.5	1.4	3-5-13	21	
764.7'	43.9'	SOIL 10: SAND, brown to light							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 592160.74, E 2545322.53 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-38** Total Depth 44.3 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
764.3'	44.3'	gray, wet, medium dense to dense, medium to coarse grained, some silt		SPT-30	43.5 - 44.3	0.7	31-50/0.3	15	
		Shale (augered) *(Continued)*							
		Auger Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591840.77, E 2545638.39 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-39** Total Depth 73.2 ft
Location	Clinton, Tennessee	Surface Elevation	835.7 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/12/09 Completed 7/12/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	20.0 ft Date/Time 7/12/09
Logged By	Patrick White	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
835.7'	0.0'	Top of Hole							
834.8'	0.9'	SOIL 4: FILL - LEAN CLAY, red brown, moist, stiff, some fine to medium gravel		SPT-1	0.0 - 1.5	1.1	1-3-9	22	Boring advanced using 4 and 1/4 inch hollow stem augers.
				SPT-2	1.5 - 3.0	1.2	9-8-9	13	
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, dark gray brown to dark gray, moist, dense		SPT-3	3.0 - 4.5	1.9	16-17-19	15	
				SPT-4	4.5 - 6.0	1.3	11-16-20	16	
				SPT-5	6.0 - 7.5	1.3	21-24-29	15	Slotted screen piezometer installed, tip depth 22 ft. See peizometer installation log for details.
				SPT-6	7.5 - 9.0	1.4	31-31-32	15	
				SPT-7	9.0 - 10.5	1.5	12-13-21	18	
				SPT-8	10.5 - 12.0	1.4	16-15-19	16	
				SPT-9	12.0 - 13.5	1.5	15-16-18	24	
				SPT-10	13.5 - 15.0	1.4	19-19-13	22	
				SPT-11	15.0 - 16.5	1.4	6-11-19	18	
				SPT-12	16.5 - 18.0	1.1	7-9-10	15	
				SPT-13	18.0 - 19.5	1.3	6-8-8	26	
				SPT-14	19.5 - 21.0	1.2	6-6-7	23	Wet to saturated and medium density begining at 20.0 feet.
813.4'	22.3'			SPT-15	21.0 - 22.5	1.3	5-2-2	34	
		SOIL 3: SLUICED FLY ASH, gray and black, wet to saturated, medium stiff to very soft, with varying percentages of bottom ash and some organics		SPT-16	22.5 - 24.0	1.4	4-6-5	36	
				SPT-17	24.0 - 25.5	1.0	2-2-1	45	Added Super Gel-X at 24 feet to prevent auger blowback.
				SPT-18	25.5 - 27.0	0.7	2-1-1	35	
				SPT-19	27.0 - 28.5	0.5	1-1-1	50	
				SPT-20	28.5 - 30.0	0.3	1-1-1	45	
				SPT-21	30.0 - 31.5	0.3	woh	33	
				SPT-22	31.5 - 33.0	0.9	1-1-1	30	
				SPT-23	33.0 - 34.5	1.1	3-2-2	41	
				SPT-24	34.5 - 36.0	1.3	1-1-1	37	
				SPT-25	36.0 - 37.5	0.7	wor-wor-woh	44	
				SPT-26	37.5 - 39.0	1.3	woh	39	
				SPT-27	39.0 - 40.5	1.2	2-1-2	48	
				SPT-28	40.5 - 42.0	1.2	1-1-1	38	
				SPT-29	42.0 - 43.5	1.4	1-1-1	56	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591840.77, E 2545638.39 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-39** Total Depth 73.2 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
				SPT-30	43.5 - 45.0	1.0	woh	50	
				SPT-31	45.0 - 46.5	0.7	wor	46	
788.8'	46.9'								
		SOIL 13: LEAN CLAY with Sand, brown, moist to wet, medium stiff, some sand		SPT-32	46.5 - 48.0	1.4	wor-4-5	22	
				SPT-33	48.0 - 49.5	0.7	6-7-8	20	
				SPT-34	49.5 - 51.0	1.1	2-3-4	21	
				SPT-35	51.0 - 52.5	1.2	4-5-6	21	
				SPT-36	52.5 - 54.0	1.1	7-5-8	20	
				SPT-37	54.0 - 55.5	1.2	5-7-9	20	Transitions to sand with clay in SPT-38.
779.2'	56.5'			SPT-38	55.5 - 57.0	1.3	6-7-9	20	
		SOIL 9: CLAYEY SAND, brown to gray, moist to wet, medium dense to very loose, fine to medium grained, some clay, trace silt		SPT-39	57.0 - 58.5	1.2	4-4-4	23	
				SPT-40	58.5 - 60.0	1.4	2-3-2	25	
				SPT-41	60.0 - 61.5	1.4	1-1-1	25	
				SPT-42	61.5 - 63.0	1.5	1-2-1	24	
				SPT-43	63.0 - 64.5	1.5	1-2-1	24	
				SPT-44	64.5 - 66.0	1.4	1-1-2	26	
				SPT-45	66.0 - 67.5	1.1	1-1-1	25	
767.2'	68.5'			SPT-46	67.5 - 69.0	1.3	1-13-21	23	
		SOIL 11: GRAVEL, red brown and gray, wet, dense to medium dense, medium to coarse grained, rounded, some coarse sand		SPT-47	69.0 - 70.5	0.7	5-7-8	14	
				SPT-48	70.5 - 72.0	1.0	5-4-4	19	
762.9'	72.8'			SPT-49	72.0 - 73.5	1.1	21-41-50/0.3	15	
762.5'	73.2'								
		Shale (augered)							
		Auger Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591821.33, E 2545513.41 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-40** Total Depth 62.7 ft
Location	Clinton, Tennessee	Surface Elevation	825.8 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/6/09 Completed 7/7/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	19.3 ft Date/Time 6/7/09
Logged By	Patrick White	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
825.8'	0.0'	Top of Hole							
		SOIL 4: FILL - LEAN CLAY, red brown, moist, stiff, some fine to medium gravel, trace silt		SPT-1	0.0 - 1.5	0.4	6-7-9	15	Boring advanced using 4 and 1/4 inch hollow stem augers.
823.0'	2.8'			SPT-2	1.5 - 3.0	0.7	14-17-18	14	
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, gray and black, moist to wet, medium dense to dense		SPT-3	3.0 - 4.5	1.1	14-15-17	20	
				SPT-4	4.5 - 6.0	1.4	4-8-10	23	
				SPT-5	6.0 - 7.5	1.4	10-12-14	23	Slotted screen piezometer installed, tip depth 29 ft. See peizometer installation log for details.
				SPT-6	7.5 - 9.0	1.3	10-15-15	24	
				SPT-7	9.0 - 10.5	1.2	5-9-13	20	
				SPT-8	10.5 - 12.0	1.3	10-14-15	22	
				SPT-9	12.0 - 13.5	1.4	13-15-17	23	
				SPT-10	13.5 - 15.0	1.4	6-7-9	38	
				SPT-11	15.0 - 16.5	1.3	3-4-4	61	
				SPT-12	16.5 - 18.0	12.0	3-3-4	73	
				SPT-13	18.0 - 19.5	1.3	4-5-4	60	
				SPT-14	19.5 - 21.0	1.2	2-2-3	62	Added water at 19.5 ft to keep sand out of auger
804.1'	21.7'								
		SOIL 3: SLUICED FLY ASH, gray and black, wet to saturated, soft to very soft, with varying percentages of bottom ash		SPT-15	21.0 - 22.5	1.5	1-1-2	46	
				SPT-16	22.5 - 24.0	0.4	2-2-2	44	
				SPT-17	24.0 - 25.5	0.3	1-1-2	48	
				SPT-18	25.5 - 27.0	0.6	woh-woh-1	49	
				SPT-19	27.0 - 28.5	0.8	woh	33	
				SPT-20	28.5 - 30.0	0.9	woh-1-1	39	
				SPT-21	30.0 - 31.5	1.1	1-1-wor	57	
				SPT-22	31.5 - 33.0	1.2	woh-1-1	52	
				SPT-23	33.0 - 34.5	1.4	woh-woh-1	45	
				SPT-24	34.5 - 36.0	1.4	wor	40	
				SPT-25	36.0 - 37.5	1.2	wor	41	
				SPT-26	37.5 - 39.0	1.4	wor	42	
				SPT-27	39.0 - 40.5	1.3	wor	43	
				SPT-28	40.5 - 42.0	1.4	wor-1-2	39	
782.5'	43.3'			SPT-29	42.0 - 43.5	1.4	1-1-1	34	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591821.33, E 2545513.41 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-40** Total Depth 62.7 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
780.5'	45.3'	SOIL 4: FILL - LEAN CLAY, brown, moist, medium stiff to soft, trace sand *(Continued)*		SPT-30	43.5 - 45.0	0.8	1-1-2	28	
				SPT-31	45.0 - 46.5	0.0	woh	--	
				SPT-32	46.5 - 48.0	1.0	woh-1-2	28	
		SOIL 6: LEAN CLAY, brown, moist, medium stiff to soft, trace sand		SPT-33	48.0 - 49.5	1.3	2-5-6	29	
				SPT-34	49.5 - 51.0	1.1	2-5-5	36	
				SPT-35	51.0 - 52.5	1.2	6-8-9	31	
				SPT-36	52.5 - 54.0	0.7	4-5-4	32	
				SPT-37	54.0 - 55.5	1.3	5-8-11	33	
				SPT-38	55.5 - 57.0	0.9	5-7-7	29	
				SPT-39	57.0 - 58.5	0.7	2-4-5	28	
				SPT-40	58.5 - 60.0	1.0	3-4-4	23	
				SPT-41	60.0 - 61.5	1.1	2-4-6	34	
763.7'	62.1'			SPT-42	61.5 - 62.8	0.5	21-31-50/0.3	13	
763.5'	62.3'								
763.1'	62.7'	SOIL 11: GRAVEL, white, wet, medium dense, medium to coarse grained, subangular, some coarse sand							
		Shale (augered)							
		Auger Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591800.67, E 2545427.16 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-41** Total Depth 44.9 ft
Location	Clinton, Tennessee	Surface Elevation	809.7 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/10/09 Completed 6/10/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	14.8 ft Date/Time 6/10/09
Logged By	Patrick White	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
809.7'	0.0'	Top of Hole							
809.5'	0.2'	FILL - CRUSHED STONE		SPT-1	0.0 - 1.5	1.1	4-5-6	20	Boring advanced using 4 1/4" hollow stem augers.
		SOIL 4: FILL - LEAN CLAY, red brown, moist, very stiff, trace silt, some fine to medium gravel		SPT-2	1.5 - 3.0	1.4	7-10-10	28	
				SPT-3	3.0 - 4.5	1.4	11-11-10	30	
				SPT-4	4.5 - 6.0	1.2	8-10-11	22	
				SPT-5	6.0 - 7.5	0.6	3-4-6	25	Slotted screen piezometer installed, tip depth 41.5 ft. See peizometer installation log for details.
				SPT-6	7.5 - 9.0	1.2	7-8-10	22	
				SPT-7	9.0 - 10.5	1.4	3-3-6	29	
				SPT-8	10.5 - 12.0	1.2	7-8-10	26	
796.3'	13.4'			SPT-9	12.0 - 13.5	1.5	9-10-12	29	
794.6'	15.1'	SOIL 1: FILL - BOTTOM ASH, black, wet, medium dense to dense		SPT-10	13.5 - 15.0	0.8	8-12-11	38	
				SPT-11	15.0 - 16.5	0.2	5-7-3	7	Added water at 15 feet to keep sand out of augers.
		SOIL 4: FILL - LEAN CLAY, dark brown to dark gray, moist, stiff to very stiff, with medium grained gravel in upper 3 feet		SPT-12	16.5 - 18.0	0.2	2-2-6	17	
				SPT-13	18.0 - 19.5	1.2	4-4-6	28	
				SPT-14	19.5 - 21.0	1.1	5-5-8	25	
				SPT-15	21.0 - 22.5	1.2	5-6-10	26	
				SPT-16	22.5 - 24.0	0.4	5-6-6	26	
				SPT-17	24.0 - 25.5	0.2	3-3-4	27	
				SPT-18	25.5 - 27.0	1.2	3-5-9	26	
				SPT-19	27.0 - 28.5	1.1	3-6-8	26	
779.7'	30.0'			SPT-20	28.5 - 30.0	1.2	3-5-7	26	
		SOIL 6: LEAN CLAY, dark brown, moist to wet, stiff to very stiff, trace silt and sand		SPT-21	30.0 - 31.5	0.0	6-5-6	--	
				SPT-22	31.5 - 33.0	1.5	9-11-12	28	
				SPT-23	33.0 - 34.5	0.9	11-8-7	28	
				SPT-24	34.5 - 36.0	0.1	3-4-5	24	
				SPT-25	36.0 - 37.5	1.2	7-8-10	26	
				SPT-26	37.5 - 39.0	1.4	4-7-7	28	
				SPT-27	39.0 - 40.5	1.3	3-6-9	72	
				SPT-28	40.5 - 42.0	1.2	5-7-7	24	
766.6'	43.1'			SPT-29	42.0 - 43.5	1.0	7-8-5	21	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591800.67, E 2545427.16 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-41** Total Depth 44.9 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
				SPT-30	43.5 - 45.0	1.3	6-16-50/0.4	16	
765.2'	44.5'	SOIL 11: GRAVEL, red brown, wet, medium dense, medium to coarse grained, rounded, some clay, some medium to coarse sand *(Continued)*							
764.8'	44.9'	Shale (augered)							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591803.05, E 2545424.87 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-41A** Total Depth 18.0 ft
Location	Clinton, Tennessee	Surface Elevation	809.6 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/14/09 Completed 7/14/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	N/A Date/Time N/A
Logged By	Patrick White	Automatic Hammer ☐	Safety Hammer ☐ Other ☐

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
809.6'	0.0'	Top of Hole							
									Boring advanced using 4 and 1/4 inch hollow stem augers.
									No samples taken, augered only for peizometer installation.
									Slotted screen piezometer installed, tip depth 18.0 ft. See peizometer installation log for details.

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591427.25, E 2545657.42 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-43** Total Depth 61.4 ft
Location	Clinton, Tennessee	Surface Elevation	825.0 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/6/09 Completed 7/6/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	18.6 ft Date/Time 7/6/09
Logged By	Patrick White	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
825.0'	0.0'	Top of Hole							
823.8'	1.2'	SOIL 4: FILL - GRAVELLY LEAN CLAY, red brown, moist, stiff		SPT-1	0.0 - 1.5	1.0	3-5-6	20	Boring advanced using 4 1/4" Hollow Stem Augers
				SPT-2	1.5 - 3.0	1.1	5-6-6	18	
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, gray and black, moist to wet, loose to dense		SPT-3	3.0 - 4.5	1.2	4-3-3	24	
				SPT-4	4.5 - 6.0	0.5	3-3-2	26	
				SPT-5	6.0 - 7.5	1.2	4-5-7	26	
				SPT-6	7.5 - 9.0	1.4	6-6-7	30	
				SPT-7	9.0 - 10.5	1.5	8-14-14	21	
				SPT-8	10.5 - 12.0	1.5	10-14-15	21	
				SPT-9	12.0 - 13.5	1.4	13-15-15	22	
				SPT-10	13.5 - 15.0	1.1	10-12-12	23	
				SPT-11	15.0 - 16.5	1.2	6-8-6	22	
				SPT-12	16.5 - 18.0	1.1	7-7-6	16	
805.5'	19.5'			SPT-13	18.0 - 19.5	0.9	5-5-5	12	
		SOIL 11: GRAVEL, green and gray, wet, medium dense to loose, some coarse sand, ROCK COLUMN		SPT-14	19.5 - 21.0	0.7	3-3-3	12	
				SPT-15	21.0 - 22.5	1.2	3-4-4	12	
				SPT-16	22.5 - 24.0	0.9	4-4-3	12	
				SPT-17	24.0 - 25.5	0.5	2-3-3	13	
				SPT-18	25.5 - 27.0	0.8	3-3-3	11	
				SPT-19	27.0 - 28.5	0.9	3-2-3	12	
				SPT-20	28.5 - 30.0	0.9	3-3-4	12	
				SPT-21	30.0 - 31.5	0.0	wor	--	
				SPT-22	31.5 - 33.0	1.0	3-4-4	11	
				SPT-23	33.0 - 34.5	1.2	3-4-5	12	
				SPT-24	34.5 - 36.0	1.2	5-7-8	12	
				SPT-25	36.0 - 37.5	1.5	10-10-9	10	
786.0'	39.0'			SPT-26	37.5 - 39.0	1.4	6-5-6	11	
		SOIL 3: SLUICED FLY ASH, gray and black, saturated, soft to very soft, with varying percentages of bottom ash		SPT-27	39.0 - 40.5	1.2	wor	36	
				SPT-28	40.5 - 42.0	0.0	woh	--	
				SPT-29	42.0 - 43.5	1.0	woh	35	

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591427.25, E 2545657.42 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-43** Total Depth 61.4 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
				SPT-30	43.5 - 45.0	1.3	2-3-5	24	
				SPT-31	45.0 - 46.5	1.1	1-1-woh	10	
778.0'	47.0'			SPT-32	46.5 - 48.0	1.2	4-3-5	22	Boring advanced in two sections due to plugged augers from rock column, new bore hole testing began at 46.5 feet.
		SOIL 10: SAND, brown, wet, medium dense to loose, trace silt, fine to medium grain size, some clay and organics		SPT-33	48.0 - 49.5	1.4	3-5-5	23	
				SPT-34	49.5 - 51.0	0.2	2-2-1	23	
				SPT-35	51.0 - 52.5	0.8	woh-1-2	24	
				SPT-36	52.5 - 54.0	1.1	1-3-3	25	
				SPT-37	54.0 - 55.5	1.0	1-5-6	24	
				SPT-38	55.5 - 57.0	1.5	2-1-1	24	
				SPT-39	57.0 - 58.5	1.3	woh	27	
765.0'	60.0'			SPT-40	58.5 - 60.0	1.4	1-1-4	37	
763.9'	61.1'	SOIL 11: GRAVEL, red brown, wet, loose, subrounded, fine to coarse grain size,		SPT-41	60.0 - 61.4	0.9	14-15-50/0.4	15	
763.6'	61.4'	Shale (augered)							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591537.09, E 2545975.54 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-44** Total Depth 66.1 ft
Location	Clinton, Tennessee	Surface Elevation	835.7 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/30/09 Completed 7/1/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	26.0 ft Date/Time 6/30/09
Logged By	Patrick White	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
835.7'	0.0'	Top of Hole							
835.1'	0.6'	FILL - CRUSHED STONE		SPT-1	0.0 - 1.5	1.2	6-12-13	23	Boring advanced using 4 and 1/4 inch hollow stem augers.
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, dark gray, moist to saturated, medium dense to dense		SPT-2	1.5 - 3.0	1.1	13-15-20	21	
				SPT-3	3.0 - 4.5	1.3	22-22-22	16	
				SPT-4	4.5 - 6.0	1.2	6-13-16	16	
				SPT-5	6.0 - 7.5	1.3	16-20-20	16	Slotted screen piezometer installed, tip depth 32.0 ft. See peizometer installation log for details.
				SPT-6	7.5 - 9.0	1.4	18-18-24	17	
				SPT-7	9.0 - 10.5	1.5	6-14-18	16	
				SPT-8	10.5 - 12.0	1.5	15-20-24	19	
				SPT-9	12.0 - 13.5	1.2	20-24-28	19	
				SPT-10	13.5 - 15.0	1.1	24-24-25	19	
				SPT-11	15.0 - 16.5	1.5	10-15-20	24	
				SPT-12	16.5 - 18.0	1.5	15-20-20	25	
				SPT-13	18.0 - 19.5	1.5	15-15-14	26	
				SPT-14	19.5 - 21.0	1.4	6-11-11	25	SPT-14 has 4 inch layer of saturated loose bottom ash.
				SPT-15	21.0 - 22.5	1.0	9-8-10	34	
				SPT-16	22.5 - 24.0	1.5	16-13-17	36	
				SPT-17	24.0 - 25.5	1.5	9-11-8	22	
				SPT-18	25.5 - 27.0	1.5	4-8-11	39	
				SPT-19	27.0 - 28.5	1.5	12-14-14	38	
				SPT-20	28.5 - 30.0	1.3	2-4-6	33	
				SPT-21	30.0 - 31.5	1.5	6-7-10	35	Added water at 30 feet to keep sand out of augers.
				SPT-22	31.5 - 33.0	1.5	8-11-12	27	
				SPT-23	33.0 - 34.5	1.5	4-4-3	34	
800.7'	35.0'								
		SOIL 3: SLUICED FLY ASH, gray, wet to saturated, very soft to medium stiff, with varying percentages of bottom ash		SPT-24	34.5 - 36.0	1.1	3-2-3	46	
				SPT-25	36.0 - 37.5	0.9	3-2-woh	30	
				SPT-26	37.5 - 39.0	0.9	woh-2-2	36	
				SPT-27	39.0 - 40.5	1.0	2-3-5	38	
				SPT-28	40.5 - 42.0	1.4	3-5-3	39	
				SPT-29	42.0 - 43.5	1.5	3-5-4	43	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591537.09, E 2545975.54 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-44** Total Depth 66.1 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
		SOIL 3: SLUICED FLY ASH, gray, wet to saturated, very soft to medium stiff, with varying percentages of bottom ash *(Continued)*		SPT-30	43.5 - 45.0	1.4	2-3-2	48	
				SPT-31	45.0 - 46.5	0.7	wor	35	
				SPT-32	46.5 - 48.0	1.2	2-3-3	22	
786.7'	49.0'			SPT-33	48.0 - 49.5	0.7	3-6-7	25	
		SOIL 6: LEAN CLAY, brown to red brown, moist, medium stiff to stiff, some fine gravel		SPT-34	49.5 - 51.0	1.4	6-8-9	24	
				SPT-35	51.0 - 52.5	1.4	7-11-14	23	
				SPT-36	52.5 - 54.0	1.0	12-12-12	22	
				SPT-37	54.0 - 55.5	0.9	9-9-7	23	
				SPT-38	55.5 - 57.0	0.9	4-7-9	23	
				SPT-39	57.0 - 58.5	1.3	2-9-12	23	
				SPT-40	58.5 - 60.0	14.0	10-13-13	20	
				SPT-41	60.0 - 61.5	1.3	6-9-10	21	
				SPT-42	61.5 - 63.0	15.0	9-11-11	18	
772.2'	63.5'								
		SOIL 11: GRAVEL, brown, wet, medium dense to loose, medium to coarse grained, subrounded, some coarse sand		SPT-43	63.0 - 64.5	12.0	8-11-9	21	
770.1'	65.6'			SPT-44	64.5 - 66.0	1.4	2-4-12	21	
769.6'	66.1'			SPT-45	66.0 - 66.1	0.1	50/0.1	12	
		Shale (augered)							
		Auger Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591478.25, E 2545990.45 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-45** Total Depth 58.2 ft
Location	Clinton, Tennessee	Surface Elevation	824.8 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/29/09 Completed 6/30/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	16.5 ft Date/Time 6/29/09
Logged By	Patrick White	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
824.8'	0.0'	Top of Hole							
~~824.2'~~	~~0.6'~~	FILL - CRUSHED STONE		SPT-1	0.0 - 1.5	0.9	1-3-6	20	Boring advanced using 4 and 1/4 inch hollow stem augers.
~~823.7'~~	~~1.1'~~	SOIL 4: FILL - LEAN CLAY, red brown, moist, stiff, some fine to medium gravel		SPT-2	1.5 - 3.0	1.1	7-8-8	24	
				SPT-3	3.0 - 4.5	1.2	10-12-12	24	
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, gray black, moist to wet, medium dense to dense, trace coal		SPT-4	4.5 - 6.0	1.0	4-11-12	24	
				SPT-5	6.0 - 7.5	1.3	12-15-19	24	Slotted screen piezometer installed, tip depth 31 ft. See peizometer installation log for details. SPT-10 is wet to saturated.
				SPT-6	7.5 - 9.0	1.3	19-20-21	23	
				SPT-7	9.0 - 10.5	1.4	6-8-9	20	
				SPT-8	10.5 - 12.0	1.1	8-10-13	25	
				SPT-9	12.0 - 13.5	1.4	11-15-19	23	
				SPT-10	13.5 - 15.0	1.2	12-14-13	20	
				SPT-11	15.0 - 16.5	1.2	5-9-12	23	
				SPT-12	16.5 - 18.0	1.1	10-12-13	30	
				SPT-13	18.0 - 19.5	1.5	7-9-10	35	
				SPT-14	19.5 - 21.0	1.4	2-4-3	49	Added water at 19.5 feet to keep sand out of augers. SPT-14 has 6 inch layer of fly ash with high organic content.
				SPT-15	21.0 - 22.5	0.0	5-3-4	--	
800.8'	24.0'			SPT-16	22.5 - 24.0	1.5	5-4-4	22	
		SOIL 3: SLUICED FLY ASH, gray, saturated, very soft to medium stiff, with varying percentages of bottom ash and some organics		SPT-17	24.0 - 25.5	0.8	1-woh-woh	34	
				SPT-18	25.5 - 27.0	1.0	2-2-2	33	
				SPT-19	27.0 - 28.5	0.4	2-2-2	30	
				SPT-20	28.5 - 30.0	1.4	2-2-3	54	
				SPT-21	30.0 - 31.5	1.3	1-1-woh	35	
				SPT-22	31.5 - 33.0	1.5	1-1-1	43	
				SPT-23	33.0 - 34.5	1.4	2-1-2	51	
				SPT-24	34.5 - 36.0	1.4	wor	54	
				SPT-25	36.0 - 37.5	1.5	wor	40	
786.9'	37.9'								
		SOIL 6: LEAN CLAY, brown to red brown, moist to wet, very soft to very stiff, some silt, trace sand		SPT-26	37.5 - 39.0	1.5	2-3-3	25	
				SPT-27	39.0 - 40.5	1.1	5-7-9	30	
				SPT-28	40.5 - 42.0	0.5	woh-woh-1	28	
				SPT-29	42.0 - 43.5	1.1	2-12-14	30	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591478.25, E 2545990.45 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-45** Total Depth 58.2 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
		SOIL 6: LEAN CLAY, brown to red brown, moist to wet, very soft to very stiff, some silt, trace sand *(Continued)*		SPT-30	43.5 - 45.0	0.7	7-10-13	26	
				SPT-31	45.0 - 46.5	1.5	3-8-8	27	
				SPT-32	46.5 - 48.0	1.0	5-8-9	25	
				SPT-33	48.0 - 49.5	1.1	5-6-6	24	
				SPT-34	49.5 - 51.0	1.3	3-4-5	24	
				SPT-35	51.0 - 52.5	1.5	5-6-6	25	
				SPT-36	52.5 - 54.0	0.8	3-4-4	25	
				SPT-37	54.0 - 55.5	0.2	wor	26	
768.2'	56.6'			SPT-38	55.5 - 57.0	1.2	5-10-20	16	
766.6'	58.2'			SPT-39	57.0 - 58.2	0.6	21-46-50/0.2	17	
		Shale (augered)							
		Auger Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591420.20, E 2546001.83 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-46** Total Depth 42.0 ft
Location	Clinton, Tennessee	Surface Elevation	808.2 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/27/09 Completed 7/27/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	2.0 ft Date/Time 7/27/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
808.2'	0.0'	Top of Hole							
		SOIL 4: FILL - LEAN CLAY, light brown, saturated, soft		SPT-1	0.0 - 1.5	0.2	1-1-1	36	Boring advanced using 3 1/4" Hollow Stem Augers
806.2'	2.0'			SPT-2	1.5 - 3.0	0.1	1-1-2	30	
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, gray, saturated, loose		SPT-3	3.0 - 4.5	0.5	1-1-1	41	
				SPT-4	4.5 - 6.0	0.1	WOH-1-1	49	SPT-3: organics in sample
800.7'	7.5'			SPT-5	6.0 - 7.5	1.0	WOH-WOH-1	47	Slotted screen piezometer installed. Tip depth at 10.0 ft. See piezometer installation log for details.
		SOIL 3: SLUICED FLY ASH, gray, saturated, very soft, with varying percentages of bottom ash		SPT-6	7.5 - 9.0	1.3	WOR-WOH-1	41	
				SPT-7	9.0 - 10.5	1.1	WOR-WOR-WOH	49	
				SPT-8	10.5 - 12.0	1.0	WOR-WOR-1	41	
				SPT-9	12.0 - 13.5	1.3	1-2-2	42	
				SPT-10	13.5 - 15.0	1.0	WOH-1-1	45	
				SPT-11	15.0 - 16.5	0.7	WOH-WOH-1	40	
				SPT-12	16.5 - 18.0	0.7	WOH-WOH-1	44	
				SPT-13	18.0 - 19.5	1.2	WOR-WOH-WOH	52	
				SPT-14	19.5 - 21.0	1.4	WOH	49	
				SPT-15	21.0 - 22.5	0.1	WOR	37	
784.2'	24.0'			SPT-16	22.5 - 24.0	1.0	WOR	31	SPT-16: silty clay in tip of spoon
		SOIL 6: LEAN CLAY, light brown to dark brown, moist, soft to stiff, some fine sand		SPT-17	24.0 - 25.5	1.0	1-1-3	28	
				SPT-18	25.5 - 27.0	1.0	2-4-7	29	
				SPT-19	27.0 - 28.5	1.0	7-7-9	30	
				SPT-20	28.5 - 30.0	1.1	7-9-11	30	
				SPT-21	30.0 - 31.5	1.2	6-7-11	28	
				SPT-22	31.5 - 33.0	1.1	6-8-11	26	
				SPT-23	33.0 - 34.5	1.4	8-9-12	25	
				SPT-24	34.5 - 36.0	1.0	2-3-5	25	
				SPT-25	36.0 - 37.5	1.1	2-3-6	24	
				SPT-26	37.5 - 39.0	1.3	2-3-5	24	
				SPT-27	39.0 - 40.5	1.2	1-1-3	27	SPT-40: limestone in tip of spoon
766.4'	41.8'			SPT-28	40.5 - 41.9	1.3	3-9-50/0.4	26	
766.2'	42.0'	Limestone (Augered)							
		Auger Refusal /							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591420.20, E 2546001.83 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-46** Total Depth 42.0 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
		Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591423.33, E 2546007.07 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	STN-46CPT Total Depth 33.0 ft
Location	Clinton, Tennessee	Surface Elevation	808.4 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/24/09 Completed 7/24/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	N/A Date/Time N/A
Logged By	Ben Halada	Automatic Hammer ☐	Safety Hammer ☐ Other ☐

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
808.4'	0.0'	Top of Hole							
		Boring advanced from ground surface to 33 feet bgs using CPT							
775.4'	33.0'	Auger Refusal / Bottom of Hole							

FMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591422.85, E 2546003.93 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-46P** Total Depth 43.0 ft
Location	Clinton, Tennessee	Surface Elevation	808.4 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/28/09 Completed 7/29/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	2.0 ft Date/Time 7/29/09
Logged By	Ben Halada	Automatic Hammer ☐	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
808.4'	0.0'	Top of Hole							
806.4'	2.0'	SOIL 4: FILL - LEAN CLAY, light brown, saturated, very soft		ST-1	0.0 - 2.0	0.8		31	Boring advanced using 4 1/4" Hollow Stem Augers
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, gray, saturated, loose		ST-2	2.0 - 4.0	1.8		--	
				ST-3	4.0 - 6.0	0.6		--	Piston sampler and sucker rods were utilized to obtain recovery during Shelby Tube sampling
801.4'	7.0'			ST-4	6.0 - 8.0	2.0		--	
		SOIL 3: SLUICED FLY ASH, gray, saturated, very soft, with varying percentages of bottom ash		ST-5	8.0 - 10.0	1.8		--	
				ST-6	10.0 - 12.0	1.0		--	Slope inclinometer installed, 46.0 ft of pipe
				ST-7	12.0 - 14.0	2.0		--	
				ST-8	14.0 - 16.0	1.6		--	
				ST-9	16.0 - 18.0	2.0		--	
				ST-10	18.0 - 20.0	2.0		--	
				ST-11	20.0 - 22.0	2.0		--	
785.4'	23.0'			ST-12	22.0 - 24.0	2.0		--	
784.4'	24.0'	SOIL 6: SILTY CLAY, light brown to dark brown, moist, soft to medium stiff							
		Augered without sampling							
766.5'	41.9'								
765.4'	43.0'	Limestone (Augered)							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591422.85, E 2546003.93 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-46P** Total Depth 43.0 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591691.40, E 2546454.06 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-47** Total Depth 69.9 ft
Location	Clinton, Tennessee	Surface Elevation	835.7 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/30/09 Completed 6/30/09
Supervisor	Patrick Kiser Driller Kent Clements	Depth to Water	27.5 ft Date/Time 6/30/09
Logged By	Jim Andrew	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
835.7'	0.0'	Top of Hole							
835.2'	0.5'	SOIL 11: FILL - GRAVEL		SPT-1	0.0 - 1.5	0.7	2-5-6	25	Boring advanced using 3 and 1/4 inch hollow stem augers.
834.7'	1.0'	SOIL 4: FILL - SILTY CLAY, reddish brown, moist, stiff		SPT-2	1.5 - 3.0	1.4	13-17-19	16	
		SOIL 2: BOTTOM ASH/FLY ASH MIXTURE, gray and dark gray, moist, very dense to dense		SPT-3	3.0 - 4.5	1.5	6-13-24	20	
				SPT-4	4.5 - 6.0	1.5	10-18-23	17	
				SPT-5	6.0 - 7.5	1.4	14-18-25	18	Slotted screen piezometer installed, tip depth 27 ft. See peizometer installation log for details.
				SPT-6	7.5 - 9.0	1.5	17-23-28	17	
				SPT-7	9.0 - 10.5	1.5	9-20-31	21	
				SPT-8	10.5 - 12.0	1.5	10-21-33	20	
				SPT-9	12.0 - 13.5	1.5	21-24-30	21	
				SPT-10	13.5 - 15.0	1.5	13-15-18	22	
				SPT-11	15.0 - 16.5	1.4	12-14-15	21	
				SPT-12	16.5 - 18.0	1.5	7-15-22	23	
				SPT-13	18.0 - 19.5	1.5	14-16-20	24	
				SPT-14	19.5 - 21.0	1.5	11-9-12	22	
				SPT-15	21.0 - 22.5	1.5	8-9-12	23	Some organics
				SPT-16	22.5 - 24.0	1.5	9-11-14	36	
				SPT-17	24.0 - 25.5	1.5	5-11-13	31	
808.7'	27.0'			SPT-18	25.5 - 27.0	1.5	3-7-8	38	
		SOIL 3: SLUICED FLY ASH, light gray and dark gray, wet to saturated, soft to medium stiff, with varying percentages of bottom ash		SPT-19	27.0 - 28.5	1.0	8-8-7	35	
				SPT-20	28.5 - 30.0	1.3	1-2-3	40	
				SPT-21	30.0 - 31.5	1.5	woh-1-2	36	
				SPT-22	31.5 - 33.0	1.5	woh-1-2	43	
				SPT-23	33.0 - 34.5	1.5	1-1-3	35	
				SPT-24	34.5 - 36.0	1.5	2-2-2	30	
				SPT-25	36.0 - 37.5	1.5	2-1-2	29	
				SPT-26	37.5 - 39.0	1.5	1-2-2	32	
				SPT-27	39.0 - 40.5	1.5	1-2-3	35	
				SPT-28	40.5 - 42.0	1.5	3-3-3	35	
				SPT-29	42.0 - 43.5	1.5	2-2-3	48	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591691.40, E 2546454.06 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-47** Total Depth 69.9 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
		SOIL 3: SLUICED FLY ASH, light gray and dark gray, wet to saturated, soft to medium stiff, with varying percentages of bottom ash *(Continued)*		SPT-30	43.5 - 45.0	1.5	woh-1-2	63	
				SPT-31	45.0 - 46.5	1.5	woh-2-2	53	
				SPT-32	46.5 - 48.0	1.5	1-2-2	51	
				SPT-33	48.0 - 49.5	1.5	wor	39	
785.2'	50.5'			SPT-34	49.5 - 51.0	1.5	1-1-3	59	
		SOIL 12: SILT, dark gray, moist, medium stiff		SPT-35	51.0 - 52.5	1.5	6-6-9	27	
782.5'	53.2'			SPT-36	52.5 - 54.0	1.5	3-5-6	26	
		SOIL 6: LEAN CLAY, brown and light brown, moist, stiff to medium stiff, wtih dark brown / black magnesium concretions		SPT-37	54.0 - 55.5	1.5	4-4-4	26	
				SPT-38	55.5 - 57.0	1.5	5-6-6	22	
				SPT-39	57.0 - 58.5	1.5	6-5-9	21	
				SPT-40	58.5 - 60.0	1.5	3-9-12	21	
				SPT-41	60.0 - 61.5	1.5	7-9-10	22	
				SPT-42	61.5 - 63.0	1.5	7-9-9	19	
				SPT-43	63.0 - 64.5	1.5	1-4-6	24	
				SPT-44	64.5 - 66.0	1.5	1-2-3	24	
768.2'	67.5'			SPT-45	66.0 - 67.5	1.5	7-9-12	25	
		SOIL 14: CLAYEY SILT to SILTY SAND, dark gray, wet to saturated, stiff		SPT-46	67.5 - 69.0	1.0	5-8-15	24	
766.2'	69.5'			SPT-47	69.0 - 69.9	0.5	15-50/0.4	14	
765.8'	69.9'								
		Shale, light gray, (augered)							
		Auger Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591636.19, E 2546471.30 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-48** Total Depth 60.4 ft
Location	Clinton, Tennessee	Surface Elevation	825.8 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/29/09 Completed 6/29/09
Supervisor	Patrick Kiser Driller Kent Clements	Depth to Water	18.0 ft Date/Time 6/29/09
Logged By	Jim Andrew	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
825.8'	0.0'	Top of Hole							
825.3'	0.5'	SOIL 11: FILL - GRAVEL		SPT-1	0.0 - 1.5	0.7	1-2-6	29	Boring advanced using 3 and 1/4 inch hollow stem augers.
824.8'	1.0'	SOIL 4: FILL - SILTY CLAY, red brown, moist, stiff		SPT-2	1.5 - 3.0	0.5	12-15-19	21	
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, gray, moist, stiff		SPT-3	3.0 - 4.5	1.5	7-12-13	19	
				SPT-4	4.5 - 6.0	1.0	4-9-12	22	
				SPT-5	6.0 - 7.5	1.2	12-14-16	22	Slotted screen piezometer installed, tip depth 25 ft. See peizometer installation log for details.
				SPT-6	7.5 - 9.0	1.5	12-15-16	22	
				SPT-7	9.0 - 10.5	1.5	6-10-13	29	
				SPT-8	10.5 - 12.0	1.5	11-11-13	28	
				SPT-9	12.0 - 13.5	1.5	11-12-13	22	
				SPT-10	13.5 - 15.0	1.5	5-7-11	27	
				SPT-11	15.0 - 16.5	1.5	3-8-9	32	
807.8'	18.0'			SPT-12	16.5 - 18.0	1.4	5-6-8	34	
		SOIL 3: SLUICED FLY ASH, dark gray and light gray, saturated, very soft to medium stiff, with varying percentages of bottom ash and some organics		SPT-13	18.0 - 19.5	1.5	2-3-4	33	
				SPT-14	19.5 - 21.0	1.5	1-2-2	47	
				SPT-15	21.0 - 22.5	1.5	1-2-3	44	
				SPT-16	22.5 - 24.0	1.5	1-3-3	37	
				SPT-17	24.0 - 25.5	1.5	1-3-4	36	
				SPT-18	25.5 - 27.0	1.5	1-3-6	34	
				SPT-19	27.0 - 28.5	1.5	woh-woh-1	30	
				SPT-20	28.5 - 30.0	1.3	woh-woh-1	36	
				SPT-21	30.0 - 31.5	1.5	woh-woh-1	64	
				SPT-22	31.5 - 33.0	1.5	wor-woh-1	53	
				SPT-23	33.0 - 34.5	0.5	wor-woh-1	54	
				SPT-24	34.5 - 36.0	1.0	woh	50	
				SPT-25	36.0 - 37.5	1.4	woh-1-1	73	
				SPT-26	37.5 - 39.0	1.5	woh-1-1	55	
				SPT-27	39.0 - 40.5	1.5	woh	63	
				SPT-28	40.5 - 42.0	1.5	wor	52	
				SPT-29	42.0 - 43.5	1.4	woh-1-3	31	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591636.19, E 2546471.30 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-48** Total Depth 60.4 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
781.3'	44.5'			SPT-30	43.5 - 45.0	1.5	2-3-3	33	
779.8'	46.0'	SOIL 12: SILT, dark gray, wet, medium stiff, with some clay		SPT-31	45.0 - 46.5	1.5	1-3-5	25	
		SOIL 13: LEAN CLAY with Sand, brown and tan brown, moist to wet, medium stiff to stiff, with manganese concretions and silt		SPT-32	46.5 - 48.0	1.5	2-5-7	27	
				SPT-33	48.0 - 49.5	1.5	1-5-8	21	
				SPT-34	49.5 - 51.0	1.5	4-6-9	23	
				SPT-35	51.0 - 52.5	1.5	10-12-13	23	
				SPT-36	52.5 - 54.0	1.5	7-12-14	24	
				SPT-37	54.0 - 55.5	1.0	3-4-7	23	
				SPT-38	55.5 - 57.0	1.3	3-4-5	23	
767.3'	58.5'			SPT-39	57.0 - 58.5	1.5	3-3-4	25	
765.8'	60.0'	SOIL 12: SILT, dark gray, wet, medium stiff		SPT-40	58.5 - 60.0	1.0	3-3-5	27	
765.4'	60.4'			SPT-41	60.0 - 60.4	0.4	50/0.4	9	
		Shale, light gray, (augered)							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591636.19, E 2546471.30 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-48P** Total Depth 45.0 ft
Location	Clinton, Tennessee	Surface Elevation	826.1 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/23/09 Completed 7/23/09
Supervisor	Ben Halada Driller Steve Bradford	Depth to Water	N/A Date/Time N/A
Logged By	Brad Smiley	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
826.1'	0.0'	Top of Hole							
		Advanced boring using mud rotary drilling without sampling							Boring advanced using Mud Rotary Drilling, 6" updraft bit Piston sampler and sucker rods were utilized to obtain recovery during Shelby Tube sampling
801.1'	25.0'								
799.1'	27.0'	No Recovery		ST-1	25.0 - 27.0	0.0		--	
		SOIL 3: SLUICED: FLY ASH, dark gray, saturated, soft, with varying percentages of bottom ash		ST-2	27.0 - 29.0	1.9		--	
				ST-3	29.0 - 31.0	2.0		--	
				ST-4	31.0 - 33.0	2.0		--	
				ST-5	33.0 - 35.0	1.7		--	
789.1'	37.0'			ST-6	35.0 - 37.0	2.0		--	
787.1'	39.0'	No Recovery		ST-7	37.0 - 39.0	0.0		--	
		SOIL 6: SILTY CLAY, dark gray and brown, moist, medium stiff		ST-8	39.0 - 41.0	1.9		--	
				ST-9	41.0 - 43.0	1.7		--	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591636.19, E 2546471.30 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-48P** Total Depth 45.0 ft

Lithology		Description	Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	Remarks
Elevation	Depth		Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	
781.1'	45.0'			ST-10	43.0 - 45.0	1.8		--	

No Refusal /
Bottom of Hole

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591576.97, E 2546494.42 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-49** Total Depth 49.5 ft
Location	Clinton, Tennessee	Surface Elevation	808.5 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/21/09 Completed 7/21/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	2.0 ft Date/Time 7/21/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
808.5'	0.0'	Top of Hole							
807.0'	1.5'	SOIL 4: FILL - FAT CLAY, brown, moist, very soft		SPT-1	0.0 - 1.5	0.1	WOH	35	Boring advanced using 4 1/4" Hollow Stem Augers
		SOIL 3: SLUICED FLY ASH, gray, saturated, very soft, with varying percentages of bottom ash		SPT-2	1.5 - 3.0	0.7	WOH-1-1	33	
				SPT-3	3.0 - 4.5	1.0	WOH-1-1	31	
				SPT-4	4.5 - 6.0	1.0	WOH	47	
				SPT-5	6.0 - 7.5	0.7	WOH	43	Slope inclinometer installed, 53.0 ft of pipe
799.5'	9.0'			SPT-6	7.5 - 9.0	1.4	WOH	50	SPT-6: organics in sample
				SPT-7	9.0 - 10.5	1.3	WOH	38	
				SPT-8	10.5 - 12.0	1.4	WOH	39	
				SPT-9	12.0 - 13.5	1.1	WOH-WOH-1	55	
				SPT-10	13.5 - 15.0	0.9	WOR-WOH-WOH	68	
				SPT-11	15.0 - 16.5	1.0	WOH	59	
				SPT-12	16.5 - 18.0	0.8	WOH	45	
				SPT-13	18.0 - 19.5	0.3	WOR	45	
				SPT-14	19.5 - 21.0	0.3	WOR-WOH-WOH	55	
				SPT-15	21.0 - 22.5	0.2	WOH	49	
				SPT-16	22.5 - 24.0	0.7	WOH	51	
				SPT-17	24.0 - 25.5	1.0	WOR	47	
				SPT-18	25.5 - 27.0	1.2	WOR-WOH-WOH	39	
		SOIL 6: LEAN CLAY, gray to brown, moist, medium stiff to stiff, some fine sand		SPT-19	27.0 - 28.5	1.0	1-3-4	26	
				SPT-20	28.5 - 30.0	1.0	1-4-6	25	
				SPT-21	30.0 - 31.5	1.0	1-3-3	25	
				SPT-22	31.5 - 33.0	1.1	8-8-14	22	
				SPT-23	33.0 - 34.5	1.0	8-9-13	24	
				SPT-24	34.5 - 36.0	1.3	5-5-8	24	
				SPT-25	36.0 - 37.5	1.1	3-3-5	24	
				SPT-26	37.5 - 39.0	1.3	6-6-8	25	
				SPT-27	39.0 - 40.5	1.0	1-1-2	27	
767.5'	41.0'								
				SPT-28	40.5 - 42.0	1.5	2-4-7	20	
765.5'	43.0'	SOIL 10: SAND, brown, saturated, dense, fine to coarse grained, some fine to coarse		SPT-29	42.0 - 43.5	1.0	14-21-22	17	
				SPT-30	43.5 - 44.2	0.6	49-50/0.2	12	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591576.97, E 2546494.42 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-49** Total Depth 49.5 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
764.0'	44.5'	gravel Limestone fragments (Augered) *(Continued)*							
		Shale (Augered)							
759.0'	49.5'	Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591577.77, E 2546496.61 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-49A** Total Depth 12.0 ft
Location	Clinton, Tennessee	Surface Elevation	808.5 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/22/09 Completed 7/22/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	N/A Date/Time N/A
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
808.5'	0.0'	Top of Hole							
		Augered without sampling							Boring advanced using 3 1/4" Hollow Stem Augers Slotted screen piezometer installed. Tip depth at 10.0 ft. See piezometer installation log for details.
796.5'	12.0'	No Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591578.88, E 2546498.71 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	STN-49CPT Total Depth 40.0 ft
Location	Clinton, Tennessee	Surface Elevation	808.6 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/22/09 Completed 7/22/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	N/A Date/Time N/A
Logged By	Ben Halada	Automatic Hammer ☐	Safety Hammer ☐ Other ☐

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
808.6'	0.0'	Top of Hole							
		Boring Advanced from Ground surface to 40 ft bgs using CPT							
768.6'	40.0'	Auger Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591577.47, E 2546496.42 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-49P** Total Depth 28.0 ft
Location	Clinton, Tennessee	Surface Elevation	808.5 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/23/09 Completed 7/23/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	N/A Date/Time N/A
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
808.5'	0.0'	Top of Hole							
807.5'	1.0'	SOIL 4: FILL - LEAN CLAY, light brown, moist, soft, some gravel		ST-1	0.0 - 2.0	0.9		--	Boring advanced using 3 1/4" Hollow Stem Augers Piston sampler and sucker rods were utilized to obtain recovery during Shelby Tube sampling Revert added to help keep augers clear
		SOIL 3: SLUICED - FLY ASH, gray, saturated, very soft, with varying percentages of bottom ash		ST-2	2.0 - 4.0	1.5		--	
				ST-3	4.0 - 6.0	1.0		--	
				ST-4	6.0 - 8.0	1.5		--	
				ST-5	8.0 - 10.0	2.0		--	
				ST-6	10.0 - 12.0	1.8		--	
				ST-7	12.0 - 14.0	1.8		--	
				ST-8	14.0 - 16.0	1.4		--	
				ST-9	16.0 - 18.0	1.6		--	
				ST-10	18.0 - 20.0	1.9		--	
				ST-11	20.0 - 22.0	2.0		--	
				ST-12	22.0 - 24.0	2.0		--	
				ST-13	24.0 - 26.0	2.0		--	
781.5'	27.0'			ST-14	26.0 - 28.0	1.4		--	
780.5'	28.0'	SOIL 6: LEAN CLAY, brown, moist, soft, some silt							
		No Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591841.40, E 2546757.19 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-50** Total Depth 60.2 ft
Location	Clinton, Tennessee	Surface Elevation	825.1 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/7/09 Completed 7/8/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	19.4 ft Date/Time 7/8/09
Logged By	Patrick White	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
825.1'	0.0'	Top of Hole							
824.0'	1.1'	SOIL 4: FILL - LEAN CLAY, red brown, moist, stiff, some fine to medium gravel		SPT-1	0.0 - 1.5	1.2	3-5-9	19	Boring advanced using 4 and 1/4 inch hollow stem augers.
				SPT-2	1.5 - 3.0	1.2	9-8-9	21	
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, black and gray, moist, dense		SPT-3	3.0 - 4.5	1.1	10-10-13	16	
				SPT-4	4.5 - 6.0	1.5	7-10-13	27	
				SPT-5	6.0 - 7.5	1.3	10-14-17	25	
				SPT-6	7.5 - 9.0	1.4	17-15-18	46	
				SPT-7	9.0 - 10.5	1.1	4-8-12	22	
				SPT-8	10.5 - 12.0	1.5	12-14-14	26	
				SPT-9	12.0 - 13.5	1.3	12-14-18	23	
				SPT-10	13.5 - 15.0	1.5	9-18-20	25	
				SPT-11	15.0 - 16.5	1.3	10-13-15	42	
				SPT-12	16.5 - 18.0	1.2	8-10-13	43	
				SPT-13	18.0 - 19.5	1.5	8-10-14	38	
				SPT-14	19.5 - 21.0	1.0	3-4-5	33	Wet to saturated begining at 19.4 Added super gel-x at 19.5 feet to prevent auger blowback.
				SPT-15	21.0 - 22.5	0.7	3-4-5	42	
801.6'	23.5'			SPT-16	22.5 - 24.0	1.4	2-5-6	33	
		SOIL 3: SLUICED FLY ASH, gray and black, wet to saturated, soft to very soft, with varying percentages of bottom ash and some organics		SPT-17	24.0 - 25.5	1.5	5-5-4	42	
				SPT-18	25.5 - 27.0	0.9	2-2-1	38	
				SPT-19	27.0 - 28.5	0.7	2-3-5	39	Brown silt layer from 28 to 30 feet.
				SPT-20	28.5 - 30.0	0.9	1-1-1	80	
				SPT-21	30.0 - 31.5	0.4	1-1-1	51	
				SPT-22	31.5 - 33.0	1.1	1-1-2	70	
				SPT-23	33.0 - 34.5	1.2	1-2-3	63	
				SPT-24	34.5 - 36.0	1.1	2-3-2	70	
				SPT-25	36.0 - 37.5	1.3	1-1-2	58	
				SPT-26	37.5 - 39.0	1.4	1-1-1	51	
				SPT-27	39.0 - 40.5	1.3	2-1-1	52	
				SPT-28	40.5 - 42.0	1.3	wor	53	
				SPT-29	42.0 - 43.5	1.4	wor	44	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591841.40, E 2546757.19 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-50** Total Depth 60.2 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
				SPT-30	43.5 - 45.0	1.4	wor-1-1	46	
				SPT-31	45.0 - 46.5	1.3	1-wor-wor	40	SPT-31 has 8 inch thick bottom ash layer.
777.2'	47.9'			SPT-32	46.5 - 48.0	1.1	1-woh-1	27	
		SOIL 13: LEAN CLAY with Sand, brown to gray brown, moist, medium stiff, trace sand, some organics		SPT-33	48.0 - 49.5	1.0	2-3-2	29	
				SPT-34	49.5 - 51.0	1.2	2-2-3	31	
				SPT-35	51.0 - 52.5	1.1	2-5-5	26	Fine sand and fine to medium gravel present begining at 51.1 feet.
				SPT-36	52.5 - 54.0	1.4	5-5-5	27	
				SPT-37	54.0 - 55.5	1.5	5-5-6	22	
767.8'	57.3'			SPT-38	55.5 - 57.0	1.4	2-4-5	22	
		SOIL 10: SAND, red brown, wet, medium dense, fine to coarse grained, some fine to medium gravel		SPT-39	57.0 - 58.5	1.0	1-4-6	22	
765.1'	60.0'			SPT-40	58.5 - 60.0	0.3	6-10-12	13	
764.9'	60.2'			SPT-41	60.0 - 60.2	0.1	50/0.2	--	
		Shale (augered)							
		Auger Refusal / Bottom of Hole							

FMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591336.60, E 2545543.56 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-51** Total Depth 50.0 ft
Location	Clinton, Tennessee	Surface Elevation	809.8 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/15/09 Completed 6/15/09
Supervisor	Briggs Evans Driller Kent Clements	Depth to Water	13.0 ft Date/Time 6/15/09
Logged By	Briggs Evans	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
809.8'	0.0'	Top of Hole							
809.3'	0.5'	FILL - Crushed Stone		SPT-1	0.0 - 1.5	1.0	2-3-4	21	Boring advanced using 3 and 1/4 inch hollow stem augers.
		SOIL 14: FILL - SANDY SILT, brown and very pale brown, moist to wet, medium stiff to stiff		SPT-2	1.5 - 3.0	1.0	3-5-5	22	
				SPT-3	3.0 - 4.5	1.5	8-10-11	26	
				ST-1	4.5 - 6.5	2.0		23	
				SPT-4	6.5 - 8.0	1.2	3-4-6	24	Slotted screen piezometer installed, tip depth 49 ft. See peizometer installation log for details.
				SPT-5	8.0 - 9.5	1.0	5-7-10	22	
799.8'	10.0'								
		SOIL 5: FILL - SANDY LEAN CLAY, brown, moist to wet, medium to stiff		ST-2	9.5 - 11.5			23	
				SPT-6	11.5 - 13.0	1.0	3-3-4	26	
				SPT-7	13.0 - 14.5	1.0	3-3-4	32	
795.3'	14.5'								
		SOIL 1: FILL - BOTTOM ASH, brown with gray, saturated, medium dense		SPT-8	14.5 - 16.0	1.0	13-8-7	10	
793.3'	16.5'			SPT-9	16.0 - 17.5	0.5	1-3-3	27	
		SOIL 6: SILTY LEAN CLAY, dark brown to gray brown, moist, soft to medium stiff		SPT-10	17.5 - 19.0	0.8	2-2-4	28	
				ST-3	19.0 - 21.0	2.0		28	
				SPT-11	21.0 - 22.5	1.0	5-8-8	20	
				SPT-12	22.5 - 24.0	0.8	8-11-12	21	
				ST-4	24.0 - 26.0	1.6		21	
				SPT-13	26.0 - 27.5	0.8	1-3-6	23	
				SPT-14	27.5 - 29.0	0.8	3-6-8	21	
				SPT-15	29.0 - 30.5	1.5	2-3-4	24	
				SPT-16	30.5 - 32.0	1.5	1-2-3	24	
				SPT-17	32.0 - 33.5	1.5	2-4-6	46	
				SPT-18	33.5 - 35.0	1.5	1-2-3	28	
				SPT-19	35.0 - 36.5	1.5	woh-1-2	24	
				SPT-20	36.5 - 38.0	1.5	3-6-7	23	
				SPT-21	38.0 - 39.5	1.8	3-7-9	25	
				SPT-22	39.5 - 41.0	1.0	1-3-5	25	
				SPT-23	41.0 - 42.5	1.0	6-6-8	28	
				SPT-24	42.5 - 44.0	0.8	5-7-9	27	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591336.60, E 2545543.56 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-51** Total Depth 50.0 ft

Lithology		Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
Elevation	Depth								
		SOIL 6: SILTY LEAN CLAY, dark brown to gray brown, moist, soft to medium stiff *(Continued)*		SPT-25	44.0 - 45.5	1.5	1-4-8	26	
				SPT-26	45.5 - 47.0	1.4	2-5-8	27	
				SPT-27	47.0 - 48.5	1.5	3-4-6	28	
759.8'	50.0'			SPT-28	48.5 - 50.0	1.5	8-20-27	12	
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591329.16, E 2545545.06 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-51A** Total Depth 17.0 ft
Location	Clinton, Tennessee	Surface Elevation	809.8 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/14/09 Completed 7/14/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	N/A Date/Time N/A
Logged By	Patrick White	Automatic Hammer ☐	Safety Hammer ☐ Other ☐

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
809.8'	0.0'	Top of Hole							
									Boring advanced using 4 and 1/4 inch hollow stem augers.
									No samples taken, augered only for peizometer installation.
									Slotted screen piezometer installed, tip depth 17.0 ft. See peizometer installation log for details.

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591336.60, E 2545543.56 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-51P** Total Depth 38.0 ft
Location	Clinton, Tennessee	Surface Elevation	809.8 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/16/09 Completed 7/16/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	N/A Date/Time N/A
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
809.8'	0.0'	Top of Hole							
		Augered without sampling							Boring advanced using 3 1/4" Hollow Stem Augers Piston sampler and sucker rods were utilized to obtain recovery during Shelby Tube sampling
779.8'	30.0'								
777.8'	32.0'	SOIL 10: SAND, gray, fine to coarse grained		ST-1	30.0 - 32.0	0.0		--	ST-1: sand residue left inside tube
		SOIL 6: LEAN CLAY, light brown, moist, medium stiff		ST-2	32.0 - 34.0	1.9		25	
				ST-3	34.0 - 36.0	1.9		23	
771.8'	38.0'			ST-4	36.0 - 38.0	2.0		24	
		No Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591060.68, E 2545599.52 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-52** Total Depth 45.0 ft
Location	Clinton, Tennessee	Surface Elevation	809.8 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/16/09 Completed 6/16/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	13.7 ft Date/Time 6/16/09
Logged By	Patrick White	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
809.8'	0.0'	Top of Hole							
808.9'	0.9'	FILL - CRUSHED STONE		SPT-1	0.0 - 1.5	1.1	13-9-6	18	Boring advanced using 4 1/4" hollow stem augers.
		SOIL 4: FILL - LEAN CLAY, red brown, moist, stiff, some fine to medium gravel, trace silt		SPT-2	1.5 - 3.0	1.2	10-9-10	16	
				SPT-3	3.0 - 4.5	1.0	12-12-10	48	
				SPT-4	4.5 - 6.0	0.8	7-4-5	19	
				SPT-5	6.0 - 7.5	0.5	6-5-7	21	SPT-5 has Medium stiff gray lean clay 8 inches thick.
				SPT-6	7.5 - 9.0	1.1	8-10-11	23	
				SPT-7	9.0 - 10.5	1.5	4-4-6	26	SPT-7 has 2 inch thick layer of bottom ash.
				SPT-8	10.5 - 12.0	1.4	6-6-6	34	
796.1'	13.7'			SPT-9	12.0 - 13.5	1.3	5-5-5	29	
794.8'	15.0'	SOIL 11: FILL - GRAVEL, dark gray, wet, medium dense, medium to coarse grained, some bottom ash		SPT-10	13.5 - 15.0	0.4	3-8-8	8	
				SPT-11	15.0 - 16.5	1.0	3-2-2	24	Added water at 15 feet to keep sand out of augers.
791.6'	18.2'			SPT-12	16.5 - 18.0	0.9	4-3-6	25	
		SOIL 8: FILL - FAT CLAY, brown and gray, moist to wet, medium stiff, some chert		SPT-13	18.0 - 19.5	0.9	3-4-7	27	
789.4'	20.4'			SPT-14	19.5 - 21.0	1.2	1-3-3	24	
		SOIL 12: SILT, dark gray, moist, medium stiff, some fine to medium sand, trace organics		SPT-15	21.0 - 22.5	1.2	3-6-7	24	
				SPT-16	22.5 - 24.0	0.9	4-5-6	25	
		SOIL 7: SANDY LEAN CLAY, dark brown, moist to wet, medium stiff to stiff, some fine to medium sand, trace silt		SPT-17	24.0 - 25.5	1.3	3-4-7	27	SPT-17 has 3 inch dark gray brown soft saturated silt.
				SPT-18	25.5 - 27.0	1.2	6-8-12	25	
				SPT-19	27.0 - 28.5	1.1	6-8-12	24	
				SPT-20	28.5 - 30.0	1.3	4-6-8	24	
				SPT-21	30.0 - 31.5	1.2	7-8-10	26	
				SPT-22	31.5 - 33.0	0.8	6-9-10	29	
				SPT-23	33.0 - 34.5	1.1	7-6-6	27	
				SPT-24	34.5 - 36.0	1.4	3-3-5	28	
				SPT-25	36.0 - 37.5	1.4	3-3-5	27	
				SPT-26	37.5 - 39.0	1.5	3-3-3	28	
				SPT-27	39.0 - 40.5	1.2	3-3-3	25	
				SPT-28	40.5 - 42.0	1.4	woh-3-4	24	
766.7'	43.1'			SPT-29	42.0 - 43.5	1.5	woh-woh-3	26	
766.2'	43.6'	SOIL 10: SAND, light gray, wet,							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591060.68, E 2545599.52 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-52** Total Depth 45.0 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
764.9'	44.9'			SPT-30	43.5 - 45.0	1.4	7-8-12	20	
764.8'	45.0'	medium dense, medium to coarse grained SOIL 11: GRAVEL, brown, wet, medium dense, medium to coarse grained, rounded, some coarse sand *(Continued)*							
		Shale (augered) Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591057.48, E 2545580.54 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-53** Total Depth 39.0 ft
Location	Clinton, Tennessee	Surface Elevation	801.3 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/6/09 Completed 7/6/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	9.0 ft Date/Time 7/6/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
801.3'	0.0'	Top of Hole							
800.8'	0.5'	FILL - TOPSOIL		SPT-1	0.0 - 1.5	1.1	4-6-6	15	Boring advanced using 3 1/4" Hollow Stem Augers
		SOIL 4: FILL - LEAN CLAY, light brown, moist, medium stiff to stiff, some fine gravel, with some silt		SPT-2	1.5 - 3.0	1.0	5-10-12	16	
				SPT-3	3.0 - 4.5	1.3	11-8-11	21	
				SPT-4	4.5 - 6.0	1.1	7-7-9	20	
				SPT-5	6.0 - 7.5	1.1	7-9-12	21	
792.3'	9.0'			SPT-6	7.5 - 9.0	1.1	10-10-9	28	
		SOIL 12: SILT, dark gray, saturated, stiff, some clay		SPT-7	9.0 - 10.5	1.1	4-4-4	22	
789.3'	12.0'			SPT-8	10.5 - 12.0	1.0	1-2-3	23	
		SOIL 6: LEAN CLAY, brown, moist to saturated, medium stiff, some silt		SPT-9	12.0 - 13.5	1.0	5-4-4	22	
786.3'	15.0'			SPT-10	13.5 - 15.0	1.0	2-3-4	24	Saturated at 13.5 ft
		SOIL 7: SANDY LEAN CLAY, brown, moist, soft to medium stiff, little silt		SPT-11	15.0 - 16.5	1.0	4-4-5	24	
				SPT-12	16.5 - 18.0	1.0	7-7-9	23	
				SPT-13	18.0 - 19.5	0.8	6-5-6	24	
				SPT-14	19.5 - 21.0	1.2	WOH-2-3	25	
				SPT-15	21.0 - 22.5	1.0	3-5-6	26	
				SPT-16	22.5 - 24.0	0.9	3-4-4	29	
				SPT-17	24.0 - 25.5	1.1	3-3-5	27	
				SPT-18	25.5 - 27.0	1.3	1-1-2	28	
				SPT-19	27.0 - 28.5	1.3	2-2-3	25	
				SPT-20	28.5 - 30.0	1.2	1-2-2	24	
				SPT-21	30.0 - 31.5	1.1	1-2-2	26	
				SPT-22	31.5 - 33.0	1.2	WOH-WOH-2	25	
				SPT-23	33.0 - 34.5	0.9	WOH-1-1	26	
766.3'	35.0'								
		SOIL 10: SAND with Gravel, brown, saturated, medium dense to dense, fine to coarse grained, some fine to coarse gravel		SPT-24	34.5 - 36.0	0.7	WOH-1-3	25	
				SPT-25	36.0 - 37.5	0.7	3-5-7	21	
762.8'	38.5'			SPT-26	37.5 - 39.0	1.0	3-47-50	16	
762.3'	39.0'	Shale (Augered)							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 590638.72, E 2545959.39 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-54** Total Depth 44.5 ft
Location	Clinton, Tennessee	Surface Elevation	810.1 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/7/09 Completed 7/7/09
Supervisor	Patrick White Driller Sam Wilks	Depth to Water	4.0 ft Date/Time 6/7/09
Logged By	Greg Budd	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
810.1'	0.0'	Top of Hole							
809.6'	0.5'	FILL: - TOPSOIL		SPT-1	0.0 - 1.5	1.0	2-3-5	7	Boring advanced using 3-1/4 inch hollow stem augers.
		SOIL 1: FILL - BOTTOM ASH, gray and black, wet, medium dense		SPT-2	1.5 - 3.0	1.0	4-7-8	17	
				SPT-3	3.0 - 4.5	1.0	5-4-2	36	
				SPT-4	4.5 - 6.0	1.0	4-6-6	35	
				SPT-5	6.0 - 7.5	1.5	9-10-9	22	
				SPT-6	7.5 - 9.0	1.5	8-8-11	19	
				SPT-7	9.0 - 10.5	1.2	4-8-11	30	
				SPT-8	10.5 - 12.0	1.1	5-6-6	33	
				SPT-9	12.0 - 13.5	1.5	5-6-6	33	
795.1'	15.0'			SPT-10	13.5 - 15.0	1.5	2-3-3	39	
		SOIL 3: SLUICED FLY ASH, gray and black, wet, medium dense to very loose, with varying percentages of bottom ash		SPT-11	15.0 - 16.5	0.9	2-2-2	45	
				SPT-12	16.5 - 18.0	0.8	2-2-3	42	
				SPT-13	18.0 - 19.5	1.5	1-1-2	35	
				SPT-14	19.5 - 21.0	15.0	1-1-2	51	
				SPT-15	21.0 - 22.5	1.2	1-1-2	49	
				SPT-16	22.5 - 24.0	1.5	2-2-2	43	
				SPT-17	24.0 - 25.5	1.5	1-1-2	69	
783.6'	26.5'			SPT-18	25.5 - 27.0	1.5	7-9-14	41	
		SOIL 7: SANDY LEAN CLAY, brown to gray brown, moist to wet, medium stiff		SPT-19	27.0 - 28.5	1.0	6-7-9	28	
				SPT-20	28.5 - 30.0	1.0	5-7-8	27	
				SPT-21	30.0 - 31.5	1.1	4-5-5	26	
				SPT-22	31.5 - 33.0	0.6	5-7-8	25	
				SPT-23	33.0 - 34.5	0.9	4-5-6	24	
				SPT-24	34.5 - 36.0	1.2	6-6-8	25	
				SPT-25	36.0 - 37.5	1.0	6-9-10	24	
				SPT-26	37.5 - 39.0	1.5	6-8-8	24	
				SPT-27	39.0 - 40.5	1.5	3-5-5	26	
				SPT-28	40.5 - 42.0	1.5	4-4-5	25	
766.6'	43.5'			SPT-29	42.0 - 43.5	1.0	3-4-5	27	
766.0'	44.1'								

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 590638.72, E 2545959.39 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-54** Total Depth 44.5 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
765.6'	44.5'	SOIL 10: SAND, gray, wet, medium dense, coarse grained		SPT-30	43.5 - 44.8	1.5	10-30-50/0.3	20	
		Auger Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 590589.87, E 2545693.73 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-55** Total Depth 46.4 ft
Location	Clinton, Tennessee	Surface Elevation	810.1 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/16/09 Completed 6/16/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	14.7 ft Date/Time 6/16/09
Logged By	Patrick White	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
810.1'	0.0'	Top of Hole							
809.5'	0.6'	FILL - CRUSHED STONE		SPT-1	0.0 - 1.5	1.0	5-7-6	18	Boring advanced using 4 1/4" hollow stem augers.
		SOIL 5: FILL - SANDY LEAN CLAY, red brown, moist, stiff, some fine to medium gravel, trace silt		SPT-2	1.5 - 3.0	1.1	5-6-7	25	
				SPT-3	3.0 - 4.5	1.2	7-10-8	23	
				SPT-4	4.5 - 6.0	1.3	5-4-3	27	
				SPT-5	6.0 - 7.5	1.0	5-8-11	24	Slotted screen piezometer installed, tip depth 40.4 ft. See peizometer installation log for details.
				SPT-6	7.5 - 9.0	1.2	9-8-8	25	
				SPT-7	9.0 - 10.5	1.4	4-4-6	24	
				SPT-8	10.5 - 12.0	1.5	6-6-11	26	SPT-7; 4 in. seam of Gray fat clay medium stiff with trace organics.
				SPT-9	12.0 - 13.5	1.3	8-7-11	27	
795.4'	14.7'			SPT-10	13.5 - 15.0	1.4	3-10-10	37	
		SOIL 1: FILL - BOTTOM ASH, gray black, wet, medium dense		SPT-11	15.0 - 16.5	1.5	8-13-9	33	
792.7'	17.4'			SPT-12	16.5 - 18.0	1.5	1-1-3	26	
		SOIL 4: FILL - LEAN CLAY, brown, moist, medium stiff, trace silt and organics		SPT-13	18.0 - 19.5	1.5	2-4-6	25	
790.6'	19.5'			SPT-14	19.5 - 21.0	0.8	1-3-4	28	Added water at 19.5 feet to control blow-back
		SOIL 6: LEAN CLAY, dark brown, moist, stiff to very stiff, trace silt, trace sand		SPT-15	21.0 - 22.5	1.1	3-5-8	27	
				SPT-16	22.5 - 24.0	1.2	8-9-12	24	
				SPT-17	24.0 - 25.5	1.4	5-7-10	27	
				SPT-18	25.5 - 27.0	1.0	9-9-10	23	
				SPT-19	27.0 - 28.5	1.4	8-7-6	23	
				SPT-20	28.5 - 30.0	1.0	3-2-1	24	
778.6'	31.5'			SPT-21	30.0 - 31.5	0.9	1-2-1	25	
		SOIL 7: SANDY LEAN CLAY, reddish brown, moist, very soft		SPT-22	31.5 - 33.0	0.9	woh	25	
				SPT-23	33.0 - 34.5	1.1	woh	25	
				SPT-24	34.5 - 36.0	1.4	wor-woh-woh	26	
				SPT-25	36.0 - 37.5	1.5	woh	26	
				SPT-26	37.5 - 39.0	1.5	woh-1-2	25	
				SPT-27	39.0 - 40.5	1.5	wor	23	
768.2'	41.9'			SPT-28	40.5 - 42.0	1.5	wor-1-1	23	
				SPT-29	42.0 - 43.5	1.0	7-8-13	13	

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 590589.87, E 2545693.73 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-55** Total Depth 46.4 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
				SPT-30	43.5 - 45.0	0.6	9-8-4	14	
763.9'	46.2'	SOIL 10: SAND with Gravel, brown, wet to saturated, very		SPT-31	45.0 - 46.4	1.1	4-5-50/0.4	14	
763.7'	46.4'	loose, medium to coarse grained sand, some chert *(Continued)*							
		Shale (augered)							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 590581.12, E 2545694.58 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-55A** Total Depth 18.0 ft
Location	Clinton, Tennessee	Surface Elevation	810.3 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/14/09 Completed 7/14/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	N/A Date/Time N/A
Logged By	Patrick White	Automatic Hammer ☐	Safety Hammer ☐ Other ☐

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
810.3'	0.0'	Top of Hole							
									Boring advanced using 4 and 1/4 inch hollow stem augers.
									No samples taken, augered only for peizometer installation.
									Slotted screen piezometer installed, tip depth 18.0 ft. See peizometer installation log for details.

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 590580.44, E 2545673.06 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-56** Total Depth 37.5 ft
Location	Clinton, Tennessee	Surface Elevation	800.2 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/8/09 Completed 6/8/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	5.0 ft Date/Time 6/8/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
800.2'	0.0'	Top of Hole							
		SOIL 4: FILL - LEAN CLAY, brown to dark gray, moist, medium stiff		SPT-1	0.0 - 1.5	1.2	WOH-3-10	24	Boring advanced using 3 1/4" Hollow Stem Augers
				SPT-2	1.5 - 3.0	1.0	6-7-11	20	
				SPT-3	3.0 - 4.5	1.1	11-13-15	22	
				SPT-4	4.5 - 6.0	1.0	7-8-11	22	
				SPT-5	6.0 - 7.5	1.3	6-7-9	25	Slotted screen peizometer installed, tip at depth 36.8 ft. See peizometer installation log for details.
791.2'	9.0'			SPT-6	7.5 - 9.0	1.3	8-9-10	25	
		SOIL 6: LEAN CLAY, dark red brown to brown, moist, medium stiff, some silt, some fine sand		SPT-7	9.0 - 10.5	1.3	4-6-8	21	
				SPT-8	10.5 - 12.0	1.1	2-2-2	23	
				SPT-9	12.0 - 13.5	1.3	2-6-7	25	
				SPT-10	13.5 - 15.0	1.0	4-6-11	24	
				SPT-11	15.0 - 16.5	1.2	8-6-7	22	
				SPT-12	16.5 - 18.0	1.1	4-6-8	26	
				SPT-13	18.0 - 19.5	1.3	8-9-11	26	
780.2'	20.0'			SPT-14	19.5 - 21.0	1.2	1-1-2	24	
		SOIL 7: SANDY LEAN CLAY, gray, moist, very soft to soft, fine to medium grained, some clay		SPT-15	21.0 - 22.5	1.4	2-1-2	21	
				SPT-16	22.5 - 24.0	1.3	1-2-2	22	
				SPT-17	24.0 - 25.5	1.3	1-1-2	23	
				SPT-18	25.5 - 27.0	1.0	WOH-1-1	26	
				SPT-19	27.0 - 28.5	1.2	1-2-2	23	
				SPT-20	28.5 - 30.0	1.3	WOH-WOH-1	22	
				SPT-21	30.0 - 31.5	1.4	WOH-WOH-1	23	SPT-24: sandstone in tip of spoon
				SPT-22	31.5 - 33.0	1.2	WOH-1-2	24	SPT-25: shale in tip of spoon
766.7'	33.5'								
		SOIL 10: SAND, brown and gray, saturated, medium dense, fine to medium grained, little clay, some gravel		SPT-23	33.0 - 34.5	1.1	WOH-3-3	2	
				SPT-24	34.5 - 36.0	1.2	3-4-11	14	
763.2'	37.0'			SPT-25	36.0 - 37.5	1.1	17-25-50	12	
762.7'	37.5'	Shale (Augered)							
		Auger Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 590578.05, E 2545666.22 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-56P** Total Depth 30.0 ft
Location	Clinton, Tennessee	Surface Elevation	799.3 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	8/6/09 Completed 8/6/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	N/A Date/Time N/A
Logged By	Ben Halada	Automatic Hammer ☐	Safety Hammer ☐ Other ☐

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
799.3'	0.0'	Top of Hole							
		Augered without sampling							Boring advanced using 3 1/4" Hollow Stem Augers Piston sampler and sucker rods were utilized to obtain recovery during Shelby Tube sampling
779.3'	20.0'								
		SOIL 7: SANDY LEAN CLAY, brown, moist, medium stiff, some fine sand		ST-1	20.0 - 22.0	2.0		23	
				ST-2	22.0 - 24.0	2.0		24	
				ST-3	24.0 - 26.0	2.0		25	
771.3'	28.0'			ST-4	26.0 - 28.0	2.0		26	
769.3'	30.0'	SOIL 14: SANDY SILT, brown, moist, medium		ST-5	28.0 - 30.0	2.0		27	
		No Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 590091.97, E 2545756.90 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-58** Total Depth 47.3 ft
Location	Clinton, Tennessee	Surface Elevation	810.3 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/18/09 Completed 6/18/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	16.0 ft Date/Time 6/18/09
Logged By	Patrick White	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
810.3'	0.0'	Top of Hole							
809.3'	1.0'	FILL - CRUSHED STONE		SPT-1	0.0 - 1.5	1.2	7-5-6	21	Boring advanced using 4 1/4" hollow stem augers.
		SOIL 4: FILL - LEAN CLAY, red brown, moist, stiff, trace silt, some fine to medium gravel		SPT-2	1.5 - 3.0	1.1	6-5-7	22	
				SPT-3	3.0 - 4.5	1.0	7-8-10	25	
				SPT-4	4.5 - 6.0	1.4	5-5-7	23	
				SPT-5	6.0 - 7.5	1.1	8-10-11	26	
				SPT-6	7.5 - 9.0	1.4	8-9-10	25	
				SPT-7	9.0 - 10.5	1.2	3-5-7	24	
				SPT-8	10.5 - 12.0	1.3	3-7-4	27	
796.8'	13.5'			SPT-9	12.0 - 13.5	1.4	7-9-9	26	
		SOIL 1: FILL - BOTTOM ASH, gray black, moist to wet, medium dense		SPT-10	13.5 - 15.0	1.2	12-11-13	34	
				SPT-11	15.0 - 16.5	1.0	7-7-7	38	
792.7'	17.6'			SPT-12	16.5 - 18.0	1.5	1-1-1	36	
		SOIL 4: FILL - LEAN CLAY, dark gray brown to brown, moist, stiff to soft, trace silt, little sand		SPT-13	18.0 - 19.5	0.3	1-wor-1	36	Saturated zone in SPT-13 from 18.5-19.5 ft. Added water at 19.5 ft to control blow-back
				SPT-14	19.5 - 21.0	0.8	3-2-2	32	
				SPT-15	21.0 - 22.5	0.9	2-3-5	32	
				SPT-16	22.5 - 24.0	1.0	4-8-10	27	
785.3'	25.0'			SPT-17	24.0 - 25.5	1.4	10-10-12	25	
		SOIL 6: LEAN CLAY, light brown to brown, moist, medium stiff to soft, some silt		SPT-18	25.5 - 27.0	0.7	3-6-6	23	
781.8'	28.5'			SPT-19	27.0 - 28.5	0.8	7-5-5	22	
		SOIL 9: CLAYEY SAND, brown, wet to saturated, loose to very loose, fine to medium grained, some clay		SPT-20	28.5 - 30.0	1.5	2-4-3	23	Transitions from sandy clay to clayey sand from SPT-20 to SPT-22
				SPT-21	30.0 - 31.5	1.2	3-4-3	24	
				SPT-22	31.5 - 33.0	1.4	woh-woh-1	22	
				SPT-23	33.0 - 34.5	0.9	wor-2-3	23	
				SPT-24	34.5 - 36.0	1.5	1-1-1	25	
				SPT-25	36.0 - 37.5	1.5	wor-wor-2	23	
				SPT-26	37.5 - 39.0	1.5	wor-wor-1	23	
				SPT-27	39.0 - 40.5	1.2	woh-woh-1	24	
				SPT-28	40.5 - 42.0	1.5	woh	24	
				SPT-29	42.0 - 43.5	1.5	wor-wor-2	25	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 590091.97, E 2545756.90 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-58** Total Depth 47.3 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
765.9'	44.4'			SPT-30	43.5 - 45.0	1.1	wor-1-2	13	
765.2'	45.1'	SOIL 10: SAND, gray, wet, loose, fine to medium grained, some clay, some organics		SPT-31	45.0 - 46.5	1.2	6-10-9	36	
763.7'	46.6'			SPT-32	46.5 - 47.3	0.7	29-50/0.3	21	
763.0'	47.3'	SOIL 11: GRAVEL, red brown and white, wet, medium dense, fine to coarse grained, some coarse sand							
		Shale (augered)							
		Auger Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 590089.21, E 2545731.11 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-59** Total Depth 38.0 ft
Location	Clinton, Tennessee	Surface Elevation	800.0 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/9/09 Completed 6/9/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	12.0 ft Date/Time 6/9/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
800.0'	0.0'	Top of Hole							
		SOIL 4: FILL - LEAN CLAY, brown, moist, medium stiff to stiff, some organics and silt below 11.5 feet		SPT-1	0.0 - 1.5	1.0	1-4-7	22	Boring advanced using 3 1/4" Hollow Stem Augers
				SPT-2	1.5 - 3.0	0.8	8-11-13	21	
				SPT-3	3.0 - 4.5	1.0	14-13-14	20	
				ST-1	4.5 - 6.5	1.8		22	
				SPT-4	6.5 - 8.0	1.3	2-5-8	26	
				SPT-5	8.0 - 9.5	1.0	4-6-6	21	
				SPT-6	9.5 - 11.0	1.2	1-4-6	24	
				SPT-7	11.0 - 12.5	1.2	3-6-8	27	
785.5'	14.5'			ST-2	12.5 - 14.5	1.5		27	
		SOIL 6: LEAN CLAY, light brown to brown, moist, medium stiff to soft, some silt		SPT-8	14.5 - 16.0	1.2	4-5-8	30	
				SPT-9	16.0 - 17.5	1.1	5-6-9	24	
781.0'	19.0'			SPT-10	17.5 - 19.0	1.2	5-7-8	27	
		SOIL 8: FAT CLAY, brown, saturated, very soft		ST-3	19.0 - 21.0	2.0		31	Water added at 19.0 ft to control blow-back;
				SPT-11	21.0 - 22.5	1.2	WOH-WOH-1	23	
				SPT-12	22.5 - 24.0	0.9	WOH-1-2	25	
774.5'	25.5'			SPT-13	24.0 - 25.5	1.1	WOH-1-1	22	
		SOIL 9: CLAYEY SAND, brown, saturated, very loose to loose, fine to medium grained, some clay		SPT-14	25.5 - 27.0	0.8	WOH-1-2	21	
				SPT-15	27.0 - 28.5	1.3	1-2-2	22	
				SPT-16	28.5 - 30.0	1.2	WOH-WOH-1	21	
				SPT-17	30.0 - 31.5	1.3	WOH-1-2	21	
				SPT-18	31.5 - 33.0	1.4	1-2-3	23	ST-4: gravelly sand in bottom of tube
765.0'	35.0'			ST-4	33.0 - 35.0	2.0		--	
		SOIL 10: SAND, light brown to brown, saturated, medium dense, fine to medium grained, some fine to coarse gravel		SPT-19	35.0 - 36.5	0.6	3-4-4	14	
762.8'	37.2'			SPT-20	36.5 - 38.0	1.2	19-21-33	12	
762.0'	38.0'	Shale (Augered)							
		Auger Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 589601.84, E 2545827.99 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-60** Total Depth 48.0 ft
Location	Clinton, Tennessee	Surface Elevation	810.2 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/5/09 Completed 6/8/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	34.0 ft Date/Time 6/8/09
Logged By	Patrick White	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
810.2'	0.0'	Top of Hole							
		SOIL 13: FILL - LEAN CLAY with Sand, light brown, moist, stiff, some silt, some fine to medium gravel		SPT-1	0.0 - 1.5	1.1	2-4-5	24	Boring advanced using 4 1/4" hollow stem augers.
				SPT-2	1.5 - 3.0	1.1	5-10-10	26	
				SPT-3	3.0 - 4.5	1.2	9-10-11	24	
				SPT-4	4.5 - 6.0	1.2	4-4-7	25	
				SPT-5	6.0 - 7.5	1.4	7-7-8	24	
				SPT-6	7.5 - 9.0	1.1	7-8-7	27	
				SPT-7	9.0 - 10.5	0.6	2-2-3	25	
799.0'	11.2'			SPT-8	10.5 - 12.0	1.4	6-8-11	24	
		SOIL 4: FILL - LEAN CLAY, dark brown light brown, moist, stiff, some silt, some organics		SPT-9	12.0 - 13.5	1.1	10-11-13	26	
				SPT-10	13.5 - 15.0	1.2	7-6-8	24	
				SPT-11	15.0 - 16.5	1.0	6-8-6	27	
				SPT-12	16.5 - 18.0	1.3	8-8-10	23	
				SPT-13	18.0 - 19.5	1.3	8-8-7	25	
				SPT-14	19.5 - 21.0	1.4	2-3-5	22	
788.2'	22.0'			SPT-15	21.0 - 22.5	1.2	6-6-7	32	
		SOIL 8: FILL - FAT CLAY, light gray brown, wet, soft to very stiff, some silt		SPT-16	22.5 - 24.0	1.2	6-5-7	26	
				SPT-17	24.0 - 25.5	1.3	2-3-5	29	
				SPT-18	25.5 - 27.0	1.2	10-9-14	24	
782.2'	28.0'			SPT-19	27.0 - 28.5	1.3	10-9-10	24	
		SOIL 9: CLAYEY SAND, light brown, moist to wet, medium dense		SPT-20	28.5 - 30.0	0.0	10-11-10	--	
				SPT-21	30.0 - 31.5	1.2	3-3-7	25	
777.1'	33.1'			SPT-22	31.5 - 33.0	1.0	4-6-8	22	
		SOIL 14: SILTY SAND, brown, wet, loose to medium dense, fine to medium grained, some silt		SPT-23	33.0 - 34.5	1.3	4-6-7	21	
				SPT-24	34.5 - 36.0	1.3	2-3-3	18	Added water at 35 feet to keep sand out of augers.
				SPT-25	36.0 - 37.5	1.2	3-3-4	21	
				SPT-26	37.5 - 39.0	1.4	1-1-1	19	
				SPT-27	39.0 - 40.5	1.4	wor-1-4	21	
				SPT-28	40.5 - 42.0	1.5	2-3-5	23	
				SPT-29	42.0 - 43.5	1.1	1-2-3	24	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 589601.84, E 2545827.99 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-60** Total Depth 48.0 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
765.4'	44.8'			SPT-30	43.5 - 45.0	0.9	1-2-11	20	SPT-32; 1 ft of gray weak shale in sample
763.7'	46.5'	SOIL 11: GRAVEL, brown, wet, medium dense, medium to coarse grained, some medium to coarse sand		SPT-31	45.0 - 46.5	0.3	3-9-5	16	
762.2'	48.0'			SPT-32	46.5 - 48.0	1.0	38-32-18	13	
		Shale (augered)							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 590000.07, E 2546208.94 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-62** Total Depth 46.7 ft
Location	Clinton, Tennessee	Surface Elevation	809.4 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/8/09 Completed 6/9/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	15.5 ft Date/Time 6/8/09
Logged By	Patrick White	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
809.4'	0.0'	Top of Hole							
808.2'	1.2'	FILL - TOPSOIL, Topsoil and gravel		SPT-1	0.0 - 1.5	0.7	3-4-5	14	Boring advanced using 4 1/4" hollow stem augers.
				SPT-2	1.5 - 3.0	0.0	4-5-7	--	
		SOIL 4: FILL - LEAN CLAY, light brown, moist, very stiff, some fine to medium gravel, some silt		SPT-3	3.0 - 4.5	1.2	7-10-12	28	
				ST-1	4.5 - 6.5	2.0		25	Slotted screen piezometer installed, tip depth 40.6 ft. See peizometer installation log for details.
				SPT-4	6.5 - 8.0	1.2	3-6-8	24	
				SPT-5	8.0 - 9.5	1.3	11-10-12	24	
				ST-2	9.5 - 11.5	2.0		23	
				SPT-6	11.5 - 13.0	1.1	3-4-4	25	
795.4'	14.0'			SPT-7a	13.0 - 14.0	1.4	8-11-13	29	
				SPT-7b	14.0 - 14.5			27	
793.7'	15.7'	SOIL 1: FILL - BOTTOM ASH, black, wet, medium dense		SPT-8	14.5 - 16.0	1.3	10-12-18	34	
793.3'	16.1'	SOIL 11: FILL - GRAVEL, gray black, wet, medium dense, coarse grained, angular, some bottom ash		SPT-9	16.0 - 17.5	0.3	5-3-6	36	Added water at 16 ft to keep sand out of auger
790.8'	18.6'			SPT-10	17.5 - 19.0	1.3	1-2-3	45	
				SPT-11	19.0 - 20.5	0.3	3-4-3	24	
		SOIL 1: FILL - BOTTOM ASH, black, wet, medium dense		SPT-12	20.5 - 22.0	0.3	2-3-3	29	
786.9'	22.5'	SOIL 11: FILL - GRAVEL, black gray, saturated, loose, coarse grained, angular, some bottom ash		SPT-13	22.0 - 23.5	0.3	4-5-5	30	
				ST-3	23.5 - 25.5	2.0		18	
				SPT-14	25.5 - 27.0	0.2	9-7-9	27	
		SOIL 8: FAT CLAY, brown, moist, very stiff to medium stiff		SPT-15	27.0 - 28.5	1.1	12-14-17	25	
				SPT-16	28.5 - 30.0	0.6	4-6-8	25	
777.9'	31.5'			SPT-17	30.0 - 31.5	1.0	2-3-3	22	
		SOIL 7: SANDY LEAN CLAY, brown, wet, medium stiff, some fine sand		SPT-18	31.5 - 33.0	1.3	3-5-4	25	
				SPT-19	33.0 - 34.5	1.2	wor-2-3	24	
				SPT-20	34.5 - 36.0	1.4	1-4-5	23	
				SPT-21	36.0 - 37.5	1.3	4-6-9	23	
				SPT-22	37.5 - 39.0	1.5	7-8-8	24	
				ST-4	39.0 - 41.0	2.0		23	
767.9'	41.5'								
		SOIL 9: SILTY, CLAYEY SAND, brown, wet, medium dense to		SPT-23	41.0 - 42.5	1.5	woh-1-2	22	
765.5'	43.9'			SPT-24	42.5 - 44.0	1.1	1-2-3	10	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 590000.07, E 2546208.94 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-62** Total Depth 46.7 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
		loose, medium to coarse grained,		SPT-25	44.0 - 45.5	0.7	7-9-21	18	
763.3'	46.1'	some silt		SPT-26	45.5 - 46.7	1.1	27-43-50/0.2	--	
762.7'	46.7'	SOIL 11: GRAVEL, red brown and gray red, wet, medium dense to dense, medium to coarse grained, rounded, with coarse sand *(Continued)*							
		Shale (augered)							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 590004.50, E 2546211.20 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-62A** Total Depth 22.0 ft
Location	Clinton, Tennessee	Surface Elevation	809.6 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/14/09 Completed 7/14/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	N/A Date/Time N/A
Logged By	Patrick White	Automatic Hammer ☐	Safety Hammer ☐ Other ☐

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
809.6'	0.0'	Top of Hole							
									Boring advanced using 4 and 1/4 inch hollow stem augers.
									No samples taken, augered only for peizometer installation.
									Slotted screen piezometer installed, tip depth 22.0 ft. See peizometer installation log for details.

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 589989.70, E 2546223.76 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-63** Total Depth 41.5 ft
Location	Clinton, Tennessee	Surface Elevation	801.2 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/10/09 Completed 6/10/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	24.0 ft Date/Time 6/10/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
801.2'	0.0'	Top of Hole							
799.7'	1.5'	SOIL 4: FILL - LEAN CLAY, light brown, moist, soft, some gravel		SPT-1	0.0 - 1.5	1.2	WOH-1-3	24	Boring advanced using 3 1/4" Hollow Stem Augers
799.2'	2.0'	SOIL 11: FILL - GRAVEL, gray, moist, dense		SPT-2	1.5 - 3.0	1.2	4-5-8	21	
				SPT-3	3.0 - 4.5	1.4	10-12-12	22	
		SOIL 13: FILL - LEAN CLAY with Sand, dark brown to dark gray, moist, medium stiff to stiff, some silt, some organics		SPT-4	4.5 - 6.0	0.9	3-4-5	23	Slotted screen piezometer installed. Tip depth at 40.0 ft. See piezometer installation log for details.
				SPT-5	6.0 - 7.5	1.1	5-5-8	26	
				SPT-6	7.5 - 9.0	1.3	7-8-10	21	
				SPT-7	9.0 - 10.5	1.0	1-3-5	22	
				SPT-8	10.5 - 12.0	1.2	1-3-6	24	
				SPT-9	12.0 - 13.5	1.0	7-8-9	25	
				SPT-10	13.5 - 15.0	1.1	2-3-4	25	
784.7'	16.5'			SPT-11	15.0 - 16.5	1.3	2-4-7	22	
		SOIL 8: FAT CLAY, brown to gray, moist, soft to medium stiff, some fine sand		SPT-12	16.5 - 18.0	1.4	7-9-11	27	
				SPT-13	18.0 - 19.5	1.0	11-13-15	25	
				SPT-14	19.5 - 21.0	1.2	2-5-6	24	
				SPT-15	21.0 - 22.5	1.4	10-10-12	24	
777.2'	24.0'			SPT-16	22.5 - 24.0	1.3	10-11-12	23	
		SOIL 7: SANDY LEAN CLAY, brown to gray, moist, soft to medium stiff		SPT-17	24.0 - 25.5	1.3	WOH-2-2	26	
				SPT-18	25.5 - 27.0	1.3	1-3-3	24	
				SPT-19	27.0 - 28.5	1.1	2-4-5	25	
				SPT-20	28.5 - 30.0	1.1	4-5-6	23	
				SPT-21	30.0 - 31.5	1.3	2-4-6	23	
				SPT-22	31.5 - 33.0	1.2	5-6-7	23	
767.2'	34.0'			SPT-23	33.0 - 34.5	1.0	5-6-6	24	
		SOIL 9: SILTY, CLAYEY SAND with Gravel, gray, saturated, medium dense to dense, fine to medium grained, some fine to medium gravel, some silty clay		SPT-24	34.5 - 36.0	1.0	1-1-5	27	
				SPT-25	36.0 - 37.5	1.0	8-12-11	15	
762.3'	38.9'			SPT-26	37.5 - 39.0	1.1	7-11-14	17	
		Shale (Augered)							
759.7'	41.5'								
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 590472.00, E 2546579.19 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-65** Total Depth 42.9 ft
Location	Clinton, Tennessee	Surface Elevation	809.1 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/9/09 Completed 6/10/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	14.9 ft Date/Time 6/10/09
Logged By	Patrick White	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
809.1'	0.0'	Top of Hole							
808.2'	0.9'	FILL - TOPSOIL		SPT-1	0.0 - 1.5	1.0	4-3-3	20	Boring advanced using 4 1/4" hollow stem augers.
		SOIL 5: FILL - SANDY LEAN CLAY, red brown, moist, medium stiff, some silt and fine and medium gravel		SPT-2	1.5 - 3.0	1.0	4-4-6	23	
				SPT-3	3.0 - 4.5	1.1	5-5-4	24	
				SPT-4	4.5 - 6.0	1.2	9-4-6	22	
				SPT-5	6.0 - 7.5	1.1	5-5-5	26	Slotted screen piezometer installed, tip depth 38 ft. See peizometer installation log for details.
				SPT-6	7.5 - 9.0	0.0	1-2-3	--	
				SPT-7	9.0 - 10.5	1.0	4-5-7	22	
798.0'	11.1'			SPT-8	10.5 - 12.0	1.2	9-11-11	22	SPT-9 Rock in spoon tip.
		SOIL 1: FILL - BOTTOM ASH, gray black, moist, medium dense		SPT-9	12.0 - 13.5	1.1	11-14-15	29	
				SPT-10	13.5 - 15.0	1.4	4-7-8	35	Saturated zone in SPT-10 from 14-14.5 ft.
				SPT-11	15.0 - 16.5	0.7	2-4-6	34	
				SPT-12	16.5 - 18.0	0.6	5-3-2	48	Added water at 15 feet to keep sand out of augers.
789.9'	19.2'			SPT-13	18.0 - 19.5	1.3	3-4-3	40	
788.1'	21.0'	SOIL 8: FILL - FAT CLAY, gray to brown, wet, medium stiff, trace silt, trace organics		SPT-14	19.5 - 21.0	0.2	3-3-5	23	
				SPT-15	21.0 - 22.5	1.5	7-7-8	31	
785.1'	24.0'	SOIL 1: FILL - BOTTOM ASH, gray, wet, dense		SPT-16	22.5 - 24.0	1.5	6-7-4	24	
		SOIL 4: FILL - LEAN CLAY, gray to brown gray, moist to wet, stiff to medium stiff, trace silt, trace organics		SPT-17	24.0 - 25.5	1.4	4-5-8	21	
				SPT-18	25.5 - 27.0	1.1	9-12-15	23	
				SPT-19	27.0 - 28.5	1.1	12-11-13	25	
				SPT-20	28.5 - 30.0	1.2	2-4-5	26	
				SPT-21	30.0 - 31.5	1.0	2-4-5	26	
				SPT-22	31.5 - 33.0	1.3	3-4-5	27	
				SPT-23	33.0 - 34.5	1.4	5-6-6	29	
				SPT-24	34.5 - 36.0	1.2	2-3-6	26	
772.0'	37.1'			SPT-25	36.0 - 37.5	1.1	5-5-6	25	
		SOIL 7: SANDY LEAN CLAY, brown, moist, medium to stiff, with some gravel		SPT-26	37.5 - 39.0	1.3	5-4-3	33	
				SPT-27	39.0 - 40.5	1.5	1-3-3	27	Fine gravel present from 39.8-41.5 ft.
767.6'	41.5'			SPT-28	40.5 - 42.0	1.4	4-8-10	42	
766.9'	42.2'								
766.2'	42.9'	SOIL 11: GRAVEL, brown gray, wet, medium dense, medium to		SPT-29	42.0 - 43.0	0.6	21-50/0.4	14	

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 590472.00, E 2546579.19 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-65** Total Depth 42.9 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
		coarse grained, rounded, some coarse sand							
		Shale (augered)							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 590474.38, E 2546581.37 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-65A** Total Depth 19.0 ft
Location	Clinton, Tennessee	Surface Elevation	809.1 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/14/09 Completed 7/14/09
Supervisor	Patrick White Driller Steve Bradford	Depth to Water	N/A Date/Time N/A
Logged By	Patrick White	Automatic Hammer ☐	Safety Hammer ☐ Other ☐

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
809.1'	0.0'	Top of Hole							
									Boring advanced using 4 and 1/4 inch hollow stem augers.
									No samples taken, augered only for peizometer installation.
									Slotted screen piezometer installed, tip depth 19.0 ft. See peizometer installation log for details.

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 590462.23, E 2546593.73 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-66** Total Depth 35.0 ft
Location	Clinton, Tennessee	Surface Elevation	799.8 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/9/09 Completed 6/9/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	33.0 ft Date/Time 6/9/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
799.8'	0.0'	Top of Hole							
		SOIL 4: FILL - LEAN CLAY, brown to dark gray, moist, medium stiff, some organics and silt between 5 and 7 feet		SPT-1	0.0 - 1.5	1.0	WOH-1-2	25	Boring advanced using 3 1/4" Hollow Stem Augers
				SPT-2	1.5 - 3.0	1.0	3-6-8	23	
				SPT-3	3.0 - 4.5	1.2	4-7-10	25	
				SPT-4	4.5 - 6.0	1.0	3-2-5	24	
				SPT-5	6.0 - 7.5	1.3	3-6-8	24	Slotted screen piezometer installed. Tip depth at 34.0 ft. See piezometer installation log for details.
				SPT-6	7.5 - 9.0	1.2	11-10-11	23	
				SPT-7	9.0 - 10.5	1.1	2-8-10	25	
				SPT-8	10.5 - 12.0	1.3	2-6-9	22	Water was first encountered at 33.0 ft during drilling.
				SPT-9	12.0 - 13.5	1.0	9-12-15	23	Water had risen to 7.0 ft once piezometer had been installed.
				SPT-10	13.5 - 15.0	1.2	2-4-6	26	
783.8'	16.0'			SPT-11	15.0 - 16.5	1.1	2-5-5	20	
		SOIL 5: FILL - SANDY LEAN CLAY, dark gray, moist, medium stiff		SPT-12	16.5 - 18.0	1.2	7-7-11	26	
				SPT-13	18.0 - 19.5	1.0	9-11-13	25	
				SPT-14	19.5 - 21.0	1.1	1-3-6	24	
				SPT-15	21.0 - 22.5	1.3	6-7-11	24	
				SPT-16	22.5 - 24.0	1.2	8-11-9	25	
				SPT-17	24.0 - 25.5	1.4	1-3-6	23	
				SPT-18	25.5 - 27.0	1.2	2-4-7	23	
772.5'	27.3'			SPT-19	27.0 - 28.5	1.1	7-8-10	24	
		SOIL 7: SANDY LEAN CLAY, dark gray, moist to wet, very soft to soft		SPT-20	28.5 - 30.0	1.4	1-1-4	28	
				SPT-21	30.0 - 31.5	1.5	WOH-WOH-2	28	
				SPT-22	31.5 - 33.0	1.2	2-3-3	48	
765.8'	34.0'			SPT-23	33.0 - 34.3	1.1	9-25-50/0.3	14	
764.8'	35.0'	Shale (Augered)							
		Auger Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 590946.92, E 2546949.33 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-67** Total Depth 30.5 ft
Location	Clinton, Tennessee	Surface Elevation	809.5 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/1/09 Completed 7/2/09
Supervisor	Patrick White Driller Kent Clements	Depth to Water	4.4 ft Date/Time 7/2/09
Logged By	Patrick White	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
809.5'	0.0'	Top of Hole							
808.7'	0.8'	FILL - CRUSHED STONE		SPT-1	0.0 - 1.5	0.7	2-5-6	16	Boring advanced using 3 and 1/4 inch hollow stem augers.
		SOIL 4: FILL - LEAN CLAY, red brown, moist, medium stiff, some fine to medium gravel		SPT-2	1.5 - 3.0	1.0	3-5-5	18	
				SPT-3	3.0 - 4.5	1.2	6-7-8	36	
				ST-1	4.5 - 6.5	2.0		23	Slotted screen piezometer installed, tip depth 11.0 ft. See peizometer installation log for details.
				SPT-4	6.5 - 8.0	0.8	3-5-5	24	
				SPT-5	8.0 - 9.5	1.0	4-5-6	22	
				ST-2	9.5 - 11.5	2.0		25	
				SPT-6	11.5 - 13.0	1.1	2-3-3	29	
796.0'	13.5'								
794.9'	14.6'	SOIL 1: FILL - BOTTOM ASH, gray and black, wet, medium dense		SPT-7	13.0 - 14.5	1.0	7-6-6	30	Water table reached at 13.5 feet, then water level rose to 4.5 feet within augers.
793.2'	16.3'			SPT-8	14.5 - 16.0	0.3	4-3-4	8	
		SOIL 11: FILL - GRAVEL, dark gray, wet, medium dense to loose, medium to coarse grained, angular		SPT-9	16.0 - 17.5	0.7	2-2-2	28	
				SPT-10	17.5 - 19.0	1.0	4-6-6	26	
				ST-3	19.0 - 21.0	2.0		26	
		SOIL 4: FILL - LEAN CLAY, brown, moist, medium stiff, trace sand, trace organics.		SPT-11	21.0 - 22.5	0.9	4-4-7	24	
				SPT-12	22.5 - 24.0	1.0	8-9-10	23	
				ST-4	24.0 - 26.0	2.0		24	
				SPT-13	26.0 - 27.5	1.1	3-7-9	27	
				SPT-14	27.5 - 29.0	1.0	9-11-13	27	
				SPT-15	29.0 - 30.5	1.2	4-5-7	26	
779.0'	30.5'								
		No Refusal / Bottom of Hole							Hole terminated due to high water level

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 590938.03, E 2546963.83 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-68** Total Depth 36.5 ft
Location	Clinton, Tennessee	Surface Elevation	800.8 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/9/09 Completed 6/9/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	N/A Date/Time 6/9/09N/A
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
800.8'	0.0'	Top of Hole							
		SOIL 4: FILL - LEAN CLAY, dark gray to brown, moist, stiff to soft, some organics and trace silt		SPT-1	0.0 - 1.5	1.3	WOH-1-2	25	Boring advanced using 3 1/4" Hollow Stem Augers
				SPT-2	1.5 - 3.0	1.1	2-7-9	21	
				SPT-3	3.0 - 4.5	1.0	11-12-14	23	
				SPT-4	4.5 - 6.0	1.2	3-5-9	22	
				SPT-5	6.0 - 7.5	1.0	8-11-14	23	Slotted screen piezometer installed. Tip depth at 35.0 ft. See piezometer installation log for details.
				SPT-6	7.5 - 9.0	1.4	9-11-17	23	
				ST-1	9.0 - 11.0	1.6		24	
				SPT-7	11.0 - 12.5	1.1	3-5-7	27	
				SPT-8	12.5 - 14.0	1.2	7-10-12	24	
				SPT-9	14.0 - 15.5	1.3	6-5-8	25	
				SPT-10	15.5 - 17.0	1.2	3-4-6	24	
				SPT-11	17.0 - 18.5	1.0	9-11-12	24	
				SPT-12	18.5 - 20.0	1.2	11-13-15	26	
				ST-2	20.0 - 22.0	1.8		23	
				SPT-13	22.0 - 23.5	1.1	2-5-8	27	
				SPT-14	23.5 - 25.0	1.5	3-3-5	25	
				ST-3	25.0 - 27.0	1.3		27	
				SPT-15	27.0 - 28.5	1.3	1-4-7	24	
770.9'	29.9'			SPT-16	28.5 - 30.0	1.3	1-1-4	25	
		SOIL 6: LEAN CLAY, dark gray brown, moist, medium stiff, some organics, some silt		ST-4	30.0 - 32.0	1.5		28	
				SPT-17	32.0 - 33.5	1.2	2-3-5	27	
				SPT-18	33.5 - 35.0	1.2	3-4-6	29	
764.8'	36.0'			SPT-19	35.0 - 36.2	1.0	12-25-50/0.2	16	
764.3'	36.5'	Shale (Augered)							
		Auger Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591380.61, E 2547267.77 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-70** Total Depth 49.0 ft
Location	Clinton, Tennessee	Surface Elevation	809.4 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/3/09 Completed 6/3/09
Supervisor	Ben Halada Driller Steve Bradford	Depth to Water	23.5 ft Date/Time 6/3/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
809.4'	0.0'	Top of Hole							
809.1'	0.3'	FILL - CRUSHED STONE		SPT-1	0.0 - 1.5	1.1	10-9-9	15	Boring advanced using 4 1/4" Hollow Stem Augers
		SOIL 5: FILL - SANDY LEAN CLAY, brown, moist, stiff, trace fine sand, some medium to coarse gravel		SPT-2	1.5 - 3.0	1.2	9-8-8	21	
				SPT-3	3.0 - 4.5	1.0	10-8-10	25	
				SPT-4	4.5 - 6.0	0.9	4-5-6	15	
				SPT-5	6.0 - 7.5	0.9	5-5-5	21	
				SPT-6	7.5 - 9.0	1.3	8-10-16	22	
800.1'	9.3'								
799.6'	9.8'	SOIL 1: FILL - BOTTOM ASH, black, moist, medium dense		SPT-7	9.0 - 10.5	1.4	8-10-11	18	
				SPT-8	10.5 - 12.0	1.2	8-9-11	24	
		SOIL 4: FILL - LEAN CLAY, dark gray to brown, moist, medium to very stiff, some silt and trace fine sand		SPT-9	12.0 - 13.5	1.3	8-10-11	26	
				SPT-10	13.5 - 15.0	1.1	8-11-8	26	
				SPT-11	15.0 - 16.5	1.2	1-3-3	25	
				SPT-12	16.5 - 18.0	1.3	5-8-9	22	
				SPT-13	18.0 - 19.5	1.1	8-8-8	24	
				SPT-14	19.5 - 21.0	1.4	3-4-5	20	SPT-14: organics present in sample
				SPT-15	21.0 - 22.5	1.2	5-8-8	25	SPT-15: organics and coal present in bottom 6" of sample
785.9'	23.5'			SPT-16	22.5 - 24.0	1.5	5-6-6	30	
		SOIL 3: SLUICED FLY ASH, black, saturated, soft to stiff, with varying percentages of bottom ash and some sandy clay		SPT-17	24.0 - 25.5	1.2	1-1-1	35	
782.7'	26.7'			SPT-18	25.5 - 27.0	1.2	8-21-9	25	
		SOIL 13: LEAN CLAY with Sand, brown, moist, medium stiff to stiff, some bottom ash		SPT-19	27.0 - 28.5	0.0	5-8-12	--	
				SPT-20	28.5 - 30.0	1.0	1-2-2	33	
				SPT-21	30.0 - 31.5	1.3	3-4-8	30	Water added at 30.0 ft to keep sand out of augers
				SPT-22	31.5 - 33.0	1.1	7-8-12	25	
				SPT-23	33.0 - 34.5	1.3	5-8-12	28	
				SPT-24	34.5 - 36.0	1.0	5-8-8	32	
				SPT-25	36.0 - 37.5	1.2	3-5-6	26	
				SPT-26	37.5 - 39.0	1.2	4-3-3	27	
768.9'	40.5'			SPT-27	39.0 - 40.5	1.5	1-1-2	28	
		SOIL 9: CLAYEY SAND, gray, moist, loose, fine to medium grained, some clay		SPT-28	40.5 - 42.0	1.2	WOH-WOH-1	26	
765.9'	43.5'			SPT-29	42.0 - 43.5	1.0	6-8-16	14	SPT-30: limestone in tip of spoon

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591380.61, E 2547267.77 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-70** Total Depth 49.0 ft

Lithology		Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
Elevation	Depth								
		Shale (Augered) *(Continued)*		SPT-30	43.5 - 45.0	0.0		--	
760.4'	49.0'	Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591954.22, E 2546956.25 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-71** Total Depth 54.5 ft
Location	Clinton, Tennessee	Surface Elevation	809.1 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	6/18/09 Completed 6/18/09
Supervisor	Briggs Evans Driller Kent Clements	Depth to Water	N/A Date/Time N/A
Logged By	Briggs Evans	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
809.1'	0.0'	Top of Hole							
		SOIL 3: SLUICED FLY ASH, dark gray and black, moist to saturated, very soft to soft, with varying percentages of bottom ash		SPT-1	0.0 - 1.5	1.3	2-2-3	34	Boring advanced using 3 and 1/4 inch hollow stem augers.
				SPT-2	1.5 - 3.0	1.5	2-2-3	47	
				SPT-3	3.0 - 4.5	1.2	1-2-2	53	
				SPT-4	4.5 - 6.0	0.8	1-1-1	54	
				SPT-5	6.0 - 7.5	1.5	1-1-1	50	
800.1'	9.0'			SPT-6	7.5 - 9.0	1.5	1-1-2	65	
		SOIL 4: FILL - CLAY with SAND and GRAVELS, light brown, saturated, very soft		SPT-7	9.0 - 10.5	0.8	woh-1-1	24	
				SPT-8	10.5 - 12.0	0.0	woh-1-1	--	
795.8'	13.3'			SPT-9	12.0 - 13.5	1.0	woh-1-2	24	
		SOIL 3: SLUICED FLY ASH, light gray and black, saturated, very soft, with varying percentages of bottom ash		SPT-10	13.5 - 15.0	0.5	1-1-woh	56	
				SPT-11	15.0 - 16.5	1.5	1-1-woh	49	
				SPT-12	16.5 - 18.0	1.0	woh	61	
				SPT-13	18.0 - 19.5	0.3	woh-1-1	47	
788.6'	20.5'			SPT-14	19.5 - 21.0	0.5	woh-1-1	28	
		SOIL 9: FILL - CLAYEY SAND with Gravel, light brown, wet to saturated, very soft		SPT-15	21.0 - 22.5	1.5	woh	29	
				SPT-16	22.5 - 24.0	0.8	woh-1-2	25	
				SPT-17	24.0 - 25.5	0.5	wor	23	
				SPT-18	25.5 - 27.0	0.4	woh-woh-1	24	
780.9'	28.2'			SPT-19	27.0 - 28.5	1.3	woh-2-5	16	
779.1'	30.0'	SOIL 11: FILL - CLAYEY GRAVEL, gray, wet, dense		SPT-20	28.5 - 30.0	1.3	10-11-13	17	
		SOIL 8: FILL - FAT CLAY with Gravel, dark gray, moist to wet, soft to medium stiff		SPT-21	30.0 - 31.5	0.3	1-2-11	33	
				SPT-22	31.5 - 33.0	1.0	8-3-2	27	
				SPT-23	33.0 - 34.5	0.8	2-2-3	36	
				SPT-24	34.5 - 36.0	1.0	2-2-2	41	
				SPT-25	36.0 - 37.5	1.5	2-3-3	36	
				SPT-26	37.5 - 39.0	1.0	2-3-4	22	
				SPT-27	39.0 - 40.5	1.0	2-4-6	31	
767.3'	41.8'			SPT-28	40.5 - 42.0	1.5	5-6-6	37	
				SPT-29	42.0 - 43.5	0.8	10-50-50	13	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591954.22, E 2546956.25 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-71** Total Depth 54.5 ft

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
~~764.8'~~	~~44.3'~~	SOIL 11: FILL - CLAYEY GRAVEL, very dark gray, moist to wet, very dense *(Continued)*		~~SPT-30~~ 19%	~~43.5 - 44.3~~ 2.7	~~0.5~~ 2.3	~~50/0.8~~ 85	~~10~~ 47.0	Began Core
		Shale (70%) Interbedded With Limestone (30%): Shale, gray, soft, very thin bedded, extremely weathered, fine grained, clayey, 35° to 45° inclined bedding planes, calcareous							
754.6'	54.5'			0%	7.5	5.0	67	54.5	
		Limestone, gray, hard, thin bedded, closely spaced fractures, slightly weathered, 35° to 45° inclined bedding planes, fossiliferous							
		Bottom of Hole							
		Base of Weathered Rock = 44.5'							
		Top of Rock = 44.3' Elevation (764.8')							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591549.15, E 2546217.62 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-87** Total Depth 63.7 ft
Location	Clinton, Tennessee	Surface Elevation	825.3 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	7/29/09 Completed 7/30/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	15.0 ft Date/Time 7/30/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
825.3'	0.0'	Top of Hole							
824.2'	1.1'	SOIL 4: FILL - LEAN CLAY, light brown, saturated, soft		SPT-1	0.0 - 1.5	1.3	1-3-6	27	Boring advanced using 4 1/4" Hollow Stem Augers
				SPT-2	1.5 - 3.0	1.3	11-15-15	18	
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, gray, saturated to moist, medium to dense		SPT-3	3.0 - 4.5	1.0	5-7-14	18	
				SPT-4	4.5 - 6.0	1.2	4-8-11	15	
				SPT-5	6.0 - 7.5	1.3	5-10-12	19	Slope inclinometer installed, 66.7 ft of pipe
				SPT-6	7.5 - 9.0	1.2	11-16-18	24	
				SPT-7	9.0 - 10.5	1.3	20-20-21	23	
				SPT-8	10.5 - 12.0	1.1	5-7-9	25	
				SPT-9	12.0 - 13.5	1.3	5-9-11	20	
				SPT-10	13.5 - 15.0	1.5	10-14-15	21	
				SPT-11	15.0 - 16.5	1.2	12-14-17	30	
				SPT-12	16.5 - 18.0	1.1	8-9-11	34	
805.8'	19.5'			SPT-13	18.0 - 19.5	1.2	8-6-7	35	
		SOIL 4: SLUICED FLY ASH, gray, saturated, very soft, with varying percentages of bottom ash and some organics		SPT-14	19.5 - 21.0	1.5	2-2-3	43	
				SPT-15	21.0 - 22.5	1.4	1-2-2	46	
				SPT-16	22.5 - 24.0	1.3	1-2-3	42	SPT-16: organics present in sample
				SPT-17	24.0 - 25.5	1.2	1-1-2	42	
				SPT-18	25.5 - 27.0	1.3	WOH-1-1	38	
				SPT-19	27.0 - 28.5	1.5	1-1-2	39	
				SPT-20	28.5 - 30.0	1.3	WOR-WOH-1	59	
				SPT-21	30.0 - 31.5	1.0	WOH-1-1	46	
				SPT-22	31.5 - 33.0	1.2	WOH-1-1	56	
				SPT-23	33.0 - 34.5	1.5	1-1-1	49	
				SPT-24	34.5 - 36.0	1.0	WOH-1-1	47	
				SPT-25	36.0 - 37.5	0.0	WOH	--	
				SPT-26	37.5 - 39.0	0.8	WOH	43	
				SPT-27	39.0 - 40.5	0.6	WOH	45	
				SPT-28	40.5 - 42.0	1.0	WOR	43	
782.1'	43.2'			SPT-29	42.0 - 43.5	1.3	WOR-WOH-1	33	

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591549.15, E 2546217.62 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-87** Total Depth 63.7 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
		SOIL 6: SILTY LEAN CLAY, gray to brown, moist, medium stiff, some fine sand *(Continued)*		SPT-30	43.5 - 45.0	1.0	2-3-4	31	
				SPT-31	45.0 - 46.5	1.2	3-6-10	30	
				SPT-32	46.5 - 48.0	1.0	8-11-13	28	
				SPT-33	48.0 - 49.5	1.0	4-5-6	25	
				SPT-34	49.5 - 51.0	1.3	5-7-9	24	
				SPT-35	51.0 - 52.5	1.0	5-8-11	23	
				SPT-36	52.5 - 54.0	1.0	6-8-10	22	
				SPT-37	54.0 - 55.5	1.2	6-6-6	93	
				SPT-38	55.5 - 57.0	1.3	5-4-3	26	
766.8'	58.5'			SPT-39	57.0 - 58.5	1.4	3-3-3	24	SPT-40: limestone in tip of spoon
765.9'	59.4'	SOIL 10: SAND, brown, moist, medium dense, fine grained, clay		SPT-40	58.5 - 59.5	1.0	6-50/0.5	24	
		Limestone (Augered)							
761.6'	63.7'	Auger Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591493.79, E 2546234.83 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-88** Total Depth 49.3 ft
Location	Clinton, Tennessee	Surface Elevation	808.6 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	8/4/09 Completed 8/4/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	2.0 ft Date/Time 8/4/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
808.6'	0.0'	Top of Hole							
806.6'	2.0'	SOIL 4: FILL - LEAN CLAY, brown, saturated, very soft		ST-1	0.0 - 2.0	1.0		40	Boring advanced using 4 1/4" Hollow Stem Augers
		SOIL 3: SLUICED FLY ASH, gray, saturated, very soft, with varying percentages of bottom ash		ST-2	2.0 - 4.0	0.5		--	
				ST-3	4.0 - 6.0	0.5		--	
				ST-4	6.0 - 8.0	1.4		--	Slope inclinometer installed, 49.3 ft of pipe
				ST-5	8.0 - 10.0	1.5		--	
				ST-6	10.0 - 12.0	2.0		--	
				ST-7	12.0 - 14.0	2.0		--	
				ST-8	14.0 - 16.0	2.0		--	
				ST-9	16.0 - 18.0	1.8		--	
				ST-10	18.0 - 20.0	2.0		--	
786.6'	22.0'			ST-11	20.0 - 22.0	2.0		--	
		SOIL 6: LEAN CLAY, gray brown to brown, moist, medium stiff		ST-12	22.0 - 24.0	2.0		37	
				ST-13	24.0 - 26.0	1.8		30	
				ST-14	26.0 - 28.0	1.6		35	
				ST-15	28.0 - 30.0	1.0		28	
				SPT-1	30.0 - 31.5	1.3	2-3-7	28	ST-16 pushed at 30.0 ft. Tube was lost.
				SPT-2	31.5 - 33.0	1.1	4-6-7	25	
				SPT-3	33.0 - 34.5	1.2	8-10-13	24	
				SPT-4	34.5 - 36.0	1.3	5-7-8	25	
				SPT-5	36.0 - 37.5	1.3	4-6-7	22	
				SPT-6	37.5 - 39.0	1.2	4-5-7	26	
				SPT-7	39.0 - 40.5	1.3	2-2-3	26	
767.6'	41.0'			SPT-8	40.5 - 42.0	1.2	1-3-4	25	
				SPT-9	42.0 - 43.5	1.0	1-3-7	23	

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591493.79, E 2546234.83 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-88** Total Depth 49.3 ft

Lithology			Overburden	Sample #	Depth	Rec. Ft.	Blows	Mois.Cont. %	
Elevation	Depth	Description	Rock Core	RQD	Run	Rec. Ft.	Rec. %	Run Depth	Remarks
764.3'	44.3'	SOIL 10: SAND, gray, saturated, medium dense to dense, fine to medium grained, some clay, some fine to medium gravel *(Continued)*		SPT-10	43.5 - 44.9	1.3	11-18-50/0.4	13	
759.3'	49.3'	Shale and Limestone (Roller bit)							
		Auger Refusal / Bottom of Hole							

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 591494.07, E 2546236.74 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-88A** Total Depth 12.0 ft
Location	Clinton, Tennessee	Surface Elevation	808.5 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	8/4/09 Completed 8/4/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	N/A Date/Time N/A
Logged By	Ben Halada	Automatic Hammer ☐	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
808.5'	0.0'	Top of Hole							
		Augered without sampling							Boring advanced using 3 1/4" Hollow Stem Augers
									Slotted screen piezometer installed. Tip depth at 10.0 ft. See piezometer installation log for details.
796.5'	12.0'								
		No Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

Project No.	172679015	Location	N 593192.06, E 2545830.78 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-89** Total Depth 40.0 ft
Location	Clinton, Tennessee	Surface Elevation	836.1 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	8/6/09 Completed 8/6/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	28.7 ft Date/Time 8/6/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
836.1'	0.0'	Top of Hole							
835.9'	0.2'	FILL - CRUSHED STONE		SPT-1	0.0 - 1.5	1.3	4-6-11	10	Boring advanced using 3 1/4" Hollow Stem Augers
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, gray, moist, medium dense to dense		SPT-2	2.5 - 4.0	1.5	30-20-32	13	
				SPT-3	5.0 - 6.5	1.4	34-27-21	12	Slotted screen piezometer installed. Tip depth at 38.0 ft. See piezometer installation log for details.
				SPT-4	7.5 - 9.0	1.2	7-9-8	7	
				SPT-5	10.0 - 11.5	1.3	5-8-15	8	
				SPT-6	12.5 - 14.0	1.1	5-15-16	16	
				SPT-7	15.0 - 16.5	1.0	9-3-3	26	
				SPT-8	17.5 - 19.0	1.5	9-15-15	18	
				SPT-9	20.0 - 21.5	1.2	21-10-9	20	
813.0'	23.1'								
		SOIL 3: SLUICED FLY ASH, gray, moist to saturated, medium stiff, with varying percentages of bottom ash		SPT-10	22.5 - 24.0	1.3	17-8-8	35	
				SPT-11	25.0 - 26.5	1.0	WOR-1-6	39	
				SPT-12	27.5 - 29.0	1.1	1-4-6	35	
				SPT-13	30.0 - 31.5	1.3	1-4-8	34	
				SPT-14	32.5 - 34.0	1.5	WOR-1-5	35	
				SPT-15	35.0 - 36.5	1.0	1-3-4	32	
796.1'	40.0'								
		No Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

SUBSURFACE LOG (DRAFT)

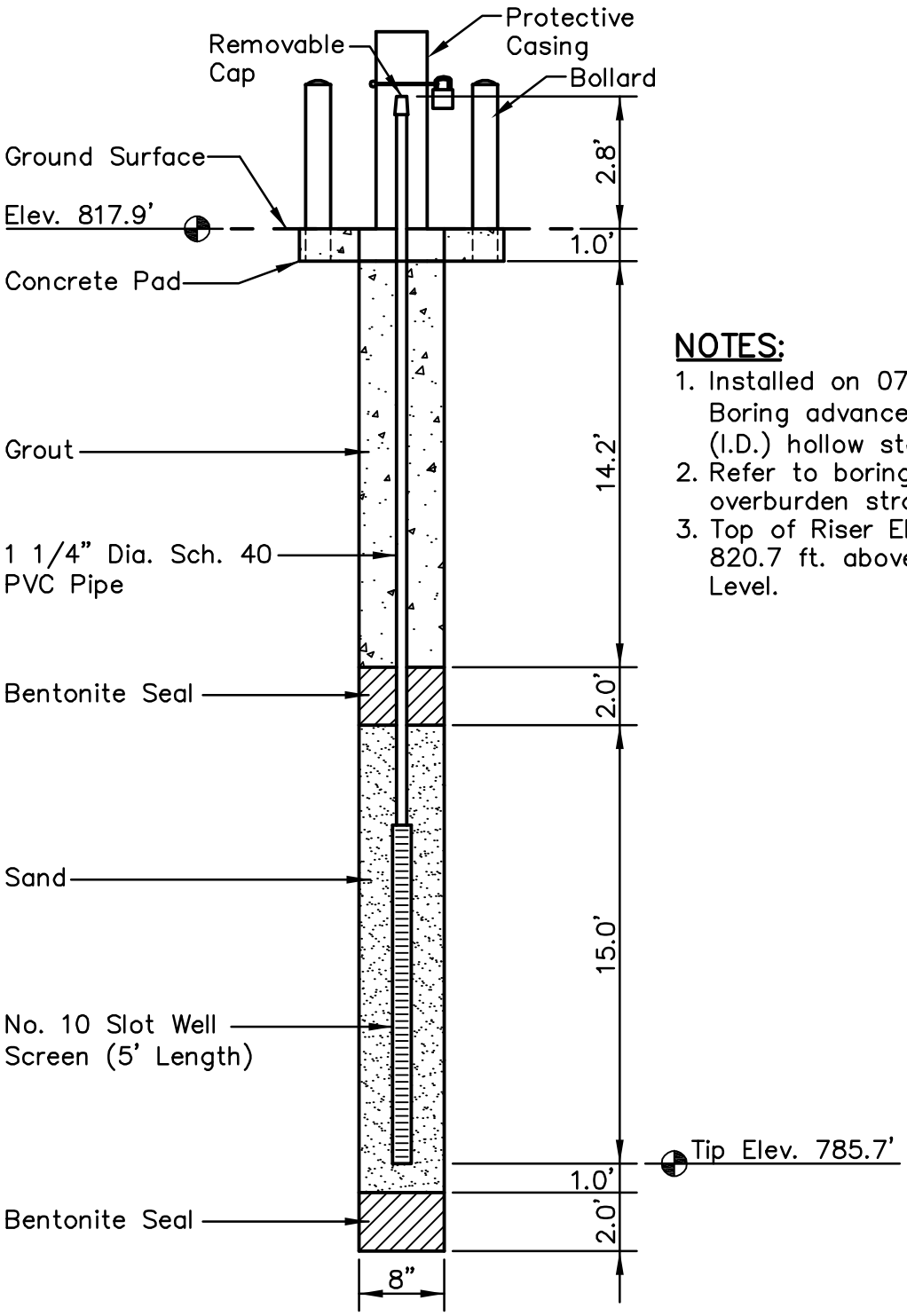
Project No.	172679015	Location	N 593043.65, E 2545471.40 (NAD27)
Project Name	Bull Run Fossil Plant (TVA)	Boring No.	**STN-90** Total Depth 37.0 ft
Location	Clinton, Tennessee	Surface Elevation	838.4 ft. (NGVD29)
Project Type	Geotechnical Exploration	Date Started	8/6/09 Completed 8/6/09
Supervisor	Ben Halada Driller Kent Clements	Depth to Water	25.0 ft Date/Time 8/6/09
Logged By	Ben Halada	Automatic Hammer ☒	Safety Hammer ☐ Other ☐

Lithology Elevation	Lithology Depth	Description	Overburden / Rock Core	Sample # / RQD	Depth / Run	Rec. Ft. / Rec. Ft.	Blows / Rec. %	Mois.Cont. % / Run Depth	Remarks
838.4'	0.0'	Top of Hole							
838.2'	0.2'	SOIL 4: FILL - LEAN CLAY, light brown, moist, soft		SPT-1	0.0 - 1.5	1.3	3-6-10	21	Boring advanced using 3 1/4" Hollow Stem Augers
		SOIL 2: FILL - BOTTOM ASH/FLY ASH MIXTURE, gray, moist, dense to very dense, with some clay partings		SPT-2	2.5 - 4.0	1.2	17-38-31	17	
				SPT-3	5.0 - 6.5	1.4	18-24-28	12	Slotted screen piezometer installed. Tip depth at 35.0 ft. See piezometer installation log for details.
				SPT-4	7.5 - 9.0	1.5	8-21-16	17	
				SPT-5	10.0 - 11.5	1.0	7-24-36	13	
				SPT-6	12.5 - 14.0	1.0	6-29-36	18	
				SPT-7	15.0 - 16.5	1.1	5-15-20	14	
				SPT-8	17.5 - 19.0	1.1	1-2-4	40	
				SPT-9	20.0 - 21.5	1.3	6-20-29	17	
				SPT-10	22.5 - 24.0	1.5	7-6-7	30	
812.8'	25.6'								
		SOIL 3: SLUICED FLY ASH, gray, moist to saturated, medium stiff, with varying percentages of bottom ash		SPT-11	25.0 - 26.5	1.4	1-3-6	34	
				SPT-12	27.5 - 29.0	1.3	3-4-5	68	
801.4'	37.0'								
		No Refusal / Bottom of Hole							

RMSM_LEGACY 172679015 BULL RUN - FINAL.GPJ FMSM.GDT 2/10/10

Appendix D

Instrumentation Logs



NOTES:

1. Installed on 07/13/2009. Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 820.7 ft. above Mean Sea Level.

LOCATION:

Northing: 594,173.80
Easting: 2,544,636.59
Ground Elevation: 817.9 feet

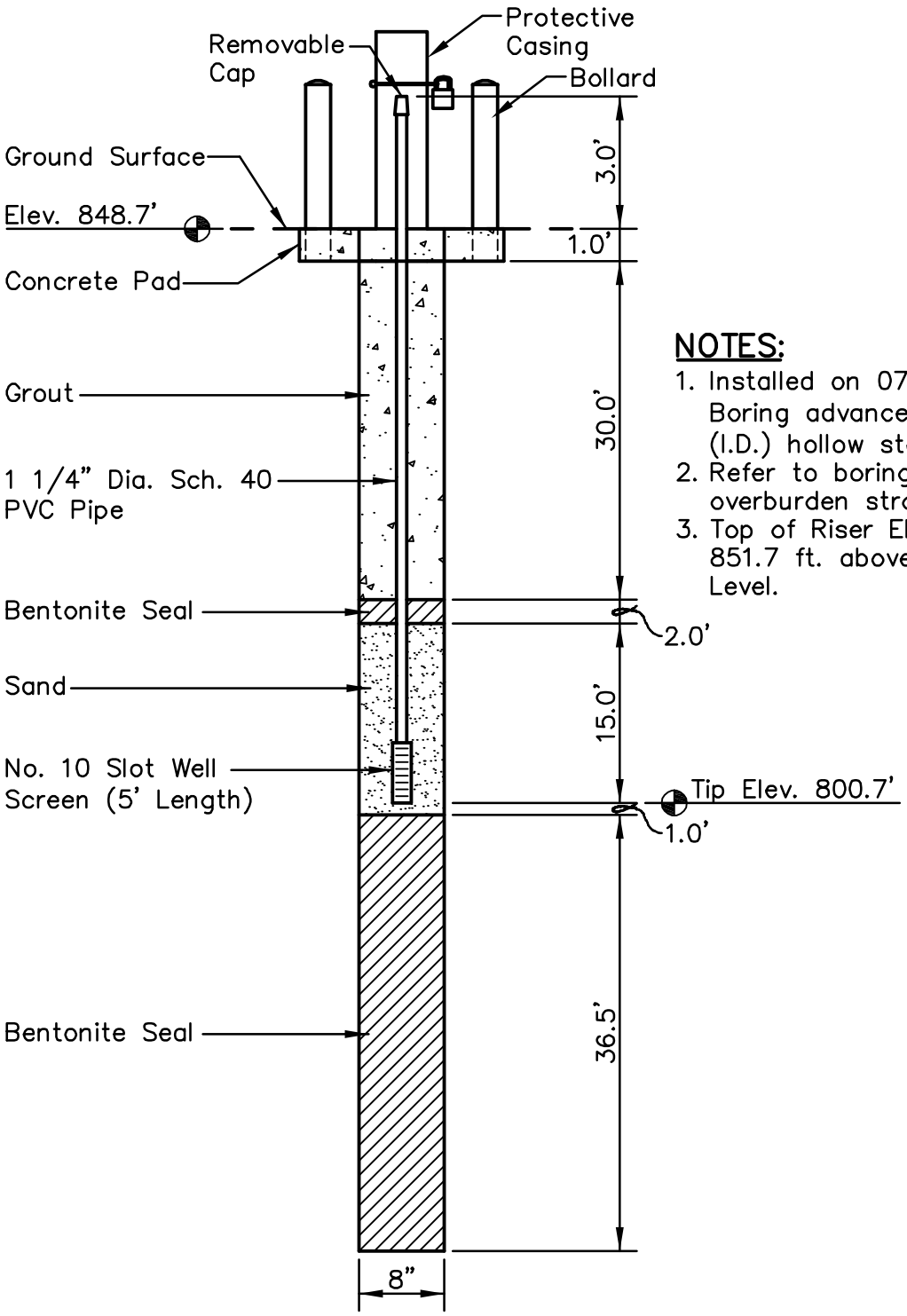
Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-10A
BOTTOM ASH DISPOSAL AREA 1
BULL RUN FOSSIL PLANT

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
Nashville, Tennessee
37027-5044
615-885-1144
www.stantec.com

DRAWN BY	TJ	DATE	AUG., 2009	REVISED	SHEET
CHECKED BY	PHW	PROJ. NO.	172679015	1. 3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
V:\1726\ACTIVE\172679015\ENVIRONMENTAL\DRAWING\GEOTECH\INSTRUMENT\790158-BRF-301-PZ10A.DWG



NOTES:

1. Installed on 07/08/2009. Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 851.7 ft. above Mean Sea Level.

LOCATION:

Northing: 593,802.44
Easting: 2,545,004.48
Ground Elevation: 848.7 feet

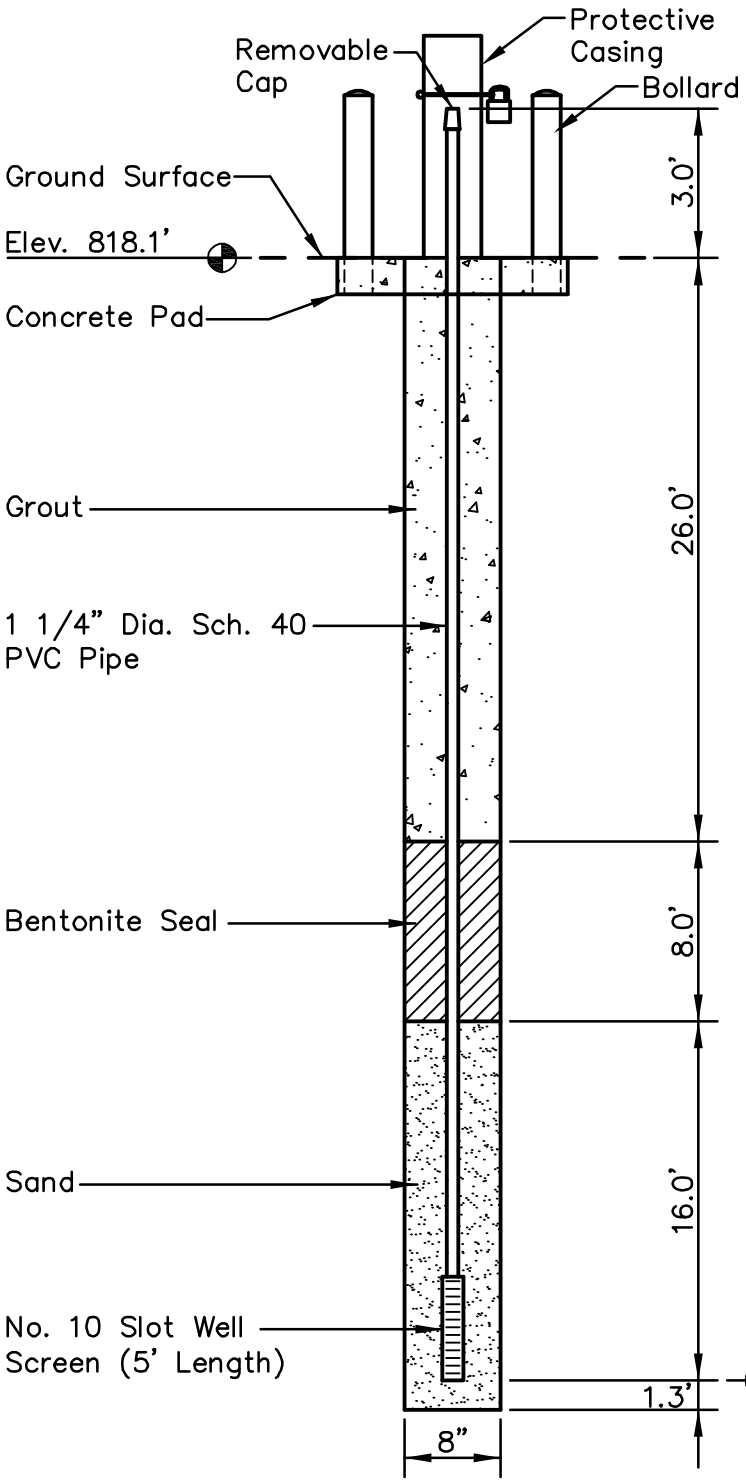
Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-14
BOTTOM ASH DISPOSAL AREA 1
BULL RUN FOSSIL PLANT

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
Nashville, Tennessee
37027-5044
615-885-1144
www.stantec.com

DRAWN BY	TJ	DATE	AUG., 2009	REVISED	SHEET
CHECKED BY	PHW	PROJ. NO.	172679015	1. 3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
V:\1726\ACTIVE\172679015\ENVIRONMENTAL\DRAWING\GEOTECH\INSTRUMENT\790158-BRF-301-PZ14.DWG



NOTES:

1. Installed on 06/25/2009. Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 821.1 ft. above Mean Sea Level.

LOCATION:

Northing: 593,734.18
Easting: 2,544,875.42
Ground Elevation: 818.1 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-15
BOTTOM ASH DISPOSAL AREA 1
BULL RUN FOSSIL PLANT

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100 Westwood Pl., Ste. 420
Nashville, Tennessee
37027-5044
615-885-1144
www.stantec.com

DRAWN BY	TJ	DATE	AUG., 2009	REVISED	SHEET
CHECKED BY	PHW	PROJ. NO.	172679015	1. 3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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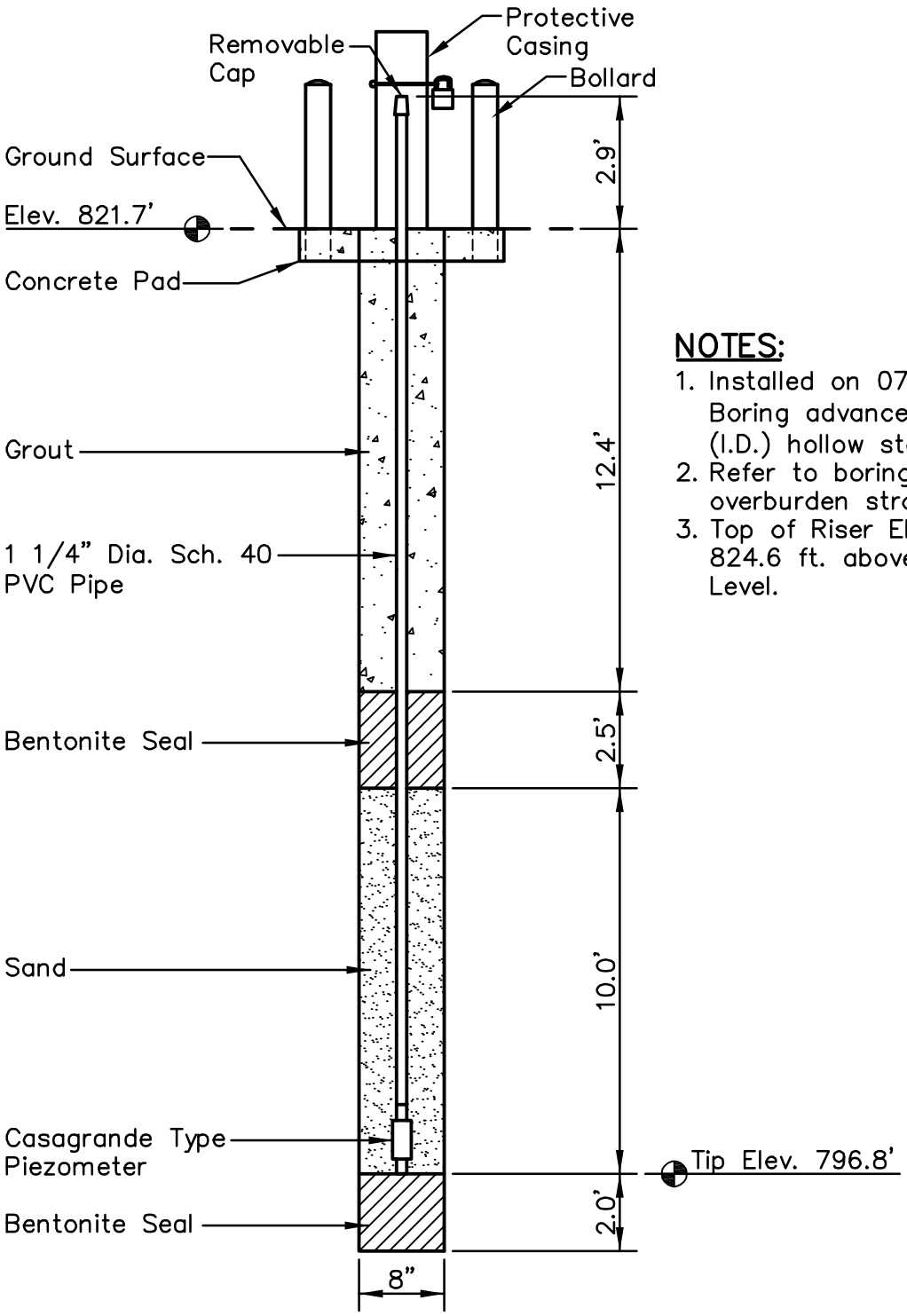

NOTES:

1. Installed on 07/09/2009. Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 824.6 ft. above Mean Sea Level.

LOCATION:

Northing: 593,524.13
Easting: 2,545,835.46
Ground Elevation: 821.7 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-18
BOTTOM ASH DISPOSAL AREA 1
BULL RUN FOSSIL PLANT

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Nashville, Tennessee
37027-5044
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DRAWN BY	TJ	DATE	AUG., 2009	REVISED	SHEET
CHECKED BY	PHW	PROJ. NO.	172679015	1. 3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 02/22/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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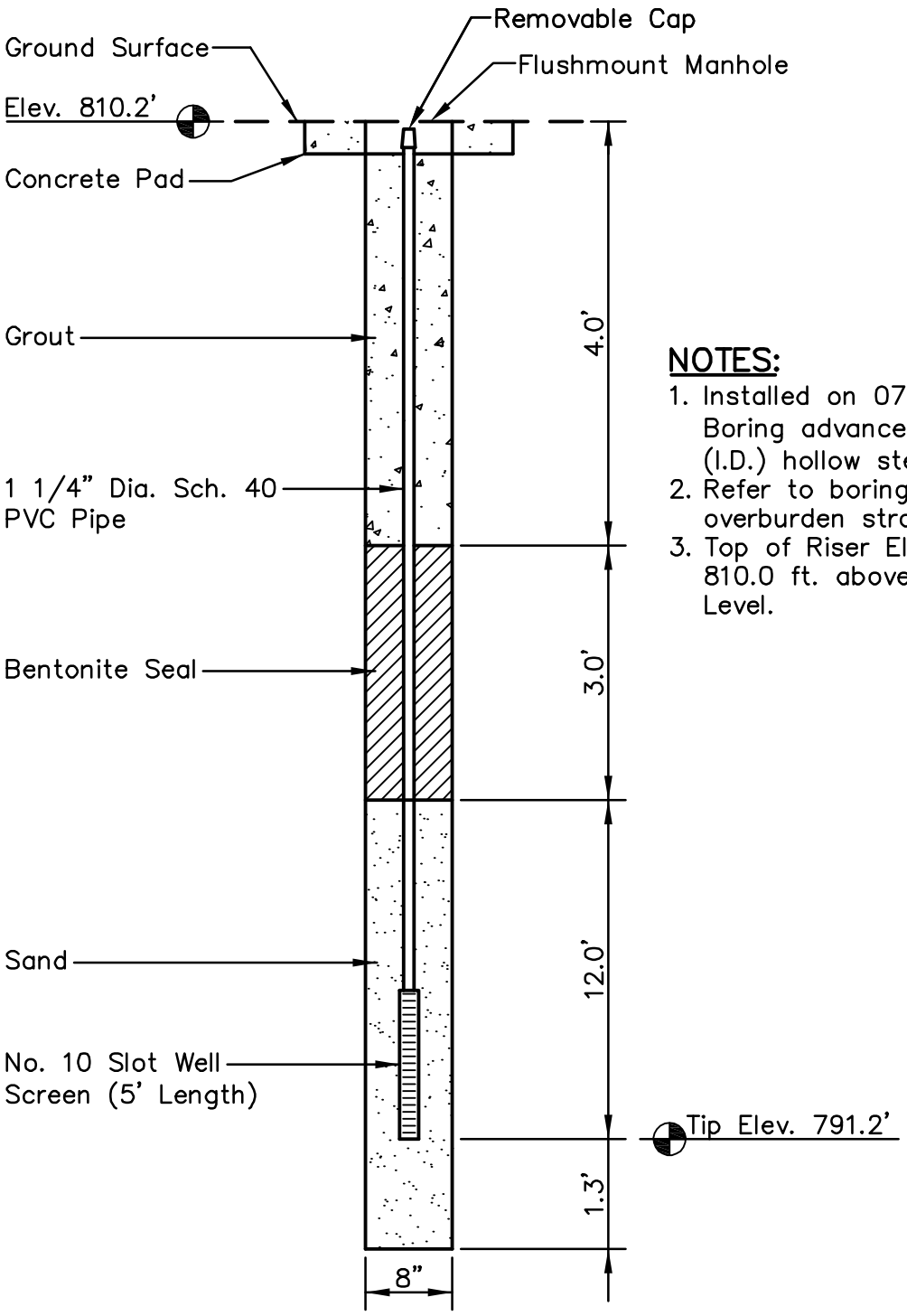

NOTES:

1. Installed on 07/09/2009. Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 810.0 ft. above Mean Sea Level.

LOCATION:

Northing: 593,480.64
Easting: 2,545,884.32
Ground Elevation: 810.2 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-19
BOTTOM ASH DISPOSAL AREA 1
BULL RUN FOSSIL PLANT

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100 Westwood Pl., Ste. 420
Nashville, Tennessee
37027-5044
615-885-1144
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CHECKED BY	PHW	PROJ. NO.	172679015	1. 3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 02/18/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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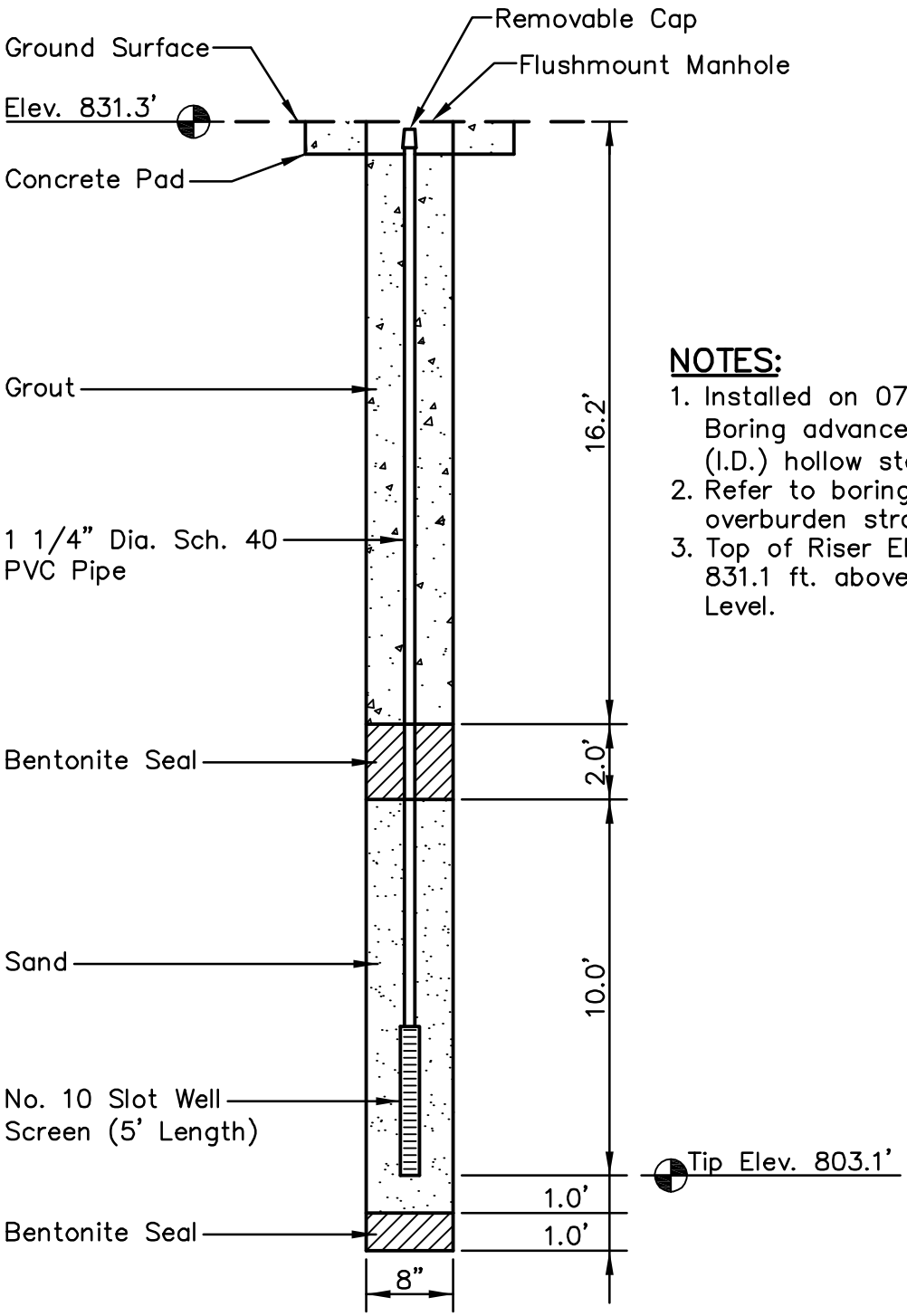

NOTES:

1. Installed on 07/10/2009. Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 831.1 ft. above Mean Sea Level.

LOCATION:

Northing: 592,960.52
Easting: 2,546,295.43
Ground Elevation: 831.3 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-27
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
Nashville, Tennessee
37027-5044
615-885-1144
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DRAWN BY	TJ	DATE	AUG., 2009	REVISED	SHEET
CHECKED BY	PHW	PROJ. NO.	172679015	1. 3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 02/17/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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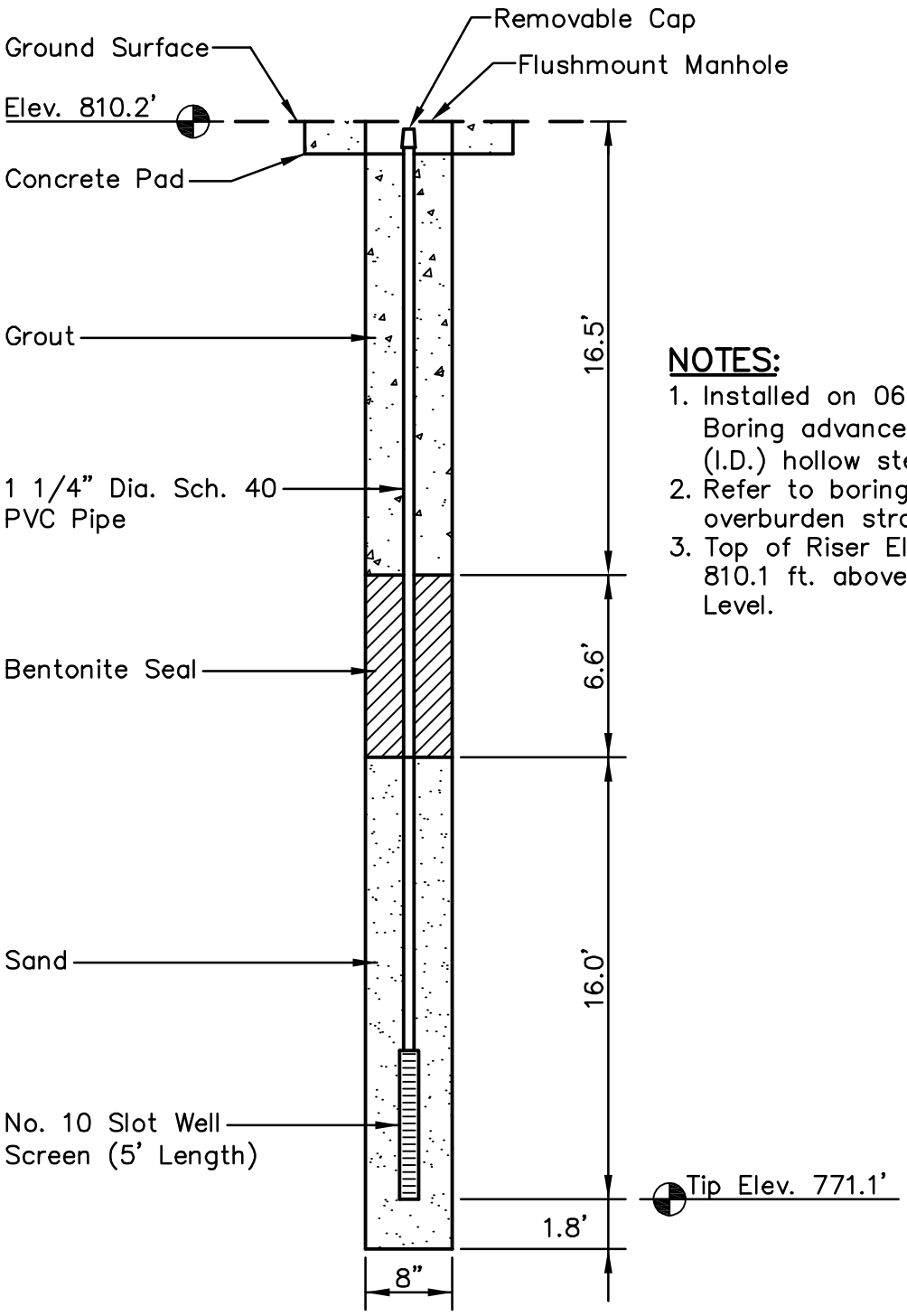

NOTES:

1. Installed on 06/23/2009. Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 810.1 ft. above Mean Sea Level.

LOCATION:

Northing: 595,020.59
Easting: 2,544,104.02
Ground Elevation: 810.2 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-3
BOTTOM ASH DISPOSAL AREA 1
BULL RUN FOSSIL PLANT

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CHECKED BY	PHW	PROJ. NO.	172679015	1. 3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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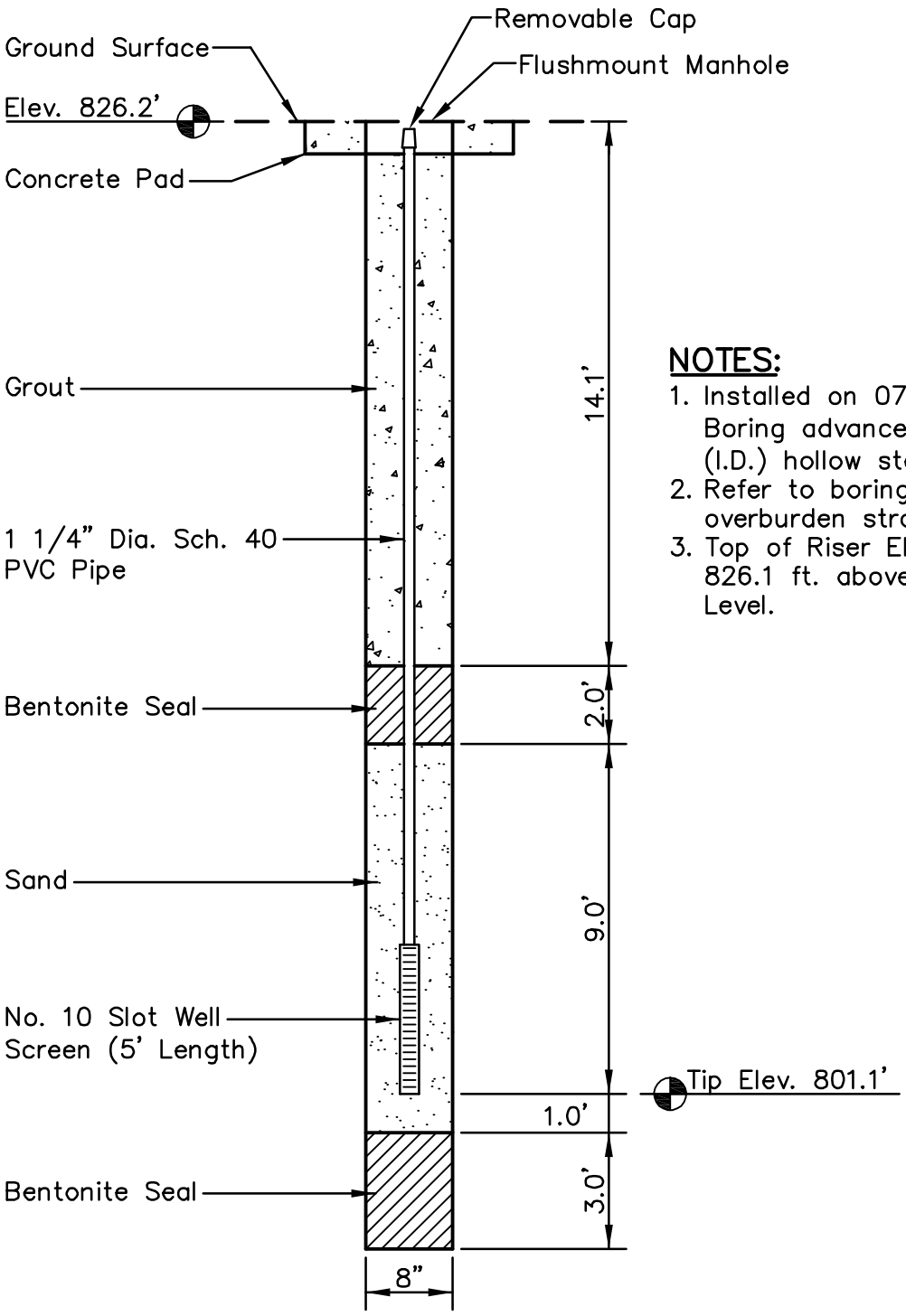

NOTES:

1. Installed on 07/09/2009. Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 826.1 ft. above Mean Sea Level.

PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
V:\1726\ACTIVE\172679015\ENVIRONMENTAL\DRAWING\GEOTECH\INSTRUMENT\790158-BRF-301-PZ30.DWG

LOCATION:

Northing: 592,227.12
Easting: 2,546,605.60
Ground Elevation: 826.2 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-30
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

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Nashville, Tennessee
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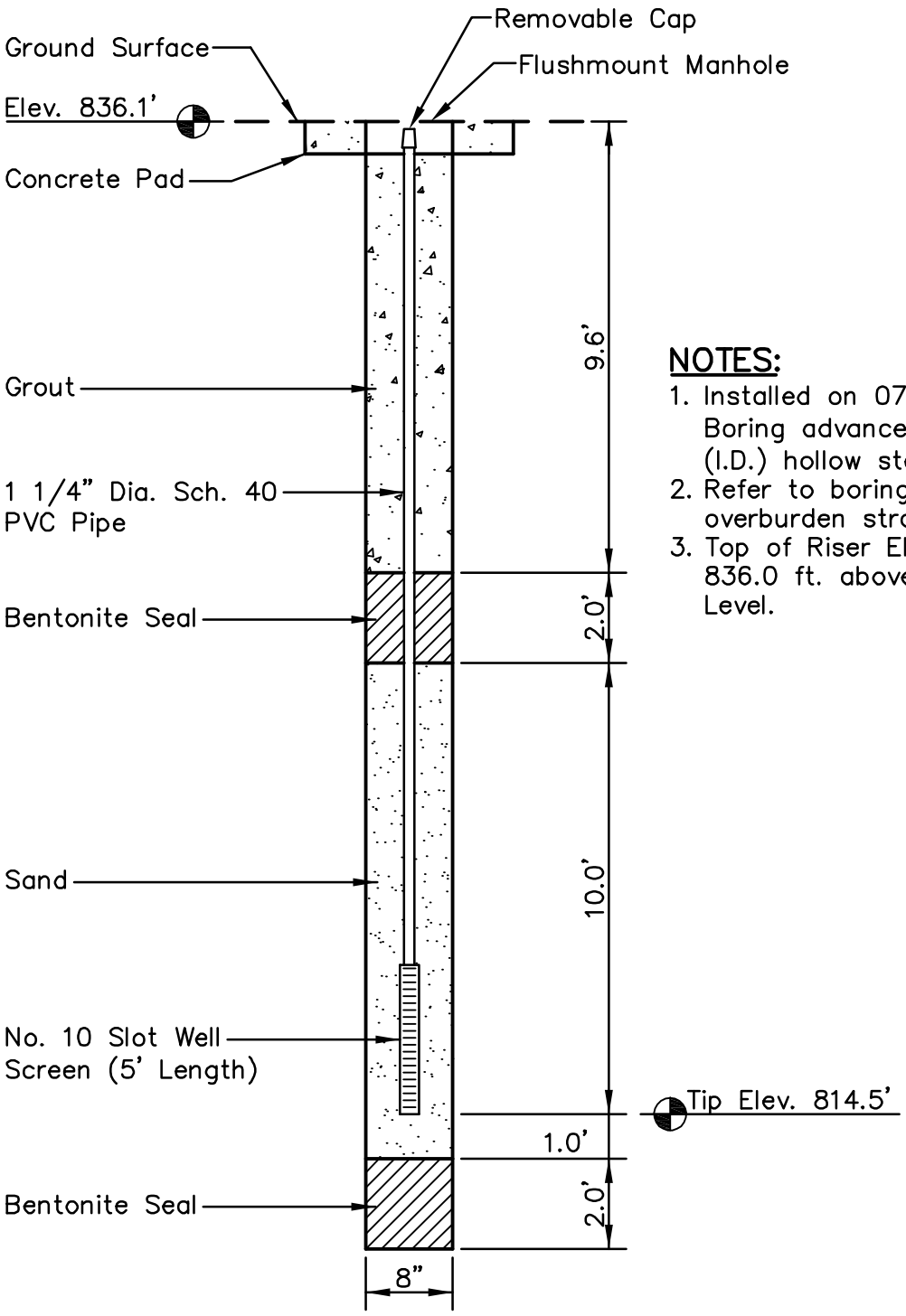
DRAWN BY	TJ	DATE	AUG., 2009	REVISED	SHEET
CHECKED BY	PHW	PROJ. NO.	172679015	1. 3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2. 4.	



NOTES:

1. Installed on 07/11/2009. Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 836.0 ft. above Mean Sea Level.

LOCATION:

Northing: 592,559.31
Easting: 2,545,426.43
Ground Elevation: 836.1 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-33
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

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CHECKED BY	PHW	PROJ. NO.	172679015	1. 3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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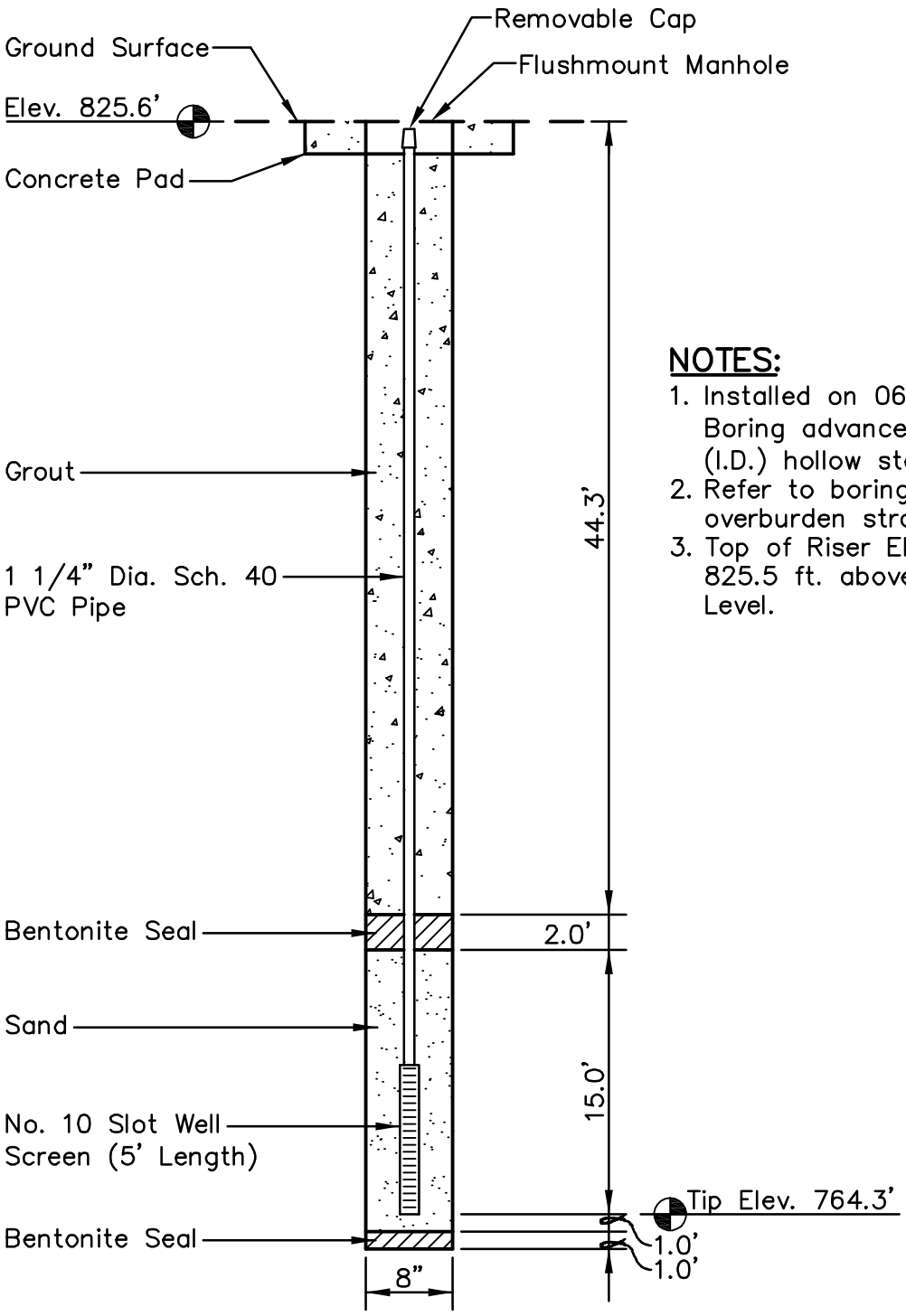

NOTES:

1. Installed on 06/04/2009. Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 825.5 ft. above Mean Sea Level.

PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
V:\1726\ACTIVE\172679015\ENVIRONMENTAL\DRAWING\GEOTECH\INSTRUMENT\790158-BRF-301-PZ34.DWG

LOCATION:

Northing: 592,527.95
Easting: 2,545,300.77
Ground Elevation: 825.6 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-34
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

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100 Westwood Pl., Ste. 420
Nashville, Tennessee
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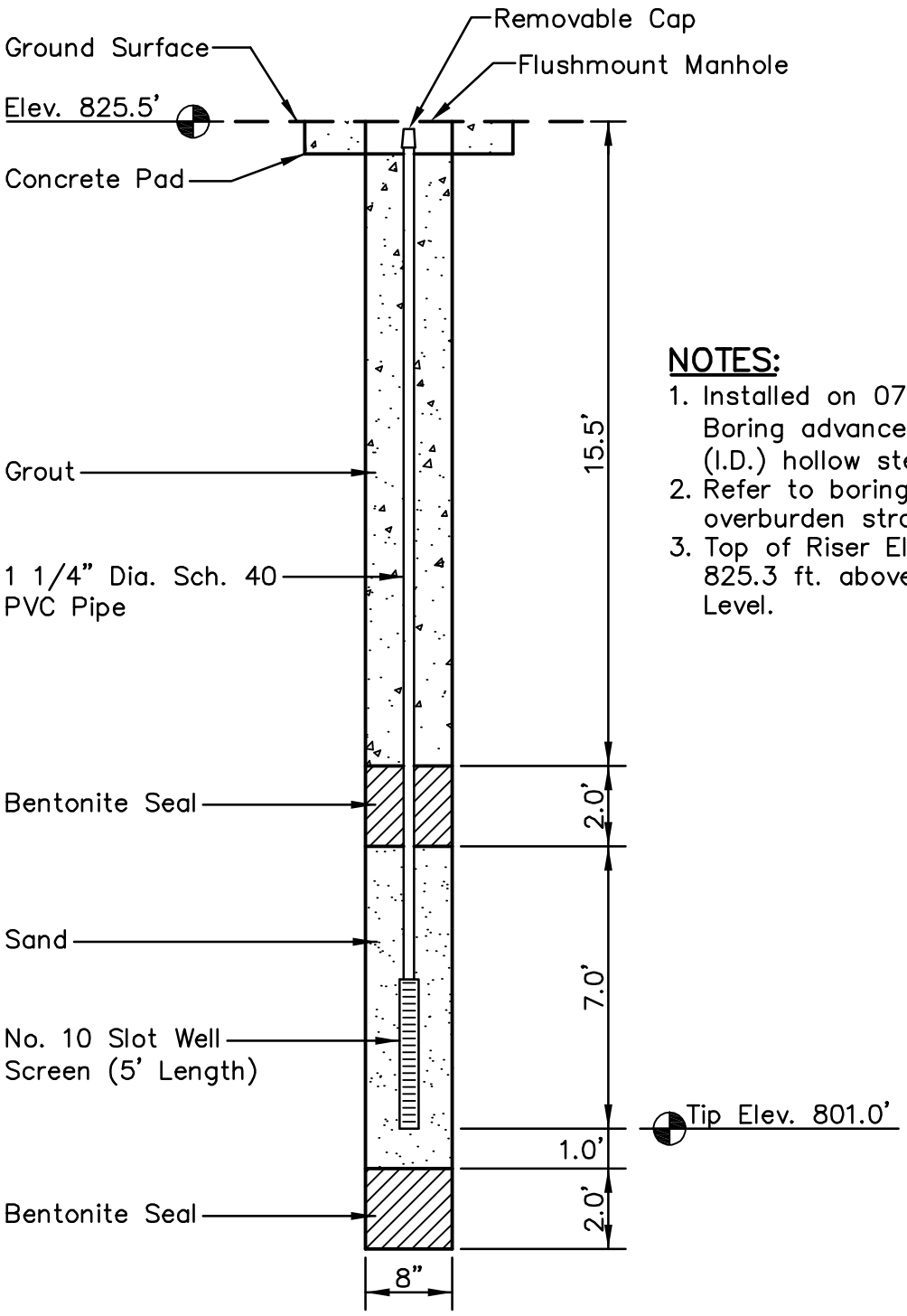
DRAWN BY	TJ	DATE	AUG., 2009	REVISED	SHEET
CHECKED BY	PHW	PROJ. NO.	172679015	1. 3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2. 4.	



NOTES:

1. Installed on 07/13/2009. Boring advanced with 4.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 825.3 ft. above Mean Sea Level.

LOCATION:

Northing: 592,522.40
Easting: 2,545,302.17
Ground Elevation: 825.5 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-34A
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

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DRAWN BY	TJ	DATE	AUG., 2009	REVISED	SHEET
CHECKED BY	PHW	PROJ. NO.	172679015	1. 3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 02/17/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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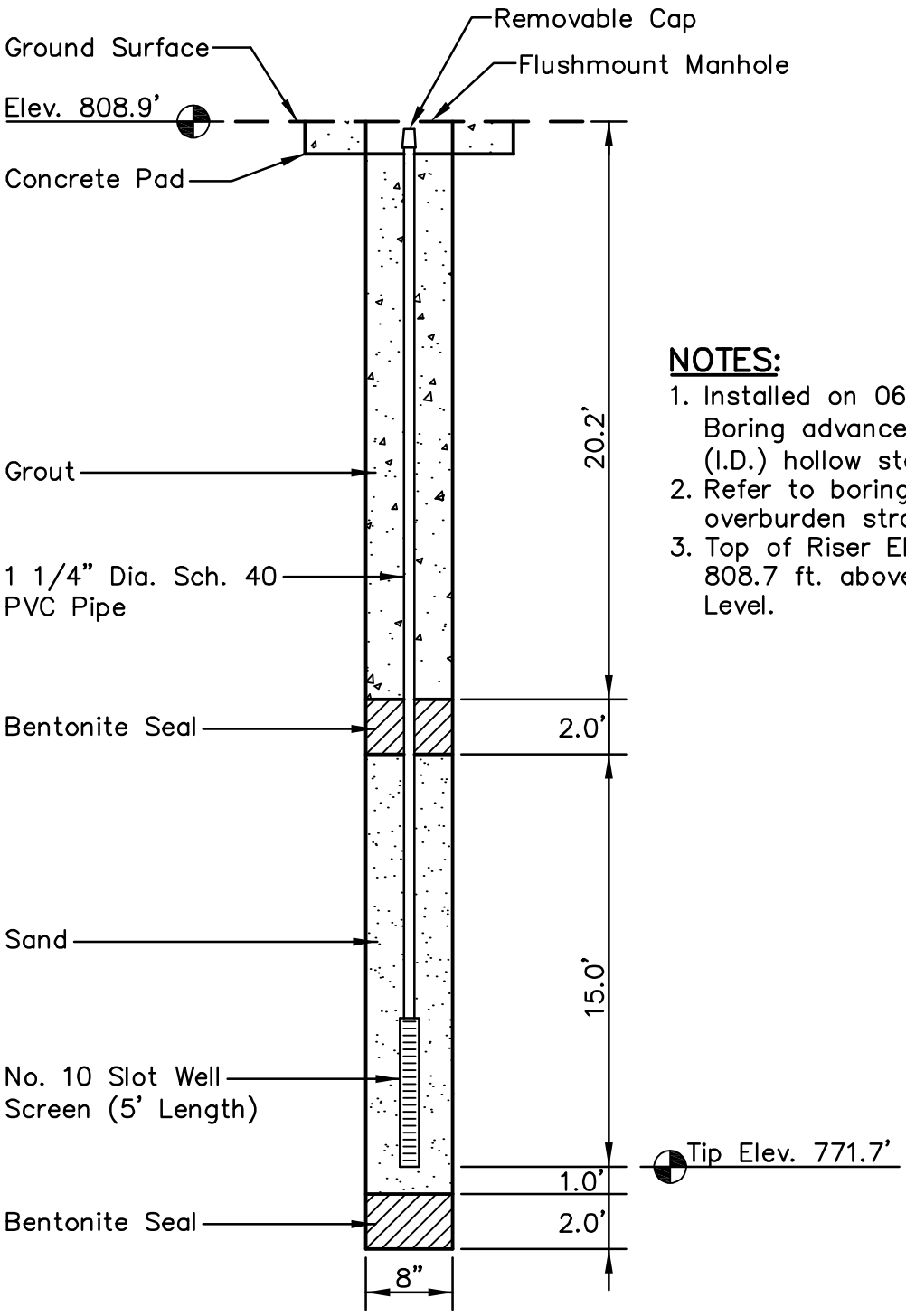

NOTES:

1. Installed on 06/15/2009. Boring advanced with 4.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 808.7 ft. above Mean Sea Level.

PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
V:\1726\ACTIVE\172679015\ENVIRONMENTAL\DRAWING\GEOTECH\INSTRUMENT\790158-BRF-301-PZ35.DWG

LOCATION:

Northing: 592,523.92
Easting: 2,545,221.40
Ground Elevation: 808.9 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-35
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

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Nashville, Tennessee
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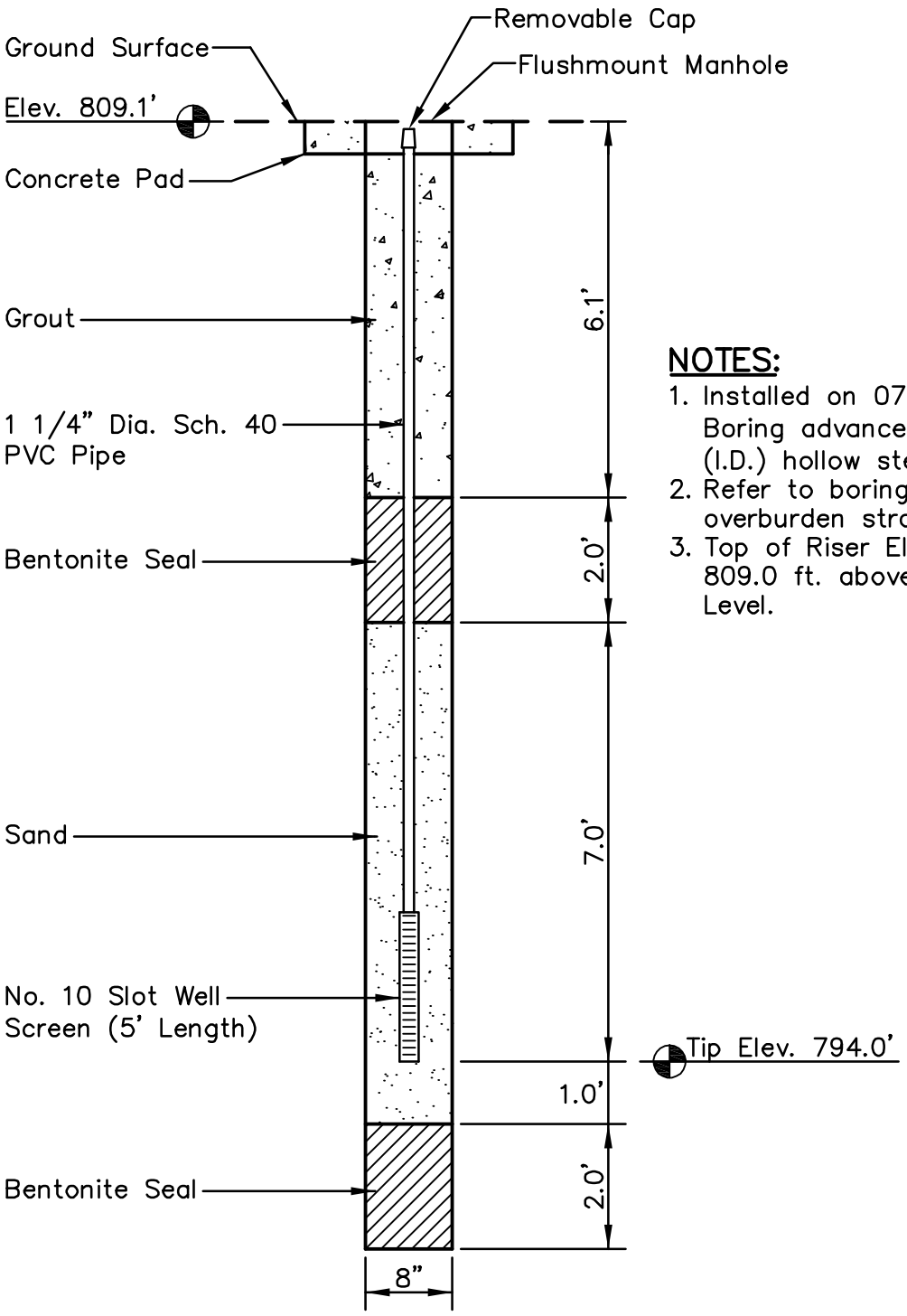
www.stantec.com

DRAWN BY	TJ	DATE	AUG., 2009	REVISED		SHEET
CHECKED BY	PHW	PROJ. NO.	172679015	1.	3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2.	4.	



NOTES:

1. Installed on 07/13/2009. Boring advanced with 4.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 809.0 ft. above Mean Sea Level.

LOCATION:

Northing: 592,527.79
Easting: 2,545,220.58
Ground Elevation: 809.1 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-35A
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

Stantec Consulting Services Inc.
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DRAWN BY	TJ	DATE	AUG., 2009	REVISED	SHEET
CHECKED BY	PHW	PROJ. NO.	172679015	1. 3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 02/18/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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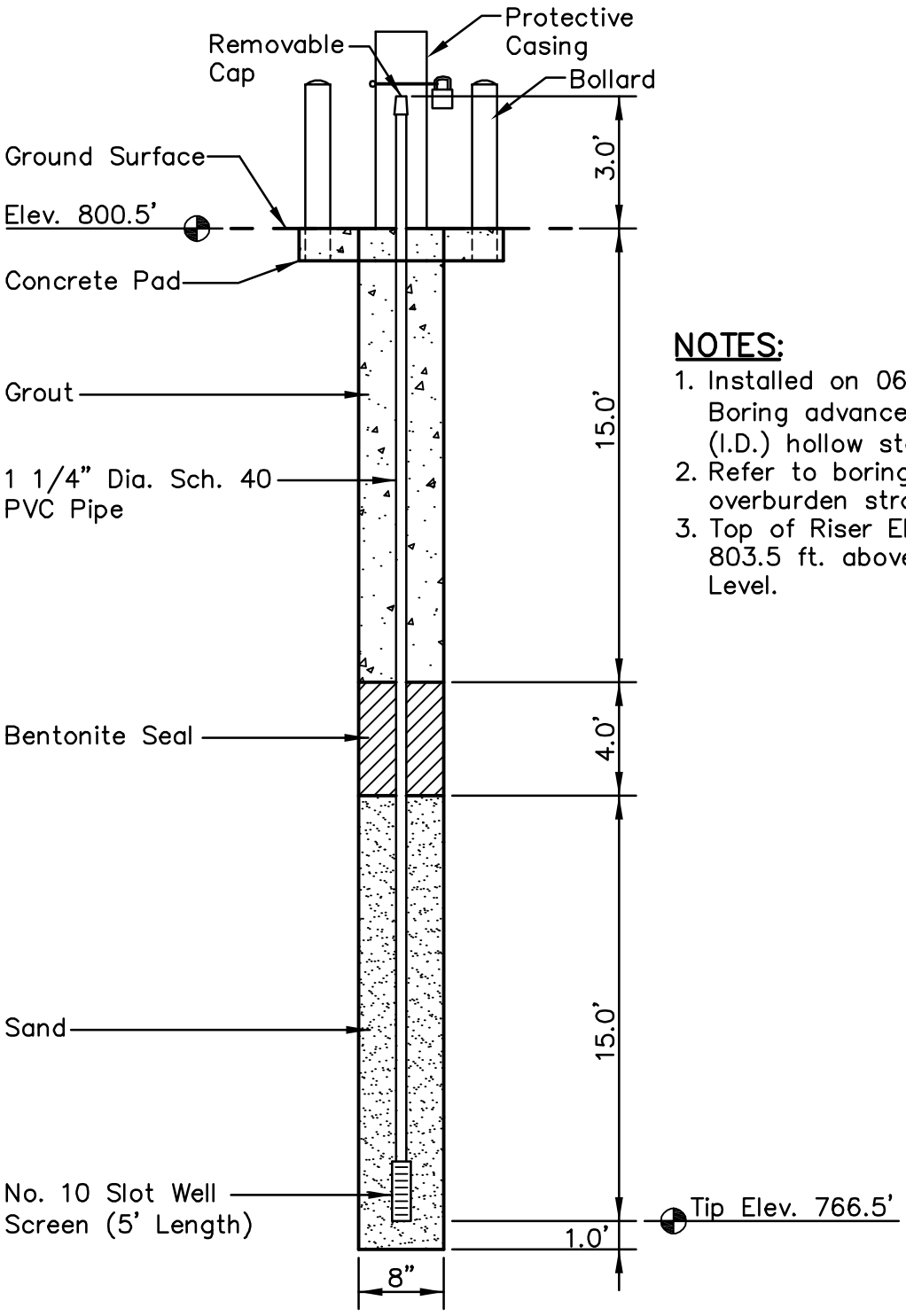

NOTES:

1. Installed on 06/16/2009. Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 803.5 ft. above Mean Sea Level.

LOCATION:

Northing: 592,517.47
Easting: 2,545,204.09
Ground Elevation: 800.5 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-36
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

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CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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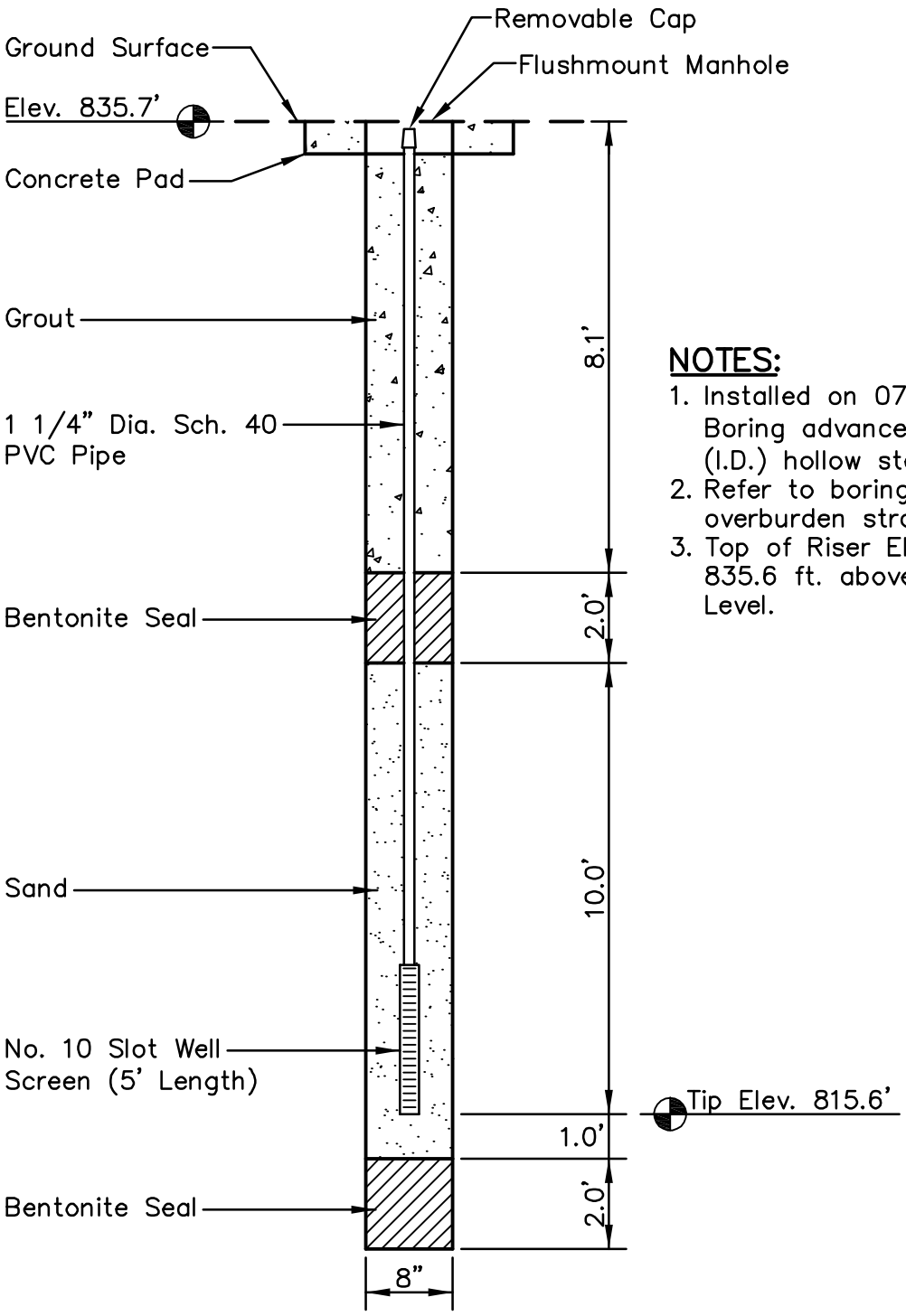

NOTES:

1. Installed on 07/13/2009. Boring advanced with 4.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 835.6 ft. above Mean Sea Level.

LOCATION:

Northing: 591,840.77
Easting: 2,545,638.39
Ground Elevation: 835.7 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-39
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

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CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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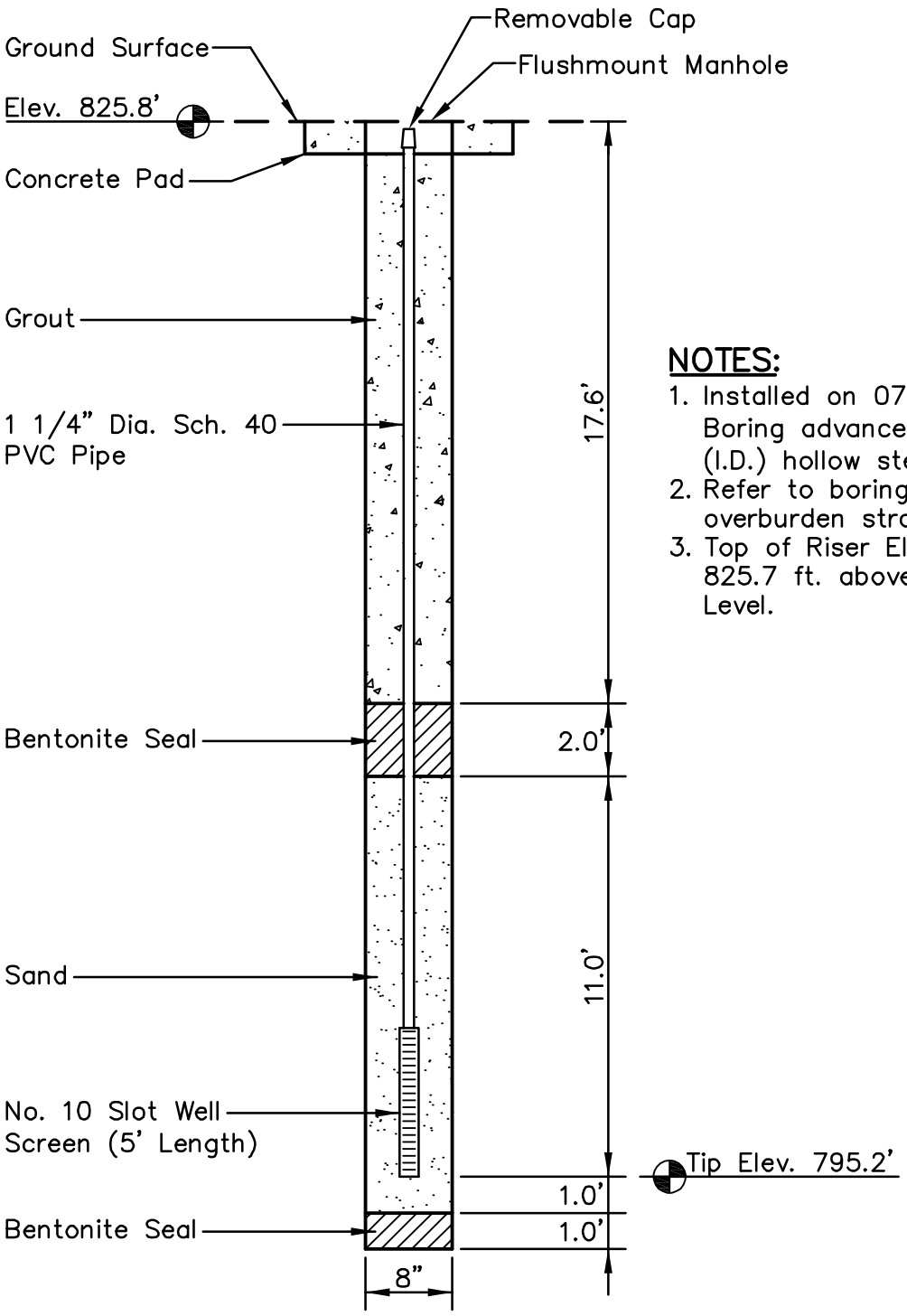

NOTES:

1. Installed on 07/07/2009. Boring advanced with 4.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 825.7 ft. above Mean Sea Level.

LOCATION:

Northing: 591,821.33
Easting: 2,545,513.41
Ground Elevation: 825.8 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-40
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

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CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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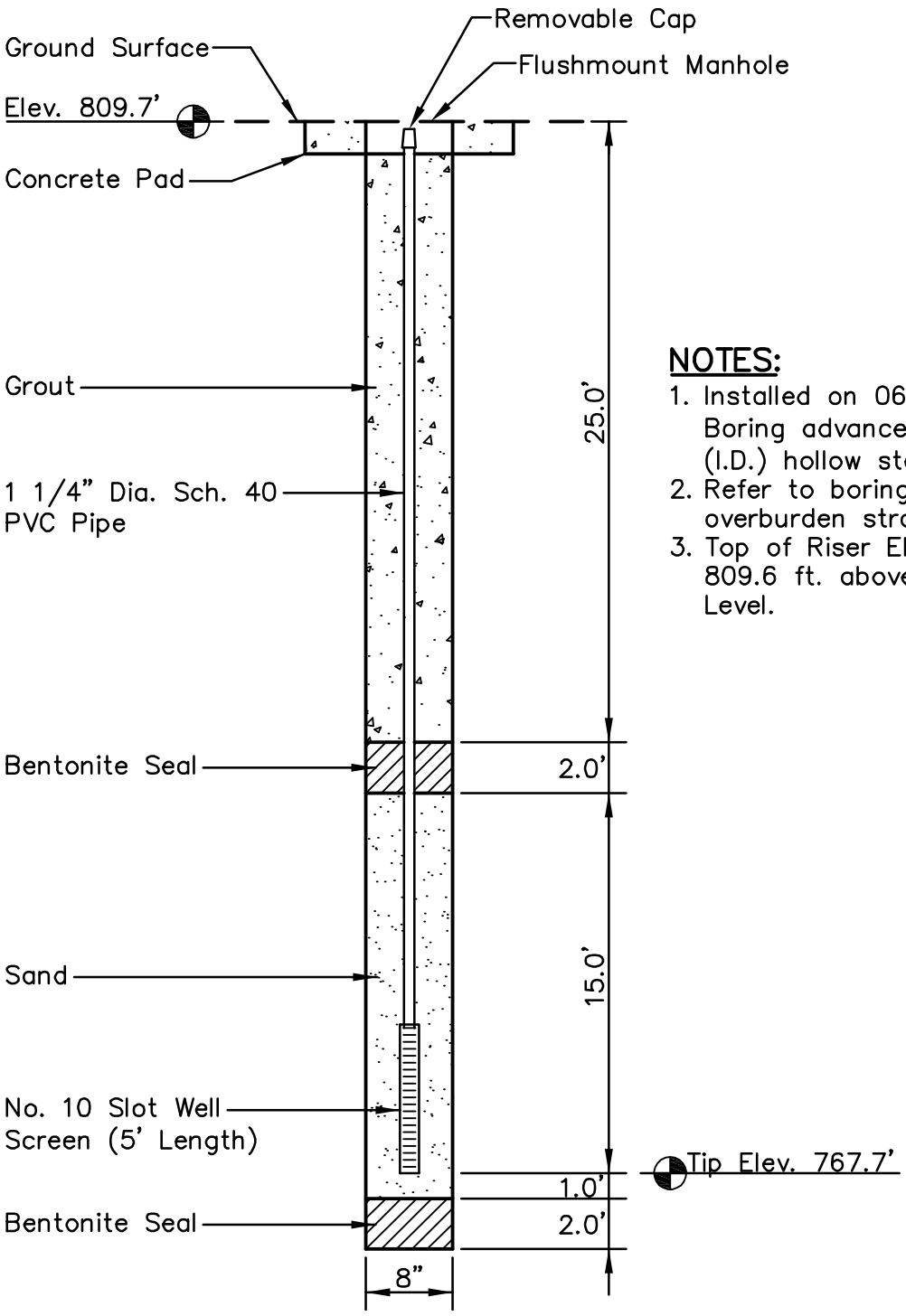

NOTES:

1. Installed on 06/11/2009. Boring advanced with 4.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 809.6 ft. above Mean Sea Level.

LOCATION:

Northing: 591,800.67
Easting: 2,545,427.16
Ground Elevation: 809.7 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-41
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

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PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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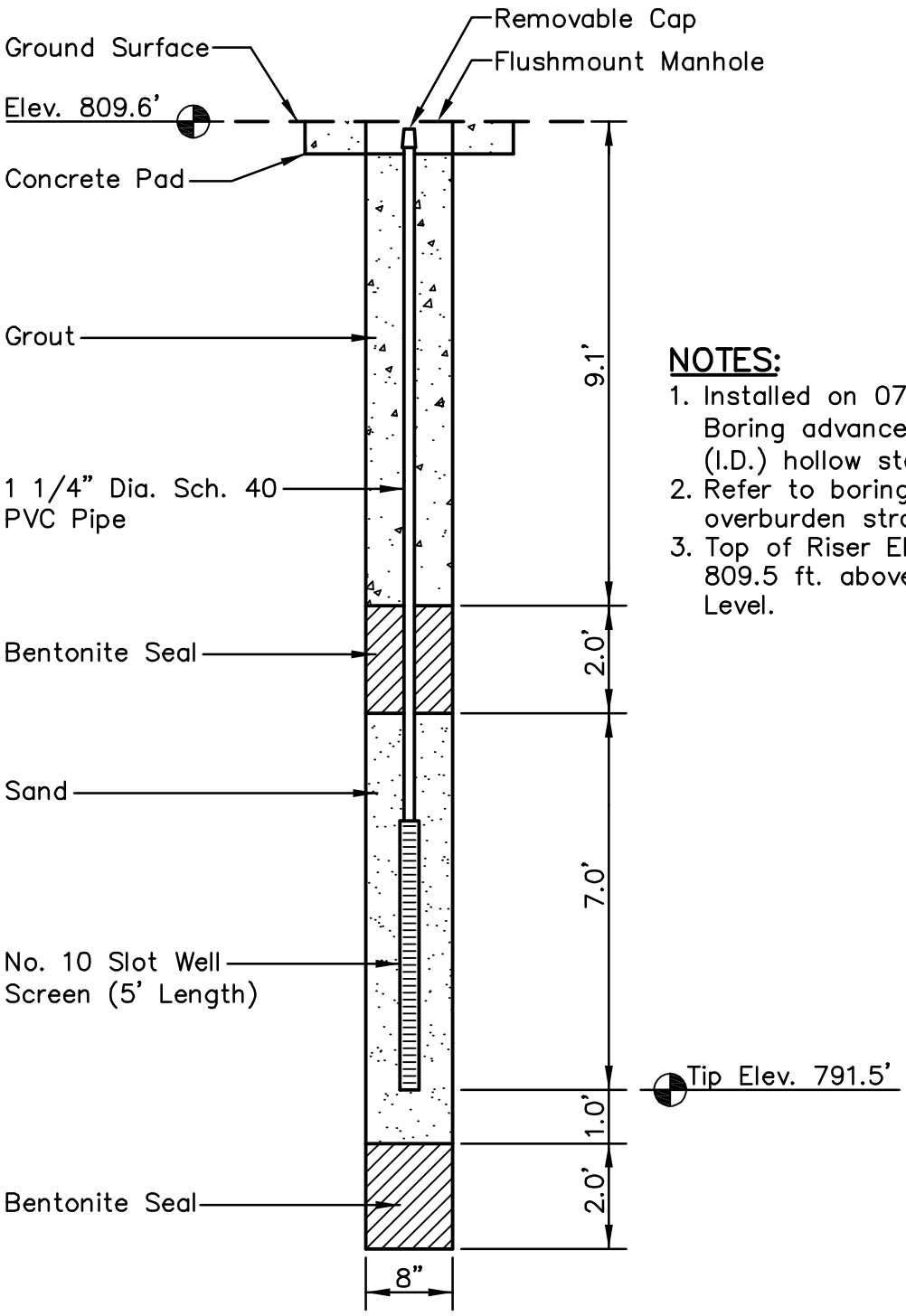

NOTES:

1. Installed on 07/14/2009. Boring advanced with 4.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 809.5 ft. above Mean Sea Level.

PLOT DATE: 02/17/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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LOCATION:

Northing: 591,803.05
Easting: 2,545,424.87
Ground Elevation: 809.6 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-41A
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

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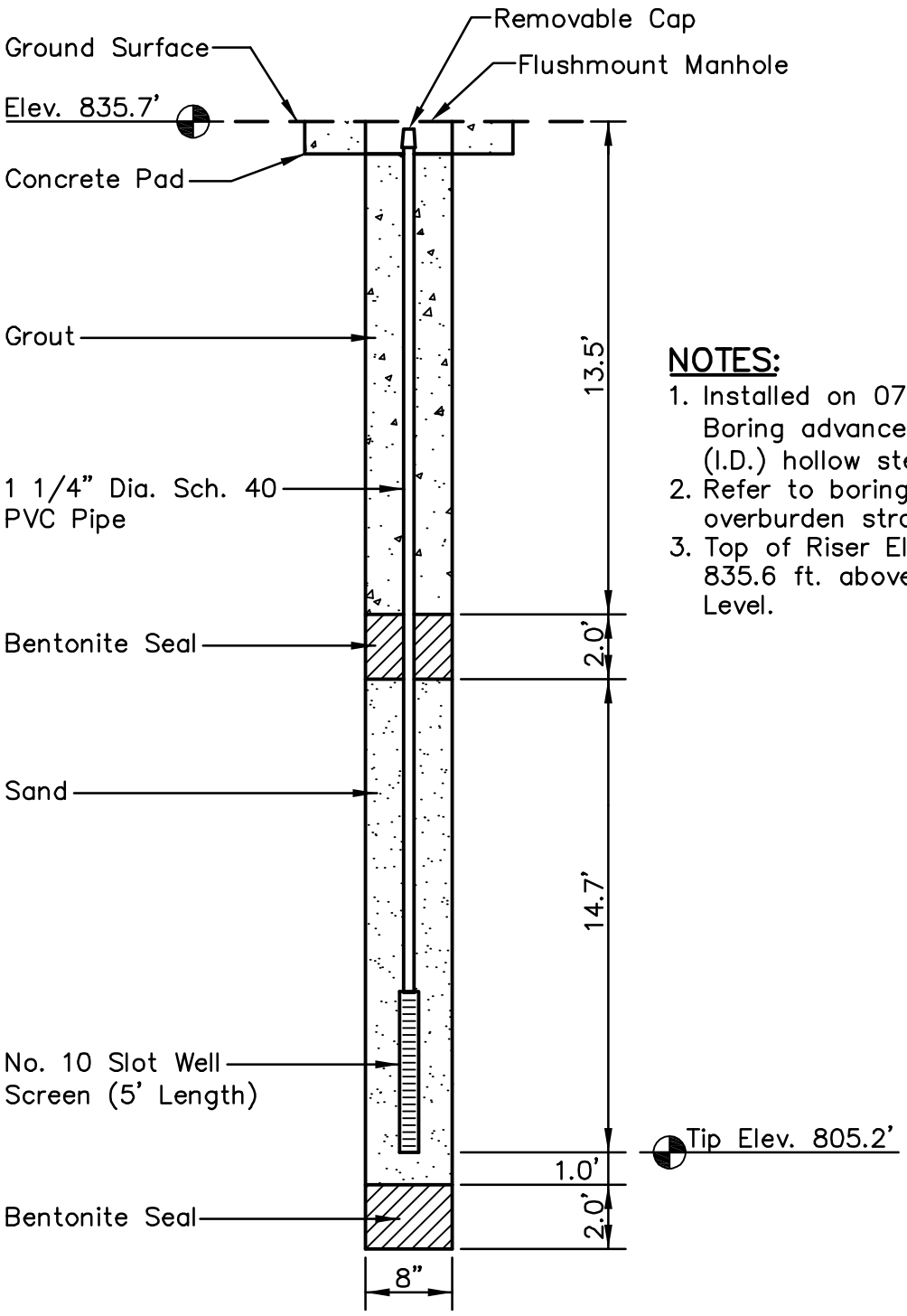

NOTES:

1. Installed on 07/01/2009. Boring advanced with 4.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 835.6 ft. above Mean Sea Level.

LOCATION:

Northing: 591,537.09
Easting: 2,545,975.54
Ground Elevation: 835.7 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-44
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

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PLOT DATE: 02/17/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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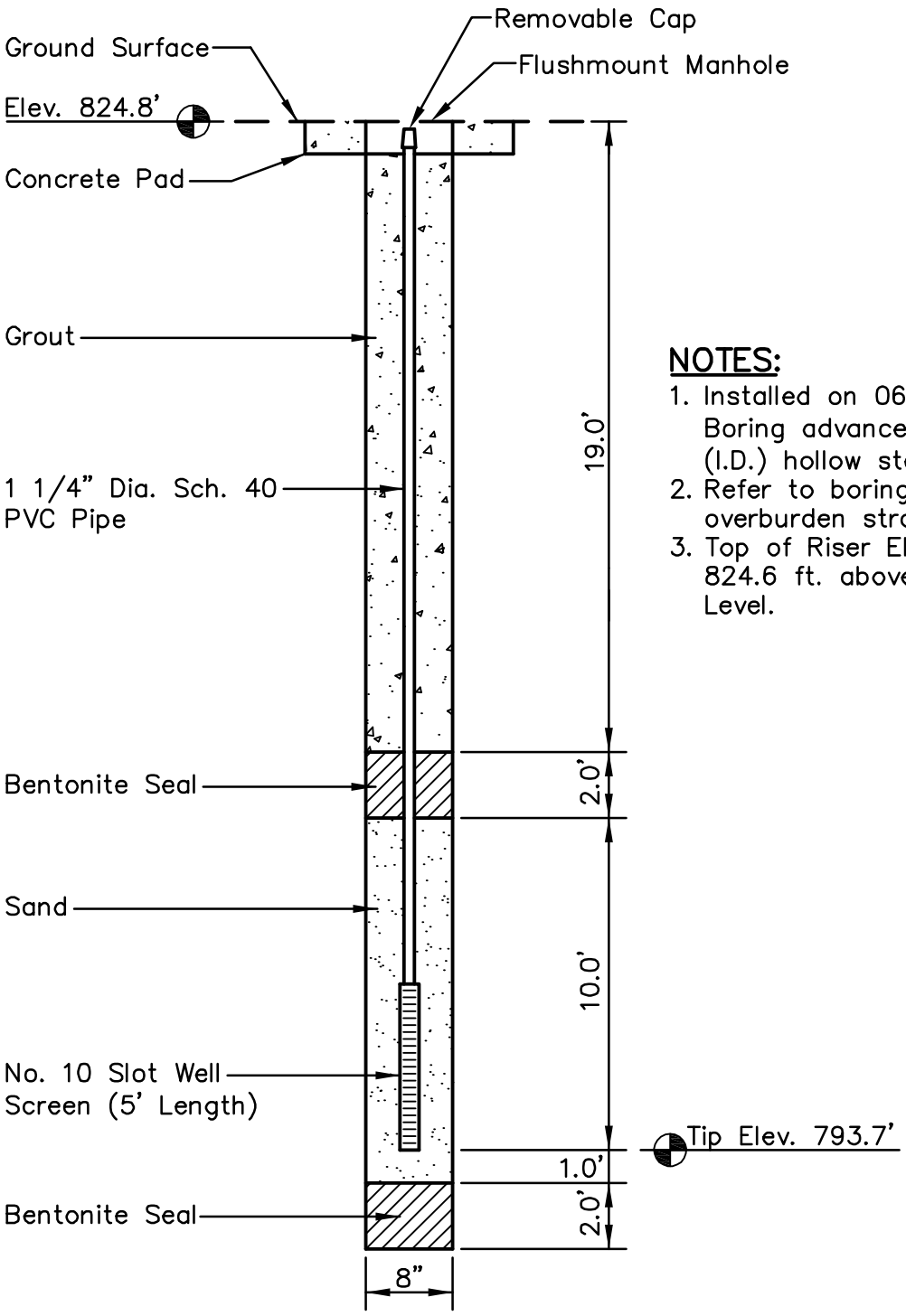

NOTES:

1. Installed on 06/30/2009. Boring advanced with 4.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 824.6 ft. above Mean Sea Level.

PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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LOCATION:

Northing: 591,478.25
Easting: 2,545,990.45
Ground Elevation: 824.8 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-45
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

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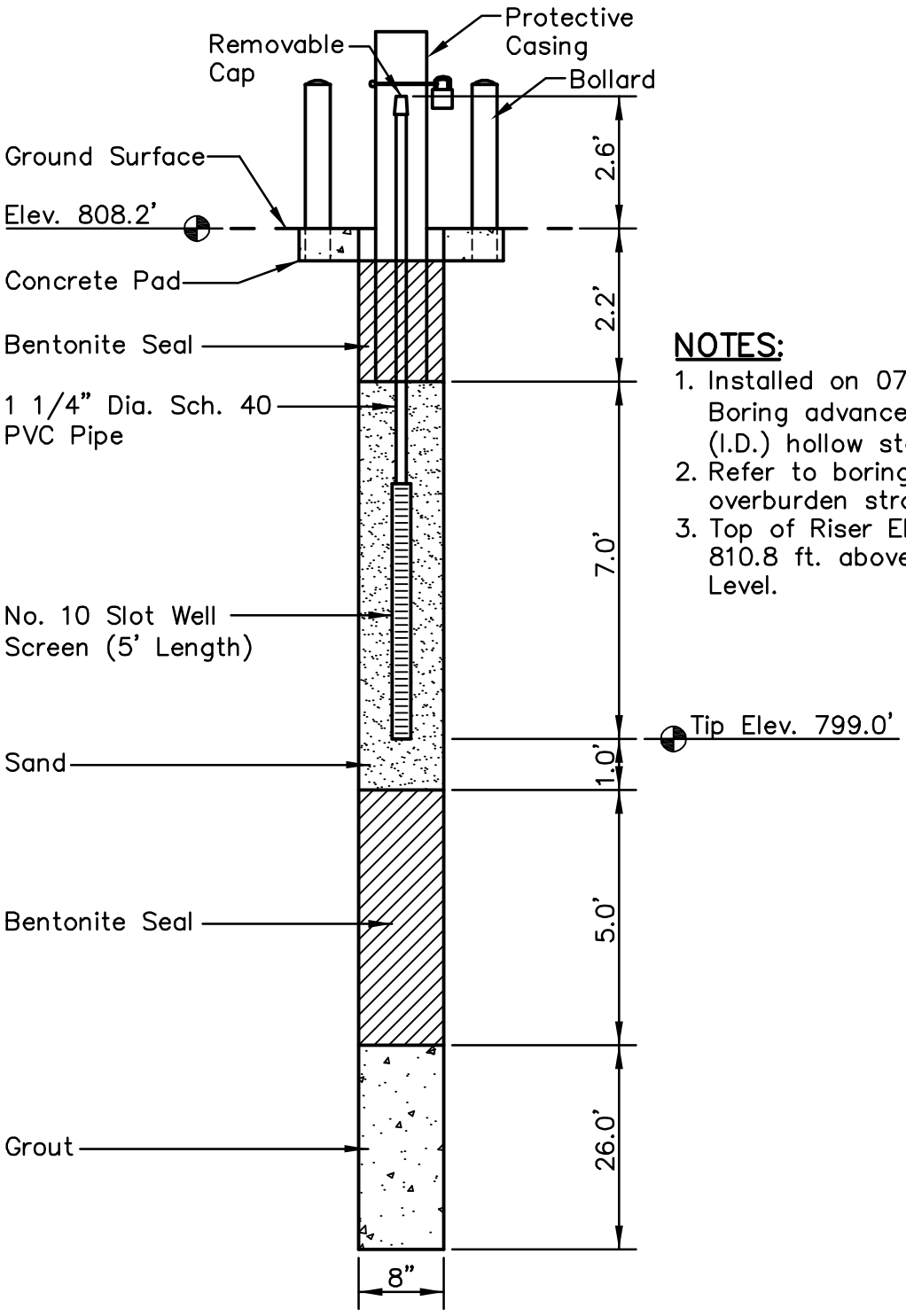

NOTES:

1. Installed on 07/27/2009, Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 810.8 ft. above Mean Sea Level.

LOCATION:

Northing: 591,420.20
Easting: 2,546,001.83
Ground Elevation: 808.2 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-46
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

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PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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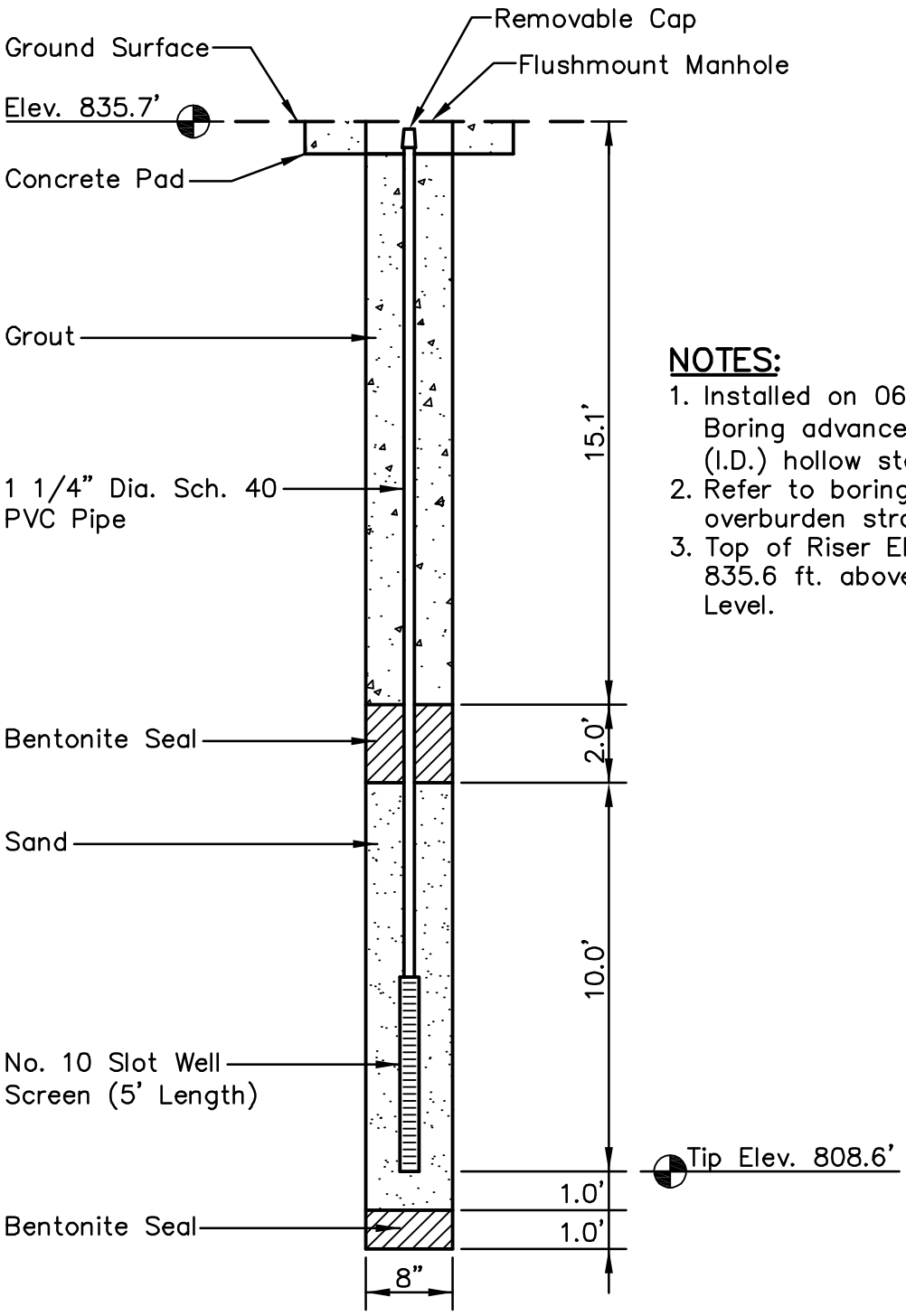

NOTES:

1. Installed on 06/30/2009. Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 835.6 ft. above Mean Sea Level.

PLOT DATE: 02/17/2010 USER: SILPACHARN, PRAYUTH (BILLY)
V:\1726\ACTIVE\172679015\ENVIRONMENTAL\DRAWING\GEOTECH\INSTRUMENT\790158-BRF-301-PZ47.DWG

LOCATION:

Northing: 591,691.40
Easting: 2,546,454.06
Ground Elevation: 835.7 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-47
GYPSUM DISPOSAL AREA 2A
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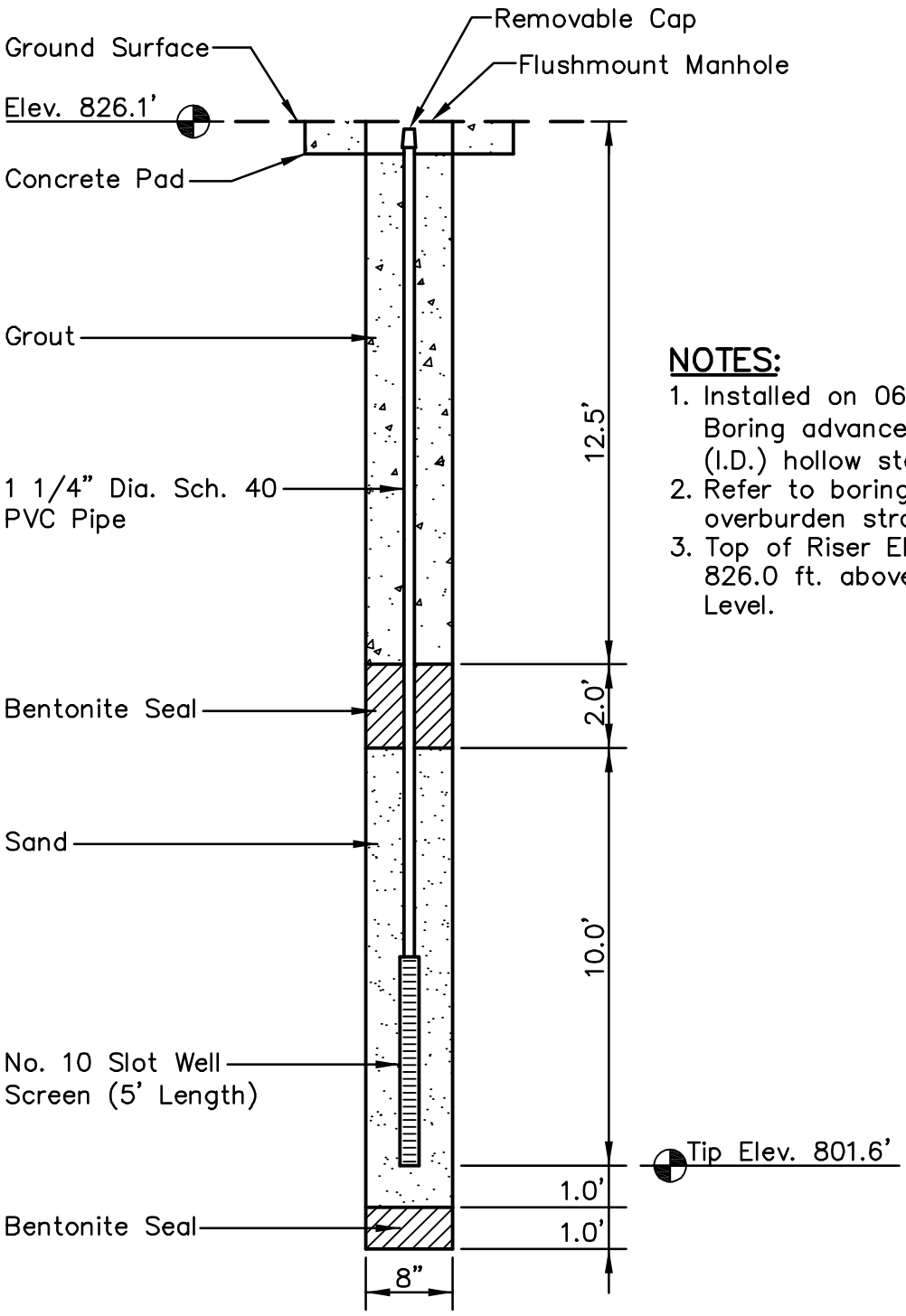

NOTES:

1. Installed on 06/29/2009. Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 826.0 ft. above Mean Sea Level.

PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
V:\1726\ACTIVE\172679015\ENVIRONMENTAL\DRAWING\GEOTECH\INSTRUMENT\790158-BRF-301-PZ48P.DWG

LOCATION:

Northing: 591,636.19
Easting: 2,546,471.30
Ground Elevation: 826.1 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-48P
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

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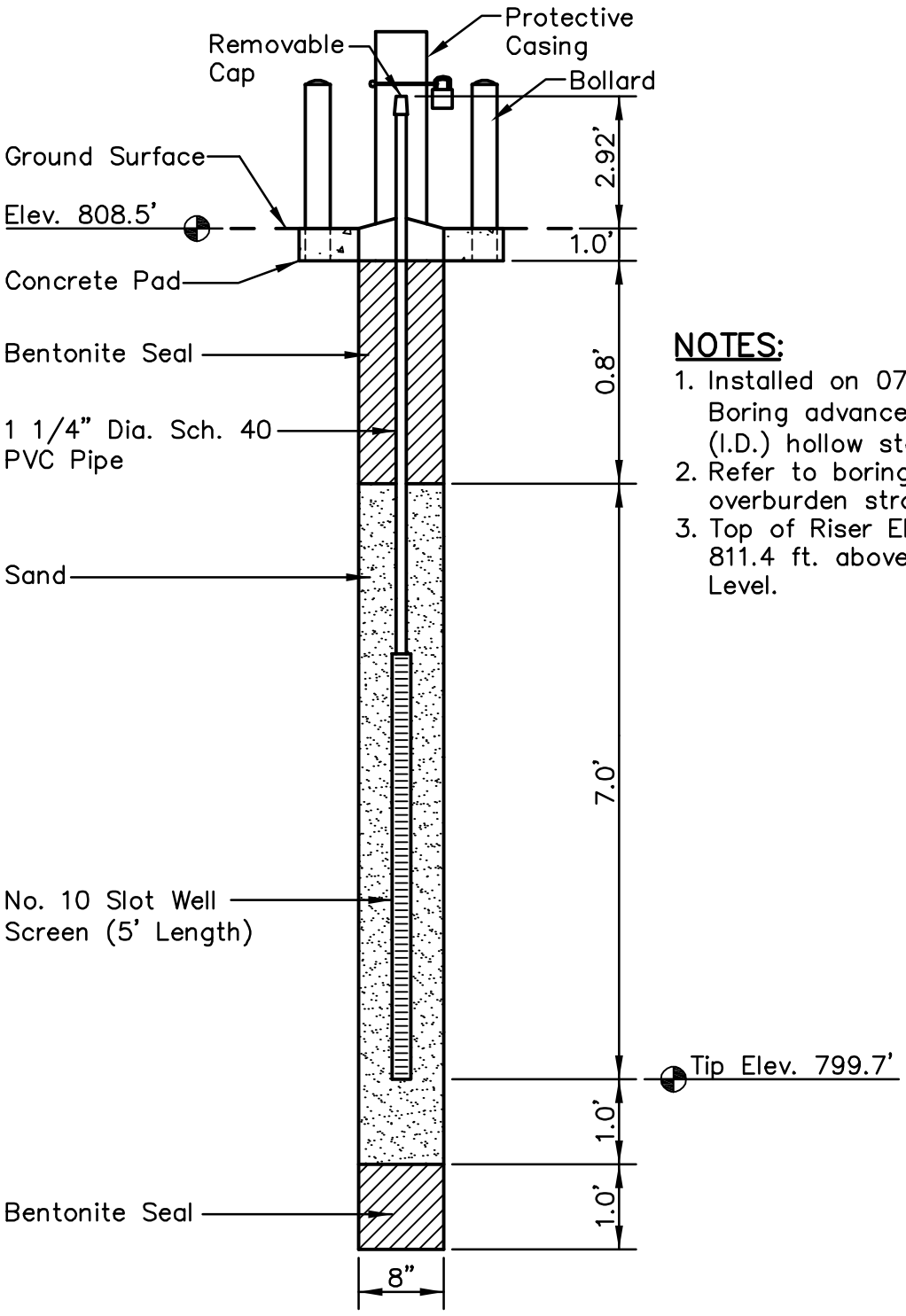

NOTES:

1. Installed on 07/20/2009, Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 811.4 ft. above Mean Sea Level.

LOCATION:

Northing: 591,577.77
Easting: 2,546,496.61
Ground Elevation: 808.5 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-49A
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

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PLOT DATE: 02/17/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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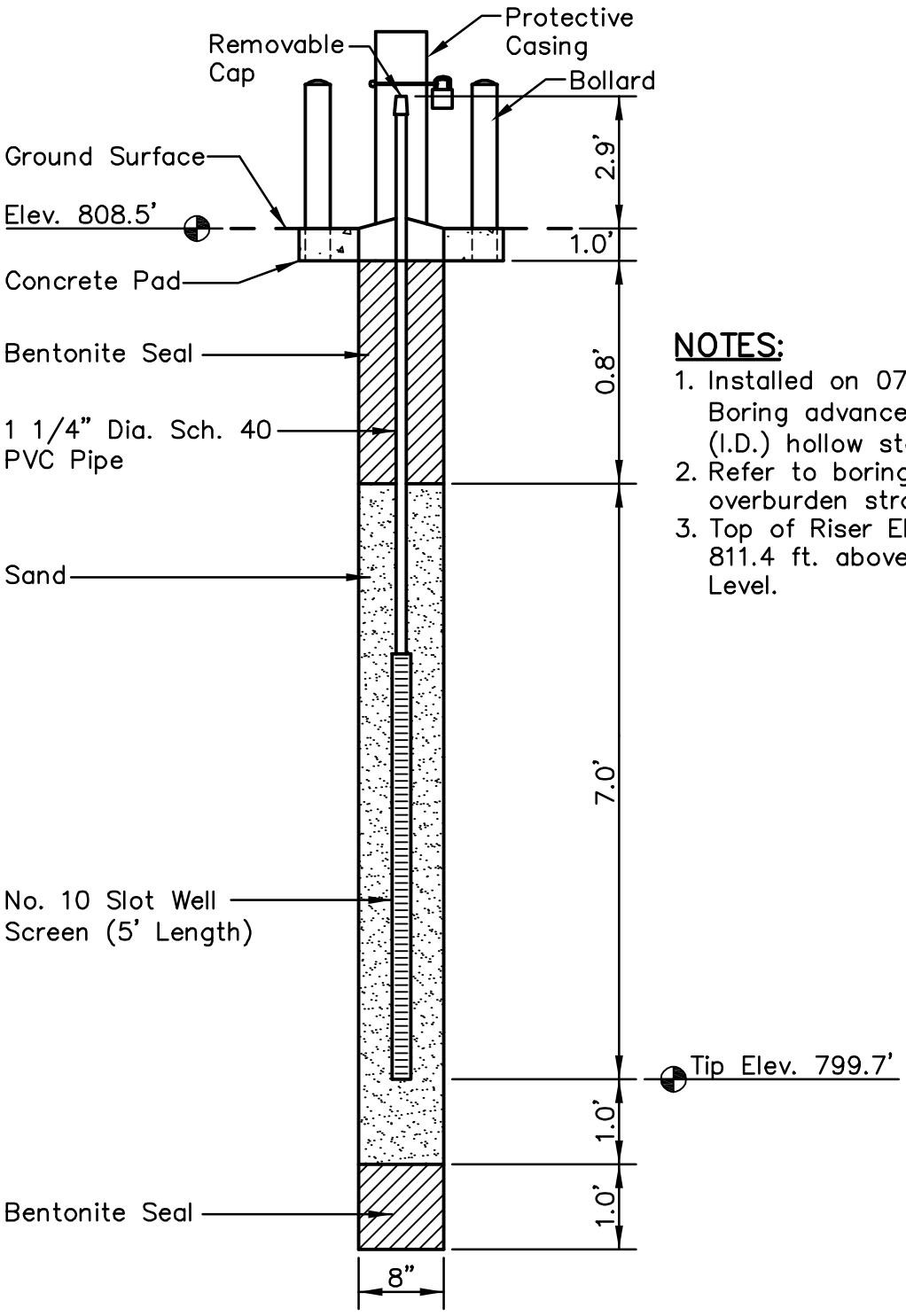

NOTES:

1. Installed on 07/20/2009, Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 811.4 ft. above Mean Sea Level.

LOCATION:

Northing: 591,577.77
Easting: 2,546,496.61
Ground Elevation: 808.5 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-49A
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

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PLOT DATE: 02/18/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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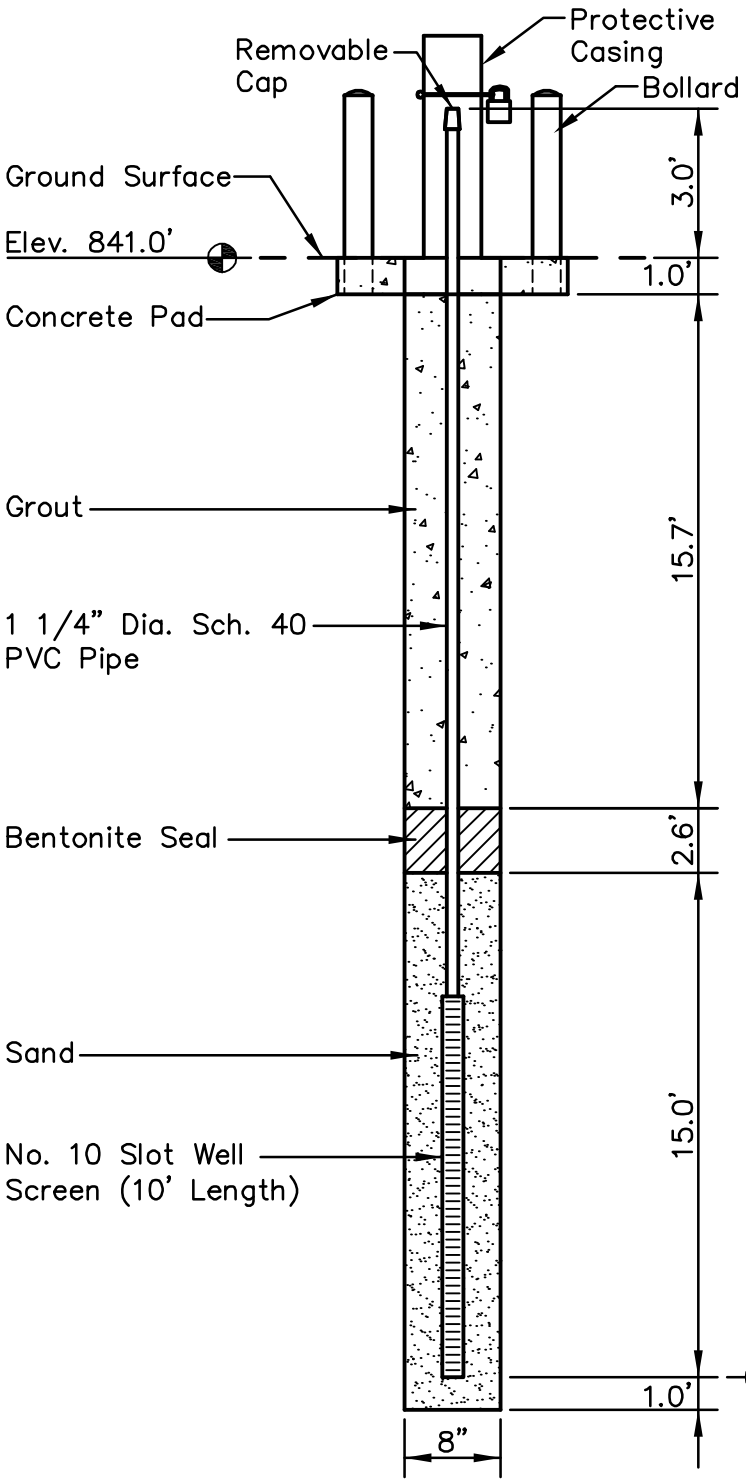

NOTES:

1. Installed on 07/08/2009. Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 844.0 ft. above Mean Sea Level.

LOCATION:

Northing: 594,652.96
Easting: 2,544,484.24
Ground Elevation: 841.0 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-5
BOTTOM ASH DISPOSAL AREA 1
BULL RUN FOSSIL PLANT

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PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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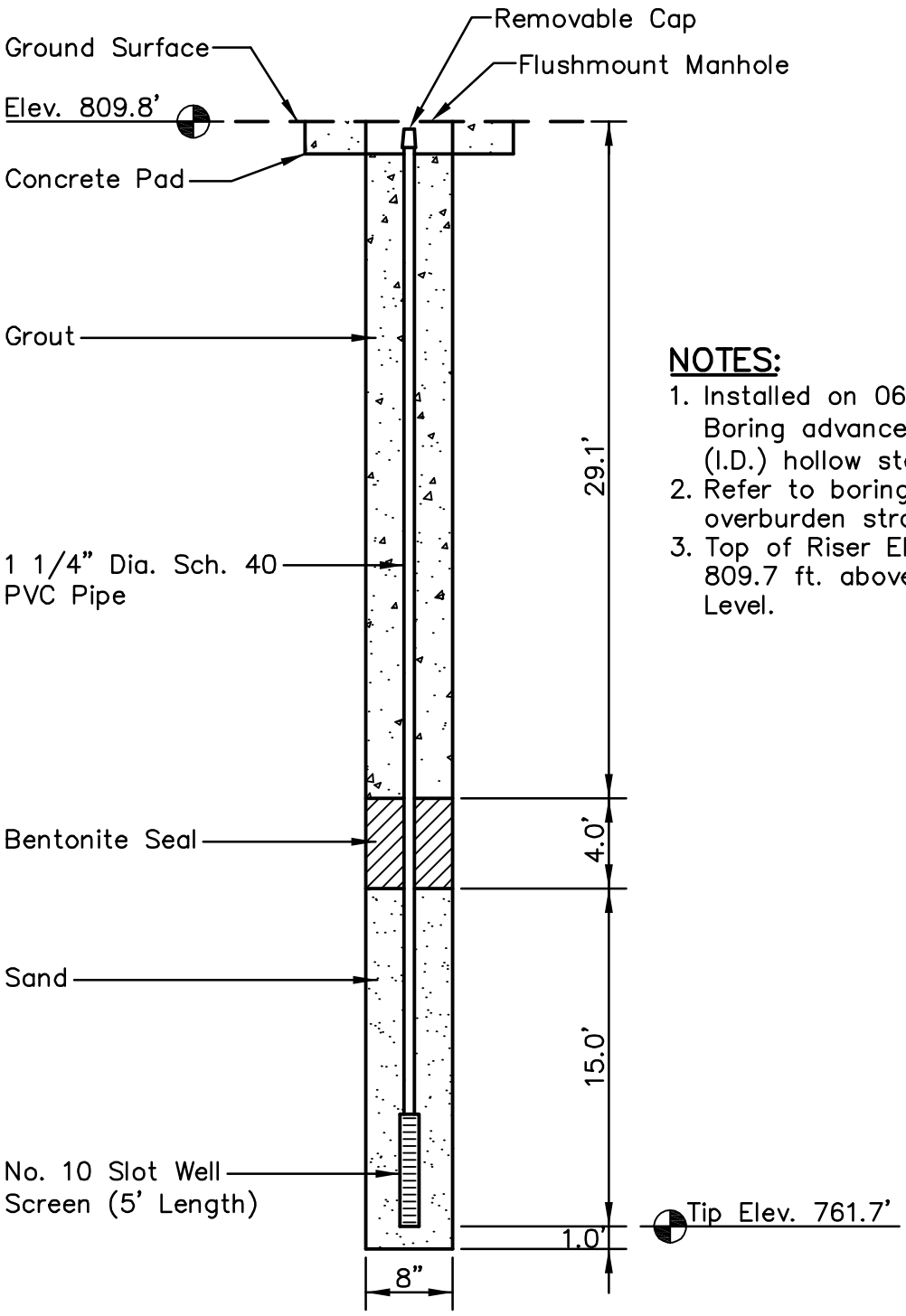

NOTES:

1. Installed on 06/15/2009. Boring advanced with 4.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 809.7 ft. above Mean Sea Level.

LOCATION:

Northing: 591,336.60
Easting: 2,545,543.56
Ground Elevation: 809.8 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-51
MAIN ASH POND AREA 2
BULL RUN FOSSIL PLANT

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PLOT DATE: 02/18/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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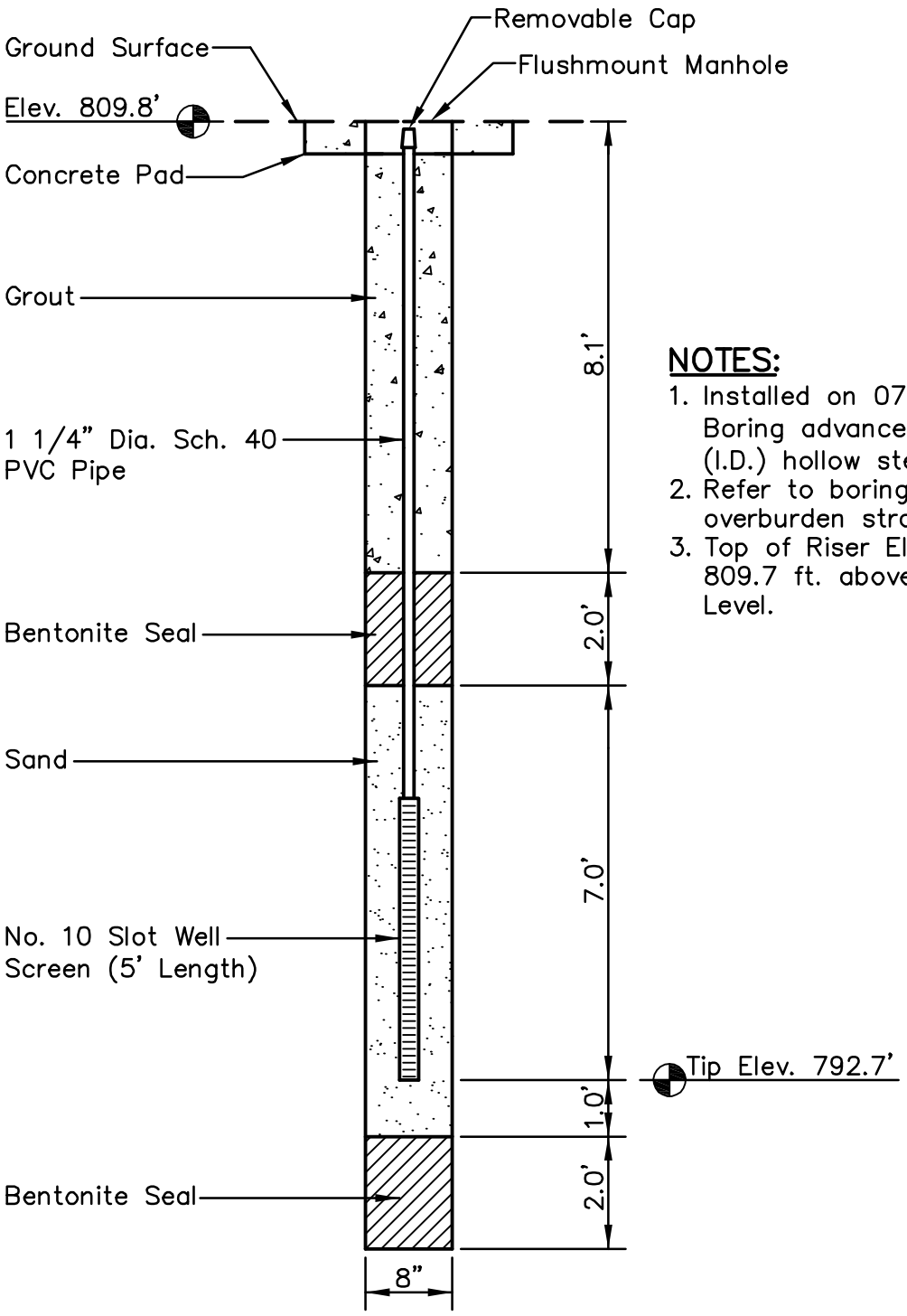

NOTES:

1. Installed on 07/14/2009. Boring advanced with 4.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 809.7 ft. above Mean Sea Level.

PLOT DATE: 02/18/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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LOCATION:

Northing: 591,329.16
Easting: 2,545,545.06
Ground Elevation: 809.8 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-51A
MAIN ASH POND AREA 2
BULL RUN FOSSIL PLANT

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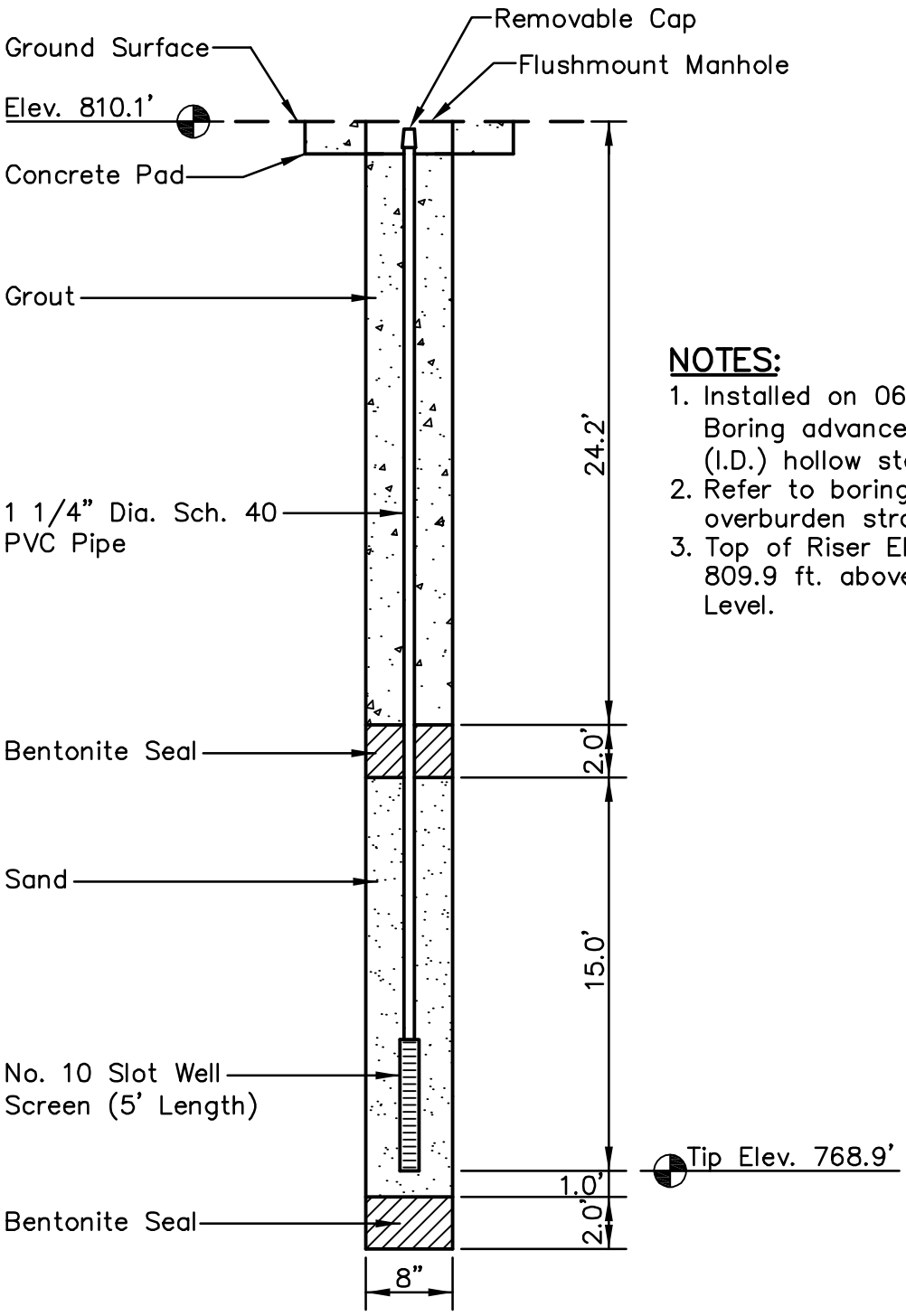

NOTES:

1. Installed on 06/17/2009. Boring advanced with 4.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 809.9 ft. above Mean Sea Level.

LOCATION:

Northing: 590,589.87
Easting: 2,545,693.73
Ground Elevation: 810.1 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-55
MAIN ASH POND AREA 2
BULL RUN FOSSIL PLANT

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PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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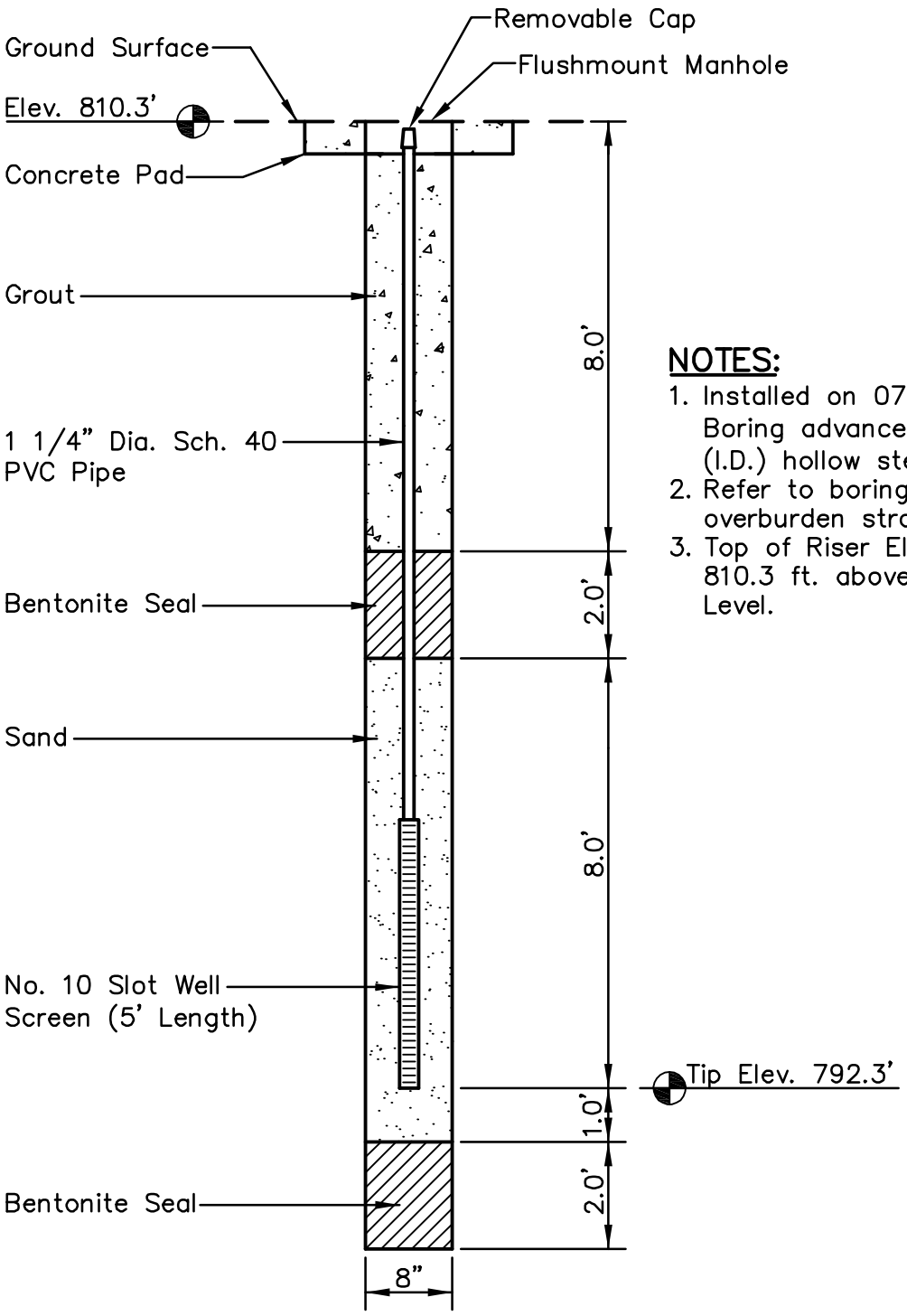

NOTES:

1. Installed on 07/14/2009. Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 810.3 ft. above Mean Sea Level.

PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
V:\1726\ACTIVE\172679015\ENVIRONMENTAL\DRAWING\GEOTECH\INSTRUMENT\790158-BRF-301-PZ55A.DWG

LOCATION:

Northing: 590,581.12
Easting: 2,545,694.58
Ground Elevation: 810.3 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-55A
MAIN ASH POND AREA 2
BULL RUN FOSSIL PLANT

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
Nashville, Tennessee
37027-5044
615-885-1144
www.stantec.com

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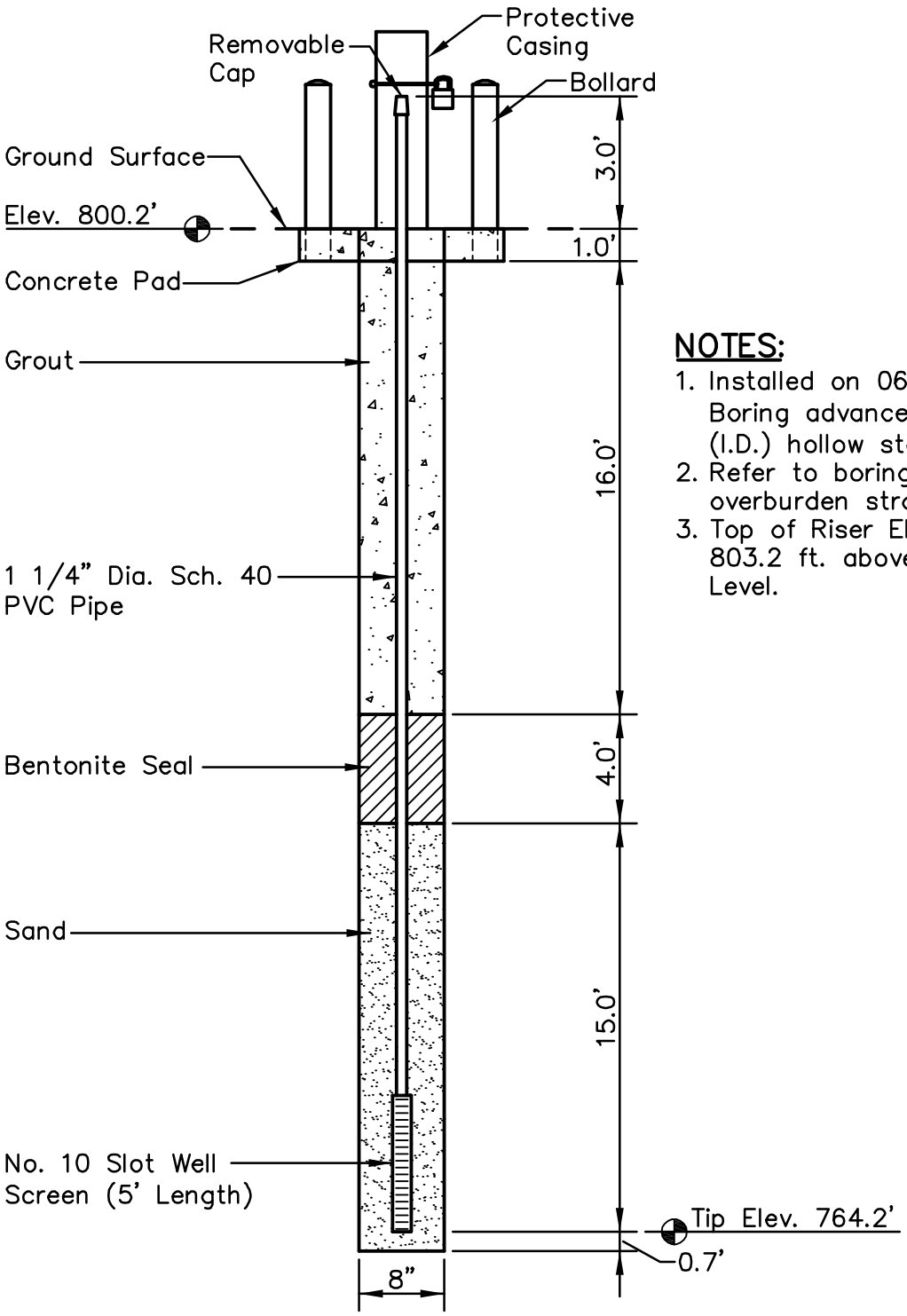
CHECKED BY	PHW	PROJ. NO.	172679015	1.	3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2.	4.	



NOTES:

1. Installed on 06/08/2009, Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 803.2 ft. above Mean Sea Level.

PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
V:\1726\ACTIVE\172679015\ENVIRONMENTAL\DRAWING\GEOTECH\INSTRUMENT\790158-BRF-301-PZ56.DWG

LOCATION:

Northing: 590,580.44
Easting: 2,545,673.06
Ground Elevation: 800.2 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-56
MAIN ASH POND AREA 2
BULL RUN FOSSIL PLANT

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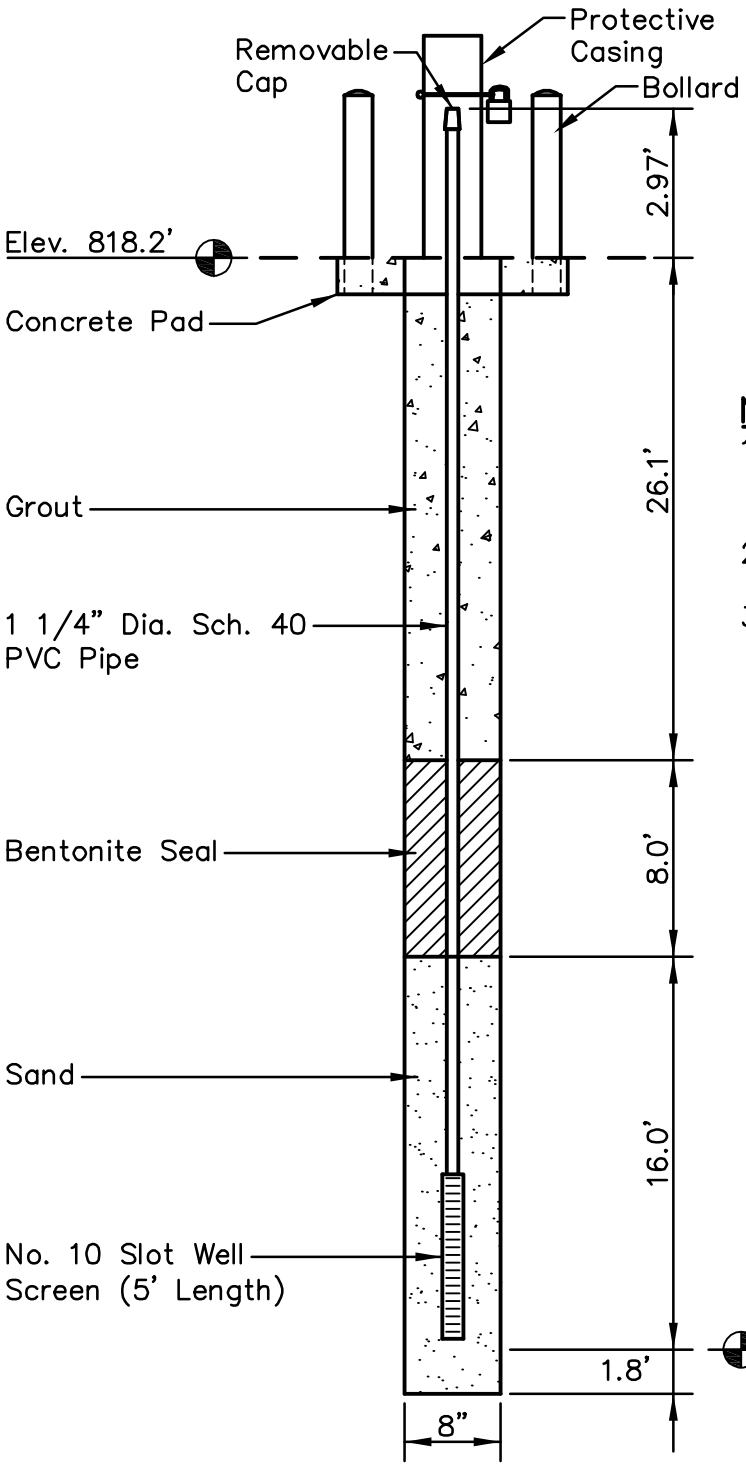
CHECKED BY	PHW	PROJ. NO.	172679015	1.	3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2.	4.	



NOTES:

1. Installed on 06/23/2009. Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 821.2 ft. above Mean Sea Level.

LOCATION:

Northing: 594,610.05
Easting: 2,544,394.75
Ground Elevation: 818.2 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-6
BOTTOM ASH DISPOSAL AREA 1
BULL RUN FOSSIL PLANT

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Nashville, Tennessee
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CHECKED BY	PHW	PROJ. NO.	172679015	1. 3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 02/18/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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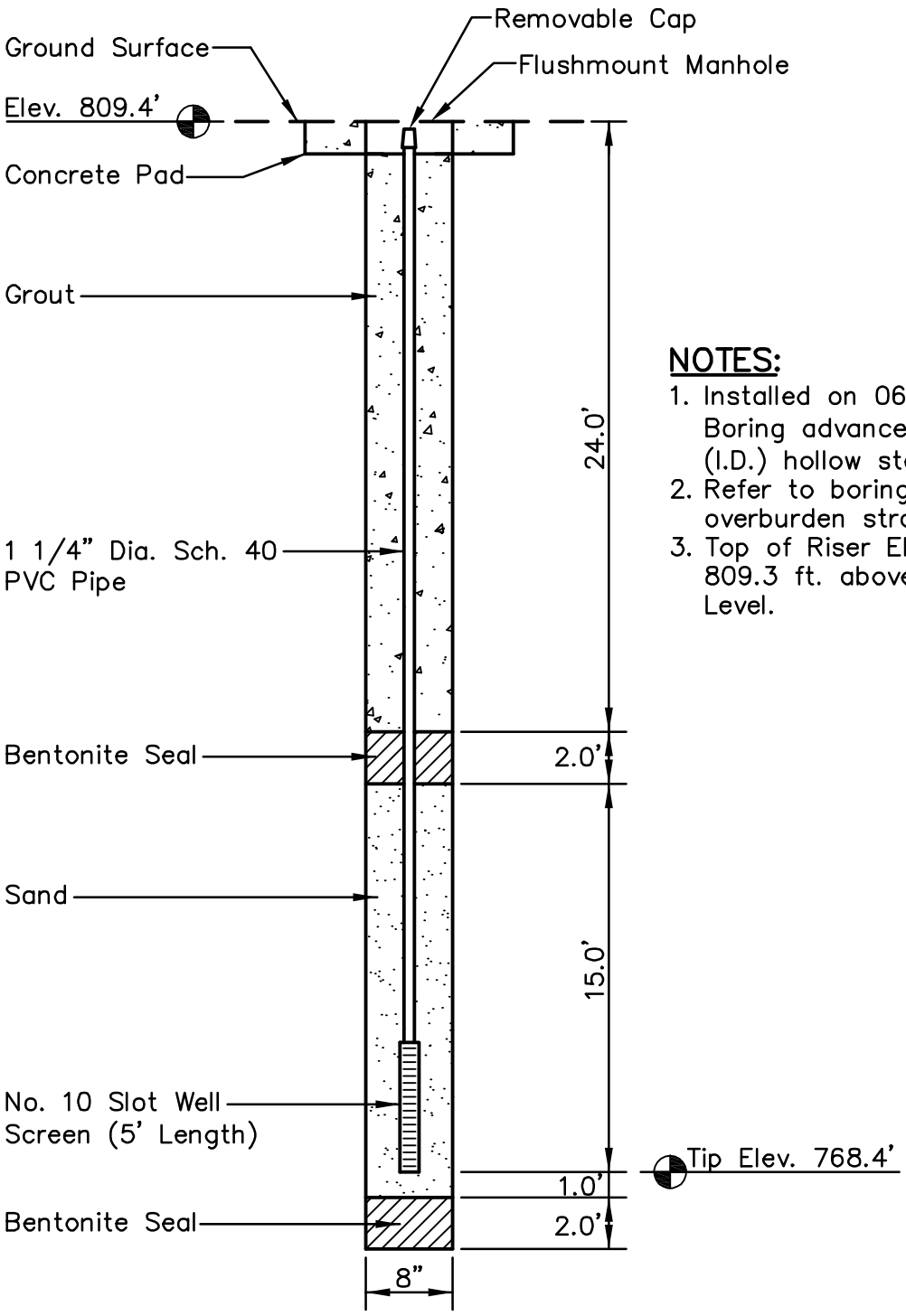

NOTES:

1. Installed on 06/09/2009. Boring advanced with 4.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 809.3 ft. above Mean Sea Level.

LOCATION:

Northing: 590,000.07
Easting: 2,546,208.94
Ground Elevation: 809.4 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-62
MAIN ASH POND AREA 2
BULL RUN FOSSIL PLANT

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CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 02/18/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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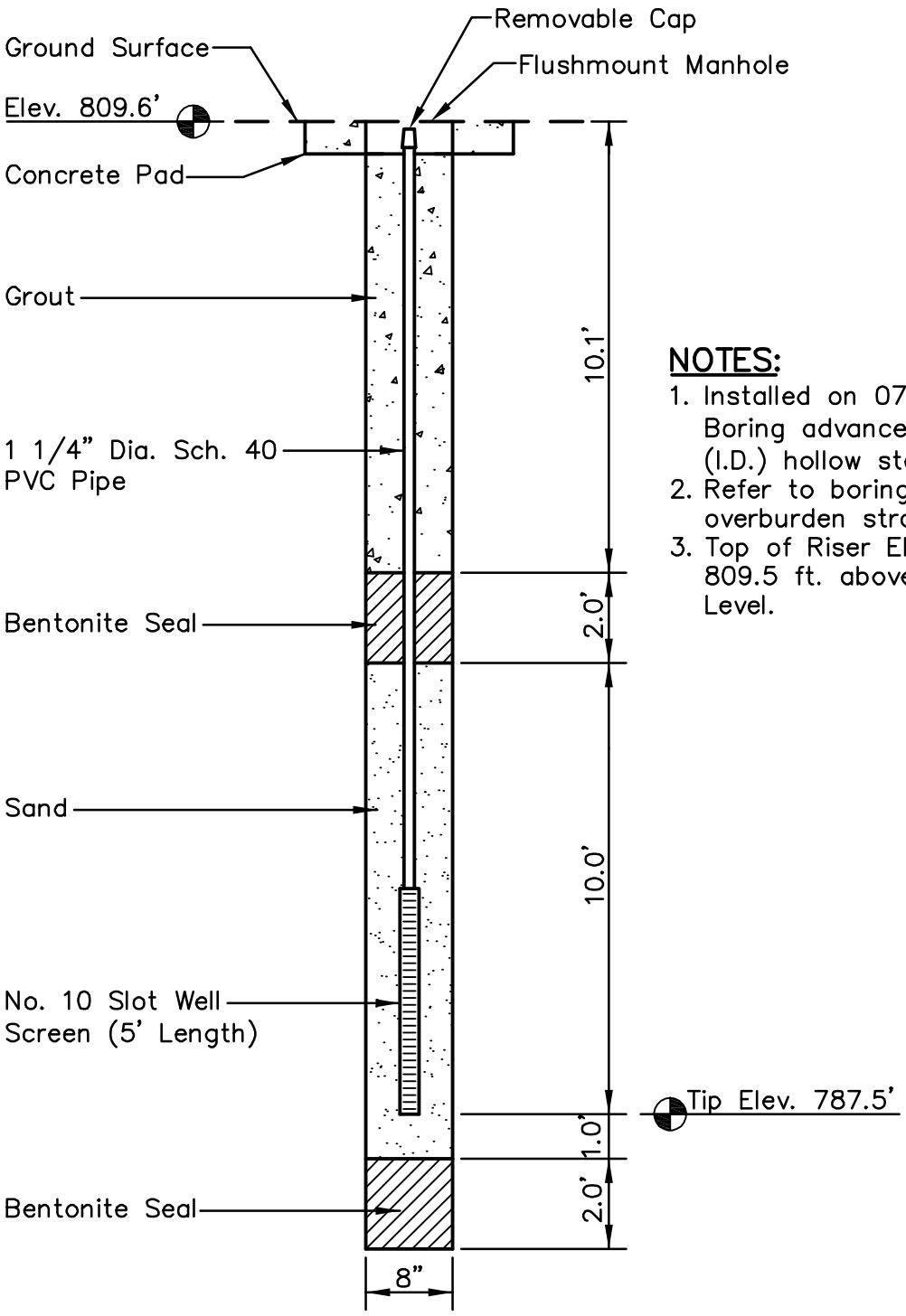

NOTES:

1. Installed on 07/14/2009. Boring advanced with 4.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 809.5 ft. above Mean Sea Level.

LOCATION:

Northing: 590,004.50
Easting: 2,546,211.20
Ground Elevation: 809.6 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-62A
MAIN ASH POND AREA 2
BULL RUN FOSSIL PLANT

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100 Westwood Pl., Ste. 420
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CHECKED BY	PHW	PROJ. NO.	172679015	1. 3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 02/18/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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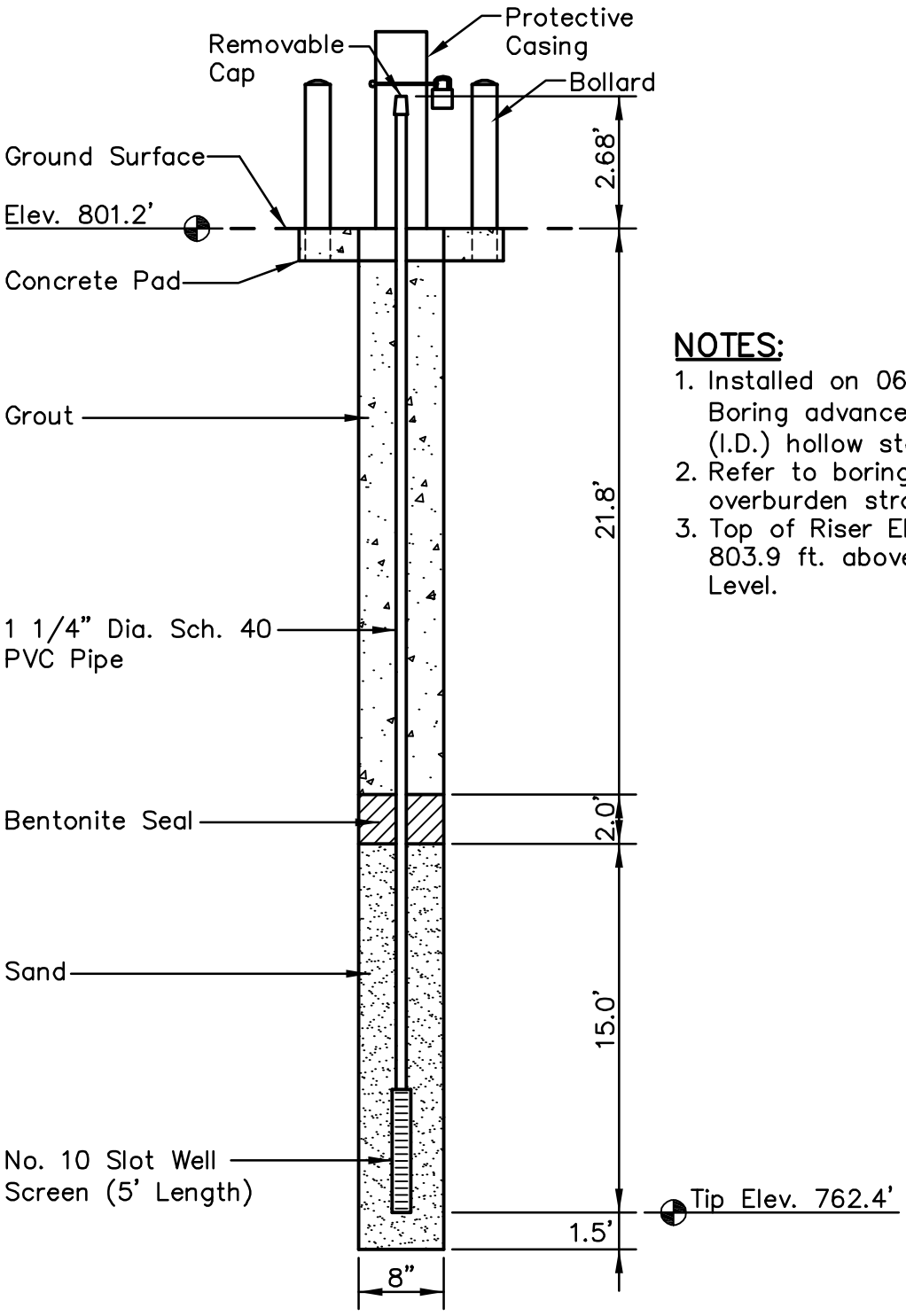

NOTES:

1. Installed on 06/10/2009, Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 803.9 ft. above Mean Sea Level.

LOCATION:

Northing: 589,989.70
Easting: 2,546,223.76
Ground Elevation: 801.2 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-63
MAIN ASH POND AREA 2
BULL RUN FOSSIL PLANT

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CHECKED BY	PHW	PROJ. NO.	172679015	1. 3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 02/18/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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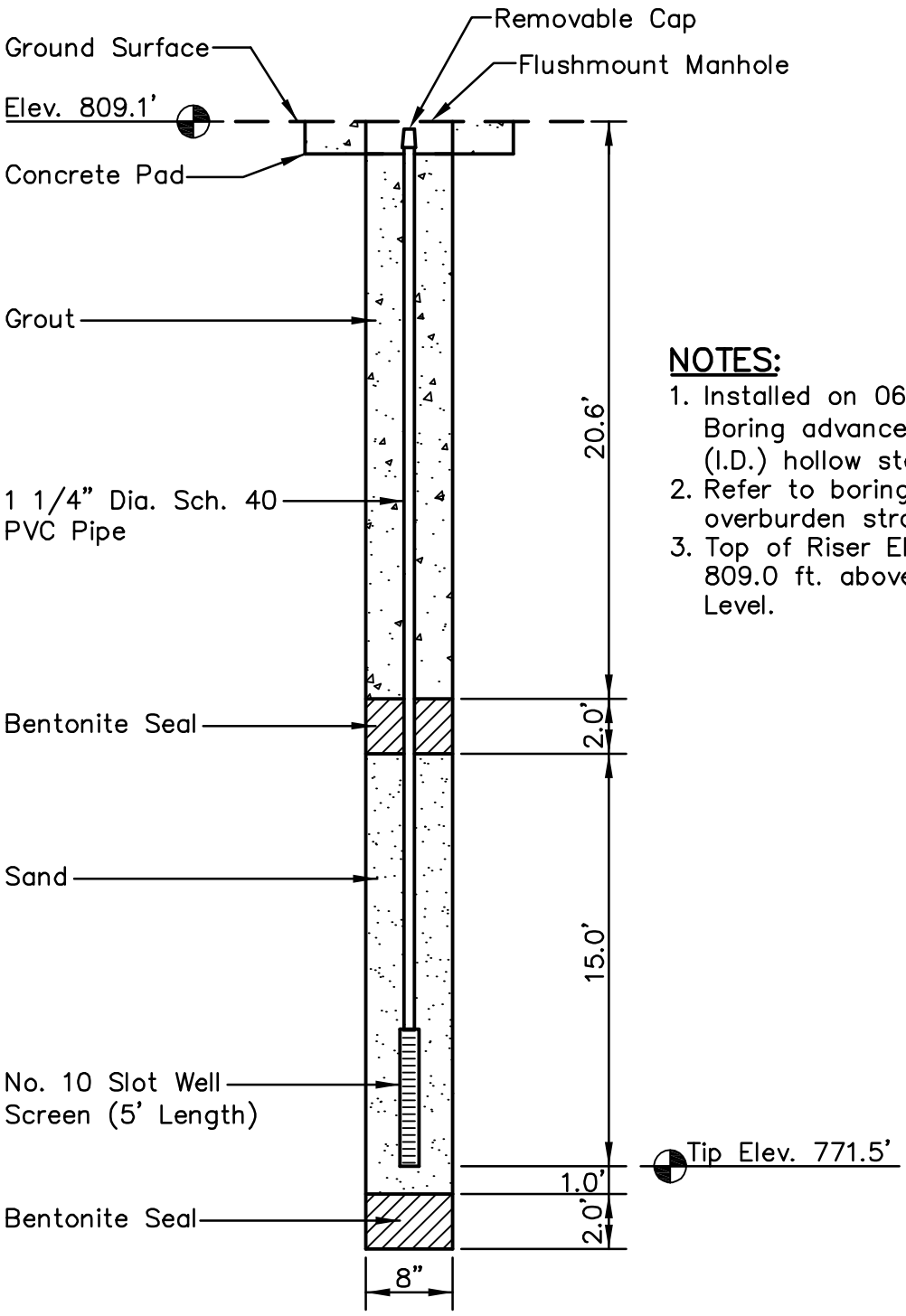

NOTES:

1. Installed on 06/10/2009. Boring advanced with 4.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 809.0 ft. above Mean Sea Level.

LOCATION:

Northing: 590,472.00
Easting: 2,546,579.19
Ground Elevation: 809.1 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-65
MAIN ASH POND AREA 2
BULL RUN FOSSIL PLANT

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CHECKED BY	PHW	PROJ. NO.	172679015	1. 3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 02/18/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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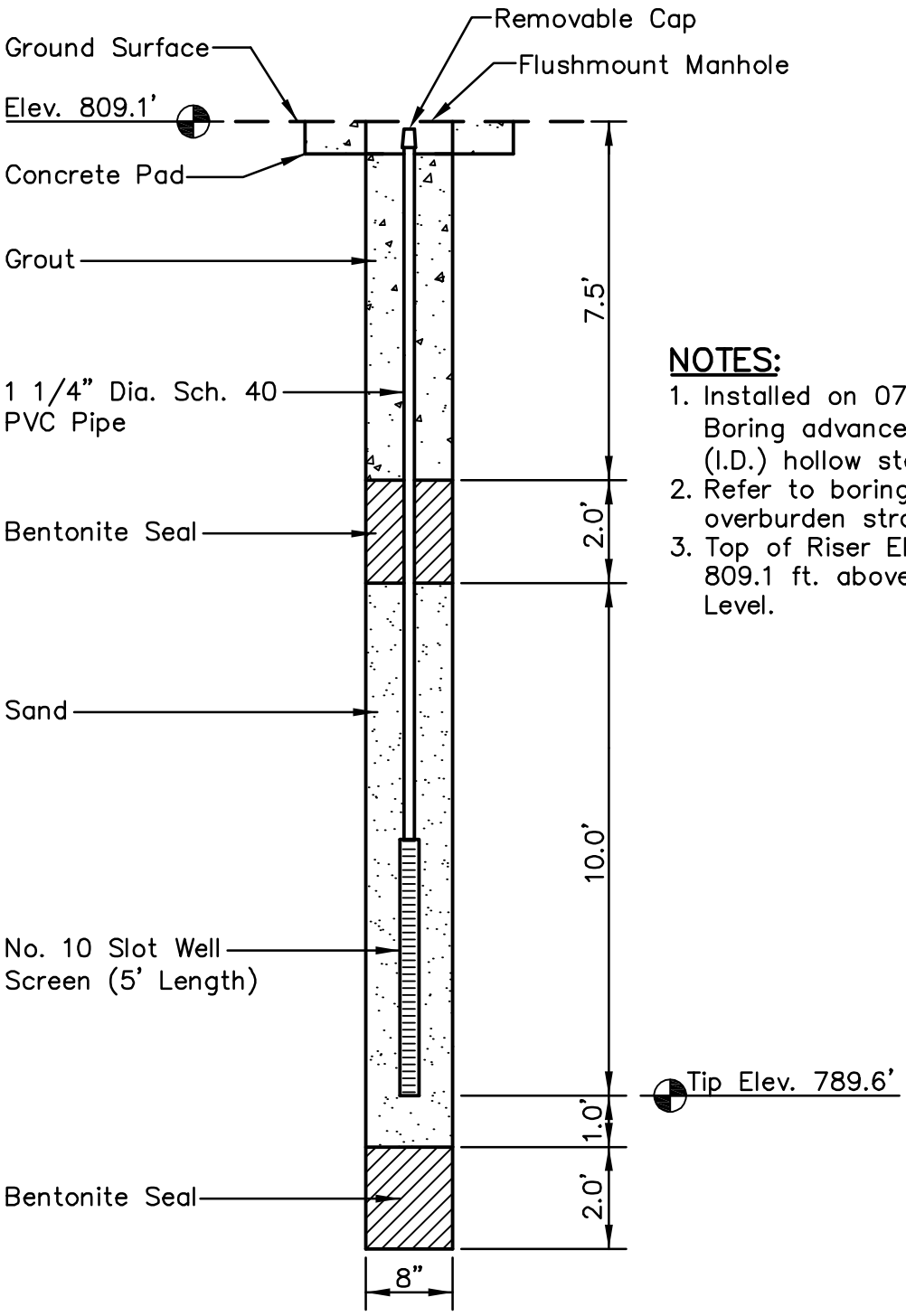

NOTES:

1. Installed on 07/14/2009. Boring advanced with 4.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 809.1 ft. above Mean Sea Level.

LOCATION:

Northing: 590,474.38
Easting: 2,546,581.37
Ground Elevation: 809.1 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-65A
MAIN ASH POND AREA 2
BULL RUN FOSSIL PLANT

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CHECKED BY	PHW	PROJ. NO.	172679015	1.	3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2.	4.	

PLOT DATE: 02/18/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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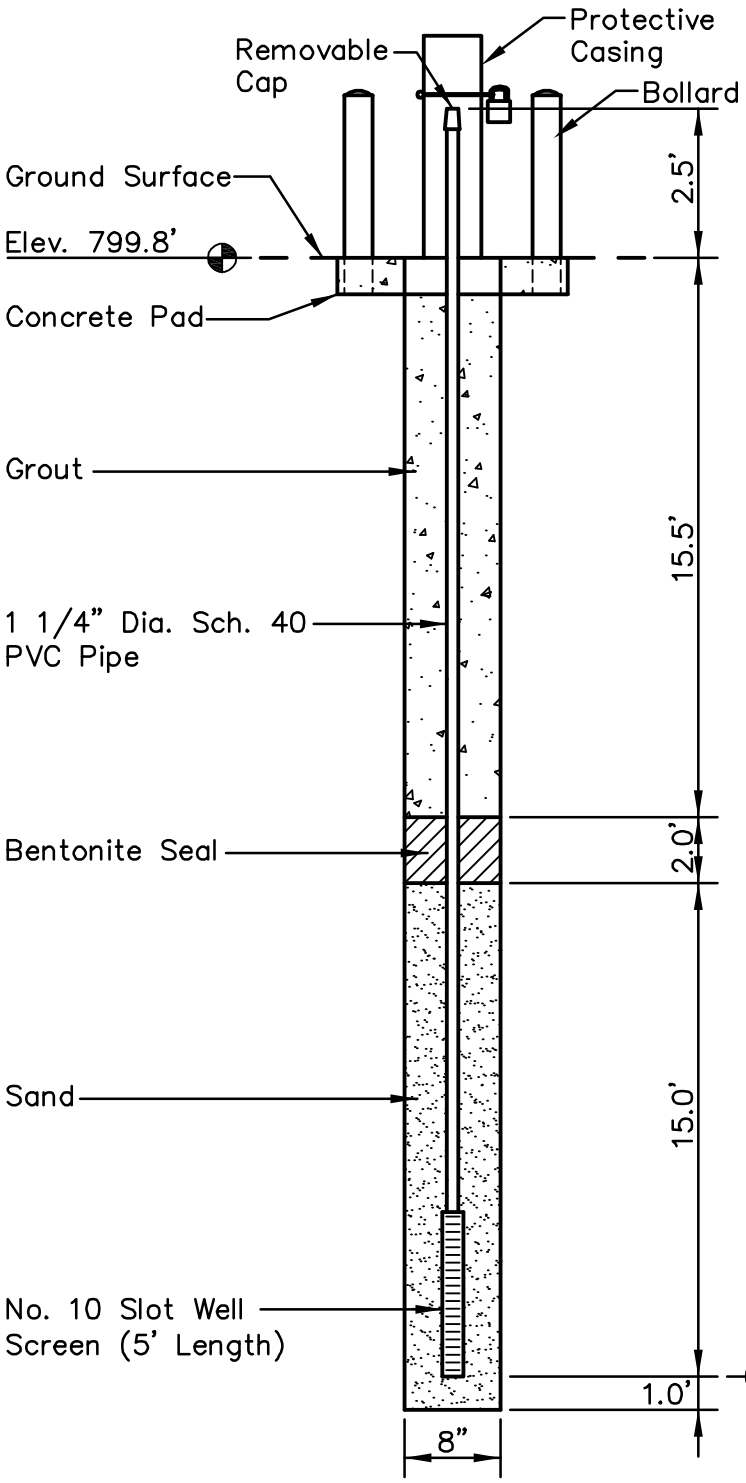

NOTES:

1. Installed on 06/09/2009, Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 802.3 ft. above Mean Sea Level.

LOCATION:

Northing: 590,462.23
Easting: 2,546,593.73
Ground Elevation: 799.8 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-66
MAIN ASH POND AREA 2
BULL RUN FOSSIL PLANT

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CHECKED BY	PHW	PROJ. NO.	172679015	1. 3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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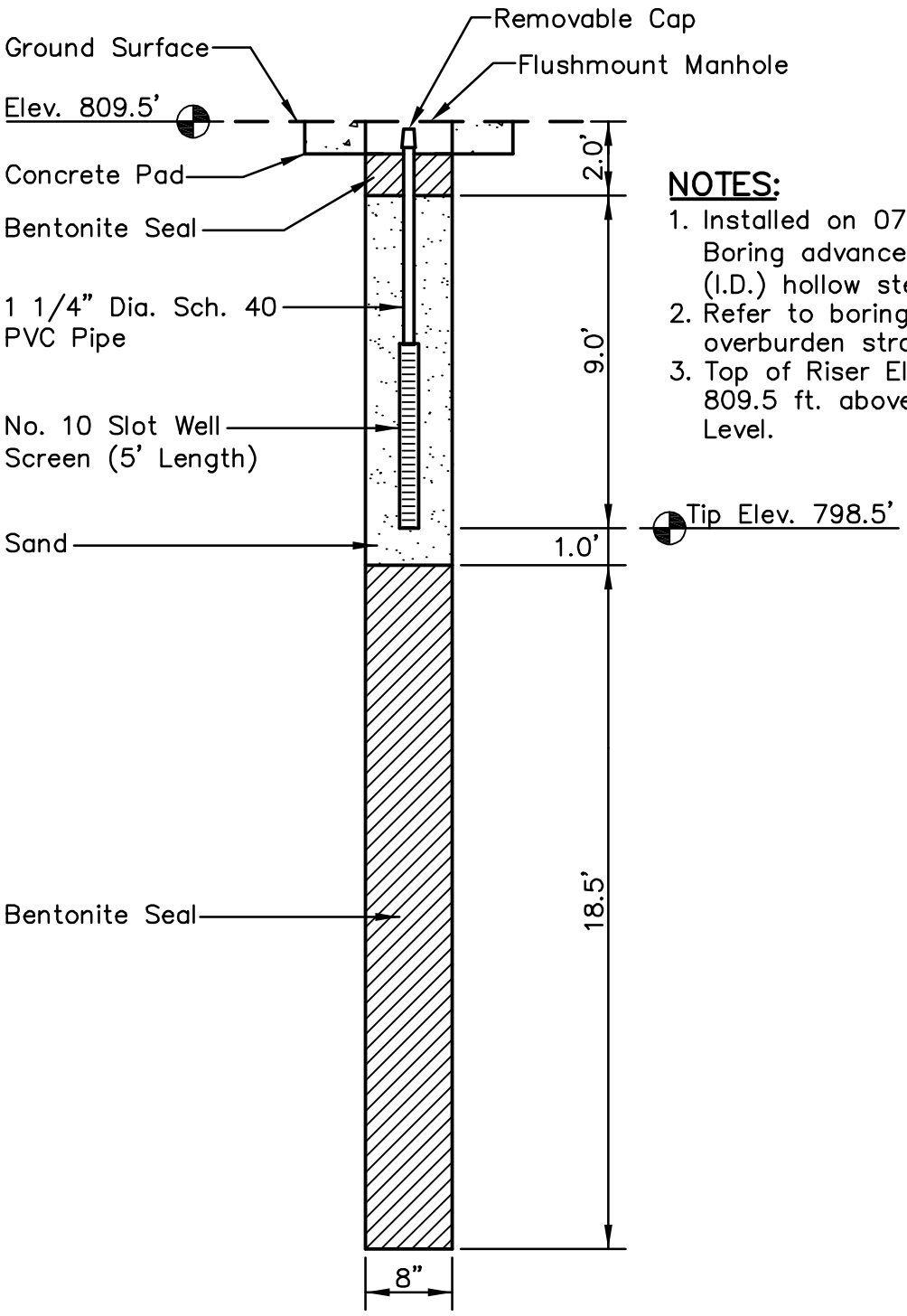

NOTES:

1. Installed on 07/02/2009. Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 809.5 ft. above Mean Sea Level.

LOCATION:

Northing: 590,946.92
Easting: 2,546,949.33
Ground Elevation: 809.5 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-67
MAIN ASH POND AREA 2
BULL RUN FOSSIL PLANT

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
Nashville, Tennessee
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DRAWN BY	BFS	DATE	AUG., 2009	REVISED		SHEET
CHECKED BY	PHW	PROJ. NO.	172679015	1.	3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2.	4.	

PLOT DATE: 02/18/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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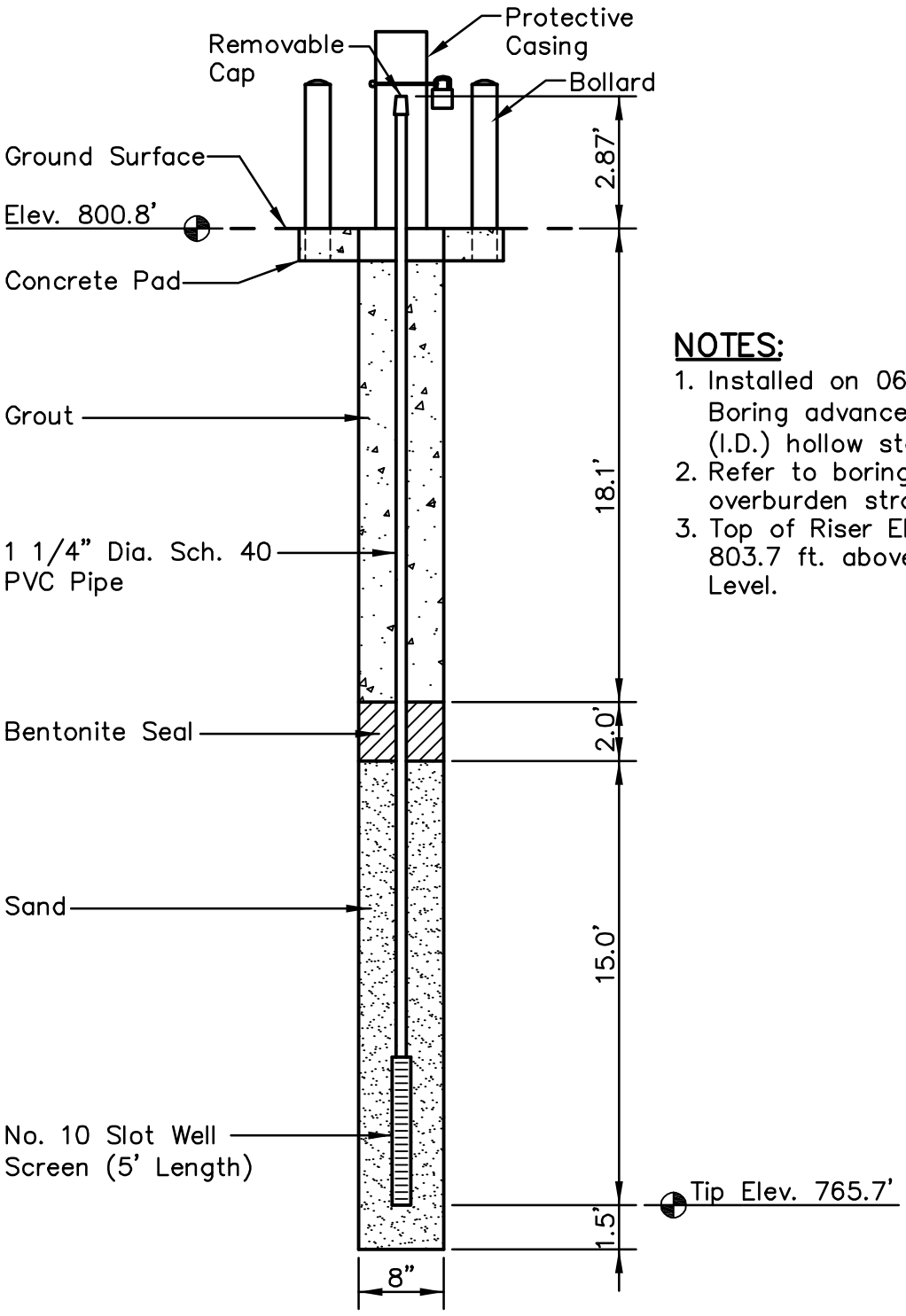

NOTES:

1. Installed on 06/09/2009, Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 803.7 ft. above Mean Sea Level.

LOCATION:

Northing: 590,938.03
Easting: 2,546,963.83
Ground Elevation: 800.8 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-68
MAIN ASH POND AREA 2
BULL RUN FOSSIL PLANT

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CHECKED BY	PHW	PROJ. NO.	172679015	1. 3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 02/18/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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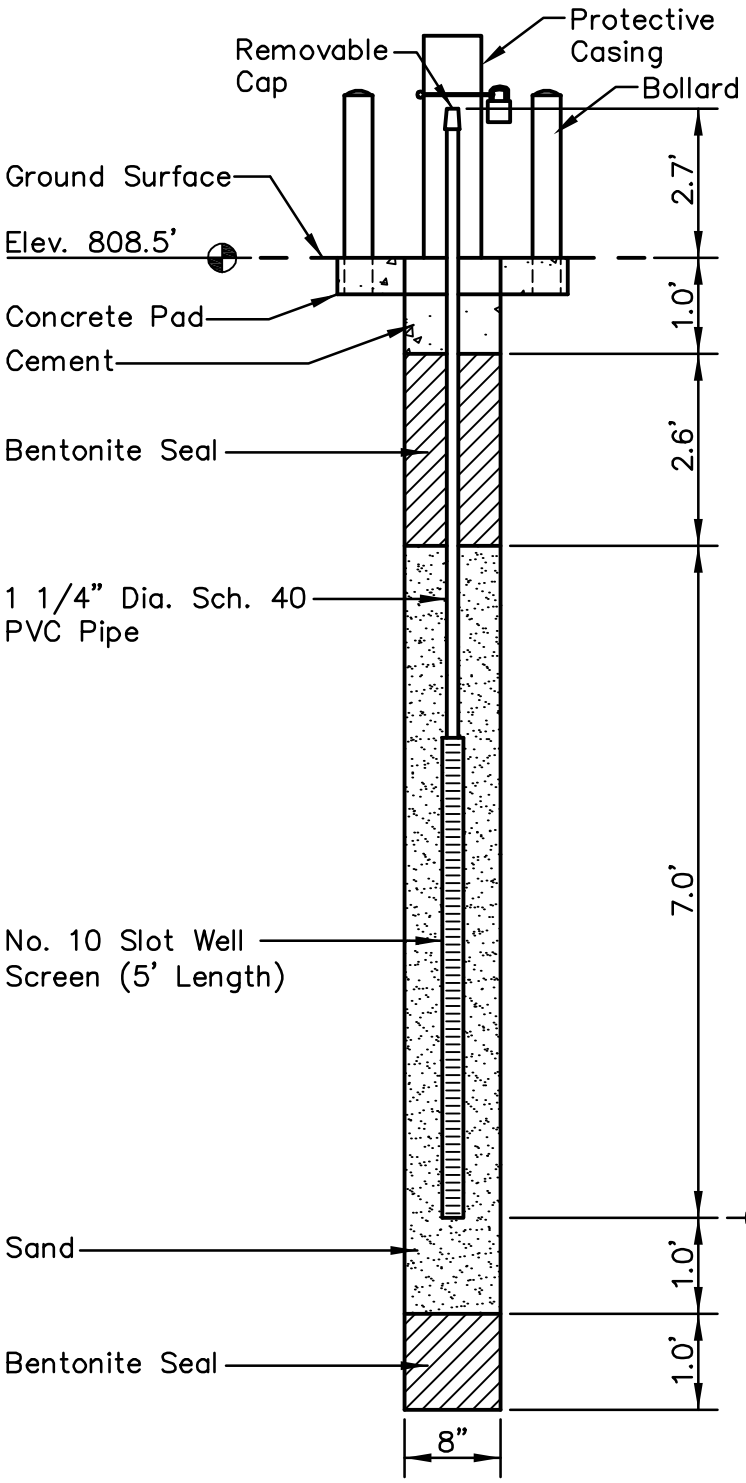

NOTES:

1. Installed on 08/04/2009, Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 811.2 ft. above Mean Sea Level.

LOCATION:

Northing: 591,494.07
Easting: 2,546,236.74
Ground Elevation: 808.5 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-88A
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

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CHECKED BY	PHW	PROJ. NO.	172679015	1. 3.	1 OF 1
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PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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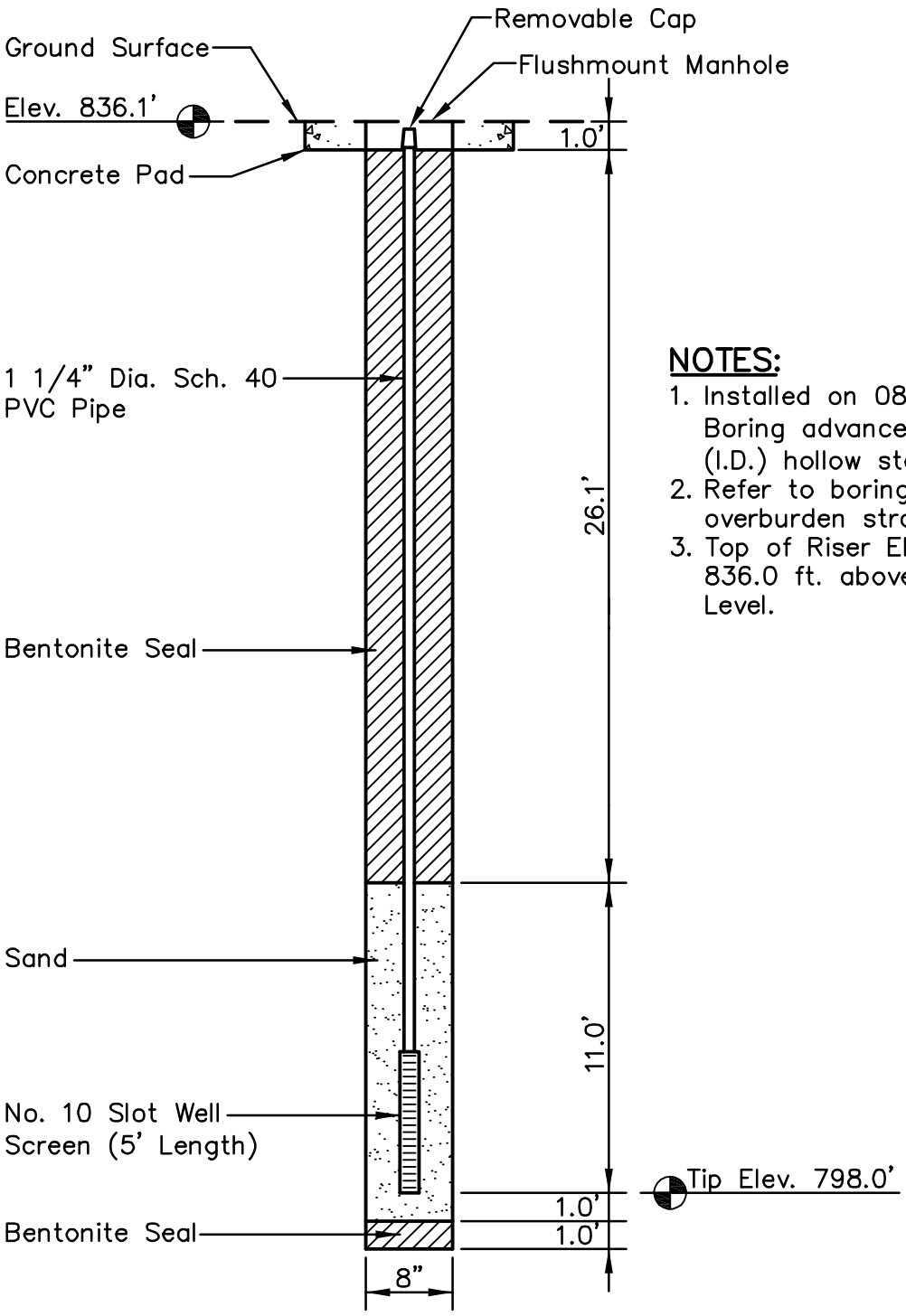

NOTES:

1. Installed on 08/06/2009. Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 836.0 ft. above Mean Sea Level.

LOCATION:

Northing: 593,192.06
Easting: 2,545,830.78
Ground Elevation: 836.1 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-89
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

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CHECKED BY	PHW	PROJ. NO.	172679015	1. 3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 02/17/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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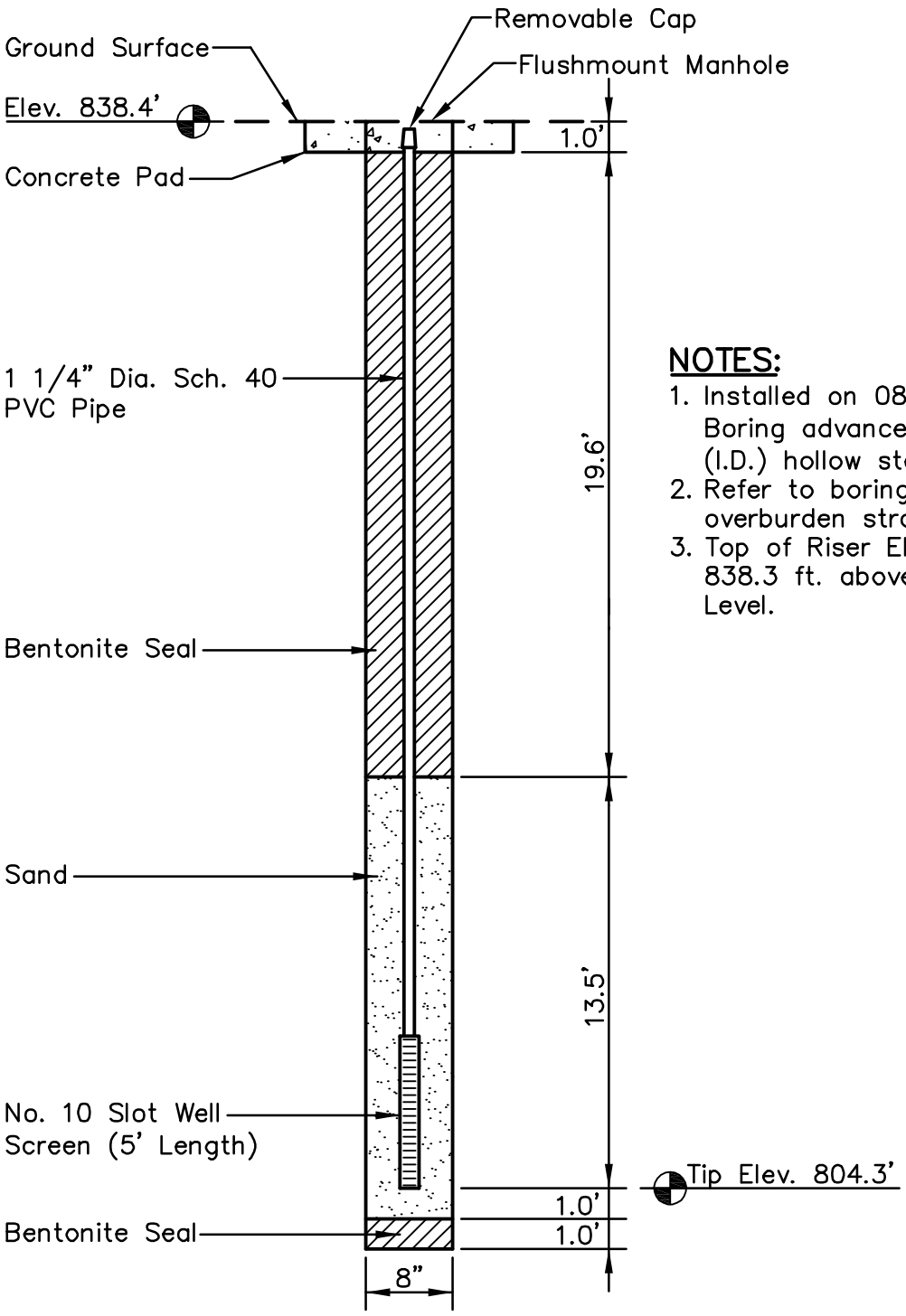

NOTES:

1. Installed on 08/06/2009. Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.
3. Top of Riser Elevation = 838.3 ft. above Mean Sea Level.

LOCATION:

Northing: 593,043.65
Easting: 2,545,471.40
Ground Elevation: 838.4 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

PIEZOMETER STN-90
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

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CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 02/18/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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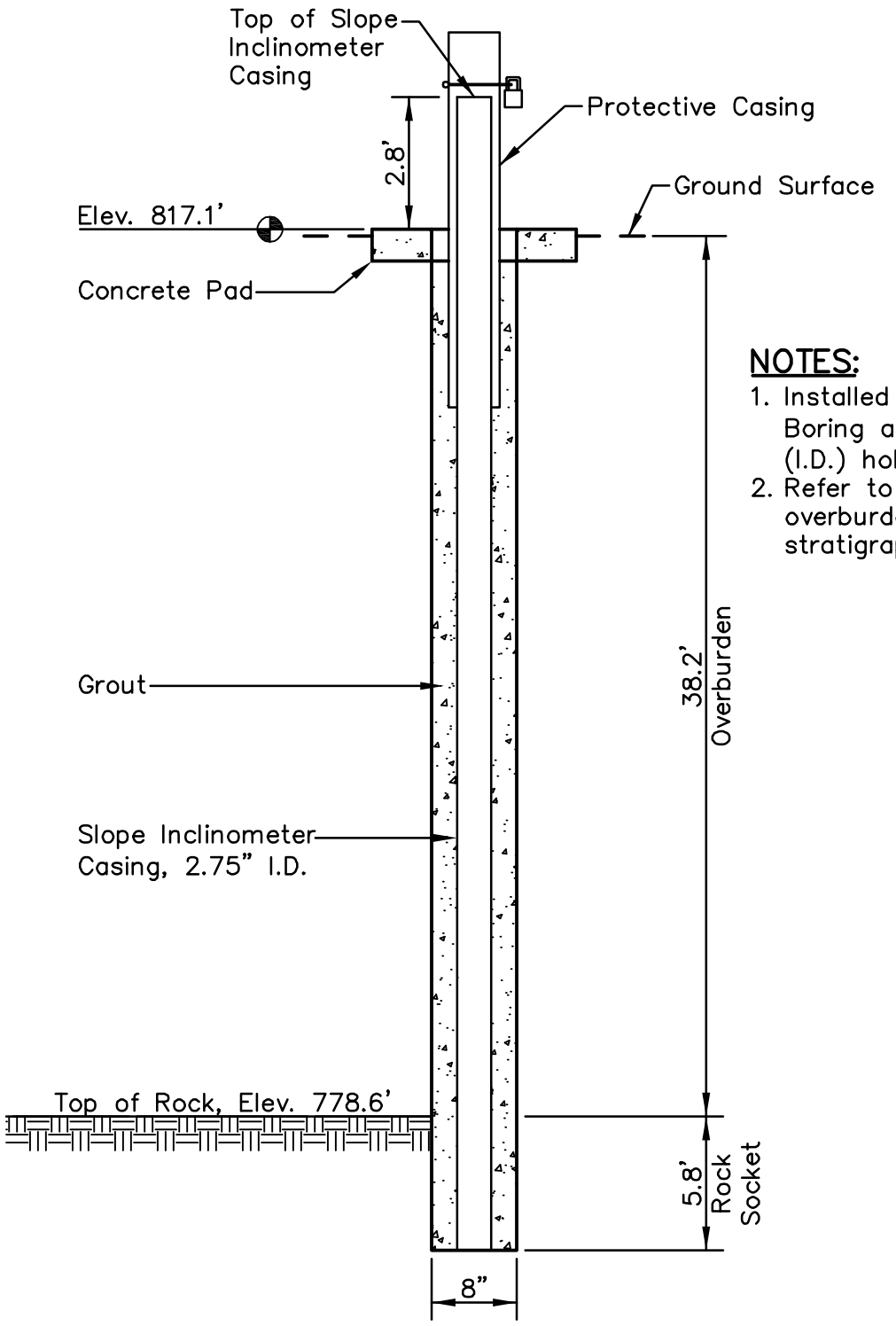

NOTES:

1. Installed on 08/04/2009. Boring advanced with 4.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden and rock stratigraphy.

LOCATION:

Northing: 592,240.40
Easting: 2,546,666.88
Ground Elevation: 817.1 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

SLOPE INCLINOMETER STN-29P
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

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CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
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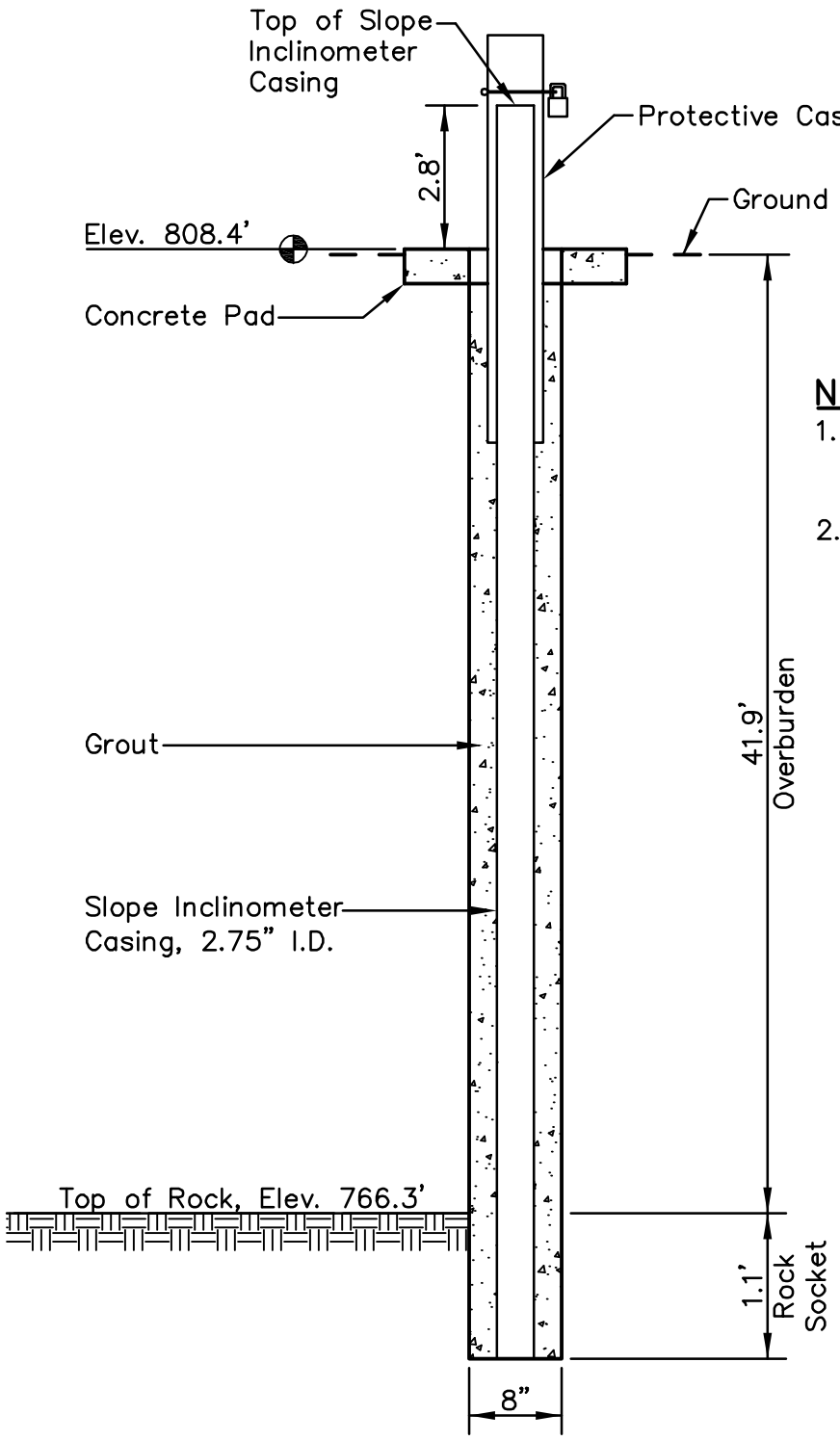


NOTES:

1. Installed on 07/27/2009. Boring advanced with 4.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden and rock stratigraphy.

LOCATION:

Northing: 591,422.85
Easting: 2,546,003.93
Ground Elevation: 808.4 feet

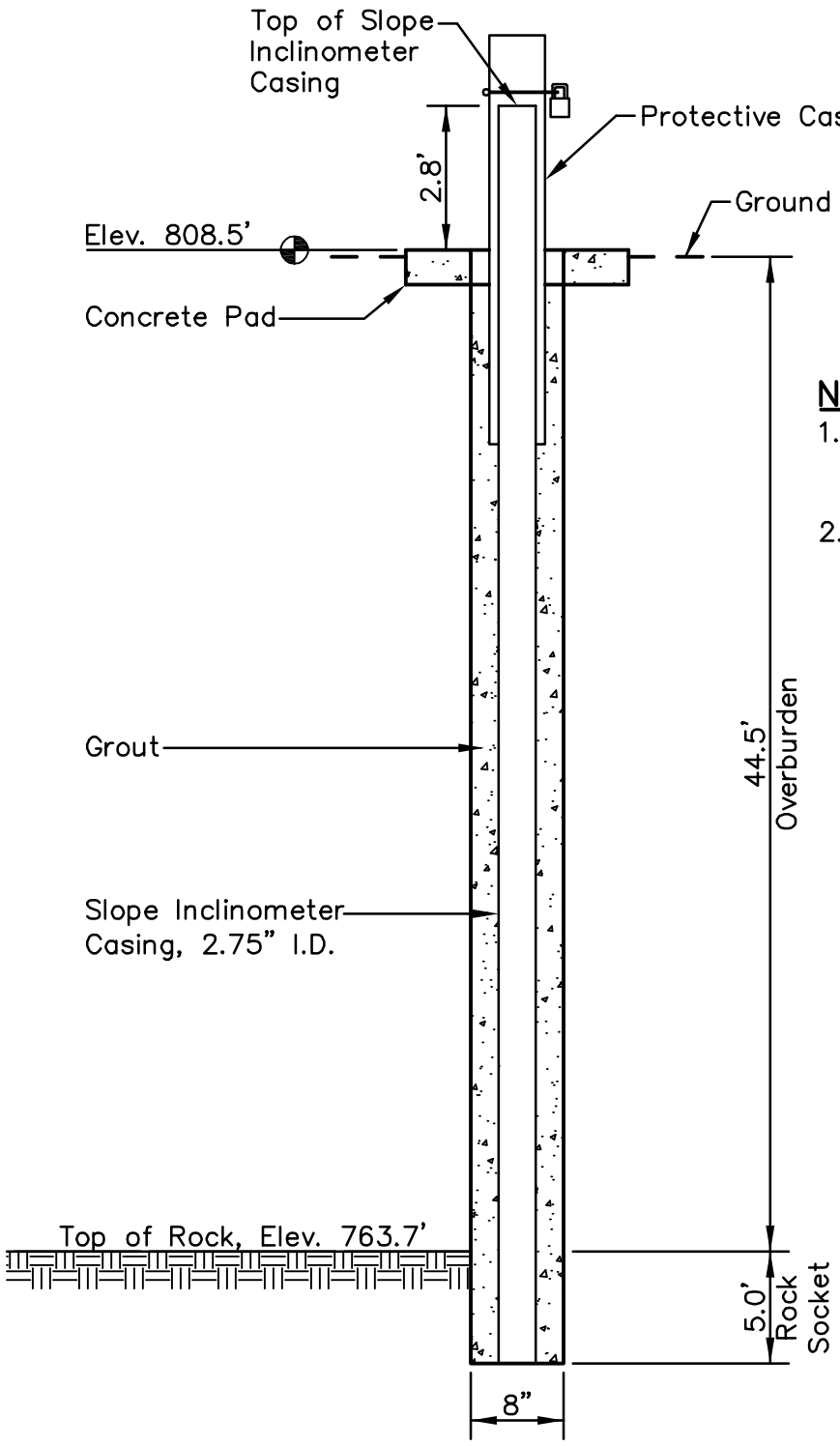
Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

SLOPE INCLINOMETER STN-46P
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
Nashville, Tennessee
37027-5044
615-885-1144
www.stantec.com

DRAWN BY	TJ	DATE	AUG., 2009	REVISED	SHEET
CHECKED BY	PHW	PROJ. NO.	172679015	1. 3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
V:\1726\ACTIVE\172679015\ENVIRONMENTAL\DRAWING\GEOTECH\INSTRUMENT\79015B-BRF-301-SI46P.DWG



NOTES:

1. Installed on 07/21/2009. Boring advanced with 4.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden and rock stratigraphy.

LOCATION:

Northing: 591,576.97
Easting: 2,546,494.42
Ground Elevation: 808.5 feet

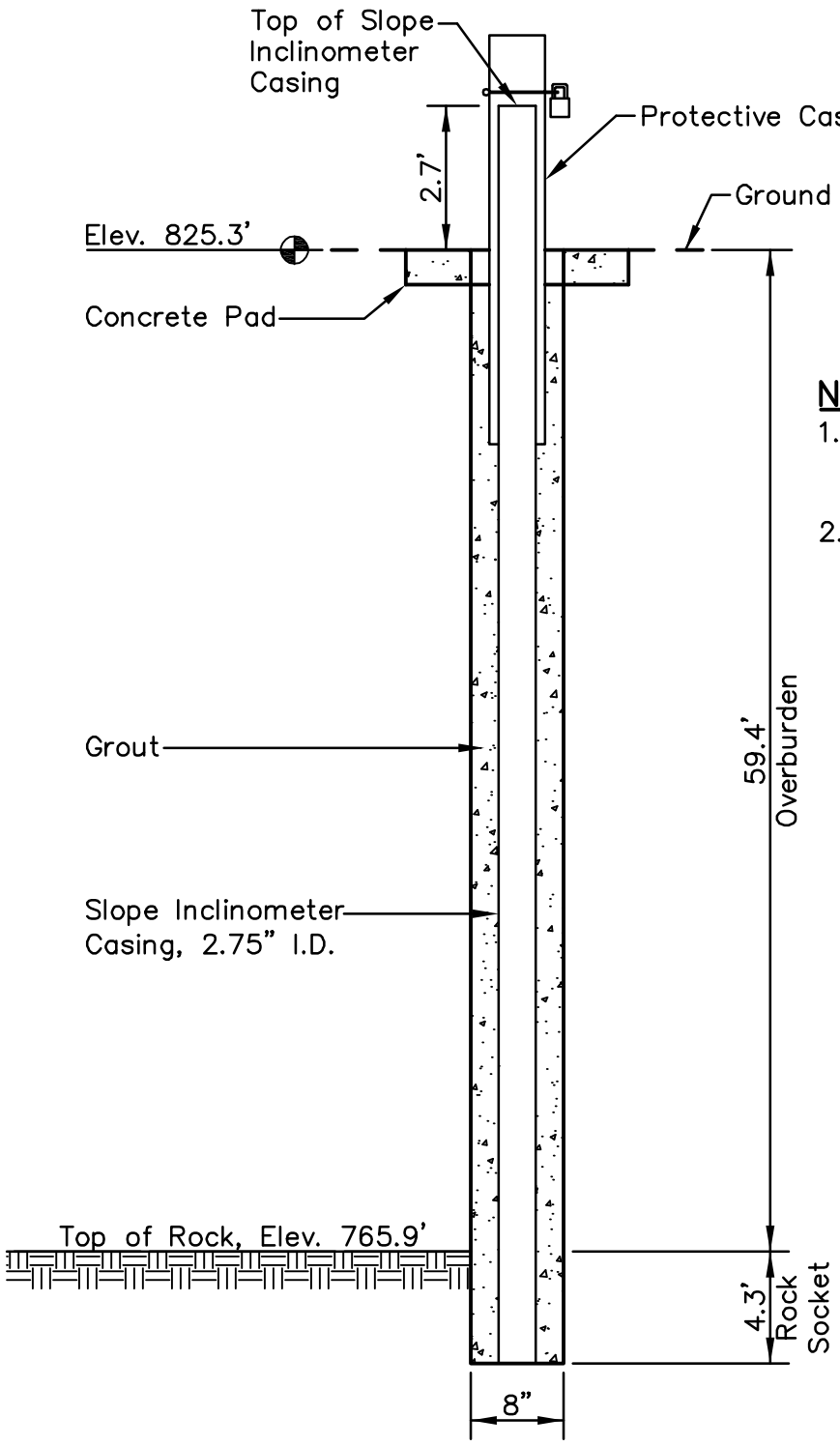
Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

SLOPE INCLINOMETER STN-49
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
Nashville, Tennessee
37027-5044
615-885-1144
www.stantec.com

DRAWN BY	TJ	DATE	AUG., 2009	REVISED	SHEET
CHECKED BY	PHW	PROJ. NO.	172679015	1. 3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
V:\1726\ACTIVE\172679015\ENVIRONMENTAL\DRAWING\GEOTECH\INSTRUMENT\790158-BRF-301-SI49.DWG



NOTES:

1. Installed on 07/30/2009. Boring advanced with 4.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden and rock stratigraphy.

LOCATION:

Northing: 591,549.15
Easting: 2,546,217.62
Ground Elevation: 825.3 feet

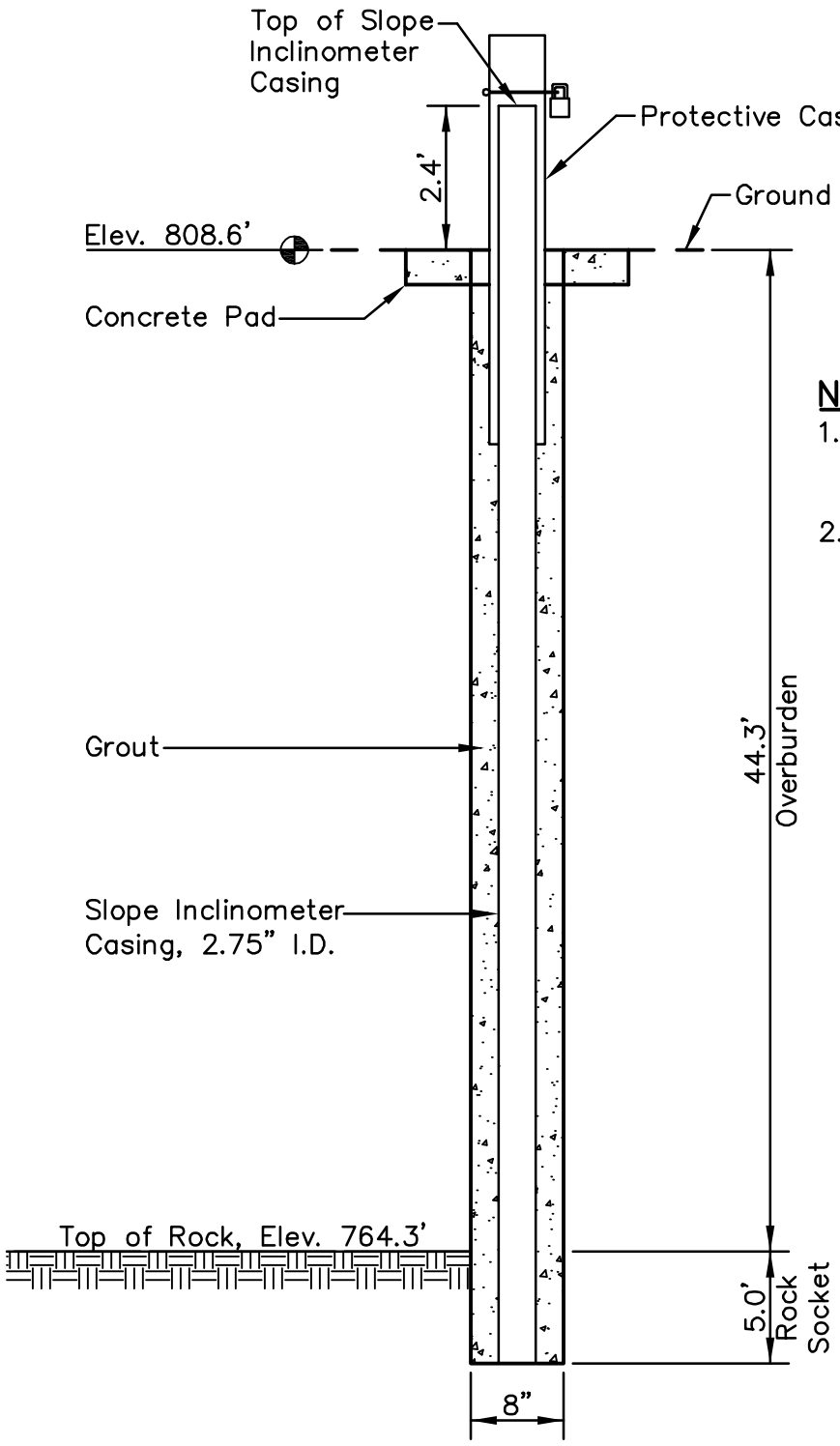
Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

SLOPE INCLINOMETER STN-87
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
Nashville, Tennessee
37027-5044
615-885-1144
www.stantec.com

DRAWN BY	TJ	DATE	AUG., 2009	REVISED	SHEET
CHECKED BY	PHW	PROJ. NO.	172679015	1. 3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 04/02/2010 USER: SILPACHARN, PRAYUTH (BILLY)
V:\1726\ACTIVE\172679015\ENVIRONMENTAL\DRAWING\GEOTECH\INSTRUMENT\790158-BRF-301-SI87.DWG



NOTES:

1. Installed on 08/04/2009. Boring advanced with 4.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden and rock stratigraphy.

LOCATION:

Northing: 591,493.79
Easting: 2,546,234.83
Ground Elevation: 808.6 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.
Horizontal Datum: NAD 27
Vertical Datum: NGVD 29

SLOPE INCLINOMETER STN-88
GYPSUM DISPOSAL AREA 2A
BULL RUN FOSSIL PLANT

Stantec Consulting Services Inc.
100 Westwood Pl., Ste. 420
Nashville, Tennessee
37027-5044
615-885-1144
www.stantec.com

DRAWN BY	TJ	DATE	DEC., 2009	REVISED	SHEET
CHECKED BY	WRM	PROJ. NO.	172679015	1. 3.	1 OF 1
CHECKED BY	PVK	SCALE	NTS	2. 4.	

PLOT DATE: 02/18/2010 USER: SILPACHARN, PRAYUTH (BILLY)
V:\1726\ACTIVE\172679015\ENVIRONMENTAL\DRAWING\GEOTECH\INSTRUMENT\79015B-BRF-301-SI88.DWG

Appendix E

Slope Monitoring Data

- Attachment 1 – Piezometer Readings
- Attachment 2 – Slope Inclinometer Readings
- Attachment 3 – Slug Test Data

Attachment 1
Piezometer Readings

Stantec

PIEZOMETER

Bull Run Fossil Plant
1265 Edgemoor Rd
Clinton,TN
172679015

		7/24/2009				7/31/2009				8/7/2009				8/14/2009			
Location	Piezometer	Surface Elevation (ft)	Stickup (ft)	Depth Measurement (ft)	Water Elevation (ft)	Surface Elevation (ft)	Stickup (ft)	Depth Measurement (ft)	Water Elevation (ft)	Surface Elevation (ft)	Stickup (ft)	Depth Measurement (ft)	Water Elevation (ft)	Surface Elevation (ft)	Stickup (ft)	Depth Measurement (ft)	Water Elevation (ft)
STN-3	PZ-3	810.2	0.0	11.0	799.1	810.2	0.0	10.5	799.6	810.2	0.0	10.6	799.5	810.2	0.0	10.6	799.5
STN-5	PZ-5	841.0	3.0	36.3	807.7	841.0	3.0	33.3	810.7	841.0	3.0	33.4	810.6	841.0	3.0	33.3	810.7
STN-6	PZ-6	818.2	3.0	25.0	796.2	818.2	3.0	24.6	796.6	818.2	3.0	24.7	796.5	818.2	3.0	24.6	796.6
STN-10	PZ-10A	817.9	2.7	13.5	807.2	817.9	2.7	13.1	807.6	817.9	2.7	13.2	807.5	817.9	2.7	13.2	807.5
STN-14	PZ-14	848.7	3.0	43.0	808.7	848.7	3.0	42.8	808.9	848.7	3.0	42.9	808.8	848.7	3.0	43.0	808.7
STN-15	PZ-15	818.1	3.0	23.3	797.8	818.1	3.0	23.0	798.1	818.1	3.0	23.0	798.1	818.1	3.0	23.0	798.1
STN-18	PZ-18	821.7	3.0	17.3	807.3	821.7	3.0	17.5	807.1	821.7	3.0	17.2	807.4	821.7	3.0	17.4	807.2
STN-19	PZ-19	810.2	-0.2	4.4	805.6	810.2	-0.2	4.1	805.9	810.2	-0.2	4.1	805.9	810.2	-0.2	4.1	805.9
STN-27	PZ-27	831.3	-0.2	22.1	809.0	831.3	-0.2	21.9	809.2	831.3	-0.2	21.9	809.2	831.3	-0.2	21.9	809.2
STN-30	PZ-30	826.2	-0.2	16.0	810.1	826.2	-0.2	15.8	810.3	826.2	-0.2	15.9	810.2	826.2	-0.2	15.7	810.4
STN-33	PZ-33	836.1	-0.2	20.6	815.4	836.1	-0.2	20.9	815.1	836.1	-0.2	20.9	815.1	836.1	-0.2	21.0	815.0
STN-34	PZ-34	825.6	-0.1	29.7	795.8	825.6	-0.1	29.3	796.2	825.6	-0.1	29.3	796.2	825.6	-0.1	29.2	796.3
STN-34A	PZ-34A	825.5	-0.2	17.2	808.1	825.5	-0.2	17.0	808.3	825.5	-0.2	17.0	808.3	825.5	-0.2	17.0	808.3
STN-35	PZ-35	808.9	-0.1	13.3	795.4	808.9	-0.1	12.9	795.8	808.9	-0.1	13.0	795.7	808.9	-0.1	13.0	795.7
STN-35A	PZ-35A	809.1	-0.2	4.2	804.8	809.1	-0.2	3.4	805.6	809.1	-0.2	3.5	805.5	809.1	-0.2	3.4	805.6
STN-36	PZ-36	800.5	3.0	9.0	794.5	800.5	3.0	8.2	795.3	800.5	3.0	8.4	795.1	800.5	3.0	8.3	795.2
STN-39	PZ-39	835.7	-0.2	19.2	816.4	835.7	-0.2	19.0	816.6	835.7	-0.2	18.9	816.7	835.7	-0.2	18.0	817.6
STN-40	PZ-40	825.8	-0.1	15.9	809.8	825.8	-0.1	15.7	810.0	825.8	-0.1	15.6	810.1	825.8	-0.1	15.4	810.3
STN-41	PZ-41	809.7	-0.1	15.4	794.2	809.7	-0.1	14.2	795.4	809.7	-0.1	14.1	795.5	809.7	-0.1	14.1	795.5
STN-41A	PZ-41A	809.6	-0.1	0.5	809.0	809.6	-0.1	0.2	809.3	809.6	-0.1	0.3	809.2	809.6	-0.1	0.1	809.4
STN-44	PZ-44	835.7	-0.1	21.2	814.4	835.7	-0.1	20.9	814.7	835.7	-0.1	20.8	814.8	835.7	-0.1	20.3	815.3
STN-45	PZ-45	824.8	-0.1	13.8	810.9	824.8	-0.1	13.8	810.9	824.8	-0.1	13.8	810.9	824.8	-0.1	13.5	811.2
STN-46	PZ-46	808.2	2.6	0.0	810.8	808.2	2.6	2.7	808.1	808.2	2.6	2.7	808.1	808.2	2.6	2.9	807.9
STN-47	PZ-47	835.7	-0.1	24.0	811.6	835.7	-0.1	23.1	812.5	835.7	-0.1	23.0	812.6	835.7	-0.1	22.7	812.9
STN-48	PZ-48	826.1	-0.2	15.5	810.5	826.1	-0.2	15.1	810.9	826.1	-0.2	15.0	811.0	826.1	-0.2	14.9	811.1
STN-49	PZ-49	808.5	2.9	1.8	809.6	808.5	2.9	1.6	809.8	808.5	2.9	1.6	809.8	808.5	2.9	1.5	809.9
STN-51	PZ-51	809.8	-0.1	15.4	794.3	809.8	-0.1	14.9	794.8	809.8	-0.1	15.0	794.7	809.8	-0.1	14.9	794.8
STN-51A	PZ-51A	809.8	-0.1	3.9	805.8	809.8	-0.1	3.8	805.9	809.8	-0.1	3.9	805.8	809.8	-0.1	3.8	805.9
STN-55	PZ-55	810.1	-0.1	13.7	796.2	810.1	-0.1	13.2	796.7	810.1	-0.1	13.5	796.4	810.1	-0.1	13.2	796.7
STN-55A	PZ-55A	810.3	-0.1	5.0	805.3	810.3	-0.1	4.6	805.7	810.3	-0.1	4.7	805.6	810.3	-0.1	4.7	805.6
STN-56	PZ-56	800.2	3.1	7.0	796.2	800.2	3.1	6.6	796.6	800.2	3.1	6.7	796.5	800.2	3.1	6.7	796.5
STN-62	PZ-62	809.4	-0.1	9.5	799.9	809.4	-0.1	9.2	800.2	809.4	-0.1	9.3	800.1	809.4	-0.1	9.3	800.1
STN-62A	PZ-62A	809.6	-0.1	3.9	805.6	809.6	-0.1	3.9	805.6	809.6	-0.1	3.9	805.6	809.6	-0.1	3.9	805.6
STN-63	PZ-63	801.2	2.7	5.8	798.1	801.2	2.7	4.9	799.0	801.2	2.7	5.0	798.9	801.2	2.7	4.9	799.0
STN-65	PZ-65	809.1	-0.1	5.0	804.0	809.1	-0.1	4.6	804.4	809.1	-0.1	4.8	804.2	809.1	-0.1	4.7	804.3
STN-65A	PZ-65A	809.1	0.0	3.0	806.1	809.1	0.0	2.8	806.3	809.1	0.0	3.0	806.1	809.1	0.0	2.9	806.2
STN-66	PZ-66	799.8	2.4	8.3	794.0	799.8	2.4	8.0	794.3	799.8	2.4	8.0	794.3	799.8	2.4	8.0	794.3
STN-67	PZ-67	809.5	0.0	5.5	804.0	809.5	0.0	5.2	804.3	809.5	0.0	4.9	804.6	809.5	0.0	5.0	804.5
STN-68	PZ-68	800.8	2.9	9.7	794.0	800.8	2.9	9.2	794.5	800.8	2.9	9.2	794.5	800.8	2.9	9.1	794.6
STN-88	PZ-88	808.5	2.7	NA	NA	808.5	2.7	NA	NA	808.5	2.7	2.7	808.5	808.5	2.7	2.6	808.6
STN-89	PZ-89	836.1	-0.1	NA	NA	836.1	-0.1	NA	NA	836.1	-0.1	26.0	810.0	836.1	-0.1	26.0	810.0
STN-90	PZ-90	838.4	0.1	NA	NA	838.4	0.1	NA	NA	838.4	0.1	28.0	810.5	838.4	0.1	28.0	810.5
STN-91A	PZ-91A	Not Installed				Not Installed				Not Installed				Not Installed			

Significant Change
*** Change from previous reading**
** NA: No Reading Taken

Stantec

PIEZOMETER

Bull Run Fossil Plant
1265 Edgemoor Rd
Clinton,TN
172679015

		9/10/2009				10/6/2009				10/14/2009:Special Reading				10/19/2009: Special Reading			
Location	Piezometer	Surface Elevation (ft)	Stickup (ft)	Depth Measurement (ft)	Water Elevation (ft)	Surface Elevation (ft)	Stickup (ft)	Depth Measurement (ft)	Water Elevation (ft)	Surface Elevation (ft)	Stickup (ft)	Depth Measurement (ft)	Water Elevation (ft)	Surface Elevation (ft)	Stickup (ft)	Depth Measurement (ft)	Water Elevation (ft)
STN-3	PZ-3	810.2	0.0	10.7	799.4	810.2	0.0	10.3	799.8	810.2	0.0	NA	NA	810.2	0.0	NA	NA
STN-5	PZ-5	841.0	3.0	36.2	807.8	841.0	3.0	36.3	807.8	841.0	3.0	NA	NA	841.0	3.0	NA	NA
STN-6	PZ-6	818.2	3.0	24.8	796.4	818.2	3.0	24.1	797.1	818.2	3.0	NA	NA	818.2	3.0	NA	NA
STN-10	PZ-10A	817.9	2.7	13.6	807.1	817.9	2.7	13.5	807.2	817.9	2.7	NA	NA	817.9	2.7	NA	NA
STN-14	PZ-14	848.7	3.0	42.7	809.0	848.7	3.0	43.6	808.1	848.7	3.0	NA	NA	848.7	3.0	NA	NA
STN-15	PZ-15	818.1	3.0	22.2	798.9	818.1	3.0	22.5	798.6	818.1	3.0	NA	NA	818.1	3.0	NA	NA
STN-18	PZ-18	821.7	3.0	18.0	806.6	821.7	3.0	17.6	807.0	821.7	3.0	NA	NA	821.7	3.0	NA	NA
STN-19	PZ-19	810.2	-0.2	4.2	805.9	810.2	-0.2	4.1	806.0	810.2	-0.2	NA	NA	810.2	-0.2	NA	NA
STN-27	PZ-27	831.3	-0.2	21.7	809.4	831.3	-0.2	21.6	809.6	831.3	-0.2	NA	NA	831.3	-0.2	NA	NA
STN-30	PZ-30	826.2	-0.2	15.3	810.8	826.2	-0.2	15.0	811.1	826.2	-0.2	NA	NA	826.2	-0.2	NA	NA
STN-33	PZ-33	836.1	-0.2	21.0	815.0	836.1	-0.2	21.0	815.0	836.1	-0.2	NA	NA	836.1	-0.2	NA	NA
STN-34	PZ-34	825.6	-0.1	29.2	796.3	825.6	-0.1	28.8	796.6	825.6	-0.1	NA	NA	825.6	-0.1	NA	NA
STN-34A	PZ-34A	825.5	-0.2	16.7	808.6	825.5	-0.2	16.5	808.8	825.5	-0.2	NA	NA	825.5	-0.2	NA	NA
STN-35	PZ-35	808.9	-0.1	16.7	792.0	808.9	-0.1	12.7	796.0	808.9	-0.1	NA	NA	808.9	-0.1	NA	NA
STN-35A	PZ-35A	809.1	-0.2	3.1	805.9	809.1	-0.2	2.6	806.3	809.1	-0.2	NA	NA	809.1	-0.2	NA	NA
STN-36	PZ-36	800.5	3.0	8.5	795.0	800.5	3.0	8.3	795.2	800.5	3.0	NA	NA	800.5	3.0	NA	NA
STN-39	PZ-39	835.7	-0.2	17.6	818.0	835.7	-0.2	17.3	818.2	835.7	-0.2	NA	NA	835.7	-0.2	NA	NA
STN-40	PZ-40	825.8	-0.1	15.2	810.5	825.8	-0.1	14.8	810.9	825.8	-0.1	NA	NA	825.8	-0.1	NA	NA
STN-41	PZ-41	809.7	-0.1	14.1	795.5	809.7	-0.1	13.6	796.0	809.7	-0.1	NA	NA	809.7	-0.1	NA	NA
STN-41A	PZ-41A	809.6	-0.1	0.0	809.5	809.6	-0.1	0.0	809.5	809.6	-0.1	NA	NA	809.6	-0.1	NA	NA
STN-44	PZ-44	835.7	-0.1	20.1	815.4	835.7	-0.1	19.7	815.8	835.7	-0.1	NA	NA	835.7	-0.1	21.9	813.7
STN-45	PZ-45	824.8	-0.1	13.3	811.3	824.8	-0.1	13.2	811.4	824.8	-0.1	13.9	810.8	824.8	-0.1	14.6	810.1
STN-46	PZ-46	808.2	2.6	2.6	808.2	808.2	2.6	3.1	807.8	808.2	2.6	3.2	807.6	808.2	2.6	3.4	807.4
STN-47	PZ-47	835.7	-0.1	22.4	813.2	835.7	-0.1	22.2	813.4	835.7	-0.1	NA	NA	835.7	-0.1	23.5	812.1
STN-48	PZ-48	826.1	-0.2	14.6	811.4	826.1	-0.2	14.4	811.6	826.1	-0.2	14.9	811.0	826.1	-0.2	15.2	810.7
STN-49	PZ-49	808.5	2.9	1.4	810.0	808.5	2.9	1.3	810.1	808.5	2.9	1.7	809.7	808.5	2.9	2.0	809.4
STN-51	PZ-51	809.8	-0.1	14.9	794.8	809.8	-0.1	14.6	795.1	809.8	-0.1	NA	NA	809.8	-0.1	NA	NA
STN-51A	PZ-51A	809.8	-0.1	3.7	806.0	809.8	-0.1	3.7	806.0	809.8	-0.1	NA	NA	809.8	-0.1	NA	NA
STN-55	PZ-55	810.1	-0.1	13.3	796.7	810.1	-0.1	13.1	796.8	810.1	-0.1	NA	NA	810.1	-0.1	NA	NA
STN-55A	PZ-55A	810.3	-0.1	4.5	805.7	810.3	-0.1	4.4	805.8	810.3	-0.1	NA	NA	810.3	-0.1	NA	NA
STN-56	PZ-56	800.2	3.1	6.7	796.5	800.2	3.1	6.5	796.7	800.2	3.1	NA	NA	800.2	3.1	NA	NA
STN-62	PZ-62	809.4	-0.1	9.3	800.0	809.4	-0.1	9.1	800.3	809.4	-0.1	NA	NA	809.4	-0.1	NA	NA
STN-62A	PZ-62A	809.6	-0.1	4.8	804.8	809.6	-0.1	3.8	805.7	809.6	-0.1	NA	NA	809.6	-0.1	NA	NA
STN-63	PZ-63	801.2	2.7	5.0	798.9	801.2	2.7	4.9	799.0	801.2	2.7	NA	NA	801.2	2.7	NA	NA
STN-65	PZ-65	809.1	-0.1	4.4	804.6	809.1	-0.1	4.7	804.3	809.1	-0.1	NA	NA	809.1	-0.1	NA	NA
STN-65A	PZ-65A	809.1	0.0	2.9	806.2	809.1	0.0	3.1	806.0	809.1	0.0	NA	NA	809.1	0.0	NA	NA
STN-66	PZ-66	799.8	2.4	8.1	794.2	799.8	2.4	7.7	794.6	799.8	2.4	NA	NA	799.8	2.4	NA	NA
STN-67	PZ-67	809.5	0.0	5.7	803.8	809.5	0.0	5.3	804.2	809.5	0.0	NA	NA	809.5	0.0	NA	NA
STN-68	PZ-68	800.8	2.9	9.4	794.3	800.8	2.9	8.9	794.8	800.8	2.9	NA	NA	800.8	2.9	NA	NA
STN-88	PZ-88	808.5	2.7	3.9	807.4	808.5	2.7	2.6	808.6	808.5	2.7	3.0	808.2	808.5	2.7	3.4	807.8
STN-89	PZ-89	836.1	-0.1	26.0	810.0	836.1	-0.1	25.7	810.3	836.1	-0.1	NA	NA	836.1	-0.1	NA	NA
STN-90	PZ-90	838.4	0.1	28.0	810.5	838.4	0.1	27.8	810.7	838.4	0.1	NA	NA	838.4	0.1	NA	NA
STN-91A	PZ-91A	Not Installed				Not Installed				Not Installed				Not Installed			

Significant Change
*** Change from previous reading**
** NA: No Reading Taken

Stantec

PIEZOMETER

Bull Run Fossil Plant
1265 Edgemoor Rd
Clinton,TN
172679015

		10/28/2009: Special Reading				11/3/2009: Special Reading				11/13/2009				11/20/2009: Special Readings			
Location	Piezometer	Surface Elevation (ft)	Stickup (ft)	Depth Measurement (ft)	Water Elevation (ft)	Surface Elevation (ft)	Stickup (ft)	Depth Measurement (ft)	Water Elevation (ft)	Surface Elevation (ft)	Stickup (ft)	Depth Measurement (ft)	Water Elevation (ft)	Surface Elevation (ft)	Stickup (ft)	Depth Measurement (ft)	Water Elevation (ft)
STN-3	PZ-3	810.2	0.0	NA	NA	810.2	0.0	NA	NA	810.2	0.0	5.8	804.3	810.2	0.0	NA	NA
STN-5	PZ-5	841.0	3.0	NA	NA	841.0	3.0	NA	NA	841.0	3.0	36.2	807.8	841.0	3.0	NA	NA
STN-6	PZ-6	818.2	3.0	NA	NA	818.2	3.0	NA	NA	818.2	3.0	24.1	797.1	818.2	3.0	NA	NA
STN-10	PZ-10A	817.9	2.7	NA	NA	817.9	2.7	NA	NA	817.9	2.7	13.7	806.9	817.9	2.7	NA	NA
STN-14	PZ-14	848.7	3.0	NA	NA	848.7	3.0	NA	NA	848.7	3.0	44.0	807.7	848.7	3.0	NA	NA
STN-15	PZ-15	818.1	3.0	NA	NA	818.1	3.0	NA	NA	818.1	3.0	22.6	798.5	818.1	3.0	NA	NA
STN-18	PZ-18	821.7	3.0	NA	NA	821.7	3.0	NA	NA	821.7	3.0	18.3	806.3	821.7	3.0	NA	NA
STN-19	PZ-19	810.2	-0.2	NA	NA	810.2	-0.2	NA	NA	810.2	-0.2	4.6	805.4	810.2	-0.2	NA	NA
STN-27	PZ-27	831.3	-0.2	NA	NA	831.3	-0.2	NA	NA	831.3	-0.2	22.0	809.2	831.3	-0.2	NA	NA
STN-30	PZ-30	826.2	-0.2	NA	NA	826.2	-0.2	NA	NA	826.2	-0.2	17.2	808.9	826.2	-0.2	NA	NA
STN-33	PZ-33	836.1	-0.2	NA	NA	836.1	-0.2	NA	NA	836.1	-0.2	21.1	814.9	836.1	-0.2	NA	NA
STN-34	PZ-34	825.6	-0.1	NA	NA	825.6	-0.1	NA	NA	825.6	-0.1	28.7	796.7	825.6	-0.1	NA	NA
STN-34A	PZ-34A	825.5	-0.2	NA	NA	825.5	-0.2	NA	NA	825.5	-0.2	16.6	808.7	825.5	-0.2	NA	NA
STN-35	PZ-35	808.9	-0.1	NA	NA	808.9	-0.1	NA	NA	808.9	-0.1	12.7	796.0	808.9	-0.1	NA	NA
STN-35A	PZ-35A	809.1	-0.2	NA	NA	809.1	-0.2	NA	NA	809.1	-0.2	3.0	806.0	809.1	-0.2	NA	NA
STN-36	PZ-36	800.5	3.0	NA	NA	800.5	3.0	NA	NA	800.5	3.0	8.2	795.3	800.5	3.0	NA	NA
STN-39	PZ-39	835.7	-0.2	NA	NA	835.7	-0.2	NA	NA	835.7	-0.2	19.4	816.2	835.7	-0.2	NA	NA
STN-40	PZ-40	825.8	-0.1	NA	NA	825.8	-0.1	NA	NA	825.8	-0.1	16.5	809.2	825.8	-0.1	NA	NA
STN-41	PZ-41	809.7	-0.1	NA	NA	809.7	-0.1	NA	NA	809.7	-0.1	13.5	796.1	809.7	-0.1	NA	NA
STN-41A	PZ-41A	809.6	-0.1	NA	NA	809.6	-0.1	NA	NA	809.6	-0.1	1.3	808.2	809.6	-0.1	NA	NA
STN-44	PZ-44	835.7	-0.1	23.0	812.6	835.7	-0.1	23.6	812.0	835.7	-0.1	23.9	811.6	835.7	-0.1	24.4	811.2
STN-45	PZ-45	824.8	-0.1	15.2	809.4	824.8	-0.1	15.6	809.1	824.8	-0.1	15.6	809.1	824.8	-0.1	16.4	808.3
STN-46	PZ-46	808.2	2.6	3.5	807.3	808.2	2.6	3.8	807.1	808.2	2.6	4.0	806.9	808.2	2.6	4.4	806.5
STN-47	PZ-47	835.7	-0.1	24.4	811.2	835.7	-0.1	24.8	810.8	835.7	-0.1	25.4	810.2	835.7	-0.1	26.3	809.4
STN-48	PZ-48	826.1	-0.2	15.8	810.2	826.1	-0.2	16.0	809.9	826.1	-0.2	16.4	809.6	825.8	-0.2	16.7	808.9
STN-49	PZ-49	808.5	2.9	2.4	809.0	808.5	2.9	2.7	808.8	808.5	2.9	2.9	808.5	808.5	2.9	3.1	808.3
STN-51	PZ-51	809.8	-0.1	NA	NA	809.8	-0.1	NA	NA	809.8	-0.1	14.7	795.0	809.8	-0.1	NA	NA
STN-51A	PZ-51A	809.8	-0.1	NA	NA	809.8	-0.1	NA	NA	809.8	-0.1	4.7	805.0	809.8	-0.1	NA	NA
STN-55	PZ-55	810.1	-0.1	NA	NA	810.1	-0.1	NA	NA	810.1	-0.1	13.4	796.6	810.1	-0.1	NA	NA
STN-55A	PZ-55A	810.3	-0.1	NA	NA	810.3	-0.1	NA	NA	810.3	-0.1	5.1	805.2	810.3	-0.1	NA	NA
STN-56	PZ-56	800.2	3.1	NA	NA	800.2	3.1	NA	NA	800.2	3.1	6.6	796.6	800.2	3.1	NA	NA
STN-62	PZ-62	809.4	-0.1	NA	NA	809.4	-0.1	NA	NA	809.4	-0.1	9.2	800.2	809.4	-0.1	NA	NA
STN-62A	PZ-62A	809.6	-0.1	NA	NA	809.6	-0.1	NA	NA	809.6	-0.1	4.4	805.1	809.6	-0.1	NA	NA
STN-63	PZ-63	801.2	2.7	NA	NA	801.2	2.7	NA	NA	801.2	2.7	5.1	798.8	801.2	2.7	NA	NA
STN-65	PZ-65	809.1	-0.1	NA	NA	809.1	-0.1	NA	NA	809.1	-0.1	5.4	803.6	809.1	-0.1	NA	NA
STN-65A	PZ-65A	809.1	0.0	NA	NA	809.1	0.0	NA	NA	809.1	0.0	4.1	805.1	809.1	0.0	NA	NA
STN-66	PZ-66	799.8	2.4	NA	NA	799.8	2.4	NA	NA	799.8	2.4	7.6	794.7	799.8	2.4	NA	NA
STN-67	PZ-67	809.5	0.0	NA	NA	809.5	0.0	NA	NA	809.5	0.0	4.9	804.6	809.5	0.0	NA	NA
STN-68	PZ-68	800.8	2.9	NA	NA	800.8	2.9	NA	NA	800.8	2.9	8.8	794.9	800.8	2.9	NA	NA
STN-88	PZ-88	808.5	2.7	3.5	807.7	808.5	2.7	3.7	807.5	808.5	2.7	3.9	807.4	808.5	2.7	4.0	807.2
STN-89	PZ-89	836.1	-0.1	NA	NA	836.1	-0.1	NA	NA	836.1	-0.1	26.1	809.9	836.1	-0.1	NA	NA
STN-90	PZ-90	838.4	0.1	NA	NA	838.4	0.1	NA	NA	838.4	0.1	27.7	810.8	838.4	0.1	NA	NA
STN-91A	PZ-91A	Not Installed				Not Installed				Not Installed				Not Installed			

Significant Change
*** Change from previous reading**
** NA: No Reading Taken

Stantec

PIEZOMETER

Bull Run Fossil Plant
1265 Edgemoor Rd
Clinton,TN
172679015

		11/24/2009				12/3/2009: Special Reading				12/10/2009				12/18/2009: Special Reading			
Location	Piezometer	Surface Elevation (ft)	Stickup (ft)	Depth Measurement (ft)	Water Elevation (ft)	Surface Elevation (ft)	Stickup (ft)	Depth Measurement (ft)	Water Elevation (ft)	Surface Elevation (ft)	Stickup (ft)	Depth Measurement (ft)	Water Elevation (ft)	Surface Elevation (ft)	Stickup (ft)	Depth Measurement (ft)	Water Elevation (ft)
STN-3	PZ-3	810.2	0.0	9.34*	800.8	810.2	0.0	8.4	801.7	810.2	0.0	8.4	801.7	810.2	0.0	8.4	801.7
STN-5	PZ-5	841.0	3.0	NA	NA	841.0	3.0	NA	NA	841.0	3.0	36.2	807.8	841.0	3.0	NA	NA
STN-6	PZ-6	818.2	3.0	NA	NA	818.2	3.0	NA	NA	818.2	3.0	24.8	796.4	818.2	3.0	NA	NA
STN-10	PZ-10A	817.9	2.7	NA	NA	817.9	2.7	NA	NA	817.9	2.7	14.0	806.6	817.9	2.7	NA	NA
STN-14	PZ-14	848.7	3.0	NA	NA	848.7	3.0	NA	NA	848.7	3.0	44.3	807.4	848.7	3.0	NA	NA
STN-15	PZ-15	818.1	3.0	NA	NA	818.1	3.0	NA	NA	818.1	3.0	49.3	771.8	818.1	3.0	23.0	798.0
STN-18	PZ-18	821.7	3.0	NA	NA	821.7	3.0	NA	NA	821.7	3.0	17.7	806.9	821.7	3.0	NA	NA
STN-19	PZ-19	810.2	-0.2	NA	NA	810.2	-0.2	NA	NA	810.2	-0.2	4.3	805.7	810.2	-0.2	NA	NA
STN-27	PZ-27	831.3	-0.2	NA	NA	831.3	-0.2	NA	NA	831.3	-0.2	22.3	808.9	831.3	-0.2	NA	NA
STN-30	PZ-30	826.2	-0.2	NA	NA	826.2	-0.2	NA	NA	826.2	-0.2	17.8	808.3	826.2	-0.2	NA	NA
STN-33	PZ-33	836.1	-0.2	NA	NA	836.1	-0.2	NA	NA	836.1	-0.2	21.1	814.9	836.1	-0.2	NA	NA
STN-34	PZ-34	825.6	-0.1	NA	NA	825.6	-0.1	NA	NA	825.6	-0.1	29.5	796.0	825.6	-0.1	NA	NA
STN-34A	PZ-34A	825.5	-0.2	NA	NA	825.5	-0.2	NA	NA	825.5	-0.2	16.8	808.5	825.5	-0.2	NA	NA
STN-35	PZ-35	808.9	-0.1	NA	NA	808.9	-0.1	NA	NA	808.9	-0.1	13.2	795.5	808.9	-0.1	NA	NA
STN-35A	PZ-35A	809.1	-0.2	NA	NA	809.1	-0.2	NA	NA	809.1	-0.2	3.5	805.5	809.1	-0.2	NA	NA
STN-36	PZ-36	800.5	3.0	NA	NA	800.5	3.0	NA	NA	800.5	3.0	8.7	794.8	800.5	3.0	NA	NA
STN-39	PZ-39	835.7	-0.2	NA	NA	835.7	-0.2	NA	NA	835.7	-0.2	19.4	816.2	835.7	-0.2	NA	NA
STN-40	PZ-40	825.8	-0.1	NA	NA	825.8	-0.1	NA	NA	825.8	-0.1	16.7	809.0	825.8	-0.1	NA	NA
STN-41	PZ-41	809.7	-0.1	NA	NA	809.7	-0.1	NA	NA	809.7	-0.1	13.9	795.7	809.7	-0.1	NA	NA
STN-41A	PZ-41A	809.6	-0.1	NA	NA	809.6	-0.1	NA	NA	809.6	-0.1	1.4	808.1	809.6	-0.1	NA	NA
STN-44	PZ-44	835.7	-0.1	24.5	811.0	835.7	-0.1	25.2	810.4	835.7	-0.1	25.0	810.5	835.7	-0.1	25.4	810.1
STN-45	PZ-45	824.8	-0.1	16.1	808.5	824.8	-0.1	16.8	807.8	824.8	-0.1	16.3	808.4	824.8	-0.1	16.9	807.7
STN-46	PZ-46	808.2	2.6	3.9	806.9	808.2	2.6	4.7	806.2	808.2	2.6	4.0	806.9	808.2	2.6	5.3	805.6
STN-47	PZ-47	835.7	-0.1	25.8	809.8	835.7	-0.1	26.3	809.4	835.7	-0.1	26.3	809.3	835.7	-0.1	27.7	807.9
STN-48	PZ-48	825.8	-0.2	16.8	808.8	825.8	-0.2	17.3	808.4	825.8	-0.2	17.3	808.4	825.8	-0.2	15.8	809.8
STN-49	PZ-49	808.5	2.9	3.1	808.3	808.5	2.9	3.3	808.1	808.5	2.9	3.3	808.1	808.5	2.9	3.0	808.4
STN-51	PZ-51	809.8	-0.1	NA	NA	809.8	-0.1	NA	NA	809.8	-0.1	4.7	804.9	809.8	-0.1	NA	NA
STN-51A	PZ-51A	809.8	-0.1	NA	NA	809.8	-0.1	NA	NA	809.8	-0.1	15.2	794.5	809.8	-0.1	NA	NA
STN-55	PZ-55	810.1	-0.1	NA	NA	810.1	-0.1	NA	NA	810.1	-0.1	13.6	796.3	810.1	-0.1	NA	NA
STN-55A	PZ-55A	810.3	-0.1	NA	NA	810.3	-0.1	NA	NA	810.3	-0.1	4.8	805.4	810.3	-0.1	NA	NA
STN-56	PZ-56	800.2	3.1	NA	NA	800.2	3.1	NA	NA	800.2	3.1	6.9	796.3	800.2	3.1	NA	NA
STN-62	PZ-62	809.4	-0.1	NA	NA	809.4	-0.1	NA	NA	809.4	-0.1	9.5	799.9	809.4	-0.1	NA	NA
STN-62A	PZ-62A	809.6	-0.1	NA	NA	809.6	-0.1	NA	NA	809.6	-0.1	4.0	805.5	809.6	-0.1	NA	NA
STN-63	PZ-63	801.2	2.7	NA	NA	801.2	2.7	NA	NA	801.2	2.7	5.3	798.6	801.2	2.7	NA	NA
STN-65	PZ-65	809.1	-0.1	NA	NA	809.1	-0.1	NA	NA	809.1	-0.1	5.1	803.9	809.1	-0.1	NA	NA
STN-65A	PZ-65A	809.1	0.0	NA	NA	809.1	0.0	NA	NA	809.1	0.0	3.7	805.4	809.1	0.0	NA	NA
STN-66	PZ-66	799.8	2.4	NA	NA	799.8	2.4	NA	NA	799.8	2.4	8.3	794.0	799.8	2.4	NA	NA
STN-67	PZ-67	809.5	0.0	NA	NA	809.5	0.0	NA	NA	809.5	0.0	4.8	804.7	809.5	0.0	NA	NA
STN-68	PZ-68	800.8	2.9	NA	NA	800.8	2.9	NA	NA	800.8	2.9	9.5	794.2	800.8	2.9	NA	NA
STN-88	PZ-88	808.5	2.7	3.9	807.3	808.5	2.7	4.1	807.1	808.5	2.7	4.0	807.2	808.5	2.7	4.0	807.2
STN-89	PZ-89	836.1	-0.1	NA	NA	836.1	-0.1	NA	NA	836.1	-0.1	26.5	809.6	836.1	-0.1	NA	NA
STN-90	PZ-90	838.4	0.1	NA	NA	838.4	0.1	NA	NA	838.4	0.1	28.0	810.6	838.4	0.1	NA	NA
STN-91A	PZ-91A	Not Installed				Not Installed				Not Installed				Not Installed			

Significant Change
*** Change from previous reading**
** NA: No Reading Taken

* Well developed with air; post-development reading shown.

Stantec

PIEZOMETER

Bull Run Fossil Plant
1265 Edgemoor Rd
Clinton,TN
172679015

		12/22/2009: Special Reading				12/28/2009: Special Reading				1/8/2010: Special Reading				1/14/2010			
Location	Piezometer	Surface Elevation (ft)	Stickup (ft)	Depth Measurement (ft)	Water Elevation (ft)	Surface Elevation (ft)	Stickup (ft)	Depth Measurement(ft)	Water Elevation (ft)	Surface Elevation (ft)	Stickup (ft)	Depth Measurement (ft)	Water Elevation (ft)	Surface Elevation (ft)	Stickup (ft)	Depth Measurement (ft)	Water Elevation (ft)
STN-3	PZ-3	810.2	0.0	8.5	801.7	810.2	0.0	8.5	801.6	810.2	0.0	8.6	801.5	810.2	0.0	8.8	801.3
STN-5	PZ-5	841.0	3.0	NA	NA	841.0	3.0	NA	NA	841.0	3.0	NA	NA	841.0	3.0	36.3	807.8
STN-6	PZ-6	818.2	3.0	NA	NA	818.2	3.0	NA	NA	818.2	3.0	NA	NA	818.2	3.0	25.0	796.2
STN-10	PZ-10A	817.9	2.7	NA	NA	817.9	2.7	NA	NA	817.9	2.7	NA	NA	817.9	2.7	14.1	806.5
STN-14	PZ-14	848.7	3.0	NA	NA	848.7	3.0	NA	NA	848.7	3.0	NA	NA	848.7	3.0	44.1	807.6
STN-15	PZ-15	818.1	3.0	23.2	797.8	818.1	3.0	23.2	797.9	818.1	3.0	23.2	797.9	818.1	3.0	23.5	797.6
STN-18	PZ-18	821.7	3.0	NA	NA	821.7	3.0	NA	NA	821.7	3.0	NA	NA	821.7	3.0	18.4	806.2
STN-19	PZ-19	810.2	-0.2	NA	NA	810.2	-0.2	NA	NA	810.2	-0.2	NA	NA	810.2	-0.2	4.9	805.1
STN-27	PZ-27	831.3	-0.2	NA	NA	831.3	-0.2	NA	NA	831.3	-0.2	NA	NA	831.3	-0.2	22.6	808.5
STN-30	PZ-30	826.2	-0.2	NA	NA	826.2	-0.2	NA	NA	826.2	-0.2	NA	NA	826.2	-0.2	18.1	807.9
STN-33	PZ-33	836.1	-0.2	NA	NA	836.1	-0.2	NA	NA	836.1	-0.2	NA	NA	836.1	-0.2	21.1	814.9
STN-34	PZ-34	825.6	-0.1	NA	NA	825.6	-0.1	NA	NA	825.6	-0.1	NA	NA	825.6	-0.1	29.7	795.8
STN-34A	PZ-34A	825.5	-0.2	NA	NA	825.5	-0.2	NA	NA	825.5	-0.2	NA	NA	825.5	-0.2	17.0	808.3
STN-35	PZ-35	808.9	-0.1	NA	NA	808.9	-0.1	NA	NA	808.9	-0.1	NA	NA	808.9	-0.1	13.7	795.0
STN-35A	PZ-35A	809.1	-0.2	NA	NA	809.1	-0.2	NA	NA	809.1	-0.2	NA	NA	809.1	-0.2	3.6	805.4
STN-36	PZ-36	800.5	3.0	NA	NA	800.5	3.0	NA	NA	800.5	3.0	NA	NA	800.5	3.0	9.3	794.2
STN-39	PZ-39	835.7	-0.2	NA	NA	835.7	-0.2	NA	NA	835.7	-0.2	NA	NA	835.7	-0.2	19.4	816.2
STN-40	PZ-40	825.8	-0.1	NA	NA	825.8	-0.1	NA	NA	825.8	-0.1	NA	NA	825.8	-0.1	17.1	808.7
STN-41	PZ-41	809.7	-0.1	NA	NA	809.7	-0.1	NA	NA	809.7	-0.1	NA	NA	809.7	-0.1	14.5	795.1
STN-41A	PZ-41A	809.6	-0.1	NA	NA	809.6	-0.1	NA	NA	809.6	-0.1	NA	NA	809.6	-0.1	1.5	808.0
STN-44	PZ-44	835.7	-0.1	24.7	810.8	835.7	-0.1	24.7	810.9	835.7	-0.1	24.7	810.9	835.7	-0.1	25.0	810.6
STN-45	PZ-45	824.8	-0.1	17.1	807.6	824.8	-0.1	17.0	807.6	824.8	-0.1	16.2	808.5	824.8	-0.1	16.2	808.5
STN-46	PZ-46	808.2	2.6	5.5	805.4	808.2	2.6	5.5	805.4	808.2	2.6	3.8	807.0	808.2	2.6	3.8	807.0
STN-47	PZ-47	835.7	-0.1	25.9	809.7	835.7	-0.1	25.9	809.7	835.7	-0.1	26.2	809.5	835.7	-0.1	26.2	809.4
STN-48	PZ-48	825.8	-0.2	17.0	808.7	825.8	-0.2	17.0	808.7	825.8	-0.2	17.1	808.5	825.8	-0.2	17.3	808.4
STN-49	PZ-49	808.5	2.9	3.2	808.2	808.5	2.9	3.2	808.2	808.5	2.9	2.9	808.5	808.5	2.9	2.9	808.6
STN-51	PZ-51	809.8	-0.1	NA	NA	809.8	-0.1	NA	NA	809.8	-0.1	NA	NA	809.8	-0.1	4.8	804.9
STN-51A	PZ-51A	809.8	-0.1	NA	NA	809.8	-0.1	NA	NA	809.8	-0.1	NA	NA	809.8	-0.1	15.8	793.9
STN-55	PZ-55	810.1	-0.1	NA	NA	810.1	-0.1	NA	NA	810.1	-0.1	NA	NA	810.1	-0.1	14.1	795.8
STN-55A	PZ-55A	810.3	-0.1	NA	NA	810.3	-0.1	NA	NA	810.3	-0.1	NA	NA	810.3	-0.1	4.8	805.5
STN-56	PZ-56	800.2	3.1	NA	NA	800.2	3.1	NA	NA	800.2	3.1	NA	NA	800.2	3.1	7.4	795.8
STN-62	PZ-62	809.4	-0.1	NA	NA	809.4	-0.1	NA	NA	809.4	-0.1	NA	NA	809.4	-0.1	9.5	799.9
STN-62A	PZ-62A	809.6	-0.1	NA	NA	809.6	-0.1	NA	NA	809.6	-0.1	NA	NA	809.6	-0.1	3.7	805.8
STN-63	PZ-63	801.2	2.7	NA	NA	801.2	2.7	NA	NA	801.2	2.7	NA	NA	801.2	2.7	5.7	798.2
STN-65	PZ-65	809.1	-0.1	NA	NA	809.1	-0.1	NA	NA	809.1	-0.1	NA	NA	809.1	-0.1	4.6	804.4
STN-65A	PZ-65A	809.1	0.0	NA	NA	809.1	0.0	NA	NA	809.1	0.0	NA	NA	809.1	0.0	3.4	805.7
STN-66	PZ-66	799.8	2.4	NA	NA	799.8	2.4	NA	NA	799.8	2.4	NA	NA	799.8	2.4	8.5	793.8
STN-67	PZ-67	809.5	0.0	NA	NA	809.5	0.0	NA	NA	809.5	0.0	NA	NA	809.5	0.0	6.1	803.4
STN-68	PZ-68	800.8	2.9	NA	NA	800.8	2.9	NA	NA	800.8	2.9	NA	NA	800.8	2.9	9.8	793.9
STN-88	PZ-88	808.5	2.7	4.2	807.0	808.5	2.7	4.3	806.9	808.5	2.7	3.8	807.4	808.5	2.7	3.9	807.3
STN-89	PZ-89	836.1	-0.1	NA	NA	836.1	-0.1	NA	NA	836.1	-0.1	NA	NA	836.1	-0.1	26.5	809.5
STN-90	PZ-90	838.4	0.1	NA	NA	838.4	0.1	NA	NA	838.4	0.1	NA	NA	838.4	0.1	27.7	810.9
STN-91A	PZ-91A	Not Installed				Not Installed				Not Installed				Not Installed			

Significant Change
*** Change from previous reading**
** NA: No Reading Taken

Stantec

PIEZOMETER

Bull Run Fossil Plant
1265 Edgemoor Rd
Clinton,TN
172679015

		1/22/2010				1/27/2010				2/19/2010				3/30/2010			
Location	Piezometer	Surface Elevation (ft)	Stickup (ft)	Depth Measurement (ft)	Water Elevation (ft)	Surface Elevation (ft)	Stickup (ft)	Depth Measurement (ft)	Water Elevation (ft)	Surface Elevation (ft)	Stickup (ft)	Depth Measurement (ft)	Water Elevation (ft)	Surface Elevation (ft)	Stickup (ft)	Depth Measurement(ft)	Water Elevation (ft)
STN-3	PZ-3	810.2	0.0	8.3	801.9	810.2	0.0	8.4	801.8	810.2	0.0	8.7	801.4	810.2	0.0	NA	NA
STN-5	PZ-5	841.0	3.0	NA	NA	841.0	3.0	NA	NA	841.0	3.0	35.8	808.2	841.0	3.0	NA	NA
STN-6	PZ-6	818.2	3.0	NA	NA	818.2	3.0	NA	NA	818.2	3.0	25.4	795.8	818.2	3.0	NA	NA
STN-10	PZ-10A	817.9	2.7	NA	NA	817.9	2.7	NA	NA	817.9	2.7	13.6	807.1	817.9	2.7	NA	NA
STN-14	PZ-14	848.7	3.0	NA	NA	848.7	3.0	NA	NA	848.7	3.0	43.2	808.4	848.7	3.0	NA	NA
STN-15	PZ-15	818.1	3.0	23.3	797.7	818.1	3.0	23.5	797.5	818.1	3.0	23.7	797.3	818.1	3.0	NA	NA
STN-18	PZ-18	821.7	3.0	NA	NA	821.7	3.0	NA	NA	821.7	3.0	17.9	806.8	821.7	3.0	NA	NA
STN-19	PZ-19	810.2	-0.2	NA	NA	810.2	-0.2	NA	NA	810.2	-0.2	4.6	805.4	810.2	-0.2	NA	NA
STN-27	PZ-27	831.3	-0.2	NA	NA	831.3	-0.2	NA	NA	831.3	-0.2	21.7	809.4	831.3	-0.2	22.0	809.1
STN-30	PZ-30	826.2	-0.2	NA	NA	826.2	-0.2	NA	NA	826.2	-0.2	16.2	809.9	826.2	-0.2	16.6	809.5
STN-33	PZ-33	836.1	-0.2	NA	NA	836.1	-0.2	NA	NA	836.1	-0.2	21.1	814.9	836.1	-0.2	21.1	814.9
STN-34	PZ-34	825.6	-0.1	NA	NA	825.6	-0.1	NA	NA	825.6	-0.1	29.8	795.7	825.6	-0.1	29.9	795.5
STN-34A	PZ-34A	825.5	-0.2	NA	NA	825.5	-0.2	NA	NA	825.5	-0.2	16.3	809.0	825.5	-0.2	16.2	809.1
STN-35	PZ-35	808.9	-0.1	NA	NA	808.9	-0.1	NA	NA	808.9	-0.1	13.7	795.0	808.9	-0.1	NA	NA
STN-35A	PZ-35A	809.1	-0.2	NA	NA	809.1	-0.2	NA	NA	809.1	-0.2	2.8	806.2	809.1	-0.2	NA	NA
STN-36	PZ-36	800.5	3.0	NA	NA	800.5	3.0	NA	NA	800.5	3.0	9.3	794.2	800.5	3.0	NA	NA
STN-39	PZ-39	835.7	-0.2	NA	NA	835.7	-0.2	NA	NA	835.7	-0.2	18.4	817.2	835.7	-0.2	NA	NA
STN-40	PZ-40	825.8	-0.1	NA	NA	825.8	-0.1	NA	NA	825.8	-0.1	23.2	802.6	825.8	-0.1	15.5	810.2
STN-41	PZ-41	809.7	-0.1	NA	NA	809.7	-0.1	NA	NA	809.7	-0.1	14.4	795.1	809.7	-0.1	15.6	794.0
STN-41A	PZ-41A	809.6	-0.1	NA	NA	809.6	-0.1	NA	NA	809.6	-0.1	0.2	809.3	809.6	-0.1	0.3	809.2
STN-44	PZ-44	835.7	-0.1	23.9	811.6	835.7	-0.1	23.0	812.5	835.7	-0.1	21.0	814.6	835.7	-0.1	22.1	813.5
STN-45	PZ-45	824.8	-0.1	15.3	809.4	824.8	-0.1	14.8	809.8	824.8	-0.1	13.9	810.8	824.8	-0.1	15.9	808.7
STN-46	PZ-46	808.2	2.6	NA	NA	808.2	2.6	NA	NA	808.2	2.6	2.8	808.0	808.2	2.6	NA	NA
STN-47	PZ-47	835.7	-0.1	25.7	809.9	835.7	-0.1	25.0	810.6	835.7	-0.1	23.2	812.4	835.7	-0.1	24.6	811.1
STN-48	PZ-48	825.8	-0.2	16.7	809.0	825.8	-0.2	16.3	809.4	825.8	-0.2	15.0	810.6	825.8	-0.2	16.2	809.5
STN-49	PZ-49	808.5	2.9	2.9	808.6	808.5	2.9	2.6	808.9	808.5	2.9	1.7	809.7	808.5	2.9	3.2	808.2
STN-51	PZ-51	809.8	-0.1	NA	NA	809.8	-0.1	NA	NA	809.8	-0.1	4.1	805.5	809.8	-0.1	NA	NA
STN-51A	PZ-51A	809.8	-0.1	NA	NA	809.8	-0.1	NA	NA	809.8	-0.1	15.7	794.0	809.8	-0.1	NA	NA
STN-55	PZ-55	810.1	-0.1	NA	NA	810.1	-0.1	NA	NA	810.1	-0.1	14.2	795.8	810.1	-0.1	NA	NA
STN-55A	PZ-55A	810.3	-0.1	NA	NA	810.3	-0.1	NA	NA	810.3	-0.1	4.6	805.7	810.3	-0.1	NA	NA
STN-56	PZ-56	800.2	3.1	NA	NA	800.2	3.1	NA	NA	800.2	3.1	7.5	795.7	800.2	3.1	NA	NA
STN-62	PZ-62	809.4	-0.1	NA	NA	809.4	-0.1	NA	NA	809.4	-0.1	9.7	799.7	809.4	-0.1	NA	NA
STN-62A	PZ-62A	809.6	-0.1	NA	NA	809.6	-0.1	NA	NA	809.6	-0.1	3.8	805.7	809.6	-0.1	NA	NA
STN-63	PZ-63	801.2	2.7	NA	NA	801.2	2.7	NA	NA	801.2	2.7	5.6	798.2	801.2	2.7	NA	NA
STN-65	PZ-65	809.1	-0.1	NA	NA	809.1	-0.1	NA	NA	809.1	-0.1	4.7	804.4	809.1	-0.1	NA	NA
STN-65A	PZ-65A	809.1	0.0	NA	NA	809.1	0.0	NA	NA	809.1	0.0	3.4	805.7	809.1	0.0	NA	NA
STN-66	PZ-66	799.8	2.4	NA	NA	799.8	2.4	NA	NA	799.8	2.4	8.9	793.4	799.8	2.4	NA	NA
STN-67	PZ-67	809.5	0.0	NA	NA	809.5	0.0	NA	NA	809.5	0.0	5.4	804.1	809.5	0.0	NA	NA
STN-68	PZ-68	800.8	2.9	NA	NA	800.8	2.9	NA	NA	800.8	2.9	10.1	793.6	800.8	2.9	NA	NA
STN-88	PZ-88	808.5	2.7	3.5	807.7	808.5	2.7	3.5	807.8	808.5	2.7	3.2	808.0	808.5	2.7	4.5	806.7
STN-89	PZ-89	836.1	-0.1	NA	NA	836.1	-0.1	NA	NA	836.1	-0.1	25.5	810.5	836.1	-0.1	25.8	810.2
STN-90	PZ-90	838.4	0.1	NA	NA	838.4	0.1	NA	NA	838.4	0.1	26.9	811.6	838.4	0.1	27.0	811.6
STN-91A	PZ-91A	Not Installed				Not Installed				Not Installed				799.0	2.8	13.4	788.4

Significant Change
*** Change from previous reading**
** NA: No Reading Taken

Stantec

PIEZOMETER

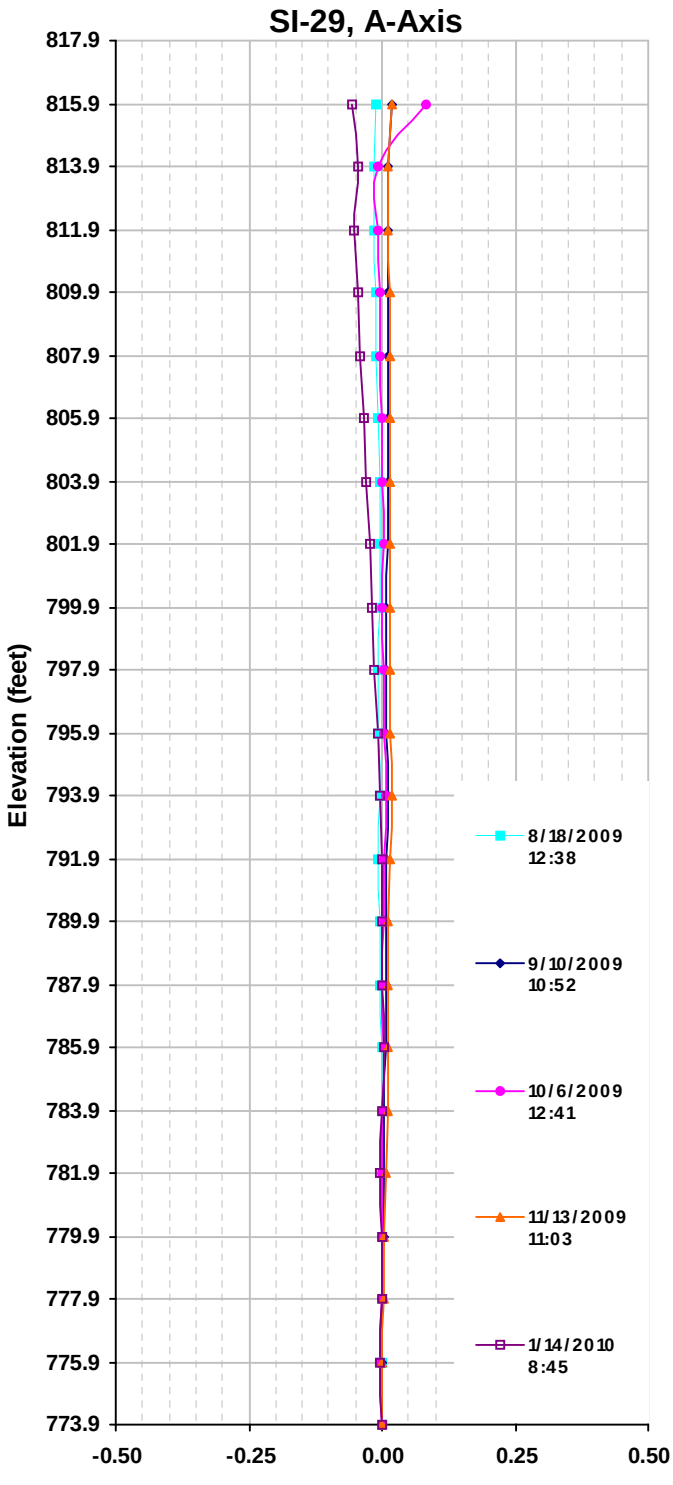
Bull Run Fossil Plant
1265 Edgemoor Rd
Clinton,TN
172679015

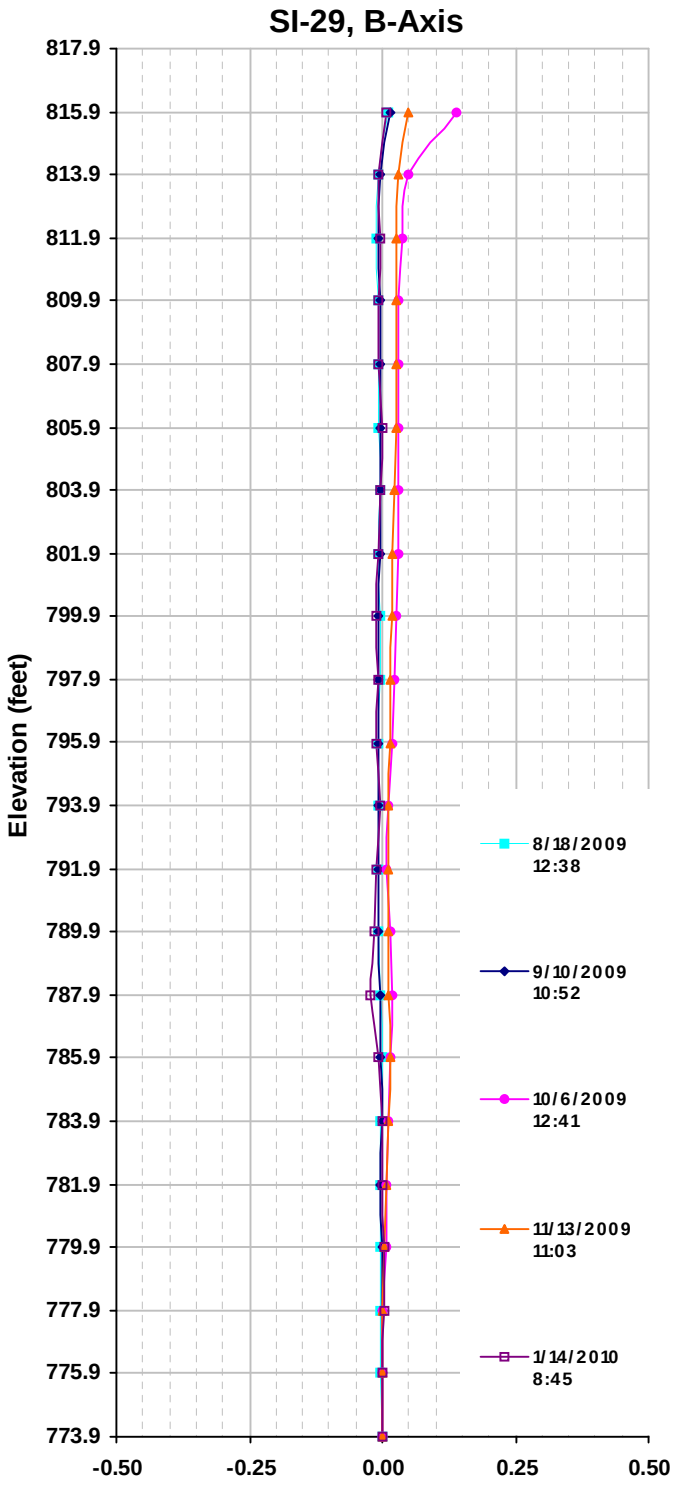
		4/2/2010			
Location	Piezometer	Surface Elevation (ft)	Stickup (ft)	Depth Measurement(ft)	Water Elevation (ft)
STN-3	PZ-3	810.2	0.0	NA	NA
STN-5	PZ-5	841.0	3.0	NA	NA
STN-6	PZ-6	818.2	3.0	NA	NA
STN-10	PZ-10A	817.9	2.7	NA	NA
STN-14	PZ-14	848.7	3.0	NA	NA
STN-15	PZ-15	818.1	3.0	NA	NA
STN-18	PZ-18	821.7	3.0	NA	NA
STN-19	PZ-19	810.2	-0.2	NA	NA
STN-27	PZ-27	831.3	-0.2	22.2	808.9
STN-30	PZ-30	826.2	-0.2	16.9	809.2
STN-33	PZ-33	836.1	-0.2	21.0	815.0
STN-34	PZ-34	825.6	-0.1	29.3	796.2
STN-34A	PZ-34A	825.5	-0.2	16.3	809.1
STN-35	PZ-35	808.9	-0.1	13.1	795.6
STN-35A	PZ-35A	809.1	-0.2	2.8	806.2
STN-36	PZ-36	800.5	3.0	8.7	794.8
STN-39	PZ-39	835.7	-0.2	19.4	816.2
STN-40	PZ-40	825.8	-0.1	15.9	809.8
STN-41	PZ-41	809.7	-0.1	14.5	795.0
STN-41A	PZ-41A	809.6	-0.1	0.7	808.8
STN-44	PZ-44	835.7	-0.1	22.7	812.9
STN-45	PZ-45	824.8	-0.1	16.4	808.3
STN-46	PZ-46	808.2	2.6	NA	NA
STN-47	PZ-47	835.7	-0.1	24.7	810.9
STN-48	PZ-48	825.8	-0.2	16.3	809.4
STN-49	PZ-49	808.5	2.9	3.2	808.2
STN-51	PZ-51	809.8	-0.1	NA	NA
STN-51A	PZ-51A	809.8	-0.1	NA	NA
STN-55	PZ-55	810.1	-0.1	NA	NA
STN-55A	PZ-55A	810.3	-0.1	NA	NA
STN-56	PZ-56	800.2	3.1	NA	NA
STN-62	PZ-62	809.4	-0.1	NA	NA
STN-62A	PZ-62A	809.6	-0.1	NA	NA
STN-63	PZ-63	801.2	2.7	NA	NA
STN-65	PZ-65	809.1	-0.1	NA	NA
STN-65A	PZ-65A	809.1	0.0	NA	NA
STN-66	PZ-66	799.8	2.4	NA	NA
STN-67	PZ-67	809.5	0.0	NA	NA
STN-68	PZ-68	800.8	2.9	NA	NA
STN-88	PZ-88	808.5	2.7	4.6	806.6
STN-89	PZ-89	836.1	-0.1	25.9	810.1
STN-90	PZ-90	838.4	0.1	27.0	811.6
STN-91A	PZ-91A	799.0	2.8	13.0	788.8

Significant Change
*** Change from previous reading**
** NA: No Reading Taken

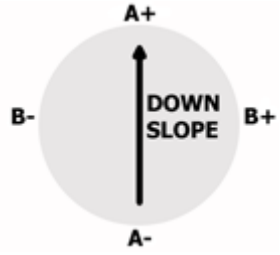
Attachment 2

Slope Inclinometer Readings





Stantec



Bull Run Fossil Plant
Bull Run
Clinton, TN
172679015
1/15/2010

SITE BRFTVA

INSTALLATION SI-29

DESCRIPTION

CURRENT SURVEY 8/18/2009 12:38:53 PM

INITIAL SURVEY 8/11/2009 1:05:08 PM

DATE PRINTED 1/15/2010 7:47:31 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-319	329	-0.3888	-315	324	-0.3834	0.0054	-0.0102
6	-222	230	-0.2712	-222	231	-0.2718	-0.0006	-0.0156
8	-135	144	-0.1674	-138	146	-0.1704	-0.0030	-0.0150
10	-13	17	-0.0180	-15	19	-0.0204	-0.0024	-0.0120
12	140	-135	0.1650	139	-132	0.1626	-0.0024	-0.0096
14	213	-208	0.2526	212	-206	0.2508	-0.0018	-0.0072
16	219	-217	0.2616	219	-215	0.2604	-0.0012	-0.0054
18	211	-204	0.2490	213	-203	0.2496	0.0006	-0.0042
20	35	-31	0.0396	38	-31	0.0414	0.0018	-0.0048
22	-150	156	-0.1836	-149	158	-0.1842	-0.0006	-0.0066
24	-242	247	-0.2934	-242	249	-0.2946	-0.0012	-0.0060
26	-315	320	-0.3810	-313	320	-0.3798	0.0012	-0.0048
28	-412	420	-0.4992	-413	421	-0.5004	-0.0012	-0.0060
30	-341	346	-0.4122	-342	347	-0.4134	-0.0012	-0.0048
32	-138	145	-0.1698	-141	145	-0.1716	-0.0018	-0.0036
34	-1	6	-0.0042	-1	6	-0.0042	0.0000	-0.0018
36	23	-18	0.0246	23	-17	0.0240	-0.0006	-0.0018
38	67	-59	0.0756	67	-58	0.0750	-0.0006	-0.0012
40	87	-82	0.1014	88	-82	0.1020	0.0006	-0.0006
42	77	-70	0.0882	77	-69	0.0876	-0.0006	-0.0012
44	54	-47	0.0606	54	-46	0.0600	-0.0006	-0.0006
46	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-29

DESCRIPTION

CURRENT SURVEY 9/10/2009 10:52:44 AM

INITIAL SURVEY 8/11/2009 1:05:08 PM

DATE PRINTED 1/15/2010 7:47:31 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-319	329	-0.3888	-311	323	-0.3804	0.0084	0.0198
6	-222	230	-0.2712	-219	233	-0.2712	0.0000	0.0114
8	-135	144	-0.1674	-134	146	-0.1680	-0.0006	0.0114
10	-13	17	-0.0180	-10	19	-0.0174	0.0006	0.0120
12	140	-135	0.1650	141	-136	0.1662	0.0012	0.0114
14	213	-208	0.2526	215	-207	0.2532	0.0006	0.0102
16	219	-217	0.2616	221	-215	0.2616	0.0000	0.0096
18	211	-204	0.2490	215	-202	0.2502	0.0012	0.0096
20	35	-31	0.0396	38	-29	0.0402	0.0006	0.0084
22	-150	156	-0.1836	-149	159	-0.1848	-0.0012	0.0078
24	-242	247	-0.2934	-240	250	-0.2940	-0.0006	0.0090
26	-315	320	-0.3810	-311	320	-0.3786	0.0024	0.0096
28	-412	420	-0.4992	-410	421	-0.4986	0.0006	0.0072
30	-341	346	-0.4122	-339	347	-0.4116	0.0006	0.0066
32	-138	145	-0.1698	-138	146	-0.1704	-0.0006	0.0060
34	-1	6	-0.0042	2	6	-0.0024	0.0018	0.0066
36	23	-18	0.0246	26	-17	0.0258	0.0012	0.0048
38	67	-59	0.0756	70	-58	0.0768	0.0012	0.0036
40	87	-82	0.1014	90	-82	0.1032	0.0018	0.0024
42	77	-70	0.0882	80	-69	0.0894	0.0012	0.0006
44	54	-47	0.0606	55	-45	0.0600	-0.0006	-0.0006
46	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-29

DESCRIPTION

CURRENT SURVEY 10/6/2009 12:41:10 PM

INITIAL SURVEY 8/11/2009 1:05:08 PM

DATE PRINTED 1/15/2010 7:47:31 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-319	329	-0.3888	-239	259	-0.2988	0.0900	0.0816
6	-222	230	-0.2712	-223	231	-0.2724	-0.0012	-0.0084
8	-135	144	-0.1674	-139	145	-0.1704	-0.0030	-0.0072
10	-13	17	-0.0180	-14	18	-0.0192	-0.0012	-0.0042
12	140	-135	0.1650	139	-131	0.1620	-0.0030	-0.0030
14	213	-208	0.2526	213	-207	0.2520	-0.0006	0.0000
16	219	-217	0.2616	219	-214	0.2598	-0.0018	0.0006
18	211	-204	0.2490	211	-206	0.2502	0.0012	0.0024
20	35	-31	0.0396	35	-28	0.0378	-0.0018	0.0012
22	-150	156	-0.1836	-151	158	-0.1854	-0.0018	0.0030
24	-242	247	-0.2934	-243	249	-0.2952	-0.0018	0.0048
26	-315	320	-0.3810	-313	318	-0.3786	0.0024	0.0066
28	-412	420	-0.4992	-411	419	-0.4980	0.0012	0.0042
30	-341	346	-0.4122	-338	345	-0.4098	0.0024	0.0030
32	-138	145	-0.1698	-141	146	-0.1722	-0.0024	0.0006
34	-1	6	-0.0042	1	6	-0.0030	0.0012	0.0030
36	23	-18	0.0246	25	-20	0.0270	0.0024	0.0018
38	67	-59	0.0756	67	-59	0.0756	0.0000	-0.0006
40	87	-82	0.1014	89	-82	0.1026	0.0012	-0.0006
42	77	-70	0.0882	77	-71	0.0888	0.0006	-0.0018
44	54	-47	0.0606	53	-44	0.0582	-0.0024	-0.0024
46	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-29

DESCRIPTION

CURRENT SURVEY 11/13/2009 11:03:54 AM

INITIAL SURVEY 8/11/2009 1:05:08 PM

DATE PRINTED 1/15/2010 7:47:31 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-319	329	-0.3888	-311	322	-0.3798	0.0090	0.0186
6	-222	230	-0.2712	-222	233	-0.2730	-0.0018	0.0096
8	-135	144	-0.1674	-137	146	-0.1698	-0.0024	0.0114
10	-13	17	-0.0180	-13	19	-0.0192	-0.0012	0.0138
12	140	-135	0.1650	141	-133	0.1644	-0.0006	0.0150
14	213	-208	0.2526	215	-206	0.2526	0.0000	0.0156
16	219	-217	0.2616	220	-214	0.2604	-0.0012	0.0156
18	211	-204	0.2490	215	-202	0.2502	0.0012	0.0168
20	35	-31	0.0396	39	-29	0.0408	0.0012	0.0156
22	-150	156	-0.1836	-149	161	-0.1860	-0.0024	0.0144
24	-242	247	-0.2934	-239	251	-0.2940	-0.0006	0.0168
26	-315	320	-0.3810	-310	319	-0.3774	0.0036	0.0174
28	-412	420	-0.4992	-409	421	-0.4980	0.0012	0.0138
30	-341	346	-0.4122	-338	347	-0.4110	0.0012	0.0126
32	-138	145	-0.1698	-138	147	-0.1710	-0.0012	0.0114
34	-1	6	-0.0042	3	6	-0.0018	0.0024	0.0126
36	23	-18	0.0246	28	-18	0.0276	0.0030	0.0102
38	67	-59	0.0756	71	-58	0.0774	0.0018	0.0072
40	87	-82	0.1014	91	-82	0.1038	0.0024	0.0054
42	77	-70	0.0882	82	-71	0.0918	0.0036	0.0030
44	54	-47	0.0606	56	-44	0.0600	-0.0006	-0.0006
46	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-29

DESCRIPTION

CURRENT SURVEY 1/14/2010 8:45:54 AM

INITIAL SURVEY 8/11/2009 1:05:08 PM

DATE PRINTED 1/15/2010 7:47:31 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-319	329	-0.3888	-334	334	-0.4008	-0.0120	-0.0582
6	-222	230	-0.2712	-220	219	-0.2634	0.0078	-0.0462
8	-135	144	-0.1674	-148	144	-0.1752	-0.0078	-0.0540
10	-13	17	-0.0180	-22	19	-0.0246	-0.0066	-0.0462
12	140	-135	0.1650	131	-135	0.1596	-0.0054	-0.0396
14	213	-208	0.2526	205	-207	0.2472	-0.0054	-0.0342
16	219	-217	0.2616	211	-213	0.2544	-0.0072	-0.0288
18	211	-204	0.2490	205	-206	0.2466	-0.0024	-0.0216
20	35	-31	0.0396	30	-30	0.0360	-0.0036	-0.0192
22	-150	156	-0.1836	-162	160	-0.1932	-0.0096	-0.0156
24	-242	247	-0.2934	-247	248	-0.2970	-0.0036	-0.0060
26	-315	320	-0.3810	-320	318	-0.3828	-0.0018	-0.0024
28	-412	420	-0.4992	-417	418	-0.5010	-0.0018	-0.0006
30	-341	346	-0.4122	-344	343	-0.4122	0.0000	0.0012
32	-138	145	-0.1698	-143	142	-0.1710	-0.0012	0.0012
34	-1	6	-0.0042	-3	1	-0.0024	0.0018	0.0024
36	23	-18	0.0246	22	-24	0.0276	0.0030	0.0006
38	67	-59	0.0756	63	-62	0.0750	-0.0006	-0.0024
40	87	-82	0.1014	84	-85	0.1014	0.0000	-0.0018
42	77	-70	0.0882	74	-74	0.0888	0.0006	-0.0018
44	54	-47	0.0606	49	-48	0.0582	-0.0024	-0.0024
46	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-29

DESCRIPTION

CURRENT SURVEY 8/18/2009 12:38:53 PM

INITIAL SURVEY 8/11/2009 1:05:08 PM

DATE PRINTED 1/15/2010 7:47:39 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-161	222	-0.2298	-143	209	-0.2112	0.0186	0.0114
6	-174	230	-0.2424	-172	227	-0.2394	0.0030	-0.0072
8	-255	288	-0.3258	-257	288	-0.3270	-0.0012	-0.0102
10	-469	515	-0.5904	-474	513	-0.5922	-0.0018	-0.0090
12	-539	574	-0.6678	-542	573	-0.6690	-0.0012	-0.0072
14	-343	399	-0.4452	-346	397	-0.4458	-0.0006	-0.0060
16	-238	288	-0.3156	-239	286	-0.3150	0.0006	-0.0054
18	-118	174	-0.1752	-121	172	-0.1758	-0.0006	-0.0060
20	-32	89	-0.0726	-33	88	-0.0726	0.0000	-0.0054
22	-85	144	-0.1374	-84	142	-0.1356	0.0018	-0.0054
24	-81	142	-0.1338	-82	140	-0.1332	0.0006	-0.0072
26	-149	197	-0.2076	-149	195	-0.2064	0.0012	-0.0078
28	-104	158	-0.1572	-107	159	-0.1596	-0.0024	-0.0090
30	26	31	-0.0030	22	33	-0.0066	-0.0036	-0.0066
32	81	-18	0.0594	78	-18	0.0576	-0.0018	-0.0030
34	29	31	-0.0012	31	30	0.0006	0.0018	-0.0012
36	-79	114	-0.1158	-82	111	-0.1158	0.0000	-0.0030
38	-217	276	-0.2958	-219	274	-0.2958	0.0000	-0.0030
40	-296	354	-0.3900	-297	352	-0.3894	0.0006	-0.0030
42	-305	369	-0.4044	-308	367	-0.4050	-0.0006	-0.0036
44	-284	348	-0.3792	-290	347	-0.3822	-0.0030	-0.0030
46	0	0	0.0000	0		0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-29

DESCRIPTION

CURRENT SURVEY 9/10/2009 10:52:44 AM

INITIAL SURVEY 8/11/2009 1:05:08 PM

DATE PRINTED 1/15/2010 7:47:39 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-161	222	-0.2298	-142	208	-0.2100	0.0198	0.0162
6	-174	230	-0.2424	-170	229	-0.2394	0.0030	-0.0036
8	-255	288	-0.3258	-257	291	-0.3288	-0.0030	-0.0066
10	-469	515	-0.5904	-469	515	-0.5904	0.0000	-0.0036
12	-539	574	-0.6678	-540	573	-0.6678	0.0000	-0.0036
14	-343	399	-0.4452	-344	397	-0.4446	0.0006	-0.0036
16	-238	288	-0.3156	-237	287	-0.3144	0.0012	-0.0042
18	-118	174	-0.1752	-118	173	-0.1746	0.0006	-0.0054
20	-32	89	-0.0726	-29	89	-0.0708	0.0018	-0.0060
22	-85	144	-0.1374	-83	146	-0.1374	0.0000	-0.0078
24	-81	142	-0.1338	-79	143	-0.1332	0.0006	-0.0078
26	-149	197	-0.2076	-148	198	-0.2076	0.0000	-0.0084
28	-104	158	-0.1572	-106	159	-0.1590	-0.0018	-0.0084
30	26	31	-0.0030	25	34	-0.0054	-0.0024	-0.0066
32	81	-18	0.0594	81	-15	0.0576	-0.0018	-0.0042
34	29	31	-0.0012	28	32	-0.0024	-0.0012	-0.0024
36	-79	114	-0.1158	-78	113	-0.1146	0.0012	-0.0012
38	-217	276	-0.2958	-218	277	-0.2970	-0.0012	-0.0024
40	-296	354	-0.3900	-295	355	-0.3900	0.0000	-0.0012
42	-305	369	-0.4044	-305	369	-0.4044	0.0000	-0.0012
44	-284	348	-0.3792	-285	349	-0.3804	-0.0012	-0.0012
46	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-29

DESCRIPTION

CURRENT SURVEY 10/6/2009 12:41:10 PM

INITIAL SURVEY 8/11/2009 1:05:08 PM

DATE PRINTED 1/15/2010 7:47:39 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-161	222	-0.2298	-83	154	-0.1422	0.0876	0.1374
6	-174	230	-0.2424	-171	215	-0.2316	0.0108	0.0498
8	-255	288	-0.3258	-253	275	-0.3168	0.0090	0.0390
10	-469	515	-0.5904	-467	515	-0.5892	0.0012	0.0300
12	-539	574	-0.6678	-543	574	-0.6702	-0.0024	0.0288
14	-343	399	-0.4452	-341	399	-0.4440	0.0012	0.0312
16	-238	288	-0.3156	-239	284	-0.3138	0.0018	0.0300
18	-118	174	-0.1752	-117	173	-0.1740	0.0012	0.0282
20	-32	89	-0.0726	-27	88	-0.0690	0.0036	0.0270
22	-85	144	-0.1374	-84	138	-0.1332	0.0042	0.0234
24	-81	142	-0.1338	-79	131	-0.1260	0.0078	0.0192
26	-149	197	-0.2076	-148	191	-0.2034	0.0042	0.0114
28	-104	158	-0.1572	-117	158	-0.1650	-0.0078	0.0072
30	26	31	-0.0030	22	31	-0.0054	-0.0024	0.0150
32	81	-18	0.0594	79	-27	0.0636	0.0042	0.0174
34	29	31	-0.0012	33	29	0.0024	0.0036	0.0132
36	-79	114	-0.1158	-79	110	-0.1134	0.0024	0.0096
38	-217	276	-0.2958	-217	274	-0.2946	0.0012	0.0072
40	-296	354	-0.3900	-297	346	-0.3858	0.0042	0.0060
42	-305	369	-0.4044	-307	367	-0.4044	0.0000	0.0018
44	-284	348	-0.3792	-288	341	-0.3774	0.0018	0.0018
46	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-29

DESCRIPTION

CURRENT SURVEY 11/13/2009 11:03:54 AM

INITIAL SURVEY 8/11/2009 1:05:08 PM

DATE PRINTED 1/15/2010 7:47:39 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-161	222	-0.2298	-142	211	-0.2118	0.0180	0.0480
6	-174	230	-0.2424	-171	226	-0.2382	0.0042	0.0300
8	-255	288	-0.3258	-257	286	-0.3258	0.0000	0.0258
10	-469	515	-0.5904	-470	514	-0.5904	0.0000	0.0258
12	-539	574	-0.6678	-541	571	-0.6672	0.0006	0.0258
14	-343	399	-0.4452	-343	396	-0.4434	0.0018	0.0252
16	-238	288	-0.3156	-236	284	-0.3120	0.0036	0.0234
18	-118	174	-0.1752	-118	172	-0.1740	0.0012	0.0198
20	-32	89	-0.0726	-27	86	-0.0678	0.0048	0.0186
22	-85	144	-0.1374	-85	145	-0.1380	-0.0006	0.0138
24	-81	142	-0.1338	-78	140	-0.1308	0.0030	0.0144
26	-149	197	-0.2076	-147	197	-0.2064	0.0012	0.0114
28	-104	158	-0.1572	-106	159	-0.1590	-0.0018	0.0102
30	26	31	-0.0030	25	31	-0.0036	-0.0006	0.0120
32	81	-18	0.0594	79	-17	0.0576	-0.0018	0.0126
34	29	31	-0.0012	33	29	0.0024	0.0036	0.0144
36	-79	114	-0.1158	-78	109	-0.1122	0.0036	0.0108
38	-217	276	-0.2958	-215	274	-0.2934	0.0024	0.0072
40	-296	354	-0.3900	-294	351	-0.3870	0.0030	0.0048
42	-305	369	-0.4044	-305	366	-0.4026	0.0018	0.0018
44	-284	348	-0.3792	-285	347	-0.3792	0.0000	0.0000
46	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-29

DESCRIPTION

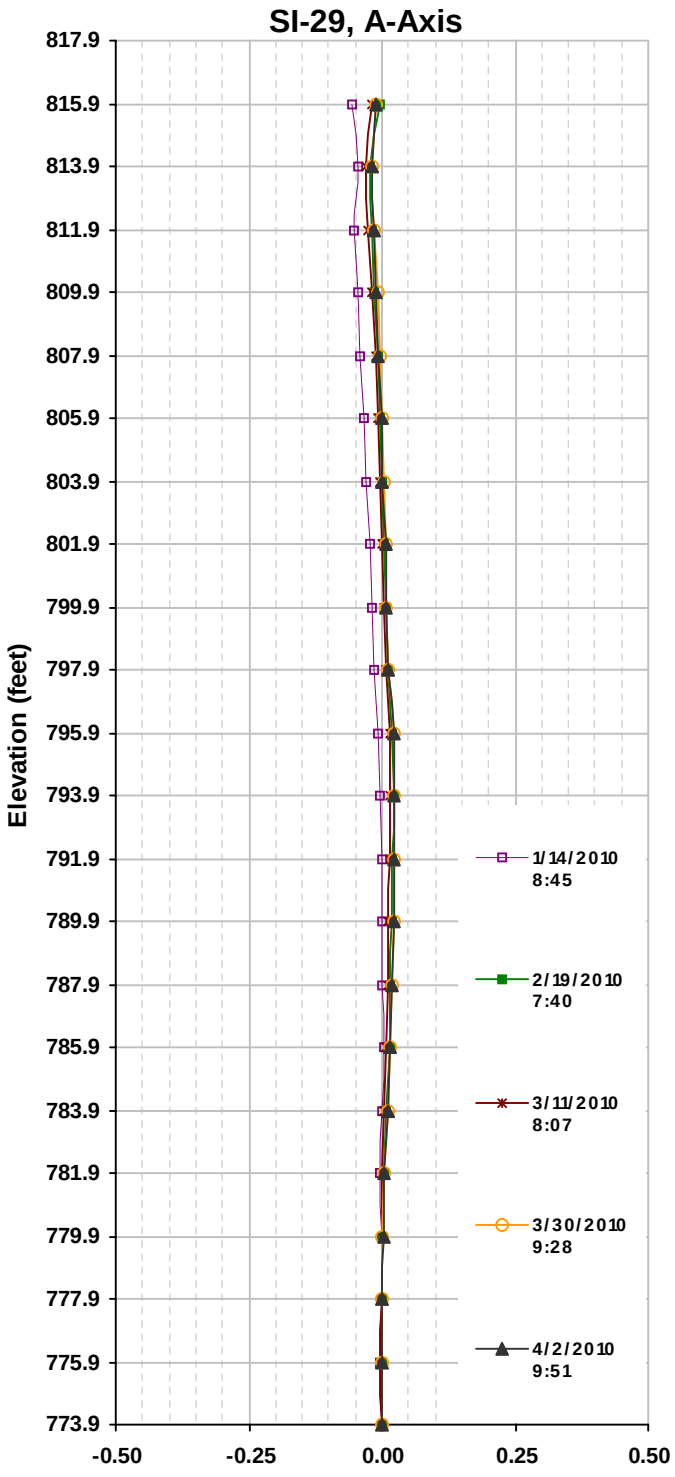
CURRENT SURVEY 1/14/2010 8:45:54 AM

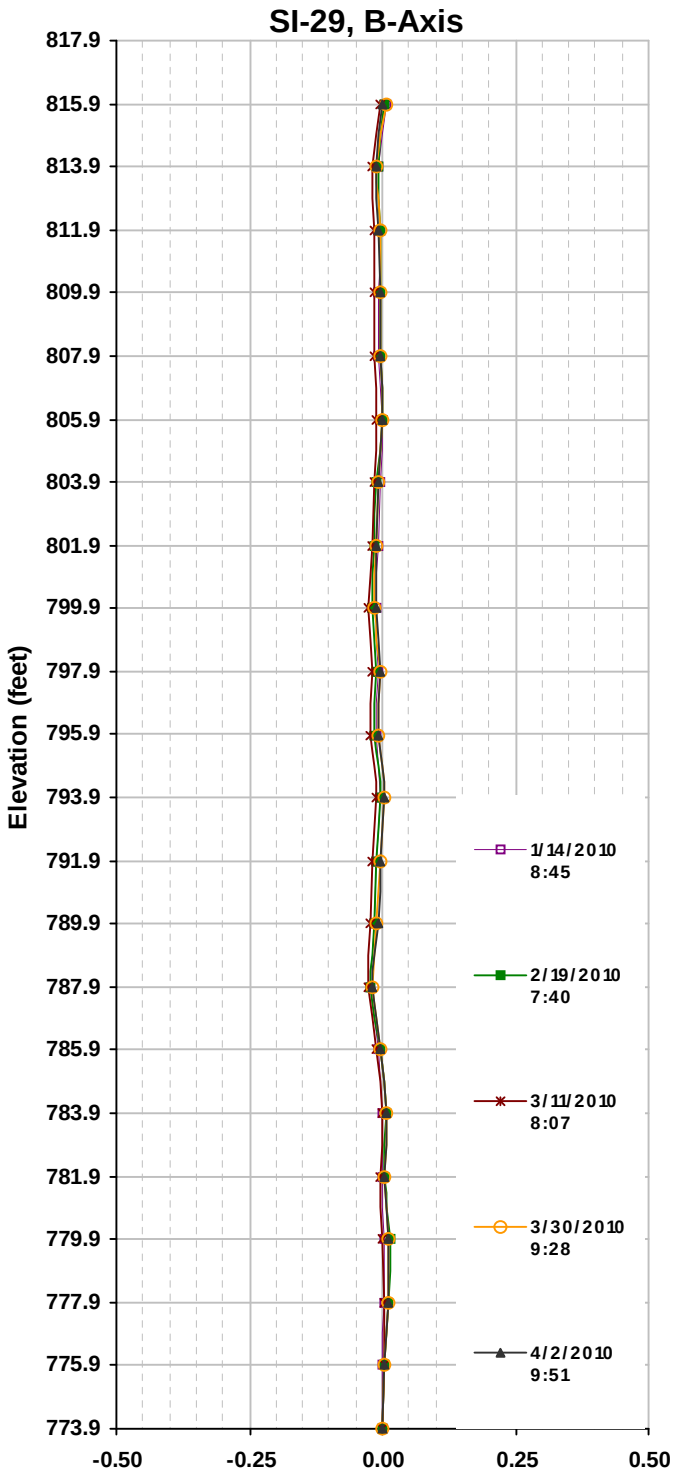
INITIAL SURVEY 8/11/2009 1:05:08 PM

DATE PRINTED 1/15/2010 7:47:39 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-161	222	-0.2298	-187	166	-0.2118	0.0180	0.0090
6	-174	230	-0.2424	-216	194	-0.2460	-0.0036	-0.0090
8	-255	288	-0.3258	-275	266	-0.3246	0.0012	-0.0054
10	-469	515	-0.5904	-492	489	-0.5886	0.0018	-0.0066
12	-539	574	-0.6678	-567	559	-0.6756	-0.0078	-0.0084
14	-343	399	-0.4452	-375	360	-0.4410	0.0042	-0.0006
16	-238	288	-0.3156	-267	252	-0.3114	0.0042	-0.0048
18	-118	174	-0.1752	-149	137	-0.1716	0.0036	-0.0090
20	-32	89	-0.0726	-78	52	-0.0780	-0.0054	-0.0126
22	-85	144	-0.1374	-125	96	-0.1326	0.0048	-0.0072
24	-81	142	-0.1338	-134	105	-0.1434	-0.0096	-0.0120
26	-149	197	-0.2076	-179	154	-0.1998	0.0078	-0.0024
28	-104	158	-0.1572	-133	123	-0.1536	0.0036	-0.0102
30	26	31	-0.0030	-3	-12	0.0054	0.0084	-0.0138
32	81	-18	0.0594	25	-52	0.0462	-0.0132	-0.0222
34	29	31	-0.0012	-21	-1	-0.0120	-0.0108	-0.0090
36	-79	114	-0.1158	-99	90	-0.1134	0.0024	0.0018
38	-217	276	-0.2958	-256	245	-0.3006	-0.0048	-0.0006
40	-296	354	-0.3900	-341	310	-0.3906	-0.0006	0.0042
42	-305	369	-0.4044	-352	315	-0.4002	0.0042	0.0048
44	-284	348	-0.3792	-333	298	-0.3786	0.0006	0.0006
46	0	0	0.0000	0	0	0.0000	0.0000	0.0000





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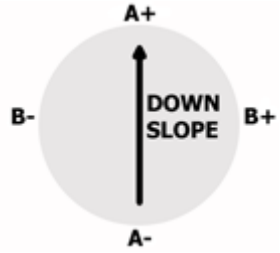


Bull Run Fossil Plant
Bull Run
Clinton, TN
172679015
4/5/2010

SITE BRFTVA

INSTALLATION SI-29

DESCRIPTION

CURRENT SURVEY 1/14/2010 8:45:54 AM

INITIAL SURVEY 8/11/2009 1:05:08 PM

DATE PRINTED 4/5/2010 10:11:12 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-319	329	-0.3888	-334	334	-0.4008	-0.0120	-0.0582
6	-222	230	-0.2712	-220	219	-0.2634	0.0078	-0.0462
8	-135	144	-0.1674	-148	144	-0.1752	-0.0078	-0.0540
10	-13	17	-0.0180	-22	19	-0.0246	-0.0066	-0.0462
12	140	-135	0.1650	131	-135	0.1596	-0.0054	-0.0396
14	213	-208	0.2526	205	-207	0.2472	-0.0054	-0.0342
16	219	-217	0.2616	211	-213	0.2544	-0.0072	-0.0288
18	211	-204	0.2490	205	-206	0.2466	-0.0024	-0.0216
20	35	-31	0.0396	30	-30	0.0360	-0.0036	-0.0192
22	-150	156	-0.1836	-162	160	-0.1932	-0.0096	-0.0156
24	-242	247	-0.2934	-247	248	-0.2970	-0.0036	-0.0060
26	-315	320	-0.3810	-320	318	-0.3828	-0.0018	-0.0024
28	-412	420	-0.4992	-417	418	-0.5010	-0.0018	-0.0006
30	-341	346	-0.4122	-344	343	-0.4122	0.0000	0.0012
32	-138	145	-0.1698	-143	142	-0.1710	-0.0012	0.0012
34	-1	6	-0.0042	-3	1	-0.0024	0.0018	0.0024
36	23	-18	0.0246	22	-24	0.0276	0.0030	0.0006
38	67	-59	0.0756	63	-62	0.0750	-0.0006	-0.0024
40	87	-82	0.1014	84	-85	0.1014	0.0000	-0.0018
42	77	-70	0.0882	74	-74	0.0888	0.0006	-0.0018
44	54	-47	0.0606	49	-48	0.0582	-0.0024	-0.0024
46	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-29

DESCRIPTION

CURRENT SURVEY 2/19/2010 7:40:03 AM

INITIAL SURVEY 8/11/2009 1:05:08 PM

DATE PRINTED 4/5/2010 10:11:13 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-319	329	-0.3888	-316	300	-0.3696	0.0192	-0.0024
6	-222	230	-0.2712	-228	229	-0.2742	-0.0030	-0.0216
8	-135	144	-0.1674	-146	142	-0.1728	-0.0054	-0.0186
10	-13	17	-0.0180	-20	17	-0.0222	-0.0042	-0.0132
12	140	-135	0.1650	132	-135	0.1602	-0.0048	-0.0090
14	213	-208	0.2526	207	-208	0.2490	-0.0036	-0.0042
16	219	-217	0.2616	214	-213	0.2562	-0.0054	-0.0006
18	211	-204	0.2490	206	-207	0.2478	-0.0012	0.0048
20	35	-31	0.0396	29	-30	0.0354	-0.0042	0.0060
22	-150	156	-0.1836	-161	159	-0.1920	-0.0084	0.0102
24	-242	247	-0.2934	-246	247	-0.2958	-0.0024	0.0186
26	-315	320	-0.3810	-318	315	-0.3798	0.0012	0.0210
28	-412	420	-0.4992	-414	416	-0.4980	0.0012	0.0198
30	-341	346	-0.4122	-341	340	-0.4086	0.0036	0.0186
32	-138	145	-0.1698	-140	140	-0.1680	0.0018	0.0150
34	-1	6	-0.0042	0	-1	0.0000	0.0042	0.0132
36	23	-18	0.0246	24	-26	0.0300	0.0054	0.0090
38	67	-59	0.0756	65	-64	0.0774	0.0018	0.0036
40	87	-82	0.1014	85	-86	0.1026	0.0012	0.0018
42	77	-70	0.0882	75	-76	0.0906	0.0024	0.0006
44	54	-47	0.0606	49	-49	0.0588	-0.0018	-0.0018
46	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-29

DESCRIPTION

CURRENT SURVEY 3/11/2010 8:07:59 AM

INITIAL SURVEY 8/11/2009 1:05:08 PM

DATE PRINTED 4/5/2010 10:11:13 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-319	329	-0.3888	-317	314	-0.3786	0.0102	-0.0186
6	-222	230	-0.2712	-227	232	-0.2754	-0.0042	-0.0288
8	-135	144	-0.1674	-144	146	-0.1740	-0.0066	-0.0246
10	-13	17	-0.0180	-19	20	-0.0234	-0.0054	-0.0180
12	140	-135	0.1650	134	-133	0.1602	-0.0048	-0.0126
14	213	-208	0.2526	208	-206	0.2484	-0.0042	-0.0078
16	219	-217	0.2616	215	-212	0.2562	-0.0054	-0.0036
18	211	-204	0.2490	208	-206	0.2484	-0.0006	0.0018
20	35	-31	0.0396	32	-28	0.0360	-0.0036	0.0024
22	-150	156	-0.1836	-158	161	-0.1914	-0.0078	0.0060
24	-242	247	-0.2934	-244	248	-0.2952	-0.0018	0.0138
26	-315	320	-0.3810	-316	316	-0.3792	0.0018	0.0156
28	-412	420	-0.4992	-411	418	-0.4974	0.0018	0.0138
30	-341	346	-0.4122	-340	343	-0.4098	0.0024	0.0120
32	-138	145	-0.1698	-139	142	-0.1686	0.0012	0.0096
34	-1	6	-0.0042	2	2	0.0000	0.0042	0.0084
36	23	-18	0.0246	26	-24	0.0300	0.0054	0.0042
38	67	-59	0.0756	66	-61	0.0762	0.0006	-0.0012
40	87	-82	0.1014	86	-82	0.1008	-0.0006	-0.0018
42	77	-70	0.0882	76	-73	0.0894	0.0012	-0.0012
44	54	-47	0.0606	51	-46	0.0582	-0.0024	-0.0024
46	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-29

DESCRIPTION

CURRENT SURVEY 3/30/2010 9:28:07 AM

INITIAL SURVEY 8/11/2009 1:05:08 PM

DATE PRINTED 4/5/2010 10:11:13 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-319	329	-0.3888	-314	321	-0.3810	0.0078	-0.0108
6	-222	230	-0.2712	-226	233	-0.2754	-0.0042	-0.0186
8	-135	144	-0.1674	-142	146	-0.1728	-0.0054	-0.0144
10	-13	17	-0.0180	-17	20	-0.0222	-0.0042	-0.0090
12	140	-135	0.1650	136	-132	0.1608	-0.0042	-0.0048
14	213	-208	0.2526	211	-205	0.2496	-0.0030	-0.0006
16	219	-217	0.2616	218	-210	0.2568	-0.0048	0.0024
18	211	-204	0.2490	210	-205	0.2490	0.0000	0.0072
20	35	-31	0.0396	32	-26	0.0348	-0.0048	0.0072
22	-150	156	-0.1836	-158	163	-0.1926	-0.0090	0.0120
24	-242	247	-0.2934	-243	250	-0.2958	-0.0024	0.0210
26	-315	320	-0.3810	-316	319	-0.3810	0.0000	0.0234
28	-412	420	-0.4992	-410	419	-0.4974	0.0018	0.0234
30	-341	346	-0.4122	-338	344	-0.4092	0.0030	0.0216
32	-138	145	-0.1698	-137	142	-0.1674	0.0024	0.0186
34	-1	6	-0.0042	5	2	0.0018	0.0060	0.0162
36	23	-18	0.0246	28	-24	0.0312	0.0066	0.0102
38	67	-59	0.0756	69	-61	0.0780	0.0024	0.0036
40	87	-82	0.1014	88	-83	0.1026	0.0012	0.0012
42	77	-70	0.0882	78	-72	0.0900	0.0018	0.0000
44	54	-47	0.0606	53	-45	0.0588	-0.0018	-0.0018
46	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-29

DESCRIPTION

CURRENT SURVEY 4/2/2010 9:51:06 AM

INITIAL SURVEY 8/11/2009 1:05:08 PM

DATE PRINTED 4/5/2010 10:11:13 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-319	329	-0.3888	-313	322	-0.3810	0.0078	-0.0120
6	-222	230	-0.2712	-224	233	-0.2742	-0.0030	-0.0198
8	-135	144	-0.1674	-142	147	-0.1734	-0.0060	-0.0168
10	-13	17	-0.0180	-17	21	-0.0228	-0.0048	-0.0108
12	140	-135	0.1650	136	-131	0.1602	-0.0048	-0.0060
14	213	-208	0.2526	211	-205	0.2496	-0.0030	-0.0012
16	219	-217	0.2616	218	-210	0.2568	-0.0048	0.0018
18	211	-204	0.2490	210	-204	0.2484	-0.0006	0.0066
20	35	-31	0.0396	32	-26	0.0348	-0.0048	0.0072
22	-150	156	-0.1836	-158	163	-0.1926	-0.0090	0.0120
24	-242	247	-0.2934	-243	250	-0.2958	-0.0024	0.0210
26	-315	320	-0.3810	-315	319	-0.3804	0.0006	0.0234
28	-412	420	-0.4992	-411	419	-0.4980	0.0012	0.0228
30	-341	346	-0.4122	-338	344	-0.4092	0.0030	0.0216
32	-138	145	-0.1698	-137	143	-0.1680	0.0018	0.0186
34	-1	6	-0.0042	4	2	0.0012	0.0054	0.0168
36	23	-18	0.0246	28	-23	0.0306	0.0060	0.0114
38	67	-59	0.0756	69	-61	0.0780	0.0024	0.0054
40	87	-82	0.1014	89	-83	0.1032	0.0018	0.0030
42	77	-70	0.0882	78	-72	0.0900	0.0018	0.0012
44	54	-47	0.0606	54	-46	0.0600	-0.0006	-0.0006
46	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-29

DESCRIPTION

CURRENT SURVEY 1/14/2010 8:45:54 AM

INITIAL SURVEY 8/11/2009 1:05:08 PM

DATE PRINTED 4/5/2010 10:11:32 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-161	222	-0.2298	-187	166	-0.2118	0.0180	0.0090
6	-174	230	-0.2424	-216	194	-0.2460	-0.0036	-0.0090
8	-255	288	-0.3258	-275	266	-0.3246	0.0012	-0.0054
10	-469	515	-0.5904	-492	489	-0.5886	0.0018	-0.0066
12	-539	574	-0.6678	-567	559	-0.6756	-0.0078	-0.0084
14	-343	399	-0.4452	-375	360	-0.4410	0.0042	-0.0006
16	-238	288	-0.3156	-267	252	-0.3114	0.0042	-0.0048
18	-118	174	-0.1752	-149	137	-0.1716	0.0036	-0.0090
20	-32	89	-0.0726	-78	52	-0.0780	-0.0054	-0.0126
22	-85	144	-0.1374	-125	96	-0.1326	0.0048	-0.0072
24	-81	142	-0.1338	-134	105	-0.1434	-0.0096	-0.0120
26	-149	197	-0.2076	-179	154	-0.1998	0.0078	-0.0024
28	-104	158	-0.1572	-133	123	-0.1536	0.0036	-0.0102
30	26	31	-0.0030	-3	-12	0.0054	0.0084	-0.0138
32	81	-18	0.0594	25	-52	0.0462	-0.0132	-0.0222
34	29	31	-0.0012	-21	-1	-0.0120	-0.0108	-0.0090
36	-79	114	-0.1158	-99	90	-0.1134	0.0024	0.0018
38	-217	276	-0.2958	-256	245	-0.3006	-0.0048	-0.0006
40	-296	354	-0.3900	-341	310	-0.3906	-0.0006	0.0042
42	-305	369	-0.4044	-352	315	-0.4002	0.0042	0.0048
44	-284	348	-0.3792	-333	298	-0.3786	0.0006	0.0006
46	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-29

DESCRIPTION

CURRENT SURVEY 2/19/2010 7:40:03 AM

INITIAL SURVEY 8/11/2009 1:05:08 PM

DATE PRINTED 4/5/2010 10:11:32 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-161	222	-0.2298	-192	171	-0.2178	0.0120	0.0042
6	-174	230	-0.2424	-216	196	-0.2472	-0.0048	-0.0078
8	-255	288	-0.3258	-275	268	-0.3258	0.0000	-0.0030
10	-469	515	-0.5904	-490	493	-0.5898	0.0006	-0.0030
12	-539	574	-0.6678	-566	554	-0.6720	-0.0042	-0.0036
14	-343	399	-0.4452	-367	358	-0.4350	0.0102	0.0006
16	-238	288	-0.3156	-268	252	-0.3120	0.0036	-0.0096
18	-118	174	-0.1752	-149	135	-0.1704	0.0048	-0.0132
20	-32	89	-0.0726	-79	56	-0.0810	-0.0084	-0.0180
22	-85	144	-0.1374	-122	99	-0.1326	0.0048	-0.0096
24	-81	142	-0.1338	-133	108	-0.1446	-0.0108	-0.0144
26	-149	197	-0.2076	-178	155	-0.1998	0.0078	-0.0036
28	-104	158	-0.1572	-133	126	-0.1554	0.0018	-0.0114
30	26	31	-0.0030	-2	-10	0.0048	0.0078	-0.0132
32	81	-18	0.0594	25	-48	0.0438	-0.0156	-0.0210
34	29	31	-0.0012	-21	0	-0.0126	-0.0114	-0.0054
36	-79	114	-0.1158	-100	91	-0.1146	0.0012	0.0060
38	-217	276	-0.2958	-259	248	-0.3042	-0.0084	0.0048
40	-296	354	-0.3900	-335	314	-0.3894	0.0006	0.0132
42	-305	369	-0.4044	-342	319	-0.3966	0.0078	0.0126
44	-284	348	-0.3792	-323	301	-0.3744	0.0048	0.0048
46	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-29

DESCRIPTION

CURRENT SURVEY 3/11/2010 8:07:59 AM

INITIAL SURVEY 8/11/2009 1:05:08 PM

DATE PRINTED 4/5/2010 10:11:32 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-161	222	-0.2298	-189	167	-0.2136	0.0162	-0.0030
6	-174	230	-0.2424	-214	196	-0.2460	-0.0036	-0.0192
8	-255	288	-0.3258	-274	269	-0.3258	0.0000	-0.0156
10	-469	515	-0.5904	-491	494	-0.5910	-0.0006	-0.0156
12	-539	574	-0.6678	-564	556	-0.6720	-0.0042	-0.0150
14	-343	399	-0.4452	-370	363	-0.4398	0.0054	-0.0108
16	-238	288	-0.3156	-265	254	-0.3114	0.0042	-0.0162
18	-118	174	-0.1752	-146	138	-0.1704	0.0048	-0.0204
20	-32	89	-0.0726	-77	55	-0.0792	-0.0066	-0.0252
22	-85	144	-0.1374	-126	98	-0.1344	0.0030	-0.0186
24	-81	142	-0.1338	-133	108	-0.1446	-0.0108	-0.0216
26	-149	197	-0.2076	-177	156	-0.1998	0.0078	-0.0108
28	-104	158	-0.1572	-132	124	-0.1536	0.0036	-0.0186
30	26	31	-0.0030	0	-9	0.0000	0.0030	-0.0222
32	81	-18	0.0594	27	-49	0.0456	-0.0138	-0.0252
34	29	31	-0.0012	-18	1	-0.0114	-0.0102	-0.0114
36	-79	114	-0.1158	-97	92	-0.1134	0.0024	-0.0012
38	-217	276	-0.2958	-256	246	-0.3012	-0.0054	-0.0036
40	-296	354	-0.3900	-342	314	-0.3936	-0.0036	0.0018
42	-305	369	-0.4044	-350	319	-0.4014	0.0030	0.0054
44	-284	348	-0.3792	-328	300	-0.3768	0.0024	0.0024
46	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-29

DESCRIPTION

CURRENT SURVEY 3/30/2010 9:28:07 AM

INITIAL SURVEY 8/11/2009 1:05:08 PM

DATE PRINTED 4/5/2010 10:11:32 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-161	222	-0.2298	-188	168	-0.2136	0.0162	0.0066
6	-174	230	-0.2424	-216	197	-0.2478	-0.0054	-0.0096
8	-255	288	-0.3258	-276	269	-0.3270	-0.0012	-0.0042
10	-469	515	-0.5904	-491	494	-0.5910	-0.0006	-0.0030
12	-539	574	-0.6678	-563	556	-0.6714	-0.0036	-0.0024
14	-343	399	-0.4452	-365	361	-0.4356	0.0096	0.0012
16	-238	288	-0.3156	-266	254	-0.3120	0.0036	-0.0084
18	-118	174	-0.1752	-152	138	-0.1740	0.0012	-0.0120
20	-32	89	-0.0726	-79	57	-0.0816	-0.0090	-0.0132
22	-85	144	-0.1374	-122	100	-0.1332	0.0042	-0.0042
24	-81	142	-0.1338	-133	110	-0.1458	-0.0120	-0.0084
26	-149	197	-0.2076	-176	155	-0.1986	0.0090	0.0036
28	-104	158	-0.1572	-129	124	-0.1518	0.0054	-0.0054
30	26	31	-0.0030	-3	-10	0.0042	0.0072	-0.0108
32	81	-18	0.0594	26	-51	0.0462	-0.0132	-0.0180
34	29	31	-0.0012	-20	1	-0.0126	-0.0114	-0.0048
36	-79	114	-0.1158	-98	92	-0.1140	0.0018	0.0066
38	-217	276	-0.2958	-257	248	-0.3030	-0.0072	0.0048
40	-296	354	-0.3900	-336	313	-0.3894	0.0006	0.0120
42	-305	369	-0.4044	-343	319	-0.3972	0.0072	0.0114
44	-284	348	-0.3792	-324	301	-0.3750	0.0042	0.0042
46	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-29

DESCRIPTION

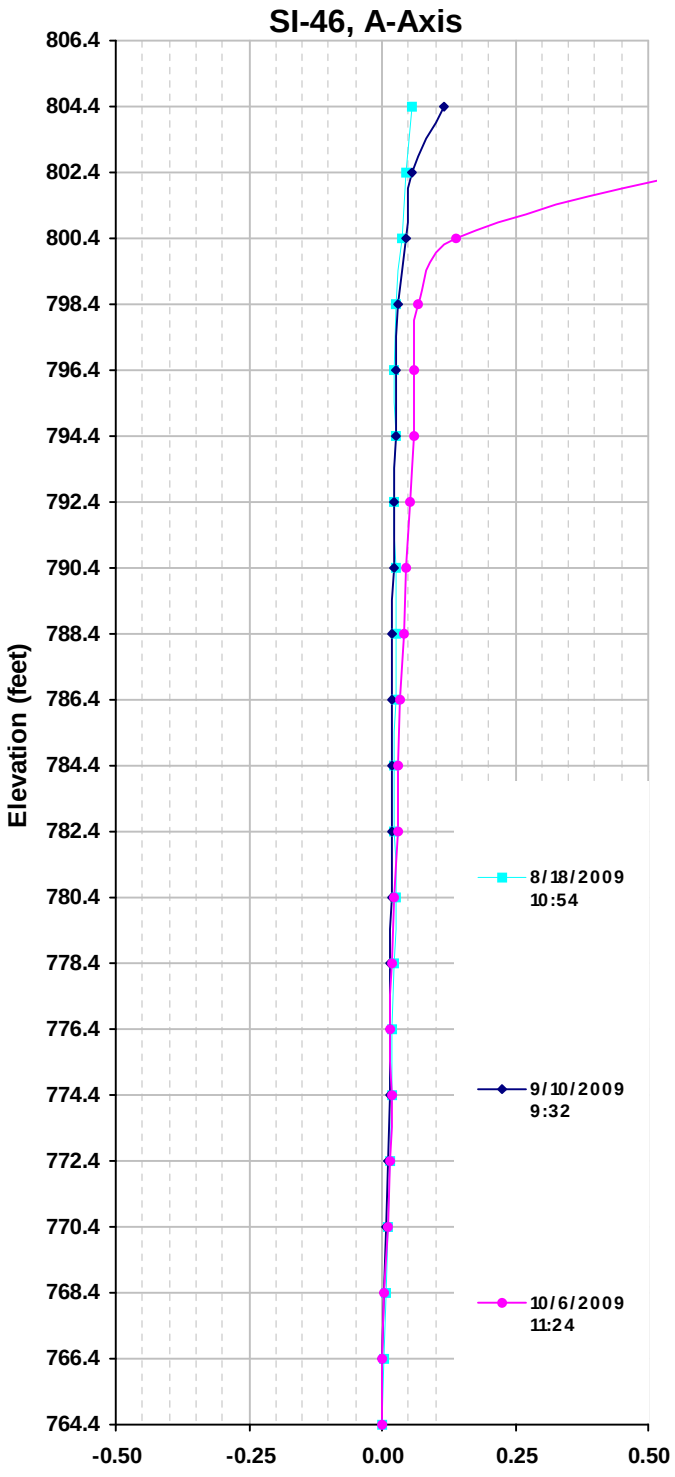
CURRENT SURVEY 4/2/2010 9:51:06 AM

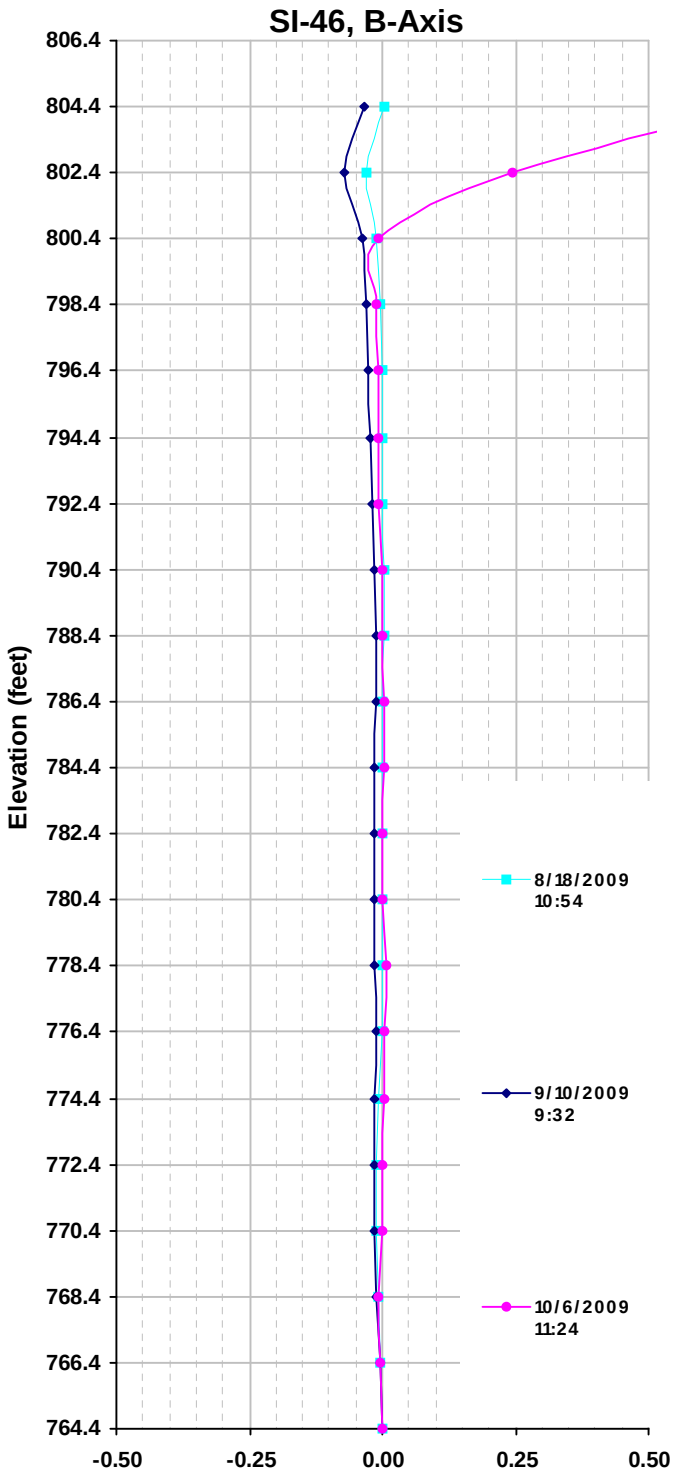
INITIAL SURVEY 8/11/2009 1:05:08 PM

DATE PRINTED 4/5/2010 10:11:32 AM

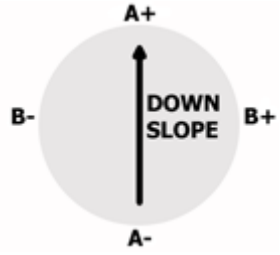
Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-161	222	-0.2298	-195	169	-0.2184	0.0114	-0.0006
6	-174	230	-0.2424	-216	197	-0.2478	-0.0054	-0.0120
8	-255	288	-0.3258	-277	268	-0.3270	-0.0012	-0.0066
10	-469	515	-0.5904	-493	493	-0.5916	-0.0012	-0.0054
12	-539	574	-0.6678	-564	555	-0.6714	-0.0036	-0.0042
14	-343	399	-0.4452	-367	361	-0.4368	0.0084	-0.0006
16	-238	288	-0.3156	-269	252	-0.3126	0.0030	-0.0090
18	-118	174	-0.1752	-153	139	-0.1752	0.0000	-0.0120
20	-32	89	-0.0726	-79	55	-0.0804	-0.0078	-0.0120
22	-85	144	-0.1374	-122	101	-0.1338	0.0036	-0.0042
24	-81	142	-0.1338	-135	109	-0.1464	-0.0126	-0.0078
26	-149	197	-0.2076	-177	154	-0.1986	0.0090	0.0048
28	-104	158	-0.1572	-131	123	-0.1524	0.0048	-0.0042
30	26	31	-0.0030	-2	-11	0.0054	0.0084	-0.0090
32	81	-18	0.0594	25	-52	0.0462	-0.0132	-0.0174
34	29	31	-0.0012	-20	-1	-0.0114	-0.0102	-0.0042
36	-79	114	-0.1158	-100	92	-0.1152	0.0006	0.0060
38	-217	276	-0.2958	-258	246	-0.3024	-0.0066	0.0054
40	-296	354	-0.3900	-333	315	-0.3888	0.0012	0.0120
42	-305	369	-0.4044	-343	319	-0.3972	0.0072	0.0108
44	-284	348	-0.3792	-323	303	-0.3756	0.0036	0.0036
46	0	0	0.0000	0	0	0.0000	0.0000	0.0000





Stantec



Bull Run Fossil Plant
Bull Run
Clinton, TN
172679015
10/7/2009

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 8/18/2009 10:54:05 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 10/7/2009 9:22:45 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	687	-690	0.8262	0.0078	0.0546
6	525	-522	0.6282	531	-529	0.6360	0.0078	0.0468
8	318	-316	0.3804	328	-328	0.3936	0.0132	0.0390
10	216	-215	0.2586	217	-218	0.2610	0.0024	0.0258
12	126	-127	0.1518	124	-126	0.1500	-0.0018	0.0234
14	74	-73	0.0882	74	-75	0.0894	0.0012	0.0252
16	-18	21	-0.0234	-20	20	-0.0240	-0.0006	0.0240
18	-103	105	-0.1248	-105	103	-0.1248	0.0000	0.0246
20	-205	204	-0.2454	-206	203	-0.2454	0.0000	0.0246
22	-310	308	-0.3708	-310	306	-0.3696	0.0012	0.0246
24	-414	417	-0.4986	-415	416	-0.4986	0.0000	0.0234
26	-522	527	-0.6294	-525	527	-0.6312	-0.0018	0.0234
28	-538	538	-0.6456	-537	535	-0.6432	0.0024	0.0252
30	-523	526	-0.6294	-522	523	-0.6270	0.0024	0.0228
32	-542	545	-0.6522	-543	544	-0.6522	0.0000	0.0204
34	-519	519	-0.6228	-515	514	-0.6174	0.0054	0.0204
36	-381	382	-0.4578	-378	378	-0.4536	0.0042	0.0150
38	-262	263	-0.3150	-259	258	-0.3102	0.0048	0.0108
40	-164	165	-0.1974	-163	161	-0.1944	0.0030	0.0060
42	-82	82	-0.0984	-81	78	-0.0954	0.0030	0.0030
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 9/10/2009 9:32:14 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 10/7/2009 9:22:45 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	740	-726	0.8796	0.0612	0.1170
6	525	-522	0.6282	538	-527	0.6390	0.0108	0.0558
8	318	-316	0.3804	335	-325	0.3960	0.0156	0.0450
10	216	-215	0.2586	223	-214	0.2622	0.0036	0.0294
12	126	-127	0.1518	130	-122	0.1512	-0.0006	0.0258
14	74	-73	0.0882	82	-72	0.0924	0.0042	0.0264
16	-18	21	-0.0234	-14	25	-0.0234	0.0000	0.0222
18	-103	105	-0.1248	-98	107	-0.1230	0.0018	0.0222
20	-205	204	-0.2454	-201	208	-0.2454	0.0000	0.0204
22	-310	308	-0.3708	-305	311	-0.3696	0.0012	0.0204
24	-414	417	-0.4986	-410	421	-0.4986	0.0000	0.0192
26	-522	527	-0.6294	-517	531	-0.6288	0.0006	0.0192
28	-538	538	-0.6456	-531	540	-0.6426	0.0030	0.0186
30	-523	526	-0.6294	-518	528	-0.6276	0.0018	0.0156
32	-542	545	-0.6522	-538	550	-0.6528	-0.0006	0.0138
34	-519	519	-0.6228	-513	520	-0.6198	0.0030	0.0144
36	-381	382	-0.4578	-374	384	-0.4548	0.0030	0.0114
38	-262	263	-0.3150	-254	263	-0.3102	0.0048	0.0084
40	-164	165	-0.1974	-158	167	-0.1950	0.0024	0.0036
42	-82	82	-0.0984	-77	85	-0.0972	0.0012	0.0012
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 10/6/2009 11:24:33 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 10/7/2009 9:22:45 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	1231	-1221	1.4712	0.6528	1.2378
6	525	-522	0.6282	897	-893	1.0740	0.4458	0.5850
8	318	-316	0.3804	382	-374	0.4536	0.0732	0.1392
10	216	-215	0.2586	222	-216	0.2628	0.0042	0.0660
12	126	-127	0.1518	132	-126	0.1548	0.0030	0.0618
14	74	-73	0.0882	82	-77	0.0954	0.0072	0.0588
16	-18	21	-0.0234	-11	18	-0.0174	0.0060	0.0516
18	-103	105	-0.1248	-97	101	-0.1188	0.0060	0.0456
20	-205	204	-0.2454	-198	203	-0.2406	0.0048	0.0396
22	-310	308	-0.3708	-305	308	-0.3678	0.0030	0.0348
24	-414	417	-0.4986	-410	415	-0.4950	0.0036	0.0318
26	-522	527	-0.6294	-515	527	-0.6252	0.0042	0.0282
28	-538	538	-0.6456	-531	535	-0.6396	0.0060	0.0240
30	-523	526	-0.6294	-519	527	-0.6276	0.0018	0.0180
32	-542	545	-0.6522	-540	549	-0.6534	-0.0012	0.0162
34	-519	519	-0.6228	-513	519	-0.6192	0.0036	0.0174
36	-381	382	-0.4578	-375	381	-0.4536	0.0042	0.0138
38	-262	263	-0.3150	-255	262	-0.3102	0.0048	0.0096
40	-164	165	-0.1974	-159	165	-0.1944	0.0030	0.0048
42	-82	82	-0.0984	-77	84	-0.0966	0.0018	0.0018
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 8/18/2009 10:54:05 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 10/7/2009 9:22:55 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	375	-335	0.4260	0.0324	0.0024
6	216	-162	0.2268	199	-145	0.2064	-0.0204	-0.0300
8	143	-78	0.1326	137	-74	0.1266	-0.0060	-0.0096
10	124	-61	0.1110	119	-61	0.1080	-0.0030	-0.0036
12	111	-46	0.0942	109	-47	0.0936	-0.0006	-0.0006
14	34	14	0.0120	32	14	0.0108	-0.0012	0.0000
16	-97	139	-0.1416	-99	140	-0.1434	-0.0018	0.0012
18	-245	293	-0.3228	-246	291	-0.3222	0.0006	0.0030
20	-364	426	-0.4740	-365	423	-0.4728	0.0012	0.0024
22	-420	485	-0.5430	-422	483	-0.5430	0.0000	0.0012
24	-469	533	-0.6012	-471	531	-0.6012	0.0000	0.0012
26	-551	604	-0.6930	-552	602	-0.6924	0.0006	0.0012
28	-543	608	-0.6906	-544	607	-0.6906	0.0000	0.0006
30	-478	513	-0.5946	-477	511	-0.5928	0.0018	0.0006
32	-353	386	-0.4434	-350	381	-0.4386	0.0048	-0.0012
34	-166	198	-0.2184	-161	196	-0.2142	0.0042	-0.0060
36	0	55	0.0000	4	45	-0.0246	0.0000	-0.0102
38	29	27	0.0012	23	26	-0.0018	-0.0030	-0.0102
40	-89	136	-0.1350	-95	137	-0.1392	-0.0042	-0.0072
42	-217	274	-0.2946	-219	277	-0.2976	-0.0030	-0.0030
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 9/10/2009 9:32:14 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 10/7/2009 9:22:55 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	372	-346	0.4308	0.0372	-0.0348
6	216	-162	0.2268	183	-139	0.1932	-0.0336	-0.0720
8	143	-78	0.1326	136	-71	0.1242	-0.0084	-0.0384
10	124	-61	0.1110	119	-57	0.1056	-0.0054	-0.0300
12	111	-46	0.0942	110	-44	0.0924	-0.0018	-0.0246
14	34	14	0.0120	27	14	0.0078	-0.0042	-0.0228
16	-97	139	-0.1416	-103	142	-0.1470	-0.0054	-0.0186
18	-245	293	-0.3228	-248	294	-0.3252	-0.0024	-0.0132
20	-364	426	-0.4740	-362	425	-0.4722	0.0018	-0.0108
22	-420	485	-0.5430	-419	484	-0.5418	0.0012	-0.0126
24	-469	533	-0.6012	-468	533	-0.6006	0.0006	-0.0138
26	-551	604	-0.6930	-548	603	-0.6906	0.0024	-0.0144
28	-543	608	-0.6906	-544	610	-0.6924	-0.0018	-0.0168
30	-478	513	-0.5946	-478	518	-0.5976	-0.0030	-0.0150
32	-353	386	-0.4434	-352	385	-0.4422	0.0012	-0.0120
34	-166	198	-0.2184	-161	199	-0.2160	0.0024	-0.0132
36	0	55	0.0000	6	51	-0.0270	0.0000	-0.0156
38	29	27	0.0012	19	27	-0.0048	-0.0060	-0.0156
40	-89	136	-0.1350	-94	140	-0.1404	-0.0054	-0.0096
42	-217	274	-0.2946	-219	279	-0.2988	-0.0042	-0.0042
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

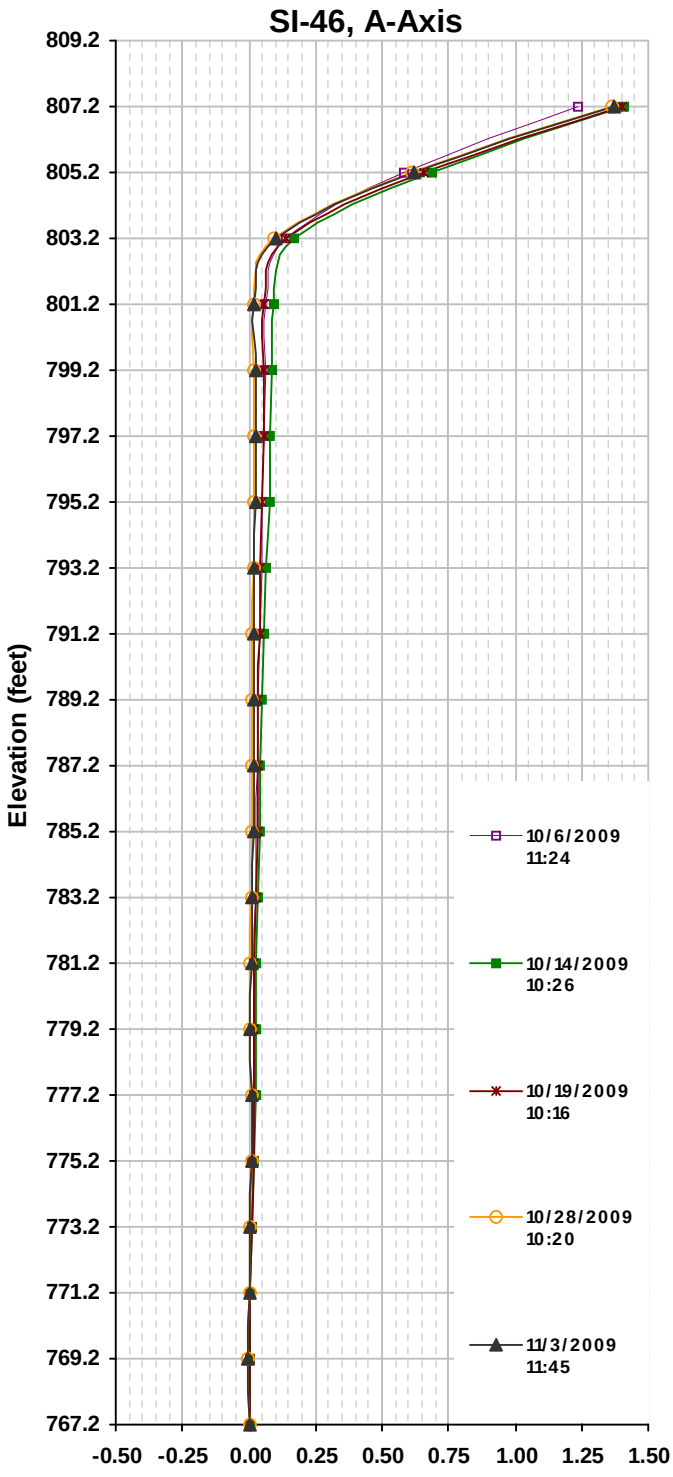
CURRENT SURVEY 10/6/2009 11:24:33 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

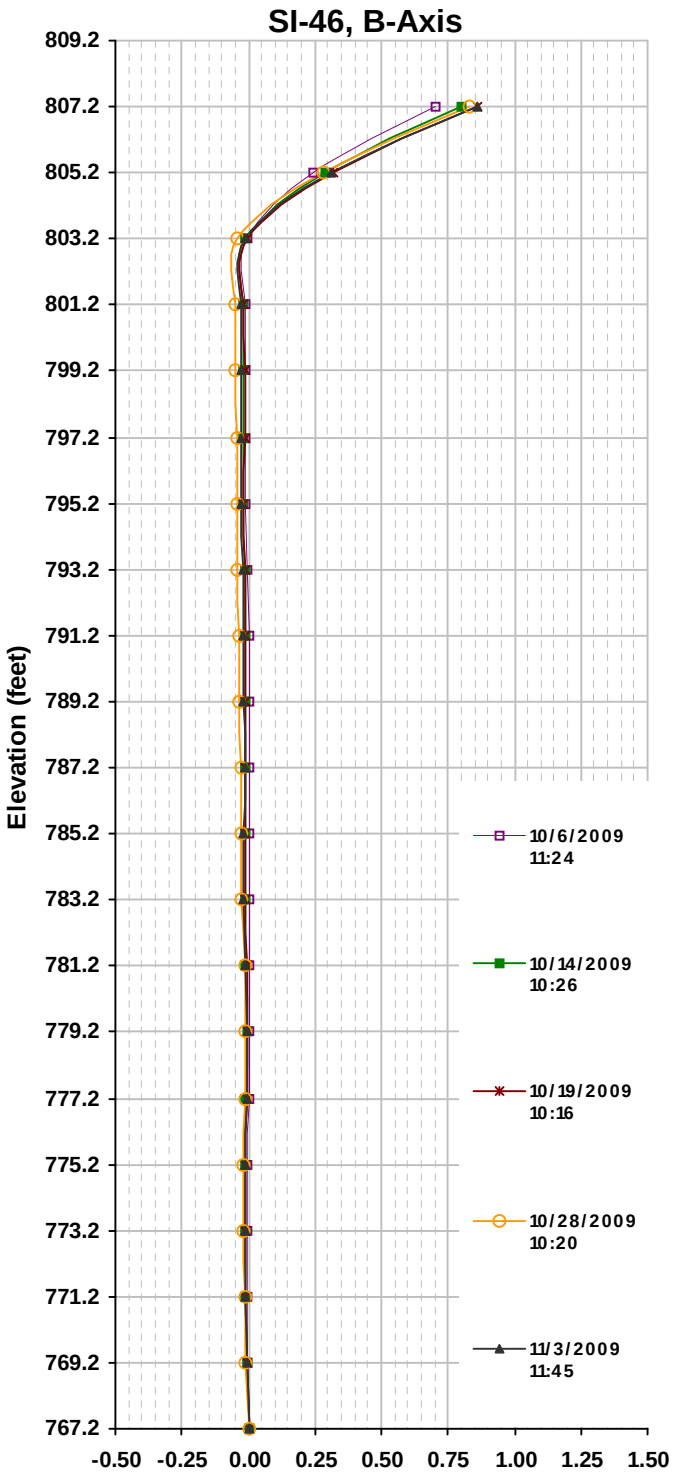
DATE PRINTED 10/7/2009 9:22:55 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	727	-699	0.8556	0.4620	0.7062
6	216	-162	0.2268	416	-380	0.4776	0.2508	0.2442
8	143	-78	0.1326	147	-81	0.1368	0.0042	-0.0066
10	124	-61	0.1110	122	-60	0.1092	-0.0018	-0.0108
12	111	-46	0.0942	113	-43	0.0936	-0.0006	-0.0090
14	34	14	0.0120	28	8	0.0120	0.0000	-0.0084
16	-97	139	-0.1416	-103	145	-0.1488	-0.0072	-0.0084
18	-245	293	-0.3228	-251	291	-0.3252	-0.0024	-0.0012
20	-364	426	-0.4740	-364	430	-0.4764	-0.0024	0.0012
22	-420	485	-0.5430	-421	486	-0.5442	-0.0012	0.0036
24	-469	533	-0.6012	-468	528	-0.5976	0.0036	0.0048
26	-551	604	-0.6930	-550	606	-0.6936	-0.0006	0.0012
28	-543	608	-0.6906	-545	613	-0.6948	-0.0042	0.0018
30	-478	513	-0.5946	-475	513	-0.5928	0.0018	0.0060
32	-353	386	-0.4434	-353	387	-0.4440	-0.0006	0.0042
34	-166	198	-0.2184	-158	195	-0.2118	0.0066	0.0048
36	0	55	0.0000	0	52	0.0000	0.0000	-0.0018
38	29	27	0.0012	23	14	0.0054	0.0042	-0.0018
40	-89	136	-0.1350	-91	135	-0.1356	-0.0006	-0.0060
42	-217	274	-0.2946	-223	277	-0.3000	-0.0054	-0.0054
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000



Cumulative Displacement (in) from 8/11/2009



Cumulative Displacement (in) from 8/11/2009

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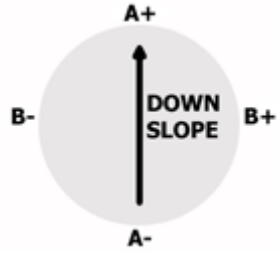


Bull Run Fossil Plant
Bull Run
Clinton, TN
172679015
11/5/2009

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 10/6/2009 11:24:33 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 11/5/2009 8:16:06 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	1231	-1221	1.4712	0.6528	1.2378
6	525	-522	0.6282	897	-893	1.0740	0.4458	0.5850
8	318	-316	0.3804	382	-374	0.4536	0.0732	0.1392
10	216	-215	0.2586	222	-216	0.2628	0.0042	0.0660
12	126	-127	0.1518	132	-126	0.1548	0.0030	0.0618
14	74	-73	0.0882	82	-77	0.0954	0.0072	0.0588
16	-18	21	-0.0234	-11	18	-0.0174	0.0060	0.0516
18	-103	105	-0.1248	-97	101	-0.1188	0.0060	0.0456
20	-205	204	-0.2454	-198	203	-0.2406	0.0048	0.0396
22	-310	308	-0.3708	-305	308	-0.3678	0.0030	0.0348
24	-414	417	-0.4986	-410	415	-0.4950	0.0036	0.0318
26	-522	527	-0.6294	-515	527	-0.6252	0.0042	0.0282
28	-538	538	-0.6456	-531	535	-0.6396	0.0060	0.0240
30	-523	526	-0.6294	-519	527	-0.6276	0.0018	0.0180
32	-542	545	-0.6522	-540	549	-0.6534	-0.0012	0.0162
34	-519	519	-0.6228	-513	519	-0.6192	0.0036	0.0174
36	-381	382	-0.4578	-375	381	-0.4536	0.0042	0.0138
38	-262	263	-0.3150	-255	262	-0.3102	0.0048	0.0096
40	-164	165	-0.1974	-159	165	-0.1944	0.0030	0.0048
42	-82	82	-0.0984	-77	84	-0.0966	0.0018	0.0018
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 10/14/2009 10:26:58 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 11/5/2009 8:16:06 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	1290	-1281	1.5426	0.7242	1.4094
6	525	-522	0.6282	958	-943	1.1406	0.5124	0.6852
8	318	-316	0.3804	390	-379	0.4614	0.0810	0.1728
10	216	-215	0.2586	226	-214	0.2640	0.0054	0.0918
12	126	-127	0.1518	135	-125	0.1560	0.0042	0.0864
14	74	-73	0.0882	85	-73	0.0948	0.0066	0.0822
16	-18	21	-0.0234	-6	19	-0.0150	0.0084	0.0756
18	-103	105	-0.1248	-90	103	-0.1158	0.0090	0.0672
20	-205	204	-0.2454	-192	204	-0.2376	0.0078	0.0582
22	-310	308	-0.3708	-299	310	-0.3654	0.0054	0.0504
24	-414	417	-0.4986	-405	419	-0.4944	0.0042	0.0450
26	-522	527	-0.6294	-513	528	-0.6246	0.0048	0.0408
28	-538	538	-0.6456	-527	538	-0.6390	0.0066	0.0360
30	-523	526	-0.6294	-513	528	-0.6246	0.0048	0.0294
32	-542	545	-0.6522	-535	550	-0.6510	0.0012	0.0246
34	-519	519	-0.6228	-510	521	-0.6186	0.0042	0.0234
36	-381	382	-0.4578	-371	383	-0.4524	0.0054	0.0192
38	-262	263	-0.3150	-251	263	-0.3084	0.0066	0.0138
40	-164	165	-0.1974	-154	167	-0.1926	0.0048	0.0072
42	-82	82	-0.0984	-74	86	-0.0960	0.0024	0.0024
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 10/19/2009 10:16:52 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 11/5/2009 8:16:06 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	1309	-1298	1.5642	0.7458	1.4040
6	525	-522	0.6282	967	-950	1.1502	0.5220	0.6582
8	318	-316	0.3804	390	-374	0.4584	0.0780	0.1362
10	216	-215	0.2586	224	-209	0.2598	0.0012	0.0582
12	126	-127	0.1518	135	-121	0.1536	0.0018	0.0570
14	74	-73	0.0882	85	-70	0.0930	0.0048	0.0552
16	-18	21	-0.0234	-6	24	-0.0180	0.0054	0.0504
18	-103	105	-0.1248	-90	108	-0.1188	0.0060	0.0450
20	-205	204	-0.2454	-192	209	-0.2406	0.0048	0.0390
22	-310	308	-0.3708	-300	315	-0.3690	0.0018	0.0342
24	-414	417	-0.4986	-405	423	-0.4968	0.0018	0.0324
26	-522	527	-0.6294	-511	531	-0.6252	0.0042	0.0306
28	-538	538	-0.6456	-525	542	-0.6402	0.0054	0.0264
30	-523	526	-0.6294	-513	531	-0.6264	0.0030	0.0210
32	-542	545	-0.6522	-535	554	-0.6534	-0.0012	0.0180
34	-519	519	-0.6228	-508	525	-0.6198	0.0030	0.0192
36	-381	382	-0.4578	-368	386	-0.4524	0.0054	0.0162
38	-262	263	-0.3150	-250	266	-0.3096	0.0054	0.0108
40	-164	165	-0.1974	-153	169	-0.1932	0.0042	0.0054
42	-82	82	-0.0984	-73	89	-0.0972	0.0012	0.0012
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 10/28/2009 10:20:49 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 11/5/2009 8:16:06 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	1305	-1307	1.5672	0.7488	1.3632
6	525	-522	0.6282	962	-954	1.1496	0.5214	0.6144
8	318	-316	0.3804	385	-378	0.4578	0.0774	0.0930
10	216	-215	0.2586	217	-211	0.2568	-0.0018	0.0156
12	126	-127	0.1518	127	-122	0.1494	-0.0024	0.0174
14	74	-73	0.0882	78	-72	0.0900	0.0018	0.0198
16	-18	21	-0.0234	-14	22	-0.0216	0.0018	0.0180
18	-103	105	-0.1248	-98	106	-0.1224	0.0024	0.0162
20	-205	204	-0.2454	-200	206	-0.2436	0.0018	0.0138
22	-310	308	-0.3708	-307	311	-0.3708	0.0000	0.0120
24	-414	417	-0.4986	-411	419	-0.4980	0.0006	0.0120
26	-522	527	-0.6294	-518	528	-0.6276	0.0018	0.0114
28	-538	538	-0.6456	-532	538	-0.6420	0.0036	0.0096
30	-523	526	-0.6294	-519	529	-0.6288	0.0006	0.0060
32	-542	545	-0.6522	-541	551	-0.6552	-0.0030	0.0054
34	-519	519	-0.6228	-515	522	-0.6222	0.0006	0.0084
36	-381	382	-0.4578	-374	383	-0.4542	0.0036	0.0078
38	-262	263	-0.3150	-256	263	-0.3114	0.0036	0.0042
40	-164	165	-0.1974	-160	167	-0.1962	0.0012	0.0006
42	-82	82	-0.0984	-79	86	-0.0990	-0.0006	-0.0006
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 11/3/2009 11:45:09 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 11/5/2009 8:16:06 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	1314	-1305	1.5714	0.7530	1.3710
6	525	-522	0.6282	965	-948	1.1478	0.5196	0.6180
8	318	-316	0.3804	388	-373	0.4566	0.0762	0.0984
10	216	-215	0.2586	220	-207	0.2562	-0.0024	0.0222
12	126	-127	0.1518	131	-119	0.1500	-0.0018	0.0246
14	74	-73	0.0882	82	-68	0.0900	0.0018	0.0264
16	-18	21	-0.0234	-10	25	-0.0210	0.0024	0.0246
18	-103	105	-0.1248	-94	109	-0.1218	0.0030	0.0222
20	-205	204	-0.2454	-196	210	-0.2436	0.0018	0.0192
22	-310	308	-0.3708	-302	317	-0.3714	-0.0006	0.0174
24	-414	417	-0.4986	-406	422	-0.4968	0.0018	0.0180
26	-522	527	-0.6294	-514	530	-0.6264	0.0030	0.0162
28	-538	538	-0.6456	-528	541	-0.6414	0.0042	0.0132
30	-523	526	-0.6294	-515	531	-0.6276	0.0018	0.0090
32	-542	545	-0.6522	-537	554	-0.6546	-0.0024	0.0072
34	-519	519	-0.6228	-511	524	-0.6210	0.0018	0.0096
36	-381	382	-0.4578	-373	386	-0.4554	0.0024	0.0078
38	-262	263	-0.3150	-251	265	-0.3096	0.0054	0.0054
40	-164	165	-0.1974	-155	170	-0.1950	0.0024	0.0000
42	-82	82	-0.0984	-78	90	-0.1008	-0.0024	-0.0024
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 10/6/2009 11:24:33 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 11/5/2009 8:16:18 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	727	-699	0.8556	0.4620	0.7062
6	216	-162	0.2268	416	-380	0.4776	0.2508	0.2442
8	143	-78	0.1326	147	-81	0.1368	0.0042	-0.0066
10	124	-61	0.1110	122	-60	0.1092	-0.0018	-0.0108
12	111	-46	0.0942	113	-43	0.0936	-0.0006	-0.0090
14	34	14	0.0120	28	8	0.0120	0.0000	-0.0084
16	-97	139	-0.1416	-103	145	-0.1488	-0.0072	-0.0084
18	-245	293	-0.3228	-251	291	-0.3252	-0.0024	-0.0012
20	-364	426	-0.4740	-364	430	-0.4764	-0.0024	0.0012
22	-420	485	-0.5430	-421	486	-0.5442	-0.0012	0.0036
24	-469	533	-0.6012	-468	528	-0.5976	0.0036	0.0048
26	-551	604	-0.6930	-550	606	-0.6936	-0.0006	0.0012
28	-543	608	-0.6906	-545	613	-0.6948	-0.0042	0.0018
30	-478	513	-0.5946	-475	513	-0.5928	0.0018	0.0060
32	-353	386	-0.4434	-353	387	-0.4440	-0.0006	0.0042
34	-166	198	-0.2184	-158	195	-0.2118	0.0066	0.0048
36	0	55	0.0000	0	52	0.0000	0.0000	-0.0018
38	29	27	0.0012	23	14	0.0054	0.0042	-0.0018
40	-89	136	-0.1350	-91	135	-0.1356	-0.0006	-0.0060
42	-217	274	-0.2946	-223	277	-0.3000	-0.0054	-0.0054
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 10/14/2009 10:26:58 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 11/5/2009 8:16:18 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	774	-738	0.9072	0.5136	0.8040
6	216	-162	0.2268	458	-422	0.5280	0.3012	0.2904
8	143	-78	0.1326	150	-89	0.1434	0.0108	-0.0108
10	124	-61	0.1110	121	-59	0.1080	-0.0030	-0.0216
12	111	-46	0.0942	111	-47	0.0948	0.0006	-0.0186
14	34	14	0.0120	31	12	0.0114	-0.0006	-0.0192
16	-97	139	-0.1416	-102	141	-0.1458	-0.0042	-0.0186
18	-245	293	-0.3228	-247	291	-0.3228	0.0000	-0.0144
20	-364	426	-0.4740	-367	425	-0.4752	-0.0012	-0.0144
22	-420	485	-0.5430	-423	485	-0.5448	-0.0018	-0.0132
24	-469	533	-0.6012	-467	530	-0.5982	0.0030	-0.0114
26	-551	604	-0.6930	-553	603	-0.6936	-0.0006	-0.0144
28	-543	608	-0.6906	-550	610	-0.6960	-0.0054	-0.0138
30	-478	513	-0.5946	-481	513	-0.5964	-0.0018	-0.0084
32	-353	386	-0.4434	-355	382	-0.4422	0.0012	-0.0066
34	-166	198	-0.2184	-163	195	-0.2148	0.0036	-0.0078
36	0	55	0.0000	5	47	-0.0252	0.0000	-0.0114
38	29	27	0.0012	21	24	-0.0018	-0.0030	-0.0114
40	-89	136	-0.1350	-95	136	-0.1386	-0.0036	-0.0084
42	-217	274	-0.2946	-222	277	-0.2994	-0.0048	-0.0048
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 10/19/2009 10:16:52 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 11/5/2009 8:16:19 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	804	-761	0.9390	0.5454	0.8646
6	216	-162	0.2268	477	-439	0.5496	0.3228	0.3192
8	143	-78	0.1326	154	-90	0.1464	0.0138	-0.0036
10	124	-61	0.1110	123	-57	0.1080	-0.0030	-0.0174
12	111	-46	0.0942	114	-43	0.0942	0.0000	-0.0144
14	34	14	0.0120	35	13	0.0132	0.0012	-0.0144
16	-97	139	-0.1416	-98	144	-0.1452	-0.0036	-0.0156
18	-245	293	-0.3228	-246	293	-0.3234	-0.0006	-0.0120
20	-364	426	-0.4740	-365	427	-0.4752	-0.0012	-0.0114
22	-420	485	-0.5430	-419	487	-0.5436	-0.0006	-0.0102
24	-469	533	-0.6012	-465	531	-0.5976	0.0036	-0.0096
26	-551	604	-0.6930	-550	607	-0.6942	-0.0012	-0.0132
28	-543	608	-0.6906	-547	614	-0.6966	-0.0060	-0.0120
30	-478	513	-0.5946	-478	516	-0.5964	-0.0018	-0.0060
32	-353	386	-0.4434	-352	384	-0.4416	0.0018	-0.0042
34	-166	198	-0.2184	-159	199	-0.2148	0.0036	-0.0060
36	0	55	0.0000	9	50	-0.0246	0.0000	-0.0096
38	29	27	0.0012	27	26	0.0006	-0.0006	-0.0096
40	-89	136	-0.1350	-91	139	-0.1380	-0.0030	-0.0090
42	-217	274	-0.2946	-221	280	-0.3006	-0.0060	-0.0060
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 10/28/2009 10:20:49 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 11/5/2009 8:16:19 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	808	-760	0.9408	0.5472	0.8286
6	216	-162	0.2268	476	-438	0.5484	0.3216	0.2814
8	143	-78	0.1326	154	-87	0.1446	0.0120	-0.0402
10	124	-61	0.1110	123	-53	0.1056	-0.0054	-0.0522
12	111	-46	0.0942	114	-39	0.0918	-0.0024	-0.0468
14	34	14	0.0120	36	17	0.0114	-0.0006	-0.0444
16	-97	139	-0.1416	-97	149	-0.1476	-0.0060	-0.0438
18	-245	293	-0.3228	-243	297	-0.3240	-0.0012	-0.0378
20	-364	426	-0.4740	-366	433	-0.4794	-0.0054	-0.0366
22	-420	485	-0.5430	-421	491	-0.5472	-0.0042	-0.0312
24	-469	533	-0.6012	-467	537	-0.6024	-0.0012	-0.0270
26	-551	604	-0.6930	-549	610	-0.6954	-0.0024	-0.0258
28	-543	608	-0.6906	-547	618	-0.6990	-0.0084	-0.0234
30	-478	513	-0.5946	-477	516	-0.5958	-0.0012	-0.0150
32	-353	386	-0.4434	-352	389	-0.4446	-0.0012	-0.0138
34	-166	198	-0.2184	-158	198	-0.2136	0.0048	-0.0126
36	0	55	0.0000	10	52	-0.0252	0.0000	-0.0174
38	29	27	0.0012	26	31	-0.0030	-0.0042	-0.0174
40	-89	136	-0.1350	-90	144	-0.1404	-0.0054	-0.0132
42	-217	274	-0.2946	-221	283	-0.3024	-0.0078	-0.0078
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

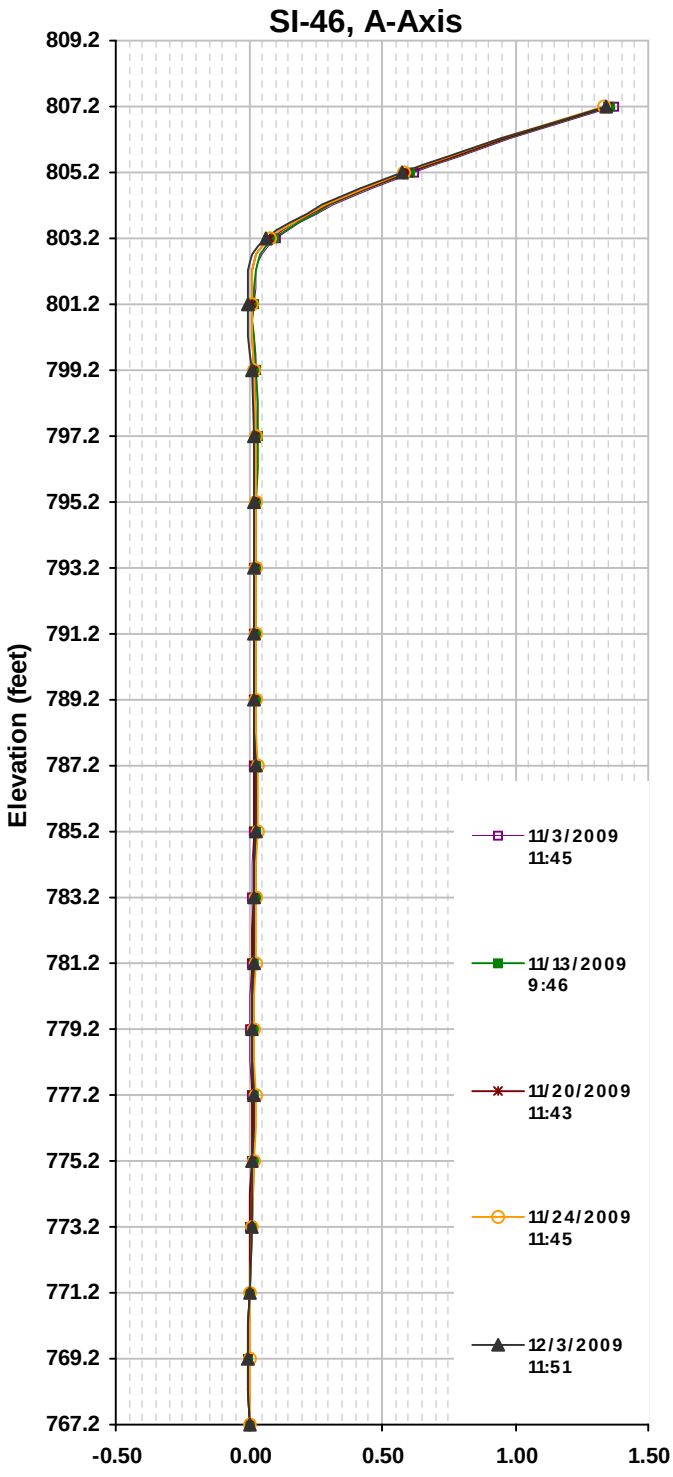
CURRENT SURVEY 11/3/2009 11:45:09 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

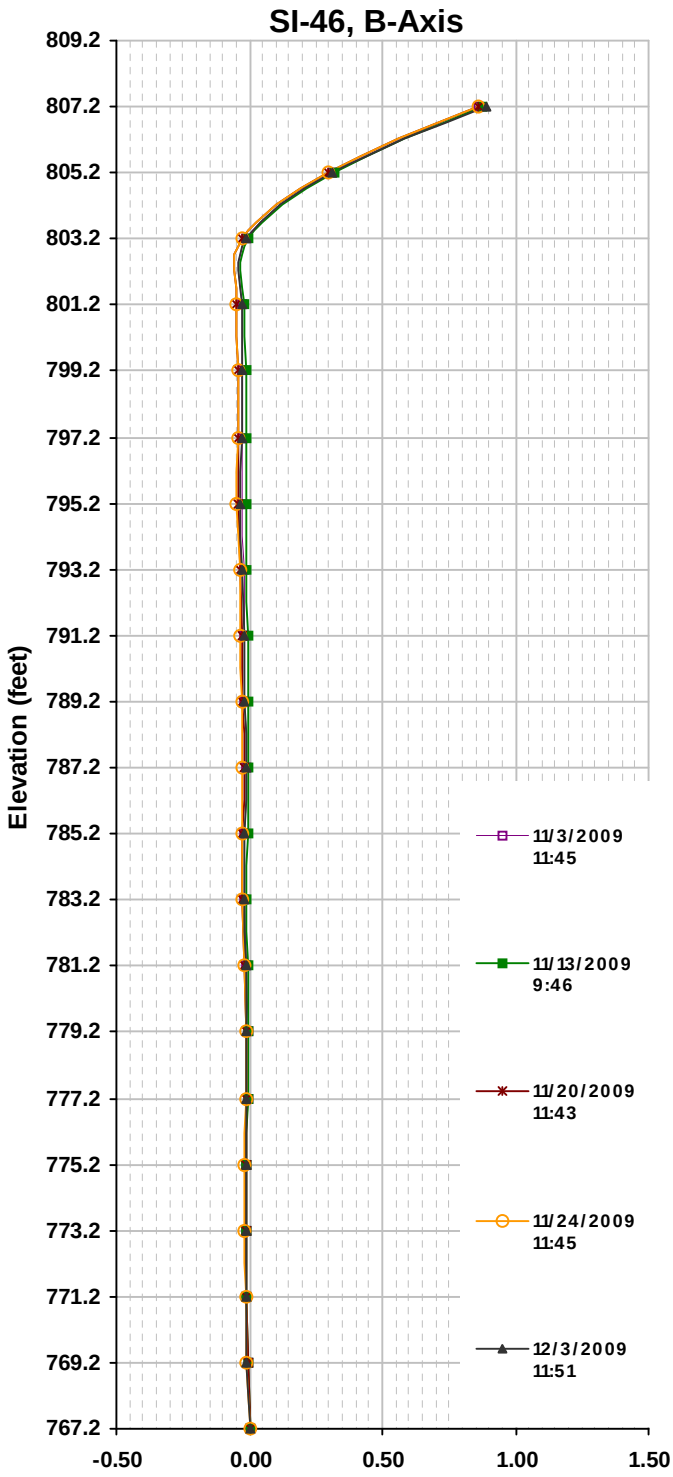
DATE PRINTED 11/5/2009 8:16:19 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	807	-769	0.9456	0.5520	0.8646
6	216	-162	0.2268	476	-443	0.5514	0.3246	0.3126
8	143	-78	0.1326	152	-93	0.1470	0.0144	-0.0120
10	124	-61	0.1110	121	-58	0.1074	-0.0036	-0.0264
12	111	-46	0.0942	111	-46	0.0942	0.0000	-0.0228
14	34	14	0.0120	33	11	0.0132	0.0012	-0.0228
16	-97	139	-0.1416	-101	143	-0.1464	-0.0048	-0.0240
18	-245	293	-0.3228	-246	290	-0.3216	0.0012	-0.0192
20	-364	426	-0.4740	-369	427	-0.4776	-0.0036	-0.0204
22	-420	485	-0.5430	-423	485	-0.5448	-0.0018	-0.0168
24	-469	533	-0.6012	-469	530	-0.5994	0.0018	-0.0150
26	-551	604	-0.6930	-551	604	-0.6930	0.0000	-0.0168
28	-543	608	-0.6906	-550	613	-0.6978	-0.0072	-0.0168
30	-478	513	-0.5946	-481	514	-0.5970	-0.0024	-0.0096
32	-353	386	-0.4434	-355	384	-0.4434	0.0000	-0.0072
34	-166	198	-0.2184	-162	194	-0.2136	0.0048	-0.0072
36	0	55	0.0000	6	47	-0.0246	0.0000	-0.0120
38	29	27	0.0012	23	25	-0.0012	-0.0024	-0.0120
40	-89	136	-0.1350	-95	137	-0.1392	-0.0042	-0.0096
42	-217	274	-0.2946	-222	278	-0.3000	-0.0054	-0.0054
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

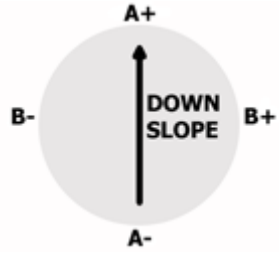


Cumulative Displacement (in) from 8/11/2009



Cumulative Displacement (in) from 8/11/2009

Stantec



Bull Run Fossil Plant
Bull Run
Clinton, TN
172679015
12/3/2009

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 11/3/2009 11:45:09 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 12/3/2009 3:25:39 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	1314	-1305	1.5714	0.7530	1.3710
6	525	-522	0.6282	965	-948	1.1478	0.5196	0.6180
8	318	-316	0.3804	388	-373	0.4566	0.0762	0.0984
10	216	-215	0.2586	220	-207	0.2562	-0.0024	0.0222
12	126	-127	0.1518	131	-119	0.1500	-0.0018	0.0246
14	74	-73	0.0882	82	-68	0.0900	0.0018	0.0264
16	-18	21	-0.0234	-10	25	-0.0210	0.0024	0.0246
18	-103	105	-0.1248	-94	109	-0.1218	0.0030	0.0222
20	-205	204	-0.2454	-196	210	-0.2436	0.0018	0.0192
22	-310	308	-0.3708	-302	317	-0.3714	-0.0006	0.0174
24	-414	417	-0.4986	-406	422	-0.4968	0.0018	0.0180
26	-522	527	-0.6294	-514	530	-0.6264	0.0030	0.0162
28	-538	538	-0.6456	-528	541	-0.6414	0.0042	0.0132
30	-523	526	-0.6294	-515	531	-0.6276	0.0018	0.0090
32	-542	545	-0.6522	-537	554	-0.6546	-0.0024	0.0072
34	-519	519	-0.6228	-511	524	-0.6210	0.0018	0.0096
36	-381	382	-0.4578	-373	386	-0.4554	0.0024	0.0078
38	-262	263	-0.3150	-251	265	-0.3096	0.0054	0.0054
40	-164	165	-0.1974	-155	170	-0.1950	0.0024	0.0000
42	-82	82	-0.0984	-78	90	-0.1008	-0.0024	-0.0024
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 11/13/2009 9:46:29 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 12/3/2009 3:25:39 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	1311	-1302	1.5678	0.7494	1.3560
6	525	-522	0.6282	955	-946	1.1406	0.5124	0.6066
8	318	-316	0.3804	383	-371	0.4524	0.0720	0.0942
10	216	-215	0.2586	216	-206	0.2532	-0.0054	0.0222
12	126	-127	0.1518	129	-119	0.1488	-0.0030	0.0276
14	74	-73	0.0882	80	-69	0.0894	0.0012	0.0306
16	-18	21	-0.0234	-12	25	-0.0222	0.0012	0.0294
18	-103	105	-0.1248	-97	109	-0.1236	0.0012	0.0282
20	-205	204	-0.2454	-199	209	-0.2448	0.0006	0.0270
22	-310	308	-0.3708	-305	315	-0.3720	-0.0012	0.0264
24	-414	417	-0.4986	-408	421	-0.4974	0.0012	0.0276
26	-522	527	-0.6294	-515	529	-0.6264	0.0030	0.0264
28	-538	538	-0.6456	-529	539	-0.6408	0.0048	0.0234
30	-523	526	-0.6294	-517	530	-0.6282	0.0012	0.0186
32	-542	545	-0.6522	-538	553	-0.6546	-0.0024	0.0174
34	-519	519	-0.6228	-511	522	-0.6198	0.0030	0.0198
36	-381	382	-0.4578	-370	383	-0.4518	0.0060	0.0168
38	-262	263	-0.3150	-251	263	-0.3084	0.0066	0.0108
40	-164	165	-0.1974	-154	167	-0.1926	0.0048	0.0042
42	-82	82	-0.0984	-75	90	-0.0990	-0.0006	-0.0006
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 11/20/2009 11:43:39 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 12/3/2009 3:25:40 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	1315	-1308	1.5738	0.7554	1.3512
6	525	-522	0.6282	957	-947	1.1424	0.5142	0.5958
8	318	-316	0.3804	383	-373	0.4536	0.0732	0.0816
10	216	-215	0.2586	213	-202	0.2490	-0.0096	0.0084
12	126	-127	0.1518	126	-116	0.1452	-0.0066	0.0180
14	74	-73	0.0882	79	-68	0.0882	0.0000	0.0246
16	-18	21	-0.0234	-12	25	-0.0222	0.0012	0.0246
18	-103	105	-0.1248	-97	108	-0.1230	0.0018	0.0234
20	-205	204	-0.2454	-199	209	-0.2448	0.0006	0.0216
22	-310	308	-0.3708	-305	314	-0.3714	-0.0006	0.0210
24	-414	417	-0.4986	-408	420	-0.4968	0.0018	0.0216
26	-522	527	-0.6294	-513	529	-0.6252	0.0042	0.0198
28	-538	538	-0.6456	-530	540	-0.6420	0.0036	0.0156
30	-523	526	-0.6294	-517	530	-0.6282	0.0012	0.0120
32	-542	545	-0.6522	-538	552	-0.6540	-0.0018	0.0108
34	-519	519	-0.6228	-512	522	-0.6204	0.0024	0.0126
36	-381	382	-0.4578	-373	384	-0.4542	0.0036	0.0102
38	-262	263	-0.3150	-254	263	-0.3102	0.0048	0.0066
40	-164	165	-0.1974	-157	167	-0.1944	0.0030	0.0018
42	-82	82	-0.0984	-77	89	-0.0996	-0.0012	-0.0012
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 11/24/2009 11:45:51 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 12/3/2009 3:25:40 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	1307	-1306	1.5678	0.7494	1.3344
6	525	-522	0.6282	950	-939	1.1334	0.5052	0.5850
8	318	-316	0.3804	380	-370	0.4500	0.0696	0.0798
10	216	-215	0.2586	210	-203	0.2478	-0.0108	0.0102
12	126	-127	0.1518	125	-117	0.1452	-0.0066	0.0210
14	74	-73	0.0882	77	-69	0.0876	-0.0006	0.0276
16	-18	21	-0.0234	-14	25	-0.0234	0.0000	0.0282
18	-103	105	-0.1248	-99	108	-0.1242	0.0006	0.0282
20	-205	204	-0.2454	-202	209	-0.2466	-0.0012	0.0276
22	-310	308	-0.3708	-309	315	-0.3744	-0.0036	0.0288
24	-414	417	-0.4986	-410	420	-0.4980	0.0006	0.0324
26	-522	527	-0.6294	-517	527	-0.6264	0.0030	0.0318
28	-538	538	-0.6456	-529	538	-0.6402	0.0054	0.0288
30	-523	526	-0.6294	-518	528	-0.6276	0.0018	0.0234
32	-542	545	-0.6522	-540	550	-0.6540	-0.0018	0.0216
34	-519	519	-0.6228	-510	519	-0.6174	0.0054	0.0234
36	-381	382	-0.4578	-370	381	-0.4506	0.0072	0.0180
38	-262	263	-0.3150	-254	261	-0.3090	0.0060	0.0108
40	-164	165	-0.1974	-157	165	-0.1932	0.0042	0.0048
42	-82	82	-0.0984	-77	86	-0.0978	0.0006	0.0006
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 12/3/2009 11:51:52 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 12/3/2009 3:25:40 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	1320	-1315	1.5810	0.7626	1.3404
6	525	-522	0.6282	954	-946	1.1400	0.5118	0.5778
8	318	-316	0.3804	378	-370	0.4488	0.0684	0.0660
10	216	-215	0.2586	207	-202	0.2454	-0.0132	-0.0024
12	126	-127	0.1518	122	-117	0.1434	-0.0084	0.0108
14	74	-73	0.0882	74	-69	0.0858	-0.0024	0.0192
16	-18	21	-0.0234	-15	25	-0.0240	-0.0006	0.0216
18	-103	105	-0.1248	-99	107	-0.1236	0.0012	0.0222
20	-205	204	-0.2454	-202	209	-0.2466	-0.0012	0.0210
22	-310	308	-0.3708	-309	314	-0.3738	-0.0030	0.0222
24	-414	417	-0.4986	-410	419	-0.4974	0.0012	0.0252
26	-522	527	-0.6294	-517	528	-0.6270	0.0024	0.0240
28	-538	538	-0.6456	-531	538	-0.6414	0.0042	0.0216
30	-523	526	-0.6294	-518	527	-0.6270	0.0024	0.0174
32	-542	545	-0.6522	-540	550	-0.6540	-0.0018	0.0150
34	-519	519	-0.6228	-514	520	-0.6204	0.0024	0.0168
36	-381	382	-0.4578	-371	382	-0.4518	0.0060	0.0144
38	-262	263	-0.3150	-254	262	-0.3096	0.0054	0.0084
40	-164	165	-0.1974	-157	166	-0.1938	0.0036	0.0030
42	-82	82	-0.0984	-78	87	-0.0990	-0.0006	-0.0006
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 11/3/2009 11:45:09 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 12/3/2009 3:25:50 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	807	-769	0.9456	0.5520	0.8646
6	216	-162	0.2268	476	-443	0.5514	0.3246	0.3126
8	143	-78	0.1326	152	-93	0.1470	0.0144	-0.0120
10	124	-61	0.1110	121	-58	0.1074	-0.0036	-0.0264
12	111	-46	0.0942	111	-46	0.0942	0.0000	-0.0228
14	34	14	0.0120	33	11	0.0132	0.0012	-0.0228
16	-97	139	-0.1416	-101	143	-0.1464	-0.0048	-0.0240
18	-245	293	-0.3228	-246	290	-0.3216	0.0012	-0.0192
20	-364	426	-0.4740	-369	427	-0.4776	-0.0036	-0.0204
22	-420	485	-0.5430	-423	485	-0.5448	-0.0018	-0.0168
24	-469	533	-0.6012	-469	530	-0.5994	0.0018	-0.0150
26	-551	604	-0.6930	-551	604	-0.6930	0.0000	-0.0168
28	-543	608	-0.6906	-550	613	-0.6978	-0.0072	-0.0168
30	-478	513	-0.5946	-481	514	-0.5970	-0.0024	-0.0096
32	-353	386	-0.4434	-355	384	-0.4434	0.0000	-0.0072
34	-166	198	-0.2184	-162	194	-0.2136	0.0048	-0.0072
36	0	55	0.0000	6	47	-0.0246	0.0000	-0.0120
38	29	27	0.0012	23	25	-0.0012	-0.0024	-0.0120
40	-89	136	-0.1350	-95	137	-0.1392	-0.0042	-0.0096
42	-217	274	-0.2946	-222	278	-0.3000	-0.0054	-0.0054
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 11/13/2009 9:46:29 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 12/3/2009 3:25:50 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	808	-772	0.9480	0.5544	0.8742
6	216	-162	0.2268	473	-442	0.5490	0.3222	0.3198
8	143	-78	0.1326	154	-90	0.1464	0.0138	-0.0024
10	124	-61	0.1110	124	-57	0.1086	-0.0024	-0.0162
12	111	-46	0.0942	114	-45	0.0954	0.0012	-0.0138
14	34	14	0.0120	31	11	0.0120	0.0000	-0.0150
16	-97	139	-0.1416	-102	146	-0.1488	-0.0072	-0.0150
18	-245	293	-0.3228	-247	294	-0.3246	-0.0018	-0.0078
20	-364	426	-0.4740	-365	429	-0.4764	-0.0024	-0.0060
22	-420	485	-0.5430	-420	487	-0.5442	-0.0012	-0.0036
24	-469	533	-0.6012	-464	531	-0.5970	0.0042	-0.0024
26	-551	604	-0.6930	-547	605	-0.6912	0.0018	-0.0066
28	-543	608	-0.6906	-546	613	-0.6954	-0.0048	-0.0084
30	-478	513	-0.5946	-477	515	-0.5952	-0.0006	-0.0036
32	-353	386	-0.4434	-353	384	-0.4422	0.0012	-0.0030
34	-166	198	-0.2184	-158	195	-0.2118	0.0066	-0.0042
36	0	55	0.0000	10	49	-0.0234	0.0000	-0.0108
38	29	27	0.0012	26	26	0.0000	-0.0012	-0.0108
40	-89	136	-0.1350	-91	140	-0.1386	-0.0036	-0.0096
42	-217	274	-0.2946	-219	282	-0.3006	-0.0060	-0.0060
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 11/20/2009 11:43:39 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 12/3/2009 3:25:50 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	822	-777	0.9594	0.5658	0.8616
6	216	-162	0.2268	478	-442	0.5520	0.3252	0.2958
8	143	-78	0.1326	158	-90	0.1488	0.0162	-0.0294
10	124	-61	0.1110	123	-54	0.1062	-0.0048	-0.0456
12	111	-46	0.0942	115	-43	0.0948	0.0006	-0.0408
14	34	14	0.0120	33	15	0.0108	-0.0012	-0.0414
16	-97	139	-0.1416	-103	147	-0.1500	-0.0084	-0.0402
18	-245	293	-0.3228	-249	297	-0.3276	-0.0048	-0.0318
20	-364	426	-0.4740	-365	432	-0.4782	-0.0042	-0.0270
22	-420	485	-0.5430	-420	490	-0.5460	-0.0030	-0.0228
24	-469	533	-0.6012	-462	533	-0.5970	0.0042	-0.0198
26	-551	604	-0.6930	-545	607	-0.6912	0.0018	-0.0240
28	-543	608	-0.6906	-548	618	-0.6996	-0.0090	-0.0258
30	-478	513	-0.5946	-479	517	-0.5976	-0.0030	-0.0168
32	-353	386	-0.4434	-357	389	-0.4476	-0.0042	-0.0138
34	-166	198	-0.2184	-161	199	-0.2160	0.0024	-0.0096
36	0	55	0.0000	8	52	-0.0264	0.0000	-0.0120
38	29	27	0.0012	25	27	-0.0012	-0.0024	-0.0120
40	-89	136	-0.1350	-92	141	-0.1398	-0.0048	-0.0096
42	-217	274	-0.2946	-218	281	-0.2994	-0.0048	-0.0048
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 11/24/2009 11:45:51 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 12/3/2009 3:25:50 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	825	-780	0.9630	0.5694	0.8628
6	216	-162	0.2268	474	-443	0.5502	0.3234	0.2934
8	143	-78	0.1326	157	-91	0.1488	0.0162	-0.0300
10	124	-61	0.1110	124	-57	0.1086	-0.0024	-0.0462
12	111	-46	0.0942	115	-43	0.0948	0.0006	-0.0438
14	34	14	0.0120	36	14	0.0132	0.0012	-0.0444
16	-97	139	-0.1416	-100	151	-0.1506	-0.0090	-0.0456
18	-245	293	-0.3228	-247	298	-0.3270	-0.0042	-0.0366
20	-364	426	-0.4740	-367	431	-0.4788	-0.0048	-0.0324
22	-420	485	-0.5430	-421	489	-0.5460	-0.0030	-0.0276
24	-469	533	-0.6012	-466	532	-0.5988	0.0024	-0.0246
26	-551	604	-0.6930	-550	608	-0.6948	-0.0018	-0.0270
28	-543	608	-0.6906	-548	616	-0.6984	-0.0078	-0.0252
30	-478	513	-0.5946	-479	518	-0.5982	-0.0036	-0.0174
32	-353	386	-0.4434	-351	386	-0.4422	0.0012	-0.0138
34	-166	198	-0.2184	-160	199	-0.2154	0.0030	-0.0150
36	0	55	0.0000	10	50	-0.0240	0.0000	-0.0180
38	29	27	0.0012	25	29	-0.0024	-0.0036	-0.0180
40	-89	136	-0.1350	-93	142	-0.1410	-0.0060	-0.0144
42	-217	274	-0.2946	-220	285	-0.3030	-0.0084	-0.0084
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

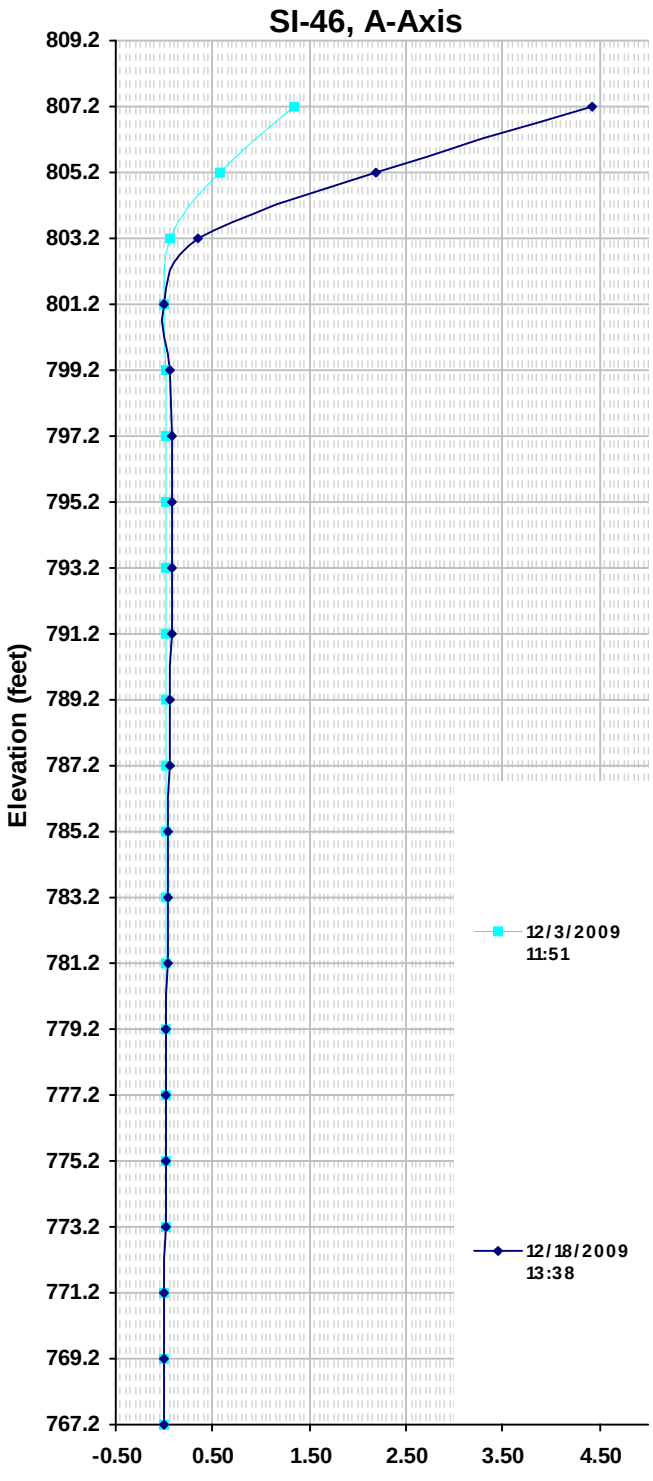
CURRENT SURVEY 12/3/2009 11:51:52 AM

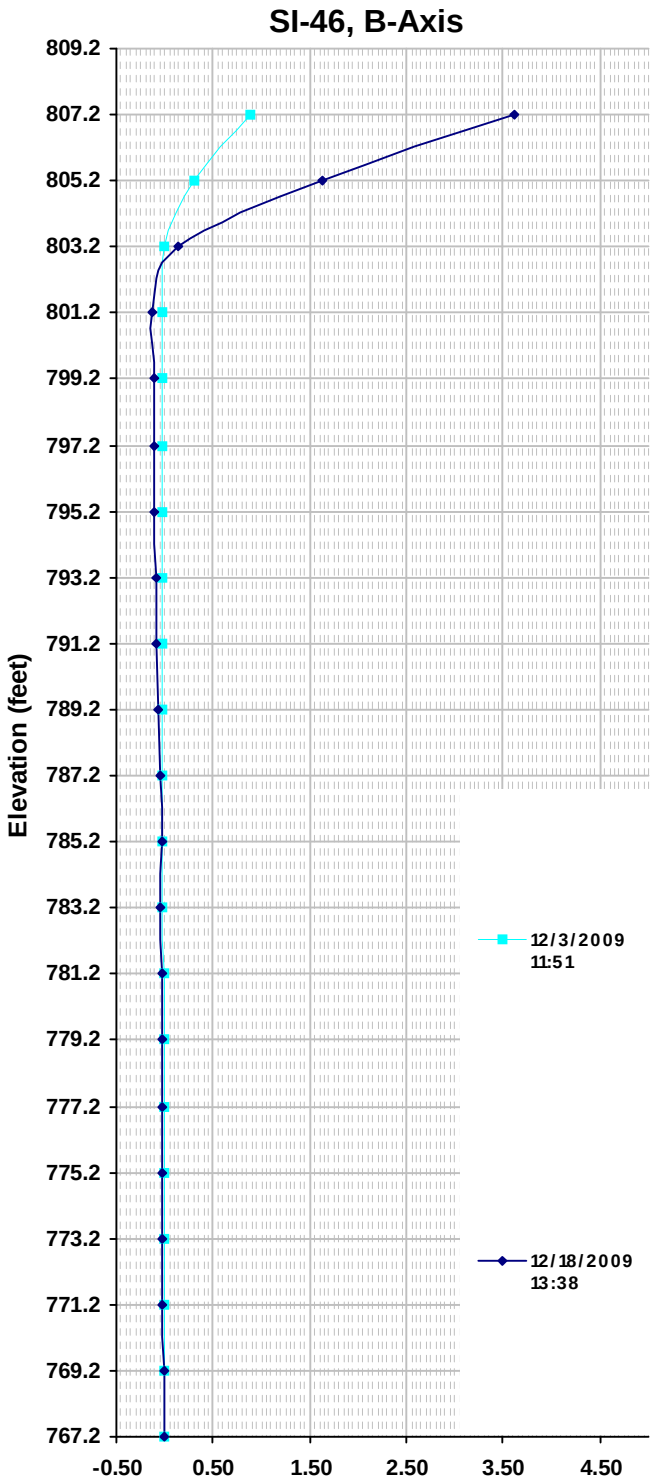
INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 12/3/2009 3:25:50 PM

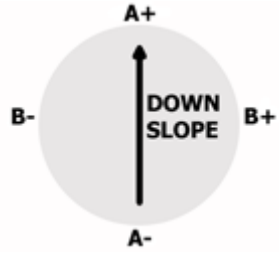
Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	831	-781	0.9672	0.5736	0.8892
6	216	-162	0.2268	479	-445	0.5544	0.3276	0.3156
8	143	-78	0.1326	157	-92	0.1494	0.0168	-0.0120
10	124	-61	0.1110	124	-57	0.1086	-0.0024	-0.0288
12	111	-46	0.0942	117	-46	0.0978	0.0036	-0.0264
14	34	14	0.0120	39	13	0.0156	0.0036	-0.0300
16	-97	139	-0.1416	-98	151	-0.1494	-0.0078	-0.0336
18	-245	293	-0.3228	-246	298	-0.3264	-0.0036	-0.0258
20	-364	426	-0.4740	-366	429	-0.4770	-0.0030	-0.0222
22	-420	485	-0.5430	-422	490	-0.5472	-0.0042	-0.0192
24	-469	533	-0.6012	-464	531	-0.5970	0.0042	-0.0150
26	-551	604	-0.6930	-547	606	-0.6918	0.0012	-0.0192
28	-543	608	-0.6906	-547	615	-0.6972	-0.0066	-0.0204
30	-478	513	-0.5946	-480	519	-0.5994	-0.0048	-0.0138
32	-353	386	-0.4434	-353	385	-0.4428	0.0006	-0.0090
34	-166	198	-0.2184	-159	198	-0.2142	0.0042	-0.0096
36	0	55	0.0000	9	50	-0.0246	0.0000	-0.0138
38	29	27	0.0012	26	27	-0.0006	-0.0018	-0.0138
40	-89	136	-0.1350	-93	139	-0.1392	-0.0042	-0.0120
42	-217	274	-0.2946	-221	283	-0.3024	-0.0078	-0.0078
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000





Stantec



Bull Run Fossil Plant
Bull Run
Clinton, TN
172679015
1/4/2010

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 12/3/2009 11:51:52 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 1/4/2010 2:37:53 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	1320	-1315	1.5810	0.7626	1.3404
6	525	-522	0.6282	954	-946	1.1400	0.5118	0.5778
8	318	-316	0.3804	378	-370	0.4488	0.0684	0.0660
10	216	-215	0.2586	207	-202	0.2454	-0.0132	-0.0024
12	126	-127	0.1518	122	-117	0.1434	-0.0084	0.0108
14	74	-73	0.0882	74	-69	0.0858	-0.0024	0.0192
16	-18	21	-0.0234	-15	25	-0.0240	-0.0006	0.0216
18	-103	105	-0.1248	-99	107	-0.1236	0.0012	0.0222
20	-205	204	-0.2454	-202	209	-0.2466	-0.0012	0.0210
22	-310	308	-0.3708	-309	314	-0.3738	-0.0030	0.0222
24	-414	417	-0.4986	-410	419	-0.4974	0.0012	0.0252
26	-522	527	-0.6294	-517	528	-0.6270	0.0024	0.0240
28	-538	538	-0.6456	-531	538	-0.6414	0.0042	0.0216
30	-523	526	-0.6294	-518	527	-0.6270	0.0024	0.0174
32	-542	545	-0.6522	-540	550	-0.6540	-0.0018	0.0150
34	-519	519	-0.6228	-514	520	-0.6204	0.0024	0.0168
36	-381	382	-0.4578	-371	382	-0.4518	0.0060	0.0144
38	-262	263	-0.3150	-254	262	-0.3096	0.0054	0.0084
40	-164	165	-0.1974	-157	166	-0.1938	0.0036	0.0030
42	-82	82	-0.0984	-78	87	-0.0990	-0.0006	-0.0006
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 12/18/2009 1:38:34 PM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 1/4/2010 2:37:53 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	2536	-2558	3.0564	2.2380	4.4178
6	525	-522	0.6282	1982	-2129	2.4666	1.8384	2.1798
8	318	-316	0.3804	592	-606	0.7188	0.3384	0.3414
10	216	-215	0.2586	167	-168	0.2010	-0.0576	0.0030
12	126	-127	0.1518	104	-107	0.1266	-0.0252	0.0606
14	74	-73	0.0882	71	-73	0.0864	-0.0018	0.0858
16	-18	21	-0.0234	-14	13	-0.0162	0.0072	0.0876
18	-103	105	-0.1248	-96	94	-0.1140	0.0108	0.0804
20	-205	204	-0.2454	-199	198	-0.2382	0.0072	0.0696
22	-310	308	-0.3708	-305	302	-0.3642	0.0066	0.0624
24	-414	417	-0.4986	-408	406	-0.4884	0.0102	0.0558
26	-522	527	-0.6294	-519	515	-0.6204	0.0090	0.0456
28	-538	538	-0.6456	-531	530	-0.6366	0.0090	0.0366
30	-523	526	-0.6294	-523	520	-0.6258	0.0036	0.0276
32	-542	545	-0.6522	-545	542	-0.6522	0.0000	0.0240
34	-519	519	-0.6228	-518	515	-0.6198	0.0030	0.0240
36	-381	382	-0.4578	-376	375	-0.4506	0.0072	0.0210
38	-262	263	-0.3150	-257	255	-0.3072	0.0078	0.0138
40	-164	165	-0.1974	-161	160	-0.1926	0.0048	0.0060
42	-82	82	-0.0984	-82	80	-0.0972	0.0012	0.0012
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 12/3/2009 11:51:52 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 1/4/2010 2:38:03 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	831	-781	0.9672	0.5736	0.8892
6	216	-162	0.2268	479	-445	0.5544	0.3276	0.3156
8	143	-78	0.1326	157	-92	0.1494	0.0168	-0.0120
10	124	-61	0.1110	124	-57	0.1086	-0.0024	-0.0288
12	111	-46	0.0942	117	-46	0.0978	0.0036	-0.0264
14	34	14	0.0120	39	13	0.0156	0.0036	-0.0300
16	-97	139	-0.1416	-98	151	-0.1494	-0.0078	-0.0336
18	-245	293	-0.3228	-246	298	-0.3264	-0.0036	-0.0258
20	-364	426	-0.4740	-366	429	-0.4770	-0.0030	-0.0222
22	-420	485	-0.5430	-422	490	-0.5472	-0.0042	-0.0192
24	-469	533	-0.6012	-464	531	-0.5970	0.0042	-0.0150
26	-551	604	-0.6930	-547	606	-0.6918	0.0012	-0.0192
28	-543	608	-0.6906	-547	615	-0.6972	-0.0066	-0.0204
30	-478	513	-0.5946	-480	519	-0.5994	-0.0048	-0.0138
32	-353	386	-0.4434	-353	385	-0.4428	0.0006	-0.0090
34	-166	198	-0.2184	-159	198	-0.2142	0.0042	-0.0096
36	0	55	0.0000	9	50	-0.0246	0.0000	-0.0138
38	29	27	0.0012	26	27	-0.0006	-0.0018	-0.0138
40	-89	136	-0.1350	-93	139	-0.1392	-0.0042	-0.0120
42	-217	274	-0.2946	-221	283	-0.3024	-0.0078	-0.0078
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

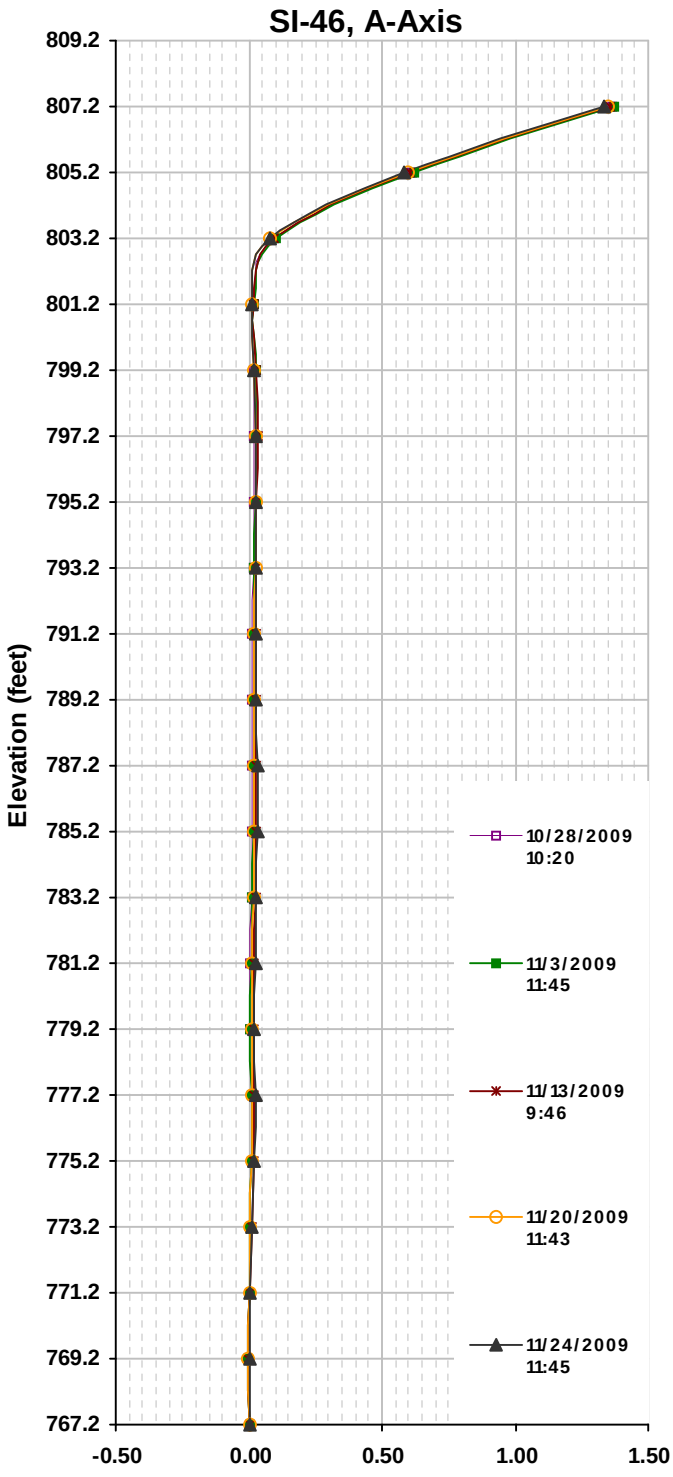
CURRENT SURVEY 12/18/2009 1:38:34 PM

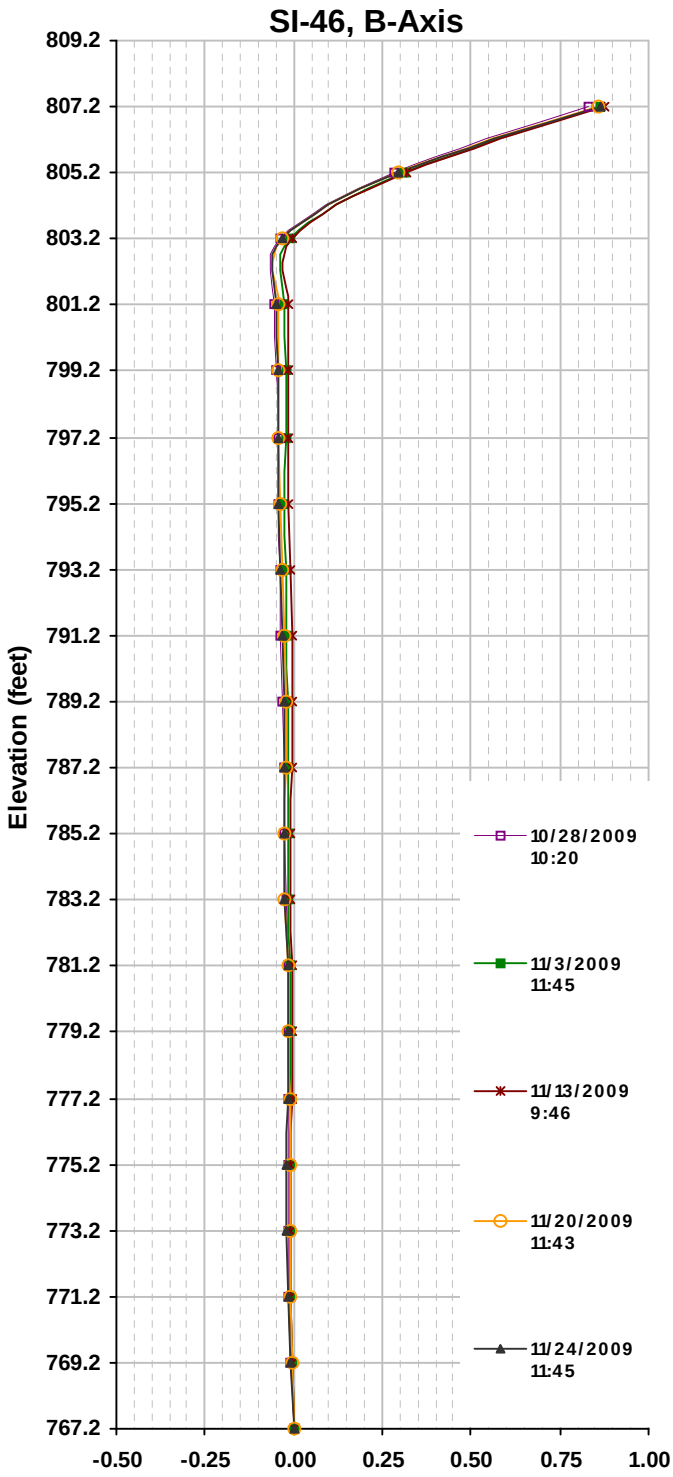
INITIAL SURVEY 8/11/2009 9:55:28 AM

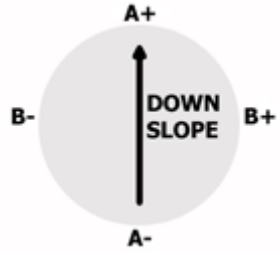
DATE PRINTED 1/4/2010 2:38:03 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	1984	-1993	2.3862	1.9926	3.6150
6	216	-162	0.2268	1485	-1367	1.7112	1.4844	1.6224
8	143	-78	0.1326	331	-348	0.4074	0.2748	0.1380
10	124	-61	0.1110	51	-89	0.0840	-0.0270	-0.1368
12	111	-46	0.0942	66	-87	0.0918	-0.0024	-0.1098
14	34	14	0.0120	2	-17	0.0114	-0.0006	-0.1074
16	-97	139	-0.1416	-137	128	-0.1590	-0.0174	-0.1068
18	-245	293	-0.3228	-285	272	-0.3342	-0.0114	-0.0894
20	-364	426	-0.4740	-420	399	-0.4914	-0.0174	-0.0780
22	-420	485	-0.5430	-482	452	-0.5604	-0.0174	-0.0606
24	-469	533	-0.6012	-525	496	-0.6126	-0.0114	-0.0432
26	-551	604	-0.6930	-593	557	-0.6900	0.0030	-0.0318
28	-543	608	-0.6906	-591	561	-0.6912	-0.0006	-0.0348
30	-478	513	-0.5946	-505	493	-0.5988	-0.0042	-0.0342
32	-353	386	-0.4434	-378	370	-0.4488	-0.0054	-0.0300
34	-166	198	-0.2184	-184	173	-0.2142	0.0042	-0.0246
36	0	55	0.0000	-36	7	-0.0258	0.0000	-0.0288
38	29	27	0.0012	-15	-6	-0.0054	-0.0066	-0.0288
40	-89	136	-0.1350	-125	118	-0.1458	-0.0108	-0.0222
42	-217	274	-0.2946	-268	242	-0.3060	-0.0114	-0.0114
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000







Stantec

Bull Run Fossil Plant
Bull Run
Clinton, TN
172679015
11/25/2009

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 10/28/2009 10:20:49 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 11/25/2009 8:12:23 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	1305	-1307	1.5672	0.7488	1.3632
6	525	-522	0.6282	962	-954	1.1496	0.5214	0.6144
8	318	-316	0.3804	385	-378	0.4578	0.0774	0.0930
10	216	-215	0.2586	217	-211	0.2568	-0.0018	0.0156
12	126	-127	0.1518	127	-122	0.1494	-0.0024	0.0174
14	74	-73	0.0882	78	-72	0.0900	0.0018	0.0198
16	-18	21	-0.0234	-14	22	-0.0216	0.0018	0.0180
18	-103	105	-0.1248	-98	106	-0.1224	0.0024	0.0162
20	-205	204	-0.2454	-200	206	-0.2436	0.0018	0.0138
22	-310	308	-0.3708	-307	311	-0.3708	0.0000	0.0120
24	-414	417	-0.4986	-411	419	-0.4980	0.0006	0.0120
26	-522	527	-0.6294	-518	528	-0.6276	0.0018	0.0114
28	-538	538	-0.6456	-532	538	-0.6420	0.0036	0.0096
30	-523	526	-0.6294	-519	529	-0.6288	0.0006	0.0060
32	-542	545	-0.6522	-541	551	-0.6552	-0.0030	0.0054
34	-519	519	-0.6228	-515	522	-0.6222	0.0006	0.0084
36	-381	382	-0.4578	-374	383	-0.4542	0.0036	0.0078
38	-262	263	-0.3150	-256	263	-0.3114	0.0036	0.0042
40	-164	165	-0.1974	-160	167	-0.1962	0.0012	0.0006
42	-82	82	-0.0984	-79	86	-0.0990	-0.0006	-0.0006
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 11/3/2009 11:45:09 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 11/25/2009 8:12:23 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	1314	-1305	1.5714	0.7530	1.3710
6	525	-522	0.6282	965	-948	1.1478	0.5196	0.6180
8	318	-316	0.3804	388	-373	0.4566	0.0762	0.0984
10	216	-215	0.2586	220	-207	0.2562	-0.0024	0.0222
12	126	-127	0.1518	131	-119	0.1500	-0.0018	0.0246
14	74	-73	0.0882	82	-68	0.0900	0.0018	0.0264
16	-18	21	-0.0234	-10	25	-0.0210	0.0024	0.0246
18	-103	105	-0.1248	-94	109	-0.1218	0.0030	0.0222
20	-205	204	-0.2454	-196	210	-0.2436	0.0018	0.0192
22	-310	308	-0.3708	-302	317	-0.3714	-0.0006	0.0174
24	-414	417	-0.4986	-406	422	-0.4968	0.0018	0.0180
26	-522	527	-0.6294	-514	530	-0.6264	0.0030	0.0162
28	-538	538	-0.6456	-528	541	-0.6414	0.0042	0.0132
30	-523	526	-0.6294	-515	531	-0.6276	0.0018	0.0090
32	-542	545	-0.6522	-537	554	-0.6546	-0.0024	0.0072
34	-519	519	-0.6228	-511	524	-0.6210	0.0018	0.0096
36	-381	382	-0.4578	-373	386	-0.4554	0.0024	0.0078
38	-262	263	-0.3150	-251	265	-0.3096	0.0054	0.0054
40	-164	165	-0.1974	-155	170	-0.1950	0.0024	0.0000
42	-82	82	-0.0984	-78	90	-0.1008	-0.0024	-0.0024
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 11/13/2009 9:46:29 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 11/25/2009 8:12:23 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	1311	-1302	1.5678	0.7494	1.3560
6	525	-522	0.6282	955	-946	1.1406	0.5124	0.6066
8	318	-316	0.3804	383	-371	0.4524	0.0720	0.0942
10	216	-215	0.2586	216	-206	0.2532	-0.0054	0.0222
12	126	-127	0.1518	129	-119	0.1488	-0.0030	0.0276
14	74	-73	0.0882	80	-69	0.0894	0.0012	0.0306
16	-18	21	-0.0234	-12	25	-0.0222	0.0012	0.0294
18	-103	105	-0.1248	-97	109	-0.1236	0.0012	0.0282
20	-205	204	-0.2454	-199	209	-0.2448	0.0006	0.0270
22	-310	308	-0.3708	-305	315	-0.3720	-0.0012	0.0264
24	-414	417	-0.4986	-408	421	-0.4974	0.0012	0.0276
26	-522	527	-0.6294	-515	529	-0.6264	0.0030	0.0264
28	-538	538	-0.6456	-529	539	-0.6408	0.0048	0.0234
30	-523	526	-0.6294	-517	530	-0.6282	0.0012	0.0186
32	-542	545	-0.6522	-538	553	-0.6546	-0.0024	0.0174
34	-519	519	-0.6228	-511	522	-0.6198	0.0030	0.0198
36	-381	382	-0.4578	-370	383	-0.4518	0.0060	0.0168
38	-262	263	-0.3150	-251	263	-0.3084	0.0066	0.0108
40	-164	165	-0.1974	-154	167	-0.1926	0.0048	0.0042
42	-82	82	-0.0984	-75	90	-0.0990	-0.0006	-0.0006
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 11/20/2009 11:43:39 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 11/25/2009 8:12:23 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	1315	-1308	1.5738	0.7554	1.3512
6	525	-522	0.6282	957	-947	1.1424	0.5142	0.5958
8	318	-316	0.3804	383	-373	0.4536	0.0732	0.0816
10	216	-215	0.2586	213	-202	0.2490	-0.0096	0.0084
12	126	-127	0.1518	126	-116	0.1452	-0.0066	0.0180
14	74	-73	0.0882	79	-68	0.0882	0.0000	0.0246
16	-18	21	-0.0234	-12	25	-0.0222	0.0012	0.0246
18	-103	105	-0.1248	-97	108	-0.1230	0.0018	0.0234
20	-205	204	-0.2454	-199	209	-0.2448	0.0006	0.0216
22	-310	308	-0.3708	-305	314	-0.3714	-0.0006	0.0210
24	-414	417	-0.4986	-408	420	-0.4968	0.0018	0.0216
26	-522	527	-0.6294	-513	529	-0.6252	0.0042	0.0198
28	-538	538	-0.6456	-530	540	-0.6420	0.0036	0.0156
30	-523	526	-0.6294	-517	530	-0.6282	0.0012	0.0120
32	-542	545	-0.6522	-538	552	-0.6540	-0.0018	0.0108
34	-519	519	-0.6228	-512	522	-0.6204	0.0024	0.0126
36	-381	382	-0.4578	-373	384	-0.4542	0.0036	0.0102
38	-262	263	-0.3150	-254	263	-0.3102	0.0048	0.0066
40	-164	165	-0.1974	-157	167	-0.1944	0.0030	0.0018
42	-82	82	-0.0984	-77	89	-0.0996	-0.0012	-0.0012
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 11/24/2009 11:45:51 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 11/25/2009 8:12:23 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	1307	-1306	1.5678	0.7494	1.3344
6	525	-522	0.6282	950	-939	1.1334	0.5052	0.5850
8	318	-316	0.3804	380	-370	0.4500	0.0696	0.0798
10	216	-215	0.2586	210	-203	0.2478	-0.0108	0.0102
12	126	-127	0.1518	125	-117	0.1452	-0.0066	0.0210
14	74	-73	0.0882	77	-69	0.0876	-0.0006	0.0276
16	-18	21	-0.0234	-14	25	-0.0234	0.0000	0.0282
18	-103	105	-0.1248	-99	108	-0.1242	0.0006	0.0282
20	-205	204	-0.2454	-202	209	-0.2466	-0.0012	0.0276
22	-310	308	-0.3708	-309	315	-0.3744	-0.0036	0.0288
24	-414	417	-0.4986	-410	420	-0.4980	0.0006	0.0324
26	-522	527	-0.6294	-517	527	-0.6264	0.0030	0.0318
28	-538	538	-0.6456	-529	538	-0.6402	0.0054	0.0288
30	-523	526	-0.6294	-518	528	-0.6276	0.0018	0.0234
32	-542	545	-0.6522	-540	550	-0.6540	-0.0018	0.0216
34	-519	519	-0.6228	-510	519	-0.6174	0.0054	0.0234
36	-381	382	-0.4578	-370	381	-0.4506	0.0072	0.0180
38	-262	263	-0.3150	-254	261	-0.3090	0.0060	0.0108
40	-164	165	-0.1974	-157	165	-0.1932	0.0042	0.0048
42	-82	82	-0.0984	-77	86	-0.0978	0.0006	0.0006
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 10/28/2009 10:20:49 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 11/25/2009 8:12:58 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	808	-760	0.9408	0.5472	0.8286
6	216	-162	0.2268	476	-438	0.5484	0.3216	0.2814
8	143	-78	0.1326	154	-87	0.1446	0.0120	-0.0402
10	124	-61	0.1110	123	-53	0.1056	-0.0054	-0.0522
12	111	-46	0.0942	114	-39	0.0918	-0.0024	-0.0468
14	34	14	0.0120	36	17	0.0114	-0.0006	-0.0444
16	-97	139	-0.1416	-97	149	-0.1476	-0.0060	-0.0438
18	-245	293	-0.3228	-243	297	-0.3240	-0.0012	-0.0378
20	-364	426	-0.4740	-366	433	-0.4794	-0.0054	-0.0366
22	-420	485	-0.5430	-421	491	-0.5472	-0.0042	-0.0312
24	-469	533	-0.6012	-467	537	-0.6024	-0.0012	-0.0270
26	-551	604	-0.6930	-549	610	-0.6954	-0.0024	-0.0258
28	-543	608	-0.6906	-547	618	-0.6990	-0.0084	-0.0234
30	-478	513	-0.5946	-477	516	-0.5958	-0.0012	-0.0150
32	-353	386	-0.4434	-352	389	-0.4446	-0.0012	-0.0138
34	-166	198	-0.2184	-158	198	-0.2136	0.0048	-0.0126
36	0	55	0.0000	10	52	-0.0252	0.0000	-0.0174
38	29	27	0.0012	26	31	-0.0030	-0.0042	-0.0174
40	-89	136	-0.1350	-90	144	-0.1404	-0.0054	-0.0132
42	-217	274	-0.2946	-221	283	-0.3024	-0.0078	-0.0078
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 11/3/2009 11:45:09 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 11/25/2009 8:12:58 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	807	-769	0.9456	0.5520	0.8646
6	216	-162	0.2268	476	-443	0.5514	0.3246	0.3126
8	143	-78	0.1326	152	-93	0.1470	0.0144	-0.0120
10	124	-61	0.1110	121	-58	0.1074	-0.0036	-0.0264
12	111	-46	0.0942	111	-46	0.0942	0.0000	-0.0228
14	34	14	0.0120	33	11	0.0132	0.0012	-0.0228
16	-97	139	-0.1416	-101	143	-0.1464	-0.0048	-0.0240
18	-245	293	-0.3228	-246	290	-0.3216	0.0012	-0.0192
20	-364	426	-0.4740	-369	427	-0.4776	-0.0036	-0.0204
22	-420	485	-0.5430	-423	485	-0.5448	-0.0018	-0.0168
24	-469	533	-0.6012	-469	530	-0.5994	0.0018	-0.0150
26	-551	604	-0.6930	-551	604	-0.6930	0.0000	-0.0168
28	-543	608	-0.6906	-550	613	-0.6978	-0.0072	-0.0168
30	-478	513	-0.5946	-481	514	-0.5970	-0.0024	-0.0096
32	-353	386	-0.4434	-355	384	-0.4434	0.0000	-0.0072
34	-166	198	-0.2184	-162	194	-0.2136	0.0048	-0.0072
36	0	55	0.0000	6	47	-0.0246	0.0000	-0.0120
38	29	27	0.0012	23	25	-0.0012	-0.0024	-0.0120
40	-89	136	-0.1350	-95	137	-0.1392	-0.0042	-0.0096
42	-217	274	-0.2946	-222	278	-0.3000	-0.0054	-0.0054
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 11/13/2009 9:46:29 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 11/25/2009 8:12:58 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	808	-772	0.9480	0.5544	0.8742
6	216	-162	0.2268	473	-442	0.5490	0.3222	0.3198
8	143	-78	0.1326	154	-90	0.1464	0.0138	-0.0024
10	124	-61	0.1110	124	-57	0.1086	-0.0024	-0.0162
12	111	-46	0.0942	114	-45	0.0954	0.0012	-0.0138
14	34	14	0.0120	31	11	0.0120	0.0000	-0.0150
16	-97	139	-0.1416	-102	146	-0.1488	-0.0072	-0.0150
18	-245	293	-0.3228	-247	294	-0.3246	-0.0018	-0.0078
20	-364	426	-0.4740	-365	429	-0.4764	-0.0024	-0.0060
22	-420	485	-0.5430	-420	487	-0.5442	-0.0012	-0.0036
24	-469	533	-0.6012	-464	531	-0.5970	0.0042	-0.0024
26	-551	604	-0.6930	-547	605	-0.6912	0.0018	-0.0066
28	-543	608	-0.6906	-546	613	-0.6954	-0.0048	-0.0084
30	-478	513	-0.5946	-477	515	-0.5952	-0.0006	-0.0036
32	-353	386	-0.4434	-353	384	-0.4422	0.0012	-0.0030
34	-166	198	-0.2184	-158	195	-0.2118	0.0066	-0.0042
36	0	55	0.0000	10	49	-0.0234	0.0000	-0.0108
38	29	27	0.0012	26	26	0.0000	-0.0012	-0.0108
40	-89	136	-0.1350	-91	140	-0.1386	-0.0036	-0.0096
42	-217	274	-0.2946	-219	282	-0.3006	-0.0060	-0.0060
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 11/20/2009 11:43:39 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 11/25/2009 8:12:58 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	822	-777	0.9594	0.5658	0.8616
6	216	-162	0.2268	478	-442	0.5520	0.3252	0.2958
8	143	-78	0.1326	158	-90	0.1488	0.0162	-0.0294
10	124	-61	0.1110	123	-54	0.1062	-0.0048	-0.0456
12	111	-46	0.0942	115	-43	0.0948	0.0006	-0.0408
14	34	14	0.0120	33	15	0.0108	-0.0012	-0.0414
16	-97	139	-0.1416	-103	147	-0.1500	-0.0084	-0.0402
18	-245	293	-0.3228	-249	297	-0.3276	-0.0048	-0.0318
20	-364	426	-0.4740	-365	432	-0.4782	-0.0042	-0.0270
22	-420	485	-0.5430	-420	490	-0.5460	-0.0030	-0.0228
24	-469	533	-0.6012	-462	533	-0.5970	0.0042	-0.0198
26	-551	604	-0.6930	-545	607	-0.6912	0.0018	-0.0240
28	-543	608	-0.6906	-548	618	-0.6996	-0.0090	-0.0258
30	-478	513	-0.5946	-479	517	-0.5976	-0.0030	-0.0168
32	-353	386	-0.4434	-357	389	-0.4476	-0.0042	-0.0138
34	-166	198	-0.2184	-161	199	-0.2160	0.0024	-0.0096
36	0	55	0.0000	8	52	-0.0264	0.0000	-0.0120
38	29	27	0.0012	25	27	-0.0012	-0.0024	-0.0120
40	-89	136	-0.1350	-92	141	-0.1398	-0.0048	-0.0096
42	-217	274	-0.2946	-218	281	-0.2994	-0.0048	-0.0048
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

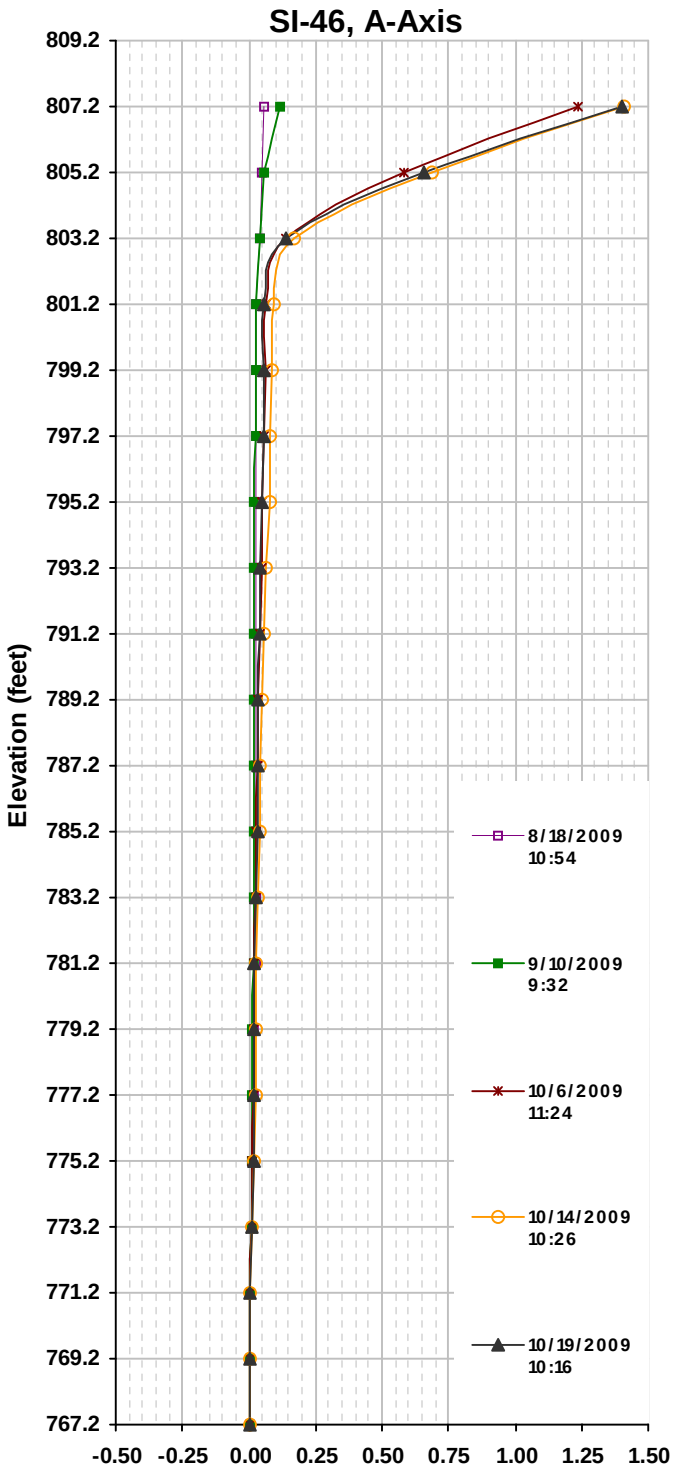
CURRENT SURVEY 11/24/2009 11:45:51 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

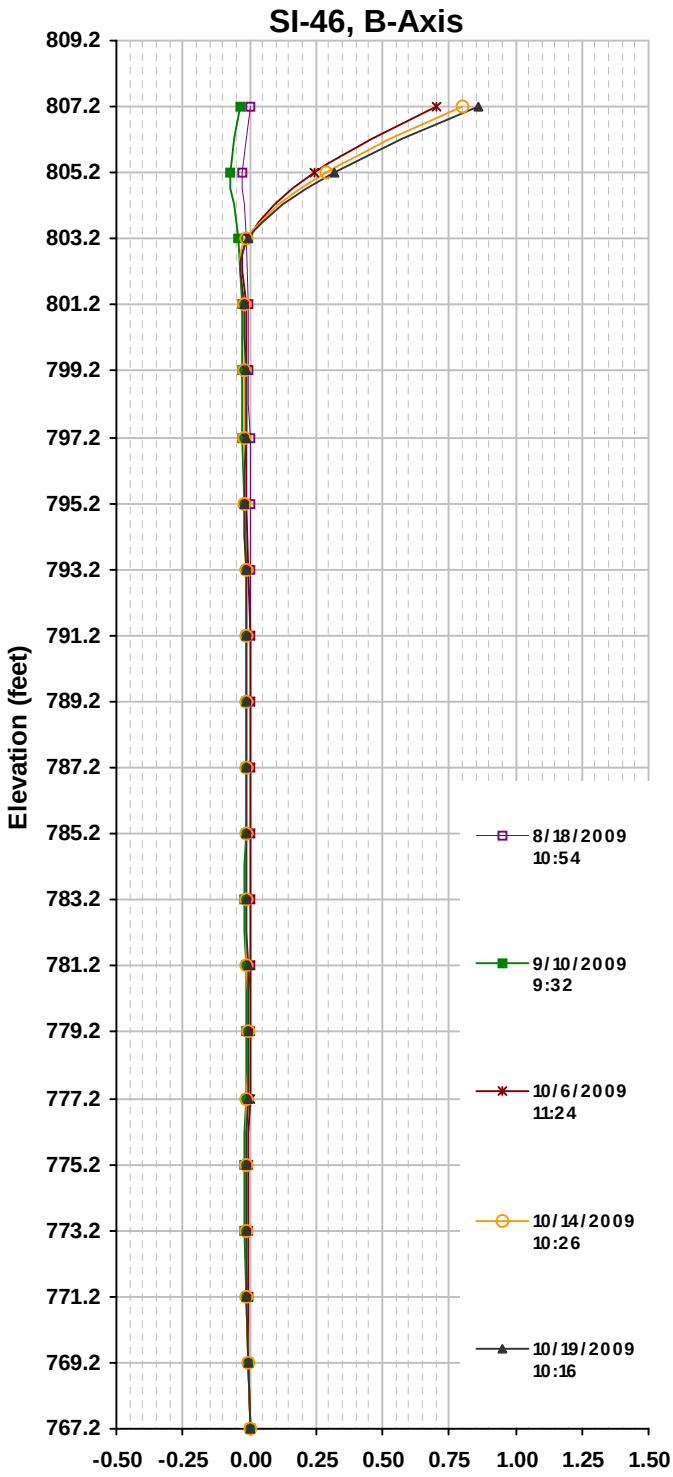
DATE PRINTED 11/25/2009 8:12:58 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	825	-780	0.9630	0.5694	0.8628
6	216	-162	0.2268	474	-443	0.5502	0.3234	0.2934
8	143	-78	0.1326	157	-91	0.1488	0.0162	-0.0300
10	124	-61	0.1110	124	-57	0.1086	-0.0024	-0.0462
12	111	-46	0.0942	115	-43	0.0948	0.0006	-0.0438
14	34	14	0.0120	36	14	0.0132	0.0012	-0.0444
16	-97	139	-0.1416	-100	151	-0.1506	-0.0090	-0.0456
18	-245	293	-0.3228	-247	298	-0.3270	-0.0042	-0.0366
20	-364	426	-0.4740	-367	431	-0.4788	-0.0048	-0.0324
22	-420	485	-0.5430	-421	489	-0.5460	-0.0030	-0.0276
24	-469	533	-0.6012	-466	532	-0.5988	0.0024	-0.0246
26	-551	604	-0.6930	-550	608	-0.6948	-0.0018	-0.0270
28	-543	608	-0.6906	-548	616	-0.6984	-0.0078	-0.0252
30	-478	513	-0.5946	-479	518	-0.5982	-0.0036	-0.0174
32	-353	386	-0.4434	-351	386	-0.4422	0.0012	-0.0138
34	-166	198	-0.2184	-160	199	-0.2154	0.0030	-0.0150
36	0	55	0.0000	10	50	-0.0240	0.0000	-0.0180
38	29	27	0.0012	25	29	-0.0024	-0.0036	-0.0180
40	-89	136	-0.1350	-93	142	-0.1410	-0.0060	-0.0144
42	-217	274	-0.2946	-220	285	-0.3030	-0.0084	-0.0084
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

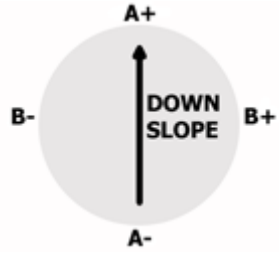


Cumulative Displacement (in) from 8/11/2009



Cumulative Displacement (in) from 8/11/2009

Stantec



Bull Run Fossil Plant
Bull Run
Clinton, TN
172679015
10/19/2009

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 8/18/2009 10:54:05 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 10/19/2009 2:19:14 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	687	-690	0.8262	0.0078	0.0546
6	525	-522	0.6282	531	-529	0.6360	0.0078	0.0468
8	318	-316	0.3804	328	-328	0.3936	0.0132	0.0390
10	216	-215	0.2586	217	-218	0.2610	0.0024	0.0258
12	126	-127	0.1518	124	-126	0.1500	-0.0018	0.0234
14	74	-73	0.0882	74	-75	0.0894	0.0012	0.0252
16	-18	21	-0.0234	-20	20	-0.0240	-0.0006	0.0240
18	-103	105	-0.1248	-105	103	-0.1248	0.0000	0.0246
20	-205	204	-0.2454	-206	203	-0.2454	0.0000	0.0246
22	-310	308	-0.3708	-310	306	-0.3696	0.0012	0.0246
24	-414	417	-0.4986	-415	416	-0.4986	0.0000	0.0234
26	-522	527	-0.6294	-525	527	-0.6312	-0.0018	0.0234
28	-538	538	-0.6456	-537	535	-0.6432	0.0024	0.0252
30	-523	526	-0.6294	-522	523	-0.6270	0.0024	0.0228
32	-542	545	-0.6522	-543	544	-0.6522	0.0000	0.0204
34	-519	519	-0.6228	-515	514	-0.6174	0.0054	0.0204
36	-381	382	-0.4578	-378	378	-0.4536	0.0042	0.0150
38	-262	263	-0.3150	-259	258	-0.3102	0.0048	0.0108
40	-164	165	-0.1974	-163	161	-0.1944	0.0030	0.0060
42	-82	82	-0.0984	-81	78	-0.0954	0.0030	0.0030
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 10/6/2009 11:24:33 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 10/19/2009 2:19:14 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	1231	-1221	1.4712	0.6528	1.2378
6	525	-522	0.6282	897	-893	1.0740	0.4458	0.5850
8	318	-316	0.3804	382	-374	0.4536	0.0732	0.1392
10	216	-215	0.2586	222	-216	0.2628	0.0042	0.0660
12	126	-127	0.1518	132	-126	0.1548	0.0030	0.0618
14	74	-73	0.0882	82	-77	0.0954	0.0072	0.0588
16	-18	21	-0.0234	-11	18	-0.0174	0.0060	0.0516
18	-103	105	-0.1248	-97	101	-0.1188	0.0060	0.0456
20	-205	204	-0.2454	-198	203	-0.2406	0.0048	0.0396
22	-310	308	-0.3708	-305	308	-0.3678	0.0030	0.0348
24	-414	417	-0.4986	-410	415	-0.4950	0.0036	0.0318
26	-522	527	-0.6294	-515	527	-0.6252	0.0042	0.0282
28	-538	538	-0.6456	-531	535	-0.6396	0.0060	0.0240
30	-523	526	-0.6294	-519	527	-0.6276	0.0018	0.0180
32	-542	545	-0.6522	-540	549	-0.6534	-0.0012	0.0162
34	-519	519	-0.6228	-513	519	-0.6192	0.0036	0.0174
36	-381	382	-0.4578	-375	381	-0.4536	0.0042	0.0138
38	-262	263	-0.3150	-255	262	-0.3102	0.0048	0.0096
40	-164	165	-0.1974	-159	165	-0.1944	0.0030	0.0048
42	-82	82	-0.0984	-77	84	-0.0966	0.0018	0.0018
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 10/14/2009 10:26:58 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 10/19/2009 2:19:14 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	1290	-1281	1.5426	0.7242	1.4094
6	525	-522	0.6282	958	-943	1.1406	0.5124	0.6852
8	318	-316	0.3804	390	-379	0.4614	0.0810	0.1728
10	216	-215	0.2586	226	-214	0.2640	0.0054	0.0918
12	126	-127	0.1518	135	-125	0.1560	0.0042	0.0864
14	74	-73	0.0882	85	-73	0.0948	0.0066	0.0822
16	-18	21	-0.0234	-6	19	-0.0150	0.0084	0.0756
18	-103	105	-0.1248	-90	103	-0.1158	0.0090	0.0672
20	-205	204	-0.2454	-192	204	-0.2376	0.0078	0.0582
22	-310	308	-0.3708	-299	310	-0.3654	0.0054	0.0504
24	-414	417	-0.4986	-405	419	-0.4944	0.0042	0.0450
26	-522	527	-0.6294	-513	528	-0.6246	0.0048	0.0408
28	-538	538	-0.6456	-527	538	-0.6390	0.0066	0.0360
30	-523	526	-0.6294	-513	528	-0.6246	0.0048	0.0294
32	-542	545	-0.6522	-535	550	-0.6510	0.0012	0.0246
34	-519	519	-0.6228	-510	521	-0.6186	0.0042	0.0234
36	-381	382	-0.4578	-371	383	-0.4524	0.0054	0.0192
38	-262	263	-0.3150	-251	263	-0.3084	0.0066	0.0138
40	-164	165	-0.1974	-154	167	-0.1926	0.0048	0.0072
42	-82	82	-0.0984	-74	86	-0.0960	0.0024	0.0024
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 10/19/2009 10:16:52 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 10/19/2009 2:19:14 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	681	-683	0.8184	1309	-1298	1.5642	0.7458	1.4040
6	525	-522	0.6282	967	-950	1.1502	0.5220	0.6582
8	318	-316	0.3804	390	-374	0.4584	0.0780	0.1362
10	216	-215	0.2586	224	-209	0.2598	0.0012	0.0582
12	126	-127	0.1518	135	-121	0.1536	0.0018	0.0570
14	74	-73	0.0882	85	-70	0.0930	0.0048	0.0552
16	-18	21	-0.0234	-6	24	-0.0180	0.0054	0.0504
18	-103	105	-0.1248	-90	108	-0.1188	0.0060	0.0450
20	-205	204	-0.2454	-192	209	-0.2406	0.0048	0.0390
22	-310	308	-0.3708	-300	315	-0.3690	0.0018	0.0342
24	-414	417	-0.4986	-405	423	-0.4968	0.0018	0.0324
26	-522	527	-0.6294	-511	531	-0.6252	0.0042	0.0306
28	-538	538	-0.6456	-525	542	-0.6402	0.0054	0.0264
30	-523	526	-0.6294	-513	531	-0.6264	0.0030	0.0210
32	-542	545	-0.6522	-535	554	-0.6534	-0.0012	0.0180
34	-519	519	-0.6228	-508	525	-0.6198	0.0030	0.0192
36	-381	382	-0.4578	-368	386	-0.4524	0.0054	0.0162
38	-262	263	-0.3150	-250	266	-0.3096	0.0054	0.0108
40	-164	165	-0.1974	-153	169	-0.1932	0.0042	0.0054
42	-82	82	-0.0984	-73	89	-0.0972	0.0012	0.0012
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 8/18/2009 10:54:05 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 10/19/2009 2:19:31 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	375	-335	0.4260	0.0324	0.0024
6	216	-162	0.2268	199	-145	0.2064	-0.0204	-0.0300
8	143	-78	0.1326	137	-74	0.1266	-0.0060	-0.0096
10	124	-61	0.1110	119	-61	0.1080	-0.0030	-0.0036
12	111	-46	0.0942	109	-47	0.0936	-0.0006	-0.0006
14	34	14	0.0120	32	14	0.0108	-0.0012	0.0000
16	-97	139	-0.1416	-99	140	-0.1434	-0.0018	0.0012
18	-245	293	-0.3228	-246	291	-0.3222	0.0006	0.0030
20	-364	426	-0.4740	-365	423	-0.4728	0.0012	0.0024
22	-420	485	-0.5430	-422	483	-0.5430	0.0000	0.0012
24	-469	533	-0.6012	-471	531	-0.6012	0.0000	0.0012
26	-551	604	-0.6930	-552	602	-0.6924	0.0006	0.0012
28	-543	608	-0.6906	-544	607	-0.6906	0.0000	0.0006
30	-478	513	-0.5946	-477	511	-0.5928	0.0018	0.0006
32	-353	386	-0.4434	-350	381	-0.4386	0.0048	-0.0012
34	-166	198	-0.2184	-161	196	-0.2142	0.0042	-0.0060
36	0	55	0.0000	4	45	-0.0246	0.0000	-0.0102
38	29	27	0.0012	23	26	-0.0018	-0.0030	-0.0102
40	-89	136	-0.1350	-95	137	-0.1392	-0.0042	-0.0072
42	-217	274	-0.2946	-219	277	-0.2976	-0.0030	-0.0030
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 10/6/2009 11:24:33 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 10/19/2009 2:19:31 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	727	-699	0.8556	0.4620	0.7062
6	216	-162	0.2268	416	-380	0.4776	0.2508	0.2442
8	143	-78	0.1326	147	-81	0.1368	0.0042	-0.0066
10	124	-61	0.1110	122	-60	0.1092	-0.0018	-0.0108
12	111	-46	0.0942	113	-43	0.0936	-0.0006	-0.0090
14	34	14	0.0120	28	8	0.0120	0.0000	-0.0084
16	-97	139	-0.1416	-103	145	-0.1488	-0.0072	-0.0084
18	-245	293	-0.3228	-251	291	-0.3252	-0.0024	-0.0012
20	-364	426	-0.4740	-364	430	-0.4764	-0.0024	0.0012
22	-420	485	-0.5430	-421	486	-0.5442	-0.0012	0.0036
24	-469	533	-0.6012	-468	528	-0.5976	0.0036	0.0048
26	-551	604	-0.6930	-550	606	-0.6936	-0.0006	0.0012
28	-543	608	-0.6906	-545	613	-0.6948	-0.0042	0.0018
30	-478	513	-0.5946	-475	513	-0.5928	0.0018	0.0060
32	-353	386	-0.4434	-353	387	-0.4440	-0.0006	0.0042
34	-166	198	-0.2184	-158	195	-0.2118	0.0066	0.0048
36	0	55	0.0000	0	52	0.0000	0.0000	-0.0018
38	29	27	0.0012	23	14	0.0054	0.0042	-0.0018
40	-89	136	-0.1350	-91	135	-0.1356	-0.0006	-0.0060
42	-217	274	-0.2946	-223	277	-0.3000	-0.0054	-0.0054
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

CURRENT SURVEY 10/14/2009 10:26:58 AM

INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 10/19/2009 2:19:31 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	774	-738	0.9072	0.5136	0.8040
6	216	-162	0.2268	458	-422	0.5280	0.3012	0.2904
8	143	-78	0.1326	150	-89	0.1434	0.0108	-0.0108
10	124	-61	0.1110	121	-59	0.1080	-0.0030	-0.0216
12	111	-46	0.0942	111	-47	0.0948	0.0006	-0.0186
14	34	14	0.0120	31	12	0.0114	-0.0006	-0.0192
16	-97	139	-0.1416	-102	141	-0.1458	-0.0042	-0.0186
18	-245	293	-0.3228	-247	291	-0.3228	0.0000	-0.0144
20	-364	426	-0.4740	-367	425	-0.4752	-0.0012	-0.0144
22	-420	485	-0.5430	-423	485	-0.5448	-0.0018	-0.0132
24	-469	533	-0.6012	-467	530	-0.5982	0.0030	-0.0114
26	-551	604	-0.6930	-553	603	-0.6936	-0.0006	-0.0144
28	-543	608	-0.6906	-550	610	-0.6960	-0.0054	-0.0138
30	-478	513	-0.5946	-481	513	-0.5964	-0.0018	-0.0084
32	-353	386	-0.4434	-355	382	-0.4422	0.0012	-0.0066
34	-166	198	-0.2184	-163	195	-0.2148	0.0036	-0.0078
36	0	55	0.0000	5	47	-0.0252	0.0000	-0.0114
38	29	27	0.0012	21	24	-0.0018	-0.0030	-0.0114
40	-89	136	-0.1350	-95	136	-0.1386	-0.0036	-0.0084
42	-217	274	-0.2946	-222	277	-0.2994	-0.0048	-0.0048
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-46

DESCRIPTION

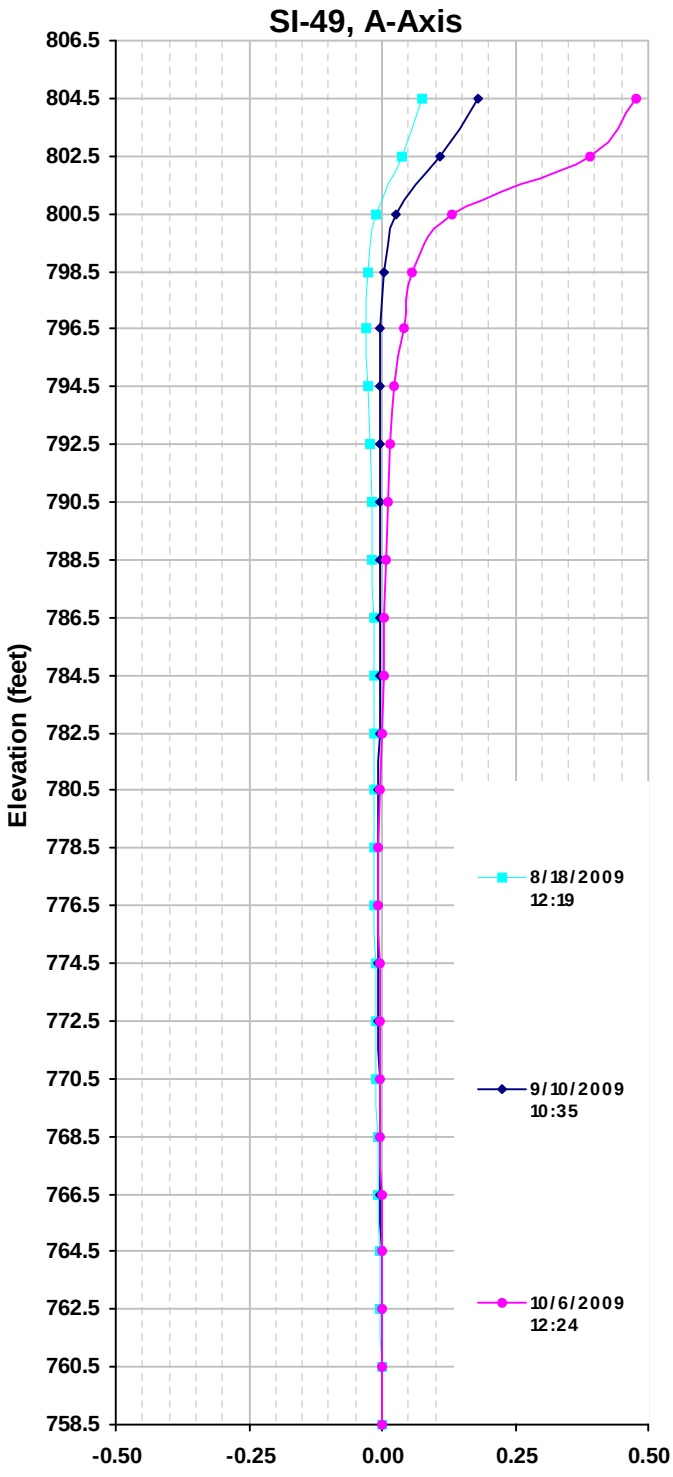
CURRENT SURVEY 10/19/2009 10:16:52 AM

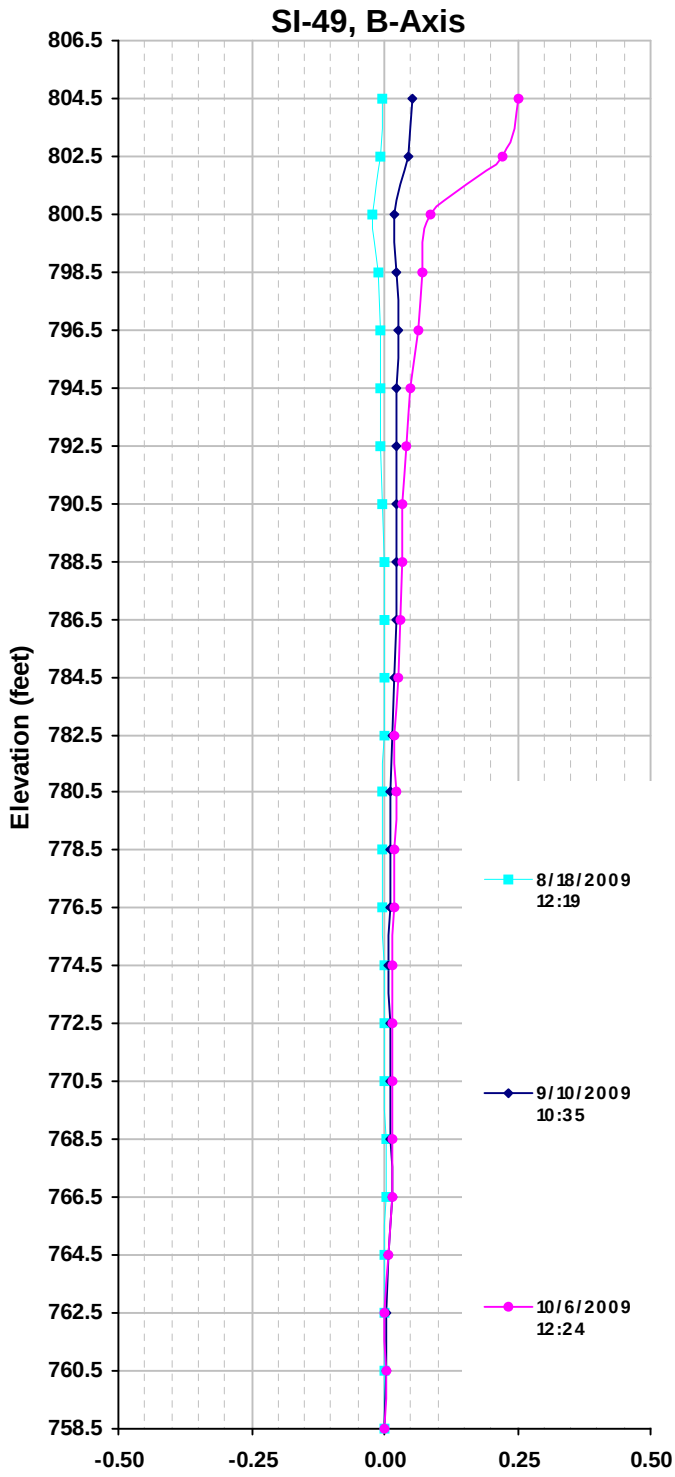
INITIAL SURVEY 8/11/2009 9:55:28 AM

DATE PRINTED 10/19/2009 2:19:31 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	347	-309	0.3936	804	-761	0.9390	0.5454	0.8646
6	216	-162	0.2268	477	-439	0.5496	0.3228	0.3192
8	143	-78	0.1326	154	-90	0.1464	0.0138	-0.0036
10	124	-61	0.1110	123	-57	0.1080	-0.0030	-0.0174
12	111	-46	0.0942	114	-43	0.0942	0.0000	-0.0144
14	34	14	0.0120	35	13	0.0132	0.0012	-0.0144
16	-97	139	-0.1416	-98	144	-0.1452	-0.0036	-0.0156
18	-245	293	-0.3228	-246	293	-0.3234	-0.0006	-0.0120
20	-364	426	-0.4740	-365	427	-0.4752	-0.0012	-0.0114
22	-420	485	-0.5430	-419	487	-0.5436	-0.0006	-0.0102
24	-469	533	-0.6012	-465	531	-0.5976	0.0036	-0.0096
26	-551	604	-0.6930	-550	607	-0.6942	-0.0012	-0.0132
28	-543	608	-0.6906	-547	614	-0.6966	-0.0060	-0.0120
30	-478	513	-0.5946	-478	516	-0.5964	-0.0018	-0.0060
32	-353	386	-0.4434	-352	384	-0.4416	0.0018	-0.0042
34	-166	198	-0.2184	-159	199	-0.2148	0.0036	-0.0060
36	0	55	0.0000	9	50	-0.0246	0.0000	-0.0096
38	29	27	0.0012	27	26	0.0006	-0.0006	-0.0096
40	-89	136	-0.1350	-91	139	-0.1380	-0.0030	-0.0090
42	-217	274	-0.2946	-221	280	-0.3006	-0.0060	-0.0060
44	0	0	0.0000	0	0	0.0000	0.0000	0.0000





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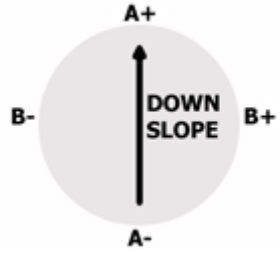


Bull Run Fossil Plant
Bull Run
Clinton, TN
172679015
10/7/2009

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 8/18/2009 12:19:59 PM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 10/7/2009 9:23:51 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	937	-925	1.1172	966	-958	1.1544	0.0372	0.0750
6	574	-569	0.6858	617	-606	0.7338	0.0480	0.0378
8	105	-99	0.1224	121	-111	0.1392	0.0168	-0.0102
10	-33	39	-0.0432	-29	41	-0.0420	0.0012	-0.0270
12	-38	43	-0.0486	-38	49	-0.0522	-0.0036	-0.0282
14	-17	20	-0.0222	-17	23	-0.0240	-0.0018	-0.0246
16	-81	85	-0.0996	-81	89	-0.1020	-0.0024	-0.0228
18	-165	167	-0.1992	-165	171	-0.2016	-0.0024	-0.0204
20	-235	240	-0.2850	-235	244	-0.2874	-0.0024	-0.0180
22	-226	230	-0.2736	-225	233	-0.2748	-0.0012	-0.0156
24	-177	181	-0.2148	-175	183	-0.2148	0.0000	-0.0144
26	-125	131	-0.1536	-124	133	-0.1542	-0.0006	-0.0144
28	-24	27	-0.0306	-22	29	-0.0306	0.0000	-0.0138
30	64	-58	0.0732	66	-55	0.0726	-0.0006	-0.0138
32	105	-97	0.1212	105	-94	0.1194	-0.0018	-0.0132
34	55	-55	0.0660	57	-51	0.0648	-0.0012	-0.0114
36	-13	12	-0.0150	-11	15	-0.0156	-0.0006	-0.0102
38	-75	78	-0.0918	-75	81	-0.0936	-0.0018	-0.0096
40	-110	113	-0.1338	-109	117	-0.1356	-0.0018	-0.0078
42	-100	103	-0.1218	-98	106	-0.1224	-0.0006	-0.0060
44	-62	65	-0.0762	-60	69	-0.0774	-0.0012	-0.0054
46	-149	156	-0.1830	-150	160	-0.1860	-0.0030	-0.0042
48	-280	285	-0.3390	-279	288	-0.3402	-0.0012	-0.0012
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 9/10/2009 10:35:42 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 10/7/2009 9:23:52 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	937	-925	1.1172	999	-984	1.1898	0.0726	0.1806
6	574	-569	0.6858	644	-633	0.7662	0.0804	0.1080
8	105	-99	0.1224	129	-116	0.1470	0.0246	0.0276
10	-33	39	-0.0432	-25	38	-0.0378	0.0054	0.0030
12	-38	43	-0.0486	-33	47	-0.0480	0.0006	-0.0024
14	-17	20	-0.0222	-13	21	-0.0204	0.0018	-0.0030
16	-81	85	-0.0996	-78	88	-0.0996	0.0000	-0.0048
18	-165	167	-0.1992	-161	171	-0.1992	0.0000	-0.0048
20	-235	240	-0.2850	-233	244	-0.2862	-0.0012	-0.0048
22	-226	230	-0.2736	-222	234	-0.2736	0.0000	-0.0036
24	-177	181	-0.2148	-171	184	-0.2130	0.0018	-0.0036
26	-125	131	-0.1536	-121	133	-0.1524	0.0012	-0.0054
28	-24	27	-0.0306	-19	30	-0.0294	0.0012	-0.0066
30	64	-58	0.0732	69	-54	0.0738	0.0006	-0.0078
32	105	-97	0.1212	106	-93	0.1194	-0.0018	-0.0084
34	55	-55	0.0660	59	-50	0.0654	-0.0006	-0.0066
36	-13	12	-0.0150	-10	17	-0.0162	-0.0012	-0.0060
38	-75	78	-0.0918	-73	82	-0.0930	-0.0012	-0.0048
40	-110	113	-0.1338	-107	118	-0.1350	-0.0012	-0.0036
42	-100	103	-0.1218	-96	108	-0.1224	-0.0006	-0.0024
44	-62	65	-0.0762	-58	70	-0.0768	-0.0006	-0.0018
46	-149	156	-0.1830	-147	160	-0.1842	-0.0012	-0.0012
48	-280	285	-0.3390	-276	289	-0.3390	0.0000	0.0000
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 10/6/2009 12:24:01 PM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 10/7/2009 9:23:52 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	937	-925	1.1172	1007	-1001	1.2048	0.0876	0.4788
6	574	-569	0.6858	788	-785	0.9438	0.2580	0.3912
8	105	-99	0.1224	166	-163	0.1974	0.0750	0.1332
10	-33	39	-0.0432	-19	24	-0.0258	0.0174	0.0582
12	-38	43	-0.0486	-21	27	-0.0288	0.0198	0.0408
14	-17	20	-0.0222	-11	15	-0.0156	0.0066	0.0210
16	-81	85	-0.0996	-78	82	-0.0960	0.0036	0.0144
18	-165	167	-0.1992	-163	164	-0.1962	0.0030	0.0108
20	-235	240	-0.2850	-233	238	-0.2826	0.0024	0.0078
22	-226	230	-0.2736	-224	228	-0.2712	0.0024	0.0054
24	-177	181	-0.2148	-173	179	-0.2112	0.0036	0.0030
26	-125	131	-0.1536	-123	128	-0.1506	0.0030	-0.0006
28	-24	27	-0.0306	-21	26	-0.0282	0.0024	-0.0036
30	64	-58	0.0732	66	-58	0.0744	0.0012	-0.0060
32	105	-97	0.1212	102	-95	0.1182	-0.0030	-0.0072
34	55	-55	0.0660	55	-54	0.0654	-0.0006	-0.0042
36	-13	12	-0.0150	-12	14	-0.0156	-0.0006	-0.0036
38	-75	78	-0.0918	-75	79	-0.0924	-0.0006	-0.0030
40	-110	113	-0.1338	-110	115	-0.1350	-0.0012	-0.0024
42	-100	103	-0.1218	-99	104	-0.1218	0.0000	-0.0012
44	-62	65	-0.0762	-62	66	-0.0768	-0.0006	-0.0012
46	-149	156	-0.1830	-149	156	-0.1830	0.0000	-0.0006
48	-280	285	-0.3390	-280	286	-0.3396	-0.0006	-0.0006
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 8/18/2009 12:19:59 PM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 10/7/2009 9:24:01 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	481	-430	0.5466	486	-436	0.5532	0.0066	-0.0024
6	406	-371	0.4662	415	-382	0.4782	0.0120	-0.0090
8	265	-201	0.2796	256	-195	0.2706	-0.0090	-0.0210
10	239	-178	0.2502	233	-177	0.2460	-0.0042	-0.0120
12	318	-282	0.3600	318	-282	0.3600	0.0000	-0.0078
14	336	-279	0.3690	333	-279	0.3672	-0.0018	-0.0078
16	242	-185	0.2562	236	-185	0.2526	-0.0036	-0.0060
18	145	-82	0.1362	141	-82	0.1338	-0.0024	-0.0024
20	102	-39	0.0846	102	-39	0.0846	0.0000	0.0000
22	139	-93	0.1392	138	-94	0.1392	0.0000	0.0000
24	206	-153	0.2154	205	-154	0.2154	0.0000	0.0000
26	327	-270	0.3582	329	-273	0.3612	0.0030	0.0000
28	435	-375	0.4860	433	-378	0.4866	0.0006	-0.0030
30	507	-450	0.5742	504	-452	0.5736	-0.0006	-0.0036
32	565	-518	0.6498	563	-518	0.6486	-0.0012	-0.0030
34	529	-476	0.6030	526	-477	0.6018	-0.0012	-0.0018
36	448	-395	0.5058	445	-395	0.5040	-0.0018	-0.0006
38	330	-277	0.3642	327	-278	0.3630	-0.0012	0.0012
40	230	-173	0.2418	229	-173	0.2412	-0.0006	0.0024
42	315	-277	0.3552	315	-279	0.3564	0.0012	0.0030
44	482	-430	0.5472	481	-432	0.5478	0.0006	0.0018
46	610	-550	0.6960	610	-551	0.6966	0.0006	0.0012
48	711	-652	0.8178	712	-652	0.8184	0.0006	0.0006
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 9/10/2009 10:35:42 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 10/7/2009 9:24:01 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	481	-430	0.5466	490	-435	0.5550	0.0084	0.0534
6	406	-371	0.4662	431	-391	0.4932	0.0270	0.0450
8	265	-201	0.2796	261	-196	0.2742	-0.0054	0.0180
10	239	-178	0.2502	237	-178	0.2490	-0.0012	0.0234
12	318	-282	0.3600	324	-280	0.3624	0.0024	0.0246
14	336	-279	0.3690	338	-279	0.3702	0.0012	0.0222
16	242	-185	0.2562	240	-185	0.2550	-0.0012	0.0210
18	145	-82	0.1362	145	-81	0.1356	-0.0006	0.0222
20	102	-39	0.0846	103	-39	0.0852	0.0006	0.0228
22	139	-93	0.1392	143	-93	0.1416	0.0024	0.0222
24	206	-153	0.2154	210	-155	0.2190	0.0036	0.0198
26	327	-270	0.3582	332	-273	0.3630	0.0048	0.0162
28	435	-375	0.4860	437	-375	0.4872	0.0012	0.0114
30	507	-450	0.5742	509	-449	0.5748	0.0006	0.0102
32	565	-518	0.6498	567	-518	0.6510	0.0012	0.0096
34	529	-476	0.6030	529	-474	0.6018	-0.0012	0.0084
36	448	-395	0.5058	447	-394	0.5046	-0.0012	0.0096
38	330	-277	0.3642	329	-276	0.3630	-0.0012	0.0108
40	230	-173	0.2418	230	-171	0.2406	-0.0012	0.0120
42	315	-277	0.3552	319	-280	0.3594	0.0042	0.0132
44	482	-430	0.5472	486	-432	0.5508	0.0036	0.0090
46	610	-550	0.6960	613	-551	0.6984	0.0024	0.0054
48	711	-652	0.8178	715	-653	0.8208	0.0030	0.0030
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

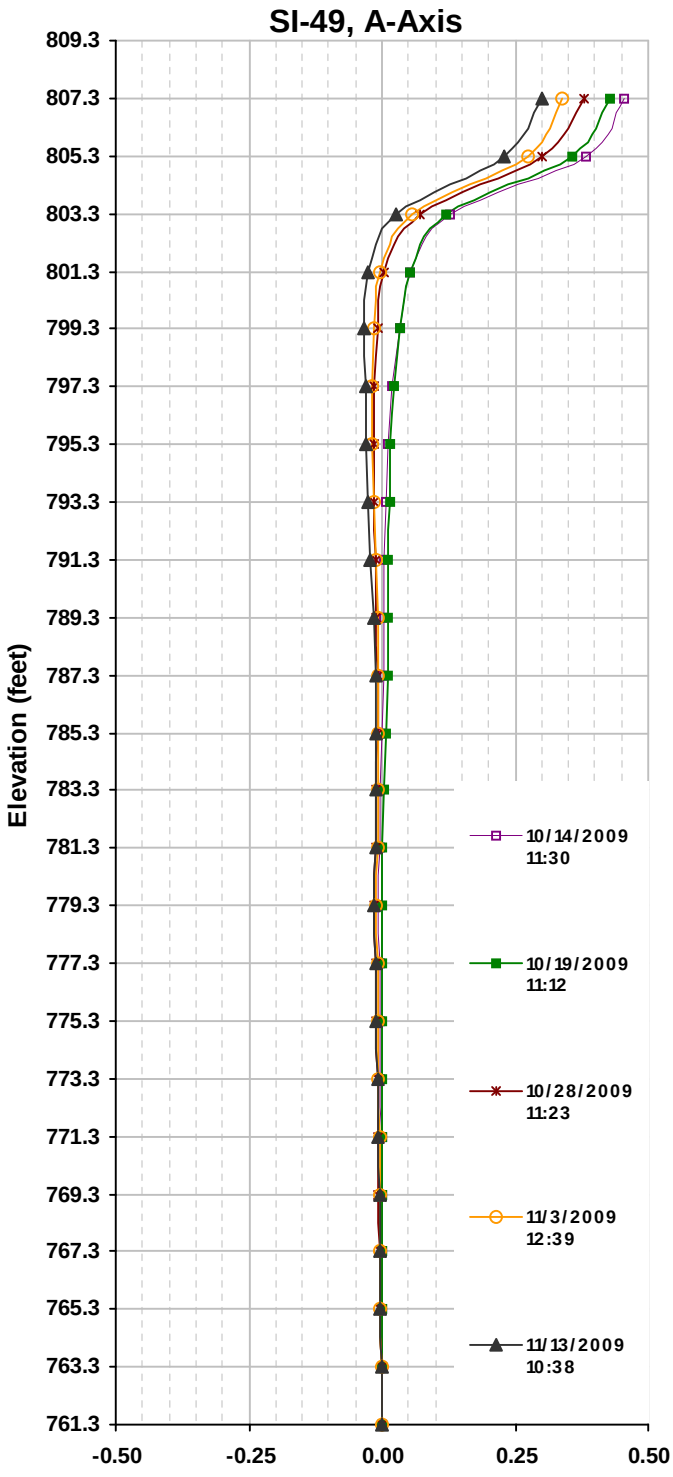
CURRENT SURVEY 10/6/2009 12:24:01 PM

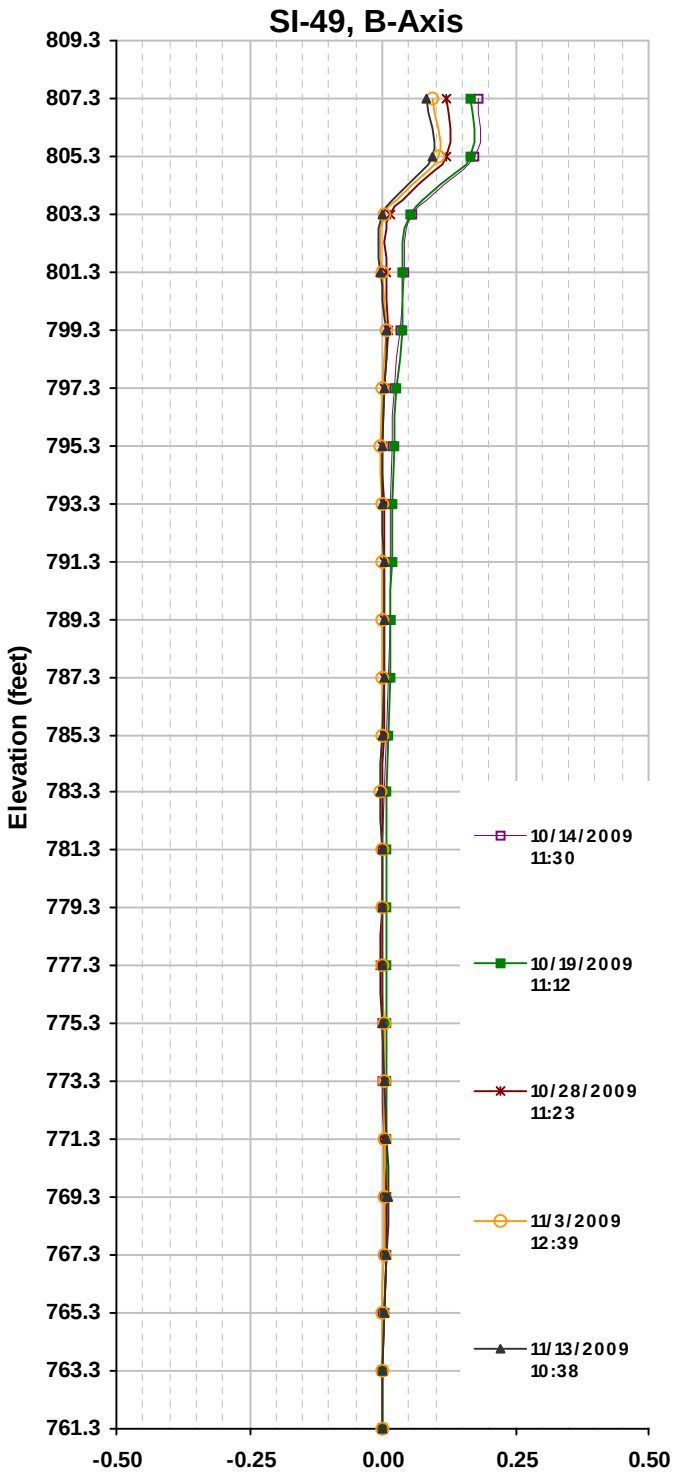
INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 10/7/2009 9:24:01 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	481	-430	0.5466	504	-457	0.5766	0.0300	0.2508
6	406	-371	0.4662	511	-488	0.5994	0.1332	0.2208
8	265	-201	0.2796	277	-219	0.2976	0.0180	0.0876
10	239	-178	0.2502	240	-186	0.2556	0.0054	0.0696
12	318	-282	0.3600	332	-292	0.3744	0.0144	0.0642
14	336	-279	0.3690	337	-291	0.3768	0.0078	0.0498
16	242	-185	0.2562	243	-195	0.2628	0.0066	0.0420
18	145	-82	0.1362	145	-87	0.1392	0.0030	0.0354
20	102	-39	0.0846	104	-41	0.0870	0.0024	0.0324
22	139	-93	0.1392	141	-96	0.1422	0.0030	0.0300
24	206	-153	0.2154	213	-157	0.2220	0.0066	0.0270
26	327	-270	0.3582	321	-274	0.3570	-0.0012	0.0204
28	435	-375	0.4860	435	-381	0.4896	0.0036	0.0216
30	507	-450	0.5742	505	-452	0.5742	0.0000	0.0180
32	565	-518	0.6498	566	-519	0.6510	0.0012	0.0180
34	529	-476	0.6030	529	-478	0.6042	0.0012	0.0168
36	448	-395	0.5058	449	-398	0.5082	0.0024	0.0156
38	330	-277	0.3642	330	-277	0.3642	0.0000	0.0132
40	230	-173	0.2418	229	-172	0.2406	-0.0012	0.0132
42	315	-277	0.3552	325	-279	0.3624	0.0072	0.0144
44	482	-430	0.5472	487	-434	0.5526	0.0054	0.0072
46	610	-550	0.6960	602	-556	0.6948	-0.0012	0.0018
48	711	-652	0.8178	714	-654	0.8208	0.0030	0.0030
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000





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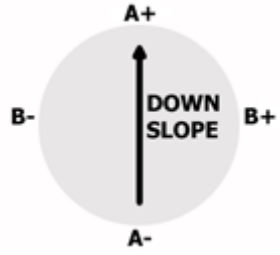


Bull Run Fossil Plant
Bull Run
Clinton, TN
172679015
11/16/2009

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 10/14/2009 11:30:58 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 11/16/2009 8:47:03 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	937	-925	1.1172	1003	-979	1.1892	0.0720	0.4560
6	574	-569	0.6858	790	-777	0.9402	0.2544	0.3840
8	105	-99	0.1224	174	-156	0.1980	0.0756	0.1296
10	-33	39	-0.0432	-11	30	-0.0246	0.0186	0.0540
12	-38	43	-0.0486	-18	34	-0.0312	0.0174	0.0354
14	-17	20	-0.0222	-6	21	-0.0162	0.0060	0.0180
16	-81	85	-0.0996	-73	88	-0.0966	0.0030	0.0120
18	-165	167	-0.1992	-156	170	-0.1956	0.0036	0.0090
20	-235	240	-0.2850	-229	245	-0.2844	0.0006	0.0054
22	-226	230	-0.2736	-218	234	-0.2712	0.0024	0.0048
24	-177	181	-0.2148	-168	185	-0.2118	0.0030	0.0024
26	-125	131	-0.1536	-118	135	-0.1518	0.0018	-0.0006
28	-24	27	-0.0306	-15	31	-0.0276	0.0030	-0.0024
30	64	-58	0.0732	71	-52	0.0738	0.0006	-0.0054
32	105	-97	0.1212	108	-90	0.1188	-0.0024	-0.0060
34	55	-55	0.0660	61	-48	0.0654	-0.0006	-0.0036
36	-13	12	-0.0150	-7	19	-0.0156	-0.0006	-0.0030
38	-75	78	-0.0918	-70	85	-0.0930	-0.0012	-0.0024
40	-110	113	-0.1338	-105	119	-0.1344	-0.0006	-0.0012
42	-100	103	-0.1218	-94	110	-0.1224	-0.0006	-0.0006
44	-62	65	-0.0762	-55	72	-0.0762	0.0000	0.0000
46	-149	156	-0.1830	-142	163	-0.1830	0.0000	0.0000
48	-280	285	-0.3390	-274	291	-0.3390	0.0000	0.0000
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 10/19/2009 11:12:40 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 11/16/2009 8:47:03 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	937	-925	1.1172	1001	-979	1.1880	0.0708	0.4284
6	574	-569	0.6858	771	-766	0.9222	0.2364	0.3576
8	105	-99	0.1224	167	-154	0.1926	0.0702	0.1212
10	-33	39	-0.0432	-15	30	-0.0270	0.0162	0.0510
12	-38	43	-0.0486	-21	37	-0.0348	0.0138	0.0348
14	-17	20	-0.0222	-9	19	-0.0168	0.0054	0.0210
16	-81	85	-0.0996	-76	87	-0.0978	0.0018	0.0156
18	-165	167	-0.1992	-159	171	-0.1980	0.0012	0.0138
20	-235	240	-0.2850	-230	245	-0.2850	0.0000	0.0126
22	-226	230	-0.2736	-219	233	-0.2712	0.0024	0.0126
24	-177	181	-0.2148	-169	183	-0.2112	0.0036	0.0102
26	-125	131	-0.1536	-118	134	-0.1512	0.0024	0.0066
28	-24	27	-0.0306	-16	30	-0.0276	0.0030	0.0042
30	64	-58	0.0732	71	-54	0.0750	0.0018	0.0012
32	105	-97	0.1212	108	-92	0.1200	-0.0012	-0.0006
34	55	-55	0.0660	60	-50	0.0660	0.0000	0.0006
36	-13	12	-0.0150	-8	18	-0.0156	-0.0006	0.0006
38	-75	78	-0.0918	-71	82	-0.0918	0.0000	0.0012
40	-110	113	-0.1338	-105	118	-0.1338	0.0000	0.0012
42	-100	103	-0.1218	-95	109	-0.1224	-0.0006	0.0012
44	-62	65	-0.0762	-56	70	-0.0756	0.0006	0.0018
46	-149	156	-0.1830	-144	160	-0.1824	0.0006	0.0012
48	-280	285	-0.3390	-274	290	-0.3384	0.0006	0.0006
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 10/28/2009 11:23:49 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 11/16/2009 8:47:03 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	937	-925	1.1172	1002	-989	1.1946	0.0774	0.3780
6	574	-569	0.6858	766	-759	0.9150	0.2292	0.3006
8	105	-99	0.1224	162	-152	0.1884	0.0660	0.0714
10	-33	39	-0.0432	-18	32	-0.0300	0.0132	0.0054
12	-38	43	-0.0486	-29	41	-0.0420	0.0066	-0.0078
14	-17	20	-0.0222	-13	21	-0.0204	0.0018	-0.0144
16	-81	85	-0.0996	-79	89	-0.1008	-0.0012	-0.0162
18	-165	167	-0.1992	-164	172	-0.2016	-0.0024	-0.0150
20	-235	240	-0.2850	-234	246	-0.2880	-0.0030	-0.0126
22	-226	230	-0.2736	-223	234	-0.2742	-0.0006	-0.0096
24	-177	181	-0.2148	-173	185	-0.2148	0.0000	-0.0090
26	-125	131	-0.1536	-121	134	-0.1530	0.0006	-0.0090
28	-24	27	-0.0306	-18	28	-0.0276	0.0030	-0.0096
30	64	-58	0.0732	69	-55	0.0744	0.0012	-0.0126
32	105	-97	0.1212	105	-93	0.1188	-0.0024	-0.0138
34	55	-55	0.0660	58	-51	0.0654	-0.0006	-0.0114
36	-13	12	-0.0150	-11	17	-0.0168	-0.0018	-0.0108
38	-75	78	-0.0918	-74	82	-0.0936	-0.0018	-0.0090
40	-110	113	-0.1338	-108	117	-0.1350	-0.0012	-0.0072
42	-100	103	-0.1218	-98	108	-0.1236	-0.0018	-0.0060
44	-62	65	-0.0762	-58	69	-0.0762	0.0000	-0.0042
46	-149	156	-0.1830	-149	162	-0.1866	-0.0036	-0.0042
48	-280	285	-0.3390	-277	289	-0.3396	-0.0006	-0.0006
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 11/3/2009 12:39:55 PM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 11/16/2009 8:47:03 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	937	-925	1.1172	993	-977	1.1820	0.0648	0.3396
6	574	-569	0.6858	753	-753	0.9036	0.2178	0.2748
8	105	-99	0.1224	157	-147	0.1824	0.0600	0.0570
10	-33	39	-0.0432	-21	31	-0.0312	0.0120	-0.0030
12	-38	43	-0.0486	-33	42	-0.0450	0.0036	-0.0150
14	-17	20	-0.0222	-15	21	-0.0216	0.0006	-0.0186
16	-81	85	-0.0996	-82	89	-0.1026	-0.0030	-0.0192
18	-165	167	-0.1992	-166	172	-0.2028	-0.0036	-0.0162
20	-235	240	-0.2850	-236	245	-0.2886	-0.0036	-0.0126
22	-226	230	-0.2736	-225	235	-0.2760	-0.0024	-0.0090
24	-177	181	-0.2148	-175	184	-0.2154	-0.0006	-0.0066
26	-125	131	-0.1536	-123	133	-0.1536	0.0000	-0.0060
28	-24	27	-0.0306	-20	27	-0.0282	0.0024	-0.0060
30	64	-58	0.0732	68	-56	0.0744	0.0012	-0.0084
32	105	-97	0.1212	105	-94	0.1194	-0.0018	-0.0096
34	55	-55	0.0660	57	-52	0.0654	-0.0006	-0.0078
36	-13	12	-0.0150	-11	15	-0.0156	-0.0006	-0.0072
38	-75	78	-0.0918	-74	81	-0.0930	-0.0012	-0.0066
40	-110	113	-0.1338	-109	116	-0.1350	-0.0012	-0.0054
42	-100	103	-0.1218	-98	107	-0.1230	-0.0012	-0.0042
44	-62	65	-0.0762	-59	68	-0.0762	0.0000	-0.0030
46	-149	156	-0.1830	-149	160	-0.1854	-0.0024	-0.0030
48	-280	285	-0.3390	-278	288	-0.3396	-0.0006	-0.0006
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 11/13/2009 10:38:06 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 11/16/2009 8:47:03 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	937	-925	1.1172	999	-978	1.1862	0.0690	0.2994
6	574	-569	0.6858	743	-741	0.8904	0.2046	0.2304
8	105	-99	0.1224	152	-141	0.1758	0.0534	0.0258
10	-33	39	-0.0432	-23	36	-0.0354	0.0078	-0.0276
12	-38	43	-0.0486	-37	50	-0.0522	-0.0036	-0.0354
14	-17	20	-0.0222	-15	24	-0.0234	-0.0012	-0.0318
16	-81	85	-0.0996	-81	91	-0.1032	-0.0036	-0.0306
18	-165	167	-0.1992	-166	176	-0.2052	-0.0060	-0.0270
20	-235	240	-0.2850	-237	249	-0.2916	-0.0066	-0.0210
22	-226	230	-0.2736	-225	236	-0.2766	-0.0030	-0.0144
24	-177	181	-0.2148	-174	186	-0.2160	-0.0012	-0.0114
26	-125	131	-0.1536	-122	134	-0.1536	0.0000	-0.0102
28	-24	27	-0.0306	-18	29	-0.0282	0.0024	-0.0102
30	64	-58	0.0732	69	-55	0.0744	0.0012	-0.0126
32	105	-97	0.1212	107	-93	0.1200	-0.0012	-0.0138
34	55	-55	0.0660	58	-50	0.0648	-0.0012	-0.0126
36	-13	12	-0.0150	-11	19	-0.0180	-0.0030	-0.0114
38	-75	78	-0.0918	-74	82	-0.0936	-0.0018	-0.0084
40	-110	113	-0.1338	-107	118	-0.1350	-0.0012	-0.0066
42	-100	103	-0.1218	-97	109	-0.1236	-0.0018	-0.0054
44	-62	65	-0.0762	-58	69	-0.0762	0.0000	-0.0036
46	-149	156	-0.1830	-149	161	-0.1860	-0.0030	-0.0036
48	-280	285	-0.3390	-277	289	-0.3396	-0.0006	-0.0006
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 10/14/2009 11:30:58 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 11/16/2009 8:47:13 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	481	-430	0.5466	485	-439	0.5544	0.0078	0.1812
6	406	-371	0.4662	507	-467	0.5844	0.1182	0.1734
8	265	-201	0.2796	274	-218	0.2952	0.0156	0.0552
10	239	-178	0.2502	238	-186	0.2544	0.0042	0.0396
12	318	-282	0.3600	329	-291	0.3720	0.0120	0.0354
14	336	-279	0.3690	338	-286	0.3744	0.0054	0.0234
16	242	-185	0.2562	241	-189	0.2580	0.0018	0.0180
18	145	-82	0.1362	143	-85	0.1368	0.0006	0.0162
20	102	-39	0.0846	102	-42	0.0864	0.0018	0.0156
22	139	-93	0.1392	141	-95	0.1416	0.0024	0.0138
24	206	-153	0.2154	209	-155	0.2184	0.0030	0.0114
26	327	-270	0.3582	329	-277	0.3636	0.0054	0.0084
28	435	-375	0.4860	434	-378	0.4872	0.0012	0.0030
30	507	-450	0.5742	504	-453	0.5742	0.0000	0.0018
32	565	-518	0.6498	565	-521	0.6516	0.0018	0.0018
34	529	-476	0.6030	527	-475	0.6012	-0.0018	0.0000
36	448	-395	0.5058	446	-397	0.5058	0.0000	0.0018
38	330	-277	0.3642	326	-278	0.3624	-0.0018	0.0018
40	230	-173	0.2418	227	-173	0.2400	-0.0018	0.0036
42	315	-277	0.3552	315	-279	0.3564	0.0012	0.0054
44	482	-430	0.5472	483	-433	0.5496	0.0024	0.0042
46	610	-550	0.6960	608	-552	0.6960	0.0000	0.0018
48	711	-652	0.8178	711	-655	0.8196	0.0018	0.0018
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 10/19/2009 11:12:40 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 11/16/2009 8:47:13 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	481	-430	0.5466	485	-427	0.5472	0.0006	0.1644
6	406	-371	0.4662	502	-463	0.5790	0.1128	0.1638
8	265	-201	0.2796	273	-217	0.2940	0.0144	0.0510
10	239	-178	0.2502	237	-179	0.2496	-0.0006	0.0366
12	318	-282	0.3600	331	-287	0.3708	0.0108	0.0372
14	336	-279	0.3690	341	-283	0.3744	0.0054	0.0264
16	242	-185	0.2562	243	-186	0.2574	0.0012	0.0210
18	145	-82	0.1362	145	-83	0.1368	0.0006	0.0198
20	102	-39	0.0846	105	-40	0.0870	0.0024	0.0192
22	139	-93	0.1392	143	-94	0.1422	0.0030	0.0168
24	206	-153	0.2154	211	-153	0.2184	0.0030	0.0138
26	327	-270	0.3582	331	-271	0.3612	0.0030	0.0108
28	435	-375	0.4860	437	-374	0.4866	0.0006	0.0078
30	507	-450	0.5742	507	-449	0.5736	-0.0006	0.0072
32	565	-518	0.6498	568	-518	0.6516	0.0018	0.0078
34	529	-476	0.6030	529	-474	0.6018	-0.0012	0.0060
36	448	-395	0.5058	449	-395	0.5064	0.0006	0.0072
38	330	-277	0.3642	330	-277	0.3642	0.0000	0.0066
40	230	-173	0.2418	230	-171	0.2406	-0.0012	0.0066
42	315	-277	0.3552	319	-276	0.3570	0.0018	0.0078
44	482	-430	0.5472	487	-431	0.5508	0.0036	0.0060
46	610	-550	0.6960	612	-549	0.6966	0.0006	0.0024
48	711	-652	0.8178	715	-651	0.8196	0.0018	0.0018
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 10/28/2009 11:23:49 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 11/16/2009 8:47:13 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	481	-430	0.5466	482	-425	0.5442	-0.0024	0.1194
6	406	-371	0.4662	499	-454	0.5718	0.1056	0.1218
8	265	-201	0.2796	270	-211	0.2886	0.0090	0.0162
10	239	-178	0.2502	234	-178	0.2472	-0.0030	0.0072
12	318	-282	0.3600	329	-283	0.3672	0.0072	0.0102
14	336	-279	0.3690	339	-281	0.3720	0.0030	0.0030
16	242	-185	0.2562	240	-183	0.2538	-0.0024	0.0000
18	145	-82	0.1362	144	-79	0.1338	-0.0024	0.0024
20	102	-39	0.0846	102	-38	0.0840	-0.0006	0.0048
22	139	-93	0.1392	142	-90	0.1392	0.0000	0.0054
24	206	-153	0.2154	211	-151	0.2172	0.0018	0.0054
26	327	-270	0.3582	333	-272	0.3630	0.0048	0.0036
28	435	-375	0.4860	437	-374	0.4866	0.0006	-0.0012
30	507	-450	0.5742	507	-450	0.5742	0.0000	-0.0018
32	565	-518	0.6498	568	-517	0.6510	0.0012	-0.0018
34	529	-476	0.6030	528	-471	0.5994	-0.0036	-0.0030
36	448	-395	0.5058	448	-392	0.5040	-0.0018	0.0006
38	330	-277	0.3642	328	-274	0.3612	-0.0030	0.0024
40	230	-173	0.2418	230	-169	0.2394	-0.0024	0.0054
42	315	-277	0.3552	320	-275	0.3570	0.0018	0.0078
44	482	-430	0.5472	487	-430	0.5502	0.0030	0.0060
46	610	-550	0.6960	613	-549	0.6972	0.0012	0.0030
48	711	-652	0.8178	715	-651	0.8196	0.0018	0.0018
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 11/3/2009 12:39:55 PM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 11/16/2009 8:47:13 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	481	-430	0.5466	471	-417	0.5328	-0.0138	0.0924
6	406	-371	0.4662	494	-451	0.5670	0.1008	0.1062
8	265	-201	0.2796	268	-208	0.2856	0.0060	0.0054
10	239	-178	0.2502	232	-174	0.2436	-0.0066	-0.0006
12	318	-282	0.3600	327	-281	0.3648	0.0048	0.0060
14	336	-279	0.3690	339	-283	0.3732	0.0042	0.0012
16	242	-185	0.2562	242	-183	0.2550	-0.0012	-0.0030
18	145	-82	0.1362	144	-78	0.1332	-0.0030	-0.0018
20	102	-39	0.0846	104	-38	0.0852	0.0006	0.0012
22	139	-93	0.1392	141	-90	0.1386	-0.0006	0.0006
24	206	-153	0.2154	209	-150	0.2154	0.0000	0.0012
26	327	-270	0.3582	331	-273	0.3624	0.0042	0.0012
28	435	-375	0.4860	435	-373	0.4848	-0.0012	-0.0030
30	507	-450	0.5742	505	-449	0.5724	-0.0018	-0.0018
32	565	-518	0.6498	567	-516	0.6498	0.0000	0.0000
34	529	-476	0.6030	528	-473	0.6006	-0.0024	0.0000
36	448	-395	0.5058	449	-394	0.5058	0.0000	0.0024
38	330	-277	0.3642	329	-276	0.3630	-0.0012	0.0024
40	230	-173	0.2418	231	-171	0.2412	-0.0006	0.0036
42	315	-277	0.3552	317	-274	0.3546	-0.0006	0.0042
44	482	-430	0.5472	486	-431	0.5502	0.0030	0.0048
46	610	-550	0.6960	613	-549	0.6972	0.0012	0.0018
48	711	-652	0.8178	714	-650	0.8184	0.0006	0.0006
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

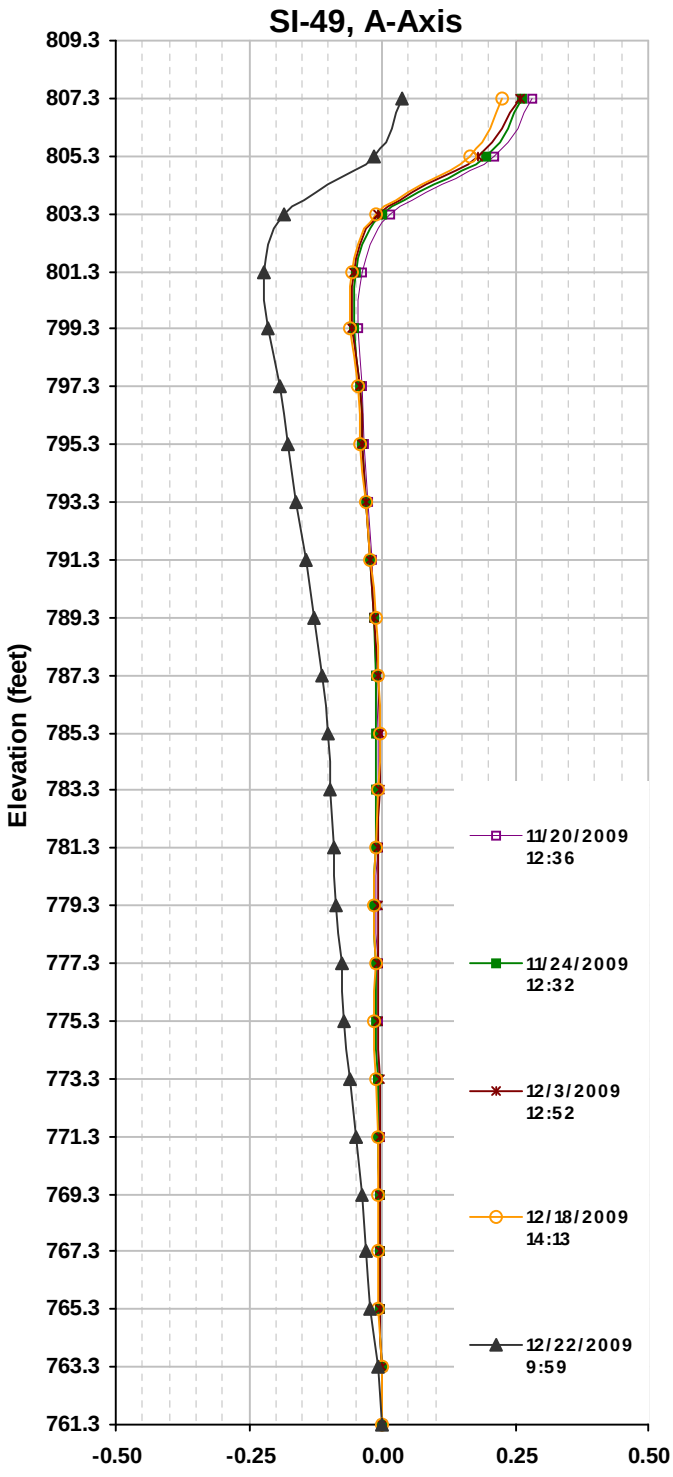
CURRENT SURVEY 11/13/2009 10:38:06 AM

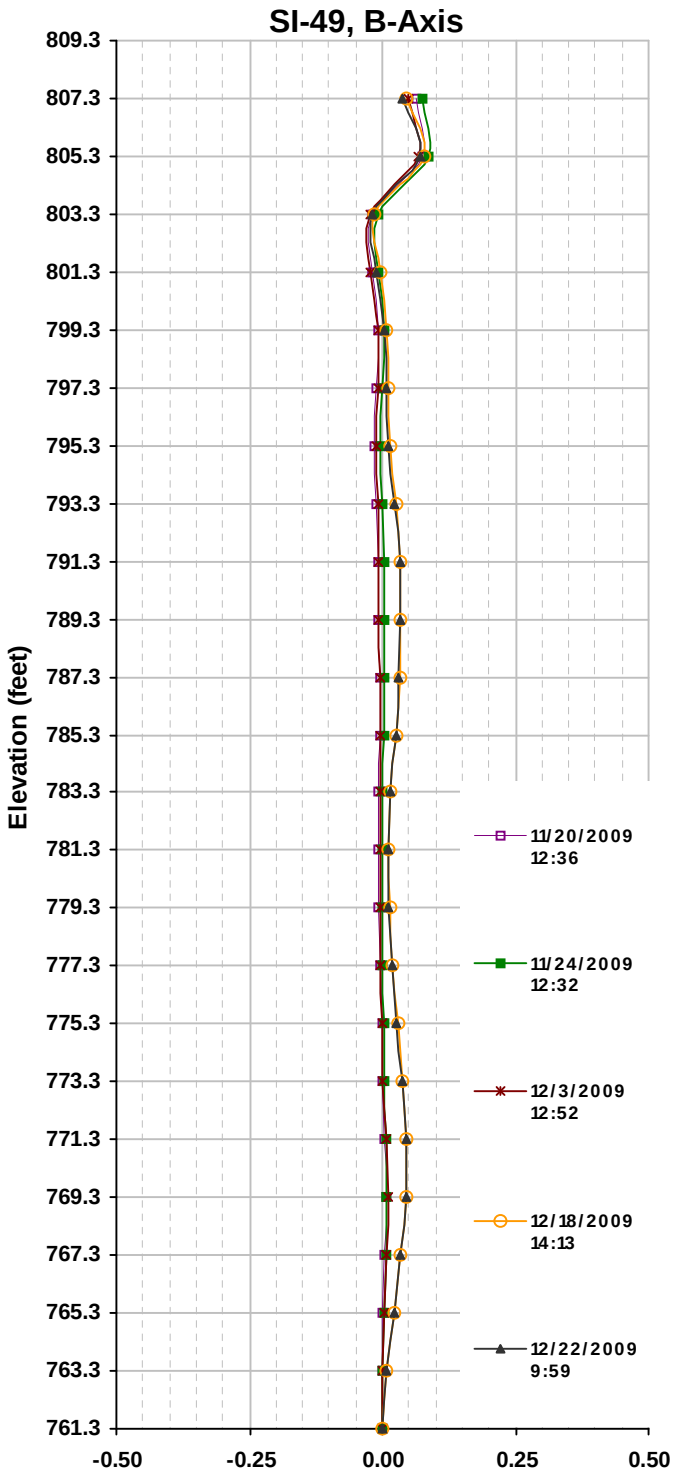
INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 11/16/2009 8:47:13 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	481	-430	0.5466	474	-417	0.5346	-0.0120	0.0810
6	406	-371	0.4662	487	-448	0.5610	0.0948	0.0930
8	265	-201	0.2796	265	-204	0.2814	0.0018	-0.0018
10	239	-178	0.2502	227	-170	0.2382	-0.0120	-0.0036
12	318	-282	0.3600	327	-282	0.3654	0.0054	0.0084
14	336	-279	0.3690	341	-281	0.3732	0.0042	0.0030
16	242	-185	0.2562	242	-182	0.2544	-0.0018	-0.0012
18	145	-82	0.1362	144	-79	0.1338	-0.0024	0.0006
20	102	-39	0.0846	105	-37	0.0852	0.0006	0.0030
22	139	-93	0.1392	142	-90	0.1392	0.0000	0.0024
24	206	-153	0.2154	210	-151	0.2166	0.0012	0.0024
26	327	-270	0.3582	332	-271	0.3618	0.0036	0.0012
28	435	-375	0.4860	436	-372	0.4848	-0.0012	-0.0024
30	507	-450	0.5742	507	-449	0.5736	-0.0006	-0.0012
32	565	-518	0.6498	568	-517	0.6510	0.0012	-0.0006
34	529	-476	0.6030	529	-471	0.6000	-0.0030	-0.0018
36	448	-395	0.5058	448	-391	0.5034	-0.0024	0.0012
38	330	-277	0.3642	328	-273	0.3606	-0.0036	0.0036
40	230	-173	0.2418	229	-169	0.2388	-0.0030	0.0072
42	315	-277	0.3552	322	-276	0.3588	0.0036	0.0102
44	482	-430	0.5472	488	-430	0.5508	0.0036	0.0066
46	610	-550	0.6960	614	-549	0.6978	0.0018	0.0030
48	711	-652	0.8178	715	-650	0.8190	0.0012	0.0012
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000





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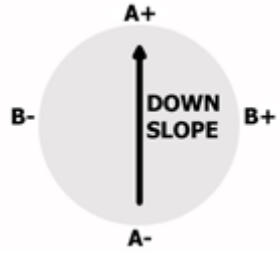


Bull Run Fossil Plant
Bull Run
Clinton, TN
172679015
12/22/2009

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 11/20/2009 12:36:32 PM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 12/22/2009 4:41:08 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	937	-925	1.1172	998	-982	1.1880	0.0708	0.2808
6	574	-569	0.6858	734	-736	0.8820	0.1962	0.2100
8	105	-99	0.1224	149	-141	0.1740	0.0516	0.0138
10	-33	39	-0.0432	-26	35	-0.0366	0.0066	-0.0378
12	-38	43	-0.0486	-43	51	-0.0564	-0.0078	-0.0444
14	-17	20	-0.0222	-18	25	-0.0258	-0.0036	-0.0366
16	-81	85	-0.0996	-86	90	-0.1056	-0.0060	-0.0330
18	-165	167	-0.1992	-169	176	-0.2070	-0.0078	-0.0270
20	-235	240	-0.2850	-238	247	-0.2910	-0.0060	-0.0192
22	-226	230	-0.2736	-227	235	-0.2772	-0.0036	-0.0132
24	-177	181	-0.2148	-176	185	-0.2166	-0.0018	-0.0096
26	-125	131	-0.1536	-125	134	-0.1554	-0.0018	-0.0078
28	-24	27	-0.0306	-19	27	-0.0276	0.0030	-0.0060
30	64	-58	0.0732	68	-57	0.0750	0.0018	-0.0090
32	105	-97	0.1212	104	-94	0.1188	-0.0024	-0.0108
34	55	-55	0.0660	57	-52	0.0654	-0.0006	-0.0084
36	-13	12	-0.0150	-12	16	-0.0168	-0.0018	-0.0078
38	-75	78	-0.0918	-75	80	-0.0930	-0.0012	-0.0060
40	-110	113	-0.1338	-109	116	-0.1350	-0.0012	-0.0048
42	-100	103	-0.1218	-98	106	-0.1224	-0.0006	-0.0036
44	-62	65	-0.0762	-59	68	-0.0762	0.0000	-0.0030
46	-149	156	-0.1830	-151	159	-0.1860	-0.0030	-0.0030
48	-280	285	-0.3390	-278	287	-0.3390	0.0000	0.0000
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 11/24/2009 12:32:14 PM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 12/22/2009 4:41:08 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	937	-925	1.1172	1000	-978	1.1868	0.0696	0.2646
6	574	-569	0.6858	738	-729	0.8802	0.1944	0.1950
8	105	-99	0.1224	149	-135	0.1704	0.0480	0.0006
10	-33	39	-0.0432	-23	40	-0.0378	0.0054	-0.0474
12	-38	43	-0.0486	-40	57	-0.0582	-0.0096	-0.0528
14	-17	20	-0.0222	-17	29	-0.0276	-0.0054	-0.0432
16	-81	85	-0.0996	-82	94	-0.1056	-0.0060	-0.0378
18	-165	167	-0.1992	-166	179	-0.2070	-0.0078	-0.0318
20	-235	240	-0.2850	-236	251	-0.2922	-0.0072	-0.0240
22	-226	230	-0.2736	-224	239	-0.2778	-0.0042	-0.0168
24	-177	181	-0.2148	-173	188	-0.2166	-0.0018	-0.0126
26	-125	131	-0.1536	-120	137	-0.1542	-0.0006	-0.0108
28	-24	27	-0.0306	-17	31	-0.0288	0.0018	-0.0102
30	64	-58	0.0732	71	-54	0.0750	0.0018	-0.0120
32	105	-97	0.1212	107	-91	0.1188	-0.0024	-0.0138
34	55	-55	0.0660	60	-48	0.0648	-0.0012	-0.0114
36	-13	12	-0.0150	-10	19	-0.0174	-0.0024	-0.0102
38	-75	78	-0.0918	-72	84	-0.0936	-0.0018	-0.0078
40	-110	113	-0.1338	-105	119	-0.1344	-0.0006	-0.0060
42	-100	103	-0.1218	-95	110	-0.1230	-0.0012	-0.0054
44	-62	65	-0.0762	-55	72	-0.0762	0.0000	-0.0042
46	-149	156	-0.1830	-147	164	-0.1866	-0.0036	-0.0042
48	-280	285	-0.3390	-275	291	-0.3396	-0.0006	-0.0006
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 12/3/2009 12:52:58 PM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 12/22/2009 4:41:09 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	937	-925	1.1172	998	-992	1.1940	0.0768	0.2586
6	574	-569	0.6858	730	-728	0.8748	0.1890	0.1818
8	105	-99	0.1224	142	-137	0.1674	0.0450	-0.0072
10	-33	39	-0.0432	-30	35	-0.0390	0.0042	-0.0522
12	-38	43	-0.0486	-50	53	-0.0618	-0.0132	-0.0564
14	-17	20	-0.0222	-23	24	-0.0282	-0.0060	-0.0432
16	-81	85	-0.0996	-88	89	-0.1062	-0.0066	-0.0372
18	-165	167	-0.1992	-173	175	-0.2088	-0.0096	-0.0306
20	-235	240	-0.2850	-242	246	-0.2928	-0.0078	-0.0210
22	-226	230	-0.2736	-231	234	-0.2790	-0.0054	-0.0132
24	-177	181	-0.2148	-179	183	-0.2172	-0.0024	-0.0078
26	-125	131	-0.1536	-126	131	-0.1542	-0.0006	-0.0054
28	-24	27	-0.0306	-22	25	-0.0282	0.0024	-0.0048
30	64	-58	0.0732	65	-60	0.0750	0.0018	-0.0072
32	105	-97	0.1212	103	-97	0.1200	-0.0012	-0.0090
34	55	-55	0.0660	55	-54	0.0654	-0.0006	-0.0078
36	-13	12	-0.0150	-15	14	-0.0174	-0.0024	-0.0072
38	-75	78	-0.0918	-77	77	-0.0924	-0.0006	-0.0048
40	-110	113	-0.1338	-111	114	-0.1350	-0.0012	-0.0042
42	-100	103	-0.1218	-101	103	-0.1224	-0.0006	-0.0030
44	-62	65	-0.0762	-61	66	-0.0762	0.0000	-0.0024
46	-149	156	-0.1830	-152	158	-0.1860	-0.0030	-0.0024
48	-280	285	-0.3390	-280	284	-0.3384	0.0006	0.0006
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 12/18/2009 2:13:21 PM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 12/22/2009 4:41:09 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	937	-925	1.1172	976	-981	1.1742	0.0570	0.2238
6	574	-569	0.6858	714	-724	0.8628	0.1770	0.1668
8	105	-99	0.1224	139	-142	0.1686	0.0462	-0.0102
10	-33	39	-0.0432	-34	32	-0.0396	0.0036	-0.0564
12	-38	43	-0.0486	-55	51	-0.0636	-0.0150	-0.0600
14	-17	20	-0.0222	-24	22	-0.0276	-0.0054	-0.0450
16	-81	85	-0.0996	-91	88	-0.1074	-0.0078	-0.0396
18	-165	167	-0.1992	-176	174	-0.2100	-0.0108	-0.0318
20	-235	240	-0.2850	-246	245	-0.2946	-0.0096	-0.0210
22	-226	230	-0.2736	-234	230	-0.2784	-0.0048	-0.0114
24	-177	181	-0.2148	-181	180	-0.2166	-0.0018	-0.0066
26	-125	131	-0.1536	-128	125	-0.1518	0.0018	-0.0048
28	-24	27	-0.0306	-24	20	-0.0264	0.0042	-0.0066
30	64	-58	0.0732	61	-66	0.0762	0.0030	-0.0108
32	105	-97	0.1212	98	-102	0.1200	-0.0012	-0.0138
34	55	-55	0.0660	55	-57	0.0672	0.0012	-0.0126
36	-13	12	-0.0150	-17	13	-0.0180	-0.0030	-0.0138
38	-75	78	-0.0918	-80	76	-0.0936	-0.0018	-0.0108
40	-110	113	-0.1338	-114	112	-0.1356	-0.0018	-0.0090
42	-100	103	-0.1218	-105	100	-0.1230	-0.0012	-0.0072
44	-62	65	-0.0762	-62	61	-0.0738	0.0024	-0.0060
46	-149	156	-0.1830	-159	158	-0.1902	-0.0072	-0.0084
48	-280	285	-0.3390	-285	282	-0.3402	-0.0012	-0.0012
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 12/22/2009 9:59:52 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 12/22/2009 4:41:09 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	937	-925	1.1172	985	-969	1.1724	0.0552	0.0384
6	574	-569	0.6858	714	-708	0.8532	0.1674	-0.0168
8	105	-99	0.1224	137	-127	0.1584	0.0360	-0.1842
10	-33	39	-0.0432	-34	46	-0.0480	-0.0048	-0.2202
12	-38	43	-0.0486	-56	65	-0.0726	-0.0240	-0.2154
14	-17	20	-0.0222	-25	35	-0.0360	-0.0138	-0.1914
16	-81	85	-0.0996	-90	101	-0.1146	-0.0150	-0.1776
18	-165	167	-0.1992	-176	187	-0.2178	-0.0186	-0.1626
20	-235	240	-0.2850	-245	258	-0.3018	-0.0168	-0.1440
22	-226	230	-0.2736	-235	245	-0.2880	-0.0144	-0.1272
24	-177	181	-0.2148	-180	194	-0.2244	-0.0096	-0.1128
26	-125	131	-0.1536	-127	140	-0.1602	-0.0066	-0.1032
28	-24	27	-0.0306	-24	35	-0.0354	-0.0048	-0.0966
30	64	-58	0.0732	61	-51	0.0672	-0.0060	-0.0918
32	105	-97	0.1212	98	-88	0.1116	-0.0096	-0.0858
34	55	-55	0.0660	56	-43	0.0594	-0.0066	-0.0762
36	-13	12	-0.0150	-16	26	-0.0252	-0.0102	-0.0696
38	-75	78	-0.0918	-79	91	-0.1020	-0.0102	-0.0594
40	-110	113	-0.1338	-113	127	-0.1440	-0.0102	-0.0492
42	-100	103	-0.1218	-104	115	-0.1314	-0.0096	-0.0390
44	-62	65	-0.0762	-61	75	-0.0816	-0.0054	-0.0294
46	-149	156	-0.1830	-158	172	-0.1980	-0.0150	-0.0240
48	-280	285	-0.3390	-284	296	-0.3480	-0.0090	-0.0090
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 11/20/2009 12:36:32 PM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 12/22/2009 4:41:18 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	481	-430	0.5466	475	-417	0.5352	-0.0114	0.0648
6	406	-371	0.4662	489	-446	0.5610	0.0948	0.0762
8	265	-201	0.2796	263	-206	0.2814	0.0018	-0.0186
10	239	-178	0.2502	223	-173	0.2376	-0.0126	-0.0204
12	318	-282	0.3600	324	-282	0.3636	0.0036	-0.0078
14	336	-279	0.3690	337	-282	0.3714	0.0024	-0.0114
16	242	-185	0.2562	238	-182	0.2520	-0.0042	-0.0138
18	145	-82	0.1362	141	-82	0.1338	-0.0024	-0.0096
20	102	-39	0.0846	102	-39	0.0846	0.0000	-0.0072
22	139	-93	0.1392	138	-90	0.1368	-0.0024	-0.0072
24	206	-153	0.2154	207	-153	0.2160	0.0006	-0.0048
26	327	-270	0.3582	328	-274	0.3612	0.0030	-0.0054
28	435	-375	0.4860	433	-374	0.4842	-0.0018	-0.0084
30	507	-450	0.5742	505	-451	0.5736	-0.0006	-0.0066
32	565	-518	0.6498	564	-518	0.6492	-0.0006	-0.0060
34	529	-476	0.6030	526	-473	0.5994	-0.0036	-0.0054
36	448	-395	0.5058	446	-394	0.5040	-0.0018	-0.0018
38	330	-277	0.3642	326	-275	0.3606	-0.0036	0.0000
40	230	-173	0.2418	227	-172	0.2394	-0.0024	0.0036
42	315	-277	0.3552	318	-278	0.3576	0.0024	0.0060
44	482	-430	0.5472	485	-433	0.5508	0.0036	0.0036
46	610	-550	0.6960	611	-550	0.6966	0.0006	0.0000
48	711	-652	0.8178	710	-652	0.8172	-0.0006	-0.0006
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 11/24/2009 12:32:14 PM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 12/22/2009 4:41:18 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	481	-430	0.5466	477	-414	0.5346	-0.0120	0.0750
6	406	-371	0.4662	492	-443	0.5610	0.0948	0.0870
8	265	-201	0.2796	264	-202	0.2796	0.0000	-0.0078
10	239	-178	0.2502	228	-168	0.2376	-0.0126	-0.0078
12	318	-282	0.3600	329	-279	0.3648	0.0048	0.0048
14	336	-279	0.3690	340	-279	0.3714	0.0024	0.0000
16	242	-185	0.2562	242	-179	0.2526	-0.0036	-0.0024
18	145	-82	0.1362	145	-77	0.1332	-0.0030	0.0012
20	102	-39	0.0846	106	-36	0.0852	0.0006	0.0042
22	139	-93	0.1392	143	-87	0.1380	-0.0012	0.0036
24	206	-153	0.2154	212	-149	0.2166	0.0012	0.0048
26	327	-270	0.3582	333	-270	0.3618	0.0036	0.0036
28	435	-375	0.4860	438	-371	0.4854	-0.0006	0.0000
30	507	-450	0.5742	508	-448	0.5736	-0.0006	0.0006
32	565	-518	0.6498	570	-515	0.6510	0.0012	0.0012
34	529	-476	0.6030	530	-470	0.6000	-0.0030	0.0000
36	448	-395	0.5058	450	-391	0.5046	-0.0012	0.0030
38	330	-277	0.3642	330	-274	0.3624	-0.0018	0.0042
40	230	-173	0.2418	231	-167	0.2388	-0.0030	0.0060
42	315	-277	0.3552	321	-274	0.3570	0.0018	0.0090
44	482	-430	0.5472	489	-430	0.5514	0.0042	0.0072
46	610	-550	0.6960	615	-547	0.6972	0.0012	0.0030
48	711	-652	0.8178	717	-649	0.8196	0.0018	0.0018
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 12/3/2009 12:52:58 PM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 12/22/2009 4:41:18 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	481	-430	0.5466	466	-414	0.5280	-0.0186	0.0480
6	406	-371	0.4662	483	-443	0.5556	0.0894	0.0666
8	265	-201	0.2796	262	-203	0.2790	-0.0006	-0.0228
10	239	-178	0.2502	224	-167	0.2346	-0.0156	-0.0222
12	318	-282	0.3600	325	-279	0.3624	0.0024	-0.0066
14	336	-279	0.3690	339	-282	0.3726	0.0036	-0.0090
16	242	-185	0.2562	242	-179	0.2526	-0.0036	-0.0126
18	145	-82	0.1362	145	-78	0.1338	-0.0024	-0.0090
20	102	-39	0.0846	104	-37	0.0846	0.0000	-0.0066
22	139	-93	0.1392	140	-87	0.1362	-0.0030	-0.0066
24	206	-153	0.2154	210	-149	0.2154	0.0000	-0.0036
26	327	-270	0.3582	330	-270	0.3600	0.0018	-0.0036
28	435	-375	0.4860	435	-371	0.4836	-0.0024	-0.0054
30	507	-450	0.5742	507	-449	0.5736	-0.0006	-0.0030
32	565	-518	0.6498	568	-516	0.6504	0.0006	-0.0024
34	529	-476	0.6030	529	-471	0.6000	-0.0030	-0.0030
36	448	-395	0.5058	449	-392	0.5046	-0.0012	0.0000
38	330	-277	0.3642	325	-273	0.3588	-0.0054	0.0012
40	230	-173	0.2418	230	-168	0.2388	-0.0030	0.0066
42	315	-277	0.3552	322	-275	0.3582	0.0030	0.0096
44	482	-430	0.5472	489	-430	0.5514	0.0042	0.0066
46	610	-550	0.6960	614	-549	0.6978	0.0018	0.0024
48	711	-652	0.8178	715	-649	0.8184	0.0006	0.0006
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 12/18/2009 2:13:21 PM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 12/22/2009 4:41:18 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	481	-430	0.5466	418	-441	0.5154	-0.0312	0.0462
6	406	-371	0.4662	463	-467	0.5580	0.0918	0.0774
8	265	-201	0.2796	216	-235	0.2706	-0.0090	-0.0144
10	239	-178	0.2502	183	-212	0.2370	-0.0132	-0.0054
12	318	-282	0.3600	288	-307	0.3570	-0.0030	0.0078
14	336	-279	0.3690	296	-315	0.3666	-0.0024	0.0108
16	242	-185	0.2562	195	-213	0.2448	-0.0114	0.0132
18	145	-82	0.1362	92	-117	0.1254	-0.0108	0.0246
20	102	-39	0.0846	57	-86	0.0858	0.0012	0.0354
22	139	-93	0.1392	107	-128	0.1410	0.0018	0.0342
24	206	-153	0.2154	177	-193	0.2220	0.0066	0.0324
26	327	-270	0.3582	299	-316	0.3690	0.0108	0.0258
28	435	-375	0.4860	399	-416	0.4890	0.0030	0.0150
30	507	-450	0.5742	462	-491	0.5718	-0.0024	0.0120
32	565	-518	0.6498	522	-551	0.6438	-0.0060	0.0144
34	529	-476	0.6030	485	-505	0.5940	-0.0090	0.0204
36	448	-395	0.5058	405	-424	0.4974	-0.0084	0.0294
38	330	-277	0.3642	289	-303	0.3552	-0.0090	0.0378
40	230	-173	0.2418	187	-216	0.2418	0.0000	0.0468
42	315	-277	0.3552	307	-305	0.3672	0.0120	0.0468
44	482	-430	0.5472	460	-473	0.5598	0.0126	0.0348
46	610	-550	0.6960	581	-601	0.7092	0.0132	0.0222
48	711	-652	0.8178	673	-705	0.8268	0.0090	0.0090
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

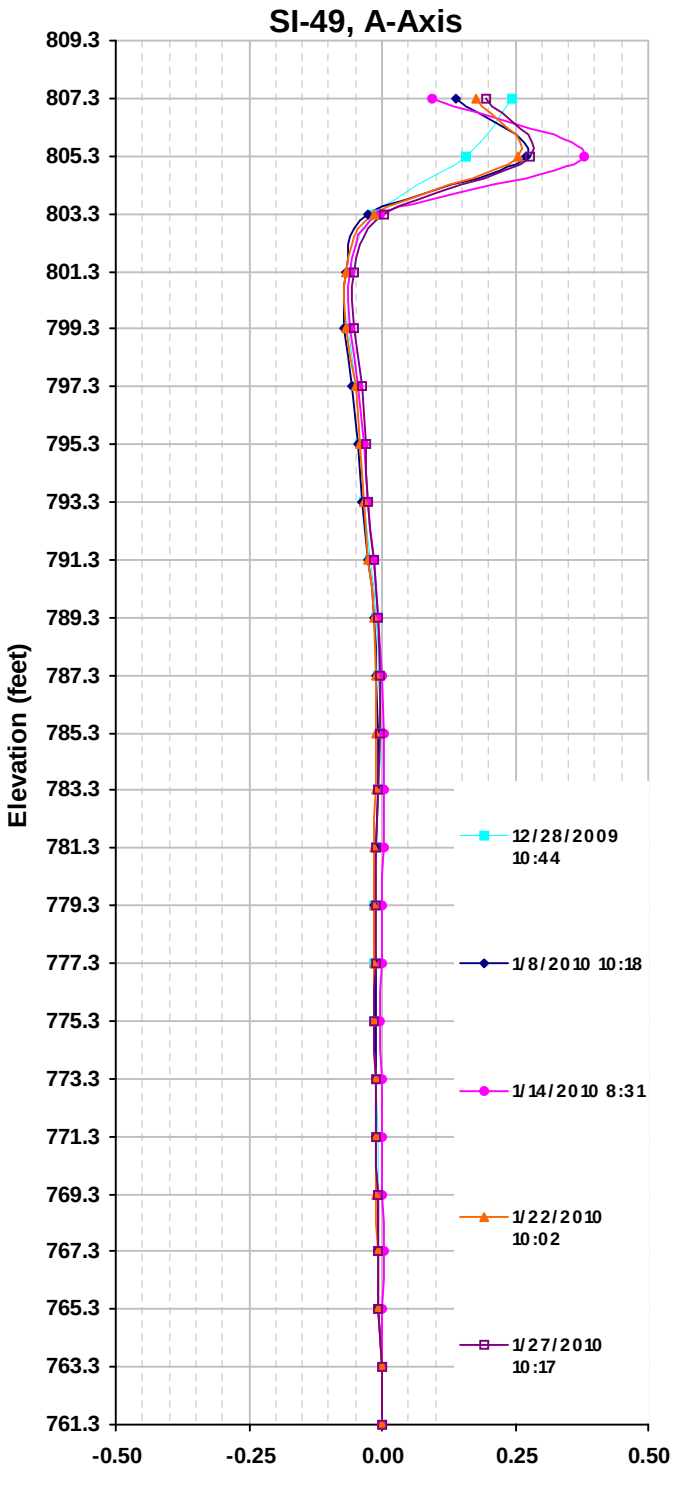
CURRENT SURVEY 12/22/2009 9:59:52 AM

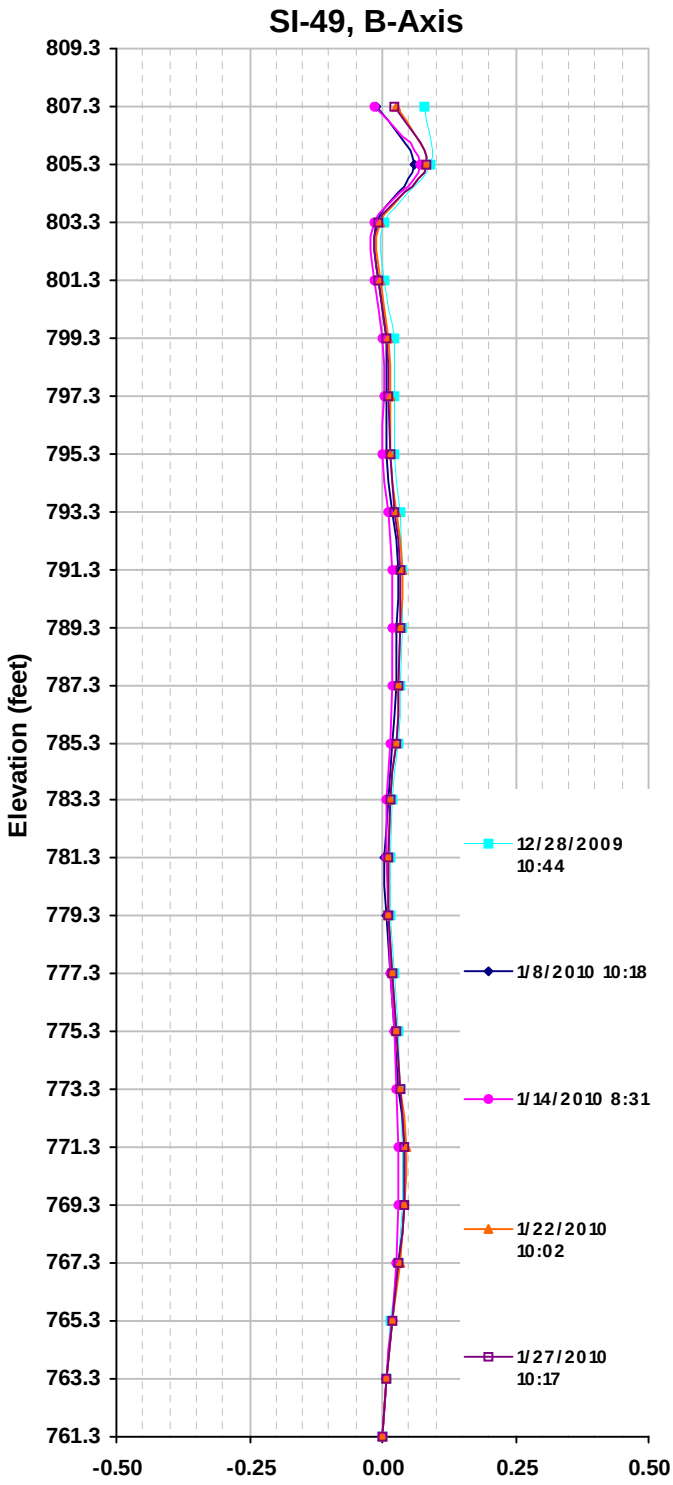
INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 12/22/2009 4:41:18 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	481	-430	0.5466	417	-437	0.5124	-0.0342	0.0360
6	406	-371	0.4662	461	-465	0.5556	0.0894	0.0702
8	265	-201	0.2796	216	-235	0.2706	-0.0090	-0.0192
10	239	-178	0.2502	181	-211	0.2352	-0.0150	-0.0102
12	318	-282	0.3600	287	-307	0.3564	-0.0036	0.0048
14	336	-279	0.3690	295	-315	0.3660	-0.0030	0.0084
16	242	-185	0.2562	195	-213	0.2448	-0.0114	0.0114
18	145	-82	0.1362	91	-116	0.1242	-0.0120	0.0228
20	102	-39	0.0846	57	-87	0.0864	0.0018	0.0348
22	139	-93	0.1392	106	-128	0.1404	0.0012	0.0330
24	206	-153	0.2154	176	-193	0.2214	0.0060	0.0318
26	327	-270	0.3582	300	-316	0.3696	0.0114	0.0258
28	435	-375	0.4860	398	-420	0.4908	0.0048	0.0144
30	507	-450	0.5742	462	-492	0.5724	-0.0018	0.0096
32	565	-518	0.6498	522	-550	0.6432	-0.0066	0.0114
34	529	-476	0.6030	484	-506	0.5940	-0.0090	0.0180
36	448	-395	0.5058	403	-424	0.4962	-0.0096	0.0270
38	330	-277	0.3642	287	-303	0.3540	-0.0102	0.0366
40	230	-173	0.2418	188	-216	0.2424	0.0006	0.0468
42	315	-277	0.3552	307	-305	0.3672	0.0120	0.0462
44	482	-430	0.5472	460	-472	0.5592	0.0120	0.0342
46	610	-550	0.6960	581	-601	0.7092	0.0132	0.0222
48	711	-652	0.8178	673	-705	0.8268	0.0090	0.0090
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000





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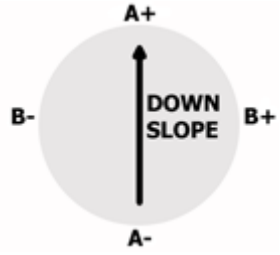


Bull Run Fossil Plant
Bull Run
Clinton, TN
172679015
1/27/2010

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 12/28/2009 10:44:06 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 1/27/2010 2:27:06 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	937	-925	1.1172	1005	-1002	1.2042	0.0870	0.2442
6	574	-569	0.6858	712	-721	0.8598	0.1740	0.1572
8	105	-99	0.1224	138	-140	0.1668	0.0444	-0.0168
10	-33	39	-0.0432	-34	34	-0.0408	0.0024	-0.0612
12	-38	43	-0.0486	-56	51	-0.0642	-0.0156	-0.0636
14	-17	20	-0.0222	-24	24	-0.0288	-0.0066	-0.0480
16	-81	85	-0.0996	-91	90	-0.1086	-0.0090	-0.0414
18	-165	167	-0.1992	-176	174	-0.2100	-0.0108	-0.0324
20	-235	240	-0.2850	-246	245	-0.2946	-0.0096	-0.0216
22	-226	230	-0.2736	-235	230	-0.2790	-0.0054	-0.0120
24	-177	181	-0.2148	-181	180	-0.2166	-0.0018	-0.0066
26	-125	131	-0.1536	-128	125	-0.1518	0.0018	-0.0048
28	-24	27	-0.0306	-22	20	-0.0252	0.0054	-0.0066
30	64	-58	0.0732	62	-66	0.0768	0.0036	-0.0120
32	105	-97	0.1212	98	-102	0.1200	-0.0012	-0.0156
34	55	-55	0.0660	55	-54	0.0654	-0.0006	-0.0144
36	-13	12	-0.0150	-16	14	-0.0180	-0.0030	-0.0138
38	-75	78	-0.0918	-79	77	-0.0936	-0.0018	-0.0108
40	-110	113	-0.1338	-113	112	-0.1350	-0.0012	-0.0090
42	-100	103	-0.1218	-105	99	-0.1224	-0.0006	-0.0078
44	-62	65	-0.0762	-64	61	-0.0750	0.0012	-0.0072
46	-149	156	-0.1830	-160	157	-0.1902	-0.0072	-0.0084
48	-280	285	-0.3390	-285	282	-0.3402	-0.0012	-0.0012
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 1/8/2010 10:18:03 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 1/27/2010 2:27:06 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	937	-925	1.1172	822	-822	0.9864	-0.1308	0.1386
6	574	-569	0.6858	814	-820	0.9804	0.2946	0.2694
8	105	-99	0.1224	138	-138	0.1656	0.0432	-0.0252
10	-33	39	-0.0432	-35	35	-0.0420	0.0012	-0.0684
12	-38	43	-0.0486	-55	50	-0.0630	-0.0144	-0.0696
14	-17	20	-0.0222	-27	27	-0.0324	-0.0102	-0.0552
16	-81	85	-0.0996	-90	88	-0.1068	-0.0072	-0.0450
18	-165	167	-0.1992	-176	175	-0.2106	-0.0114	-0.0378
20	-235	240	-0.2850	-246	246	-0.2952	-0.0102	-0.0264
22	-226	230	-0.2736	-235	232	-0.2802	-0.0066	-0.0162
24	-177	181	-0.2148	-181	181	-0.2172	-0.0024	-0.0096
26	-125	131	-0.1536	-129	127	-0.1536	0.0000	-0.0072
28	-24	27	-0.0306	-24	21	-0.0270	0.0036	-0.0072
30	64	-58	0.0732	61	-65	0.0756	0.0024	-0.0108
32	105	-97	0.1212	98	-102	0.1200	-0.0012	-0.0132
34	55	-55	0.0660	56	-55	0.0666	0.0006	-0.0120
36	-13	12	-0.0150	-15	13	-0.0168	-0.0018	-0.0126
38	-75	78	-0.0918	-79	76	-0.0930	-0.0012	-0.0108
40	-110	113	-0.1338	-113	113	-0.1356	-0.0018	-0.0096
42	-100	103	-0.1218	-105	100	-0.1230	-0.0012	-0.0078
44	-62	65	-0.0762	-63	62	-0.0750	0.0012	-0.0066
46	-149	156	-0.1830	-159	157	-0.1896	-0.0066	-0.0078
48	-280	285	-0.3390	-285	282	-0.3402	-0.0012	-0.0012
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 1/14/2010 8:31:11 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 1/27/2010 2:27:06 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	937	-925	1.1172	695	-693	0.8328	-0.2844	0.0948
6	574	-569	0.6858	888	-893	1.0686	0.3828	0.3792
8	105	-99	0.1224	150	-150	0.1800	0.0576	-0.0036
10	-33	39	-0.0432	-35	36	-0.0426	0.0006	-0.0612
12	-38	43	-0.0486	-56	53	-0.0654	-0.0168	-0.0618
14	-17	20	-0.0222	-28	27	-0.0330	-0.0108	-0.0450
16	-81	85	-0.0996	-89	88	-0.1062	-0.0066	-0.0342
18	-165	167	-0.1992	-175	175	-0.2100	-0.0108	-0.0276
20	-235	240	-0.2850	-245	246	-0.2946	-0.0096	-0.0168
22	-226	230	-0.2736	-235	233	-0.2808	-0.0072	-0.0072
24	-177	181	-0.2148	-181	183	-0.2184	-0.0036	0.0000
26	-125	131	-0.1536	-129	129	-0.1548	-0.0012	0.0036
28	-24	27	-0.0306	-24	23	-0.0282	0.0024	0.0048
30	64	-58	0.0732	62	-64	0.0756	0.0024	0.0024
32	105	-97	0.1212	100	-102	0.1212	0.0000	0.0000
34	55	-55	0.0660	57	-57	0.0684	0.0024	0.0000
36	-13	12	-0.0150	-14	12	-0.0156	-0.0006	-0.0024
38	-75	78	-0.0918	-77	76	-0.0918	0.0000	-0.0018
40	-110	113	-0.1338	-113	114	-0.1362	-0.0024	-0.0018
42	-100	103	-0.1218	-105	101	-0.1236	-0.0018	0.0006
44	-62	65	-0.0762	-60	62	-0.0732	0.0030	0.0024
46	-149	156	-0.1830	-152	156	-0.1848	-0.0018	-0.0006
48	-280	285	-0.3390	-281	282	-0.3378	0.0012	0.0012
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 1/22/2010 10:02:57 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 1/27/2010 2:27:07 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	937	-925	1.1172	866	-864	1.0380	-0.0792	0.1752
6	574	-569	0.6858	792	-800	0.9552	0.2694	0.2544
8	105	-99	0.1224	145	-147	0.1752	0.0528	-0.0150
10	-33	39	-0.0432	-38	36	-0.0444	-0.0012	-0.0678
12	-38	43	-0.0486	-58	51	-0.0654	-0.0168	-0.0666
14	-17	20	-0.0222	-27	25	-0.0312	-0.0090	-0.0498
16	-81	85	-0.0996	-89	87	-0.1056	-0.0060	-0.0408
18	-165	167	-0.1992	-175	173	-0.2088	-0.0096	-0.0348
20	-235	240	-0.2850	-245	244	-0.2934	-0.0084	-0.0252
22	-226	230	-0.2736	-234	230	-0.2784	-0.0048	-0.0168
24	-177	181	-0.2148	-181	180	-0.2166	-0.0018	-0.0120
26	-125	131	-0.1536	-129	126	-0.1530	0.0006	-0.0102
28	-24	27	-0.0306	-25	22	-0.0282	0.0024	-0.0108
30	64	-58	0.0732	61	-64	0.0750	0.0018	-0.0132
32	105	-97	0.1212	98	-103	0.1206	-0.0006	-0.0150
34	55	-55	0.0660	56	-55	0.0666	0.0006	-0.0144
36	-13	12	-0.0150	-16	13	-0.0174	-0.0024	-0.0150
38	-75	78	-0.0918	-78	76	-0.0924	-0.0006	-0.0126
40	-110	113	-0.1338	-114	113	-0.1362	-0.0024	-0.0120
42	-100	103	-0.1218	-106	100	-0.1236	-0.0018	-0.0096
44	-62	65	-0.0762	-64	61	-0.0750	0.0012	-0.0078
46	-149	156	-0.1830	-160	157	-0.1902	-0.0072	-0.0090
48	-280	285	-0.3390	-286	282	-0.3408	-0.0018	-0.0018
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 1/27/2010 10:17:50 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 1/27/2010 2:27:07 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	937	-925	1.1172	862	-864	1.0356	-0.0816	0.1950
6	574	-569	0.6858	794	-802	0.9576	0.2718	0.2766
8	105	-99	0.1224	149	-148	0.1782	0.0558	0.0048
10	-33	39	-0.0432	-35	35	-0.0420	0.0012	-0.0510
12	-38	43	-0.0486	-55	51	-0.0636	-0.0150	-0.0522
14	-17	20	-0.0222	-26	25	-0.0306	-0.0084	-0.0372
16	-81	85	-0.0996	-87	86	-0.1038	-0.0042	-0.0288
18	-165	167	-0.1992	-173	172	-0.2070	-0.0078	-0.0246
20	-235	240	-0.2850	-244	244	-0.2928	-0.0078	-0.0168
22	-226	230	-0.2736	-232	230	-0.2772	-0.0036	-0.0090
24	-177	181	-0.2148	-179	179	-0.2148	0.0000	-0.0054
26	-125	131	-0.1536	-128	126	-0.1524	0.0012	-0.0054
28	-24	27	-0.0306	-23	21	-0.0264	0.0042	-0.0066
30	64	-58	0.0732	61	-64	0.0750	0.0018	-0.0108
32	105	-97	0.1212	99	-102	0.1206	-0.0006	-0.0126
34	55	-55	0.0660	56	-56	0.0672	0.0012	-0.0120
36	-13	12	-0.0150	-15	13	-0.0168	-0.0018	-0.0132
38	-75	78	-0.0918	-78	76	-0.0924	-0.0006	-0.0114
40	-110	113	-0.1338	-114	113	-0.1362	-0.0024	-0.0108
42	-100	103	-0.1218	-105	101	-0.1236	-0.0018	-0.0084
44	-62	65	-0.0762	-64	62	-0.0756	0.0006	-0.0066
46	-149	156	-0.1830	-158	157	-0.1890	-0.0060	-0.0072
48	-280	285	-0.3390	-285	282	-0.3402	-0.0012	-0.0012
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 12/28/2009 10:44:06 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 1/27/2010 2:27:15 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	481	-430	0.5466	435	-456	0.5346	-0.0120	0.0792
6	406	-371	0.4662	462	-463	0.5550	0.0888	0.0912
8	265	-201	0.2796	221	-241	0.2772	-0.0024	0.0024
10	239	-178	0.2502	182	-208	0.2340	-0.0162	0.0048
12	318	-282	0.3600	290	-307	0.3582	-0.0018	0.0210
14	336	-279	0.3690	299	-316	0.3690	0.0000	0.0228
16	242	-185	0.2562	198	-212	0.2460	-0.0102	0.0228
18	145	-82	0.1362	100	-117	0.1302	-0.0060	0.0330
20	102	-39	0.0846	58	-84	0.0852	0.0006	0.0390
22	139	-93	0.1392	110	-127	0.1422	0.0030	0.0384
24	206	-153	0.2154	173	-194	0.2202	0.0048	0.0354
26	327	-270	0.3582	296	-318	0.3684	0.0102	0.0306
28	435	-375	0.4860	400	-420	0.4920	0.0060	0.0204
30	507	-450	0.5742	467	-487	0.5724	-0.0018	0.0144
32	565	-518	0.6498	524	-549	0.6438	-0.0060	0.0162
34	529	-476	0.6030	487	-505	0.5952	-0.0078	0.0222
36	448	-395	0.5058	411	-423	0.5004	-0.0054	0.0300
38	330	-277	0.3642	296	-308	0.3624	-0.0018	0.0354
40	230	-173	0.2418	189	-214	0.2418	0.0000	0.0372
42	315	-277	0.3552	304	-303	0.3642	0.0090	0.0372
44	482	-430	0.5472	461	-473	0.5604	0.0132	0.0282
46	610	-550	0.6960	578	-596	0.7044	0.0084	0.0150
48	711	-652	0.8178	673	-701	0.8244	0.0066	0.0066
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 1/8/2010 10:18:03 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 1/27/2010 2:27:15 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	481	-430	0.5466	383	-406	0.4734	-0.0732	-0.0126
6	406	-371	0.4662	445	-449	0.5364	0.0702	0.0606
8	265	-201	0.2796	219	-243	0.2772	-0.0024	-0.0096
10	239	-178	0.2502	182	-208	0.2340	-0.0162	-0.0072
12	318	-282	0.3600	294	-309	0.3618	0.0018	0.0090
14	336	-279	0.3690	299	-318	0.3702	0.0012	0.0072
16	242	-185	0.2562	195	-213	0.2448	-0.0114	0.0060
18	145	-82	0.1362	93	-116	0.1254	-0.0108	0.0174
20	102	-39	0.0846	60	-85	0.0870	0.0024	0.0282
22	139	-93	0.1392	109	-125	0.1404	0.0012	0.0258
24	206	-153	0.2154	174	-193	0.2202	0.0048	0.0246
26	327	-270	0.3582	297	-316	0.3678	0.0096	0.0198
28	435	-375	0.4860	398	-420	0.4908	0.0048	0.0102
30	507	-450	0.5742	464	-489	0.5718	-0.0024	0.0054
32	565	-518	0.6498	521	-549	0.6420	-0.0078	0.0078
34	529	-476	0.6030	486	-505	0.5946	-0.0084	0.0156
36	448	-395	0.5058	406	-424	0.4980	-0.0078	0.0240
38	330	-277	0.3642	290	-304	0.3564	-0.0078	0.0318
40	230	-173	0.2418	187	-215	0.2412	-0.0006	0.0396
42	315	-277	0.3552	304	-303	0.3642	0.0090	0.0402
44	482	-430	0.5472	460	-471	0.5586	0.0114	0.0312
46	610	-550	0.6960	579	-600	0.7074	0.0114	0.0198
48	711	-652	0.8178	672	-705	0.8262	0.0084	0.0084
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 1/14/2010 8:31:11 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 1/27/2010 2:27:15 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	481	-430	0.5466	373	-393	0.4596	-0.0870	-0.0156
6	406	-371	0.4662	457	-467	0.5544	0.0882	0.0714
8	265	-201	0.2796	223	-242	0.2790	-0.0006	-0.0168
10	239	-178	0.2502	182	-209	0.2346	-0.0156	-0.0162
12	318	-282	0.3600	289	-305	0.3564	-0.0036	-0.0006
14	336	-279	0.3690	300	-318	0.3708	0.0018	0.0030
16	242	-185	0.2562	199	-214	0.2478	-0.0084	0.0012
18	145	-82	0.1362	94	-115	0.1254	-0.0108	0.0096
20	102	-39	0.0846	57	-85	0.0852	0.0006	0.0204
22	139	-93	0.1392	108	-125	0.1398	0.0006	0.0198
24	206	-153	0.2154	173	-191	0.2184	0.0030	0.0192
26	327	-270	0.3582	296	-313	0.3654	0.0072	0.0162
28	435	-375	0.4860	398	-417	0.4890	0.0030	0.0090
30	507	-450	0.5742	463	-488	0.5706	-0.0036	0.0060
32	565	-518	0.6498	523	-551	0.6444	-0.0054	0.0096
34	529	-476	0.6030	488	-507	0.5970	-0.0060	0.0150
36	448	-395	0.5058	409	-426	0.5010	-0.0048	0.0210
38	330	-277	0.3642	292	-305	0.3582	-0.0060	0.0258
40	230	-173	0.2418	188	-216	0.2424	0.0006	0.0318
42	315	-277	0.3552	303	-298	0.3606	0.0054	0.0312
44	482	-430	0.5472	455	-470	0.5550	0.0078	0.0258
46	610	-550	0.6960	580	-598	0.7068	0.0108	0.0180
48	711	-652	0.8178	674	-701	0.8250	0.0072	0.0072
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 1/22/2010 10:02:57 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 1/27/2010 2:27:16 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	481	-430	0.5466	398	-418	0.4896	-0.0570	0.0270
6	406	-371	0.4662	460	-465	0.5550	0.0888	0.0840
8	265	-201	0.2796	220	-245	0.2790	-0.0006	-0.0048
10	239	-178	0.2502	184	-207	0.2346	-0.0156	-0.0042
12	318	-282	0.3600	293	-304	0.3582	-0.0018	0.0114
14	336	-279	0.3690	297	-315	0.3672	-0.0018	0.0132
16	242	-185	0.2562	195	-213	0.2448	-0.0114	0.0150
18	145	-82	0.1362	92	-116	0.1248	-0.0114	0.0264
20	102	-39	0.0846	60	-85	0.0870	0.0024	0.0378
22	139	-93	0.1392	112	-127	0.1434	0.0042	0.0354
24	206	-153	0.2154	178	-192	0.2220	0.0066	0.0312
26	327	-270	0.3582	299	-315	0.3684	0.0102	0.0246
28	435	-375	0.4860	398	-416	0.4884	0.0024	0.0144
30	507	-450	0.5742	466	-490	0.5736	-0.0006	0.0120
32	565	-518	0.6498	522	-549	0.6426	-0.0072	0.0126
34	529	-476	0.6030	487	-505	0.5952	-0.0078	0.0198
36	448	-395	0.5058	406	-424	0.4980	-0.0078	0.0276
38	330	-277	0.3642	289	-304	0.3558	-0.0084	0.0354
40	230	-173	0.2418	190	-214	0.2424	0.0006	0.0438
42	315	-277	0.3552	307	-302	0.3654	0.0102	0.0432
44	482	-430	0.5472	466	-468	0.5604	0.0132	0.0330
46	610	-550	0.6960	581	-598	0.7074	0.0114	0.0198
48	711	-652	0.8178	674	-703	0.8262	0.0084	0.0084
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

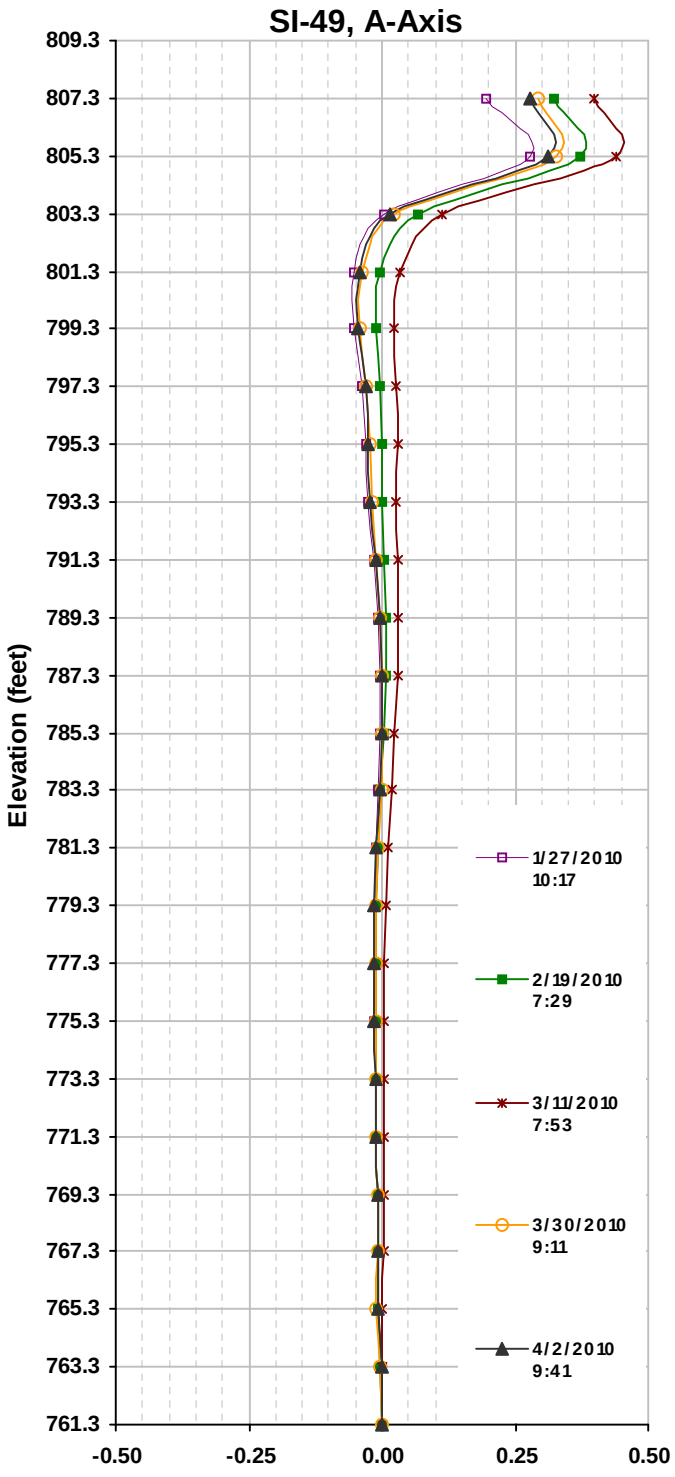
CURRENT SURVEY 1/27/2010 10:17:50 AM

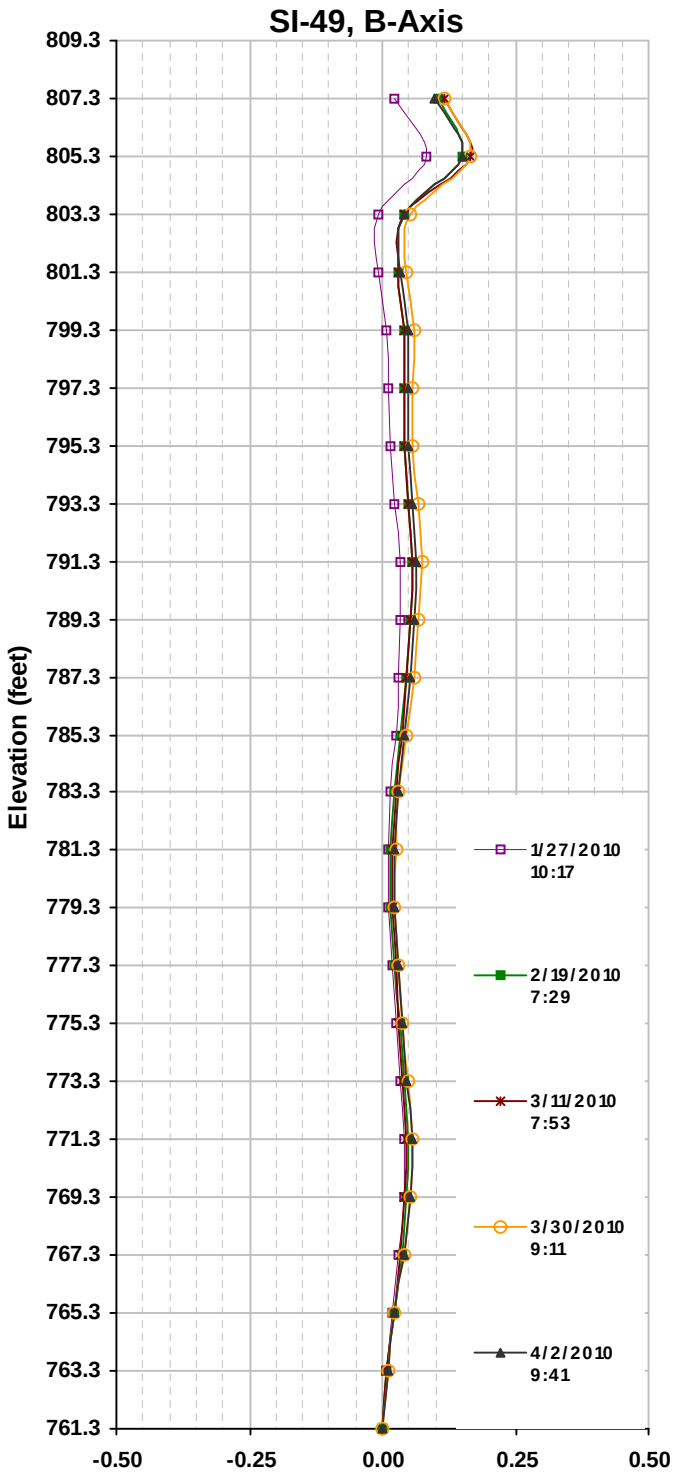
INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 1/27/2010 2:27:16 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	481	-430	0.5466	393	-415	0.4848	-0.0618	0.0216
6	406	-371	0.4662	460	-471	0.5586	0.0924	0.0834
8	265	-201	0.2796	222	-244	0.2796	0.0000	-0.0090
10	239	-178	0.2502	182	-208	0.2340	-0.0162	-0.0090
12	318	-282	0.3600	289	-305	0.3564	-0.0036	0.0072
14	336	-279	0.3690	296	-315	0.3666	-0.0024	0.0108
16	242	-185	0.2562	198	-213	0.2466	-0.0096	0.0132
18	145	-82	0.1362	92	-116	0.1248	-0.0114	0.0228
20	102	-39	0.0846	59	-85	0.0864	0.0018	0.0342
22	139	-93	0.1392	110	-127	0.1422	0.0030	0.0324
24	206	-153	0.2154	174	-193	0.2202	0.0048	0.0294
26	327	-270	0.3582	297	-314	0.3666	0.0084	0.0246
28	435	-375	0.4860	401	-420	0.4926	0.0066	0.0162
30	507	-450	0.5742	465	-490	0.5730	-0.0012	0.0096
32	565	-518	0.6498	521	-550	0.6426	-0.0072	0.0108
34	529	-476	0.6030	486	-506	0.5952	-0.0078	0.0180
36	448	-395	0.5058	406	-425	0.4986	-0.0072	0.0258
38	330	-277	0.3642	289	-305	0.3564	-0.0078	0.0330
40	230	-173	0.2418	188	-216	0.2424	0.0006	0.0408
42	315	-277	0.3552	306	-301	0.3642	0.0090	0.0402
44	482	-430	0.5472	460	-471	0.5586	0.0114	0.0312
46	610	-550	0.6960	579	-601	0.7080	0.0120	0.0198
48	711	-652	0.8178	672	-704	0.8256	0.0078	0.0078
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000





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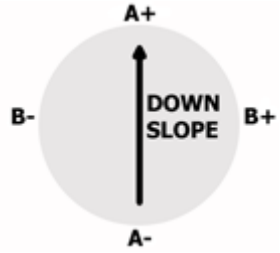


Bull Run Fossil Plant
Bull Run
Clinton, TN
172679015
4/5/2010

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 1/27/2010 10:17:50 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 4/5/2010 10:13:05 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	937	-925	1.1172	862	-864	1.0356	-0.0816	0.1950
6	574	-569	0.6858	794	-802	0.9576	0.2718	0.2766
8	105	-99	0.1224	149	-148	0.1782	0.0558	0.0048
10	-33	39	-0.0432	-35	35	-0.0420	0.0012	-0.0510
12	-38	43	-0.0486	-55	51	-0.0636	-0.0150	-0.0522
14	-17	20	-0.0222	-26	25	-0.0306	-0.0084	-0.0372
16	-81	85	-0.0996	-87	86	-0.1038	-0.0042	-0.0288
18	-165	167	-0.1992	-173	172	-0.2070	-0.0078	-0.0246
20	-235	240	-0.2850	-244	244	-0.2928	-0.0078	-0.0168
22	-226	230	-0.2736	-232	230	-0.2772	-0.0036	-0.0090
24	-177	181	-0.2148	-179	179	-0.2148	0.0000	-0.0054
26	-125	131	-0.1536	-128	126	-0.1524	0.0012	-0.0054
28	-24	27	-0.0306	-23	21	-0.0264	0.0042	-0.0066
30	64	-58	0.0732	61	-64	0.0750	0.0018	-0.0108
32	105	-97	0.1212	99	-102	0.1206	-0.0006	-0.0126
34	55	-55	0.0660	56	-56	0.0672	0.0012	-0.0120
36	-13	12	-0.0150	-15	13	-0.0168	-0.0018	-0.0132
38	-75	78	-0.0918	-78	76	-0.0924	-0.0006	-0.0114
40	-110	113	-0.1338	-114	113	-0.1362	-0.0024	-0.0108
42	-100	103	-0.1218	-105	101	-0.1236	-0.0018	-0.0084
44	-62	65	-0.0762	-64	62	-0.0756	0.0006	-0.0066
46	-149	156	-0.1830	-158	157	-0.1890	-0.0060	-0.0072
48	-280	285	-0.3390	-285	282	-0.3402	-0.0012	-0.0012
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 2/19/2010 7:29:07 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 4/5/2010 10:13:05 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	937	-925	1.1172	889	-890	1.0674	-0.0498	0.3234
6	574	-569	0.6858	823	-828	0.9906	0.3048	0.3732
8	105	-99	0.1224	163	-159	0.1932	0.0708	0.0684
10	-33	39	-0.0432	-28	30	-0.0348	0.0084	-0.0024
12	-38	43	-0.0486	-46	44	-0.0540	-0.0054	-0.0108
14	-17	20	-0.0222	-22	24	-0.0276	-0.0054	-0.0054
16	-81	85	-0.0996	-83	83	-0.0996	0.0000	0.0000
18	-165	167	-0.1992	-168	169	-0.2022	-0.0030	0.0000
20	-235	240	-0.2850	-240	242	-0.2892	-0.0042	0.0030
22	-226	230	-0.2736	-228	227	-0.2730	0.0006	0.0072
24	-177	181	-0.2148	-175	177	-0.2112	0.0036	0.0066
26	-125	131	-0.1536	-124	123	-0.1482	0.0054	0.0030
28	-24	27	-0.0306	-21	20	-0.0246	0.0060	-0.0024
30	64	-58	0.0732	63	-64	0.0762	0.0030	-0.0084
32	105	-97	0.1212	100	-102	0.1212	0.0000	-0.0114
34	55	-55	0.0660	57	-55	0.0672	0.0012	-0.0114
36	-13	12	-0.0150	-14	13	-0.0162	-0.0012	-0.0126
38	-75	78	-0.0918	-77	77	-0.0924	-0.0006	-0.0114
40	-110	113	-0.1338	-112	114	-0.1356	-0.0018	-0.0108
42	-100	103	-0.1218	-104	101	-0.1230	-0.0012	-0.0090
44	-62	65	-0.0762	-63	62	-0.0750	0.0012	-0.0078
46	-149	156	-0.1830	-159	157	-0.1896	-0.0066	-0.0090
48	-280	285	-0.3390	-286	283	-0.3414	-0.0024	-0.0024
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 3/11/2010 7:53:58 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 4/5/2010 10:13:05 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	937	-925	1.1172	904	-891	1.0770	-0.0402	0.3978
6	574	-569	0.6858	841	-845	1.0116	0.3258	0.4380
8	105	-99	0.1224	168	-164	0.1992	0.0768	0.1122
10	-33	39	-0.0432	-24	28	-0.0312	0.0120	0.0354
12	-38	43	-0.0486	-42	43	-0.0510	-0.0024	0.0234
14	-17	20	-0.0222	-19	23	-0.0252	-0.0030	0.0258
16	-81	85	-0.0996	-80	84	-0.0984	0.0012	0.0288
18	-165	167	-0.1992	-165	168	-0.1998	-0.0006	0.0276
20	-235	240	-0.2850	-237	242	-0.2874	-0.0024	0.0282
22	-226	230	-0.2736	-225	228	-0.2718	0.0018	0.0306
24	-177	181	-0.2148	-172	178	-0.2100	0.0048	0.0288
26	-125	131	-0.1536	-122	125	-0.1482	0.0054	0.0240
28	-24	27	-0.0306	-18	21	-0.0234	0.0072	0.0186
30	64	-58	0.0732	66	-64	0.0780	0.0048	0.0114
32	105	-97	0.1212	103	-101	0.1224	0.0012	0.0066
34	55	-55	0.0660	60	-55	0.0690	0.0030	0.0054
36	-13	12	-0.0150	-11	14	-0.0150	0.0000	0.0024
38	-75	78	-0.0918	-74	79	-0.0918	0.0000	0.0024
40	-110	113	-0.1338	-110	115	-0.1350	-0.0012	0.0024
42	-100	103	-0.1218	-101	103	-0.1224	-0.0006	0.0036
44	-62	65	-0.0762	-57	62	-0.0714	0.0048	0.0042
46	-149	156	-0.1830	-150	158	-0.1848	-0.0018	-0.0006
48	-280	285	-0.3390	-279	284	-0.3378	0.0012	0.0012
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 3/30/2010 9:11:31 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 4/5/2010 10:13:05 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	937	-925	1.1172	906	-898	1.0824	-0.0348	0.2922
6	574	-569	0.6858	825	-825	0.9900	0.3042	0.3270
8	105	-99	0.1224	156	-147	0.1818	0.0594	0.0228
10	-33	39	-0.0432	-29	34	-0.0378	0.0054	-0.0366
12	-38	43	-0.0486	-51	53	-0.0624	-0.0138	-0.0420
14	-17	20	-0.0222	-20	27	-0.0282	-0.0060	-0.0282
16	-81	85	-0.0996	-84	89	-0.1038	-0.0042	-0.0222
18	-165	167	-0.1992	-170	175	-0.2070	-0.0078	-0.0180
20	-235	240	-0.2850	-241	247	-0.2928	-0.0078	-0.0102
22	-226	230	-0.2736	-229	233	-0.2772	-0.0036	-0.0024
24	-177	181	-0.2148	-176	182	-0.2148	0.0000	0.0012
26	-125	131	-0.1536	-123	128	-0.1506	0.0030	0.0012
28	-24	27	-0.0306	-19	23	-0.0252	0.0054	-0.0018
30	64	-58	0.0732	66	-62	0.0768	0.0036	-0.0072
32	105	-97	0.1212	103	-99	0.1212	0.0000	-0.0108
34	55	-55	0.0660	60	-52	0.0672	0.0012	-0.0108
36	-13	12	-0.0150	-11	16	-0.0162	-0.0012	-0.0120
38	-75	78	-0.0918	-74	80	-0.0924	-0.0006	-0.0108
40	-110	113	-0.1338	-109	116	-0.1350	-0.0012	-0.0102
42	-100	103	-0.1218	-101	103	-0.1224	-0.0006	-0.0090
44	-62	65	-0.0762	-60	64	-0.0744	0.0018	-0.0084
46	-149	156	-0.1830	-157	161	-0.1908	-0.0078	-0.0102
48	-280	285	-0.3390	-283	286	-0.3414	-0.0024	-0.0024
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 4/2/2010 9:41:34 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 4/5/2010 10:13:06 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	937	-925	1.1172	907	-897	1.0824	-0.0348	0.2766
6	574	-569	0.6858	820	-820	0.9840	0.2982	0.3114
8	105	-99	0.1224	152	-146	0.1788	0.0564	0.0132
10	-33	39	-0.0432	-30	36	-0.0396	0.0036	-0.0432
12	-38	43	-0.0486	-52	54	-0.0636	-0.0150	-0.0468
14	-17	20	-0.0222	-20	27	-0.0282	-0.0060	-0.0318
16	-81	85	-0.0996	-84	90	-0.1044	-0.0048	-0.0258
18	-165	167	-0.1992	-170	176	-0.2076	-0.0084	-0.0210
20	-235	240	-0.2850	-241	247	-0.2928	-0.0078	-0.0126
22	-226	230	-0.2736	-229	233	-0.2772	-0.0036	-0.0048
24	-177	181	-0.2148	-176	182	-0.2148	0.0000	-0.0012
26	-125	131	-0.1536	-123	128	-0.1506	0.0030	-0.0012
28	-24	27	-0.0306	-19	23	-0.0252	0.0054	-0.0042
30	64	-58	0.0732	67	-62	0.0774	0.0042	-0.0096
32	105	-97	0.1212	103	-98	0.1206	-0.0006	-0.0138
34	55	-55	0.0660	60	-51	0.0666	0.0006	-0.0132
36	-13	12	-0.0150	-12	17	-0.0174	-0.0024	-0.0138
38	-75	78	-0.0918	-75	80	-0.0930	-0.0012	-0.0114
40	-110	113	-0.1338	-110	116	-0.1356	-0.0018	-0.0102
42	-100	103	-0.1218	-101	104	-0.1230	-0.0012	-0.0084
44	-62	65	-0.0762	-60	64	-0.0744	0.0018	-0.0072
46	-149	156	-0.1830	-156	161	-0.1902	-0.0072	-0.0090
48	-280	285	-0.3390	-283	285	-0.3408	-0.0018	-0.0018
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 1/27/2010 10:17:50 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 4/5/2010 10:13:16 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	481	-430	0.5466	393	-415	0.4848	-0.0618	0.0216
6	406	-371	0.4662	460	-471	0.5586	0.0924	0.0834
8	265	-201	0.2796	222	-244	0.2796	0.0000	-0.0090
10	239	-178	0.2502	182	-208	0.2340	-0.0162	-0.0090
12	318	-282	0.3600	289	-305	0.3564	-0.0036	0.0072
14	336	-279	0.3690	296	-315	0.3666	-0.0024	0.0108
16	242	-185	0.2562	198	-213	0.2466	-0.0096	0.0132
18	145	-82	0.1362	92	-116	0.1248	-0.0114	0.0228
20	102	-39	0.0846	59	-85	0.0864	0.0018	0.0342
22	139	-93	0.1392	110	-127	0.1422	0.0030	0.0324
24	206	-153	0.2154	174	-193	0.2202	0.0048	0.0294
26	327	-270	0.3582	297	-314	0.3666	0.0084	0.0246
28	435	-375	0.4860	401	-420	0.4926	0.0066	0.0162
30	507	-450	0.5742	465	-490	0.5730	-0.0012	0.0096
32	565	-518	0.6498	521	-550	0.6426	-0.0072	0.0108
34	529	-476	0.6030	486	-506	0.5952	-0.0078	0.0180
36	448	-395	0.5058	406	-425	0.4986	-0.0072	0.0258
38	330	-277	0.3642	289	-305	0.3564	-0.0078	0.0330
40	230	-173	0.2418	188	-216	0.2424	0.0006	0.0408
42	315	-277	0.3552	306	-301	0.3642	0.0090	0.0402
44	482	-430	0.5472	460	-471	0.5586	0.0114	0.0312
46	610	-550	0.6960	579	-601	0.7080	0.0120	0.0198
48	711	-652	0.8178	672	-704	0.8256	0.0078	0.0078
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 2/19/2010 7:29:07 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 4/5/2010 10:13:16 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	481	-430	0.5466	406	-433	0.5034	-0.0432	0.1062
6	406	-371	0.4662	478	-482	0.5760	0.1098	0.1494
8	265	-201	0.2796	230	-250	0.2880	0.0084	0.0396
10	239	-178	0.2502	187	-210	0.2382	-0.0120	0.0312
12	318	-282	0.3600	295	-308	0.3618	0.0018	0.0432
14	336	-279	0.3690	298	-317	0.3690	0.0000	0.0414
16	242	-185	0.2562	200	-214	0.2484	-0.0078	0.0414
18	145	-82	0.1362	94	-118	0.1272	-0.0090	0.0492
20	102	-39	0.0846	63	-87	0.0900	0.0054	0.0582
22	139	-93	0.1392	115	-128	0.1458	0.0066	0.0528
24	206	-153	0.2154	182	-195	0.2262	0.0108	0.0462
26	327	-270	0.3582	301	-316	0.3702	0.0120	0.0354
28	435	-375	0.4860	401	-420	0.4926	0.0066	0.0234
30	507	-450	0.5742	467	-491	0.5748	0.0006	0.0168
32	565	-518	0.6498	522	-549	0.6426	-0.0072	0.0162
34	529	-476	0.6030	485	-505	0.5940	-0.0090	0.0234
36	448	-395	0.5058	407	-422	0.4974	-0.0084	0.0324
38	330	-277	0.3642	292	-304	0.3576	-0.0066	0.0408
40	230	-173	0.2418	191	-215	0.2436	0.0018	0.0474
42	315	-277	0.3552	305	-302	0.3642	0.0090	0.0456
44	482	-430	0.5472	466	-472	0.5628	0.0156	0.0366
46	610	-550	0.6960	580	-600	0.7080	0.0120	0.0210
48	711	-652	0.8178	674	-704	0.8268	0.0090	0.0090
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 3/11/2010 7:53:58 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 4/5/2010 10:13:16 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	481	-430	0.5466	407	-424	0.4986	-0.0480	0.1182
6	406	-371	0.4662	491	-496	0.5922	0.1260	0.1662
8	265	-201	0.2796	234	-246	0.2880	0.0084	0.0402
10	239	-178	0.2502	189	-210	0.2394	-0.0108	0.0318
12	318	-282	0.3600	295	-307	0.3612	0.0012	0.0426
14	336	-279	0.3690	300	-315	0.3690	0.0000	0.0414
16	242	-185	0.2562	203	-213	0.2496	-0.0066	0.0414
18	145	-82	0.1362	97	-116	0.1278	-0.0084	0.0480
20	102	-39	0.0846	64	-85	0.0894	0.0048	0.0564
22	139	-93	0.1392	115	-127	0.1452	0.0060	0.0516
24	206	-153	0.2154	180	-192	0.2232	0.0078	0.0456
26	327	-270	0.3582	303	-314	0.3702	0.0120	0.0378
28	435	-375	0.4860	403	-418	0.4926	0.0066	0.0258
30	507	-450	0.5742	468	-487	0.5730	-0.0012	0.0192
32	565	-518	0.6498	525	-549	0.6444	-0.0054	0.0204
34	529	-476	0.6030	490	-505	0.5970	-0.0060	0.0258
36	448	-395	0.5058	410	-423	0.4998	-0.0060	0.0318
38	330	-277	0.3642	294	-303	0.3582	-0.0060	0.0378
40	230	-173	0.2418	193	-213	0.2436	0.0018	0.0438
42	315	-277	0.3552	308	-299	0.3642	0.0090	0.0420
44	482	-430	0.5472	463	-469	0.5592	0.0120	0.0330
46	610	-550	0.6960	583	-597	0.7080	0.0120	0.0210
48	711	-652	0.8178	677	-701	0.8268	0.0090	0.0090
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

CURRENT SURVEY 3/30/2010 9:11:31 AM

INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 4/5/2010 10:13:16 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	481	-430	0.5466	405	-428	0.4998	-0.0468	0.1170
6	406	-371	0.4662	482	-482	0.5784	0.1122	0.1638
8	265	-201	0.2796	228	-248	0.2856	0.0060	0.0516
10	239	-178	0.2502	189	-206	0.2370	-0.0132	0.0456
12	318	-282	0.3600	297	-305	0.3612	0.0012	0.0588
14	336	-279	0.3690	300	-315	0.3690	0.0000	0.0576
16	242	-185	0.2562	201	-212	0.2478	-0.0084	0.0576
18	145	-82	0.1362	95	-117	0.1272	-0.0090	0.0660
20	102	-39	0.0846	65	-86	0.0906	0.0060	0.0750
22	139	-93	0.1392	116	-128	0.1464	0.0072	0.0690
24	206	-153	0.2154	192	-194	0.2316	0.0162	0.0618
26	327	-270	0.3582	304	-316	0.3720	0.0138	0.0456
28	435	-375	0.4860	402	-419	0.4926	0.0066	0.0318
30	507	-450	0.5742	470	-489	0.5754	0.0012	0.0252
32	565	-518	0.6498	524	-548	0.6432	-0.0066	0.0240
34	529	-476	0.6030	488	-504	0.5952	-0.0078	0.0306
36	448	-395	0.5058	408	-419	0.4962	-0.0096	0.0384
38	330	-277	0.3642	292	-303	0.3570	-0.0072	0.0480
40	230	-173	0.2418	193	-213	0.2436	0.0018	0.0552
42	315	-277	0.3552	309	-302	0.3666	0.0114	0.0534
44	482	-430	0.5472	473	-472	0.5670	0.0198	0.0420
46	610	-550	0.6960	583	-597	0.7080	0.0120	0.0222
48	711	-652	0.8178	677	-703	0.8280	0.0102	0.0102
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-49

DESCRIPTION

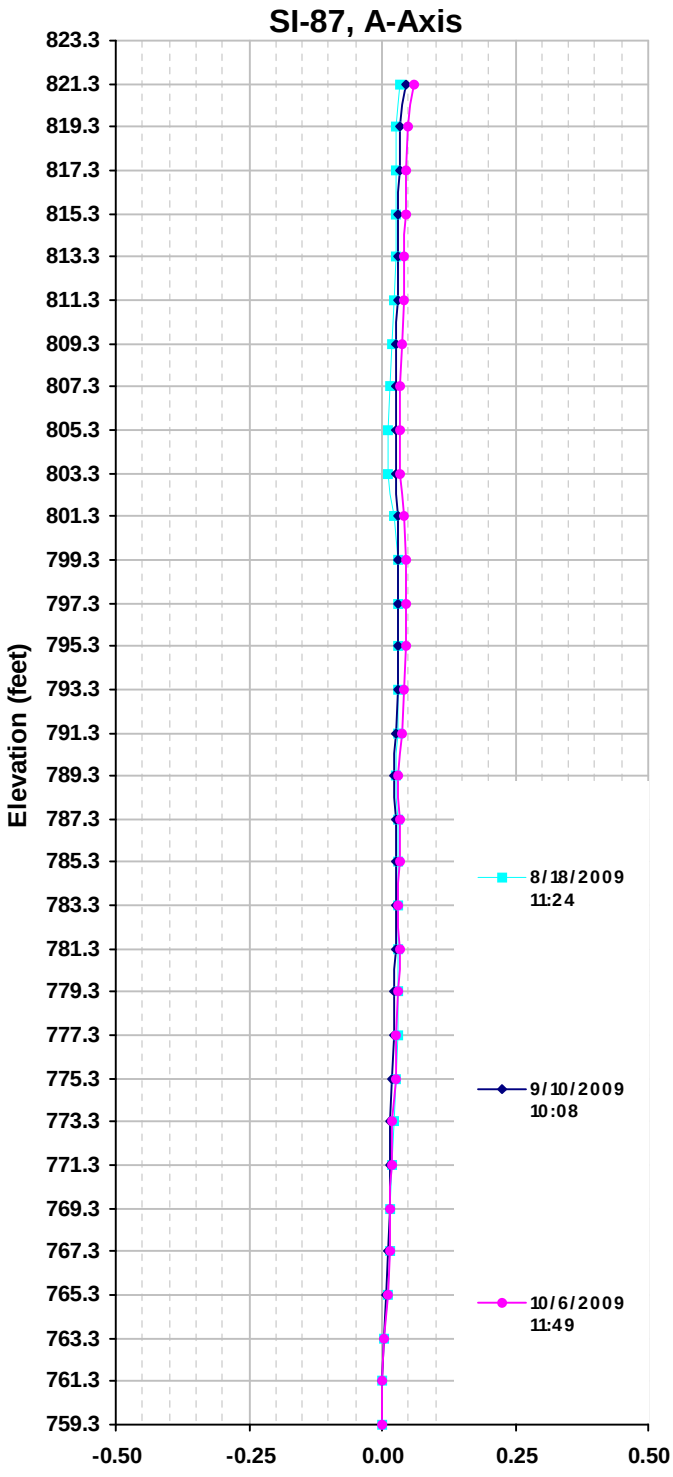
CURRENT SURVEY 4/2/2010 9:41:34 AM

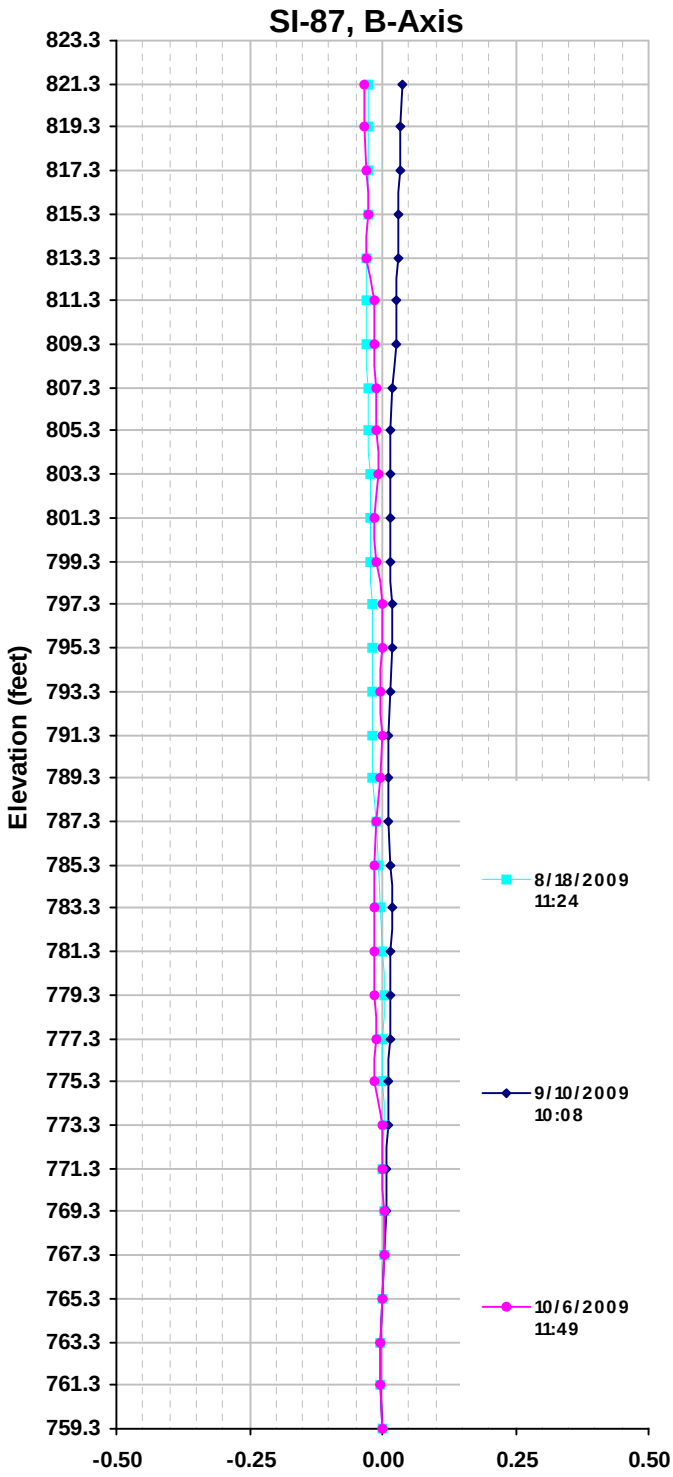
INITIAL SURVEY 8/11/2009 12:22:56 PM

DATE PRINTED 4/5/2010 10:13:16 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	481	-430	0.5466	400	-426	0.4956	-0.0510	0.0984
6	406	-371	0.4662	477	-482	0.5754	0.1092	0.1494
8	265	-201	0.2796	227	-249	0.2856	0.0060	0.0402
10	239	-178	0.2502	185	-206	0.2346	-0.0156	0.0342
12	318	-282	0.3600	298	-305	0.3618	0.0018	0.0498
14	336	-279	0.3690	298	-316	0.3684	-0.0006	0.0480
16	242	-185	0.2562	199	-215	0.2484	-0.0078	0.0486
18	145	-82	0.1362	94	-118	0.1272	-0.0090	0.0564
20	102	-39	0.0846	64	-86	0.0900	0.0054	0.0654
22	139	-93	0.1392	115	-129	0.1464	0.0072	0.0600
24	206	-153	0.2154	185	-195	0.2280	0.0126	0.0528
26	327	-270	0.3582	301	-316	0.3702	0.0120	0.0402
28	435	-375	0.4860	399	-421	0.4920	0.0060	0.0282
30	507	-450	0.5742	467	-490	0.5742	0.0000	0.0222
32	565	-518	0.6498	524	-547	0.6426	-0.0072	0.0222
34	529	-476	0.6030	486	-505	0.5946	-0.0084	0.0294
36	448	-395	0.5058	406	-422	0.4968	-0.0090	0.0378
38	330	-277	0.3642	290	-304	0.3564	-0.0078	0.0468
40	230	-173	0.2418	193	-214	0.2442	0.0024	0.0546
42	315	-277	0.3552	308	-303	0.3666	0.0114	0.0522
44	482	-430	0.5472	468	-473	0.5646	0.0174	0.0408
46	610	-550	0.6960	582	-600	0.7092	0.0132	0.0234
48	711	-652	0.8178	676	-704	0.8280	0.0102	0.0102
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000





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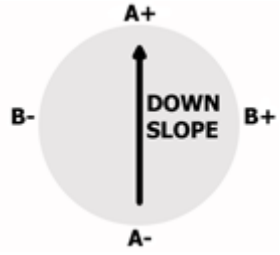


Bull Run Fossil Plant
Bull Run
Clinton, TN
172679015
10/7/2009

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 8/18/2009 11:24:47 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 10/7/2009 9:24:42 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-6	8	-0.0084	5	7	-0.0012	0.0072	0.0336
6	-87	95	-0.1092	-83	99	-0.1092	0.0000	0.0264
8	-141	146	-0.1722	-136	149	-0.1710	0.0012	0.0264
10	-157	160	-0.1902	-152	165	-0.1902	0.0000	0.0252
12	-103	104	-0.1242	-95	106	-0.1206	0.0036	0.0252
14	31	-30	0.0366	38	-29	0.0402	0.0036	0.0216
16	146	-143	0.1734	154	-142	0.1776	0.0042	0.0180
18	281	-283	0.3384	286	-281	0.3402	0.0018	0.0138
20	377	-373	0.4500	381	-369	0.4500	0.0000	0.0120
22	259	-257	0.3096	251	-245	0.2976	-0.0120	0.0120
24	68	-64	0.0792	67	-58	0.0750	-0.0042	0.0240
26	-73	76	-0.0894	-71	82	-0.0918	-0.0024	0.0282
28	-163	165	-0.1968	-160	169	-0.1974	-0.0006	0.0306
30	-161	161	-0.1932	-155	165	-0.1920	0.0012	0.0312
32	-155	153	-0.1848	-149	156	-0.1830	0.0018	0.0300
34	-90	91	-0.1086	-83	93	-0.1056	0.0030	0.0282
36	-134	137	-0.1626	-137	145	-0.1692	-0.0066	0.0252
38	-251	251	-0.3012	-246	256	-0.3012	0.0000	0.0318
40	-246	245	-0.2946	-239	249	-0.2928	0.0018	0.0318
42	-265	265	-0.3180	-262	269	-0.3186	-0.0006	0.0300
44	-293	295	-0.3528	-287	298	-0.3510	0.0018	0.0306
46	-323	327	-0.3900	-320	331	-0.3906	-0.0006	0.0288
48	-316	318	-0.3804	-309	320	-0.3774	0.0030	0.0294
50	-196	194	-0.2340	-186	195	-0.2286	0.0054	0.0264
52	-68	66	-0.0804	-61	69	-0.0780	0.0024	0.0210
54	1	-1	0.0012	8	2	0.0036	0.0024	0.0186
56	17	-13	0.0180	21	-9	0.0180	0.0000	0.0162
58	54	-51	0.0630	63	-53	0.0696	0.0066	0.0162
60	181	-183	0.2184	190	-181	0.2226	0.0042	0.0096
62	301	-302	0.3618	309	-301	0.3660	0.0042	0.0054
64	342	-342	0.4104	348	-338	0.4116	0.0012	0.0012
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 9/10/2009 10:08:28 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 10/7/2009 9:24:42 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-6	8	-0.0084	5	5	0.0000	0.0084	0.0438
6	-87	95	-0.1092	-82	97	-0.1074	0.0018	0.0354
8	-141	146	-0.1722	-135	148	-0.1698	0.0024	0.0336
10	-157	160	-0.1902	-151	164	-0.1890	0.0012	0.0312
12	-103	104	-0.1242	-98	108	-0.1236	0.0006	0.0300
14	31	-30	0.0366	37	-27	0.0384	0.0018	0.0294
16	146	-143	0.1734	153	-141	0.1764	0.0030	0.0276
18	281	-283	0.3384	286	-278	0.3384	0.0000	0.0246
20	377	-373	0.4500	382	-368	0.4500	0.0000	0.0246
22	259	-257	0.3096	257	-249	0.3036	-0.0060	0.0246
24	68	-64	0.0792	72	-59	0.0786	-0.0006	0.0306
26	-73	76	-0.0894	-69	81	-0.0900	-0.0006	0.0312
28	-163	165	-0.1968	-159	169	-0.1968	0.0000	0.0318
30	-161	161	-0.1932	-154	164	-0.1908	0.0024	0.0318
32	-155	153	-0.1848	-147	155	-0.1812	0.0036	0.0294
34	-90	91	-0.1086	-81	93	-0.1044	0.0042	0.0258
36	-134	137	-0.1626	-134	144	-0.1668	-0.0042	0.0216
38	-251	251	-0.3012	-246	257	-0.3018	-0.0006	0.0258
40	-246	245	-0.2946	-239	249	-0.2928	0.0018	0.0264
42	-265	265	-0.3180	-261	269	-0.3180	0.0000	0.0246
44	-293	295	-0.3528	-286	298	-0.3504	0.0024	0.0246
46	-323	327	-0.3900	-318	330	-0.3888	0.0012	0.0222
48	-316	318	-0.3804	-311	321	-0.3792	0.0012	0.0210
50	-196	194	-0.2340	-189	196	-0.2310	0.0030	0.0198
52	-68	66	-0.0804	-62	69	-0.0786	0.0018	0.0168
54	1	-1	0.0012	7	2	0.0030	0.0018	0.0150
56	17	-13	0.0180	22	-9	0.0186	0.0006	0.0132
58	54	-51	0.0630	61	-51	0.0672	0.0042	0.0126
60	181	-183	0.2184	189	-181	0.2220	0.0036	0.0084
62	301	-302	0.3618	309	-299	0.3648	0.0030	0.0048
64	342	-342	0.4104	349	-338	0.4122	0.0018	0.0018
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 10/6/2009 11:49:03 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 10/7/2009 9:24:42 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-6	8	-0.0084	6	3	0.0018	0.0102	0.0594
6	-87	95	-0.1092	-83	94	-0.1062	0.0030	0.0492
8	-141	146	-0.1722	-137	146	-0.1698	0.0024	0.0462
10	-157	160	-0.1902	-152	163	-0.1890	0.0012	0.0438
12	-103	104	-0.1242	-97	106	-0.1218	0.0024	0.0426
14	31	-30	0.0366	37	-28	0.0390	0.0024	0.0402
16	146	-143	0.1734	155	-138	0.1758	0.0024	0.0378
18	281	-283	0.3384	287	-281	0.3408	0.0024	0.0354
20	377	-373	0.4500	382	-369	0.4506	0.0006	0.0330
22	259	-257	0.3096	253	-248	0.3006	-0.0090	0.0324
24	68	-64	0.0792	67	-59	0.0756	-0.0036	0.0414
26	-73	76	-0.0894	-70	82	-0.0912	-0.0018	0.0450
28	-163	165	-0.1968	-159	167	-0.1956	0.0012	0.0468
30	-161	161	-0.1932	-153	162	-0.1890	0.0042	0.0456
32	-155	153	-0.1848	-145	154	-0.1794	0.0054	0.0414
34	-90	91	-0.1086	-81	90	-0.1026	0.0060	0.0360
36	-134	137	-0.1626	-137	142	-0.1674	-0.0048	0.0300
38	-251	251	-0.3012	-247	256	-0.3018	-0.0006	0.0348
40	-246	245	-0.2946	-238	246	-0.2904	0.0042	0.0354
42	-265	265	-0.3180	-262	270	-0.3192	-0.0012	0.0312
44	-293	295	-0.3528	-285	297	-0.3492	0.0036	0.0324
46	-323	327	-0.3900	-318	329	-0.3882	0.0018	0.0288
48	-316	318	-0.3804	-311	319	-0.3780	0.0024	0.0270
50	-196	194	-0.2340	-189	194	-0.2298	0.0042	0.0246
52	-68	66	-0.0804	-62	67	-0.0774	0.0030	0.0204
54	1	-1	0.0012	7	1	0.0036	0.0024	0.0174
56	17	-13	0.0180	21	-10	0.0186	0.0006	0.0150
58	54	-51	0.0630	61	-52	0.0678	0.0048	0.0144
60	181	-183	0.2184	191	-182	0.2238	0.0054	0.0096
62	301	-302	0.3618	308	-302	0.3660	0.0042	0.0042
64	342	-342	0.4104	346	-338	0.4104	0.0000	0.0000
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 8/18/2009 11:24:47 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 10/7/2009 9:24:51 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-622	687	-0.7854	-621	686	-0.7842	0.0012	-0.0246
6	-578	613	-0.7146	-579	611	-0.7140	0.0006	-0.0258
8	-390	426	-0.4896	-390	425	-0.4890	0.0006	-0.0264
10	-153	189	-0.2052	-153	186	-0.2034	0.0018	-0.0270
12	49	-11	0.0360	50	-13	0.0378	0.0018	-0.0288
14	247	-190	0.2622	243	-190	0.2598	-0.0024	-0.0306
16	385	-347	0.4392	375	-351	0.4356	-0.0036	-0.0282
18	705	-667	0.8232	706	-671	0.8262	0.0030	-0.0246
20	910	-857	1.0602	903	-858	1.0566	-0.0036	-0.0276
22	791	-759	0.9300	789	-758	0.9282	-0.0018	-0.0240
24	582	-546	0.6768	577	-550	0.6762	-0.0006	-0.0222
26	283	-247	0.3180	276	-248	0.3144	-0.0036	-0.0216
28	71	-11	0.0492	68	-15	0.0498	0.0006	-0.0180
30	72	-22	0.0564	73	-22	0.0570	0.0006	-0.0186
32	161	-103	0.1584	162	-103	0.1590	0.0006	-0.0192
34	131	-67	0.1188	127	-67	0.1164	-0.0024	-0.0198
36	59	-16	0.0450	51	-14	0.0390	-0.0060	-0.0174
38	-80	117	-0.1182	-87	119	-0.1236	-0.0054	-0.0114
40	-242	294	-0.3216	-245	297	-0.3252	-0.0036	-0.0060
42	-335	393	-0.4368	-335	394	-0.4374	-0.0006	-0.0024
44	-380	442	-0.4932	-385	445	-0.4980	-0.0048	-0.0018
46	-465	518	-0.5898	-466	515	-0.5886	0.0012	0.0030
48	-449	513	-0.5772	-450	512	-0.5772	0.0000	0.0018
50	-416	477	-0.5358	-419	475	-0.5364	-0.0006	0.0018
52	-377	437	-0.4884	-377	434	-0.4866	0.0018	0.0024
54	-338	405	-0.4458	-340	406	-0.4476	-0.0018	0.0006
56	-362	412	-0.4644	-363	411	-0.4644	0.0000	0.0024
58	-289	331	-0.3720	-289	327	-0.3696	0.0024	0.0024
60	-142	193	-0.2010	-140	190	-0.1980	0.0030	0.0000
62	-53	111	-0.0984	-55	110	-0.0990	-0.0006	-0.0030
64	-82	143	-0.1350	-87	142	-0.1374	-0.0024	-0.0024
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 9/10/2009 10:08:28 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 10/7/2009 9:24:51 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-622	687	-0.7854	-619	685	-0.7824	0.0030	0.0366
6	-578	613	-0.7146	-576	613	-0.7134	0.0012	0.0336
8	-390	426	-0.4896	-389	425	-0.4884	0.0012	0.0324
10	-153	189	-0.2052	-152	187	-0.2034	0.0018	0.0312
12	49	-11	0.0360	52	-12	0.0384	0.0024	0.0294
14	247	-190	0.2622	250	-190	0.2640	0.0018	0.0270
16	385	-347	0.4392	391	-350	0.4446	0.0054	0.0252
18	705	-667	0.8232	709	-673	0.8292	0.0060	0.0198
20	910	-857	1.0602	910	-858	1.0608	0.0006	0.0138
22	791	-759	0.9300	793	-757	0.9300	0.0000	0.0132
24	582	-546	0.6768	581	-544	0.6750	-0.0018	0.0132
26	283	-247	0.3180	281	-243	0.3144	-0.0036	0.0150
28	71	-11	0.0492	73	-11	0.0504	0.0012	0.0186
30	72	-22	0.0564	77	-22	0.0594	0.0030	0.0174
32	161	-103	0.1584	166	-103	0.1614	0.0030	0.0144
34	131	-67	0.1188	132	-66	0.1188	0.0000	0.0114
36	59	-16	0.0450	61	-15	0.0456	0.0006	0.0114
38	-80	117	-0.1182	-85	121	-0.1236	-0.0054	0.0108
40	-242	294	-0.3216	-245	294	-0.3234	-0.0018	0.0162
42	-335	393	-0.4368	-331	393	-0.4344	0.0024	0.0180
44	-380	442	-0.4932	-378	445	-0.4938	-0.0006	0.0156
46	-465	518	-0.5898	-461	518	-0.5874	0.0024	0.0162
48	-449	513	-0.5772	-447	511	-0.5748	0.0024	0.0138
50	-416	477	-0.5358	-413	477	-0.5340	0.0018	0.0114
52	-377	437	-0.4884	-373	436	-0.4854	0.0030	0.0096
54	-338	405	-0.4458	-337	405	-0.4452	0.0006	0.0066
56	-362	412	-0.4644	-359	412	-0.4626	0.0018	0.0060
58	-289	331	-0.3720	-285	329	-0.3684	0.0036	0.0042
60	-142	193	-0.2010	-138	191	-0.1974	0.0036	0.0006
62	-53	111	-0.0984	-50	111	-0.0966	0.0018	-0.0030
64	-82	143	-0.1350	-89	144	-0.1398	-0.0048	-0.0048
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

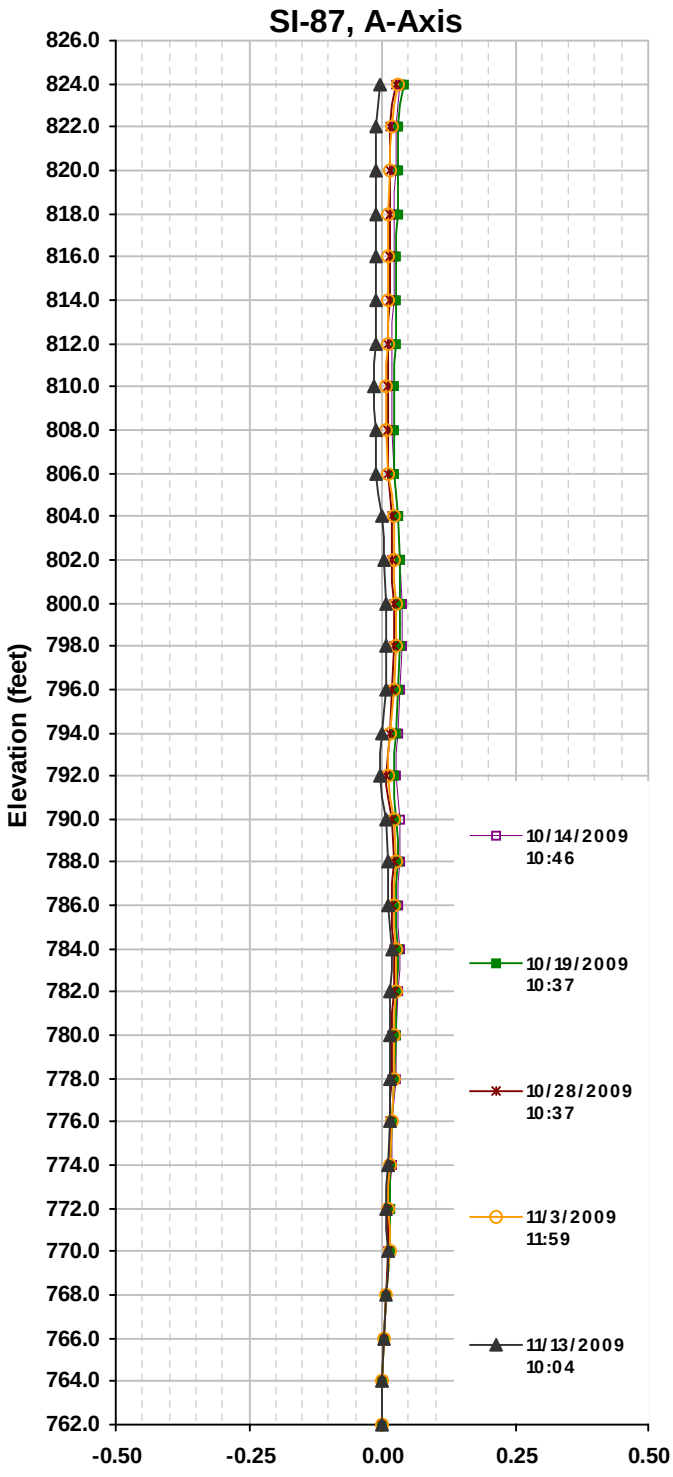
CURRENT SURVEY 10/6/2009 11:49:03 AM

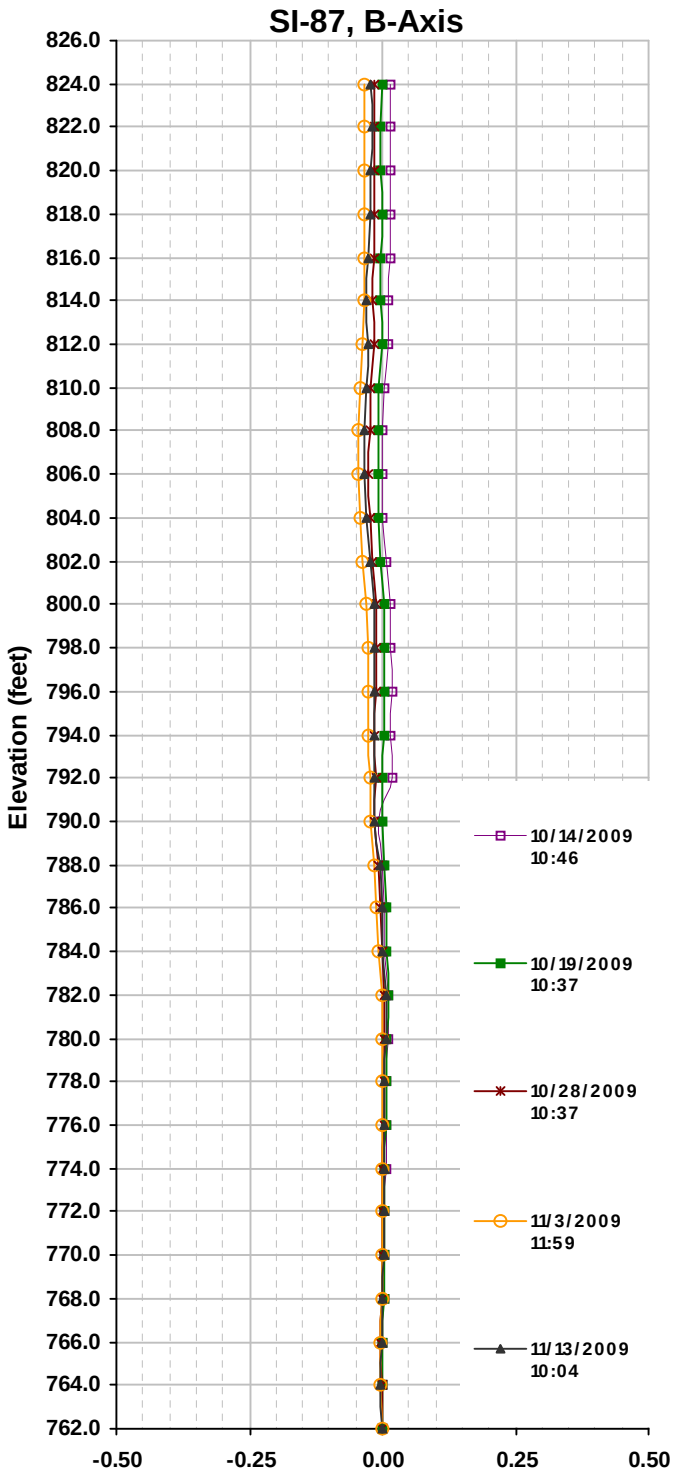
INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 10/7/2009 9:24:51 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-622	687	-0.7854	-621	688	-0.7854	0.0000	-0.0324
6	-578	613	-0.7146	-580	613	-0.7158	-0.0012	-0.0324
8	-390	426	-0.4896	-390	432	-0.4932	-0.0036	-0.0312
10	-153	189	-0.2052	-150	190	-0.2040	0.0012	-0.0276
12	49	-11	0.0360	26	-8	0.0204	-0.0156	-0.0288
14	247	-190	0.2622	246	-195	0.2646	0.0024	-0.0132
16	385	-347	0.4392	389	-333	0.4332	-0.0060	-0.0156
18	705	-667	0.8232	703	-669	0.8232	0.0000	-0.0096
20	910	-857	1.0602	907	-859	1.0596	-0.0006	-0.0096
22	791	-759	0.9300	793	-766	0.9354	0.0054	-0.0090
24	582	-546	0.6768	578	-542	0.6720	-0.0048	-0.0144
26	283	-247	0.3180	278	-239	0.3102	-0.0078	-0.0096
28	71	-11	0.0492	70	-10	0.0480	-0.0012	-0.0018
30	72	-22	0.0564	77	-22	0.0594	0.0030	-0.0006
32	161	-103	0.1584	154	-107	0.1566	-0.0018	-0.0036
34	131	-67	0.1188	130	-69	0.1194	0.0006	-0.0018
36	59	-16	0.0450	59	-31	0.0540	0.0090	-0.0024
38	-80	117	-0.1182	-83	105	-0.1128	0.0054	-0.0114
40	-242	294	-0.3216	-241	300	-0.3246	-0.0030	-0.0168
42	-335	393	-0.4368	-336	392	-0.4368	0.0000	-0.0138
44	-380	442	-0.4932	-385	437	-0.4932	0.0000	-0.0138
46	-465	518	-0.5898	-468	520	-0.5928	-0.0030	-0.0138
48	-449	513	-0.5772	-448	509	-0.5742	0.0030	-0.0108
50	-416	477	-0.5358	-441	477	-0.5508	-0.0150	-0.0138
52	-377	437	-0.4884	-381	434	-0.4890	-0.0006	0.0012
54	-338	405	-0.4458	-338	406	-0.4464	-0.0006	0.0018
56	-362	412	-0.4644	-363	411	-0.4644	0.0000	0.0024
58	-289	331	-0.3720	-291	328	-0.3714	0.0006	0.0024
60	-142	193	-0.2010	-138	190	-0.1968	0.0042	0.0018
62	-53	111	-0.0984	-55	105	-0.0960	0.0024	-0.0024
64	-82	143	-0.1350	-90	143	-0.1398	-0.0048	-0.0048
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000





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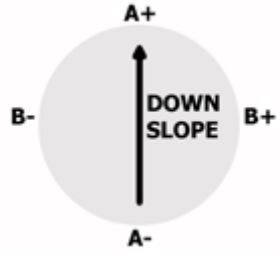


Bull Run Fossil Plant
Bull Run
Clinton, TN
172679015
11/16/2009

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 10/14/2009 10:46:31 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 11/16/2009 8:48:24 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-6	8	-0.0084	10	9	0.0006	0.0090	0.0354
6	-87	95	-0.1092	-79	101	-0.1080	0.0012	0.0264
8	-141	146	-0.1722	-133	149	-0.1692	0.0030	0.0252
10	-157	160	-0.1902	-148	167	-0.1890	0.0012	0.0222
12	-103	104	-0.1242	-94	113	-0.1242	0.0000	0.0210
14	31	-30	0.0366	41	-22	0.0378	0.0012	0.0210
16	146	-143	0.1734	156	-135	0.1746	0.0012	0.0198
18	281	-283	0.3384	289	-273	0.3372	-0.0012	0.0186
20	377	-373	0.4500	383	-364	0.4482	-0.0018	0.0198
22	259	-257	0.3096	256	-243	0.2994	-0.0102	0.0216
24	68	-64	0.0792	72	-54	0.0756	-0.0036	0.0318
26	-73	76	-0.0894	-67	86	-0.0918	-0.0024	0.0354
28	-163	165	-0.1968	-155	173	-0.1968	0.0000	0.0378
30	-161	161	-0.1932	-149	167	-0.1896	0.0036	0.0378
32	-155	153	-0.1848	-142	159	-0.1806	0.0042	0.0342
34	-90	91	-0.1086	-77	95	-0.1032	0.0054	0.0300
36	-134	137	-0.1626	-133	151	-0.1704	-0.0078	0.0246
38	-251	251	-0.3012	-243	262	-0.3030	-0.0018	0.0324
40	-246	245	-0.2946	-233	253	-0.2916	0.0030	0.0342
42	-265	265	-0.3180	-257	275	-0.3192	-0.0012	0.0312
44	-293	295	-0.3528	-281	301	-0.3492	0.0036	0.0324
46	-323	327	-0.3900	-314	333	-0.3882	0.0018	0.0288
48	-316	318	-0.3804	-306	324	-0.3780	0.0024	0.0270
50	-196	194	-0.2340	-183	200	-0.2298	0.0042	0.0246
52	-68	66	-0.0804	-56	73	-0.0774	0.0030	0.0204
54	1	-1	0.0012	12	6	0.0036	0.0024	0.0174
56	17	-13	0.0180	25	-5	0.0180	0.0000	0.0150
58	54	-51	0.0630	65	-50	0.0690	0.0060	0.0150
60	181	-183	0.2184	195	-178	0.2238	0.0054	0.0090
62	301	-302	0.3618	313	-296	0.3654	0.0036	0.0036
64	342	-342	0.4104	351	-333	0.4104	0.0000	0.0000
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 10/19/2009 10:37:11 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 11/16/2009 8:48:24 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-6	8	-0.0084	9	7	0.0012	0.0096	0.0414
6	-87	95	-0.1092	-80	99	-0.1074	0.0018	0.0318
8	-141	146	-0.1722	-134	150	-0.1704	0.0018	0.0300
10	-157	160	-0.1902	-150	166	-0.1896	0.0006	0.0282
12	-103	104	-0.1242	-96	109	-0.1230	0.0012	0.0276
14	31	-30	0.0366	39	-25	0.0384	0.0018	0.0264
16	146	-143	0.1734	155	-138	0.1758	0.0024	0.0246
18	281	-283	0.3384	287	-276	0.3378	-0.0006	0.0222
20	377	-373	0.4500	383	-366	0.4494	-0.0006	0.0228
22	259	-257	0.3096	256	-246	0.3012	-0.0084	0.0234
24	68	-64	0.0792	71	-57	0.0768	-0.0024	0.0318
26	-73	76	-0.0894	-67	83	-0.0900	-0.0006	0.0342
28	-163	165	-0.1968	-157	171	-0.1968	0.0000	0.0348
30	-161	161	-0.1932	-151	165	-0.1896	0.0036	0.0348
32	-155	153	-0.1848	-143	158	-0.1806	0.0042	0.0312
34	-90	91	-0.1086	-78	93	-0.1026	0.0060	0.0270
36	-134	137	-0.1626	-134	148	-0.1692	-0.0066	0.0210
38	-251	251	-0.3012	-246	261	-0.3042	-0.0030	0.0276
40	-246	245	-0.2946	-236	250	-0.2916	0.0030	0.0306
42	-265	265	-0.3180	-260	273	-0.3198	-0.0018	0.0276
44	-293	295	-0.3528	-284	299	-0.3498	0.0030	0.0294
46	-323	327	-0.3900	-315	333	-0.3888	0.0012	0.0264
48	-316	318	-0.3804	-309	323	-0.3792	0.0012	0.0252
50	-196	194	-0.2340	-185	198	-0.2298	0.0042	0.0240
52	-68	66	-0.0804	-56	71	-0.0762	0.0042	0.0198
54	1	-1	0.0012	10	4	0.0036	0.0024	0.0156
56	17	-13	0.0180	24	-5	0.0174	-0.0006	0.0132
58	54	-51	0.0630	63	-50	0.0678	0.0048	0.0138
60	181	-183	0.2184	193	-179	0.2232	0.0048	0.0090
62	301	-302	0.3618	311	-298	0.3654	0.0036	0.0042
64	342	-342	0.4104	350	-335	0.4110	0.0006	0.0006
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 10/28/2009 10:37:56 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 11/16/2009 8:48:24 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-6	8	-0.0084	6	6	0.0000	0.0084	0.0246
6	-87	95	-0.1092	-82	99	-0.1086	0.0006	0.0162
8	-141	146	-0.1722	-136	149	-0.1710	0.0012	0.0156
10	-157	160	-0.1902	-152	165	-0.1902	0.0000	0.0144
12	-103	104	-0.1242	-97	110	-0.1242	0.0000	0.0144
14	31	-30	0.0366	38	-26	0.0384	0.0018	0.0144
16	146	-143	0.1734	153	-140	0.1758	0.0024	0.0126
18	281	-283	0.3384	286	-278	0.3384	0.0000	0.0102
20	377	-373	0.4500	382	-367	0.4494	-0.0006	0.0102
22	259	-257	0.3096	258	-246	0.3024	-0.0072	0.0108
24	68	-64	0.0792	71	-58	0.0774	-0.0018	0.0180
26	-73	76	-0.0894	-69	83	-0.0912	-0.0018	0.0198
28	-163	165	-0.1968	-158	170	-0.1968	0.0000	0.0216
30	-161	161	-0.1932	-154	163	-0.1902	0.0030	0.0216
32	-155	153	-0.1848	-145	157	-0.1812	0.0036	0.0186
34	-90	91	-0.1086	-80	91	-0.1026	0.0060	0.0150
36	-134	137	-0.1626	-137	148	-0.1710	-0.0084	0.0090
38	-251	251	-0.3012	-249	261	-0.3060	-0.0048	0.0174
40	-246	245	-0.2946	-239	249	-0.2928	0.0018	0.0222
42	-265	265	-0.3180	-262	273	-0.3210	-0.0030	0.0204
44	-293	295	-0.3528	-286	298	-0.3504	0.0024	0.0234
46	-323	327	-0.3900	-317	330	-0.3882	0.0018	0.0210
48	-316	318	-0.3804	-310	322	-0.3792	0.0012	0.0192
50	-196	194	-0.2340	-189	196	-0.2310	0.0030	0.0180
52	-68	66	-0.0804	-61	70	-0.0786	0.0018	0.0150
54	1	-1	0.0012	8	3	0.0030	0.0018	0.0132
56	17	-13	0.0180	22	-7	0.0174	-0.0006	0.0114
58	54	-51	0.0630	62	-51	0.0678	0.0048	0.0120
60	181	-183	0.2184	190	-181	0.2226	0.0042	0.0072
62	301	-302	0.3618	309	-299	0.3648	0.0030	0.0030
64	342	-342	0.4104	348	-336	0.4104	0.0000	0.0000
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 11/3/2009 11:59:40 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 11/16/2009 8:48:25 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-6	8	-0.0084	8	7	0.0006	0.0090	0.0288
6	-87	95	-0.1092	-81	94	-0.1050	0.0042	0.0198
8	-141	146	-0.1722	-134	147	-0.1686	0.0036	0.0156
10	-157	160	-0.1902	-150	166	-0.1896	0.0006	0.0120
12	-103	104	-0.1242	-95	111	-0.1236	0.0006	0.0114
14	31	-30	0.0366	40	-23	0.0378	0.0012	0.0108
16	146	-143	0.1734	155	-138	0.1758	0.0024	0.0096
18	281	-283	0.3384	287	-274	0.3366	-0.0018	0.0072
20	377	-373	0.4500	383	-365	0.4488	-0.0012	0.0090
22	259	-257	0.3096	254	-243	0.2982	-0.0114	0.0102
24	68	-64	0.0792	71	-57	0.0768	-0.0024	0.0216
26	-73	76	-0.0894	-67	85	-0.0912	-0.0018	0.0240
28	-163	165	-0.1968	-157	171	-0.1968	0.0000	0.0258
30	-161	161	-0.1932	-151	166	-0.1902	0.0030	0.0258
32	-155	153	-0.1848	-142	155	-0.1782	0.0066	0.0228
34	-90	91	-0.1086	-77	94	-0.1026	0.0060	0.0162
36	-134	137	-0.1626	-137	152	-0.1734	-0.0108	0.0102
38	-251	251	-0.3012	-248	262	-0.3060	-0.0048	0.0210
40	-246	245	-0.2946	-237	251	-0.2928	0.0018	0.0258
42	-265	265	-0.3180	-260	276	-0.3216	-0.0036	0.0240
44	-293	295	-0.3528	-283	301	-0.3504	0.0024	0.0276
46	-323	327	-0.3900	-315	333	-0.3888	0.0012	0.0252
48	-316	318	-0.3804	-307	323	-0.3780	0.0024	0.0240
50	-196	194	-0.2340	-186	198	-0.2304	0.0036	0.0216
52	-68	66	-0.0804	-58	71	-0.0774	0.0030	0.0180
54	1	-1	0.0012	11	5	0.0036	0.0024	0.0150
56	17	-13	0.0180	23	-6	0.0174	-0.0006	0.0126
58	54	-51	0.0630	63	-50	0.0678	0.0048	0.0132
60	181	-183	0.2184	193	-179	0.2232	0.0048	0.0084
62	301	-302	0.3618	312	-298	0.3660	0.0042	0.0036
64	342	-342	0.4104	350	-333	0.4098	-0.0006	-0.0006
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 11/13/2009 10:04:59 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 11/16/2009 8:48:25 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-6	8	-0.0084	6	7	-0.0006	0.0078	-0.0030
6	-87	95	-0.1092	-82	99	-0.1086	0.0006	-0.0108
8	-141	146	-0.1722	-137	150	-0.1722	0.0000	-0.0114
10	-157	160	-0.1902	-152	166	-0.1908	-0.0006	-0.0114
12	-103	104	-0.1242	-97	110	-0.1242	0.0000	-0.0108
14	31	-30	0.0366	38	-25	0.0378	0.0012	-0.0108
16	146	-143	0.1734	153	-139	0.1752	0.0018	-0.0120
18	281	-283	0.3384	285	-277	0.3372	-0.0012	-0.0138
20	377	-373	0.4500	381	-366	0.4482	-0.0018	-0.0126
22	259	-257	0.3096	252	-244	0.2976	-0.0120	-0.0108
24	68	-64	0.0792	69	-57	0.0756	-0.0036	0.0012
26	-73	76	-0.0894	-69	84	-0.0918	-0.0024	0.0048
28	-163	165	-0.1968	-159	171	-0.1980	-0.0012	0.0072
30	-161	161	-0.1932	-153	165	-0.1908	0.0024	0.0084
32	-155	153	-0.1848	-144	155	-0.1794	0.0054	0.0060
34	-90	91	-0.1086	-79	92	-0.1026	0.0060	0.0006
36	-134	137	-0.1626	-139	151	-0.1740	-0.0114	-0.0054
38	-251	251	-0.3012	-250	263	-0.3078	-0.0066	0.0060
40	-246	245	-0.2946	-239	251	-0.2940	0.0006	0.0126
42	-265	265	-0.3180	-264	275	-0.3234	-0.0054	0.0120
44	-293	295	-0.3528	-286	301	-0.3522	0.0006	0.0174
46	-323	327	-0.3900	-317	333	-0.3900	0.0000	0.0168
48	-316	318	-0.3804	-311	323	-0.3804	0.0000	0.0168
50	-196	194	-0.2340	-187	198	-0.2310	0.0030	0.0168
52	-68	66	-0.0804	-60	70	-0.0780	0.0024	0.0138
54	1	-1	0.0012	9	3	0.0036	0.0024	0.0114
56	17	-13	0.0180	22	-6	0.0168	-0.0012	0.0090
58	54	-51	0.0630	62	-50	0.0672	0.0042	0.0102
60	181	-183	0.2184	191	-179	0.2220	0.0036	0.0060
62	301	-302	0.3618	310	-298	0.3648	0.0030	0.0024
64	342	-342	0.4104	348	-335	0.4098	-0.0006	-0.0006
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 10/14/2009 10:46:31 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 11/16/2009 8:48:36 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-622	687	-0.7854	-623	687	-0.7860	-0.0006	0.0138
6	-578	613	-0.7146	-581	611	-0.7152	-0.0006	0.0144
8	-390	426	-0.4896	-393	425	-0.4908	-0.0012	0.0150
10	-153	189	-0.2052	-151	188	-0.2034	0.0018	0.0162
12	49	-11	0.0360	50	-14	0.0384	0.0024	0.0144
14	247	-190	0.2622	245	-195	0.2640	0.0018	0.0120
16	385	-347	0.4392	387	-353	0.4440	0.0048	0.0102
18	705	-667	0.8232	706	-675	0.8286	0.0054	0.0054
20	910	-857	1.0602	907	-861	1.0608	0.0006	0.0000
22	791	-759	0.9300	789	-757	0.9276	-0.0024	-0.0006
24	582	-546	0.6768	575	-544	0.6714	-0.0054	0.0018
26	283	-247	0.3180	275	-242	0.3102	-0.0078	0.0072
28	71	-11	0.0492	67	-12	0.0474	-0.0018	0.0150
30	72	-22	0.0564	73	-20	0.0558	-0.0006	0.0168
32	161	-103	0.1584	162	-104	0.1596	0.0012	0.0174
34	131	-67	0.1188	128	-67	0.1170	-0.0018	0.0162
36	59	-16	0.0450	55	-60	0.0690	0.0240	0.0180
38	-80	117	-0.1182	-87	122	-0.1254	-0.0072	-0.0060
40	-242	294	-0.3216	-245	296	-0.3246	-0.0030	0.0012
42	-335	393	-0.4368	-335	394	-0.4374	-0.0006	0.0042
44	-380	442	-0.4932	-385	445	-0.4980	-0.0048	0.0048
46	-465	518	-0.5898	-465	519	-0.5904	-0.0006	0.0096
48	-449	513	-0.5772	-449	511	-0.5760	0.0012	0.0102
50	-416	477	-0.5358	-417	475	-0.5352	0.0006	0.0090
52	-377	437	-0.4884	-375	435	-0.4860	0.0024	0.0084
54	-338	405	-0.4458	-339	403	-0.4452	0.0006	0.0060
56	-362	412	-0.4644	-362	411	-0.4638	0.0006	0.0054
58	-289	331	-0.3720	-287	330	-0.3702	0.0018	0.0048
60	-142	193	-0.2010	-138	189	-0.1962	0.0048	0.0030
62	-53	111	-0.0984	-53	111	-0.0984	0.0000	-0.0018
64	-82	143	-0.1350	-85	143	-0.1368	-0.0018	-0.0018
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 10/19/2009 10:37:11 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 11/16/2009 8:48:37 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-622	687	-0.7854	-619	687	-0.7836	0.0018	-0.0012
6	-578	613	-0.7146	-579	612	-0.7146	0.0000	-0.0030
8	-390	426	-0.4896	-392	426	-0.4908	-0.0012	-0.0030
10	-153	189	-0.2052	-151	188	-0.2034	0.0018	-0.0018
12	49	-11	0.0360	51	-11	0.0372	0.0012	-0.0036
14	247	-190	0.2622	246	-186	0.2592	-0.0030	-0.0048
16	385	-347	0.4392	389	-351	0.4440	0.0048	-0.0018
18	705	-667	0.8232	704	-672	0.8256	0.0024	-0.0066
20	910	-857	1.0602	909	-857	1.0596	-0.0006	-0.0090
22	791	-759	0.9300	793	-756	0.9294	-0.0006	-0.0084
24	582	-546	0.6768	576	-543	0.6714	-0.0054	-0.0078
26	283	-247	0.3180	278	-244	0.3132	-0.0048	-0.0024
28	71	-11	0.0492	72	-9	0.0486	-0.0006	0.0024
30	72	-22	0.0564	73	-18	0.0546	-0.0018	0.0030
32	161	-103	0.1584	165	-103	0.1608	0.0024	0.0048
34	131	-67	0.1188	133	-66	0.1194	0.0006	0.0024
36	59	-16	0.0450	63	-17	0.0480	0.0030	0.0018
38	-80	117	-0.1182	-82	123	-0.1230	-0.0048	-0.0012
40	-242	294	-0.3216	-244	297	-0.3246	-0.0030	0.0036
42	-335	393	-0.4368	-333	395	-0.4368	0.0000	0.0066
44	-380	442	-0.4932	-381	446	-0.4962	-0.0030	0.0066
46	-465	518	-0.5898	-462	519	-0.5886	0.0012	0.0096
48	-449	513	-0.5772	-447	514	-0.5766	0.0006	0.0084
50	-416	477	-0.5358	-414	477	-0.5346	0.0012	0.0078
52	-377	437	-0.4884	-370	437	-0.4842	0.0042	0.0066
54	-338	405	-0.4458	-337	406	-0.4458	0.0000	0.0024
56	-362	412	-0.4644	-360	414	-0.4644	0.0000	0.0024
58	-289	331	-0.3720	-286	334	-0.3720	0.0000	0.0024
60	-142	193	-0.2010	-138	192	-0.1980	0.0030	0.0024
62	-53	111	-0.0984	-51	113	-0.0984	0.0000	-0.0006
64	-82	143	-0.1350	-81	145	-0.1356	-0.0006	-0.0006
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 10/28/2009 10:37:56 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 11/16/2009 8:48:37 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-622	687	-0.7854	-621	690	-0.7866	-0.0012	-0.0144
6	-578	613	-0.7146	-576	613	-0.7134	0.0012	-0.0132
8	-390	426	-0.4896	-390	426	-0.4896	0.0000	-0.0144
10	-153	189	-0.2052	-151	189	-0.2040	0.0012	-0.0144
12	49	-11	0.0360	53	-10	0.0378	0.0018	-0.0156
14	247	-190	0.2622	249	-186	0.2610	-0.0012	-0.0174
16	385	-347	0.4392	390	-350	0.4440	0.0048	-0.0162
18	705	-667	0.8232	706	-670	0.8256	0.0024	-0.0210
20	910	-857	1.0602	913	-857	1.0620	0.0018	-0.0234
22	791	-759	0.9300	793	-754	0.9282	-0.0018	-0.0252
24	582	-546	0.6768	578	-542	0.6720	-0.0048	-0.0234
26	283	-247	0.3180	278	-242	0.3120	-0.0060	-0.0186
28	71	-11	0.0492	72	-9	0.0486	-0.0006	-0.0126
30	72	-22	0.0564	75	-17	0.0552	-0.0012	-0.0120
32	161	-103	0.1584	167	-101	0.1608	0.0024	-0.0108
34	131	-67	0.1188	132	-65	0.1182	-0.0006	-0.0132
36	59	-16	0.0450	62	-16	0.0468	0.0018	-0.0126
38	-80	117	-0.1182	-85	126	-0.1266	-0.0084	-0.0144
40	-242	294	-0.3216	-242	299	-0.3246	-0.0030	-0.0060
42	-335	393	-0.4368	-334	398	-0.4392	-0.0024	-0.0030
44	-380	442	-0.4932	-383	447	-0.4980	-0.0048	-0.0006
46	-465	518	-0.5898	-462	521	-0.5898	0.0000	0.0042
48	-449	513	-0.5772	-447	514	-0.5766	0.0006	0.0042
50	-416	477	-0.5358	-413	478	-0.5346	0.0012	0.0036
52	-377	437	-0.4884	-373	438	-0.4866	0.0018	0.0024
54	-338	405	-0.4458	-336	408	-0.4464	-0.0006	0.0006
56	-362	412	-0.4644	-358	414	-0.4632	0.0012	0.0012
58	-289	331	-0.3720	-287	334	-0.3726	-0.0006	0.0000
60	-142	193	-0.2010	-137	193	-0.1980	0.0030	0.0006
62	-53	111	-0.0984	-51	114	-0.0990	-0.0006	-0.0024
64	-82	143	-0.1350	-83	145	-0.1368	-0.0018	-0.0018
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 11/3/2009 11:59:40 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 11/16/2009 8:48:37 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-622	687	-0.7854	-622	687	-0.7854	0.0000	-0.0342
6	-578	613	-0.7146	-578	611	-0.7134	0.0012	-0.0342
8	-390	426	-0.4896	-392	427	-0.4914	-0.0018	-0.0354
10	-153	189	-0.2052	-153	189	-0.2052	0.0000	-0.0336
12	49	-11	0.0360	49	-13	0.0372	0.0012	-0.0336
14	247	-190	0.2622	246	-193	0.2634	0.0012	-0.0348
16	385	-347	0.4392	390	-353	0.4458	0.0066	-0.0360
18	705	-667	0.8232	705	-673	0.8268	0.0036	-0.0426
20	910	-857	1.0602	906	-859	1.0590	-0.0012	-0.0462
22	791	-759	0.9300	790	-755	0.9270	-0.0030	-0.0450
24	582	-546	0.6768	575	-543	0.6708	-0.0060	-0.0420
26	283	-247	0.3180	277	-241	0.3108	-0.0072	-0.0360
28	71	-11	0.0492	68	-10	0.0468	-0.0024	-0.0288
30	72	-22	0.0564	73	-19	0.0552	-0.0012	-0.0264
32	161	-103	0.1584	163	-102	0.1590	0.0006	-0.0252
34	131	-67	0.1188	128	-65	0.1158	-0.0030	-0.0258
36	59	-16	0.0450	58	-17	0.0450	0.0000	-0.0228
38	-80	117	-0.1182	-88	124	-0.1272	-0.0090	-0.0228
40	-242	294	-0.3216	-245	298	-0.3258	-0.0042	-0.0138
42	-335	393	-0.4368	-337	395	-0.4392	-0.0024	-0.0096
44	-380	442	-0.4932	-386	447	-0.4998	-0.0066	-0.0072
46	-465	518	-0.5898	-466	520	-0.5916	-0.0018	-0.0006
48	-449	513	-0.5772	-450	513	-0.5778	-0.0006	0.0012
50	-416	477	-0.5358	-416	476	-0.5352	0.0006	0.0018
52	-377	437	-0.4884	-376	436	-0.4872	0.0012	0.0012
54	-338	405	-0.4458	-339	406	-0.4470	-0.0012	0.0000
56	-362	412	-0.4644	-361	411	-0.4632	0.0012	0.0012
58	-289	331	-0.3720	-287	331	-0.3708	0.0012	0.0000
60	-142	193	-0.2010	-140	190	-0.1980	0.0030	-0.0012
62	-53	111	-0.0984	-53	113	-0.0996	-0.0012	-0.0042
64	-82	143	-0.1350	-85	145	-0.1380	-0.0030	-0.0030
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

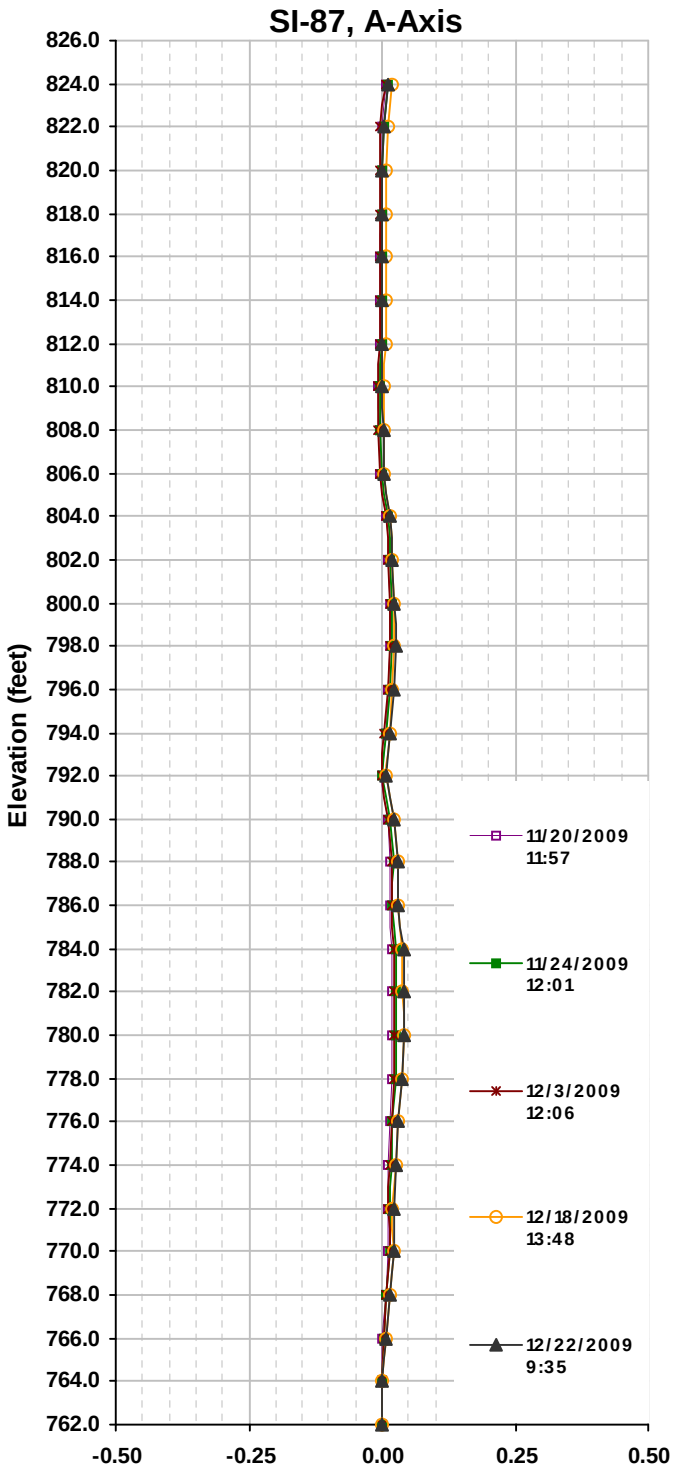
CURRENT SURVEY 11/13/2009 10:04:59 AM

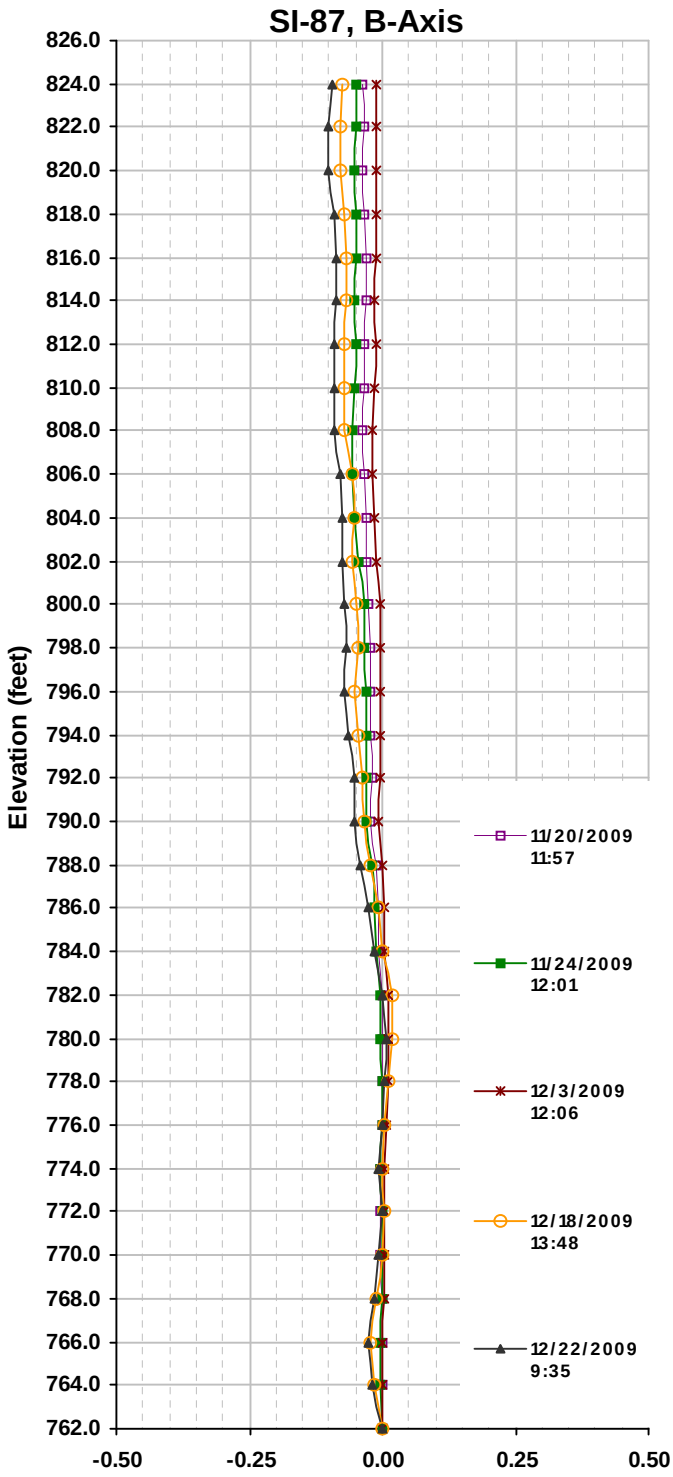
INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 11/16/2009 8:48:37 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-622	687	-0.7854	-622	689	-0.7866	-0.0012	-0.0210
6	-578	613	-0.7146	-578	610	-0.7128	0.0018	-0.0198
8	-390	426	-0.4896	-390	425	-0.4890	0.0006	-0.0216
10	-153	189	-0.2052	-151	187	-0.2028	0.0024	-0.0222
12	49	-11	0.0360	52	-14	0.0396	0.0036	-0.0246
14	247	-190	0.2622	246	-189	0.2610	-0.0012	-0.0282
16	385	-347	0.4392	389	-351	0.4440	0.0048	-0.0270
18	705	-667	0.8232	707	-671	0.8268	0.0036	-0.0318
20	910	-857	1.0602	906	-857	1.0578	-0.0024	-0.0354
22	791	-759	0.9300	790	-754	0.9264	-0.0036	-0.0330
24	582	-546	0.6768	575	-543	0.6708	-0.0060	-0.0294
26	283	-247	0.3180	276	-241	0.3102	-0.0078	-0.0234
28	71	-11	0.0492	70	-10	0.0480	-0.0012	-0.0156
30	72	-22	0.0564	74	-20	0.0564	0.0000	-0.0144
32	161	-103	0.1584	164	-101	0.1590	0.0006	-0.0144
34	131	-67	0.1188	130	-65	0.1170	-0.0018	-0.0150
36	59	-16	0.0450	59	-18	0.0462	0.0012	-0.0132
38	-80	117	-0.1182	-88	125	-0.1278	-0.0096	-0.0144
40	-242	294	-0.3216	-243	299	-0.3252	-0.0036	-0.0048
42	-335	393	-0.4368	-335	397	-0.4392	-0.0024	-0.0012
44	-380	442	-0.4932	-384	447	-0.4986	-0.0054	0.0012
46	-465	518	-0.5898	-463	520	-0.5898	0.0000	0.0066
48	-449	513	-0.5772	-447	513	-0.5760	0.0012	0.0066
50	-416	477	-0.5358	-414	477	-0.5346	0.0012	0.0054
52	-377	437	-0.4884	-374	437	-0.4866	0.0018	0.0042
54	-338	405	-0.4458	-338	407	-0.4470	-0.0012	0.0024
56	-362	412	-0.4644	-361	414	-0.4650	-0.0006	0.0036
58	-289	331	-0.3720	-286	330	-0.3696	0.0024	0.0042
60	-142	193	-0.2010	-138	191	-0.1974	0.0036	0.0018
62	-53	111	-0.0984	-51	112	-0.0978	0.0006	-0.0018
64	-82	143	-0.1350	-84	145	-0.1374	-0.0024	-0.0024
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000





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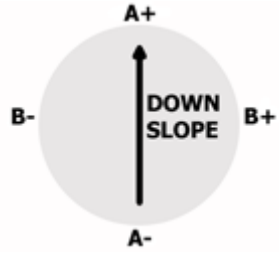


Bull Run Fossil Plant
Bull Run
Clinton, TN
172679015
12/22/2009

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 11/20/2009 11:57:46 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 12/22/2009 4:41:53 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-6	8	-0.0084	-1	2	-0.0018	0.0066	0.0084
6	-87	95	-0.1092	-88	91	-0.1074	0.0018	0.0018
8	-141	146	-0.1722	-141	143	-0.1704	0.0018	0.0000
10	-157	160	-0.1902	-156	160	-0.1896	0.0006	-0.0018
12	-103	104	-0.1242	-103	104	-0.1242	0.0000	-0.0024
14	31	-30	0.0366	33	-30	0.0378	0.0012	-0.0024
16	146	-143	0.1734	148	-145	0.1758	0.0024	-0.0036
18	281	-283	0.3384	280	-281	0.3366	-0.0018	-0.0060
20	377	-373	0.4500	377	-371	0.4488	-0.0012	-0.0042
22	259	-257	0.3096	247	-250	0.2982	-0.0114	-0.0030
24	68	-64	0.0792	64	-62	0.0756	-0.0036	0.0084
26	-73	76	-0.0894	-74	79	-0.0918	-0.0024	0.0120
28	-163	165	-0.1968	-163	166	-0.1974	-0.0006	0.0144
30	-161	161	-0.1932	-157	159	-0.1896	0.0036	0.0150
32	-155	153	-0.1848	-149	150	-0.1794	0.0054	0.0114
34	-90	91	-0.1086	-84	86	-0.1020	0.0066	0.0060
36	-134	137	-0.1626	-143	147	-0.1740	-0.0114	-0.0006
38	-251	251	-0.3012	-255	257	-0.3072	-0.0060	0.0108
40	-246	245	-0.2946	-243	245	-0.2928	0.0018	0.0168
42	-265	265	-0.3180	-269	270	-0.3234	-0.0054	0.0150
44	-293	295	-0.3528	-291	295	-0.3516	0.0012	0.0204
46	-323	327	-0.3900	-322	327	-0.3894	0.0006	0.0192
48	-316	318	-0.3804	-315	318	-0.3798	0.0006	0.0186
50	-196	194	-0.2340	-193	191	-0.2304	0.0036	0.0180
52	-68	66	-0.0804	-66	65	-0.0786	0.0018	0.0144
54	1	-1	0.0012	3	-2	0.0030	0.0018	0.0126
56	17	-13	0.0180	17	-11	0.0168	-0.0012	0.0108
58	54	-51	0.0630	57	-57	0.0684	0.0054	0.0120
60	181	-183	0.2184	186	-186	0.2232	0.0048	0.0066
62	301	-302	0.3618	304	-304	0.3648	0.0030	0.0018
64	342	-342	0.4104	342	-340	0.4092	-0.0012	-0.0012
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 11/24/2009 12:01:32 PM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 12/22/2009 4:41:53 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-6	8	-0.0084	7	7	0.0000	0.0084	0.0108
6	-87	95	-0.1092	-82	99	-0.1086	0.0006	0.0024
8	-141	146	-0.1722	-136	150	-0.1716	0.0006	0.0018
10	-157	160	-0.1902	-151	166	-0.1902	0.0000	0.0012
12	-103	104	-0.1242	-97	110	-0.1242	0.0000	0.0012
14	31	-30	0.0366	38	-26	0.0384	0.0018	0.0012
16	146	-143	0.1734	154	-140	0.1764	0.0030	-0.0006
18	281	-283	0.3384	286	-277	0.3378	-0.0006	-0.0036
20	377	-373	0.4500	382	-366	0.4488	-0.0012	-0.0030
22	259	-257	0.3096	252	-243	0.2970	-0.0126	-0.0018
24	68	-64	0.0792	70	-56	0.0756	-0.0036	0.0108
26	-73	76	-0.0894	-69	85	-0.0924	-0.0030	0.0144
28	-163	165	-0.1968	-158	171	-0.1974	-0.0006	0.0174
30	-161	161	-0.1932	-151	165	-0.1896	0.0036	0.0180
32	-155	153	-0.1848	-143	156	-0.1794	0.0054	0.0144
34	-90	91	-0.1086	-78	91	-0.1014	0.0072	0.0090
36	-134	137	-0.1626	-140	153	-0.1758	-0.0132	0.0018
38	-251	251	-0.3012	-250	263	-0.3078	-0.0066	0.0150
40	-246	245	-0.2946	-238	251	-0.2934	0.0012	0.0216
42	-265	265	-0.3180	-265	276	-0.3246	-0.0066	0.0204
44	-293	295	-0.3528	-286	301	-0.3522	0.0006	0.0270
46	-323	327	-0.3900	-317	332	-0.3894	0.0006	0.0264
48	-316	318	-0.3804	-309	323	-0.3792	0.0012	0.0258
50	-196	194	-0.2340	-186	197	-0.2298	0.0042	0.0246
52	-68	66	-0.0804	-59	70	-0.0774	0.0030	0.0204
54	1	-1	0.0012	10	3	0.0042	0.0030	0.0174
56	17	-13	0.0180	22	-6	0.0168	-0.0012	0.0144
58	54	-51	0.0630	63	-53	0.0696	0.0066	0.0156
60	181	-183	0.2184	192	-181	0.2238	0.0054	0.0090
62	301	-302	0.3618	310	-299	0.3654	0.0036	0.0036
64	342	-342	0.4104	349	-335	0.4104	0.0000	0.0000
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 12/3/2009 12:06:59 PM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 12/22/2009 4:41:54 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-6	8	-0.0084	7	7	0.0000	0.0084	0.0060
6	-87	95	-0.1092	-82	99	-0.1086	0.0006	-0.0024
8	-141	146	-0.1722	-136	150	-0.1716	0.0006	-0.0030
10	-157	160	-0.1902	-151	167	-0.1908	-0.0006	-0.0036
12	-103	104	-0.1242	-96	110	-0.1236	0.0006	-0.0030
14	31	-30	0.0366	39	-24	0.0378	0.0012	-0.0036
16	146	-143	0.1734	155	-138	0.1758	0.0024	-0.0048
18	281	-283	0.3384	287	-275	0.3372	-0.0012	-0.0072
20	377	-373	0.4500	382	-366	0.4488	-0.0012	-0.0060
22	259	-257	0.3096	253	-243	0.2976	-0.0120	-0.0048
24	68	-64	0.0792	69	-56	0.0750	-0.0042	0.0072
26	-73	76	-0.0894	-69	86	-0.0930	-0.0036	0.0114
28	-163	165	-0.1968	-158	171	-0.1974	-0.0006	0.0150
30	-161	161	-0.1932	-151	165	-0.1896	0.0036	0.0156
32	-155	153	-0.1848	-142	154	-0.1776	0.0072	0.0120
34	-90	91	-0.1086	-78	93	-0.1026	0.0060	0.0048
36	-134	137	-0.1626	-138	153	-0.1746	-0.0120	-0.0012
38	-251	251	-0.3012	-250	265	-0.3090	-0.0078	0.0108
40	-246	245	-0.2946	-238	252	-0.2940	0.0006	0.0186
42	-265	265	-0.3180	-263	277	-0.3240	-0.0060	0.0180
44	-293	295	-0.3528	-285	301	-0.3516	0.0012	0.0240
46	-323	327	-0.3900	-316	333	-0.3894	0.0006	0.0228
48	-316	318	-0.3804	-309	323	-0.3792	0.0012	0.0222
50	-196	194	-0.2340	-186	198	-0.2304	0.0036	0.0210
52	-68	66	-0.0804	-59	71	-0.0780	0.0024	0.0174
54	1	-1	0.0012	10	4	0.0036	0.0024	0.0150
56	17	-13	0.0180	23	-6	0.0174	-0.0006	0.0126
58	54	-51	0.0630	63	-50	0.0678	0.0048	0.0132
60	181	-183	0.2184	193	-179	0.2232	0.0048	0.0084
62	301	-302	0.3618	311	-298	0.3654	0.0036	0.0036
64	342	-342	0.4104	350	-334	0.4104	0.0000	0.0000
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 12/18/2009 1:48:17 PM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 12/22/2009 4:41:54 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-6	8	-0.0084	1	0	0.0006	0.0090	0.0192
6	-87	95	-0.1092	-89	89	-0.1068	0.0024	0.0102
8	-141	146	-0.1722	-144	142	-0.1716	0.0006	0.0078
10	-157	160	-0.1902	-158	158	-0.1896	0.0006	0.0072
12	-103	104	-0.1242	-104	103	-0.1242	0.0000	0.0066
14	31	-30	0.0366	30	-31	0.0366	0.0000	0.0066
16	146	-143	0.1734	147	-147	0.1764	0.0030	0.0066
18	281	-283	0.3384	280	-282	0.3372	-0.0012	0.0036
20	377	-373	0.4500	373	-377	0.4500	0.0000	0.0048
22	259	-257	0.3096	249	-248	0.2982	-0.0114	0.0048
24	68	-64	0.0792	62	-65	0.0762	-0.0030	0.0162
26	-73	76	-0.0894	-78	78	-0.0936	-0.0042	0.0192
28	-163	165	-0.1968	-165	164	-0.1974	-0.0006	0.0234
30	-161	161	-0.1932	-158	157	-0.1890	0.0042	0.0240
32	-155	153	-0.1848	-150	148	-0.1788	0.0060	0.0198
34	-90	91	-0.1086	-85	84	-0.1014	0.0072	0.0138
36	-134	137	-0.1626	-149	147	-0.1776	-0.0150	0.0066
38	-251	251	-0.3012	-259	257	-0.3096	-0.0084	0.0216
40	-246	245	-0.2946	-247	245	-0.2952	-0.0006	0.0300
42	-265	265	-0.3180	-274	269	-0.3258	-0.0078	0.0306
44	-293	295	-0.3528	-294	295	-0.3534	-0.0006	0.0384
46	-323	327	-0.3900	-327	325	-0.3912	-0.0012	0.0390
48	-316	318	-0.3804	-314	313	-0.3762	0.0042	0.0402
50	-196	194	-0.2340	-190	189	-0.2274	0.0066	0.0360
52	-68	66	-0.0804	-64	62	-0.0756	0.0048	0.0294
54	1	-1	0.0012	5	-5	0.0060	0.0048	0.0246
56	17	-13	0.0180	12	-13	0.0150	-0.0030	0.0198
58	54	-51	0.0630	58	-60	0.0708	0.0078	0.0228
60	181	-183	0.2184	188	-191	0.2274	0.0090	0.0150
62	301	-302	0.3618	306	-307	0.3678	0.0060	0.0060
64	342	-342	0.4104	342	-342	0.4104	0.0000	0.0000
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 12/22/2009 9:35:36 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 12/22/2009 4:41:54 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-6	8	-0.0084	1	-1	0.0012	0.0096	0.0126
6	-87	95	-0.1092	-90	88	-0.1068	0.0024	0.0030
8	-141	146	-0.1722	-144	142	-0.1716	0.0006	0.0006
10	-157	160	-0.1902	-159	158	-0.1902	0.0000	0.0000
12	-103	104	-0.1242	-104	103	-0.1242	0.0000	0.0000
14	31	-30	0.0366	30	-32	0.0372	0.0006	0.0000
16	146	-143	0.1734	143	-146	0.1734	0.0000	-0.0006
18	281	-283	0.3384	278	-281	0.3354	-0.0030	-0.0006
20	377	-373	0.4500	371	-378	0.4494	-0.0006	0.0024
22	259	-257	0.3096	248	-249	0.2982	-0.0114	0.0030
24	68	-64	0.0792	61	-64	0.0750	-0.0042	0.0144
26	-73	76	-0.0894	-79	78	-0.0942	-0.0048	0.0186
28	-163	165	-0.1968	-166	164	-0.1980	-0.0012	0.0234
30	-161	161	-0.1932	-158	158	-0.1896	0.0036	0.0246
32	-155	153	-0.1848	-150	148	-0.1788	0.0060	0.0210
34	-90	91	-0.1086	-86	83	-0.1014	0.0072	0.0150
36	-134	137	-0.1626	-149	147	-0.1776	-0.0150	0.0078
38	-251	251	-0.3012	-259	257	-0.3096	-0.0084	0.0228
40	-246	245	-0.2946	-247	245	-0.2952	-0.0006	0.0312
42	-265	265	-0.3180	-274	270	-0.3264	-0.0084	0.0318
44	-293	295	-0.3528	-294	294	-0.3528	0.0000	0.0402
46	-323	327	-0.3900	-329	323	-0.3912	-0.0012	0.0402
48	-316	318	-0.3804	-314	313	-0.3762	0.0042	0.0414
50	-196	194	-0.2340	-190	189	-0.2274	0.0066	0.0372
52	-68	66	-0.0804	-64	62	-0.0756	0.0048	0.0306
54	1	-1	0.0012	5	-5	0.0060	0.0048	0.0258
56	17	-13	0.0180	11	-14	0.0150	-0.0030	0.0210
58	54	-51	0.0630	58	-61	0.0714	0.0084	0.0240
60	181	-183	0.2184	188	-192	0.2280	0.0096	0.0156
62	301	-302	0.3618	305	-309	0.3684	0.0066	0.0060
64	342	-342	0.4104	341	-342	0.4098	-0.0006	-0.0006
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 11/20/2009 11:57:46 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 12/22/2009 4:42:21 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-622	687	-0.7854	-623	688	-0.7866	-0.0012	-0.0360
6	-578	613	-0.7146	-578	611	-0.7134	0.0012	-0.0348
8	-390	426	-0.4896	-396	426	-0.4932	-0.0036	-0.0360
10	-153	189	-0.2052	-156	188	-0.2064	-0.0012	-0.0324
12	49	-11	0.0360	48	-13	0.0366	0.0006	-0.0312
14	247	-190	0.2622	247	-192	0.2634	0.0012	-0.0318
16	385	-347	0.4392	383	-351	0.4404	0.0012	-0.0330
18	705	-667	0.8232	705	-673	0.8268	0.0036	-0.0342
20	910	-857	1.0602	904	-857	1.0566	-0.0036	-0.0378
22	791	-759	0.9300	791	-755	0.9276	-0.0024	-0.0342
24	582	-546	0.6768	578	-548	0.6756	-0.0012	-0.0318
26	283	-247	0.3180	277	-243	0.3120	-0.0060	-0.0306
28	71	-11	0.0492	70	-9	0.0474	-0.0018	-0.0246
30	72	-22	0.0564	73	-18	0.0546	-0.0018	-0.0228
32	161	-103	0.1584	163	-102	0.1590	0.0006	-0.0210
34	131	-67	0.1188	130	-66	0.1176	-0.0012	-0.0216
36	59	-16	0.0450	59	-18	0.0462	0.0012	-0.0204
38	-80	117	-0.1182	-87	125	-0.1272	-0.0090	-0.0216
40	-242	294	-0.3216	-245	298	-0.3258	-0.0042	-0.0126
42	-335	393	-0.4368	-335	397	-0.4392	-0.0024	-0.0084
44	-380	442	-0.4932	-383	447	-0.4980	-0.0048	-0.0060
46	-465	518	-0.5898	-464	520	-0.5904	-0.0006	-0.0012
48	-449	513	-0.5772	-448	514	-0.5772	0.0000	-0.0006
50	-416	477	-0.5358	-415	477	-0.5352	0.0006	-0.0006
52	-377	437	-0.4884	-373	437	-0.4860	0.0024	-0.0012
54	-338	405	-0.4458	-338	407	-0.4470	-0.0012	-0.0036
56	-362	412	-0.4644	-361	413	-0.4644	0.0000	-0.0024
58	-289	331	-0.3720	-288	335	-0.3738	-0.0018	-0.0024
60	-142	193	-0.2010	-141	193	-0.2004	0.0006	-0.0006
62	-53	111	-0.0984	-52	114	-0.0996	-0.0012	-0.0012
64	-82	143	-0.1350	-80	145	-0.1350	0.0000	0.0000
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 11/24/2009 12:01:32 PM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 12/22/2009 4:42:21 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-622	687	-0.7854	-619	690	-0.7854	0.0000	-0.0504
6	-578	613	-0.7146	-575	614	-0.7134	0.0012	-0.0504
8	-390	426	-0.4896	-394	429	-0.4938	-0.0042	-0.0516
10	-153	189	-0.2052	-150	189	-0.2034	0.0018	-0.0474
12	49	-11	0.0360	52	-11	0.0378	0.0018	-0.0492
14	247	-190	0.2622	248	-186	0.2604	-0.0018	-0.0510
16	385	-347	0.4392	389	-350	0.4434	0.0042	-0.0492
18	705	-667	0.8232	707	-670	0.8262	0.0030	-0.0534
20	910	-857	1.0602	909	-855	1.0584	-0.0018	-0.0564
22	791	-759	0.9300	791	-753	0.9264	-0.0036	-0.0546
24	582	-546	0.6768	577	-539	0.6696	-0.0072	-0.0510
26	283	-247	0.3180	277	-239	0.3096	-0.0084	-0.0438
28	71	-11	0.0492	71	-6	0.0462	-0.0030	-0.0354
30	72	-22	0.0564	76	-16	0.0552	-0.0012	-0.0324
32	161	-103	0.1584	165	-99	0.1584	0.0000	-0.0312
34	131	-67	0.1188	131	-63	0.1164	-0.0024	-0.0312
36	59	-16	0.0450	61	-14	0.0450	0.0000	-0.0288
38	-80	117	-0.1182	-86	129	-0.1290	-0.0108	-0.0288
40	-242	294	-0.3216	-243	300	-0.3258	-0.0042	-0.0180
42	-335	393	-0.4368	-335	399	-0.4404	-0.0036	-0.0138
44	-380	442	-0.4932	-382	450	-0.4992	-0.0060	-0.0102
46	-465	518	-0.5898	-463	522	-0.5910	-0.0012	-0.0042
48	-449	513	-0.5772	-447	517	-0.5784	-0.0012	-0.0030
50	-416	477	-0.5358	-413	480	-0.5358	0.0000	-0.0018
52	-377	437	-0.4884	-372	439	-0.4866	0.0018	-0.0018
54	-338	405	-0.4458	-337	409	-0.4476	-0.0018	-0.0036
56	-362	412	-0.4644	-359	416	-0.4650	-0.0006	-0.0018
58	-289	331	-0.3720	-286	333	-0.3714	0.0006	-0.0012
60	-142	193	-0.2010	-137	193	-0.1980	0.0030	-0.0018
62	-53	111	-0.0984	-49	116	-0.0990	-0.0006	-0.0048
64	-82	143	-0.1350	-82	150	-0.1392	-0.0042	-0.0042
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 12/3/2009 12:06:59 PM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 12/22/2009 4:42:21 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-622	687	-0.7854	-619	690	-0.7854	0.0000	-0.0114
6	-578	613	-0.7146	-578	613	-0.7146	0.0000	-0.0114
8	-390	426	-0.4896	-391	427	-0.4908	-0.0012	-0.0114
10	-153	189	-0.2052	-151	189	-0.2040	0.0012	-0.0102
12	49	-11	0.0360	54	-11	0.0390	0.0030	-0.0114
14	247	-190	0.2622	247	-185	0.2592	-0.0030	-0.0144
16	385	-347	0.4392	390	-349	0.4434	0.0042	-0.0114
18	705	-667	0.8232	707	-670	0.8262	0.0030	-0.0156
20	910	-857	1.0602	910	-856	1.0596	-0.0006	-0.0186
22	791	-759	0.9300	793	-754	0.9282	-0.0018	-0.0180
24	582	-546	0.6768	578	-543	0.6726	-0.0042	-0.0162
26	283	-247	0.3180	278	-241	0.3114	-0.0066	-0.0120
28	71	-11	0.0492	73	-7	0.0480	-0.0012	-0.0054
30	72	-22	0.0564	75	-17	0.0552	-0.0012	-0.0042
32	161	-103	0.1584	166	-100	0.1596	0.0012	-0.0030
34	131	-67	0.1188	133	-66	0.1194	0.0006	-0.0042
36	59	-16	0.0450	63	-17	0.0480	0.0030	-0.0048
38	-80	117	-0.1182	-83	127	-0.1260	-0.0078	-0.0078
40	-242	294	-0.3216	-242	299	-0.3246	-0.0030	0.0000
42	-335	393	-0.4368	-333	399	-0.4392	-0.0024	0.0030
44	-380	442	-0.4932	-382	449	-0.4986	-0.0054	0.0054
46	-465	518	-0.5898	-461	522	-0.5898	0.0000	0.0108
48	-449	513	-0.5772	-445	515	-0.5760	0.0012	0.0108
50	-416	477	-0.5358	-411	478	-0.5334	0.0024	0.0096
52	-377	437	-0.4884	-371	438	-0.4854	0.0030	0.0072
54	-338	405	-0.4458	-335	409	-0.4464	-0.0006	0.0042
56	-362	412	-0.4644	-357	416	-0.4638	0.0006	0.0048
58	-289	331	-0.3720	-284	335	-0.3714	0.0006	0.0042
60	-142	193	-0.2010	-134	194	-0.1968	0.0042	0.0036
62	-53	111	-0.0984	-47	115	-0.0972	0.0012	-0.0006
64	-82	143	-0.1350	-80	148	-0.1368	-0.0018	-0.0018
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 12/18/2009 1:48:17 PM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 12/22/2009 4:42:21 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-622	687	-0.7854	-666	633	-0.7794	0.0060	-0.0738
6	-578	613	-0.7146	-598	593	-0.7146	0.0000	-0.0798
8	-390	426	-0.4896	-416	411	-0.4962	-0.0066	-0.0798
10	-153	189	-0.2052	-176	174	-0.2100	-0.0048	-0.0732
12	49	-11	0.0360	28	-30	0.0348	-0.0012	-0.0684
14	247	-190	0.2622	211	-233	0.2664	0.0042	-0.0672
16	385	-347	0.4392	364	-367	0.4386	-0.0006	-0.0714
18	705	-667	0.8232	682	-691	0.8238	0.0006	-0.0708
20	910	-857	1.0602	858	-886	1.0464	-0.0138	-0.0714
22	791	-759	0.9300	772	-772	0.9264	-0.0036	-0.0576
24	582	-546	0.6768	561	-568	0.6774	0.0006	-0.0540
26	283	-247	0.3180	257	-263	0.3120	-0.0060	-0.0546
28	71	-11	0.0492	25	-54	0.0474	-0.0018	-0.0486
30	72	-22	0.0564	44	-60	0.0624	0.0060	-0.0468
32	161	-103	0.1584	112	-142	0.1524	-0.0060	-0.0528
34	131	-67	0.1188	78	-102	0.1080	-0.0108	-0.0468
36	59	-16	0.0450	34	-39	0.0438	-0.0012	-0.0360
38	-80	117	-0.1182	-112	106	-0.1308	-0.0126	-0.0348
40	-242	294	-0.3216	-284	275	-0.3354	-0.0138	-0.0222
42	-335	393	-0.4368	-385	357	-0.4452	-0.0084	-0.0084
44	-380	442	-0.4932	-438	417	-0.5130	-0.0198	0.0000
46	-465	518	-0.5898	-507	472	-0.5874	0.0024	0.0198
48	-449	513	-0.5772	-492	458	-0.5700	0.0072	0.0174
50	-416	477	-0.5358	-458	425	-0.5298	0.0060	0.0102
52	-377	437	-0.4884	-419	385	-0.4824	0.0060	0.0042
54	-338	405	-0.4458	-394	359	-0.4518	-0.0060	-0.0018
56	-362	412	-0.4644	-395	369	-0.4584	0.0060	0.0042
58	-289	331	-0.3720	-307	299	-0.3636	0.0084	-0.0018
60	-142	193	-0.2010	-164	150	-0.1884	0.0126	-0.0102
62	-53	111	-0.0984	-105	71	-0.1056	-0.0072	-0.0228
64	-82	143	-0.1350	-133	118	-0.1506	-0.0156	-0.0156
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

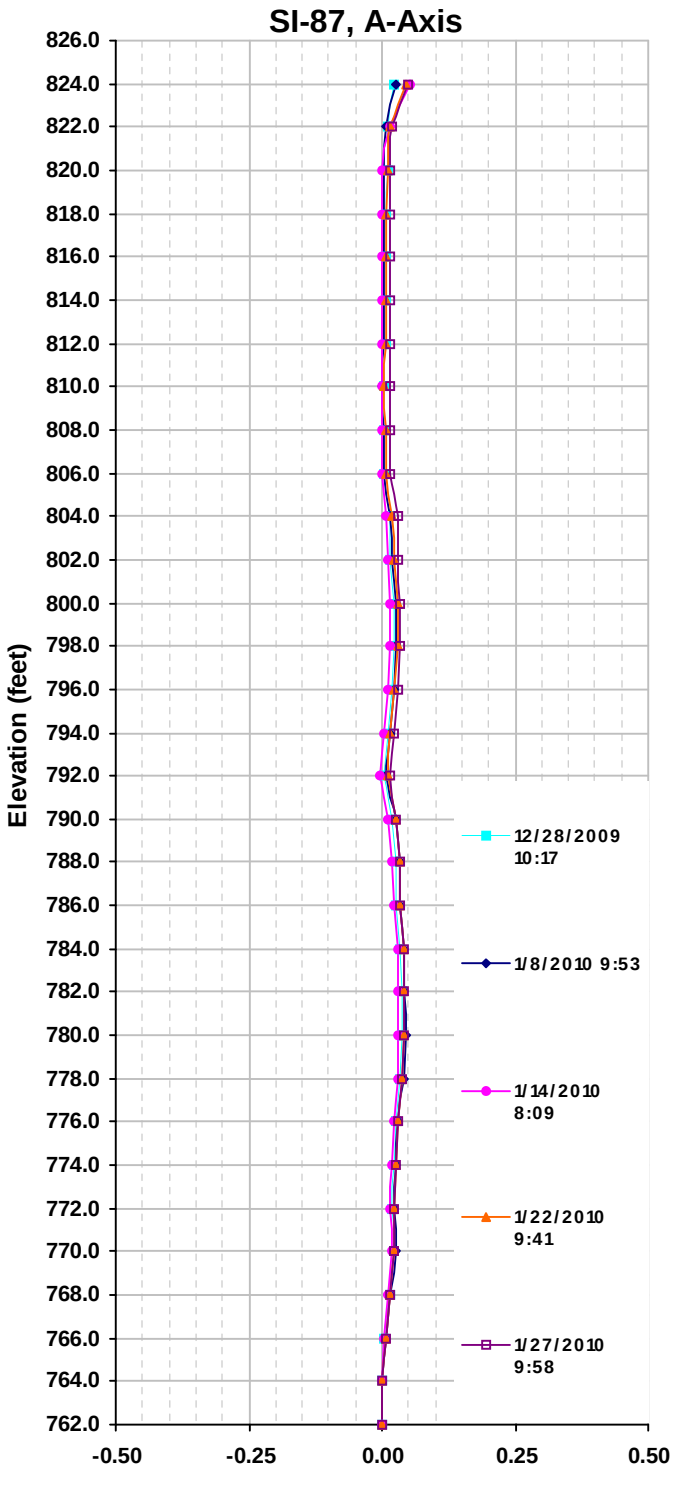
CURRENT SURVEY 12/22/2009 9:35:36 AM

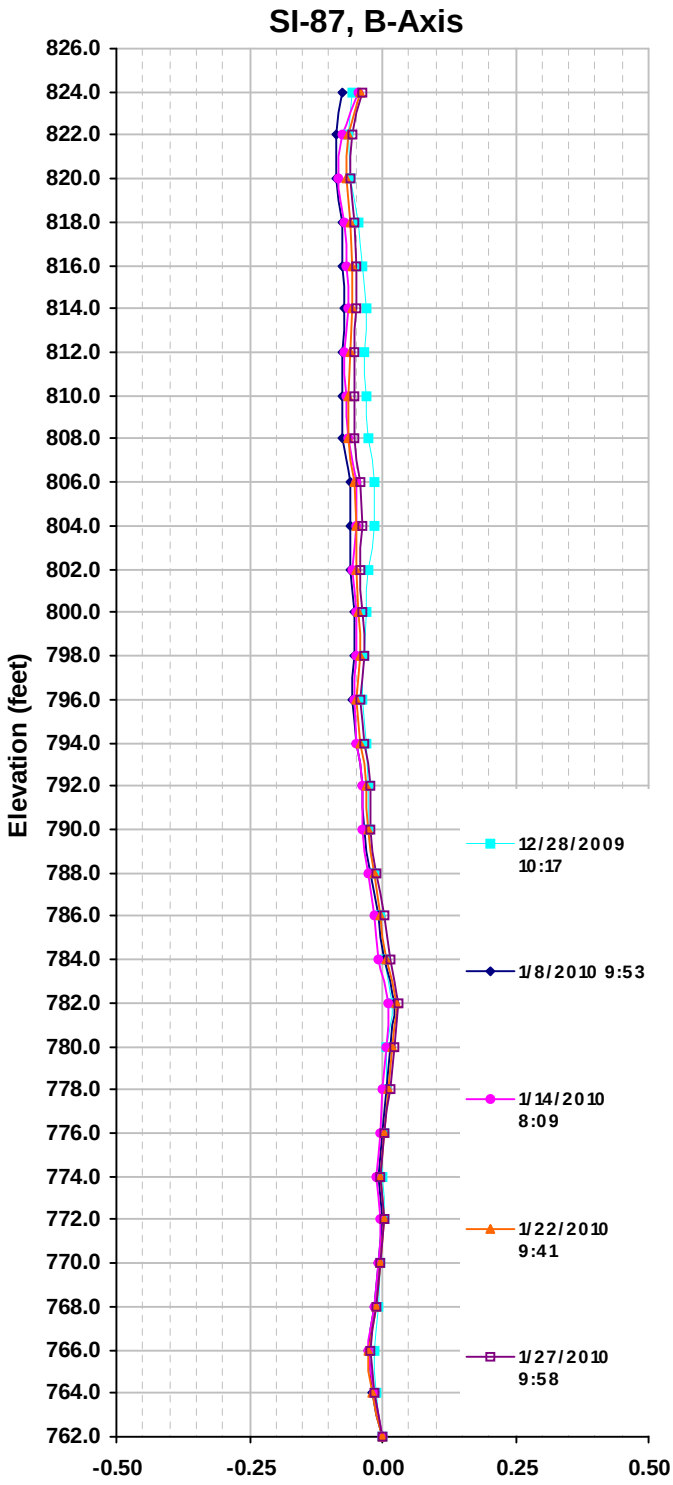
INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 12/22/2009 4:42:21 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-622	687	-0.7854	-667	633	-0.7800	0.0054	-0.0954
6	-578	613	-0.7146	-598	594	-0.7152	-0.0006	-0.1008
8	-390	426	-0.4896	-417	413	-0.4980	-0.0084	-0.1002
10	-153	189	-0.2052	-175	174	-0.2094	-0.0042	-0.0918
12	49	-11	0.0360	28	-29	0.0342	-0.0018	-0.0876
14	247	-190	0.2622	210	-234	0.2664	0.0042	-0.0858
16	385	-347	0.4392	364	-369	0.4398	0.0006	-0.0900
18	705	-667	0.8232	681	-690	0.8226	-0.0006	-0.0906
20	910	-857	1.0602	861	-886	1.0482	-0.0120	-0.0900
22	791	-759	0.9300	771	-772	0.9258	-0.0042	-0.0780
24	582	-546	0.6768	562	-571	0.6798	0.0030	-0.0738
26	283	-247	0.3180	256	-262	0.3108	-0.0072	-0.0768
28	71	-11	0.0492	24	-55	0.0474	-0.0018	-0.0696
30	72	-22	0.0564	44	-54	0.0588	0.0024	-0.0678
32	161	-103	0.1584	111	-145	0.1536	-0.0048	-0.0702
34	131	-67	0.1188	77	-102	0.1074	-0.0114	-0.0654
36	59	-16	0.0450	32	-40	0.0432	-0.0018	-0.0540
38	-80	117	-0.1182	-113	105	-0.1308	-0.0126	-0.0522
40	-242	294	-0.3216	-285	275	-0.3360	-0.0144	-0.0396
42	-335	393	-0.4368	-386	356	-0.4452	-0.0084	-0.0252
44	-380	442	-0.4932	-437	416	-0.5118	-0.0186	-0.0168
46	-465	518	-0.5898	-525	470	-0.5970	-0.0072	0.0018
48	-449	513	-0.5772	-493	459	-0.5712	0.0060	0.0090
50	-416	477	-0.5358	-460	426	-0.5316	0.0042	0.0030
52	-377	437	-0.4884	-421	385	-0.4836	0.0048	-0.0012
54	-338	405	-0.4458	-395	358	-0.4518	-0.0060	-0.0060
56	-362	412	-0.4644	-395	369	-0.4584	0.0060	0.0000
58	-289	331	-0.3720	-306	300	-0.3636	0.0084	-0.0060
60	-142	193	-0.2010	-163	150	-0.1878	0.0132	-0.0144
62	-53	111	-0.0984	-105	75	-0.1080	-0.0096	-0.0276
64	-82	143	-0.1350	-136	119	-0.1530	-0.0180	-0.0180
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000





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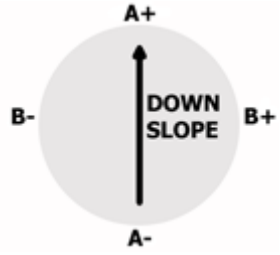


Bull Run Fossil Plant
Bull Run
Clinton, TN
172679015
1/27/2010

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 12/28/2009 10:17:51 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 1/27/2010 2:27:57 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-6	8	-0.0084	2	0	0.0012	0.0096	0.0222
6	-87	95	-0.1092	-88	90	-0.1068	0.0024	0.0126
8	-141	146	-0.1722	-141	143	-0.1704	0.0018	0.0102
10	-157	160	-0.1902	-157	159	-0.1896	0.0006	0.0084
12	-103	104	-0.1242	-103	104	-0.1242	0.0000	0.0078
14	31	-30	0.0366	32	-31	0.0378	0.0012	0.0078
16	146	-143	0.1734	149	-145	0.1764	0.0030	0.0066
18	281	-283	0.3384	282	-281	0.3378	-0.0006	0.0036
20	377	-373	0.4500	375	-376	0.4506	0.0006	0.0042
22	259	-257	0.3096	252	-247	0.2994	-0.0102	0.0036
24	68	-64	0.0792	64	-63	0.0762	-0.0030	0.0138
26	-73	76	-0.0894	-77	79	-0.0936	-0.0042	0.0168
28	-163	165	-0.1968	-164	165	-0.1974	-0.0006	0.0210
30	-161	161	-0.1932	-156	159	-0.1890	0.0042	0.0216
32	-155	153	-0.1848	-148	150	-0.1788	0.0060	0.0174
34	-90	91	-0.1086	-84	85	-0.1014	0.0072	0.0114
36	-134	137	-0.1626	-147	148	-0.1770	-0.0144	0.0042
38	-251	251	-0.3012	-257	258	-0.3090	-0.0078	0.0186
40	-246	245	-0.2946	-245	247	-0.2952	-0.0006	0.0264
42	-265	265	-0.3180	-272	272	-0.3264	-0.0084	0.0270
44	-293	295	-0.3528	-293	296	-0.3534	-0.0006	0.0354
46	-323	327	-0.3900	-326	326	-0.3912	-0.0012	0.0360
48	-316	318	-0.3804	-313	313	-0.3756	0.0048	0.0372
50	-196	194	-0.2340	-189	191	-0.2280	0.0060	0.0324
52	-68	66	-0.0804	-63	64	-0.0762	0.0042	0.0264
54	1	-1	0.0012	6	-3	0.0054	0.0042	0.0222
56	17	-13	0.0180	13	-12	0.0150	-0.0030	0.0180
58	54	-51	0.0630	59	-58	0.0702	0.0072	0.0210
60	181	-183	0.2184	190	-188	0.2268	0.0084	0.0138
62	301	-302	0.3618	306	-306	0.3672	0.0054	0.0054
64	342	-342	0.4104	344	-340	0.4104	0.0000	0.0000
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 1/8/2010 9:53:20 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 1/27/2010 2:27:57 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-6	8	-0.0084	8	-7	0.0090	0.0174	0.0252
6	-87	95	-0.1092	-87	88	-0.1050	0.0042	0.0078
8	-141	146	-0.1722	-142	143	-0.1710	0.0012	0.0036
10	-157	160	-0.1902	-158	160	-0.1908	-0.0006	0.0024
12	-103	104	-0.1242	-103	105	-0.1248	-0.0006	0.0030
14	31	-30	0.0366	31	-30	0.0366	0.0000	0.0036
16	146	-143	0.1734	148	-145	0.1758	0.0024	0.0036
18	281	-283	0.3384	281	-281	0.3372	-0.0012	0.0012
20	377	-373	0.4500	373	-375	0.4488	-0.0012	0.0024
22	259	-257	0.3096	250	-246	0.2976	-0.0120	0.0036
24	68	-64	0.0792	63	-62	0.0750	-0.0042	0.0156
26	-73	76	-0.0894	-78	80	-0.0948	-0.0054	0.0198
28	-163	165	-0.1968	-165	166	-0.1986	-0.0018	0.0252
30	-161	161	-0.1932	-156	159	-0.1890	0.0042	0.0270
32	-155	153	-0.1848	-148	149	-0.1782	0.0066	0.0228
34	-90	91	-0.1086	-84	85	-0.1014	0.0072	0.0162
36	-134	137	-0.1626	-148	149	-0.1782	-0.0156	0.0090
38	-251	251	-0.3012	-258	259	-0.3102	-0.0090	0.0246
40	-246	245	-0.2946	-246	246	-0.2952	-0.0006	0.0336
42	-265	265	-0.3180	-273	271	-0.3264	-0.0084	0.0342
44	-293	295	-0.3528	-293	296	-0.3534	-0.0006	0.0426
46	-323	327	-0.3900	-326	326	-0.3912	-0.0012	0.0432
48	-316	318	-0.3804	-312	314	-0.3756	0.0048	0.0444
50	-196	194	-0.2340	-188	189	-0.2262	0.0078	0.0396
52	-68	66	-0.0804	-62	63	-0.0750	0.0054	0.0318
54	1	-1	0.0012	5	-4	0.0054	0.0042	0.0264
56	17	-13	0.0180	13	-12	0.0150	-0.0030	0.0222
58	54	-51	0.0630	60	-60	0.0720	0.0090	0.0252
60	181	-183	0.2184	190	-190	0.2280	0.0096	0.0162
62	301	-302	0.3618	307	-307	0.3684	0.0066	0.0066
64	342	-342	0.4104	343	-341	0.4104	0.0000	0.0000
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 1/14/2010 8:09:55 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 1/27/2010 2:27:57 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-6	8	-0.0084	24	-26	0.0300	0.0384	0.0528
6	-87	95	-0.1092	-81	79	-0.0960	0.0132	0.0144
8	-141	146	-0.1722	-143	144	-0.1722	0.0000	0.0012
10	-157	160	-0.1902	-157	159	-0.1896	0.0006	0.0012
12	-103	104	-0.1242	-104	105	-0.1254	-0.0012	0.0006
14	31	-30	0.0366	31	-30	0.0366	0.0000	0.0018
16	146	-143	0.1734	147	-146	0.1758	0.0024	0.0018
18	281	-283	0.3384	281	-281	0.3372	-0.0012	-0.0006
20	377	-373	0.4500	375	-377	0.4512	0.0012	0.0006
22	259	-257	0.3096	253	-248	0.3006	-0.0090	-0.0006
24	68	-64	0.0792	65	-64	0.0774	-0.0018	0.0084
26	-73	76	-0.0894	-77	78	-0.0930	-0.0036	0.0102
28	-163	165	-0.1968	-164	165	-0.1974	-0.0006	0.0138
30	-161	161	-0.1932	-157	159	-0.1896	0.0036	0.0144
32	-155	153	-0.1848	-148	149	-0.1782	0.0066	0.0108
34	-90	91	-0.1086	-84	85	-0.1014	0.0072	0.0042
36	-134	137	-0.1626	-146	148	-0.1764	-0.0138	-0.0030
38	-251	251	-0.3012	-258	259	-0.3102	-0.0090	0.0108
40	-246	245	-0.2946	-246	247	-0.2958	-0.0012	0.0198
42	-265	265	-0.3180	-273	272	-0.3270	-0.0090	0.0210
44	-293	295	-0.3528	-292	296	-0.3528	0.0000	0.0300
46	-323	327	-0.3900	-326	326	-0.3912	-0.0012	0.0300
48	-316	318	-0.3804	-314	316	-0.3780	0.0024	0.0312
50	-196	194	-0.2340	-190	191	-0.2286	0.0054	0.0288
52	-68	66	-0.0804	-63	64	-0.0762	0.0042	0.0234
54	1	-1	0.0012	6	-3	0.0054	0.0042	0.0192
56	17	-13	0.0180	12	-12	0.0144	-0.0036	0.0150
58	54	-51	0.0630	58	-58	0.0696	0.0066	0.0186
60	181	-183	0.2184	188	-188	0.2256	0.0072	0.0120
62	301	-302	0.3618	306	-306	0.3672	0.0054	0.0048
64	342	-342	0.4104	343	-340	0.4098	-0.0006	-0.0006
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 1/22/2010 9:41:00 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 1/27/2010 2:27:57 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-6	8	-0.0084	18	-17	0.0210	0.0294	0.0456
6	-87	95	-0.1092	-86	85	-0.1026	0.0066	0.0162
8	-141	146	-0.1722	-143	142	-0.1710	0.0012	0.0096
10	-157	160	-0.1902	-158	159	-0.1902	0.0000	0.0084
12	-103	104	-0.1242	-104	103	-0.1242	0.0000	0.0084
14	31	-30	0.0366	30	-32	0.0372	0.0006	0.0084
16	146	-143	0.1734	146	-147	0.1758	0.0024	0.0078
18	281	-283	0.3384	280	-283	0.3378	-0.0006	0.0054
20	377	-373	0.4500	373	-377	0.4500	0.0000	0.0060
22	259	-257	0.3096	247	-247	0.2964	-0.0132	0.0060
24	68	-64	0.0792	63	-62	0.0750	-0.0042	0.0192
26	-73	76	-0.0894	-78	79	-0.0942	-0.0048	0.0234
28	-163	165	-0.1968	-165	164	-0.1974	-0.0006	0.0282
30	-161	161	-0.1932	-157	157	-0.1884	0.0048	0.0288
32	-155	153	-0.1848	-148	148	-0.1776	0.0072	0.0240
34	-90	91	-0.1086	-85	84	-0.1014	0.0072	0.0168
36	-134	137	-0.1626	-148	148	-0.1776	-0.0150	0.0096
38	-251	251	-0.3012	-259	257	-0.3096	-0.0084	0.0246
40	-246	245	-0.2946	-246	245	-0.2946	0.0000	0.0330
42	-265	265	-0.3180	-273	270	-0.3258	-0.0078	0.0330
44	-293	295	-0.3528	-293	295	-0.3528	0.0000	0.0408
46	-323	327	-0.3900	-326	326	-0.3912	-0.0012	0.0408
48	-316	318	-0.3804	-314	314	-0.3768	0.0036	0.0420
50	-196	194	-0.2340	-190	189	-0.2274	0.0066	0.0384
52	-68	66	-0.0804	-63	62	-0.0750	0.0054	0.0318
54	1	-1	0.0012	5	-5	0.0060	0.0048	0.0264
56	17	-13	0.0180	13	-13	0.0156	-0.0024	0.0216
58	54	-51	0.0630	58	-60	0.0708	0.0078	0.0240
60	181	-183	0.2184	189	-190	0.2274	0.0090	0.0162
62	301	-302	0.3618	307	-308	0.3690	0.0072	0.0072
64	342	-342	0.4104	343	-341	0.4104	0.0000	0.0000
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 1/27/2010 9:58:52 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 1/27/2010 2:27:57 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-6	8	-0.0084	17	-15	0.0192	0.0276	0.0474
6	-87	95	-0.1092	-85	87	-0.1032	0.0060	0.0198
8	-141	146	-0.1722	-143	143	-0.1716	0.0006	0.0138
10	-157	160	-0.1902	-158	159	-0.1902	0.0000	0.0132
12	-103	104	-0.1242	-104	104	-0.1248	-0.0006	0.0132
14	31	-30	0.0366	30	-31	0.0366	0.0000	0.0138
16	146	-143	0.1734	144	-146	0.1740	0.0006	0.0138
18	281	-283	0.3384	280	-281	0.3366	-0.0018	0.0132
20	377	-373	0.4500	373	-377	0.4500	0.0000	0.0150
22	259	-257	0.3096	246	-248	0.2964	-0.0132	0.0150
24	68	-64	0.0792	63	-64	0.0762	-0.0030	0.0282
26	-73	76	-0.0894	-77	78	-0.0930	-0.0036	0.0312
28	-163	165	-0.1968	-164	164	-0.1968	0.0000	0.0348
30	-161	161	-0.1932	-156	157	-0.1878	0.0054	0.0348
32	-155	153	-0.1848	-148	148	-0.1776	0.0072	0.0294
34	-90	91	-0.1086	-84	84	-0.1008	0.0078	0.0222
36	-134	137	-0.1626	-147	146	-0.1758	-0.0132	0.0144
38	-251	251	-0.3012	-258	257	-0.3090	-0.0078	0.0276
40	-246	245	-0.2946	-245	245	-0.2940	0.0006	0.0354
42	-265	265	-0.3180	-272	270	-0.3252	-0.0072	0.0348
44	-293	295	-0.3528	-292	296	-0.3528	0.0000	0.0420
46	-323	327	-0.3900	-325	325	-0.3900	0.0000	0.0420
48	-316	318	-0.3804	-313	315	-0.3768	0.0036	0.0420
50	-196	194	-0.2340	-189	190	-0.2274	0.0066	0.0384
52	-68	66	-0.0804	-62	63	-0.0750	0.0054	0.0318
54	1	-1	0.0012	6	-4	0.0060	0.0048	0.0264
56	17	-13	0.0180	13	-13	0.0156	-0.0024	0.0216
58	54	-51	0.0630	59	-59	0.0708	0.0078	0.0240
60	181	-183	0.2184	190	-190	0.2280	0.0096	0.0162
62	301	-302	0.3618	307	-307	0.3684	0.0066	0.0066
64	342	-342	0.4104	343	-341	0.4104	0.0000	0.0000
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 12/28/2009 10:17:51 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 1/27/2010 2:28:06 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-622	687	-0.7854	-663	636	-0.7794	0.0060	-0.0570
6	-578	613	-0.7146	-599	598	-0.7182	-0.0036	-0.0630
8	-390	426	-0.4896	-424	415	-0.5034	-0.0138	-0.0594
10	-153	189	-0.2052	-179	176	-0.2130	-0.0078	-0.0456
12	49	-11	0.0360	27	-22	0.0294	-0.0066	-0.0378
14	247	-190	0.2622	211	-228	0.2634	0.0012	-0.0312
16	385	-347	0.4392	363	-362	0.4350	-0.0042	-0.0324
18	705	-667	0.8232	681	-690	0.8226	-0.0006	-0.0282
20	910	-857	1.0602	860	-885	1.0470	-0.0132	-0.0276
22	791	-759	0.9300	776	-775	0.9306	0.0006	-0.0144
24	582	-546	0.6768	578	-571	0.6894	0.0126	-0.0150
26	283	-247	0.3180	269	-265	0.3204	0.0024	-0.0276
28	71	-11	0.0492	36	-54	0.0540	0.0048	-0.0300
30	72	-22	0.0564	43	-56	0.0594	0.0030	-0.0348
32	161	-103	0.1584	112	-140	0.1512	-0.0072	-0.0378
34	131	-67	0.1188	89	-101	0.1140	-0.0048	-0.0306
36	59	-16	0.0450	34	-41	0.0450	0.0000	-0.0258
38	-80	117	-0.1182	-109	105	-0.1284	-0.0102	-0.0258
40	-242	294	-0.3216	-280	273	-0.3318	-0.0102	-0.0156
42	-335	393	-0.4368	-383	359	-0.4452	-0.0084	-0.0054
44	-380	442	-0.4932	-431	416	-0.5082	-0.0150	0.0030
46	-465	518	-0.5898	-496	472	-0.5808	0.0090	0.0180
48	-449	513	-0.5772	-490	471	-0.5766	0.0006	0.0090
50	-416	477	-0.5358	-459	427	-0.5316	0.0042	0.0084
52	-377	437	-0.4884	-417	387	-0.4824	0.0060	0.0042
54	-338	405	-0.4458	-388	362	-0.4500	-0.0042	-0.0018
56	-362	412	-0.4644	-394	372	-0.4596	0.0048	0.0024
58	-289	331	-0.3720	-307	303	-0.3660	0.0060	-0.0024
60	-142	193	-0.2010	-166	158	-0.1944	0.0066	-0.0084
62	-53	111	-0.0984	-94	79	-0.1038	-0.0054	-0.0150
64	-82	143	-0.1350	-123	118	-0.1446	-0.0096	-0.0096
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 1/8/2010 9:53:20 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 1/27/2010 2:28:06 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-622	687	-0.7854	-661	633	-0.7764	0.0090	-0.0768
6	-578	613	-0.7146	-598	592	-0.7140	0.0006	-0.0858
8	-390	426	-0.4896	-419	413	-0.4992	-0.0096	-0.0864
10	-153	189	-0.2052	-175	172	-0.2082	-0.0030	-0.0768
12	49	-11	0.0360	26	-30	0.0336	-0.0024	-0.0738
14	247	-190	0.2622	212	-233	0.2670	0.0048	-0.0714
16	385	-347	0.4392	363	-369	0.4392	0.0000	-0.0762
18	705	-667	0.8232	679	-691	0.8220	-0.0012	-0.0762
20	910	-857	1.0602	859	-886	1.0470	-0.0132	-0.0750
22	791	-759	0.9300	771	-774	0.9270	-0.0030	-0.0618
24	582	-546	0.6768	561	-569	0.6780	0.0012	-0.0588
26	283	-247	0.3180	259	-261	0.3120	-0.0060	-0.0600
28	71	-11	0.0492	26	-54	0.0480	-0.0012	-0.0540
30	72	-22	0.0564	42	-61	0.0618	0.0054	-0.0528
32	161	-103	0.1584	111	-139	0.1500	-0.0084	-0.0582
34	131	-67	0.1188	77	-101	0.1068	-0.0120	-0.0498
36	59	-16	0.0450	32	-39	0.0426	-0.0024	-0.0378
38	-80	117	-0.1182	-114	106	-0.1320	-0.0138	-0.0354
40	-242	294	-0.3216	-285	276	-0.3366	-0.0150	-0.0216
42	-335	393	-0.4368	-387	361	-0.4488	-0.0120	-0.0066
44	-380	442	-0.4932	-435	416	-0.5106	-0.0174	0.0054
46	-465	518	-0.5898	-501	471	-0.5832	0.0066	0.0228
48	-449	513	-0.5772	-489	457	-0.5676	0.0096	0.0162
50	-416	477	-0.5358	-453	427	-0.5280	0.0078	0.0066
52	-377	437	-0.4884	-416	386	-0.4812	0.0072	-0.0012
54	-338	405	-0.4458	-394	363	-0.4542	-0.0084	-0.0084
56	-362	412	-0.4644	-394	369	-0.4578	0.0066	0.0000
58	-289	331	-0.3720	-307	300	-0.3642	0.0078	-0.0066
60	-142	193	-0.2010	-164	151	-0.1890	0.0120	-0.0144
62	-53	111	-0.0984	-104	74	-0.1068	-0.0084	-0.0264
64	-82	143	-0.1350	-135	120	-0.1530	-0.0180	-0.0180
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 1/14/2010 8:09:55 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 1/27/2010 2:28:06 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-622	687	-0.7854	-646	616	-0.7572	0.0282	-0.0456
6	-578	613	-0.7146	-596	581	-0.7062	0.0084	-0.0738
8	-390	426	-0.4896	-419	413	-0.4992	-0.0096	-0.0822
10	-153	189	-0.2052	-175	174	-0.2094	-0.0042	-0.0726
12	49	-11	0.0360	27	-28	0.0330	-0.0030	-0.0684
14	247	-190	0.2622	212	-232	0.2664	0.0042	-0.0654
16	385	-347	0.4392	362	-364	0.4356	-0.0036	-0.0696
18	705	-667	0.8232	680	-688	0.8208	-0.0024	-0.0660
20	910	-857	1.0602	859	-886	1.0470	-0.0132	-0.0636
22	791	-759	0.9300	775	-774	0.9294	-0.0006	-0.0504
24	582	-546	0.6768	566	-570	0.6816	0.0048	-0.0498
26	283	-247	0.3180	260	-263	0.3138	-0.0042	-0.0546
28	71	-11	0.0492	27	-52	0.0474	-0.0018	-0.0504
30	72	-22	0.0564	43	-58	0.0606	0.0042	-0.0486
32	161	-103	0.1584	112	-143	0.1530	-0.0054	-0.0528
34	131	-67	0.1188	80	-100	0.1080	-0.0108	-0.0474
36	59	-16	0.0450	34	-40	0.0444	-0.0006	-0.0366
38	-80	117	-0.1182	-109	105	-0.1284	-0.0102	-0.0360
40	-242	294	-0.3216	-279	274	-0.3318	-0.0102	-0.0258
42	-335	393	-0.4368	-382	359	-0.4446	-0.0078	-0.0156
44	-380	442	-0.4932	-436	417	-0.5118	-0.0186	-0.0078
46	-465	518	-0.5898	-506	472	-0.5868	0.0030	0.0108
48	-449	513	-0.5772	-492	459	-0.5706	0.0066	0.0078
50	-416	477	-0.5358	-455	428	-0.5298	0.0060	0.0012
52	-377	437	-0.4884	-419	387	-0.4836	0.0048	-0.0048
54	-338	405	-0.4458	-394	361	-0.4530	-0.0072	-0.0096
56	-362	412	-0.4644	-395	371	-0.4596	0.0048	-0.0024
58	-289	331	-0.3720	-308	301	-0.3654	0.0066	-0.0072
60	-142	193	-0.2010	-164	152	-0.1896	0.0114	-0.0138
62	-53	111	-0.0984	-103	76	-0.1074	-0.0090	-0.0252
64	-82	143	-0.1350	-133	119	-0.1512	-0.0162	-0.0162
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 1/22/2010 9:41:00 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 1/27/2010 2:28:07 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-622	687	-0.7854	-652	624	-0.7656	0.0198	-0.0426
6	-578	613	-0.7146	-596	588	-0.7104	0.0042	-0.0624
8	-390	426	-0.4896	-416	411	-0.4962	-0.0066	-0.0666
10	-153	189	-0.2052	-174	172	-0.2076	-0.0024	-0.0600
12	49	-11	0.0360	28	-29	0.0342	-0.0018	-0.0576
14	247	-190	0.2622	213	-234	0.2682	0.0060	-0.0558
16	385	-347	0.4392	368	-366	0.4404	0.0012	-0.0618
18	705	-667	0.8232	683	-691	0.8244	0.0012	-0.0630
20	910	-857	1.0602	860	-886	1.0476	-0.0126	-0.0642
22	791	-759	0.9300	773	-772	0.9270	-0.0030	-0.0516
24	582	-546	0.6768	562	-569	0.6786	0.0018	-0.0486
26	283	-247	0.3180	258	-261	0.3114	-0.0066	-0.0504
28	71	-11	0.0492	27	-52	0.0474	-0.0018	-0.0438
30	72	-22	0.0564	45	-60	0.0630	0.0066	-0.0420
32	161	-103	0.1584	112	-138	0.1500	-0.0084	-0.0486
34	131	-67	0.1188	81	-100	0.1086	-0.0102	-0.0402
36	59	-16	0.0450	33	-38	0.0426	-0.0024	-0.0300
38	-80	117	-0.1182	-112	107	-0.1314	-0.0132	-0.0276
40	-242	294	-0.3216	-279	276	-0.3330	-0.0114	-0.0144
42	-335	393	-0.4368	-385	361	-0.4476	-0.0108	-0.0030
44	-380	442	-0.4932	-436	417	-0.5118	-0.0186	0.0078
46	-465	518	-0.5898	-501	472	-0.5838	0.0060	0.0264
48	-449	513	-0.5772	-488	460	-0.5688	0.0084	0.0204
50	-416	477	-0.5358	-452	426	-0.5268	0.0090	0.0120
52	-377	437	-0.4884	-415	386	-0.4806	0.0078	0.0030
54	-338	405	-0.4458	-393	363	-0.4536	-0.0078	-0.0048
56	-362	412	-0.4644	-394	370	-0.4584	0.0060	0.0030
58	-289	331	-0.3720	-306	299	-0.3630	0.0090	-0.0030
60	-142	193	-0.2010	-162	150	-0.1872	0.0138	-0.0120
62	-53	111	-0.0984	-103	74	-0.1062	-0.0078	-0.0258
64	-82	143	-0.1350	-134	121	-0.1530	-0.0180	-0.0180
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

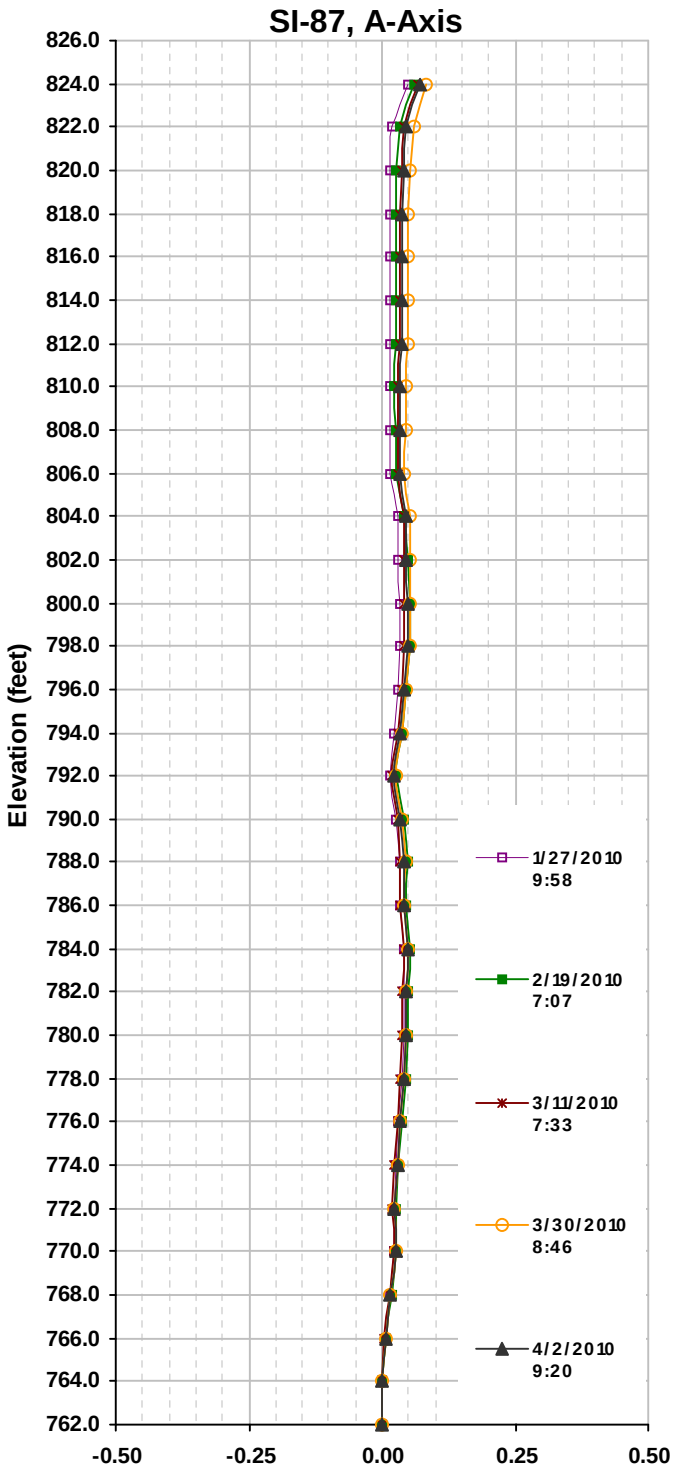
CURRENT SURVEY 1/27/2010 9:58:52 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

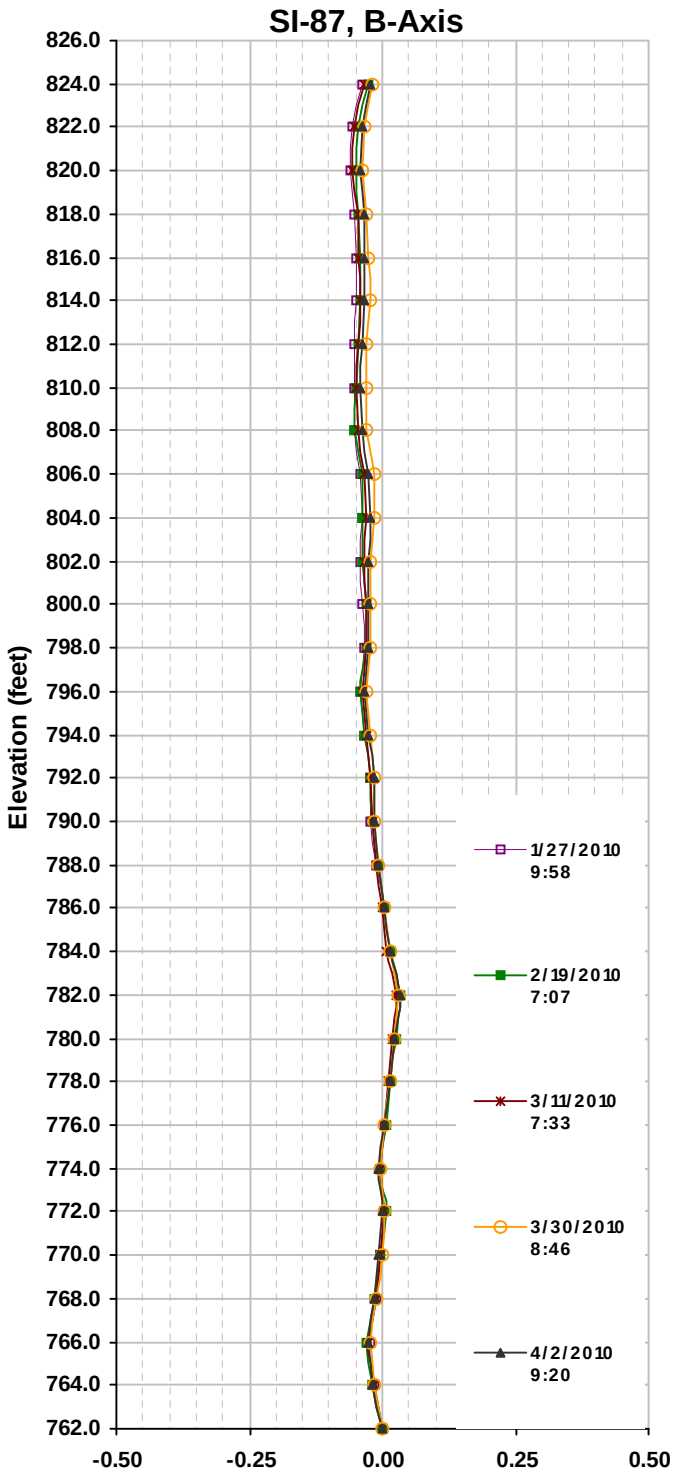
DATE PRINTED 1/27/2010 2:28:07 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-622	687	-0.7854	-653	623	-0.7656	0.0198	-0.0372
6	-578	613	-0.7146	-597	590	-0.7122	0.0024	-0.0570
8	-390	426	-0.4896	-416	412	-0.4968	-0.0072	-0.0594
10	-153	189	-0.2052	-174	172	-0.2076	-0.0024	-0.0522
12	49	-11	0.0360	28	-30	0.0348	-0.0012	-0.0498
14	247	-190	0.2622	211	-232	0.2658	0.0036	-0.0486
16	385	-347	0.4392	365	-368	0.4398	0.0006	-0.0522
18	705	-667	0.8232	682	-689	0.8226	-0.0006	-0.0528
20	910	-857	1.0602	860	-886	1.0476	-0.0126	-0.0522
22	791	-759	0.9300	772	-774	0.9276	-0.0024	-0.0396
24	582	-546	0.6768	562	-571	0.6798	0.0030	-0.0372
26	283	-247	0.3180	259	-264	0.3138	-0.0042	-0.0402
28	71	-11	0.0492	27	-54	0.0486	-0.0006	-0.0360
30	72	-22	0.0564	43	-61	0.0624	0.0060	-0.0354
32	161	-103	0.1584	112	-139	0.1506	-0.0078	-0.0414
34	131	-67	0.1188	78	-101	0.1074	-0.0114	-0.0336
36	59	-16	0.0450	33	-41	0.0444	-0.0006	-0.0222
38	-80	117	-0.1182	-112	104	-0.1296	-0.0114	-0.0216
40	-242	294	-0.3216	-283	275	-0.3348	-0.0132	-0.0102
42	-335	393	-0.4368	-385	360	-0.4470	-0.0102	0.0030
44	-380	442	-0.4932	-436	416	-0.5112	-0.0180	0.0132
46	-465	518	-0.5898	-500	471	-0.5826	0.0072	0.0312
48	-449	513	-0.5772	-487	459	-0.5676	0.0096	0.0240
50	-416	477	-0.5358	-451	426	-0.5262	0.0096	0.0144
52	-377	437	-0.4884	-414	385	-0.4794	0.0090	0.0048
54	-338	405	-0.4458	-393	363	-0.4536	-0.0078	-0.0042
56	-362	412	-0.4644	-394	370	-0.4584	0.0060	0.0036
58	-289	331	-0.3720	-305	301	-0.3636	0.0084	-0.0024
60	-142	193	-0.2010	-163	150	-0.1878	0.0132	-0.0108
62	-53	111	-0.0984	-103	74	-0.1062	-0.0078	-0.0240
64	-82	143	-0.1350	-133	119	-0.1512	-0.0162	-0.0162
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

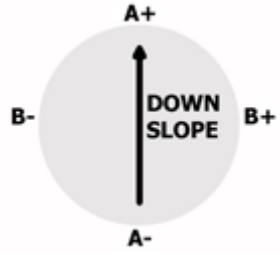


Cumulative Displacement (in) from 8/11/2009



Cumulative Displacement (in) from 8/11/2009

Stantec



Bull Run Fossil Plant
Bull Run
Clinton, TN
172679015
4/5/2010

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 1/27/2010 9:58:52 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 4/5/2010 10:14:30 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-6	8	-0.0084	17	-15	0.0192	0.0276	0.0474
6	-87	95	-0.1092	-85	87	-0.1032	0.0060	0.0198
8	-141	146	-0.1722	-143	143	-0.1716	0.0006	0.0138
10	-157	160	-0.1902	-158	159	-0.1902	0.0000	0.0132
12	-103	104	-0.1242	-104	104	-0.1248	-0.0006	0.0132
14	31	-30	0.0366	30	-31	0.0366	0.0000	0.0138
16	146	-143	0.1734	144	-146	0.1740	0.0006	0.0138
18	281	-283	0.3384	280	-281	0.3366	-0.0018	0.0132
20	377	-373	0.4500	373	-377	0.4500	0.0000	0.0150
22	259	-257	0.3096	246	-248	0.2964	-0.0132	0.0150
24	68	-64	0.0792	63	-64	0.0762	-0.0030	0.0282
26	-73	76	-0.0894	-77	78	-0.0930	-0.0036	0.0312
28	-163	165	-0.1968	-164	164	-0.1968	0.0000	0.0348
30	-161	161	-0.1932	-156	157	-0.1878	0.0054	0.0348
32	-155	153	-0.1848	-148	148	-0.1776	0.0072	0.0294
34	-90	91	-0.1086	-84	84	-0.1008	0.0078	0.0222
36	-134	137	-0.1626	-147	146	-0.1758	-0.0132	0.0144
38	-251	251	-0.3012	-258	257	-0.3090	-0.0078	0.0276
40	-246	245	-0.2946	-245	245	-0.2940	0.0006	0.0354
42	-265	265	-0.3180	-272	270	-0.3252	-0.0072	0.0348
44	-293	295	-0.3528	-292	296	-0.3528	0.0000	0.0420
46	-323	327	-0.3900	-325	325	-0.3900	0.0000	0.0420
48	-316	318	-0.3804	-313	315	-0.3768	0.0036	0.0420
50	-196	194	-0.2340	-189	190	-0.2274	0.0066	0.0384
52	-68	66	-0.0804	-62	63	-0.0750	0.0054	0.0318
54	1	-1	0.0012	6	-4	0.0060	0.0048	0.0264
56	17	-13	0.0180	13	-13	0.0156	-0.0024	0.0216
58	54	-51	0.0630	59	-59	0.0708	0.0078	0.0240
60	181	-183	0.2184	190	-190	0.2280	0.0096	0.0162
62	301	-302	0.3618	307	-307	0.3684	0.0066	0.0066
64	342	-342	0.4104	343	-341	0.4104	0.0000	0.0000
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 2/19/2010 7:07:39 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 4/5/2010 10:14:30 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-6	8	-0.0084	16	-13	0.0174	0.0258	0.0594
6	-87	95	-0.1092	-85	86	-0.1026	0.0066	0.0336
8	-141	146	-0.1722	-142	142	-0.1704	0.0018	0.0270
10	-157	160	-0.1902	-158	159	-0.1902	0.0000	0.0252
12	-103	104	-0.1242	-103	104	-0.1242	0.0000	0.0252
14	31	-30	0.0366	31	-31	0.0372	0.0006	0.0252
16	146	-143	0.1734	144	-146	0.1740	0.0006	0.0246
18	281	-283	0.3384	277	-281	0.3348	-0.0036	0.0240
20	377	-373	0.4500	374	-376	0.4500	0.0000	0.0276
22	259	-257	0.3096	247	-246	0.2958	-0.0138	0.0276
24	68	-64	0.0792	62	-59	0.0726	-0.0066	0.0414
26	-73	76	-0.0894	-78	80	-0.0948	-0.0054	0.0480
28	-163	165	-0.1968	-163	164	-0.1962	0.0006	0.0534
30	-161	161	-0.1932	-154	156	-0.1860	0.0072	0.0528
32	-155	153	-0.1848	-147	147	-0.1764	0.0084	0.0456
34	-90	91	-0.1086	-82	83	-0.0990	0.0096	0.0372
36	-134	137	-0.1626	-146	147	-0.1758	-0.0132	0.0276
38	-251	251	-0.3012	-256	257	-0.3078	-0.0066	0.0408
40	-246	245	-0.2946	-244	245	-0.2934	0.0012	0.0474
42	-265	265	-0.3180	-271	269	-0.3240	-0.0060	0.0462
44	-293	295	-0.3528	-291	294	-0.3510	0.0018	0.0522
46	-323	327	-0.3900	-325	325	-0.3900	0.0000	0.0504
48	-316	318	-0.3804	-312	314	-0.3756	0.0048	0.0504
50	-196	194	-0.2340	-187	190	-0.2262	0.0078	0.0456
52	-68	66	-0.0804	-61	62	-0.0738	0.0066	0.0378
54	1	-1	0.0012	7	-5	0.0072	0.0060	0.0312
56	17	-13	0.0180	14	-12	0.0156	-0.0024	0.0252
58	54	-51	0.0630	61	-60	0.0726	0.0096	0.0276
60	181	-183	0.2184	191	-190	0.2286	0.0102	0.0180
62	301	-302	0.3618	308	-307	0.3690	0.0072	0.0078
64	342	-342	0.4104	344	-341	0.4110	0.0006	0.0006
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 3/11/2010 7:33:32 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 4/5/2010 10:14:30 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-6	8	-0.0084	18	-13	0.0186	0.0270	0.0690
6	-87	95	-0.1092	-85	88	-0.1038	0.0054	0.0420
8	-141	146	-0.1722	-141	143	-0.1704	0.0018	0.0366
10	-157	160	-0.1902	-157	160	-0.1902	0.0000	0.0348
12	-103	104	-0.1242	-103	105	-0.1248	-0.0006	0.0348
14	31	-30	0.0366	32	-30	0.0372	0.0006	0.0354
16	146	-143	0.1734	149	-145	0.1764	0.0030	0.0348
18	281	-283	0.3384	283	-281	0.3384	0.0000	0.0318
20	377	-373	0.4500	376	-377	0.4518	0.0018	0.0318
22	259	-257	0.3096	252	-248	0.3000	-0.0096	0.0300
24	68	-64	0.0792	65	-64	0.0774	-0.0018	0.0396
26	-73	76	-0.0894	-74	78	-0.0912	-0.0018	0.0414
28	-163	165	-0.1968	-162	165	-0.1962	0.0006	0.0432
30	-161	161	-0.1932	-154	157	-0.1866	0.0066	0.0426
32	-155	153	-0.1848	-146	149	-0.1770	0.0078	0.0360
34	-90	91	-0.1086	-81	84	-0.0990	0.0096	0.0282
36	-134	137	-0.1626	-143	146	-0.1734	-0.0108	0.0186
38	-251	251	-0.3012	-255	257	-0.3072	-0.0060	0.0294
40	-246	245	-0.2946	-243	245	-0.2928	0.0018	0.0354
42	-265	265	-0.3180	-270	271	-0.3246	-0.0066	0.0336
44	-293	295	-0.3528	-290	295	-0.3510	0.0018	0.0402
46	-323	327	-0.3900	-323	325	-0.3888	0.0012	0.0384
48	-316	318	-0.3804	-313	316	-0.3774	0.0030	0.0372
50	-196	194	-0.2340	-189	192	-0.2286	0.0054	0.0342
52	-68	66	-0.0804	-62	64	-0.0756	0.0048	0.0288
54	1	-1	0.0012	7	-3	0.0060	0.0048	0.0240
56	17	-13	0.0180	14	-11	0.0150	-0.0030	0.0192
58	54	-51	0.0630	60	-58	0.0708	0.0078	0.0222
60	181	-183	0.2184	191	-188	0.2274	0.0090	0.0144
62	301	-302	0.3618	308	-305	0.3678	0.0060	0.0054
64	342	-342	0.4104	344	-339	0.4098	-0.0006	-0.0006
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 3/30/2010 8:46:21 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 4/5/2010 10:14:30 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-6	8	-0.0084	17	-10	0.0162	0.0246	0.0834
6	-87	95	-0.1092	-83	88	-0.1026	0.0066	0.0588
8	-141	146	-0.1722	-140	144	-0.1704	0.0018	0.0522
10	-157	160	-0.1902	-155	161	-0.1896	0.0006	0.0504
12	-103	104	-0.1242	-100	106	-0.1236	0.0006	0.0498
14	31	-30	0.0366	34	-29	0.0378	0.0012	0.0492
16	146	-143	0.1734	151	-144	0.1770	0.0036	0.0480
18	281	-283	0.3384	284	-280	0.3384	0.0000	0.0444
20	377	-373	0.4500	377	-376	0.4518	0.0018	0.0444
22	259	-257	0.3096	252	-249	0.3006	-0.0090	0.0426
24	68	-64	0.0792	67	-64	0.0786	-0.0006	0.0516
26	-73	76	-0.0894	-73	79	-0.0912	-0.0018	0.0522
28	-163	165	-0.1968	-161	165	-0.1956	0.0012	0.0540
30	-161	161	-0.1932	-152	158	-0.1860	0.0072	0.0528
32	-155	153	-0.1848	-144	149	-0.1758	0.0090	0.0456
34	-90	91	-0.1086	-79	84	-0.0978	0.0108	0.0366
36	-134	137	-0.1626	-143	148	-0.1746	-0.0120	0.0258
38	-251	251	-0.3012	-254	258	-0.3072	-0.0060	0.0378
40	-246	245	-0.2946	-242	246	-0.2928	0.0018	0.0438
42	-265	265	-0.3180	-269	272	-0.3246	-0.0066	0.0420
44	-293	295	-0.3528	-288	296	-0.3504	0.0024	0.0486
46	-323	327	-0.3900	-322	326	-0.3888	0.0012	0.0462
48	-316	318	-0.3804	-311	317	-0.3768	0.0036	0.0450
50	-196	194	-0.2340	-187	192	-0.2274	0.0066	0.0414
52	-68	66	-0.0804	-60	65	-0.0750	0.0054	0.0348
54	1	-1	0.0012	9	-3	0.0072	0.0060	0.0294
56	17	-13	0.0180	15	-11	0.0156	-0.0024	0.0234
58	54	-51	0.0630	62	-58	0.0720	0.0090	0.0258
60	181	-183	0.2184	192	-188	0.2280	0.0096	0.0168
62	301	-302	0.3618	309	-305	0.3684	0.0066	0.0072
64	342	-342	0.4104	346	-339	0.4110	0.0006	0.0006
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 4/2/2010 9:20:58 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 4/5/2010 10:14:30 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-6	8	-0.0084	18	-9	0.0162	0.0246	0.0708
6	-87	95	-0.1092	-82	89	-0.1026	0.0066	0.0462
8	-141	146	-0.1722	-139	145	-0.1704	0.0018	0.0396
10	-157	160	-0.1902	-155	162	-0.1902	0.0000	0.0378
12	-103	104	-0.1242	-100	106	-0.1236	0.0006	0.0378
14	31	-30	0.0366	34	-28	0.0372	0.0006	0.0372
16	146	-143	0.1734	148	-144	0.1752	0.0018	0.0366
18	281	-283	0.3384	284	-280	0.3384	0.0000	0.0348
20	377	-373	0.4500	377	-375	0.4512	0.0012	0.0348
22	259	-257	0.3096	252	-246	0.2988	-0.0108	0.0336
24	68	-64	0.0792	67	-62	0.0774	-0.0018	0.0444
26	-73	76	-0.0894	-73	80	-0.0918	-0.0024	0.0462
28	-163	165	-0.1968	-161	166	-0.1962	0.0006	0.0486
30	-161	161	-0.1932	-152	159	-0.1866	0.0066	0.0480
32	-155	153	-0.1848	-144	150	-0.1764	0.0084	0.0414
34	-90	91	-0.1086	-79	85	-0.0984	0.0102	0.0330
36	-134	137	-0.1626	-143	149	-0.1752	-0.0126	0.0228
38	-251	251	-0.3012	-254	259	-0.3078	-0.0066	0.0354
40	-246	245	-0.2946	-242	247	-0.2934	0.0012	0.0420
42	-265	265	-0.3180	-269	272	-0.3246	-0.0066	0.0408
44	-293	295	-0.3528	-288	296	-0.3504	0.0024	0.0474
46	-323	327	-0.3900	-322	327	-0.3894	0.0006	0.0450
48	-316	318	-0.3804	-310	317	-0.3762	0.0042	0.0444
50	-196	194	-0.2340	-186	193	-0.2274	0.0066	0.0402
52	-68	66	-0.0804	-59	66	-0.0750	0.0054	0.0336
54	1	-1	0.0012	9	-2	0.0066	0.0054	0.0282
56	17	-13	0.0180	16	-10	0.0156	-0.0024	0.0228
58	54	-51	0.0630	62	-57	0.0714	0.0084	0.0252
60	181	-183	0.2184	193	-187	0.2280	0.0096	0.0168
62	301	-302	0.3618	310	-305	0.3690	0.0072	0.0072
64	342	-342	0.4104	346	-338	0.4104	0.0000	0.0000
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 1/27/2010 9:58:52 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 4/5/2010 10:14:42 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-622	687	-0.7854	-653	623	-0.7656	0.0198	-0.0372
6	-578	613	-0.7146	-597	590	-0.7122	0.0024	-0.0570
8	-390	426	-0.4896	-416	412	-0.4968	-0.0072	-0.0594
10	-153	189	-0.2052	-174	172	-0.2076	-0.0024	-0.0522
12	49	-11	0.0360	28	-30	0.0348	-0.0012	-0.0498
14	247	-190	0.2622	211	-232	0.2658	0.0036	-0.0486
16	385	-347	0.4392	365	-368	0.4398	0.0006	-0.0522
18	705	-667	0.8232	682	-689	0.8226	-0.0006	-0.0528
20	910	-857	1.0602	860	-886	1.0476	-0.0126	-0.0522
22	791	-759	0.9300	772	-774	0.9276	-0.0024	-0.0396
24	582	-546	0.6768	562	-571	0.6798	0.0030	-0.0372
26	283	-247	0.3180	259	-264	0.3138	-0.0042	-0.0402
28	71	-11	0.0492	27	-54	0.0486	-0.0006	-0.0360
30	72	-22	0.0564	43	-61	0.0624	0.0060	-0.0354
32	161	-103	0.1584	112	-139	0.1506	-0.0078	-0.0414
34	131	-67	0.1188	78	-101	0.1074	-0.0114	-0.0336
36	59	-16	0.0450	33	-41	0.0444	-0.0006	-0.0222
38	-80	117	-0.1182	-112	104	-0.1296	-0.0114	-0.0216
40	-242	294	-0.3216	-283	275	-0.3348	-0.0132	-0.0102
42	-335	393	-0.4368	-385	360	-0.4470	-0.0102	0.0030
44	-380	442	-0.4932	-436	416	-0.5112	-0.0180	0.0132
46	-465	518	-0.5898	-500	471	-0.5826	0.0072	0.0312
48	-449	513	-0.5772	-487	459	-0.5676	0.0096	0.0240
50	-416	477	-0.5358	-451	426	-0.5262	0.0096	0.0144
52	-377	437	-0.4884	-414	385	-0.4794	0.0090	0.0048
54	-338	405	-0.4458	-393	363	-0.4536	-0.0078	-0.0042
56	-362	412	-0.4644	-394	370	-0.4584	0.0060	0.0036
58	-289	331	-0.3720	-305	301	-0.3636	0.0084	-0.0024
60	-142	193	-0.2010	-163	150	-0.1878	0.0132	-0.0108
62	-53	111	-0.0984	-103	74	-0.1062	-0.0078	-0.0240
64	-82	143	-0.1350	-133	119	-0.1512	-0.0162	-0.0162
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 2/19/2010 7:07:39 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 4/5/2010 10:14:42 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-622	687	-0.7854	-651	626	-0.7662	0.0192	-0.0270
6	-578	613	-0.7146	-595	589	-0.7104	0.0042	-0.0462
8	-390	426	-0.4896	-416	410	-0.4956	-0.0060	-0.0504
10	-153	189	-0.2052	-173	173	-0.2076	-0.0024	-0.0444
12	49	-11	0.0360	29	-28	0.0342	-0.0018	-0.0420
14	247	-190	0.2622	215	-233	0.2688	0.0066	-0.0402
16	385	-347	0.4392	370	-367	0.4422	0.0030	-0.0468
18	705	-667	0.8232	685	-690	0.8250	0.0018	-0.0498
20	910	-857	1.0602	862	-884	1.0476	-0.0126	-0.0516
22	791	-759	0.9300	773	-772	0.9270	-0.0030	-0.0390
24	582	-546	0.6768	562	-569	0.6786	0.0018	-0.0360
26	283	-247	0.3180	258	-262	0.3120	-0.0060	-0.0378
28	71	-11	0.0492	29	-51	0.0480	-0.0012	-0.0318
30	72	-22	0.0564	47	-62	0.0654	0.0090	-0.0306
32	161	-103	0.1584	114	-138	0.1512	-0.0072	-0.0396
34	131	-67	0.1188	80	-100	0.1080	-0.0108	-0.0324
36	59	-16	0.0450	32	-38	0.0420	-0.0030	-0.0216
38	-80	117	-0.1182	-110	105	-0.1290	-0.0108	-0.0186
40	-242	294	-0.3216	-282	276	-0.3348	-0.0132	-0.0078
42	-335	393	-0.4368	-384	362	-0.4476	-0.0108	0.0054
44	-380	442	-0.4932	-436	417	-0.5118	-0.0186	0.0162
46	-465	518	-0.5898	-498	471	-0.5814	0.0084	0.0348
48	-449	513	-0.5772	-485	461	-0.5676	0.0096	0.0264
50	-416	477	-0.5358	-449	427	-0.5256	0.0102	0.0168
52	-377	437	-0.4884	-413	386	-0.4794	0.0090	0.0066
54	-338	405	-0.4458	-392	365	-0.4542	-0.0084	-0.0024
56	-362	412	-0.4644	-391	369	-0.4560	0.0084	0.0060
58	-289	331	-0.3720	-303	299	-0.3612	0.0108	-0.0024
60	-142	193	-0.2010	-160	150	-0.1860	0.0150	-0.0132
62	-53	111	-0.0984	-101	77	-0.1068	-0.0084	-0.0282
64	-82	143	-0.1350	-134	124	-0.1548	-0.0198	-0.0198
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 3/11/2010 7:33:32 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 4/5/2010 10:14:42 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-622	687	-0.7854	-652	629	-0.7686	0.0168	-0.0348
6	-578	613	-0.7146	-594	591	-0.7110	0.0036	-0.0516
8	-390	426	-0.4896	-414	416	-0.4980	-0.0084	-0.0552
10	-153	189	-0.2052	-172	175	-0.2082	-0.0030	-0.0468
12	49	-11	0.0360	29	-26	0.0330	-0.0030	-0.0438
14	247	-190	0.2622	215	-232	0.2682	0.0060	-0.0408
16	385	-347	0.4392	367	-366	0.4398	0.0006	-0.0468
18	705	-667	0.8232	684	-685	0.8214	-0.0018	-0.0474
20	910	-857	1.0602	862	-884	1.0476	-0.0126	-0.0456
22	791	-759	0.9300	774	-771	0.9270	-0.0030	-0.0330
24	582	-546	0.6768	566	-569	0.6810	0.0042	-0.0300
26	283	-247	0.3180	262	-264	0.3156	-0.0024	-0.0342
28	71	-11	0.0492	29	-49	0.0468	-0.0024	-0.0318
30	72	-22	0.0564	48	-59	0.0642	0.0078	-0.0294
32	161	-103	0.1584	115	-139	0.1524	-0.0060	-0.0372
34	131	-67	0.1188	82	-99	0.1086	-0.0102	-0.0312
36	59	-16	0.0450	35	-39	0.0444	-0.0006	-0.0210
38	-80	117	-0.1182	-107	104	-0.1266	-0.0084	-0.0204
40	-242	294	-0.3216	-279	277	-0.3336	-0.0120	-0.0120
42	-335	393	-0.4368	-381	361	-0.4452	-0.0084	0.0000
44	-380	442	-0.4932	-432	417	-0.5094	-0.0162	0.0084
46	-465	518	-0.5898	-500	473	-0.5838	0.0060	0.0246
48	-449	513	-0.5772	-489	461	-0.5700	0.0072	0.0186
50	-416	477	-0.5358	-451	429	-0.5280	0.0078	0.0114
52	-377	437	-0.4884	-414	387	-0.4806	0.0078	0.0036
54	-338	405	-0.4458	-390	365	-0.4530	-0.0072	-0.0042
56	-362	412	-0.4644	-392	371	-0.4578	0.0066	0.0030
58	-289	331	-0.3720	-304	302	-0.3636	0.0084	-0.0036
60	-142	193	-0.2010	-160	154	-0.1884	0.0126	-0.0120
62	-53	111	-0.0984	-101	79	-0.1080	-0.0096	-0.0246
64	-82	143	-0.1350	-129	121	-0.1500	-0.0150	-0.0150
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

CURRENT SURVEY 3/30/2010 8:46:21 AM

INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 4/5/2010 10:14:42 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-622	687	-0.7854	-652	629	-0.7686	0.0168	-0.0180
6	-578	613	-0.7146	-594	592	-0.7116	0.0030	-0.0348
8	-390	426	-0.4896	-414	413	-0.4962	-0.0066	-0.0378
10	-153	189	-0.2052	-173	175	-0.2088	-0.0036	-0.0312
12	49	-11	0.0360	29	-25	0.0324	-0.0036	-0.0276
14	247	-190	0.2622	217	-230	0.2682	0.0060	-0.0240
16	385	-347	0.4392	365	-367	0.4392	0.0000	-0.0300
18	705	-667	0.8232	684	-686	0.8220	-0.0012	-0.0300
20	910	-857	1.0602	863	-884	1.0482	-0.0120	-0.0288
22	791	-759	0.9300	777	-773	0.9300	0.0000	-0.0168
24	582	-546	0.6768	568	-571	0.6834	0.0066	-0.0168
26	283	-247	0.3180	265	-265	0.3180	0.0000	-0.0234
28	71	-11	0.0492	31	-49	0.0480	-0.0012	-0.0234
30	72	-22	0.0564	48	-59	0.0642	0.0078	-0.0222
32	161	-103	0.1584	116	-137	0.1518	-0.0066	-0.0300
34	131	-67	0.1188	83	-99	0.1092	-0.0096	-0.0234
36	59	-16	0.0450	37	-40	0.0462	0.0012	-0.0138
38	-80	117	-0.1182	-105	104	-0.1254	-0.0072	-0.0150
40	-242	294	-0.3216	-279	277	-0.3336	-0.0120	-0.0078
42	-335	393	-0.4368	-381	362	-0.4458	-0.0090	0.0042
44	-380	442	-0.4932	-435	418	-0.5118	-0.0186	0.0132
46	-465	518	-0.5898	-498	472	-0.5820	0.0078	0.0318
48	-449	513	-0.5772	-484	461	-0.5670	0.0102	0.0240
50	-416	477	-0.5358	-449	429	-0.5268	0.0090	0.0138
52	-377	437	-0.4884	-413	389	-0.4812	0.0072	0.0048
54	-338	405	-0.4458	-391	365	-0.4536	-0.0078	-0.0024
56	-362	412	-0.4644	-392	371	-0.4578	0.0066	0.0054
58	-289	331	-0.3720	-303	302	-0.3630	0.0090	-0.0012
60	-142	193	-0.2010	-160	154	-0.1884	0.0126	-0.0102
62	-53	111	-0.0984	-100	78	-0.1068	-0.0084	-0.0228
64	-82	143	-0.1350	-128	121	-0.1494	-0.0144	-0.0144
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-87

DESCRIPTION

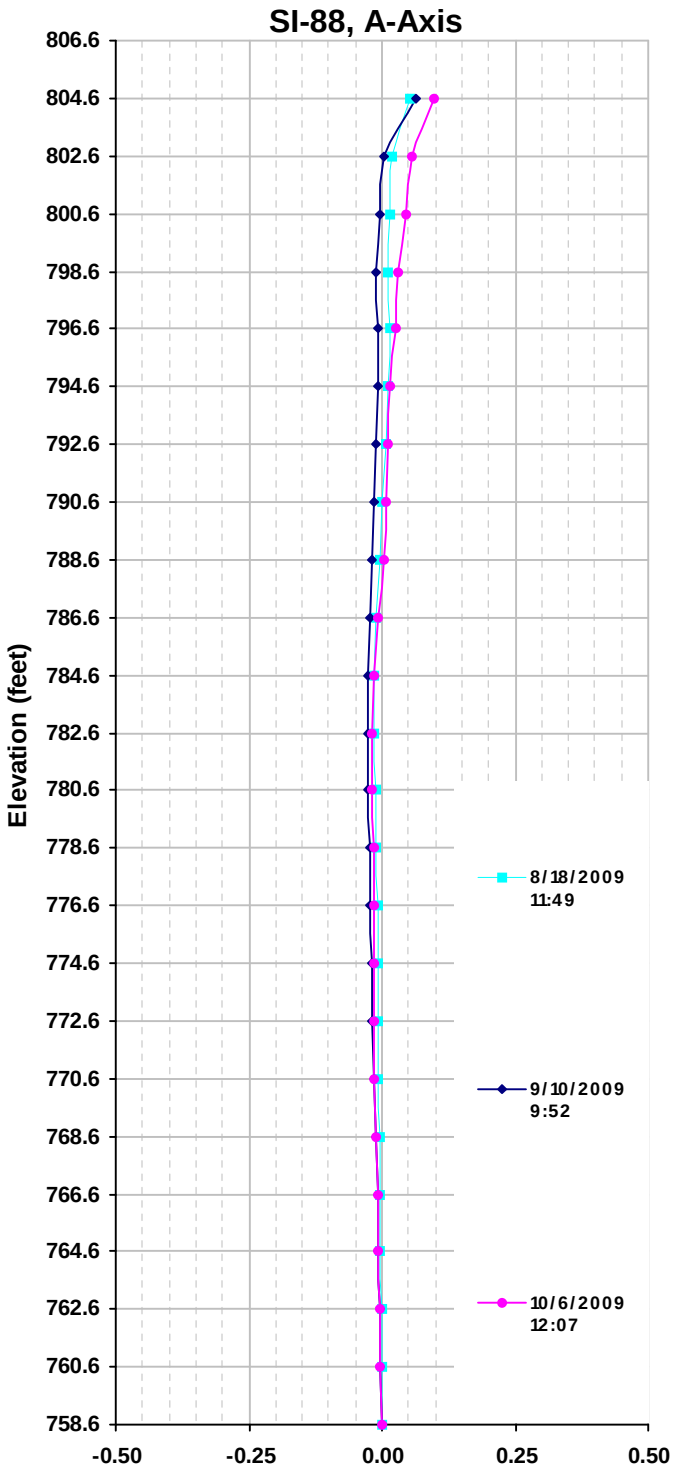
CURRENT SURVEY 4/2/2010 9:20:58 AM

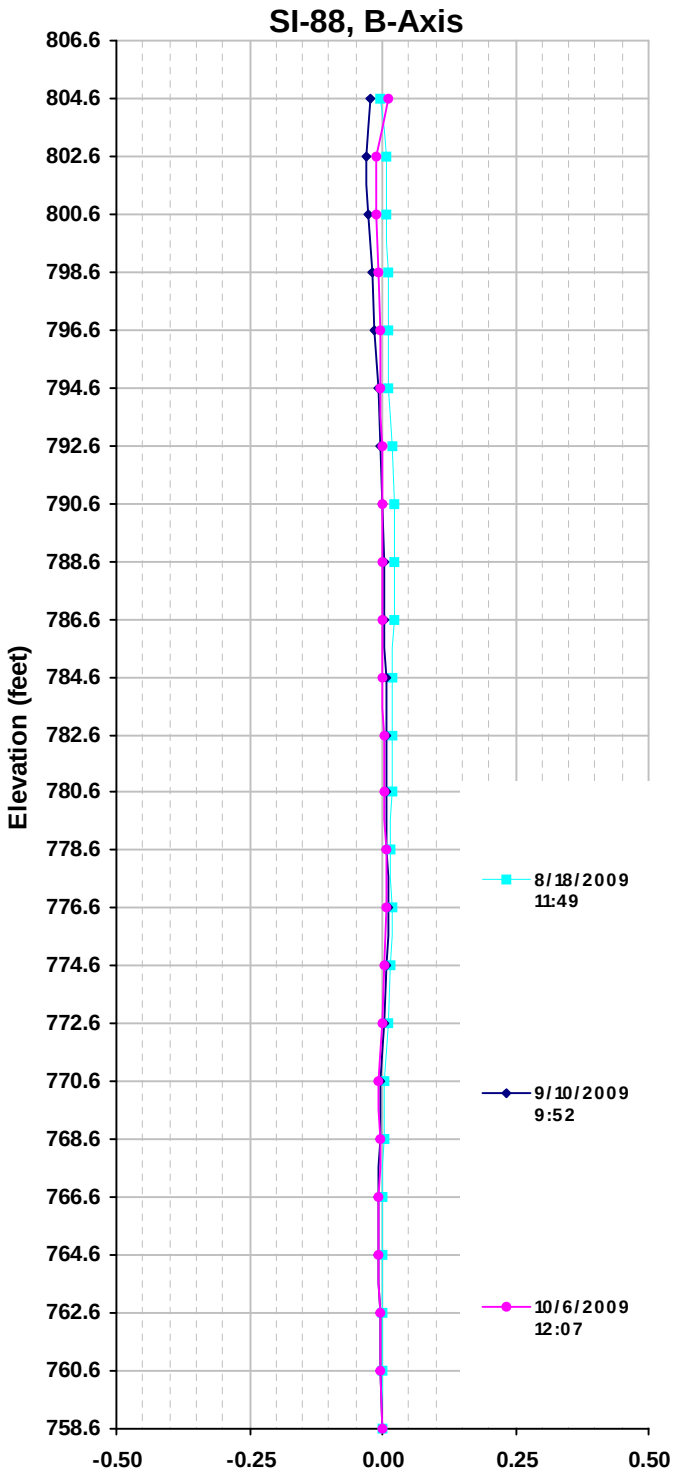
INITIAL SURVEY 8/11/2009 10:28:11 AM

DATE PRINTED 4/5/2010 10:14:42 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-622	687	-0.7854	-653	627	-0.7680	0.0174	-0.0210
6	-578	613	-0.7146	-595	590	-0.7110	0.0036	-0.0384
8	-390	426	-0.4896	-415	412	-0.4962	-0.0066	-0.0420
10	-153	189	-0.2052	-173	173	-0.2076	-0.0024	-0.0354
12	49	-11	0.0360	30	-29	0.0354	-0.0006	-0.0330
14	247	-190	0.2622	214	-232	0.2676	0.0054	-0.0324
16	385	-347	0.4392	368	-367	0.4410	0.0018	-0.0378
18	705	-667	0.8232	682	-688	0.8220	-0.0012	-0.0396
20	910	-857	1.0602	861	-885	1.0476	-0.0126	-0.0384
22	791	-759	0.9300	772	-774	0.9276	-0.0024	-0.0258
24	582	-546	0.6768	563	-572	0.6810	0.0042	-0.0234
26	283	-247	0.3180	263	-265	0.3168	-0.0012	-0.0276
28	71	-11	0.0492	30	-51	0.0486	-0.0006	-0.0264
30	72	-22	0.0564	47	-61	0.0648	0.0084	-0.0258
32	161	-103	0.1584	115	-138	0.1518	-0.0066	-0.0342
34	131	-67	0.1188	80	-100	0.1080	-0.0108	-0.0276
36	59	-16	0.0450	34	-41	0.0450	0.0000	-0.0168
38	-80	117	-0.1182	-110	103	-0.1278	-0.0096	-0.0168
40	-242	294	-0.3216	-280	276	-0.3336	-0.0120	-0.0072
42	-335	393	-0.4368	-383	362	-0.4470	-0.0102	0.0048
44	-380	442	-0.4932	-436	416	-0.5112	-0.0180	0.0150
46	-465	518	-0.5898	-496	471	-0.5802	0.0096	0.0330
48	-449	513	-0.5772	-484	461	-0.5670	0.0102	0.0234
50	-416	477	-0.5358	-448	427	-0.5250	0.0108	0.0132
52	-377	437	-0.4884	-411	386	-0.4782	0.0102	0.0024
54	-338	405	-0.4458	-390	365	-0.4530	-0.0072	-0.0078
56	-362	412	-0.4644	-393	371	-0.4584	0.0060	-0.0006
58	-289	331	-0.3720	-304	301	-0.3630	0.0090	-0.0066
60	-142	193	-0.2010	-162	153	-0.1890	0.0120	-0.0156
62	-53	111	-0.0984	-102	78	-0.1080	-0.0096	-0.0276
64	-82	143	-0.1350	-134	121	-0.1530	-0.0180	-0.0180
66	0	0	0.0000	0	0	0.0000	0.0000	0.0000





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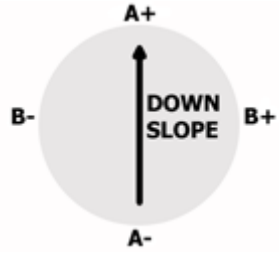


Bull Run Fossil Plant
Bull Run
Clinton, TN
172679015
10/7/2009

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 8/18/2009 11:49:41 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 10/7/2009 9:25:27 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-470	482	-0.5712	-447	449	-0.5376	0.0336	0.0540
6	-520	521	-0.6246	-510	519	-0.6174	0.0072	0.0204
8	-676	678	-0.8124	-670	679	-0.8094	0.0030	0.0132
10	-838	838	-1.0056	-836	847	-1.0098	-0.0042	0.0102
12	-809	802	-0.9666	-801	805	-0.9636	0.0030	0.0144
14	-607	604	-0.7266	-597	607	-0.7224	0.0042	0.0114
16	-392	389	-0.4686	-381	389	-0.4620	0.0066	0.0072
18	-241	238	-0.2874	-233	241	-0.2844	0.0030	0.0006
20	-86	83	-0.1014	-78	78	-0.0936	0.0078	-0.0024
22	22	-27	0.0294	31	-24	0.0330	0.0036	-0.0102
24	49	-50	0.0594	53	-46	0.0594	0.0000	-0.0138
26	23	-25	0.0288	27	-19	0.0276	-0.0012	-0.0138
28	5	-6	0.0066	7	0	0.0042	-0.0024	-0.0126
30	-11	9	-0.0120	-7	15	-0.0132	-0.0012	-0.0102
32	-37	34	-0.0426	-34	39	-0.0438	-0.0012	-0.0090
34	-65	64	-0.0774	-61	69	-0.0780	-0.0006	-0.0078
36	-83	80	-0.0978	-78	85	-0.0978	0.0000	-0.0072
38	-114	111	-0.1350	-112	117	-0.1374	-0.0024	-0.0072
40	-169	167	-0.2016	-163	172	-0.2010	0.0006	-0.0048
42	-243	241	-0.2904	-242	245	-0.2922	-0.0018	-0.0054
44	-249	250	-0.2994	-248	254	-0.3012	-0.0018	-0.0036
46	-246	246	-0.2952	-242	251	-0.2958	-0.0006	-0.0018
48	-280	278	-0.3348	-278	282	-0.3360	-0.0012	-0.0012
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 9/10/2009 9:52:12 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 10/7/2009 9:25:27 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-470	482	-0.5712	-420	433	-0.5118	0.0594	0.0642
6	-520	521	-0.6246	-509	518	-0.6162	0.0084	0.0048
8	-676	678	-0.8124	-667	677	-0.8064	0.0060	-0.0036
10	-838	838	-1.0056	-834	846	-1.0080	-0.0024	-0.0096
12	-809	802	-0.9666	-803	805	-0.9648	0.0018	-0.0072
14	-607	604	-0.7266	-599	607	-0.7236	0.0030	-0.0090
16	-392	389	-0.4686	-383	390	-0.4638	0.0048	-0.0120
18	-241	238	-0.2874	-234	242	-0.2856	0.0018	-0.0168
20	-86	83	-0.1014	-80	85	-0.0990	0.0024	-0.0186
22	22	-27	0.0294	33	-25	0.0348	0.0054	-0.0210
24	49	-50	0.0594	54	-46	0.0600	0.0006	-0.0264
26	23	-25	0.0288	26	-18	0.0264	-0.0024	-0.0270
28	5	-6	0.0066	7	1	0.0036	-0.0030	-0.0246
30	-11	9	-0.0120	-7	13	-0.0120	0.0000	-0.0216
32	-37	34	-0.0426	-35	40	-0.0450	-0.0024	-0.0216
34	-65	64	-0.0774	-62	70	-0.0792	-0.0018	-0.0192
36	-83	80	-0.0978	-78	87	-0.0990	-0.0012	-0.0174
38	-114	111	-0.1350	-113	120	-0.1398	-0.0048	-0.0162
40	-169	167	-0.2016	-165	175	-0.2040	-0.0024	-0.0114
42	-243	241	-0.2904	-241	246	-0.2922	-0.0018	-0.0090
44	-249	250	-0.2994	-247	255	-0.3012	-0.0018	-0.0072
46	-246	246	-0.2952	-243	253	-0.2976	-0.0024	-0.0054
48	-280	278	-0.3348	-278	285	-0.3378	-0.0030	-0.0030
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 10/6/2009 12:07:28 PM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 10/7/2009 9:25:27 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-470	482	-0.5712	-440	446	-0.5316	0.0396	0.0978
6	-520	521	-0.6246	-506	513	-0.6114	0.0132	0.0582
8	-676	678	-0.8124	-659	667	-0.7956	0.0168	0.0450
10	-838	838	-1.0056	-831	839	-1.0020	0.0036	0.0282
12	-809	802	-0.9666	-797	799	-0.9576	0.0090	0.0246
14	-607	604	-0.7266	-598	607	-0.7230	0.0036	0.0156
16	-392	389	-0.4686	-384	391	-0.4650	0.0036	0.0120
18	-241	238	-0.2874	-231	241	-0.2832	0.0042	0.0084
20	-86	83	-0.1014	-70	79	-0.0894	0.0120	0.0042
22	22	-27	0.0294	32	-30	0.0372	0.0078	-0.0078
24	49	-50	0.0594	54	-50	0.0624	0.0030	-0.0156
26	23	-25	0.0288	26	-20	0.0276	-0.0012	-0.0186
28	5	-6	0.0066	7	-2	0.0054	-0.0012	-0.0174
30	-11	9	-0.0120	-8	13	-0.0126	-0.0006	-0.0162
32	-37	34	-0.0426	-32	42	-0.0444	-0.0018	-0.0156
34	-65	64	-0.0774	-62	68	-0.0780	-0.0006	-0.0138
36	-83	80	-0.0978	-79	84	-0.0978	0.0000	-0.0132
38	-114	111	-0.1350	-112	117	-0.1374	-0.0024	-0.0132
40	-169	167	-0.2016	-166	173	-0.2034	-0.0018	-0.0108
42	-243	241	-0.2904	-241	246	-0.2922	-0.0018	-0.0090
44	-249	250	-0.2994	-249	254	-0.3018	-0.0024	-0.0072
46	-246	246	-0.2952	-245	251	-0.2976	-0.0024	-0.0048
48	-280	278	-0.3348	-279	283	-0.3372	-0.0024	-0.0024
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 8/18/2009 11:49:41 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 10/7/2009 9:25:35 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	62	-6	0.0408	50	1	0.0294	-0.0114	-0.0054
6	31	24	0.0042	24	18	0.0036	-0.0006	0.0060
8	-69	126	-0.1170	-76	124	-0.1200	-0.0030	0.0066
10	-53	102	-0.0930	-53	103	-0.0936	-0.0006	0.0096
12	-14	67	-0.0486	-18	67	-0.0510	-0.0024	0.0102
14	-65	121	-0.1116	-73	122	-0.1170	-0.0054	0.0126
16	-150	205	-0.2130	-155	206	-0.2166	-0.0036	0.0180
18	-189	246	-0.2610	-192	243	-0.2610	0.0000	0.0216
20	-201	246	-0.2682	-203	244	-0.2682	0.0000	0.0216
22	-143	193	-0.2016	-141	190	-0.1986	0.0030	0.0216
24	-162	218	-0.2280	-163	219	-0.2292	-0.0012	0.0186
26	-150	206	-0.2136	-152	204	-0.2136	0.0000	0.0198
28	-136	194	-0.1980	-137	188	-0.1950	0.0030	0.0198
30	-115	160	-0.1650	-115	161	-0.1656	-0.0006	0.0168
32	17	20	-0.0018	15	17	-0.0012	0.0006	0.0174
34	173	-145	0.1908	175	-151	0.1956	0.0048	0.0168
36	349	-321	0.4020	354	-327	0.4086	0.0066	0.0120
38	556	-529	0.6510	559	-531	0.6540	0.0030	0.0054
40	790	-760	0.9300	793	-762	0.9330	0.0030	0.0024
42	964	-915	1.1274	962	-919	1.1286	0.0012	-0.0006
44	929	-872	1.0806	923	-877	1.0800	-0.0006	-0.0018
46	876	-819	1.0170	872	-821	1.0158	-0.0012	-0.0012
48	869	-814	1.0098	863	-820	1.0098	0.0000	0.0000
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 9/10/2009 9:52:12 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 10/7/2009 9:25:35 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	62	-6	0.0408	64	-11	0.0450	0.0042	-0.0240
6	31	24	0.0042	27	25	0.0012	-0.0030	-0.0282
8	-69	126	-0.1170	-73	134	-0.1242	-0.0072	-0.0252
10	-53	102	-0.0930	-53	110	-0.0978	-0.0048	-0.0180
12	-14	67	-0.0486	-15	74	-0.0534	-0.0048	-0.0132
14	-65	121	-0.1116	-70	126	-0.1176	-0.0060	-0.0084
16	-150	205	-0.2130	-151	210	-0.2166	-0.0036	-0.0024
18	-189	246	-0.2610	-189	250	-0.2634	-0.0024	0.0012
20	-201	246	-0.2682	-201	249	-0.2700	-0.0018	0.0036
22	-143	193	-0.2016	-138	199	-0.2022	-0.0006	0.0054
24	-162	218	-0.2280	-162	223	-0.2310	-0.0030	0.0060
26	-150	206	-0.2136	-146	208	-0.2124	0.0012	0.0090
28	-136	194	-0.1980	-135	197	-0.1992	-0.0012	0.0078
30	-115	160	-0.1650	-114	163	-0.1662	-0.0012	0.0090
32	17	20	-0.0018	20	18	0.0012	0.0030	0.0102
34	173	-145	0.1908	178	-146	0.1944	0.0036	0.0072
36	349	-321	0.4020	356	-324	0.4080	0.0060	0.0036
38	556	-529	0.6510	560	-529	0.6534	0.0024	-0.0024
40	790	-760	0.9300	795	-762	0.9342	0.0042	-0.0048
42	964	-915	1.1274	965	-911	1.1256	-0.0018	-0.0090
44	929	-872	1.0806	927	-869	1.0776	-0.0030	-0.0072
46	876	-819	1.0170	876	-817	1.0158	-0.0012	-0.0042
48	869	-814	1.0098	867	-811	1.0068	-0.0030	-0.0030
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

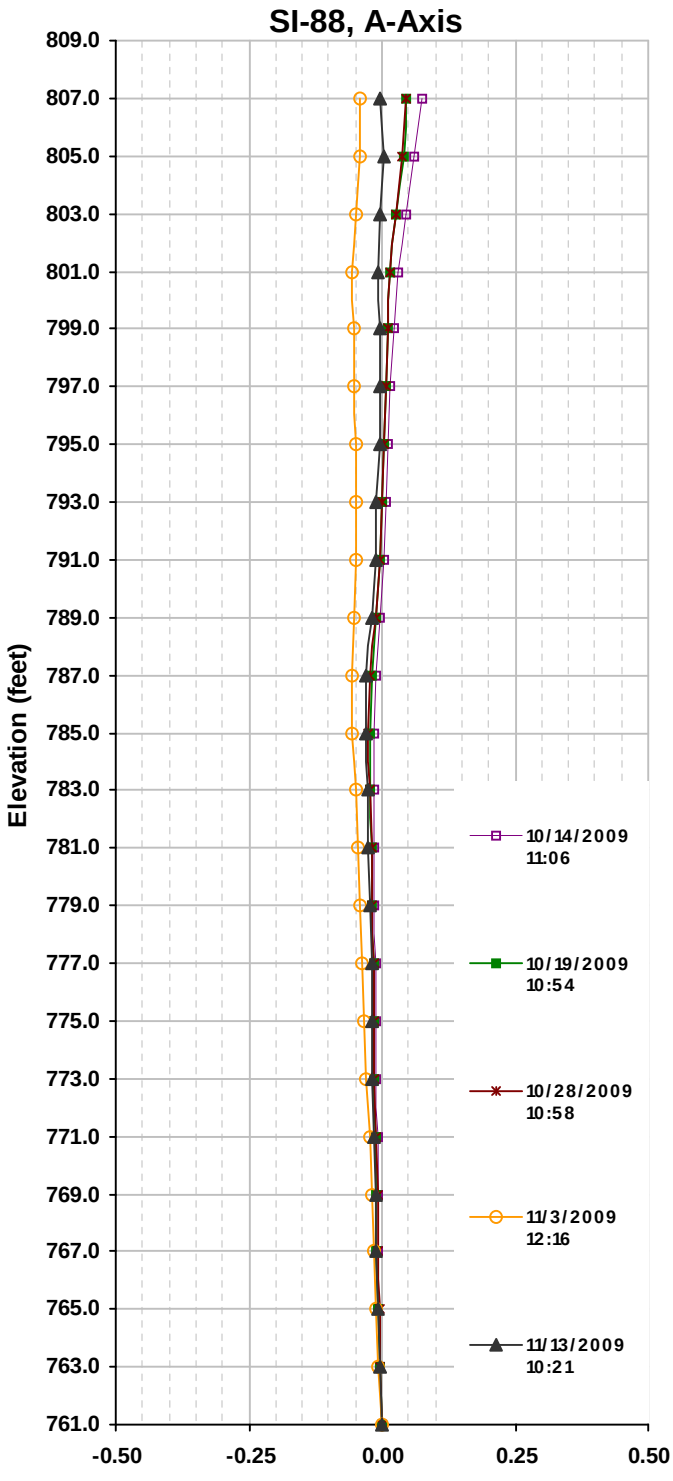
CURRENT SURVEY 10/6/2009 12:07:28 PM

INITIAL SURVEY 8/11/2009 10:55:47 AM

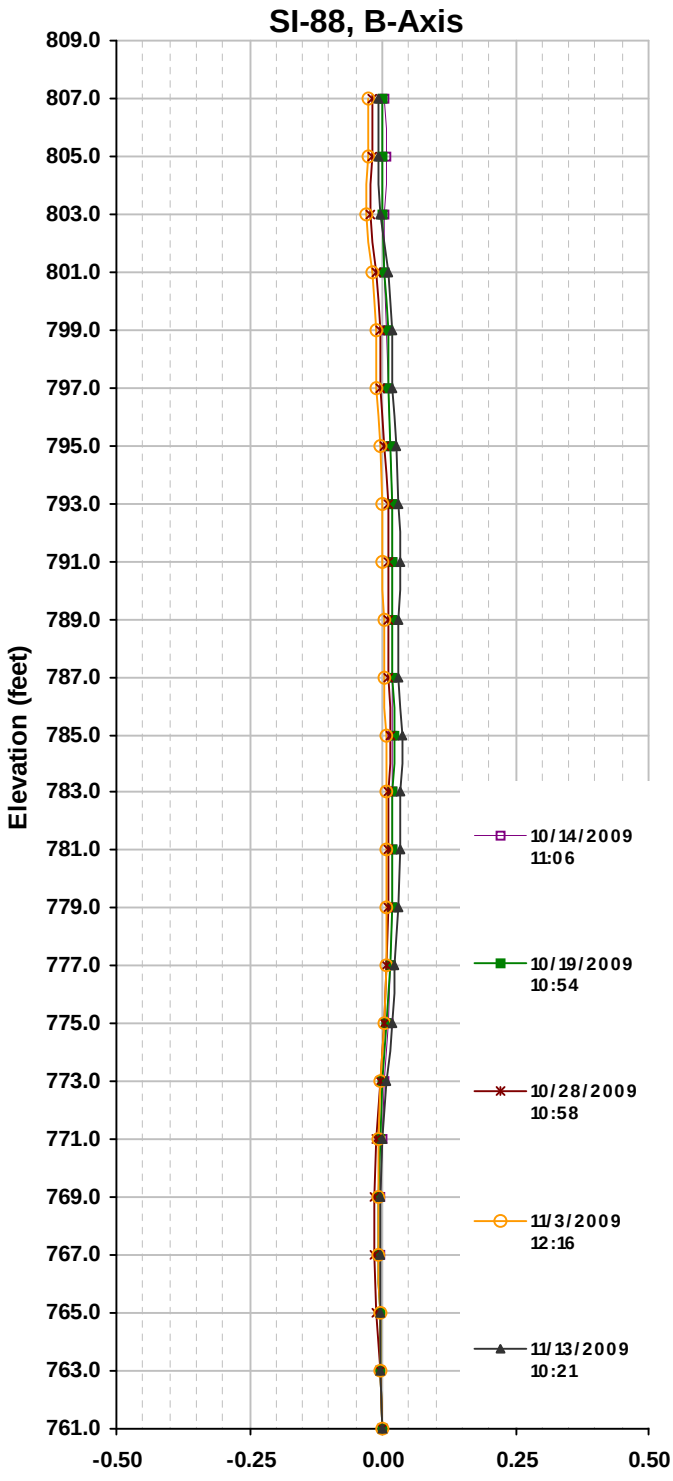
DATE PRINTED 10/7/2009 9:25:35 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	62	-6	0.0408	77	-27	0.0624	0.0216	0.0114
6	31	24	0.0042	29	18	0.0066	0.0024	-0.0102
8	-69	126	-0.1170	-73	129	-0.1212	-0.0042	-0.0126
10	-53	102	-0.0930	-51	109	-0.0960	-0.0030	-0.0084
12	-14	67	-0.0486	-13	70	-0.0498	-0.0012	-0.0054
14	-65	121	-0.1116	-69	121	-0.1140	-0.0024	-0.0042
16	-150	205	-0.2130	-150	207	-0.2142	-0.0012	-0.0018
18	-189	246	-0.2610	-190	247	-0.2622	-0.0012	-0.0006
20	-201	246	-0.2682	-197	247	-0.2664	0.0018	0.0006
22	-143	193	-0.2016	-138	199	-0.2022	-0.0006	-0.0012
24	-162	218	-0.2280	-167	223	-0.2340	-0.0060	-0.0006
26	-150	206	-0.2136	-148	206	-0.2124	0.0012	0.0054
28	-136	194	-0.1980	-136	197	-0.1998	-0.0018	0.0042
30	-115	160	-0.1650	-114	162	-0.1656	-0.0006	0.0060
32	17	20	-0.0018	13	13	0.0000	0.0018	0.0066
34	173	-145	0.1908	178	-149	0.1962	0.0054	0.0048
36	349	-321	0.4020	354	-330	0.4104	0.0084	-0.0006
38	556	-529	0.6510	557	-521	0.6468	-0.0042	-0.0090
40	790	-760	0.9300	795	-761	0.9336	0.0036	-0.0048
42	964	-915	1.1274	966	-911	1.1262	-0.0012	-0.0084
44	929	-872	1.0806	927	-869	1.0776	-0.0030	-0.0072
46	876	-819	1.0170	877	-818	1.0170	0.0000	-0.0042
48	869	-814	1.0098	865	-811	1.0056	-0.0042	-0.0042
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

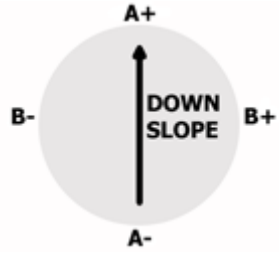


Cumulative Displacement (in) from 8/11/2009



Cumulative Displacement (in) from 8/11/2009

Stantec



Bull Run Fossil Plant
Bull Run
Clinton, TN
172679015
11/16/2009

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 10/14/2009 11:06:36 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 11/16/2009 8:49:12 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-470	482	-0.5712	-455	474	-0.5574	0.0138	0.0756
6	-520	521	-0.6246	-499	517	-0.6096	0.0150	0.0618
8	-676	678	-0.8124	-652	671	-0.7938	0.0186	0.0468
10	-838	838	-1.0056	-825	844	-1.0014	0.0042	0.0282
12	-809	802	-0.9666	-792	806	-0.9588	0.0078	0.0240
14	-607	604	-0.7266	-594	611	-0.7230	0.0036	0.0162
16	-392	389	-0.4686	-377	395	-0.4632	0.0054	0.0126
18	-241	238	-0.2874	-228	245	-0.2838	0.0036	0.0072
20	-86	83	-0.1014	-72	86	-0.0948	0.0066	0.0036
22	22	-27	0.0294	41	-23	0.0384	0.0090	-0.0030
24	49	-50	0.0594	61	-45	0.0636	0.0042	-0.0120
26	23	-25	0.0288	31	-15	0.0276	-0.0012	-0.0162
28	5	-6	0.0066	14	3	0.0066	0.0000	-0.0150
30	-11	9	-0.0120	-3	19	-0.0132	-0.0012	-0.0150
32	-37	34	-0.0426	-29	45	-0.0444	-0.0018	-0.0138
34	-65	64	-0.0774	-56	72	-0.0768	0.0006	-0.0120
36	-83	80	-0.0978	-74	91	-0.0990	-0.0012	-0.0126
38	-114	111	-0.1350	-107	122	-0.1374	-0.0024	-0.0114
40	-169	167	-0.2016	-160	178	-0.2028	-0.0012	-0.0090
42	-243	241	-0.2904	-235	249	-0.2904	0.0000	-0.0078
44	-249	250	-0.2994	-244	258	-0.3012	-0.0018	-0.0078
46	-246	246	-0.2952	-238	255	-0.2958	-0.0006	-0.0060
48	-280	278	-0.3348	-277	290	-0.3402	-0.0054	-0.0054
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 10/19/2009 10:54:44 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 11/16/2009 8:49:12 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-470	482	-0.5712	-463	481	-0.5664	0.0048	0.0462
6	-520	521	-0.6246	-503	515	-0.6108	0.0138	0.0414
8	-676	678	-0.8124	-661	672	-0.7998	0.0126	0.0276
10	-838	838	-1.0056	-828	843	-1.0026	0.0030	0.0150
12	-809	802	-0.9666	-796	806	-0.9612	0.0054	0.0120
14	-607	604	-0.7266	-595	611	-0.7236	0.0030	0.0066
16	-392	389	-0.4686	-378	394	-0.4632	0.0054	0.0036
18	-241	238	-0.2874	-231	243	-0.2844	0.0030	-0.0018
20	-86	83	-0.1014	-74	84	-0.0948	0.0066	-0.0048
22	22	-27	0.0294	38	-26	0.0384	0.0090	-0.0114
24	49	-50	0.0594	58	-45	0.0618	0.0024	-0.0204
26	23	-25	0.0288	29	-16	0.0270	-0.0018	-0.0228
28	5	-6	0.0066	10	2	0.0048	-0.0018	-0.0210
30	-11	9	-0.0120	-5	17	-0.0132	-0.0012	-0.0192
32	-37	34	-0.0426	-31	42	-0.0438	-0.0012	-0.0180
34	-65	64	-0.0774	-58	71	-0.0774	0.0000	-0.0168
36	-83	80	-0.0978	-76	88	-0.0984	-0.0006	-0.0168
38	-114	111	-0.1350	-110	121	-0.1386	-0.0036	-0.0162
40	-169	167	-0.2016	-162	177	-0.2034	-0.0018	-0.0126
42	-243	241	-0.2904	-239	247	-0.2916	-0.0012	-0.0108
44	-249	250	-0.2994	-245	258	-0.3018	-0.0024	-0.0096
46	-246	246	-0.2952	-241	254	-0.2970	-0.0018	-0.0072
48	-280	278	-0.3348	-279	288	-0.3402	-0.0054	-0.0054
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 10/28/2009 10:58:33 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 11/16/2009 8:49:12 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-470	482	-0.5712	-465	473	-0.5628	0.0084	0.0450
6	-520	521	-0.6246	-507	515	-0.6132	0.0114	0.0366
8	-676	678	-0.8124	-662	672	-0.8004	0.0120	0.0252
10	-838	838	-1.0056	-832	842	-1.0044	0.0012	0.0132
12	-809	802	-0.9666	-798	805	-0.9618	0.0048	0.0120
14	-607	604	-0.7266	-598	608	-0.7236	0.0030	0.0072
16	-392	389	-0.4686	-381	390	-0.4626	0.0060	0.0042
18	-241	238	-0.2874	-233	241	-0.2844	0.0030	-0.0018
20	-86	83	-0.1014	-75	82	-0.0942	0.0072	-0.0048
22	22	-27	0.0294	37	-30	0.0402	0.0108	-0.0120
24	49	-50	0.0594	55	-47	0.0612	0.0018	-0.0228
26	23	-25	0.0288	26	-18	0.0264	-0.0024	-0.0246
28	5	-6	0.0066	9	1	0.0048	-0.0018	-0.0222
30	-11	9	-0.0120	-7	13	-0.0120	0.0000	-0.0204
32	-37	34	-0.0426	-34	43	-0.0462	-0.0036	-0.0204
34	-65	64	-0.0774	-60	70	-0.0780	-0.0006	-0.0168
36	-83	80	-0.0978	-78	86	-0.0984	-0.0006	-0.0162
38	-114	111	-0.1350	-111	121	-0.1392	-0.0042	-0.0156
40	-169	167	-0.2016	-165	177	-0.2052	-0.0036	-0.0114
42	-243	241	-0.2904	-240	246	-0.2916	-0.0012	-0.0078
44	-249	250	-0.2994	-248	255	-0.3018	-0.0024	-0.0066
46	-246	246	-0.2952	-241	252	-0.2958	-0.0006	-0.0042
48	-280	278	-0.3348	-278	286	-0.3384	-0.0036	-0.0036
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 11/3/2009 12:16:23 PM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 11/16/2009 8:49:12 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-470	482	-0.5712	-475	474	-0.5694	0.0018	-0.0402
6	-520	521	-0.6246	-515	515	-0.6180	0.0066	-0.0420
8	-676	678	-0.8124	-672	672	-0.8064	0.0060	-0.0486
10	-838	838	-1.0056	-839	842	-1.0086	-0.0030	-0.0546
12	-809	802	-0.9666	-807	804	-0.9666	0.0000	-0.0516
14	-607	604	-0.7266	-609	607	-0.7296	-0.0030	-0.0516
16	-392	389	-0.4686	-391	389	-0.4680	0.0006	-0.0486
18	-241	238	-0.2874	-241	240	-0.2886	-0.0012	-0.0492
20	-86	83	-0.1014	-84	80	-0.0984	0.0030	-0.0480
22	22	-27	0.0294	29	-31	0.0360	0.0066	-0.0510
24	49	-50	0.0594	47	-49	0.0576	-0.0018	-0.0576
26	23	-25	0.0288	18	-20	0.0228	-0.0060	-0.0558
28	5	-6	0.0066	1	-2	0.0018	-0.0048	-0.0498
30	-11	9	-0.0120	-15	11	-0.0156	-0.0036	-0.0450
32	-37	34	-0.0426	-41	38	-0.0474	-0.0048	-0.0414
34	-65	64	-0.0774	-67	66	-0.0798	-0.0024	-0.0366
36	-83	80	-0.0978	-86	84	-0.1020	-0.0042	-0.0342
38	-114	111	-0.1350	-118	117	-0.1410	-0.0060	-0.0300
40	-169	167	-0.2016	-173	173	-0.2076	-0.0060	-0.0240
42	-243	241	-0.2904	-246	243	-0.2934	-0.0030	-0.0180
44	-249	250	-0.2994	-252	253	-0.3030	-0.0036	-0.0150
46	-246	246	-0.2952	-250	249	-0.2994	-0.0042	-0.0114
48	-280	278	-0.3348	-287	283	-0.3420	-0.0072	-0.0072
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 11/13/2009 10:21:06 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 11/16/2009 8:49:12 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-470	482	-0.5712	-475	487	-0.5772	-0.0060	-0.0024
6	-520	521	-0.6246	-508	521	-0.6174	0.0072	0.0036
8	-676	678	-0.8124	-667	681	-0.8088	0.0036	-0.0036
10	-838	838	-1.0056	-834	848	-1.0092	-0.0036	-0.0072
12	-809	802	-0.9666	-801	810	-0.9666	0.0000	-0.0036
14	-607	604	-0.7266	-599	611	-0.7260	0.0006	-0.0036
16	-392	389	-0.4686	-380	392	-0.4632	0.0054	-0.0042
18	-241	238	-0.2874	-231	243	-0.2844	0.0030	-0.0096
20	-86	83	-0.1014	-73	84	-0.0942	0.0072	-0.0126
22	22	-27	0.0294	38	-27	0.0390	0.0096	-0.0198
24	49	-50	0.0594	57	-44	0.0606	0.0012	-0.0294
26	23	-25	0.0288	27	-15	0.0252	-0.0036	-0.0306
28	5	-6	0.0066	10	3	0.0042	-0.0024	-0.0270
30	-11	9	-0.0120	-6	16	-0.0132	-0.0012	-0.0246
32	-37	34	-0.0426	-32	45	-0.0462	-0.0036	-0.0234
34	-65	64	-0.0774	-58	71	-0.0774	0.0000	-0.0198
36	-83	80	-0.0978	-76	88	-0.0984	-0.0006	-0.0198
38	-114	111	-0.1350	-110	123	-0.1398	-0.0048	-0.0192
40	-169	167	-0.2016	-163	179	-0.2052	-0.0036	-0.0144
42	-243	241	-0.2904	-238	248	-0.2916	-0.0012	-0.0108
44	-249	250	-0.2994	-245	258	-0.3018	-0.0024	-0.0096
46	-246	246	-0.2952	-241	255	-0.2976	-0.0024	-0.0072
48	-280	278	-0.3348	-278	288	-0.3396	-0.0048	-0.0048
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 10/14/2009 11:06:36 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 11/16/2009 8:49:21 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	62	-6	0.0408	59	-7	0.0396	-0.0012	0.0054
6	31	24	0.0042	27	13	0.0084	0.0042	0.0066
8	-69	126	-0.1170	-73	126	-0.1194	-0.0024	0.0024
10	-53	102	-0.0930	-54	107	-0.0966	-0.0036	0.0048
12	-14	67	-0.0486	-16	67	-0.0498	-0.0012	0.0084
14	-65	121	-0.1116	-73	122	-0.1170	-0.0054	0.0096
16	-150	205	-0.2130	-154	205	-0.2154	-0.0024	0.0150
18	-189	246	-0.2610	-193	245	-0.2628	-0.0018	0.0174
20	-201	246	-0.2682	-202	245	-0.2682	0.0000	0.0192
22	-143	193	-0.2016	-139	195	-0.2004	0.0012	0.0192
24	-162	218	-0.2280	-165	219	-0.2304	-0.0024	0.0180
26	-150	206	-0.2136	-149	203	-0.2112	0.0024	0.0204
28	-136	194	-0.1980	-138	193	-0.1986	-0.0006	0.0180
30	-115	160	-0.1650	-115	161	-0.1656	-0.0006	0.0186
32	17	20	-0.0018	18	13	0.0030	0.0048	0.0192
34	173	-145	0.1908	173	-150	0.1938	0.0030	0.0144
36	349	-321	0.4020	354	-328	0.4092	0.0072	0.0114
38	556	-529	0.6510	560	-533	0.6558	0.0048	0.0042
40	790	-760	0.9300	792	-765	0.9342	0.0042	-0.0006
42	964	-915	1.1274	964	-915	1.1274	0.0000	-0.0048
44	929	-872	1.0806	924	-873	1.0782	-0.0024	-0.0048
46	876	-819	1.0170	873	-822	1.0170	0.0000	-0.0024
48	869	-814	1.0098	864	-815	1.0074	-0.0024	-0.0024
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 10/19/2009 10:54:44 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 11/16/2009 8:49:21 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	62	-6	0.0408	62	-5	0.0402	-0.0006	0.0006
6	31	24	0.0042	27	16	0.0066	0.0024	0.0012
8	-69	126	-0.1170	-73	132	-0.1230	-0.0060	-0.0012
10	-53	102	-0.0930	-54	109	-0.0978	-0.0048	0.0048
12	-14	67	-0.0486	-15	69	-0.0504	-0.0018	0.0096
14	-65	121	-0.1116	-70	122	-0.1152	-0.0036	0.0114
16	-150	205	-0.2130	-153	207	-0.2160	-0.0030	0.0150
18	-189	246	-0.2610	-189	247	-0.2616	-0.0006	0.0180
20	-201	246	-0.2682	-200	247	-0.2682	0.0000	0.0186
22	-143	193	-0.2016	-138	197	-0.2010	0.0006	0.0186
24	-162	218	-0.2280	-163	222	-0.2310	-0.0030	0.0180
26	-150	206	-0.2136	-147	205	-0.2112	0.0024	0.0210
28	-136	194	-0.1980	-136	194	-0.1980	0.0000	0.0186
30	-115	160	-0.1650	-113	160	-0.1638	0.0012	0.0186
32	17	20	-0.0018	19	15	0.0024	0.0042	0.0174
34	173	-145	0.1908	178	-147	0.1950	0.0042	0.0132
36	349	-321	0.4020	356	-327	0.4098	0.0078	0.0090
38	556	-529	0.6510	559	-532	0.6546	0.0036	0.0012
40	790	-760	0.9300	793	-764	0.9342	0.0042	-0.0024
42	964	-915	1.1274	965	-913	1.1268	-0.0006	-0.0066
44	929	-872	1.0806	926	-870	1.0776	-0.0030	-0.0060
46	876	-819	1.0170	875	-819	1.0164	-0.0006	-0.0030
48	869	-814	1.0098	866	-813	1.0074	-0.0024	-0.0024
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 10/28/2009 10:58:33 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 11/16/2009 8:49:21 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	62	-6	0.0408	66	-5	0.0426	0.0018	-0.0174
6	31	24	0.0042	29	18	0.0066	0.0024	-0.0192
8	-69	126	-0.1170	-74	137	-0.1266	-0.0096	-0.0216
10	-53	102	-0.0930	-53	114	-0.1002	-0.0072	-0.0120
12	-14	67	-0.0486	-13	72	-0.0510	-0.0024	-0.0048
14	-65	121	-0.1116	-73	126	-0.1194	-0.0078	-0.0024
16	-150	205	-0.2130	-153	209	-0.2172	-0.0042	0.0054
18	-189	246	-0.2610	-189	250	-0.2634	-0.0024	0.0096
20	-201	246	-0.2682	-198	249	-0.2682	0.0000	0.0120
22	-143	193	-0.2016	-136	199	-0.2010	0.0006	0.0120
24	-162	218	-0.2280	-162	225	-0.2322	-0.0042	0.0114
26	-150	206	-0.2136	-145	206	-0.2106	0.0030	0.0156
28	-136	194	-0.1980	-133	196	-0.1974	0.0006	0.0126
30	-115	160	-0.1650	-111	165	-0.1656	-0.0006	0.0120
32	17	20	-0.0018	22	17	0.0030	0.0048	0.0126
34	173	-145	0.1908	179	-144	0.1938	0.0030	0.0078
36	349	-321	0.4020	357	-328	0.4110	0.0090	0.0048
38	556	-529	0.6510	565	-531	0.6576	0.0066	-0.0042
40	790	-760	0.9300	796	-762	0.9348	0.0048	-0.0108
42	964	-915	1.1274	968	-911	1.1274	0.0000	-0.0156
44	929	-872	1.0806	927	-868	1.0770	-0.0036	-0.0156
46	876	-819	1.0170	863	-817	1.0080	-0.0090	-0.0120
48	869	-814	1.0098	869	-809	1.0068	-0.0030	-0.0030
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 11/3/2009 12:16:23 PM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 11/16/2009 8:49:21 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	62	-6	0.0408	63	-9	0.0432	0.0024	-0.0252
6	31	24	0.0042	30	18	0.0072	0.0030	-0.0276
8	-69	126	-0.1170	-78	137	-0.1290	-0.0120	-0.0306
10	-53	102	-0.0930	-56	111	-0.1002	-0.0072	-0.0186
12	-14	67	-0.0486	-13	69	-0.0492	-0.0006	-0.0114
14	-65	121	-0.1116	-71	125	-0.1176	-0.0060	-0.0108
16	-150	205	-0.2130	-152	209	-0.2166	-0.0036	-0.0048
18	-189	246	-0.2610	-190	249	-0.2634	-0.0024	-0.0012
20	-201	246	-0.2682	-202	248	-0.2700	-0.0018	0.0012
22	-143	193	-0.2016	-138	198	-0.2016	0.0000	0.0030
24	-162	218	-0.2280	-164	224	-0.2328	-0.0048	0.0030
26	-150	206	-0.2136	-147	206	-0.2118	0.0018	0.0078
28	-136	194	-0.1980	-135	196	-0.1986	-0.0006	0.0060
30	-115	160	-0.1650	-114	165	-0.1674	-0.0024	0.0066
32	17	20	-0.0018	18	17	0.0006	0.0024	0.0090
34	173	-145	0.1908	176	-146	0.1932	0.0024	0.0066
36	349	-321	0.4020	355	-327	0.4092	0.0072	0.0042
38	556	-529	0.6510	561	-531	0.6552	0.0042	-0.0030
40	790	-760	0.9300	791	-762	0.9318	0.0018	-0.0072
42	964	-915	1.1274	965	-912	1.1262	-0.0012	-0.0090
44	929	-872	1.0806	926	-869	1.0770	-0.0036	-0.0078
46	876	-819	1.0170	875	-818	1.0158	-0.0012	-0.0042
48	869	-814	1.0098	867	-811	1.0068	-0.0030	-0.0030
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

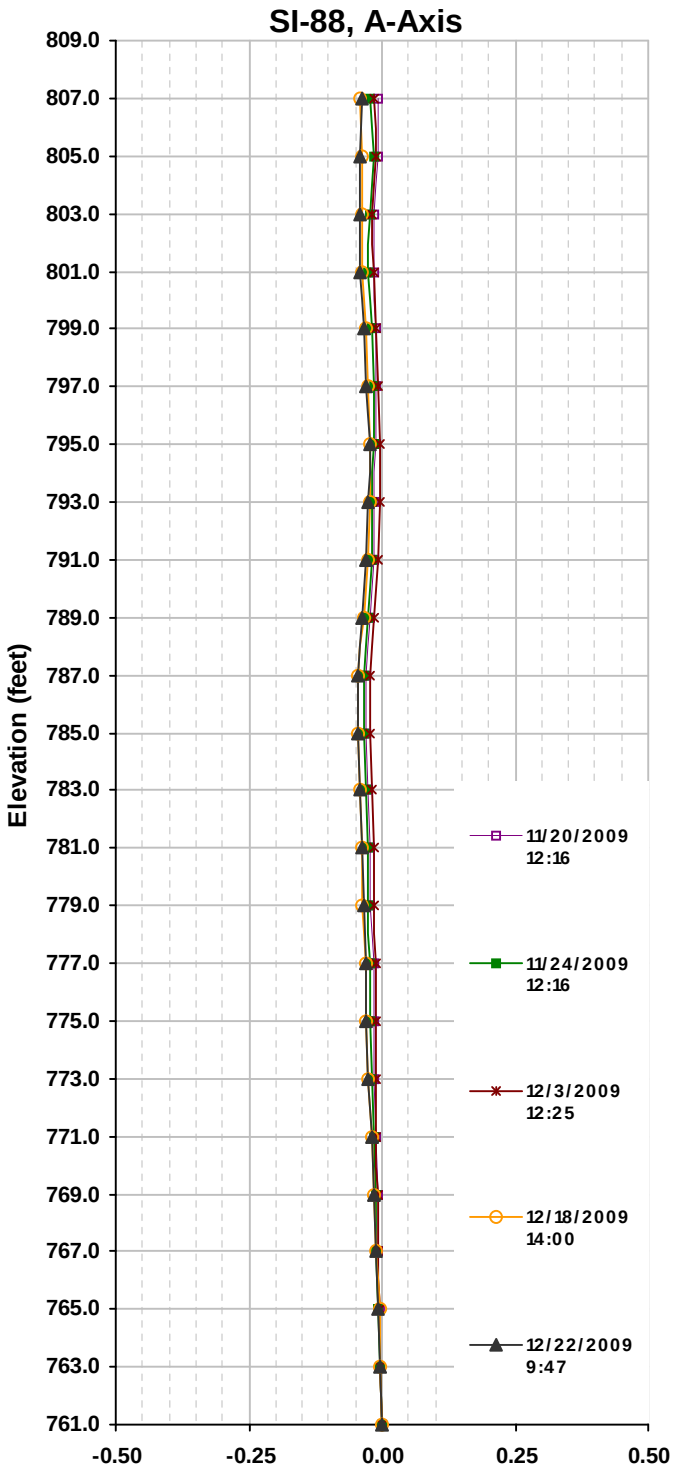
CURRENT SURVEY 11/13/2009 10:21:06 AM

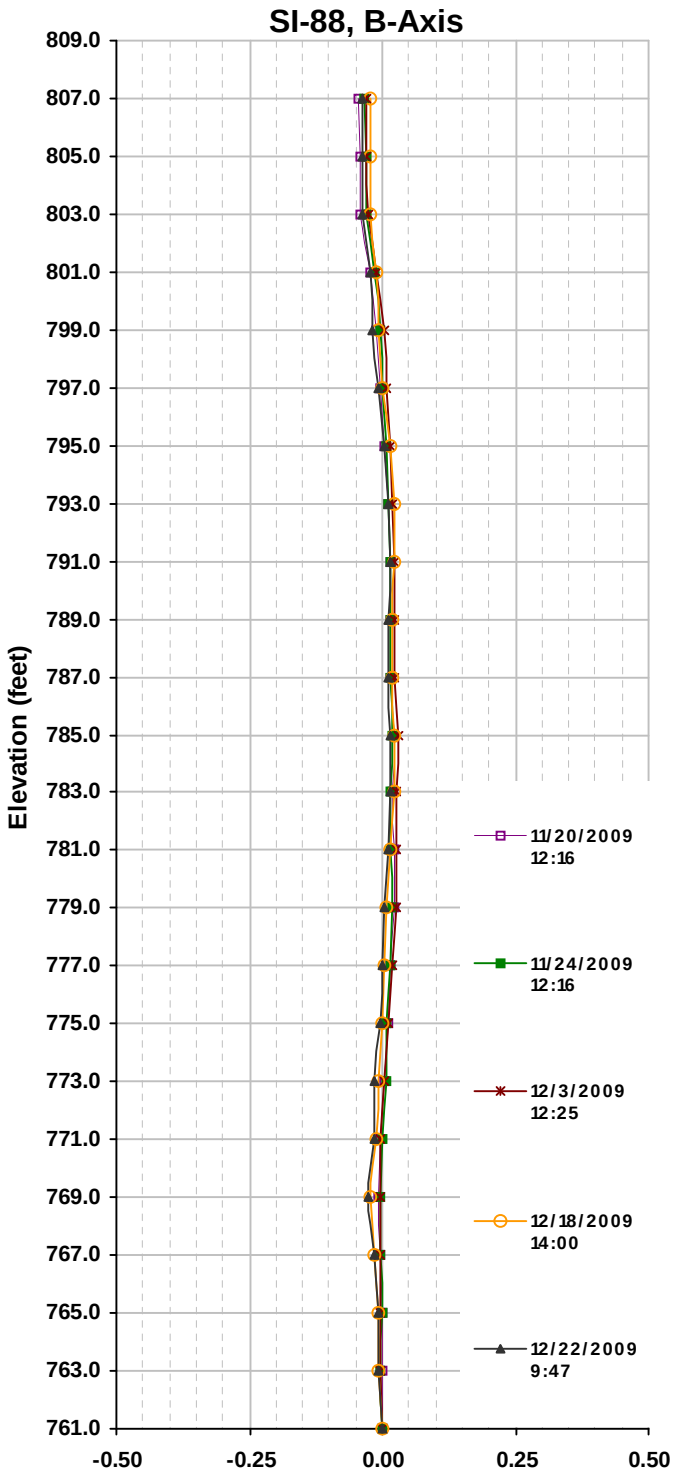
INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 11/16/2009 8:49:21 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	62	-6	0.0408	65	-4	0.0414	0.0006	-0.0060
6	31	24	0.0042	23	18	0.0030	-0.0012	-0.0066
8	-69	126	-0.1170	-79	141	-0.1320	-0.0150	-0.0054
10	-53	102	-0.0930	-56	115	-0.1026	-0.0096	0.0096
12	-14	67	-0.0486	-14	69	-0.0498	-0.0012	0.0192
14	-65	121	-0.1116	-70	126	-0.1176	-0.0060	0.0204
16	-150	205	-0.2130	-152	209	-0.2166	-0.0036	0.0264
18	-189	246	-0.2610	-190	249	-0.2634	-0.0024	0.0300
20	-201	246	-0.2682	-199	247	-0.2676	0.0006	0.0324
22	-143	193	-0.2016	-137	197	-0.2004	0.0012	0.0318
24	-162	218	-0.2280	-165	225	-0.2340	-0.0060	0.0306
26	-150	206	-0.2136	-146	205	-0.2106	0.0030	0.0366
28	-136	194	-0.1980	-134	195	-0.1974	0.0006	0.0336
30	-115	160	-0.1650	-111	162	-0.1638	0.0012	0.0330
32	17	20	-0.0018	22	12	0.0060	0.0078	0.0318
34	173	-145	0.1908	179	-150	0.1974	0.0066	0.0240
36	349	-321	0.4020	358	-330	0.4128	0.0108	0.0174
38	556	-529	0.6510	563	-533	0.6576	0.0066	0.0066
40	790	-760	0.9300	794	-764	0.9348	0.0048	0.0000
42	964	-915	1.1274	969	-911	1.1280	0.0006	-0.0048
44	929	-872	1.0806	927	-870	1.0782	-0.0024	-0.0054
46	876	-819	1.0170	877	-819	1.0176	0.0006	-0.0030
48	869	-814	1.0098	867	-810	1.0062	-0.0036	-0.0036
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000





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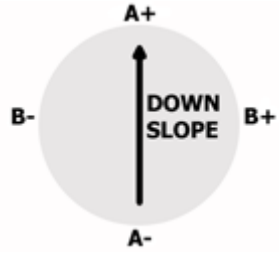


Bull Run Fossil Plant
Bull Run
Clinton, TN
172679015
12/22/2009

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 11/20/2009 12:16:25 PM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 12/22/2009 4:42:49 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-470	482	-0.5712	-471	482	-0.5718	-0.0006	-0.0078
6	-520	521	-0.6246	-513	517	-0.6180	0.0066	-0.0072
8	-676	678	-0.8124	-674	678	-0.8112	0.0012	-0.0138
10	-838	838	-1.0056	-839	844	-1.0098	-0.0042	-0.0150
12	-809	802	-0.9666	-806	807	-0.9678	-0.0012	-0.0108
14	-607	604	-0.7266	-603	608	-0.7266	0.0000	-0.0096
16	-392	389	-0.4686	-385	390	-0.4650	0.0036	-0.0096
18	-241	238	-0.2874	-236	241	-0.2862	0.0012	-0.0132
20	-86	83	-0.1014	-78	80	-0.0948	0.0066	-0.0144
22	22	-27	0.0294	34	-31	0.0390	0.0096	-0.0210
24	49	-50	0.0594	51	-47	0.0588	-0.0006	-0.0306
26	23	-25	0.0288	22	-18	0.0240	-0.0048	-0.0300
28	5	-6	0.0066	5	-1	0.0036	-0.0030	-0.0252
30	-11	9	-0.0120	-10	12	-0.0132	-0.0012	-0.0222
32	-37	34	-0.0426	-37	41	-0.0468	-0.0042	-0.0210
34	-65	64	-0.0774	-63	67	-0.0780	-0.0006	-0.0168
36	-83	80	-0.0978	-81	84	-0.0990	-0.0012	-0.0162
38	-114	111	-0.1350	-114	118	-0.1392	-0.0042	-0.0150
40	-169	167	-0.2016	-167	174	-0.2046	-0.0030	-0.0108
42	-243	241	-0.2904	-242	244	-0.2916	-0.0012	-0.0078
44	-249	250	-0.2994	-248	253	-0.3006	-0.0012	-0.0066
46	-246	246	-0.2952	-245	250	-0.2970	-0.0018	-0.0054
48	-280	278	-0.3348	-281	283	-0.3384	-0.0036	-0.0036
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 11/24/2009 12:16:05 PM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 12/22/2009 4:42:49 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-470	482	-0.5712	-473	486	-0.5754	-0.0042	-0.0210
6	-520	521	-0.6246	-508	523	-0.6186	0.0060	-0.0168
8	-676	678	-0.8124	-667	684	-0.8106	0.0018	-0.0228
10	-838	838	-1.0056	-833	851	-1.0104	-0.0048	-0.0246
12	-809	802	-0.9666	-802	814	-0.9696	-0.0030	-0.0198
14	-607	604	-0.7266	-600	615	-0.7290	-0.0024	-0.0168
16	-392	389	-0.4686	-381	395	-0.4656	0.0030	-0.0144
18	-241	238	-0.2874	-231	246	-0.2862	0.0012	-0.0174
20	-86	83	-0.1014	-73	86	-0.0954	0.0060	-0.0186
22	22	-27	0.0294	39	-25	0.0384	0.0090	-0.0246
24	49	-50	0.0594	57	-42	0.0594	0.0000	-0.0336
26	23	-25	0.0288	27	-13	0.0240	-0.0048	-0.0336
28	5	-6	0.0066	10	5	0.0030	-0.0036	-0.0288
30	-11	9	-0.0120	-5	16	-0.0126	-0.0006	-0.0252
32	-37	34	-0.0426	-29	46	-0.0450	-0.0024	-0.0246
34	-65	64	-0.0774	-57	73	-0.0780	-0.0006	-0.0222
36	-83	80	-0.0978	-76	90	-0.0996	-0.0018	-0.0216
38	-114	111	-0.1350	-109	123	-0.1392	-0.0042	-0.0198
40	-169	167	-0.2016	-163	179	-0.2052	-0.0036	-0.0156
42	-243	241	-0.2904	-237	250	-0.2922	-0.0018	-0.0120
44	-249	250	-0.2994	-245	259	-0.3024	-0.0030	-0.0102
46	-246	246	-0.2952	-239	256	-0.2970	-0.0018	-0.0072
48	-280	278	-0.3348	-277	290	-0.3402	-0.0054	-0.0054
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 12/3/2009 12:25:23 PM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 12/22/2009 4:42:50 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-470	482	-0.5712	-478	478	-0.5736	-0.0024	-0.0150
6	-520	521	-0.6246	-515	517	-0.6192	0.0054	-0.0126
8	-676	678	-0.8124	-678	678	-0.8136	-0.0012	-0.0180
10	-838	838	-1.0056	-842	845	-1.0122	-0.0066	-0.0168
12	-809	802	-0.9666	-810	808	-0.9708	-0.0042	-0.0102
14	-607	604	-0.7266	-607	609	-0.7296	-0.0030	-0.0060
16	-392	389	-0.4686	-387	390	-0.4662	0.0024	-0.0030
18	-241	238	-0.2874	-237	240	-0.2862	0.0012	-0.0054
20	-86	83	-0.1014	-79	79	-0.0948	0.0066	-0.0066
22	22	-27	0.0294	33	-32	0.0390	0.0096	-0.0132
24	49	-50	0.0594	51	-49	0.0600	0.0006	-0.0228
26	23	-25	0.0288	21	-19	0.0240	-0.0048	-0.0234
28	5	-6	0.0066	5	-2	0.0042	-0.0024	-0.0186
30	-11	9	-0.0120	-10	10	-0.0120	0.0000	-0.0162
32	-37	34	-0.0426	-37	40	-0.0462	-0.0036	-0.0162
34	-65	64	-0.0774	-63	66	-0.0774	0.0000	-0.0126
36	-83	80	-0.0978	-81	83	-0.0984	-0.0006	-0.0126
38	-114	111	-0.1350	-114	115	-0.1374	-0.0024	-0.0120
40	-169	167	-0.2016	-169	171	-0.2040	-0.0024	-0.0096
42	-243	241	-0.2904	-243	242	-0.2910	-0.0006	-0.0072
44	-249	250	-0.2994	-250	251	-0.3006	-0.0012	-0.0066
46	-246	246	-0.2952	-245	249	-0.2964	-0.0012	-0.0054
48	-280	278	-0.3348	-283	282	-0.3390	-0.0042	-0.0042
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 12/18/2009 2:00:08 PM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 12/22/2009 4:42:50 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-470	482	-0.5712	-478	478	-0.5736	-0.0024	-0.0396
6	-520	521	-0.6246	-520	518	-0.6228	0.0018	-0.0372
8	-676	678	-0.8124	-678	677	-0.8130	-0.0006	-0.0390
10	-838	838	-1.0056	-845	844	-1.0134	-0.0078	-0.0384
12	-809	802	-0.9666	-812	807	-0.9714	-0.0048	-0.0306
14	-607	604	-0.7266	-611	608	-0.7314	-0.0048	-0.0258
16	-392	389	-0.4686	-389	387	-0.4656	0.0030	-0.0210
18	-241	238	-0.2874	-239	236	-0.2850	0.0024	-0.0240
20	-86	83	-0.1014	-78	77	-0.0930	0.0084	-0.0264
22	22	-27	0.0294	31	-35	0.0396	0.0102	-0.0348
24	49	-50	0.0594	49	-51	0.0600	0.0006	-0.0450
26	23	-25	0.0288	20	-20	0.0240	-0.0048	-0.0456
28	5	-6	0.0066	1	-3	0.0024	-0.0042	-0.0408
30	-11	9	-0.0120	-11	10	-0.0126	-0.0006	-0.0366
32	-37	34	-0.0426	-42	38	-0.0480	-0.0054	-0.0360
34	-65	64	-0.0774	-67	65	-0.0792	-0.0018	-0.0306
36	-83	80	-0.0978	-85	83	-0.1008	-0.0030	-0.0288
38	-114	111	-0.1350	-119	117	-0.1416	-0.0066	-0.0258
40	-169	167	-0.2016	-174	168	-0.2052	-0.0036	-0.0192
42	-243	241	-0.2904	-248	245	-0.2958	-0.0054	-0.0156
44	-249	250	-0.2994	-253	254	-0.3042	-0.0048	-0.0102
46	-246	246	-0.2952	-248	249	-0.2982	-0.0030	-0.0054
48	-280	278	-0.3348	-284	278	-0.3372	-0.0024	-0.0024
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 12/22/2009 9:47:30 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 12/22/2009 4:42:50 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-470	482	-0.5712	-470	478	-0.5688	0.0024	-0.0390
6	-520	521	-0.6246	-520	518	-0.6228	0.0018	-0.0414
8	-676	678	-0.8124	-679	676	-0.8130	-0.0006	-0.0432
10	-838	838	-1.0056	-844	845	-1.0134	-0.0078	-0.0426
12	-809	802	-0.9666	-812	809	-0.9726	-0.0060	-0.0348
14	-607	604	-0.7266	-610	609	-0.7314	-0.0048	-0.0288
16	-392	389	-0.4686	-389	388	-0.4662	0.0024	-0.0240
18	-241	238	-0.2874	-239	237	-0.2856	0.0018	-0.0264
20	-86	83	-0.1014	-78	78	-0.0936	0.0078	-0.0282
22	22	-27	0.0294	31	-34	0.0390	0.0096	-0.0360
24	49	-50	0.0594	49	-50	0.0594	0.0000	-0.0456
26	23	-25	0.0288	19	-20	0.0234	-0.0054	-0.0456
28	5	-6	0.0066	1	-3	0.0024	-0.0042	-0.0402
30	-11	9	-0.0120	-11	11	-0.0132	-0.0012	-0.0360
32	-37	34	-0.0426	-41	38	-0.0474	-0.0048	-0.0348
34	-65	64	-0.0774	-67	65	-0.0792	-0.0018	-0.0300
36	-83	80	-0.0978	-84	84	-0.1008	-0.0030	-0.0282
38	-114	111	-0.1350	-119	118	-0.1422	-0.0072	-0.0252
40	-169	167	-0.2016	-172	169	-0.2046	-0.0030	-0.0180
42	-243	241	-0.2904	-248	245	-0.2958	-0.0054	-0.0150
44	-249	250	-0.2994	-253	252	-0.3030	-0.0036	-0.0096
46	-246	246	-0.2952	-248	249	-0.2982	-0.0030	-0.0060
48	-280	278	-0.3348	-284	279	-0.3378	-0.0030	-0.0030
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 11/20/2009 12:16:25 PM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 12/22/2009 4:42:56 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	62	-6	0.0408	62	-5	0.0402	-0.0006	-0.0438
6	31	24	0.0042	21	19	0.0012	-0.0030	-0.0432
8	-69	126	-0.1170	-83	141	-0.1344	-0.0174	-0.0402
10	-53	102	-0.0930	-60	117	-0.1062	-0.0132	-0.0228
12	-14	67	-0.0486	-16	72	-0.0528	-0.0042	-0.0096
14	-65	121	-0.1116	-74	129	-0.1218	-0.0102	-0.0054
16	-150	205	-0.2130	-154	209	-0.2178	-0.0048	0.0048
18	-189	246	-0.2610	-192	249	-0.2646	-0.0036	0.0096
20	-201	246	-0.2682	-201	248	-0.2694	-0.0012	0.0132
22	-143	193	-0.2016	-137	198	-0.2010	0.0006	0.0144
24	-162	218	-0.2280	-167	226	-0.2358	-0.0078	0.0138
26	-150	206	-0.2136	-147	206	-0.2118	0.0018	0.0216
28	-136	194	-0.1980	-138	195	-0.1998	-0.0018	0.0198
30	-115	160	-0.1650	-113	163	-0.1656	-0.0006	0.0216
32	17	20	-0.0018	21	15	0.0036	0.0054	0.0222
34	173	-145	0.1908	179	-148	0.1962	0.0054	0.0168
36	349	-321	0.4020	356	-327	0.4098	0.0078	0.0114
38	556	-529	0.6510	562	-533	0.6570	0.0060	0.0036
40	790	-760	0.9300	793	-763	0.9336	0.0036	-0.0024
42	964	-915	1.1274	966	-911	1.1262	-0.0012	-0.0060
44	929	-872	1.0806	926	-870	1.0776	-0.0030	-0.0048
46	876	-819	1.0170	875	-820	1.0170	0.0000	-0.0018
48	869	-814	1.0098	867	-813	1.0080	-0.0018	-0.0018
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 11/24/2009 12:16:05 PM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 12/22/2009 4:42:57 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	62	-6	0.0408	63	-1	0.0384	-0.0024	-0.0324
6	31	24	0.0042	27	20	0.0042	0.0000	-0.0300
8	-69	126	-0.1170	-79	144	-0.1338	-0.0168	-0.0300
10	-53	102	-0.0930	-55	118	-0.1038	-0.0108	-0.0132
12	-14	67	-0.0486	-12	71	-0.0498	-0.0012	-0.0024
14	-65	121	-0.1116	-70	130	-0.1200	-0.0084	-0.0012
16	-150	205	-0.2130	-150	212	-0.2172	-0.0042	0.0072
18	-189	246	-0.2610	-189	252	-0.2646	-0.0036	0.0114
20	-201	246	-0.2682	-197	249	-0.2676	0.0006	0.0150
22	-143	193	-0.2016	-135	199	-0.2004	0.0012	0.0144
24	-162	218	-0.2280	-163	227	-0.2340	-0.0060	0.0132
26	-150	206	-0.2136	-144	208	-0.2112	0.0024	0.0192
28	-136	194	-0.1980	-133	197	-0.1980	0.0000	0.0168
30	-115	160	-0.1650	-110	166	-0.1656	-0.0006	0.0168
32	17	20	-0.0018	21	17	0.0024	0.0042	0.0174
34	173	-145	0.1908	181	-147	0.1968	0.0060	0.0132
36	349	-321	0.4020	345	-327	0.4032	0.0012	0.0072
38	556	-529	0.6510	565	-530	0.6570	0.0060	0.0060
40	790	-760	0.9300	796	-762	0.9348	0.0048	0.0000
42	964	-915	1.1274	969	-910	1.1274	0.0000	-0.0048
44	929	-872	1.0806	929	-867	1.0776	-0.0030	-0.0048
46	876	-819	1.0170	879	-817	1.0176	0.0006	-0.0018
48	869	-814	1.0098	869	-810	1.0074	-0.0024	-0.0024
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 12/3/2009 12:25:23 PM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 12/22/2009 4:42:57 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	62	-6	0.0408	66	-3	0.0414	0.0006	-0.0282
6	31	24	0.0042	25	20	0.0030	-0.0012	-0.0288
8	-69	126	-0.1170	-82	143	-0.1350	-0.0180	-0.0276
10	-53	102	-0.0930	-58	118	-0.1056	-0.0126	-0.0096
12	-14	67	-0.0486	-13	73	-0.0516	-0.0030	0.0030
14	-65	121	-0.1116	-72	131	-0.1218	-0.0102	0.0060
16	-150	205	-0.2130	-151	210	-0.2166	-0.0036	0.0162
18	-189	246	-0.2610	-190	251	-0.2646	-0.0036	0.0198
20	-201	246	-0.2682	-198	249	-0.2682	0.0000	0.0234
22	-143	193	-0.2016	-135	199	-0.2004	0.0012	0.0234
24	-162	218	-0.2280	-163	227	-0.2340	-0.0060	0.0222
26	-150	206	-0.2136	-145	207	-0.2112	0.0024	0.0282
28	-136	194	-0.1980	-133	196	-0.1974	0.0006	0.0258
30	-115	160	-0.1650	-110	165	-0.1650	0.0000	0.0252
32	17	20	-0.0018	22	14	0.0048	0.0066	0.0252
34	173	-145	0.1908	181	-147	0.1968	0.0060	0.0186
36	349	-321	0.4020	359	-327	0.4116	0.0096	0.0126
38	556	-529	0.6510	563	-531	0.6564	0.0054	0.0030
40	790	-760	0.9300	793	-761	0.9324	0.0024	-0.0024
42	964	-915	1.1274	969	-911	1.1280	0.0006	-0.0048
44	929	-872	1.0806	929	-867	1.0776	-0.0030	-0.0054
46	876	-819	1.0170	877	-818	1.0170	0.0000	-0.0024
48	869	-814	1.0098	869	-810	1.0074	-0.0024	-0.0024
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 12/18/2009 2:00:08 PM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 12/22/2009 4:42:57 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	62	-6	0.0408	15	-52	0.0402	-0.0006	-0.0240
6	31	24	0.0042	-5	-10	0.0030	-0.0012	-0.0234
8	-69	126	-0.1170	-123	92	-0.1290	-0.0120	-0.0222
10	-53	102	-0.0930	-91	71	-0.0972	-0.0042	-0.0102
12	-14	67	-0.0486	-59	34	-0.0558	-0.0072	-0.0060
14	-65	121	-0.1116	-114	94	-0.1248	-0.0132	0.0012
16	-150	205	-0.2130	-196	170	-0.2196	-0.0066	0.0144
18	-189	246	-0.2610	-236	201	-0.2622	-0.0012	0.0210
20	-201	246	-0.2682	-232	208	-0.2640	0.0042	0.0222
22	-143	193	-0.2016	-182	154	-0.2016	0.0000	0.0180
24	-162	218	-0.2280	-211	177	-0.2328	-0.0048	0.0180
26	-150	206	-0.2136	-196	158	-0.2124	0.0012	0.0228
28	-136	194	-0.1980	-176	145	-0.1926	0.0054	0.0216
30	-115	160	-0.1650	-143	120	-0.1578	0.0072	0.0162
32	17	20	-0.0018	-1	-5	0.0024	0.0042	0.0090
34	173	-145	0.1908	158	-165	0.1938	0.0030	0.0048
36	349	-321	0.4020	337	-349	0.4116	0.0096	0.0018
38	556	-529	0.6510	543	-549	0.6552	0.0042	-0.0078
40	790	-760	0.9300	779	-789	0.9408	0.0108	-0.0120
42	964	-915	1.1274	922	-942	1.1184	-0.0090	-0.0228
44	929	-872	1.0806	881	-909	1.0740	-0.0066	-0.0138
46	876	-819	1.0170	831	-865	1.0176	0.0006	-0.0072
48	869	-814	1.0098	823	-847	1.0020	-0.0078	-0.0078
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

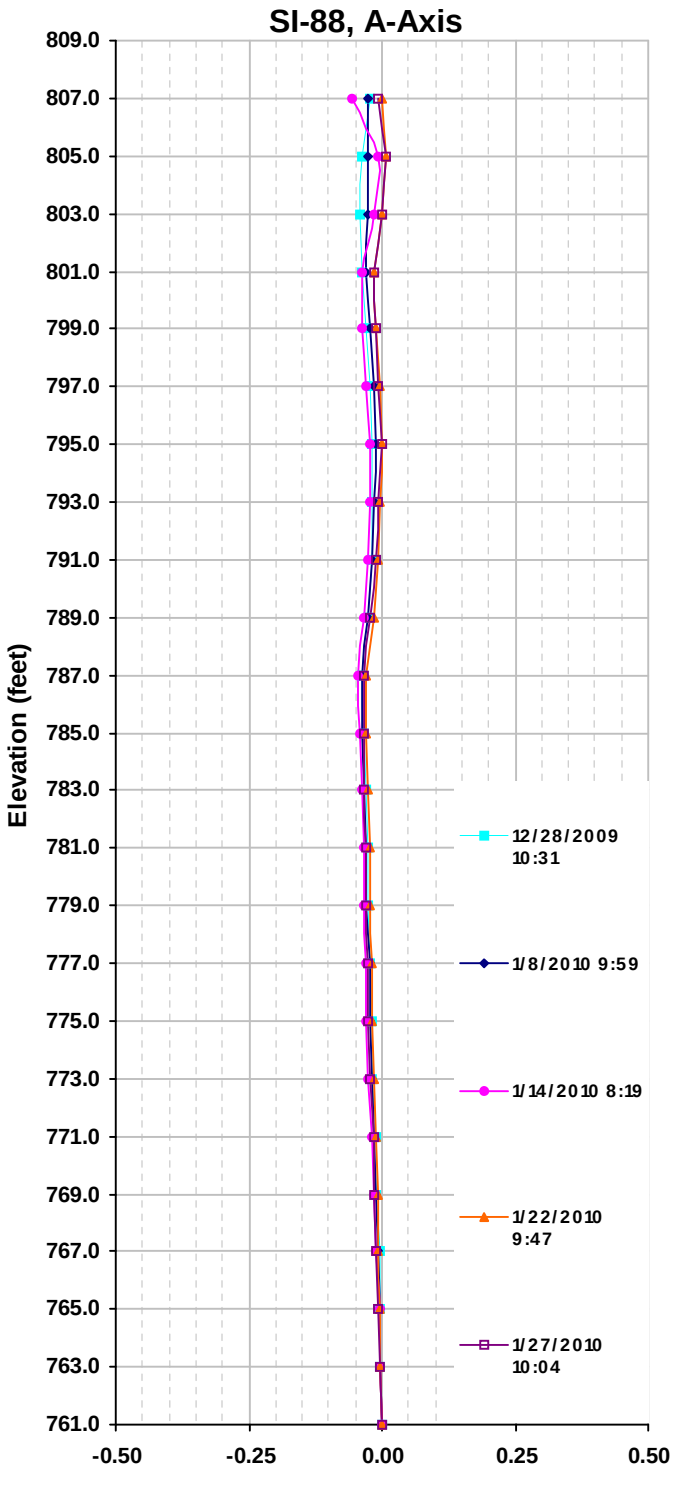
CURRENT SURVEY 12/22/2009 9:47:30 AM

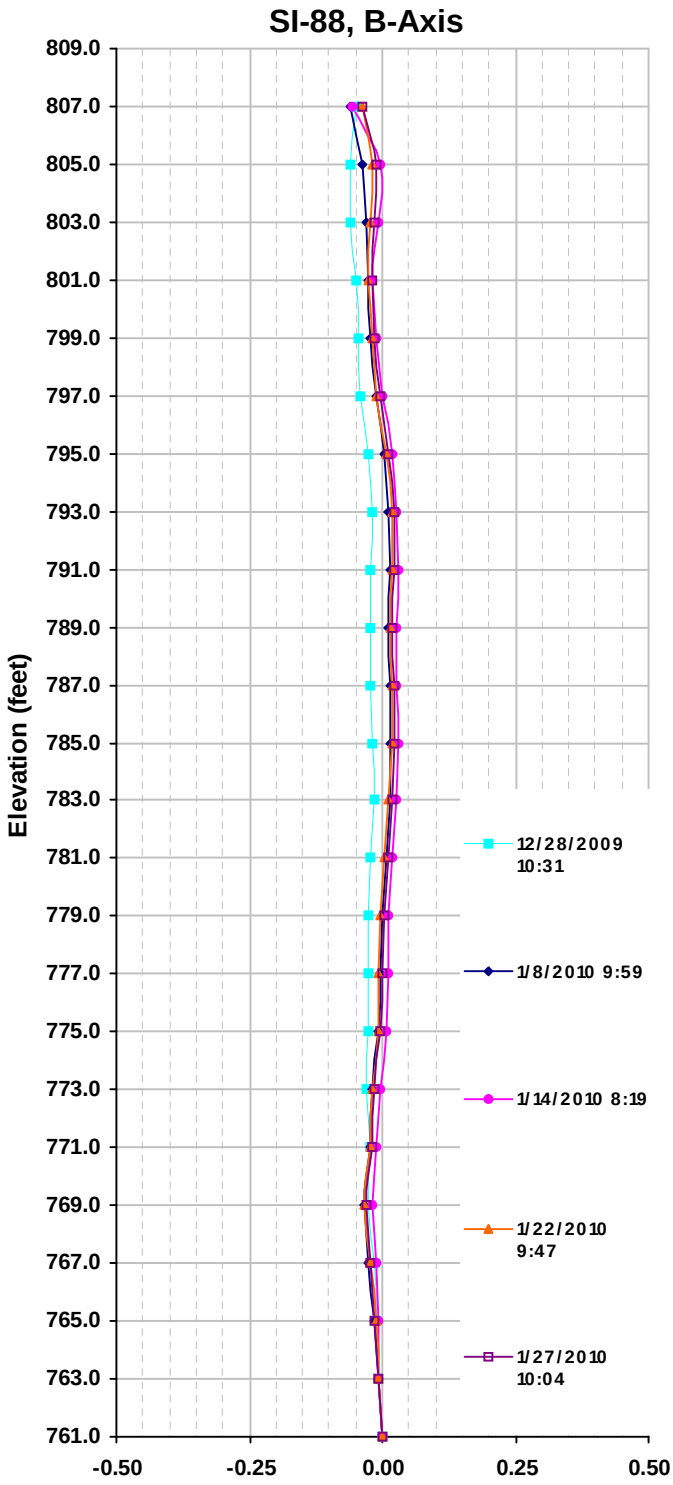
INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 12/22/2009 4:42:57 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	62	-6	0.0408	15	-52	0.0402	-0.0006	-0.0384
6	31	24	0.0042	-6	-11	0.0030	-0.0012	-0.0378
8	-69	126	-0.1170	-126	92	-0.1308	-0.0138	-0.0366
10	-53	102	-0.0930	-93	71	-0.0984	-0.0054	-0.0228
12	-14	67	-0.0486	-62	33	-0.0570	-0.0084	-0.0174
14	-65	121	-0.1116	-116	94	-0.1260	-0.0144	-0.0090
16	-150	205	-0.2130	-198	169	-0.2202	-0.0072	0.0054
18	-189	246	-0.2610	-236	200	-0.2616	-0.0006	0.0126
20	-201	246	-0.2682	-233	209	-0.2652	0.0030	0.0132
22	-143	193	-0.2016	-184	152	-0.2016	0.0000	0.0102
24	-162	218	-0.2280	-213	176	-0.2334	-0.0054	0.0102
26	-150	206	-0.2136	-197	158	-0.2130	0.0006	0.0156
28	-136	194	-0.1980	-177	145	-0.1932	0.0048	0.0150
30	-115	160	-0.1650	-143	119	-0.1572	0.0078	0.0102
32	17	20	-0.0018	-3	-7	0.0024	0.0042	0.0024
34	173	-145	0.1908	157	-166	0.1938	0.0030	-0.0018
36	349	-321	0.4020	337	-349	0.4116	0.0096	-0.0048
38	556	-529	0.6510	541	-545	0.6516	0.0006	-0.0144
40	790	-760	0.9300	777	-789	0.9396	0.0096	-0.0150
42	964	-915	1.1274	921	-943	1.1184	-0.0090	-0.0246
44	929	-872	1.0806	880	-910	1.0740	-0.0066	-0.0156
46	876	-819	1.0170	829	-864	1.0158	-0.0012	-0.0090
48	869	-814	1.0098	822	-848	1.0020	-0.0078	-0.0078
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000





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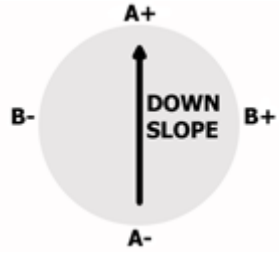


Bull Run Fossil Plant
Bull Run
Clinton, TN
172679015
1/27/2010

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 12/28/2009 10:31:32 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 1/27/2010 2:28:41 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-470	482	-0.5712	-463	463	-0.5556	0.0156	-0.0228
6	-520	521	-0.6246	-520	519	-0.6234	0.0012	-0.0384
8	-676	678	-0.8124	-679	679	-0.8148	-0.0024	-0.0396
10	-838	838	-1.0056	-844	845	-1.0134	-0.0078	-0.0372
12	-809	802	-0.9666	-812	810	-0.9732	-0.0066	-0.0294
14	-607	604	-0.7266	-611	609	-0.7320	-0.0054	-0.0228
16	-392	389	-0.4686	-389	390	-0.4674	0.0012	-0.0174
18	-241	238	-0.2874	-239	239	-0.2868	0.0006	-0.0186
20	-86	83	-0.1014	-79	79	-0.0948	0.0066	-0.0192
22	22	-27	0.0294	32	-34	0.0396	0.0102	-0.0258
24	49	-50	0.0594	48	-50	0.0588	-0.0006	-0.0360
26	23	-25	0.0288	20	-19	0.0234	-0.0054	-0.0354
28	5	-6	0.0066	2	-3	0.0030	-0.0036	-0.0300
30	-11	9	-0.0120	-10	11	-0.0126	-0.0006	-0.0264
32	-37	34	-0.0426	-40	38	-0.0468	-0.0042	-0.0258
34	-65	64	-0.0774	-66	65	-0.0786	-0.0012	-0.0216
36	-83	80	-0.0978	-84	84	-0.1008	-0.0030	-0.0204
38	-114	111	-0.1350	-118	117	-0.1410	-0.0060	-0.0174
40	-169	167	-0.2016	-171	168	-0.2034	-0.0018	-0.0114
42	-243	241	-0.2904	-247	244	-0.2946	-0.0042	-0.0096
44	-249	250	-0.2994	-252	248	-0.3000	-0.0006	-0.0054
46	-246	246	-0.2952	-247	248	-0.2970	-0.0018	-0.0048
48	-280	278	-0.3348	-283	280	-0.3378	-0.0030	-0.0030
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 1/8/2010 9:59:58 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 1/27/2010 2:28:41 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-470	482	-0.5712	-473	477	-0.5700	0.0012	-0.0246
6	-520	521	-0.6246	-520	523	-0.6258	-0.0012	-0.0258
8	-676	678	-0.8124	-672	676	-0.8088	0.0036	-0.0246
10	-838	838	-1.0056	-840	845	-1.0110	-0.0054	-0.0282
12	-809	802	-0.9666	-810	811	-0.9726	-0.0060	-0.0228
14	-607	604	-0.7266	-608	611	-0.7314	-0.0048	-0.0168
16	-392	389	-0.4686	-386	389	-0.4650	0.0036	-0.0120
18	-241	238	-0.2874	-236	239	-0.2850	0.0024	-0.0156
20	-86	83	-0.1014	-75	80	-0.0930	0.0084	-0.0180
22	22	-27	0.0294	35	-33	0.0408	0.0114	-0.0264
24	49	-50	0.0594	51	-48	0.0594	0.0000	-0.0378
26	23	-25	0.0288	22	-18	0.0240	-0.0048	-0.0378
28	5	-6	0.0066	4	-1	0.0030	-0.0036	-0.0330
30	-11	9	-0.0120	-8	13	-0.0126	-0.0006	-0.0294
32	-37	34	-0.0426	-39	40	-0.0474	-0.0048	-0.0288
34	-65	64	-0.0774	-64	67	-0.0786	-0.0012	-0.0240
36	-83	80	-0.0978	-81	86	-0.1002	-0.0024	-0.0228
38	-114	111	-0.1350	-115	120	-0.1410	-0.0060	-0.0204
40	-169	167	-0.2016	-169	171	-0.2040	-0.0024	-0.0144
42	-243	241	-0.2904	-244	247	-0.2946	-0.0042	-0.0120
44	-249	250	-0.2994	-249	254	-0.3018	-0.0024	-0.0078
46	-246	246	-0.2952	-245	250	-0.2970	-0.0018	-0.0054
48	-280	278	-0.3348	-281	283	-0.3384	-0.0036	-0.0036
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 1/14/2010 8:19:39 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 1/27/2010 2:28:41 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-470	482	-0.5712	-514	519	-0.6198	-0.0486	-0.0552
6	-520	521	-0.6246	-514	516	-0.6180	0.0066	-0.0066
8	-676	678	-0.8124	-655	656	-0.7866	0.0258	-0.0132
10	-838	838	-1.0056	-838	841	-1.0074	-0.0018	-0.0390
12	-809	802	-0.9666	-813	813	-0.9756	-0.0090	-0.0372
14	-607	604	-0.7266	-611	612	-0.7338	-0.0072	-0.0282
16	-392	389	-0.4686	-387	389	-0.4656	0.0030	-0.0210
18	-241	238	-0.2874	-238	239	-0.2862	0.0012	-0.0240
20	-86	83	-0.1014	-76	80	-0.0936	0.0078	-0.0252
22	22	-27	0.0294	34	-33	0.0402	0.0108	-0.0330
24	49	-50	0.0594	50	-48	0.0588	-0.0006	-0.0438
26	23	-25	0.0288	21	-18	0.0234	-0.0054	-0.0432
28	5	-6	0.0066	3	-2	0.0030	-0.0036	-0.0378
30	-11	9	-0.0120	-8	12	-0.0120	0.0000	-0.0342
32	-37	34	-0.0426	-40	39	-0.0474	-0.0048	-0.0342
34	-65	64	-0.0774	-65	66	-0.0786	-0.0012	-0.0294
36	-83	80	-0.0978	-82	86	-0.1008	-0.0030	-0.0282
38	-114	111	-0.1350	-117	119	-0.1416	-0.0066	-0.0252
40	-169	167	-0.2016	-171	170	-0.2046	-0.0030	-0.0186
42	-243	241	-0.2904	-246	246	-0.2952	-0.0048	-0.0156
44	-249	250	-0.2994	-252	256	-0.3048	-0.0054	-0.0108
46	-246	246	-0.2952	-246	249	-0.2970	-0.0018	-0.0054
48	-280	278	-0.3348	-282	282	-0.3384	-0.0036	-0.0036
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 1/22/2010 9:47:58 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 1/27/2010 2:28:41 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-470	482	-0.5712	-485	483	-0.5808	-0.0096	-0.0006
6	-520	521	-0.6246	-513	514	-0.6162	0.0084	0.0090
8	-676	678	-0.8124	-665	666	-0.7986	0.0138	0.0006
10	-838	838	-1.0056	-839	842	-1.0086	-0.0030	-0.0132
12	-809	802	-0.9666	-811	810	-0.9726	-0.0060	-0.0102
14	-607	604	-0.7266	-610	611	-0.7326	-0.0060	-0.0042
16	-392	389	-0.4686	-386	386	-0.4632	0.0054	0.0018
18	-241	238	-0.2874	-237	237	-0.2844	0.0030	-0.0036
20	-86	83	-0.1014	-75	77	-0.0912	0.0102	-0.0066
22	22	-27	0.0294	34	-35	0.0414	0.0120	-0.0168
24	49	-50	0.0594	50	-50	0.0600	0.0006	-0.0288
26	23	-25	0.0288	22	-20	0.0252	-0.0036	-0.0294
28	5	-6	0.0066	3	-3	0.0036	-0.0030	-0.0258
30	-11	9	-0.0120	-9	11	-0.0120	0.0000	-0.0228
32	-37	34	-0.0426	-39	39	-0.0468	-0.0042	-0.0228
34	-65	64	-0.0774	-64	65	-0.0774	0.0000	-0.0186
36	-83	80	-0.0978	-82	85	-0.1002	-0.0024	-0.0186
38	-114	111	-0.1350	-116	118	-0.1404	-0.0054	-0.0162
40	-169	167	-0.2016	-170	169	-0.2034	-0.0018	-0.0108
42	-243	241	-0.2904	-244	245	-0.2934	-0.0030	-0.0090
44	-249	250	-0.2994	-250	252	-0.3012	-0.0018	-0.0060
46	-246	246	-0.2952	-245	249	-0.2964	-0.0012	-0.0042
48	-280	278	-0.3348	-281	282	-0.3378	-0.0030	-0.0030
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 1/27/2010 10:04:53 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 1/27/2010 2:28:41 PM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-470	482	-0.5712	-486	494	-0.5880	-0.0168	-0.0084
6	-520	521	-0.6246	-513	515	-0.6168	0.0078	0.0084
8	-676	678	-0.8124	-663	666	-0.7974	0.0150	0.0006
10	-838	838	-1.0056	-838	841	-1.0074	-0.0018	-0.0144
12	-809	802	-0.9666	-811	810	-0.9726	-0.0060	-0.0126
14	-607	604	-0.7266	-609	610	-0.7314	-0.0048	-0.0066
16	-392	389	-0.4686	-385	387	-0.4632	0.0054	-0.0018
18	-241	238	-0.2874	-236	237	-0.2838	0.0036	-0.0072
20	-86	83	-0.1014	-74	77	-0.0906	0.0108	-0.0108
22	22	-27	0.0294	35	-35	0.0420	0.0126	-0.0216
24	49	-50	0.0594	51	-50	0.0606	0.0012	-0.0342
26	23	-25	0.0288	23	-20	0.0258	-0.0030	-0.0354
28	5	-6	0.0066	4	-2	0.0036	-0.0030	-0.0324
30	-11	9	-0.0120	-9	12	-0.0126	-0.0006	-0.0294
32	-37	34	-0.0426	-38	39	-0.0462	-0.0036	-0.0288
34	-65	64	-0.0774	-64	66	-0.0780	-0.0006	-0.0252
36	-83	80	-0.0978	-82	86	-0.1008	-0.0030	-0.0246
38	-114	111	-0.1350	-116	119	-0.1410	-0.0060	-0.0216
40	-169	167	-0.2016	-170	170	-0.2040	-0.0024	-0.0156
42	-243	241	-0.2904	-243	245	-0.2928	-0.0024	-0.0132
44	-249	250	-0.2994	-249	256	-0.3030	-0.0036	-0.0108
46	-246	246	-0.2952	-245	251	-0.2976	-0.0024	-0.0072
48	-280	278	-0.3348	-281	285	-0.3396	-0.0048	-0.0048
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 12/28/2009 10:31:32 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 1/27/2010 2:28:50 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	62	-6	0.0408	30	-52	0.0492	0.0084	-0.0504
6	31	24	0.0042	-2	-11	0.0054	0.0012	-0.0588
8	-69	126	-0.1170	-120	94	-0.1284	-0.0114	-0.0600
10	-53	102	-0.0930	-88	74	-0.0972	-0.0042	-0.0486
12	-14	67	-0.0486	-56	32	-0.0528	-0.0042	-0.0444
14	-65	121	-0.1116	-113	94	-0.1242	-0.0126	-0.0402
16	-150	205	-0.2130	-194	174	-0.2208	-0.0078	-0.0276
18	-189	246	-0.2610	-229	204	-0.2598	0.0012	-0.0198
20	-201	246	-0.2682	-228	216	-0.2664	0.0018	-0.0210
22	-143	193	-0.2016	-180	158	-0.2028	-0.0012	-0.0228
24	-162	218	-0.2280	-201	182	-0.2298	-0.0018	-0.0216
26	-150	206	-0.2136	-192	172	-0.2184	-0.0048	-0.0198
28	-136	194	-0.1980	-171	147	-0.1908	0.0072	-0.0150
30	-115	160	-0.1650	-143	124	-0.1602	0.0048	-0.0222
32	17	20	-0.0018	-4	2	-0.0036	-0.0018	-0.0270
34	173	-145	0.1908	157	-160	0.1902	-0.0006	-0.0252
36	349	-321	0.4020	335	-344	0.4074	0.0054	-0.0246
38	556	-529	0.6510	536	-538	0.6444	-0.0066	-0.0300
40	790	-760	0.9300	772	-783	0.9330	0.0030	-0.0234
42	964	-915	1.1274	922	-940	1.1172	-0.0102	-0.0264
44	929	-872	1.0806	893	-901	1.0764	-0.0042	-0.0162
46	876	-819	1.0170	837	-852	1.0134	-0.0036	-0.0120
48	869	-814	1.0098	825	-844	1.0014	-0.0084	-0.0084
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 1/8/2010 9:59:58 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 1/27/2010 2:28:50 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	62	-6	0.0408	6	-27	0.0198	-0.0210	-0.0588
6	31	24	0.0042	-11	-4	-0.0042	-0.0084	-0.0378
8	-69	126	-0.1170	-115	88	-0.1218	-0.0048	-0.0294
10	-53	102	-0.0930	-87	72	-0.0954	-0.0024	-0.0246
12	-14	67	-0.0486	-59	39	-0.0588	-0.0102	-0.0222
14	-65	121	-0.1116	-116	95	-0.1266	-0.0150	-0.0120
16	-150	205	-0.2130	-195	176	-0.2226	-0.0096	0.0030
18	-189	246	-0.2610	-234	205	-0.2634	-0.0024	0.0126
20	-201	246	-0.2682	-232	208	-0.2640	0.0042	0.0150
22	-143	193	-0.2016	-182	159	-0.2046	-0.0030	0.0108
24	-162	218	-0.2280	-205	179	-0.2304	-0.0024	0.0138
26	-150	206	-0.2136	-192	160	-0.2112	0.0024	0.0162
28	-136	194	-0.1980	-173	147	-0.1920	0.0060	0.0138
30	-115	160	-0.1650	-142	119	-0.1566	0.0084	0.0078
32	17	20	-0.0018	-1	-5	0.0024	0.0042	-0.0006
34	173	-145	0.1908	159	-166	0.1950	0.0042	-0.0048
36	349	-321	0.4020	338	-348	0.4116	0.0096	-0.0090
38	556	-529	0.6510	544	-549	0.6558	0.0048	-0.0186
40	790	-760	0.9300	779	-790	0.9414	0.0114	-0.0234
42	964	-915	1.1274	922	-941	1.1178	-0.0096	-0.0348
44	929	-872	1.0806	883	-900	1.0698	-0.0108	-0.0252
46	876	-819	1.0170	832	-854	1.0116	-0.0054	-0.0144
48	869	-814	1.0098	824	-844	1.0008	-0.0090	-0.0090
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 1/14/2010 8:19:39 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 1/27/2010 2:28:50 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	62	-6	0.0408	-21	-2	-0.0114	-0.0522	-0.0570
6	31	24	0.0042	-5	-15	0.0060	0.0018	-0.0048
8	-69	126	-0.1170	-100	72	-0.1032	0.0138	-0.0066
10	-53	102	-0.0930	-91	77	-0.1008	-0.0078	-0.0204
12	-14	67	-0.0486	-60	41	-0.0606	-0.0120	-0.0126
14	-65	121	-0.1116	-118	100	-0.1308	-0.0192	-0.0006
16	-150	205	-0.2130	-197	173	-0.2220	-0.0090	0.0186
18	-189	246	-0.2610	-234	204	-0.2628	-0.0018	0.0276
20	-201	246	-0.2682	-232	209	-0.2646	0.0036	0.0294
22	-143	193	-0.2016	-183	156	-0.2034	-0.0018	0.0258
24	-162	218	-0.2280	-205	178	-0.2298	-0.0018	0.0276
26	-150	206	-0.2136	-192	159	-0.2106	0.0030	0.0294
28	-136	194	-0.1980	-173	146	-0.1914	0.0066	0.0264
30	-115	160	-0.1650	-142	120	-0.1572	0.0078	0.0198
32	17	20	-0.0018	0	-6	0.0000	0.0018	0.0120
34	173	-145	0.1908	160	-165	0.1950	0.0042	0.0102
36	349	-321	0.4020	340	-348	0.4128	0.0108	0.0060
38	556	-529	0.6510	545	-549	0.6564	0.0054	-0.0048
40	790	-760	0.9300	781	-786	0.9402	0.0102	-0.0102
42	964	-915	1.1274	923	-941	1.1184	-0.0090	-0.0204
44	929	-872	1.0806	889	-908	1.0782	-0.0024	-0.0114
46	876	-819	1.0170	832	-860	1.0152	-0.0018	-0.0090
48	869	-814	1.0098	825	-846	1.0026	-0.0072	-0.0072
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 1/22/2010 9:47:58 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 1/27/2010 2:28:50 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	62	-6	0.0408	4	-29	0.0198	-0.0210	-0.0384
6	31	24	0.0042	-2	-15	0.0078	0.0036	-0.0174
8	-69	126	-0.1170	-106	83	-0.1134	0.0036	-0.0210
10	-53	102	-0.0930	-89	73	-0.0972	-0.0042	-0.0246
12	-14	67	-0.0486	-58	41	-0.0594	-0.0108	-0.0204
14	-65	121	-0.1116	-116	100	-0.1296	-0.0180	-0.0096
16	-150	205	-0.2130	-196	178	-0.2244	-0.0114	0.0084
18	-189	246	-0.2610	-230	205	-0.2610	0.0000	0.0198
20	-201	246	-0.2682	-231	209	-0.2640	0.0042	0.0198
22	-143	193	-0.2016	-181	160	-0.2046	-0.0030	0.0156
24	-162	218	-0.2280	-201	178	-0.2274	0.0006	0.0186
26	-150	206	-0.2136	-185	162	-0.2082	0.0054	0.0180
28	-136	194	-0.1980	-170	146	-0.1896	0.0084	0.0126
30	-115	160	-0.1650	-141	120	-0.1566	0.0084	0.0042
32	17	20	-0.0018	0	-6	0.0000	0.0018	-0.0042
34	173	-145	0.1908	158	-163	0.1926	0.0018	-0.0060
36	349	-321	0.4020	340	-348	0.4128	0.0108	-0.0078
38	556	-529	0.6510	544	-550	0.6564	0.0054	-0.0186
40	790	-760	0.9300	780	-786	0.9396	0.0096	-0.0240
42	964	-915	1.1274	922	-940	1.1172	-0.0102	-0.0336
44	929	-872	1.0806	882	-899	1.0686	-0.0120	-0.0234
46	876	-819	1.0170	833	-856	1.0134	-0.0036	-0.0114
48	869	-814	1.0098	825	-845	1.0020	-0.0078	-0.0078
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

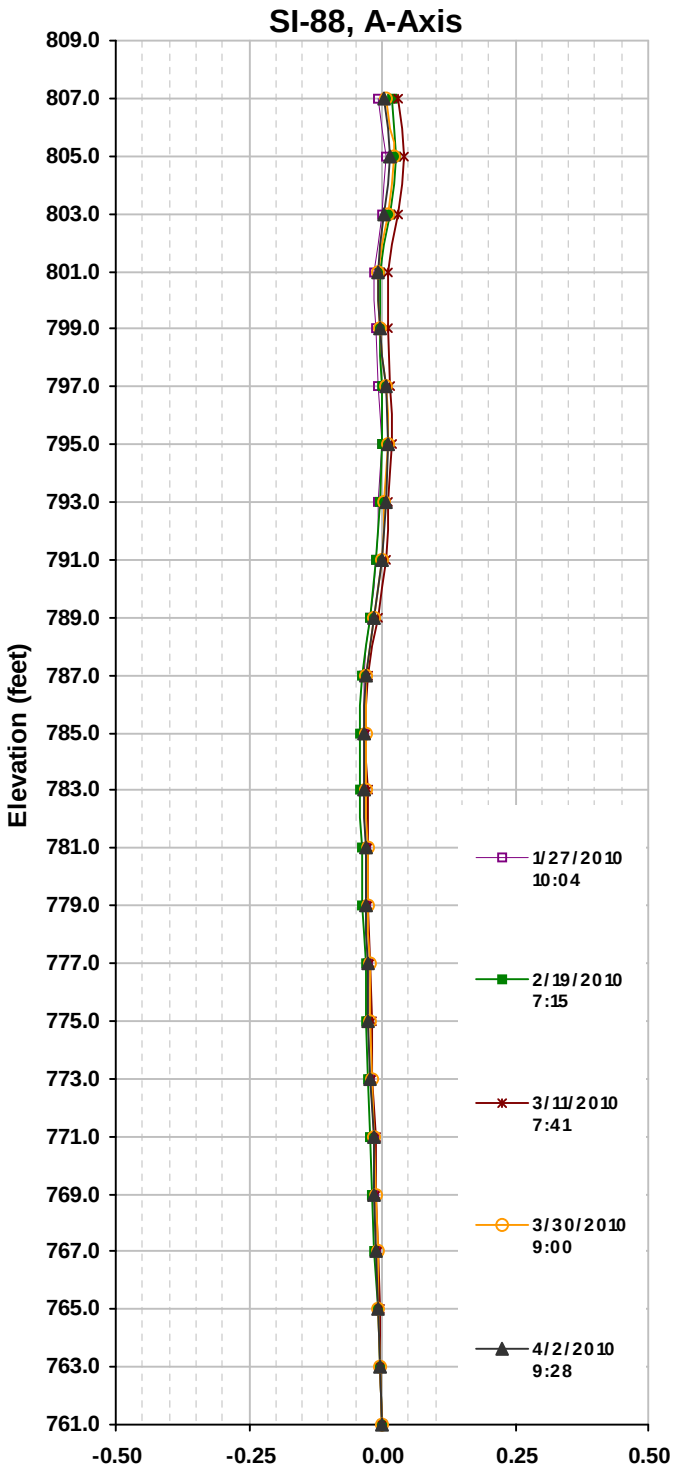
CURRENT SURVEY 1/27/2010 10:04:53 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

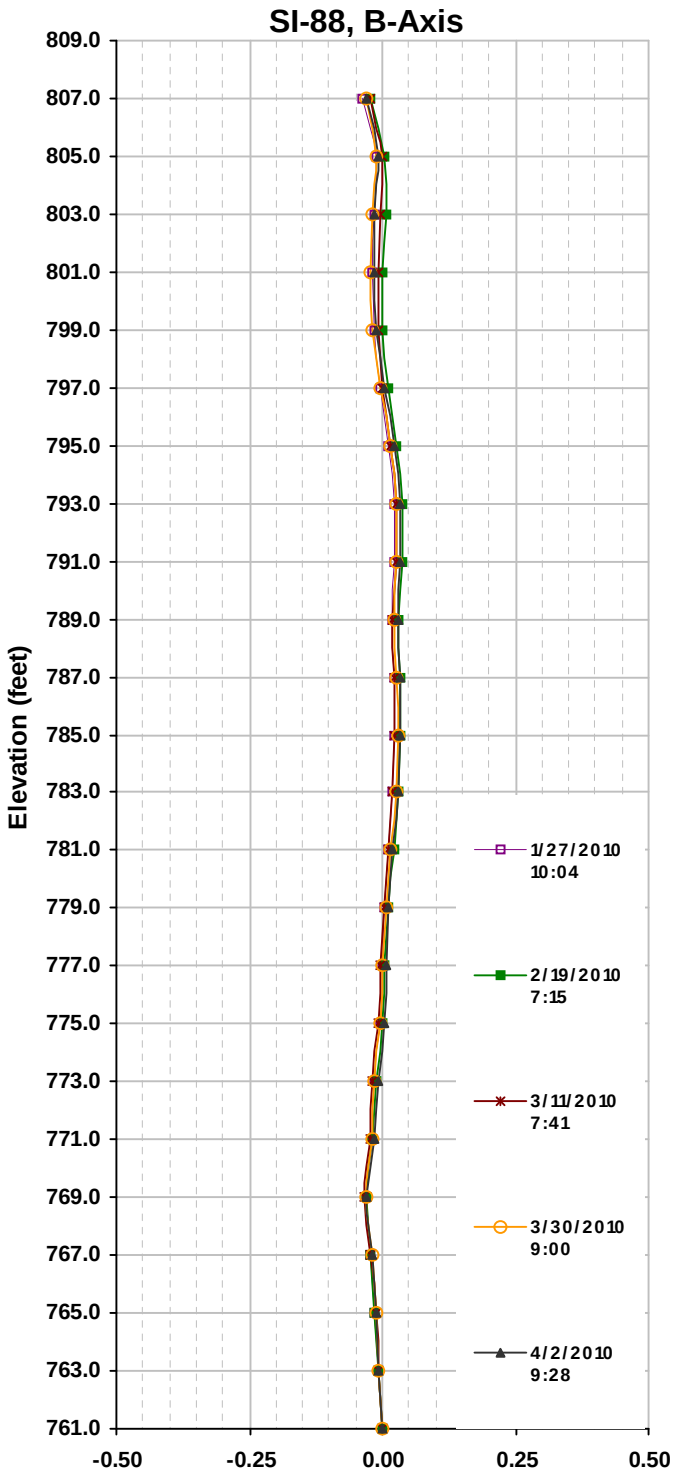
DATE PRINTED 1/27/2010 2:28:50 PM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	62	-6	0.0408	-1	-26	0.0150	-0.0258	-0.0360
6	31	24	0.0042	-2	-16	0.0084	0.0042	-0.0102
8	-69	126	-0.1170	-107	83	-0.1140	0.0030	-0.0144
10	-53	102	-0.0930	-90	72	-0.0972	-0.0042	-0.0174
12	-14	67	-0.0486	-60	38	-0.0588	-0.0102	-0.0132
14	-65	121	-0.1116	-115	96	-0.1266	-0.0150	-0.0030
16	-150	205	-0.2130	-197	177	-0.2244	-0.0114	0.0120
18	-189	246	-0.2610	-232	204	-0.2616	-0.0006	0.0234
20	-201	246	-0.2682	-231	207	-0.2628	0.0054	0.0240
22	-143	193	-0.2016	-184	159	-0.2058	-0.0042	0.0186
24	-162	218	-0.2280	-203	178	-0.2286	-0.0006	0.0228
26	-150	206	-0.2136	-189	161	-0.2100	0.0036	0.0234
28	-136	194	-0.1980	-170	147	-0.1902	0.0078	0.0198
30	-115	160	-0.1650	-143	119	-0.1572	0.0078	0.0120
32	17	20	-0.0018	-1	-7	0.0036	0.0054	0.0042
34	173	-145	0.1908	158	-166	0.1944	0.0036	-0.0012
36	349	-321	0.4020	339	-348	0.4122	0.0102	-0.0048
38	556	-529	0.6510	543	-551	0.6564	0.0054	-0.0150
40	790	-760	0.9300	779	-789	0.9408	0.0108	-0.0204
42	964	-915	1.1274	922	-942	1.1184	-0.0090	-0.0312
44	929	-872	1.0806	881	-905	1.0716	-0.0090	-0.0222
46	876	-819	1.0170	832	-854	1.0116	-0.0054	-0.0132
48	869	-814	1.0098	824	-846	1.0020	-0.0078	-0.0078
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

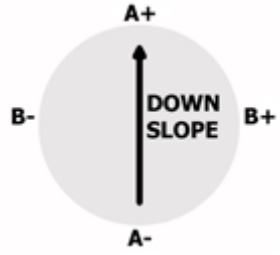


Cumulative Displacement (in) from 8/11/2009



Cumulative Displacement (in) from 8/11/2009

Stantec



Bull Run Fossil Plant
Bull Run
Clinton, TN
172679015
4/5/2010

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 1/27/2010 10:04:53 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 4/5/2010 10:15:36 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-470	482	-0.5712	-486	494	-0.5880	-0.0168	-0.0084
6	-520	521	-0.6246	-513	515	-0.6168	0.0078	0.0084
8	-676	678	-0.8124	-663	666	-0.7974	0.0150	0.0006
10	-838	838	-1.0056	-838	841	-1.0074	-0.0018	-0.0144
12	-809	802	-0.9666	-811	810	-0.9726	-0.0060	-0.0126
14	-607	604	-0.7266	-609	610	-0.7314	-0.0048	-0.0066
16	-392	389	-0.4686	-385	387	-0.4632	0.0054	-0.0018
18	-241	238	-0.2874	-236	237	-0.2838	0.0036	-0.0072
20	-86	83	-0.1014	-74	77	-0.0906	0.0108	-0.0108
22	22	-27	0.0294	35	-35	0.0420	0.0126	-0.0216
24	49	-50	0.0594	51	-50	0.0606	0.0012	-0.0342
26	23	-25	0.0288	23	-20	0.0258	-0.0030	-0.0354
28	5	-6	0.0066	4	-2	0.0036	-0.0030	-0.0324
30	-11	9	-0.0120	-9	12	-0.0126	-0.0006	-0.0294
32	-37	34	-0.0426	-38	39	-0.0462	-0.0036	-0.0288
34	-65	64	-0.0774	-64	66	-0.0780	-0.0006	-0.0252
36	-83	80	-0.0978	-82	86	-0.1008	-0.0030	-0.0246
38	-114	111	-0.1350	-116	119	-0.1410	-0.0060	-0.0216
40	-169	167	-0.2016	-170	170	-0.2040	-0.0024	-0.0156
42	-243	241	-0.2904	-243	245	-0.2928	-0.0024	-0.0132
44	-249	250	-0.2994	-249	256	-0.3030	-0.0036	-0.0108
46	-246	246	-0.2952	-245	251	-0.2976	-0.0024	-0.0072
48	-280	278	-0.3348	-281	285	-0.3396	-0.0048	-0.0048
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 2/19/2010 7:15:31 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 4/5/2010 10:15:36 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-470	482	-0.5712	-482	485	-0.5802	-0.0090	0.0174
6	-520	521	-0.6246	-511	513	-0.6144	0.0102	0.0264
8	-676	678	-0.8124	-660	662	-0.7932	0.0192	0.0162
10	-838	838	-1.0056	-834	839	-1.0038	0.0018	-0.0030
12	-809	802	-0.9666	-808	809	-0.9702	-0.0036	-0.0048
14	-607	604	-0.7266	-607	609	-0.7296	-0.0030	-0.0012
16	-392	389	-0.4686	-384	385	-0.4614	0.0072	0.0018
18	-241	238	-0.2874	-235	235	-0.2820	0.0054	-0.0054
20	-86	83	-0.1014	-72	75	-0.0882	0.0132	-0.0108
22	22	-27	0.0294	37	-37	0.0444	0.0150	-0.0240
24	49	-50	0.0594	52	-51	0.0618	0.0024	-0.0390
26	23	-25	0.0288	24	-21	0.0270	-0.0018	-0.0414
28	5	-6	0.0066	4	-2	0.0036	-0.0030	-0.0396
30	-11	9	-0.0120	-9	12	-0.0126	-0.0006	-0.0366
32	-37	34	-0.0426	-39	41	-0.0480	-0.0054	-0.0360
34	-65	64	-0.0774	-64	66	-0.0780	-0.0006	-0.0306
36	-83	80	-0.0978	-82	85	-0.1002	-0.0024	-0.0300
38	-114	111	-0.1350	-116	119	-0.1410	-0.0060	-0.0276
40	-169	167	-0.2016	-171	170	-0.2046	-0.0030	-0.0216
42	-243	241	-0.2904	-246	247	-0.2958	-0.0054	-0.0186
44	-249	250	-0.2994	-250	256	-0.3036	-0.0042	-0.0132
46	-246	246	-0.2952	-246	252	-0.2988	-0.0036	-0.0090
48	-280	278	-0.3348	-282	285	-0.3402	-0.0054	-0.0054
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 3/11/2010 7:41:00 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 4/5/2010 10:15:36 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-470	482	-0.5712	-480	492	-0.5832	-0.0120	0.0294
6	-520	521	-0.6246	-510	514	-0.6144	0.0102	0.0414
8	-676	678	-0.8124	-659	664	-0.7938	0.0186	0.0312
10	-838	838	-1.0056	-834	840	-1.0044	0.0012	0.0126
12	-809	802	-0.9666	-808	810	-0.9708	-0.0042	0.0114
14	-607	604	-0.7266	-606	610	-0.7296	-0.0030	0.0156
16	-392	389	-0.4686	-382	387	-0.4614	0.0072	0.0186
18	-241	238	-0.2874	-233	237	-0.2820	0.0054	0.0114
20	-86	83	-0.1014	-69	76	-0.0870	0.0144	0.0060
22	22	-27	0.0294	40	-36	0.0456	0.0162	-0.0084
24	49	-50	0.0594	55	-50	0.0630	0.0036	-0.0246
26	23	-25	0.0288	26	-21	0.0282	-0.0006	-0.0282
28	5	-6	0.0066	6	-2	0.0048	-0.0018	-0.0276
30	-11	9	-0.0120	-7	13	-0.0120	0.0000	-0.0258
32	-37	34	-0.0426	-38	41	-0.0474	-0.0048	-0.0258
34	-65	64	-0.0774	-63	67	-0.0780	-0.0006	-0.0210
36	-83	80	-0.0978	-80	86	-0.0996	-0.0018	-0.0204
38	-114	111	-0.1350	-115	120	-0.1410	-0.0060	-0.0186
40	-169	167	-0.2016	-169	171	-0.2040	-0.0024	-0.0126
42	-243	241	-0.2904	-243	247	-0.2940	-0.0036	-0.0102
44	-249	250	-0.2994	-248	253	-0.3006	-0.0012	-0.0066
46	-246	246	-0.2952	-243	251	-0.2964	-0.0012	-0.0054
48	-280	278	-0.3348	-280	285	-0.3390	-0.0042	-0.0042
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 3/30/2010 9:00:00 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 4/5/2010 10:15:36 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-470	482	-0.5712	-484	490	-0.5844	-0.0132	0.0084
6	-520	521	-0.6246	-509	514	-0.6138	0.0108	0.0216
8	-676	678	-0.8124	-661	665	-0.7956	0.0168	0.0108
10	-838	838	-1.0056	-837	843	-1.0080	-0.0024	-0.0060
12	-809	802	-0.9666	-812	815	-0.9762	-0.0096	-0.0036
14	-607	604	-0.7266	-607	612	-0.7314	-0.0048	0.0060
16	-392	389	-0.4686	-383	389	-0.4632	0.0054	0.0108
18	-241	238	-0.2874	-234	238	-0.2832	0.0042	0.0054
20	-86	83	-0.1014	-69	76	-0.0870	0.0144	0.0012
22	22	-27	0.0294	39	-35	0.0444	0.0150	-0.0132
24	49	-50	0.0594	54	-49	0.0618	0.0024	-0.0282
26	23	-25	0.0288	26	-20	0.0276	-0.0012	-0.0306
28	5	-6	0.0066	6	-1	0.0042	-0.0024	-0.0294
30	-11	9	-0.0120	-7	13	-0.0120	0.0000	-0.0270
32	-37	34	-0.0426	-37	41	-0.0468	-0.0042	-0.0270
34	-65	64	-0.0774	-63	67	-0.0780	-0.0006	-0.0228
36	-83	80	-0.0978	-80	86	-0.0996	-0.0018	-0.0222
38	-114	111	-0.1350	-115	120	-0.1410	-0.0060	-0.0204
40	-169	167	-0.2016	-169	171	-0.2040	-0.0024	-0.0144
42	-243	241	-0.2904	-243	247	-0.2940	-0.0036	-0.0120
44	-249	250	-0.2994	-247	256	-0.3018	-0.0024	-0.0084
46	-246	246	-0.2952	-244	252	-0.2976	-0.0024	-0.0060
48	-280	278	-0.3348	-280	284	-0.3384	-0.0036	-0.0036
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 4/2/2010 9:28:49 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 4/5/2010 10:15:36 AM

Data Reduction for A Axis:

	Initial			Current				
Depth (ft)	A0	A180	Incr. Dev (in)	A0	A180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	-470	482	-0.5712	-481	490	-0.5826	-0.0114	0.0036
6	-520	521	-0.6246	-508	517	-0.6150	0.0096	0.0150
8	-676	678	-0.8124	-662	669	-0.7986	0.0138	0.0054
10	-838	838	-1.0056	-837	846	-1.0098	-0.0042	-0.0084
12	-809	802	-0.9666	-812	818	-0.9780	-0.0114	-0.0042
14	-607	604	-0.7266	-606	613	-0.7314	-0.0048	0.0072
16	-392	389	-0.4686	-382	389	-0.4626	0.0060	0.0120
18	-241	238	-0.2874	-232	239	-0.2826	0.0048	0.0060
20	-86	83	-0.1014	-67	76	-0.0858	0.0156	0.0012
22	22	-27	0.0294	41	-35	0.0456	0.0162	-0.0144
24	49	-50	0.0594	55	-48	0.0618	0.0024	-0.0306
26	23	-25	0.0288	28	-19	0.0282	-0.0006	-0.0330
28	5	-6	0.0066	7	0	0.0042	-0.0024	-0.0324
30	-11	9	-0.0120	-5	15	-0.0120	0.0000	-0.0300
32	-37	34	-0.0426	-37	42	-0.0474	-0.0048	-0.0300
34	-65	64	-0.0774	-61	68	-0.0774	0.0000	-0.0252
36	-83	80	-0.0978	-79	88	-0.1002	-0.0024	-0.0252
38	-114	111	-0.1350	-114	122	-0.1416	-0.0066	-0.0228
40	-169	167	-0.2016	-168	172	-0.2040	-0.0024	-0.0162
42	-243	241	-0.2904	-242	248	-0.2940	-0.0036	-0.0138
44	-249	250	-0.2994	-246	257	-0.3018	-0.0024	-0.0102
46	-246	246	-0.2952	-243	254	-0.2982	-0.0030	-0.0078
48	-280	278	-0.3348	-279	287	-0.3396	-0.0048	-0.0048
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 1/27/2010 10:04:53 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 4/5/2010 10:15:46 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	62	-6	0.0408	-1	-26	0.0150	-0.0258	-0.0360
6	31	24	0.0042	-2	-16	0.0084	0.0042	-0.0102
8	-69	126	-0.1170	-107	83	-0.1140	0.0030	-0.0144
10	-53	102	-0.0930	-90	72	-0.0972	-0.0042	-0.0174
12	-14	67	-0.0486	-60	38	-0.0588	-0.0102	-0.0132
14	-65	121	-0.1116	-115	96	-0.1266	-0.0150	-0.0030
16	-150	205	-0.2130	-197	177	-0.2244	-0.0114	0.0120
18	-189	246	-0.2610	-232	204	-0.2616	-0.0006	0.0234
20	-201	246	-0.2682	-231	207	-0.2628	0.0054	0.0240
22	-143	193	-0.2016	-184	159	-0.2058	-0.0042	0.0186
24	-162	218	-0.2280	-203	178	-0.2286	-0.0006	0.0228
26	-150	206	-0.2136	-189	161	-0.2100	0.0036	0.0234
28	-136	194	-0.1980	-170	147	-0.1902	0.0078	0.0198
30	-115	160	-0.1650	-143	119	-0.1572	0.0078	0.0120
32	17	20	-0.0018	-1	-7	0.0036	0.0054	0.0042
34	173	-145	0.1908	158	-166	0.1944	0.0036	-0.0012
36	349	-321	0.4020	339	-348	0.4122	0.0102	-0.0048
38	556	-529	0.6510	543	-551	0.6564	0.0054	-0.0150
40	790	-760	0.9300	779	-789	0.9408	0.0108	-0.0204
42	964	-915	1.1274	922	-942	1.1184	-0.0090	-0.0312
44	929	-872	1.0806	881	-905	1.0716	-0.0090	-0.0222
46	876	-819	1.0170	832	-854	1.0116	-0.0054	-0.0132
48	869	-814	1.0098	824	-846	1.0020	-0.0078	-0.0078
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 2/19/2010 7:15:31 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 4/5/2010 10:15:46 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	62	-6	0.0408	4	-24	0.0168	-0.0240	-0.0210
6	31	24	0.0042	0	-17	0.0000	-0.0042	0.0030
8	-69	126	-0.1170	-101	82	-0.1098	0.0072	0.0072
10	-53	102	-0.0930	-85	71	-0.0936	-0.0006	0.0000
12	-14	67	-0.0486	-57	39	-0.0576	-0.0090	0.0006
14	-65	121	-0.1116	-114	99	-0.1278	-0.0162	0.0096
16	-150	205	-0.2130	-195	180	-0.2250	-0.0120	0.0258
18	-189	246	-0.2610	-228	206	-0.2604	0.0006	0.0378
20	-201	246	-0.2682	-229	207	-0.2616	0.0066	0.0372
22	-143	193	-0.2016	-180	163	-0.2058	-0.0042	0.0306
24	-162	218	-0.2280	-199	179	-0.2268	0.0012	0.0348
26	-150	206	-0.2136	-186	163	-0.2094	0.0042	0.0336
28	-136	194	-0.1980	-167	149	-0.1896	0.0084	0.0294
30	-115	160	-0.1650	-141	119	-0.1560	0.0090	0.0210
32	17	20	-0.0018	1	-7	0.0048	0.0066	0.0120
34	173	-145	0.1908	161	-166	0.1962	0.0054	0.0054
36	349	-321	0.4020	341	-347	0.4128	0.0108	0.0000
38	556	-529	0.6510	545	-552	0.6582	0.0072	-0.0108
40	790	-760	0.9300	781	-790	0.9426	0.0126	-0.0180
42	964	-915	1.1274	924	-941	1.1190	-0.0084	-0.0306
44	929	-872	1.0806	883	-905	1.0728	-0.0078	-0.0222
46	876	-819	1.0170	834	-852	1.0116	-0.0054	-0.0144
48	869	-814	1.0098	825	-843	1.0008	-0.0090	-0.0090
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 3/11/2010 7:41:00 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 4/5/2010 10:15:47 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	62	-6	0.0408	4	-24	0.0168	-0.0240	-0.0228
6	31	24	0.0042	1	-16	0.0102	0.0060	0.0012
8	-69	126	-0.1170	-103	86	-0.1134	0.0036	-0.0048
10	-53	102	-0.0930	-83	72	-0.0930	0.0000	-0.0084
12	-14	67	-0.0486	-55	41	-0.0576	-0.0090	-0.0084
14	-65	121	-0.1116	-114	98	-0.1272	-0.0156	0.0006
16	-150	205	-0.2130	-193	180	-0.2238	-0.0108	0.0162
18	-189	246	-0.2610	-228	207	-0.2610	0.0000	0.0270
20	-201	246	-0.2682	-227	207	-0.2604	0.0078	0.0270
22	-143	193	-0.2016	-178	164	-0.2052	-0.0036	0.0192
24	-162	218	-0.2280	-200	180	-0.2280	0.0000	0.0228
26	-150	206	-0.2136	-186	165	-0.2106	0.0030	0.0228
28	-136	194	-0.1980	-167	148	-0.1890	0.0090	0.0198
30	-115	160	-0.1650	-140	121	-0.1566	0.0084	0.0108
32	17	20	-0.0018	3	-3	0.0036	0.0054	0.0024
34	173	-145	0.1908	162	-163	0.1950	0.0042	-0.0030
36	349	-321	0.4020	342	-346	0.4128	0.0108	-0.0072
38	556	-529	0.6510	542	-549	0.6546	0.0036	-0.0180
40	790	-760	0.9300	782	-787	0.9414	0.0114	-0.0216
42	964	-915	1.1274	925	-939	1.1184	-0.0090	-0.0330
44	929	-872	1.0806	884	-898	1.0692	-0.0114	-0.0240
46	876	-819	1.0170	834	-853	1.0122	-0.0048	-0.0126
48	869	-814	1.0098	827	-843	1.0020	-0.0078	-0.0078
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 3/30/2010 9:00:00 AM

INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 4/5/2010 10:15:47 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	62	-6	0.0408	3	-31	0.0204	-0.0204	-0.0312
6	31	24	0.0042	2	-17	0.0114	0.0072	-0.0108
8	-69	126	-0.1170	-106	84	-0.1140	0.0030	-0.0180
10	-53	102	-0.0930	-86	73	-0.0954	-0.0024	-0.0210
12	-14	67	-0.0486	-61	45	-0.0636	-0.0150	-0.0186
14	-65	121	-0.1116	-115	100	-0.1290	-0.0174	-0.0036
16	-150	205	-0.2130	-196	180	-0.2256	-0.0126	0.0138
18	-189	246	-0.2610	-231	206	-0.2622	-0.0012	0.0264
20	-201	246	-0.2682	-230	210	-0.2640	0.0042	0.0276
22	-143	193	-0.2016	-180	161	-0.2046	-0.0030	0.0234
24	-162	218	-0.2280	-204	180	-0.2304	-0.0024	0.0264
26	-150	206	-0.2136	-189	161	-0.2100	0.0036	0.0288
28	-136	194	-0.1980	-168	147	-0.1890	0.0090	0.0252
30	-115	160	-0.1650	-140	120	-0.1560	0.0090	0.0162
32	17	20	-0.0018	1	-6	0.0042	0.0060	0.0072
34	173	-145	0.1908	160	-165	0.1950	0.0042	0.0012
36	349	-321	0.4020	340	-347	0.4122	0.0102	-0.0030
38	556	-529	0.6510	545	-550	0.6570	0.0060	-0.0132
40	790	-760	0.9300	780	-786	0.9396	0.0096	-0.0192
42	964	-915	1.1274	925	-939	1.1184	-0.0090	-0.0288
44	929	-872	1.0806	884	-903	1.0722	-0.0084	-0.0198
46	876	-819	1.0170	834	-856	1.0140	-0.0030	-0.0114
48	869	-814	1.0098	825	-844	1.0014	-0.0084	-0.0084
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

SITE BRFTVA

INSTALLATION SI-88

DESCRIPTION

CURRENT SURVEY 4/2/2010 9:28:49 AM

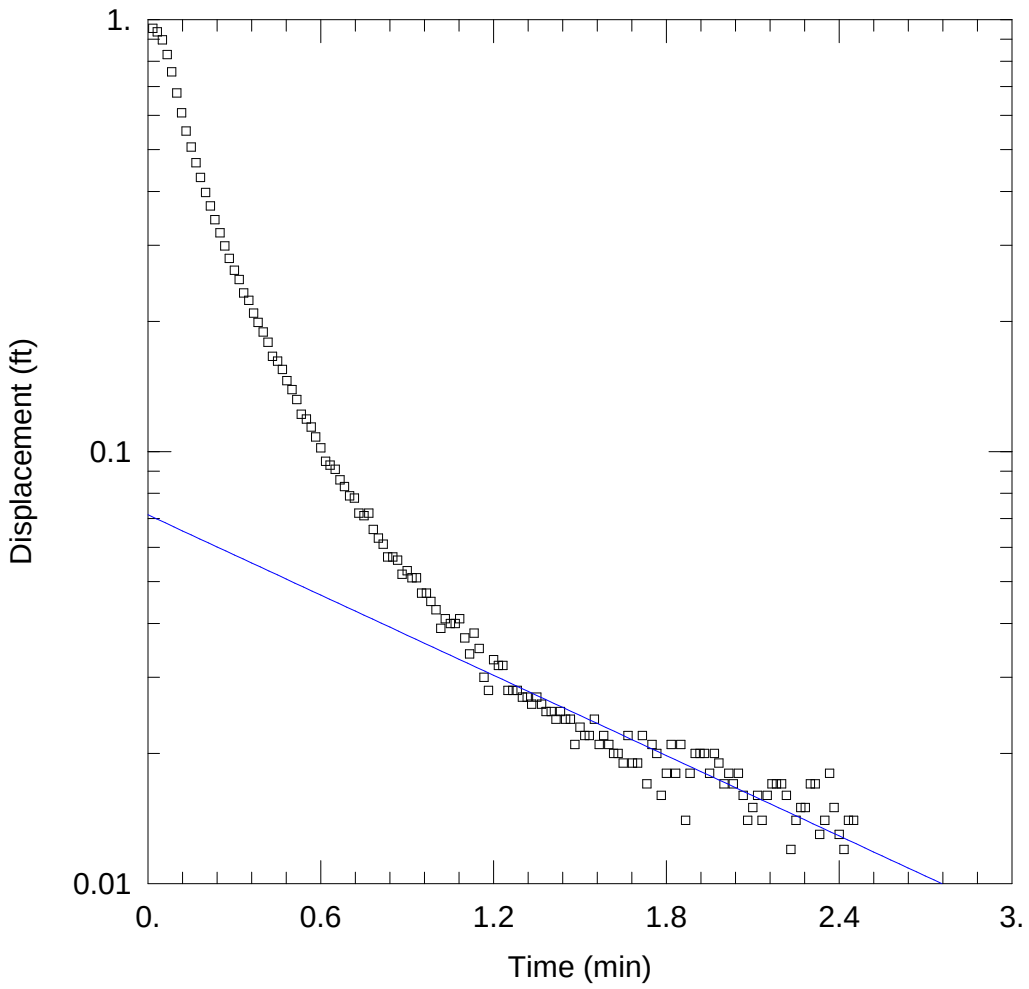
INITIAL SURVEY 8/11/2009 10:55:47 AM

DATE PRINTED 4/5/2010 10:15:47 AM

Data Reduction for B Axis:

	Initial			Current				
Depth (ft)	B0	B180	Incr. Dev (in)	B0	B180	Incr. Dev (in)	Incr. Disp. (in)	Cum. Disp. (in)
4	62	-6	0.0408	9	-23	0.0192	-0.0216	-0.0300
6	31	24	0.0042	-1	-16	0.0090	0.0048	-0.0084
8	-69	126	-0.1170	-105	86	-0.1146	0.0024	-0.0132
10	-53	102	-0.0930	-90	74	-0.0984	-0.0054	-0.0156
12	-14	67	-0.0486	-62	43	-0.0630	-0.0144	-0.0102
14	-65	121	-0.1116	-118	98	-0.1296	-0.0180	0.0042
16	-150	205	-0.2130	-196	178	-0.2244	-0.0114	0.0222
18	-189	246	-0.2610	-228	209	-0.2622	-0.0012	0.0336
20	-201	246	-0.2682	-231	207	-0.2628	0.0054	0.0348
22	-143	193	-0.2016	-178	165	-0.2058	-0.0042	0.0294
24	-162	218	-0.2280	-201	181	-0.2292	-0.0012	0.0336
26	-150	206	-0.2136	-184	164	-0.2088	0.0048	0.0348
28	-136	194	-0.1980	-166	146	-0.1872	0.0108	0.0300
30	-115	160	-0.1650	-142	120	-0.1572	0.0078	0.0192
32	17	20	-0.0018	1	-5	0.0036	0.0054	0.0114
34	173	-145	0.1908	159	-165	0.1944	0.0036	0.0060
36	349	-321	0.4020	341	-348	0.4134	0.0114	0.0024
38	556	-529	0.6510	544	-553	0.6582	0.0072	-0.0090
40	790	-760	0.9300	781	-790	0.9426	0.0126	-0.0162
42	964	-915	1.1274	923	-940	1.1178	-0.0096	-0.0288
44	929	-872	1.0806	883	-906	1.0734	-0.0072	-0.0192
46	876	-819	1.0170	836	-854	1.0140	-0.0030	-0.0120
48	869	-814	1.0098	825	-843	1.0008	-0.0090	-0.0090
50	0	0	0.0000	0	0	0.0000	0.0000	0.0000

Attachment 3
Slug Test Data



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-27.aqt
Date: 11/20/09 Time: 09:17:19

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-27
Test Date: 11/6/09

AQUIFER DATA

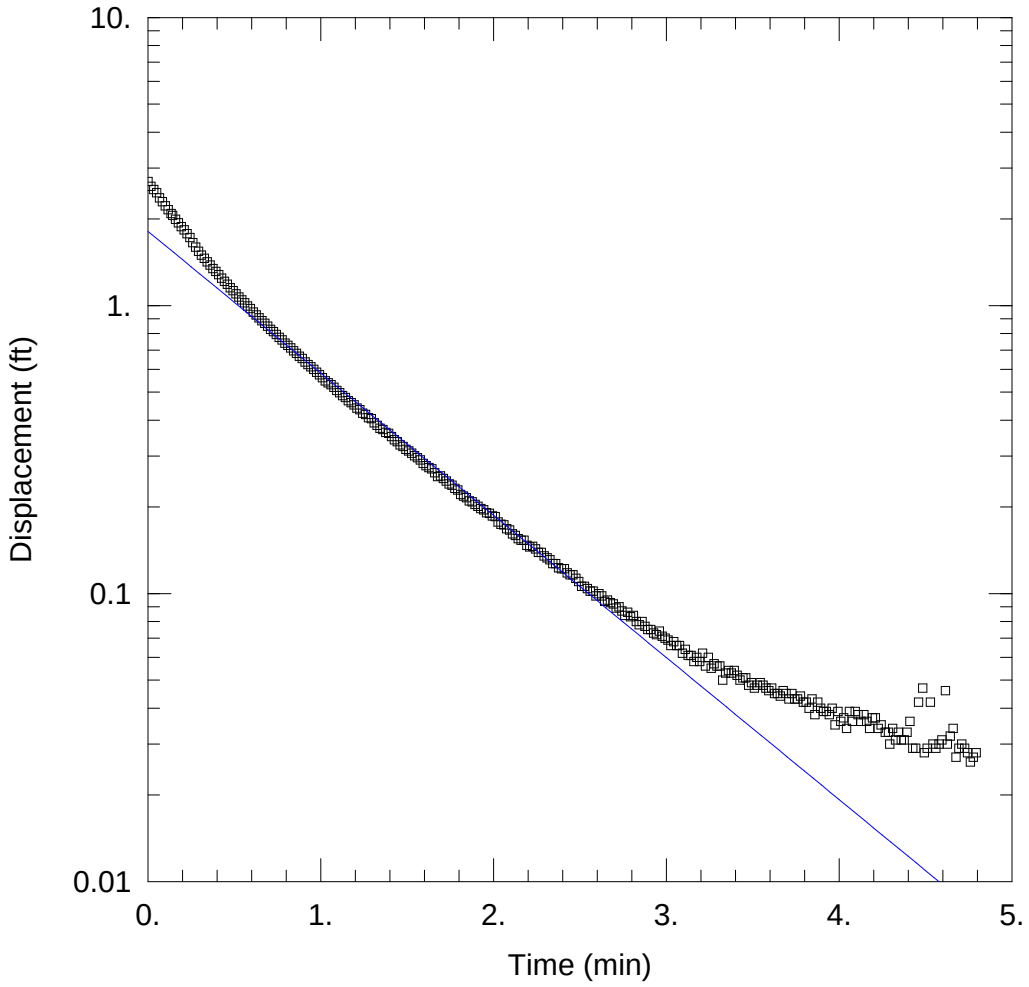
Saturated Thickness: 18.67 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (STN-27)

Initial Displacement: 1.032 ft
Total Well Penetration Depth: 5.97 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 5.97 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0001955 cm/sec
y0 = 0.07135 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-30.aqt
Date: 11/20/09 Time: 09:22:50

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-30
Test Date: 11/6/09

AQUIFER DATA

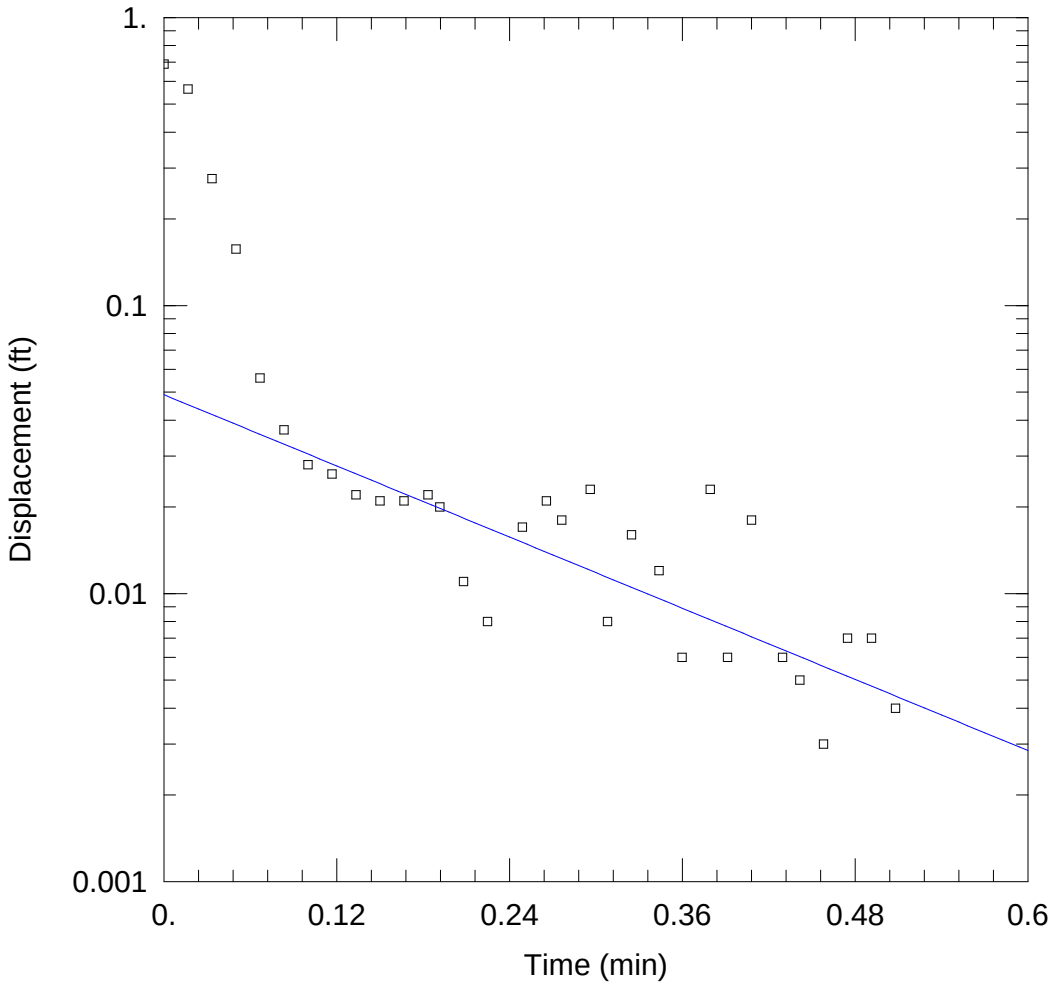
Saturated Thickness: 26.36 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (STN-30)

Initial Displacement: 2.695 ft
Total Well Penetration Depth: 7.96 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 7.96 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0003223 cm/sec
y0 = 1.81 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-33.aqt
Date: 11/20/09 Time: 09:33:10

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-33
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 3.38 ft Anisotropy Ratio (Kz/Kr): 1.

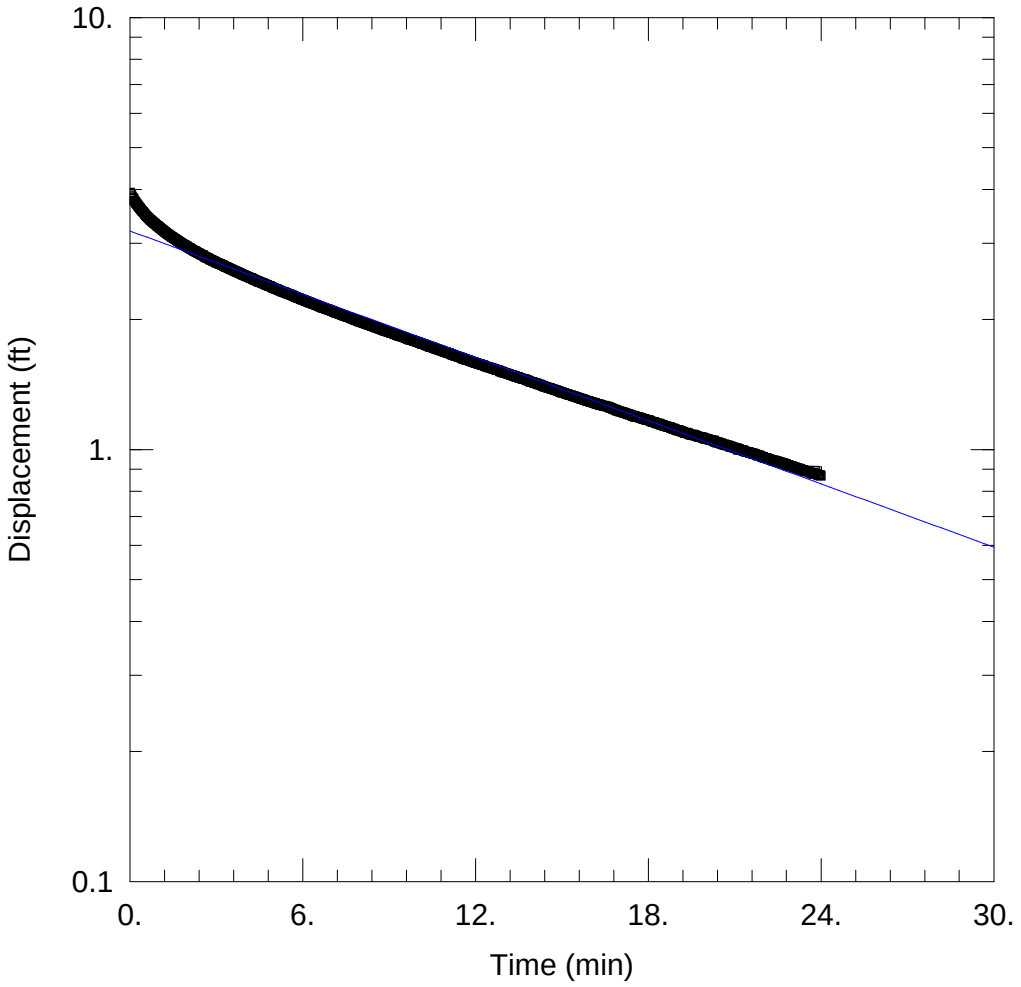
WELL DATA (STN-33)

Initial Displacement: 0.69 ft
Total Well Penetration Depth: 5. ft
Casing Radius: 0.0417 ft
Static Water Column Height: 2.78 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.002097 cm/sec
y0 = 0.04899 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-34.aqt
Date: 11/20/09 Time: 09:42:14

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-34
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 42.56 ft Anisotropy Ratio (Kz/Kr): 1.

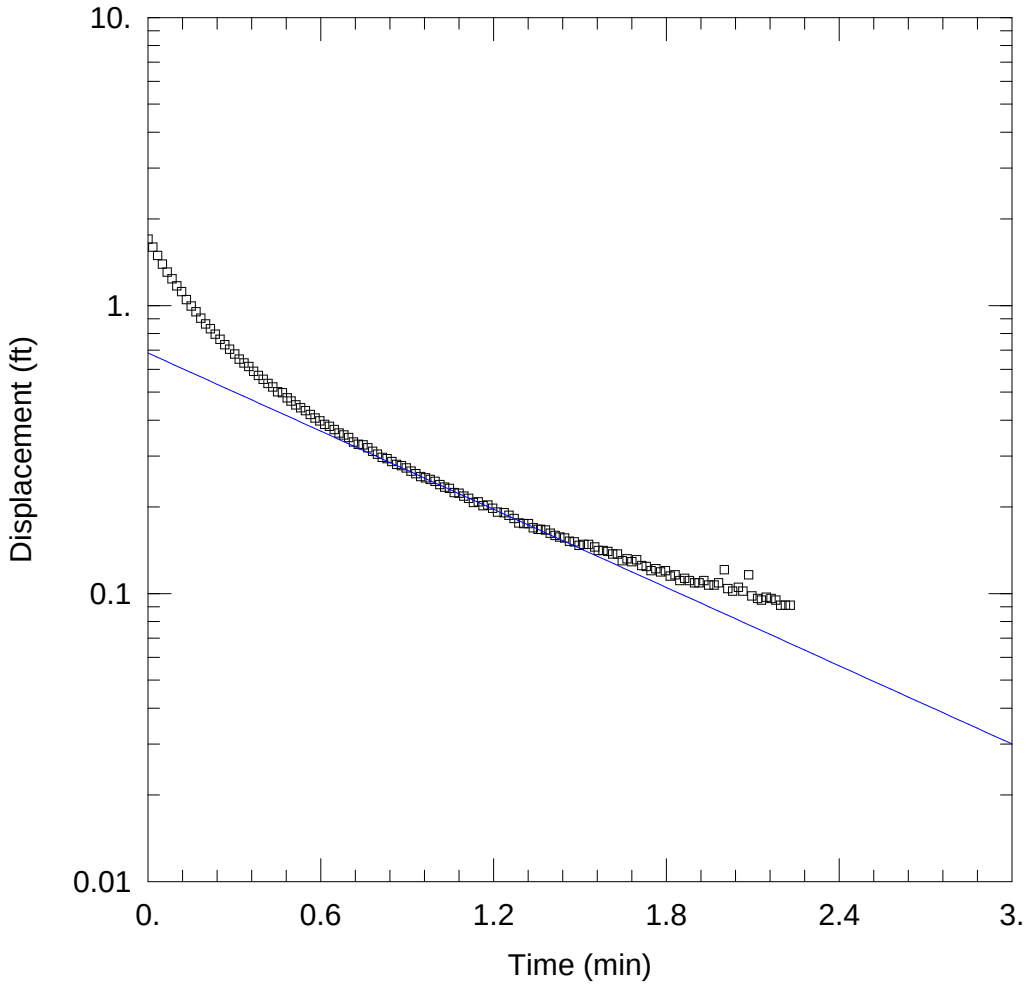
WELL DATA (STN-34)

Initial Displacement: 3.938 ft
Total Well Penetration Depth: 40.56 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 40.56 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 2.045E-5 cm/sec
y0 = 3.205 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-34a.aqt
Date: 11/20/09 Time: 10:08:58

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-34a
Test Date: 11/6/09

AQUIFER DATA

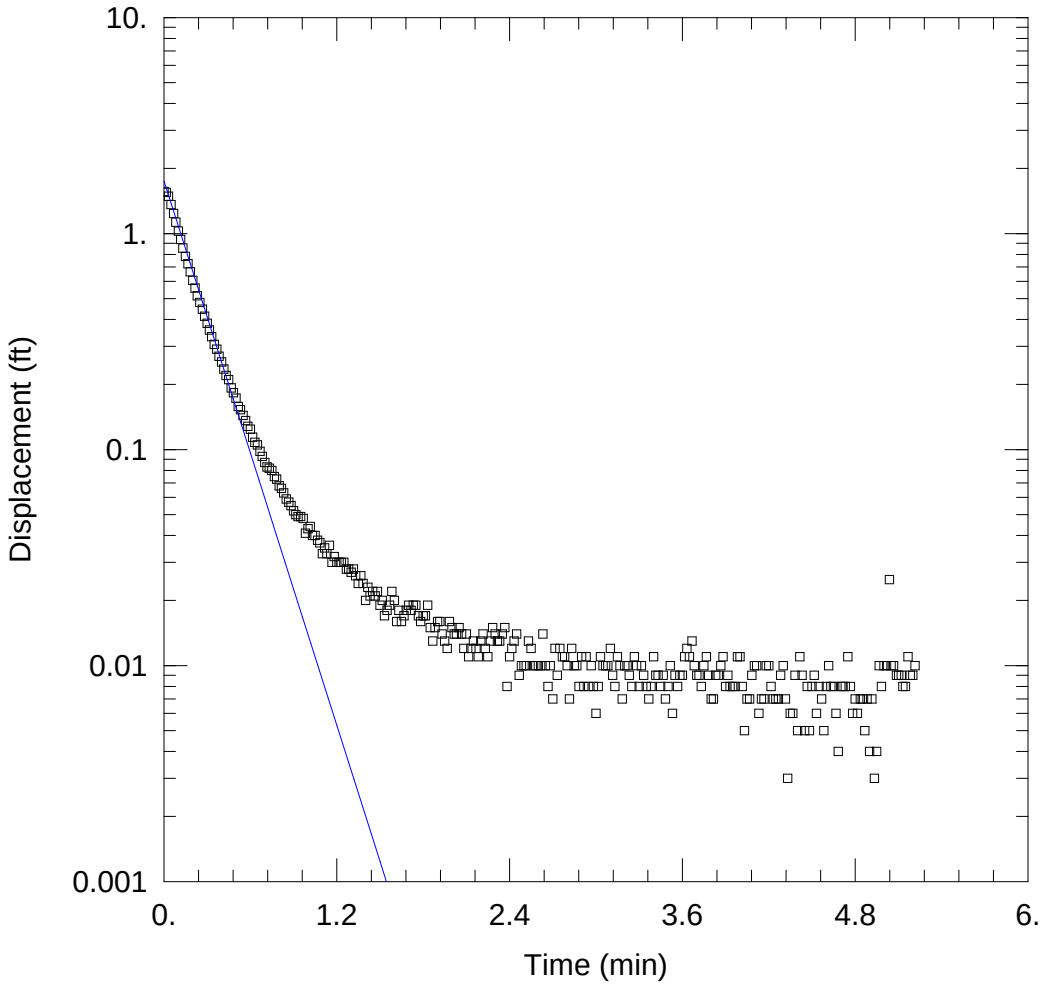
Saturated Thickness: 8.37 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (STN-34a)

Initial Displacement: 1.701 ft
Total Well Penetration Depth: 8.37 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 8.37 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0003453 cm/sec
y0 = 0.6841 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-35.aqt
Date: 11/20/09 Time: 10:14:24

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-35
Test Date: 11/6/09

AQUIFER DATA

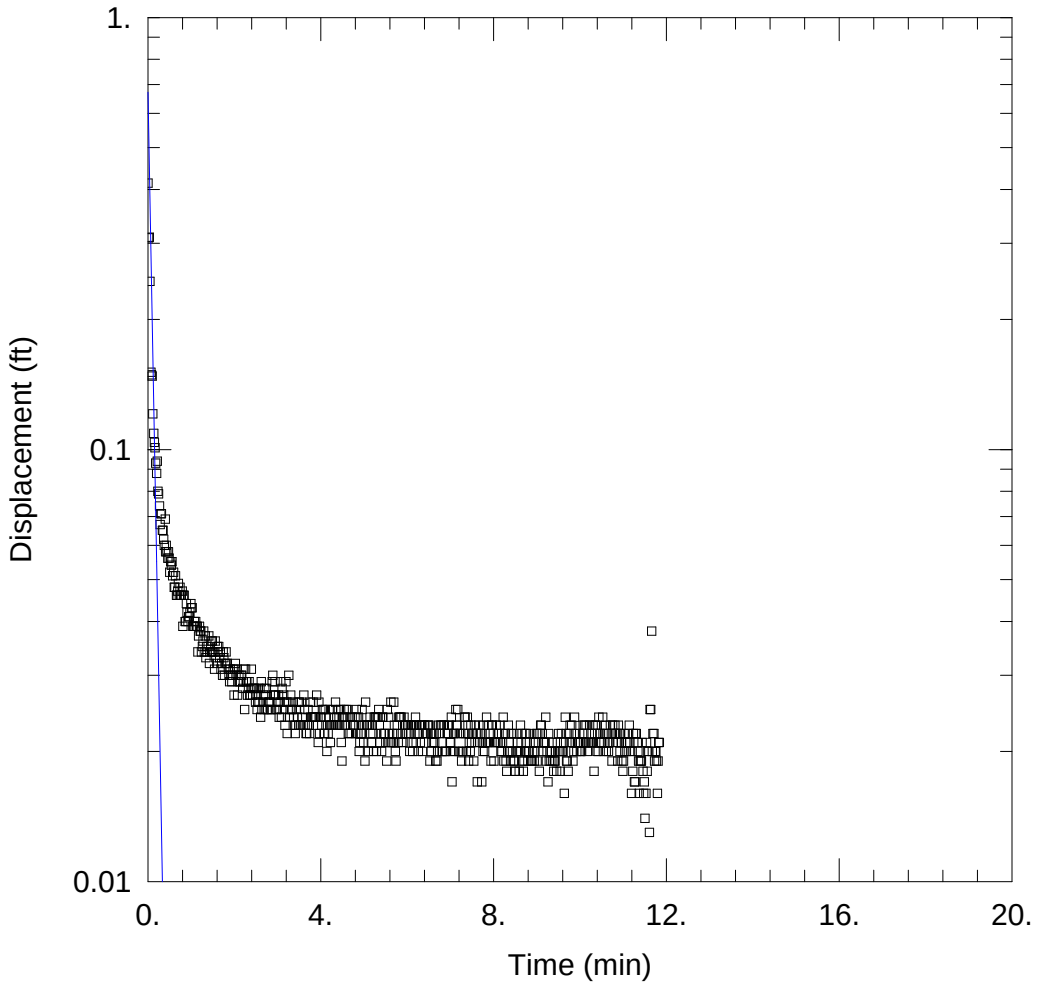
Saturated Thickness: 31.5 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (STN-35)

Initial Displacement: 1.565 ft
Total Well Penetration Depth: 25.1 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 25.1 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.001618 cm/sec
y0 = 1.752 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-35a.aqt
Date: 11/20/09 Time: 10:30:23

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-35a
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 11.28 ft Anisotropy Ratio (Kz/Kr): 1.

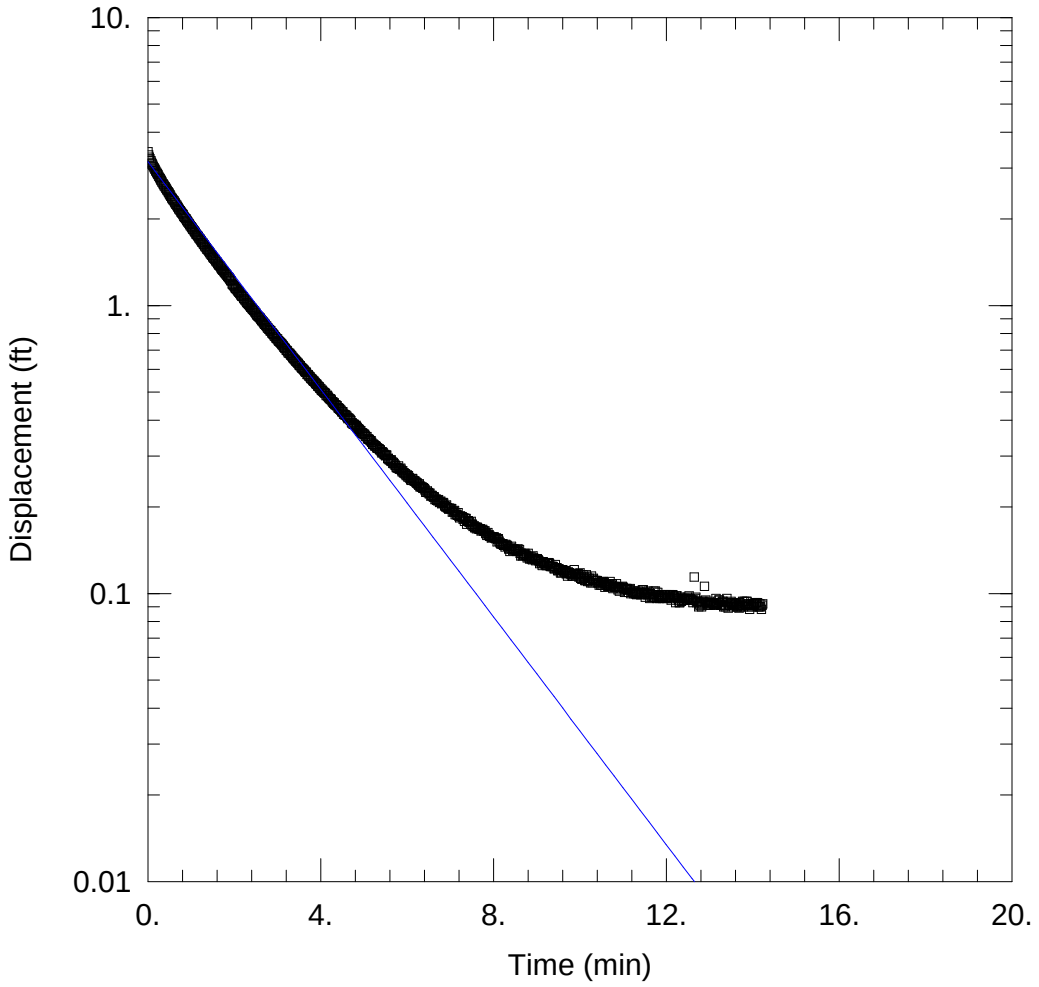
WELL DATA (STN-35a)

Initial Displacement: 0.414 ft
Total Well Penetration Depth: 11.18 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 11.18 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.004239 cm/sec
y0 = 0.672 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-36.aqt
Date: 11/20/09 Time: 10:34:47

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-36
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 27.3 ft Anisotropy Ratio (Kz/Kr): 1.

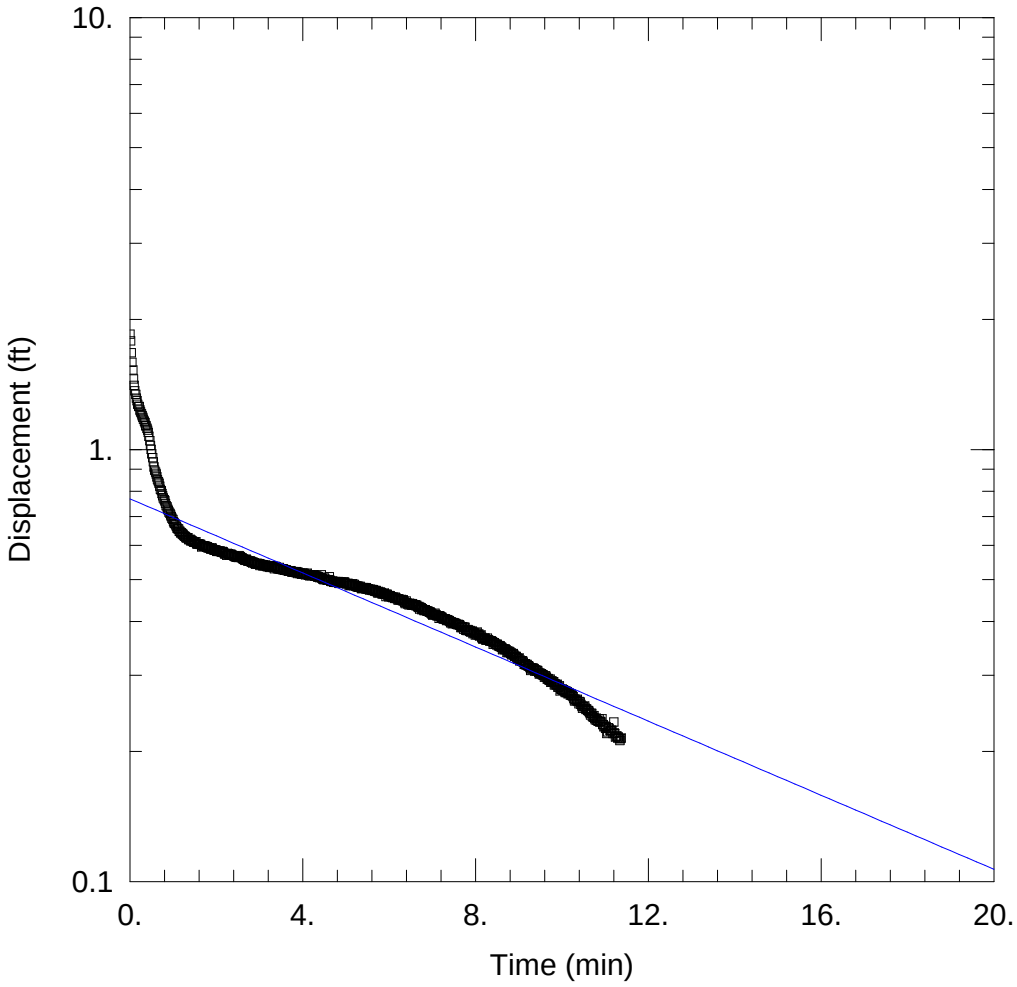
WELL DATA (STN-36)

Initial Displacement: 3.417 ft
Total Well Penetration Depth: 26.6 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 26.6 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0001631 cm/sec
y0 = 3.154 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-39.aqt
Date: 11/20/09 Time: 10:39:12

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-39
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 3.05 ft Anisotropy Ratio (Kz/Kr): 1.

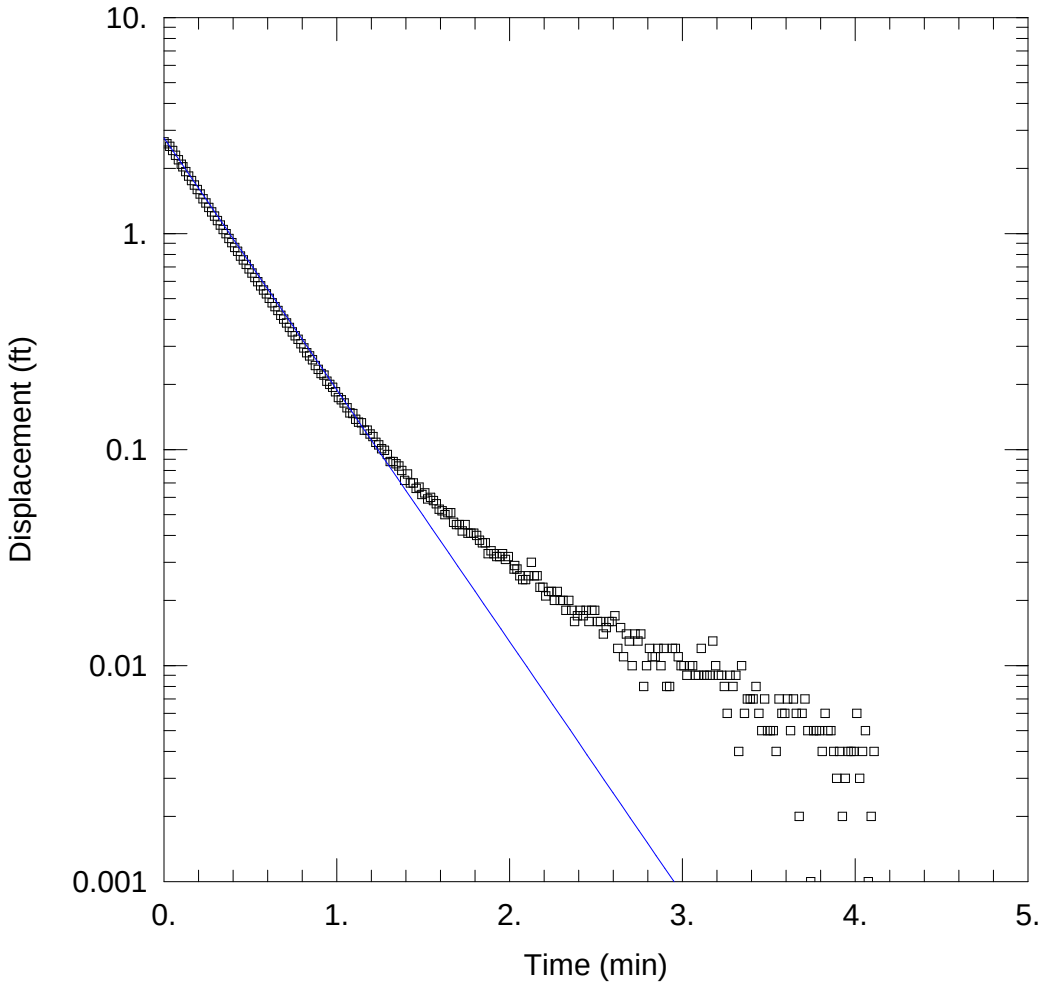
WELL DATA (STN-39)

Initial Displacement: 1.849 ft Static Water Column Height: 2.75 ft
Total Well Penetration Depth: 5. ft Screen Length: 5. ft
Casing Radius: 0.0417 ft Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 4.816E-5 cm/sec y0 = 0.7688 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-40.aqt
Date: 11/20/09 Time: 10:44:17

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-40
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 26.87 ft Anisotropy Ratio (Kz/Kr): 1.

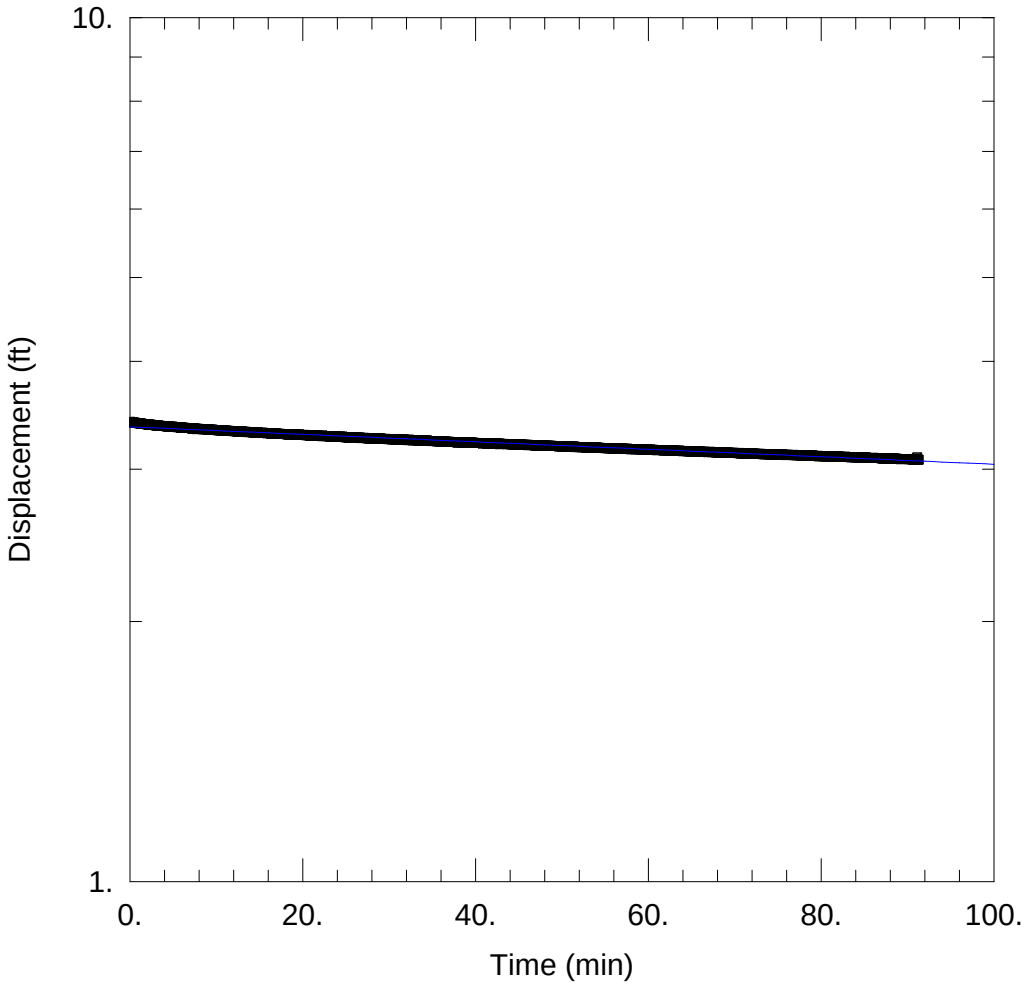
WELL DATA (STN-40)

Initial Displacement: 2.656 ft
Total Well Penetration Depth: 12.57 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 12.57 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0008121 cm/sec
y0 = 2.771 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-41.aqt
Date: 11/20/09 Time: 10:50:45

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-41
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 30.7 ft Anisotropy Ratio (Kz/Kr): 1.

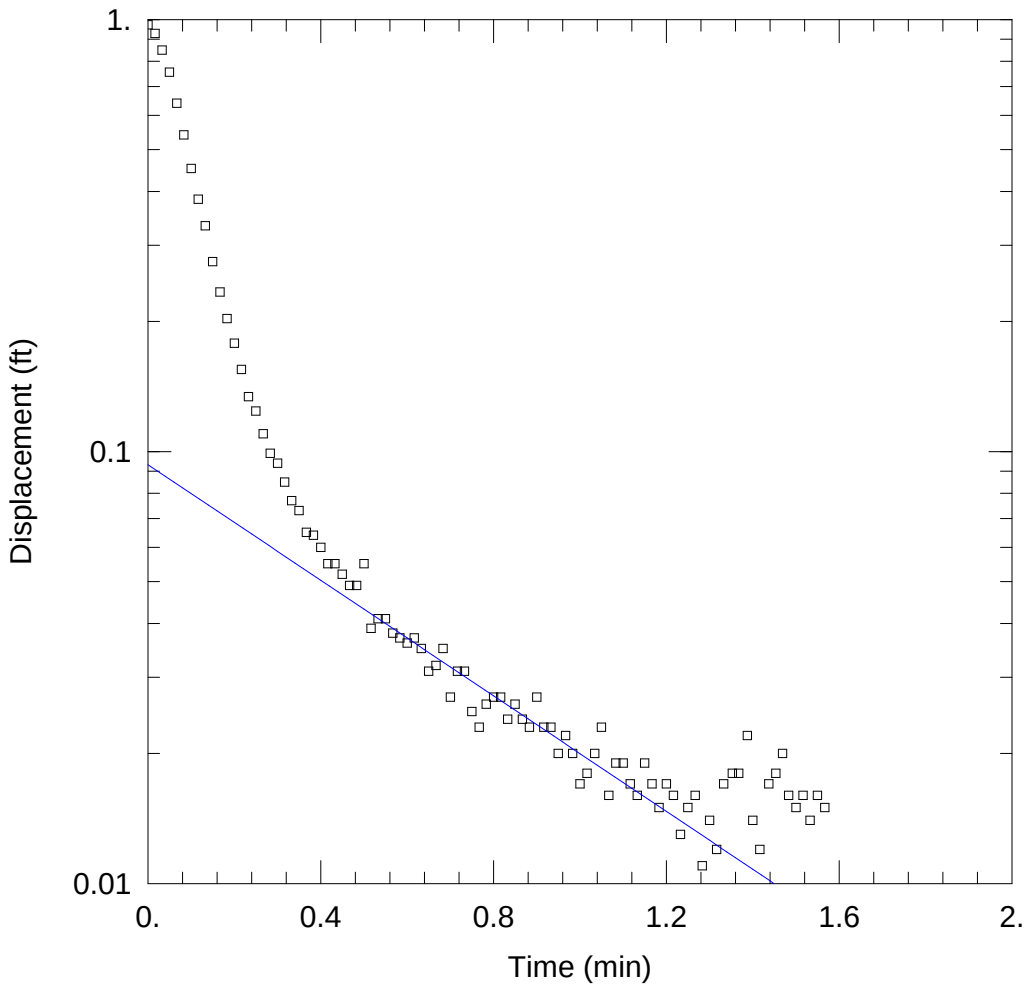
WELL DATA (STN-41)

Initial Displacement: 3.407 ft
Total Well Penetration Depth: 27.7 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 27.7 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 3.444E-7 cm/sec
y0 = 3.359 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-41a.aqt
Date: 11/20/09 Time: 11:39:05

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-41a
Test Date: 11/6/09

AQUIFER DATA

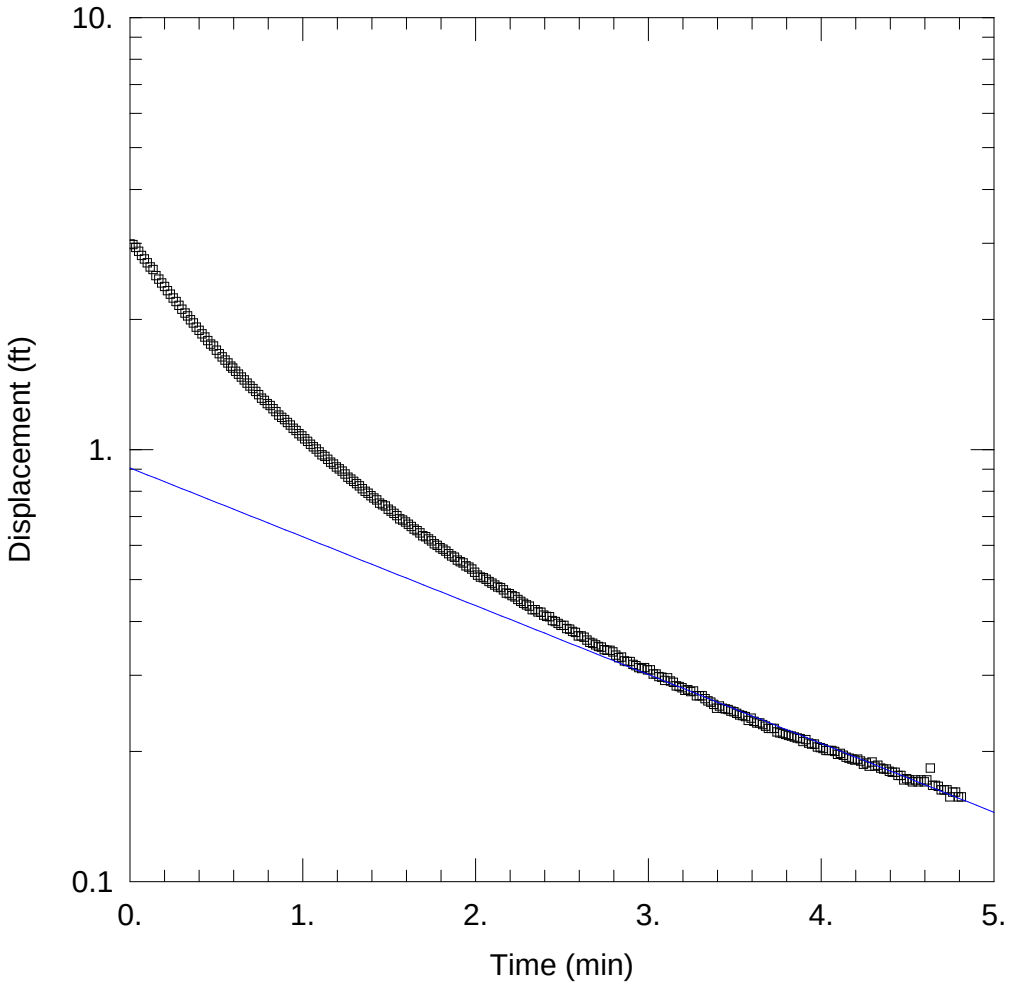
Saturated Thickness: 18.3 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (STN-41a)

Initial Displacement: 0.972 ft
Total Well Penetration Depth: 17.9 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 17.9 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0005353 cm/sec
y0 = 0.09322 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-44.aqt
Date: 11/20/09 Time: 11:43:33

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-44
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 11.28 ft Anisotropy Ratio (Kz/Kr): 1.

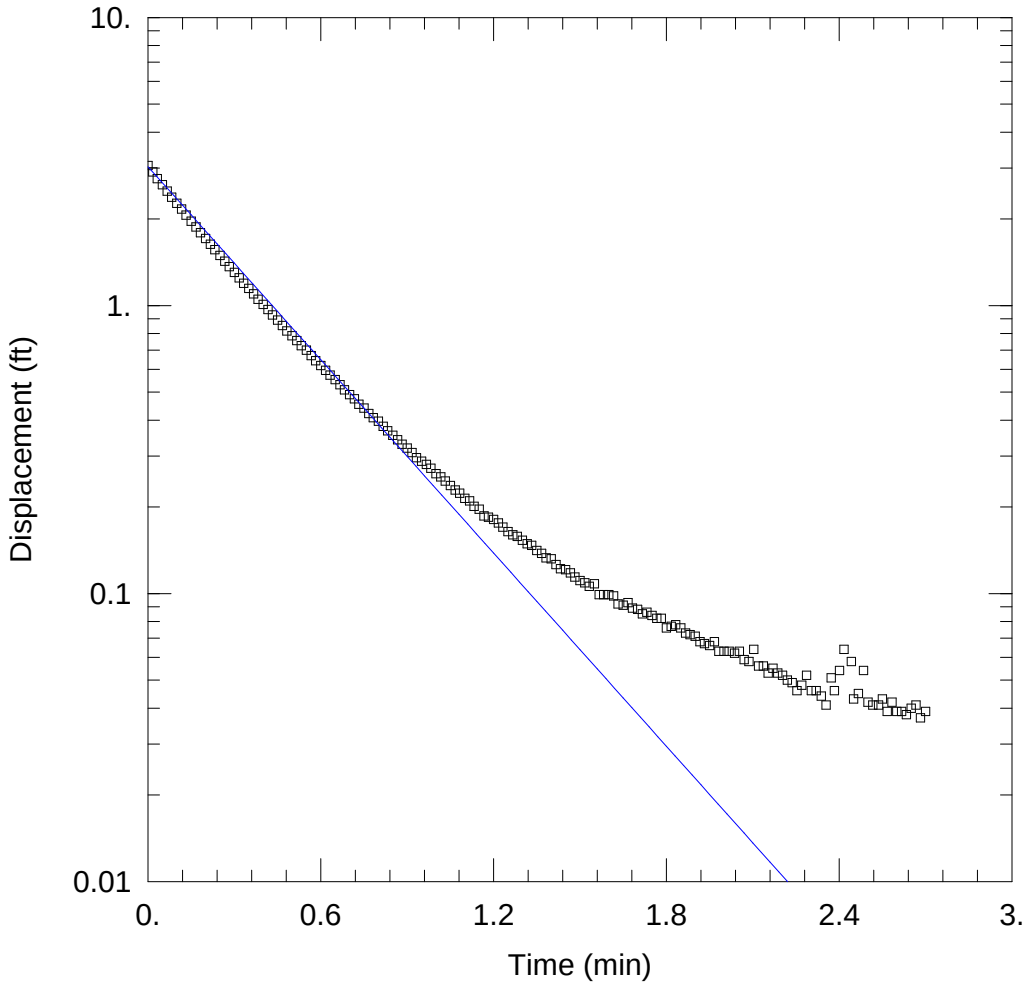
WELL DATA (STN-44)

Initial Displacement: 2.99 ft
Total Well Penetration Depth: 8.28 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 8.28 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0001091 cm/sec
y0 = 0.9064 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-45.aqt
Date: 11/20/09 Time: 12:50:11

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-45
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 22.19 ft Anisotropy Ratio (Kz/Kr): 1.

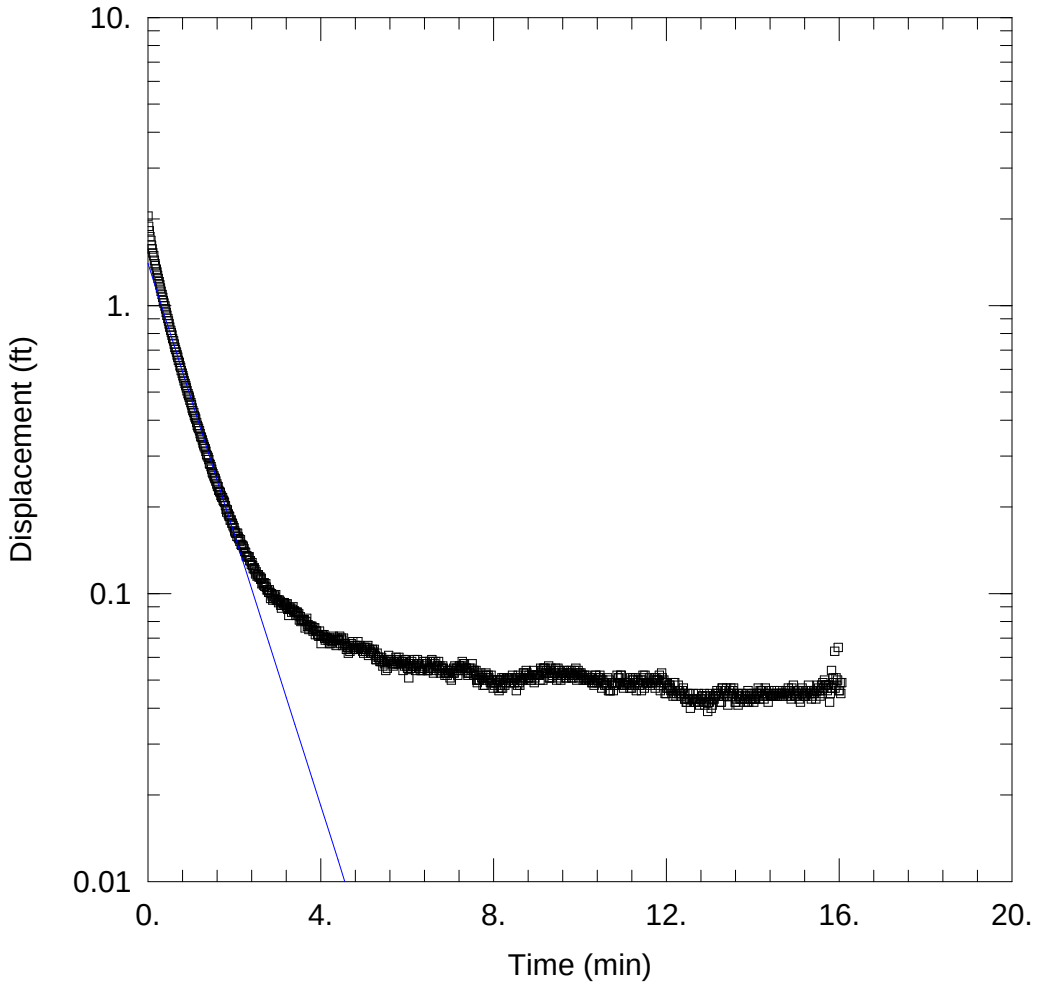
WELL DATA (STN-45)

Initial Displacement: 3.061 ft
Total Well Penetration Depth: 15.29 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 15.29 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0008124 cm/sec
y0 = 3.035 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-46.aqt
Date: 11/20/09 Time: 12:54:33

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-46
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 15.18 ft Anisotropy Ratio (Kz/Kr): 1.

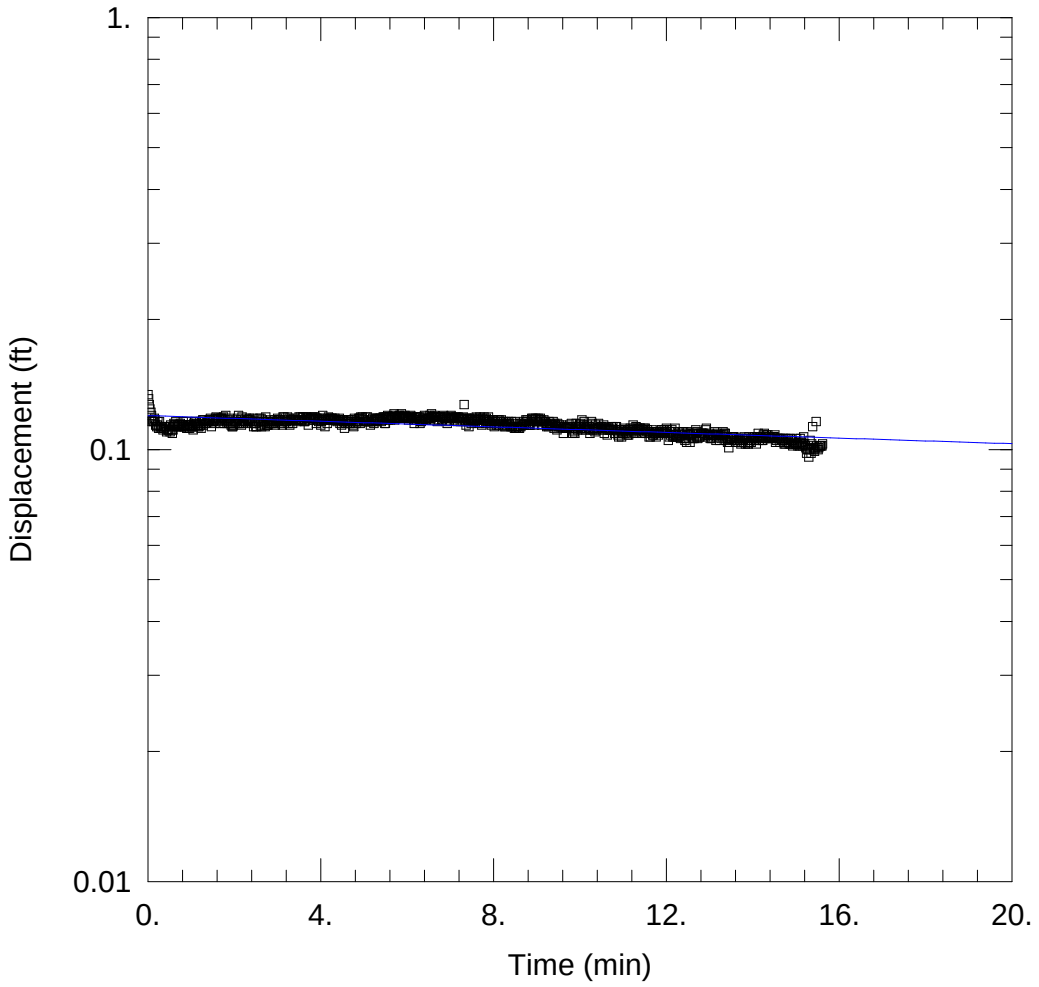
WELL DATA (STN-46)

Initial Displacement: 2.044 ft
Total Well Penetration Depth: 5. ft
Casing Radius: 0.0417 ft
Static Water Column Height: 1.18 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0002907 cm/sec
y0 = 1.399 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-47.aqt
Date: 11/20/09 Time: 12:59:01

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-47
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 25.47 ft Anisotropy Ratio (Kz/Kr): 1.

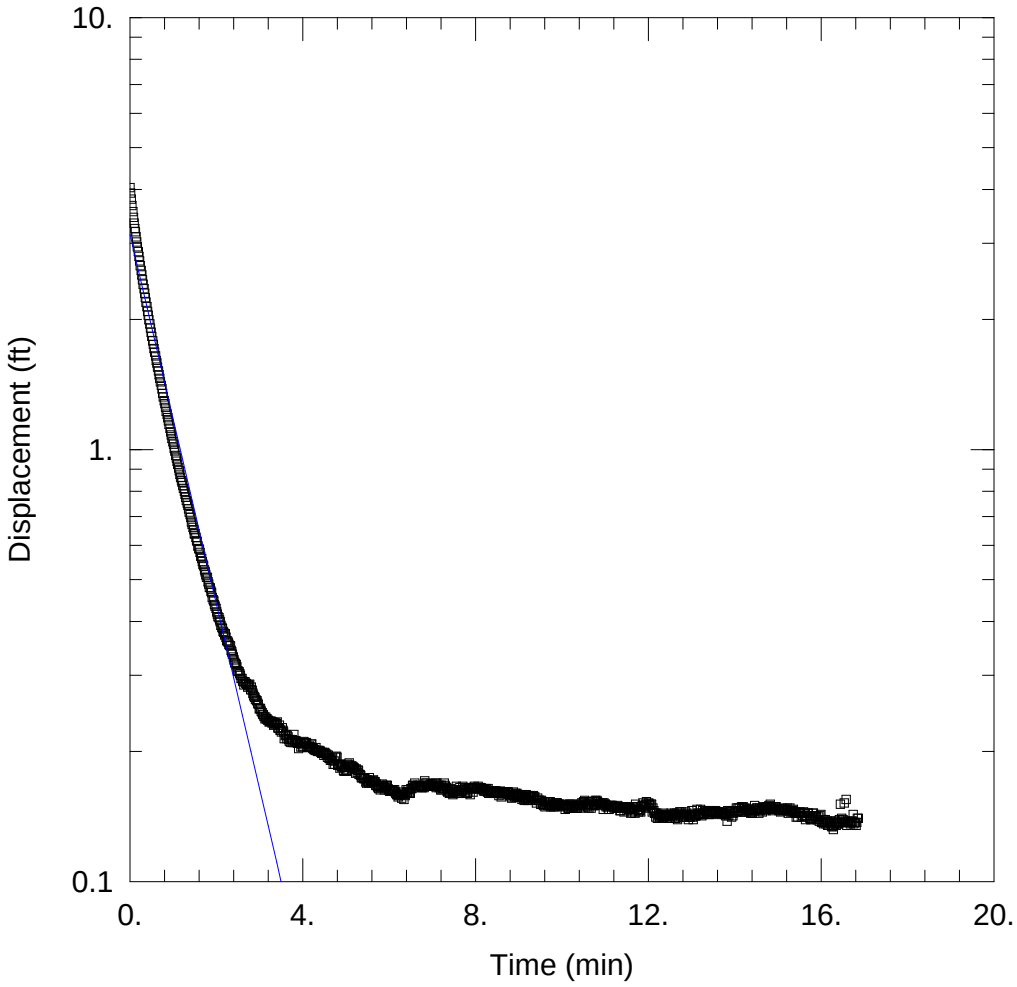
WELL DATA (STN-47)

Initial Displacement: 0.134 ft Static Water Column Height: 1.97 ft
Total Well Penetration Depth: 5. ft Screen Length: 5. ft
Casing Radius: 0.0417 ft Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 1.983E-6 cm/sec y0 = 0.1198 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-48.aqt
Date: 11/20/09 Time: 13:03:19

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-48
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 28.33 ft Anisotropy Ratio (Kz/Kr): 1.

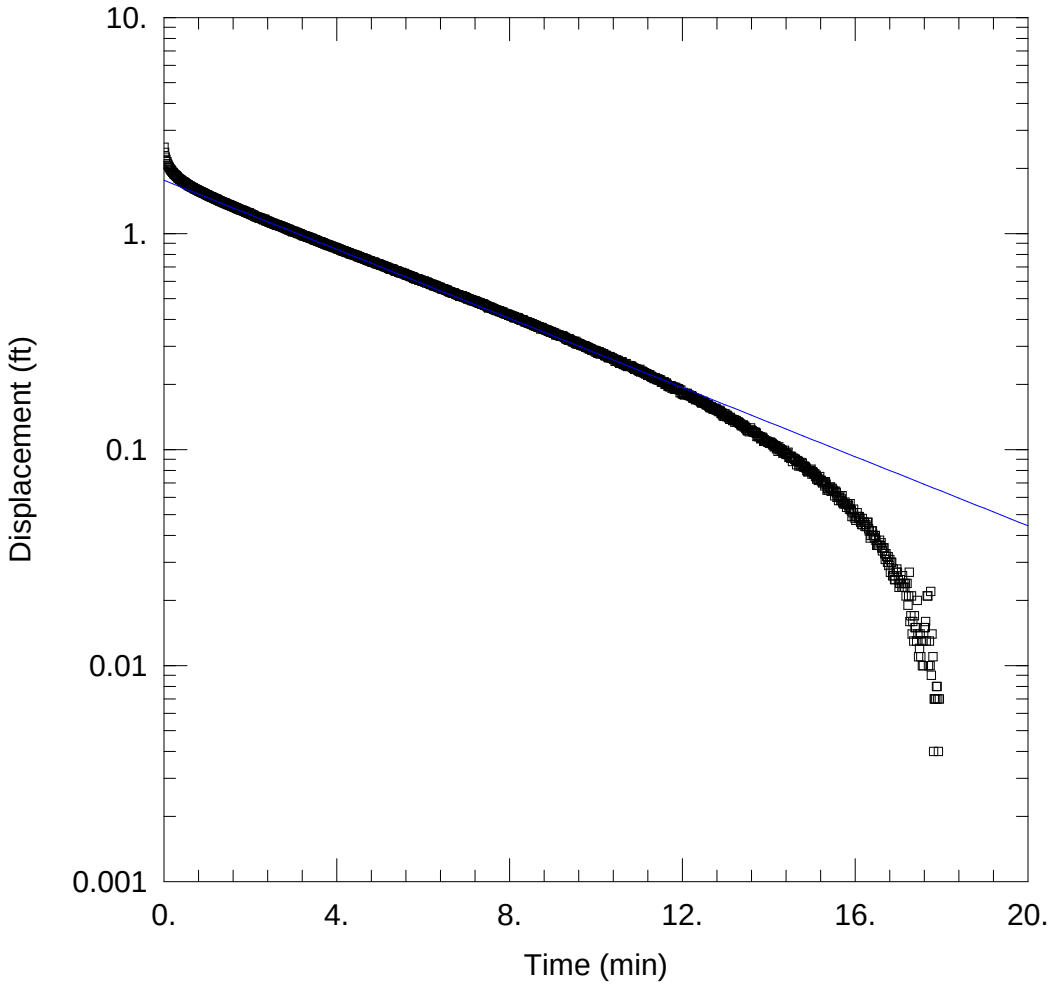
WELL DATA (STN-48)

Initial Displacement: 4.037 ft
Total Well Penetration Depth: 8.83 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 8.83 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0002836 cm/sec
y0 = 3.148 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-49a.aqt
Date: 11/20/09 Time: 14:15:57

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-49a
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 24.2 ft Anisotropy Ratio (Kz/Kr): 1.

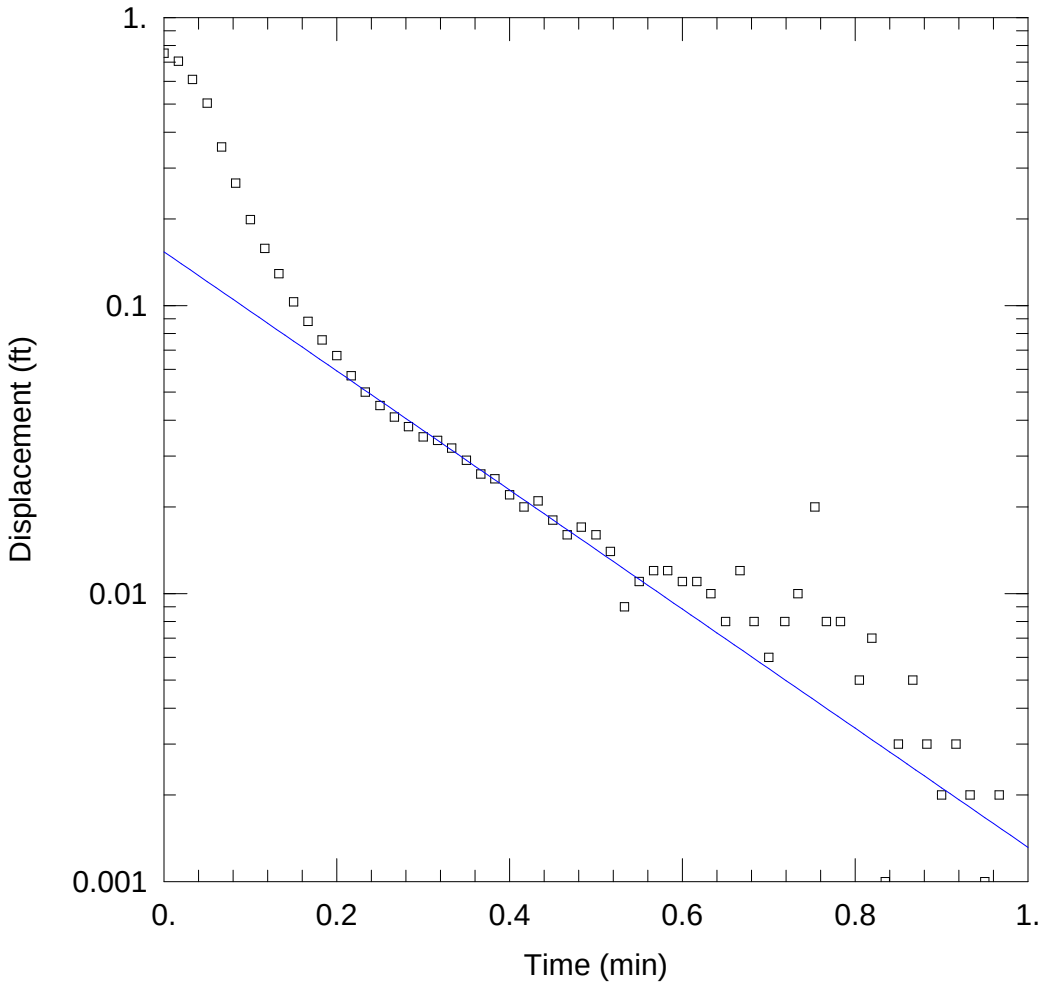
WELL DATA (STN-49a)

Initial Displacement: 2.509 ft
Total Well Penetration Depth: 7.3 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 7.3 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 5.162E-5 cm/sec
y0 = 1.763 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-51.aqt
Date: 11/20/09 Time: 14:08:17

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-51
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 44.5 ft Anisotropy Ratio (Kz/Kr): 1.

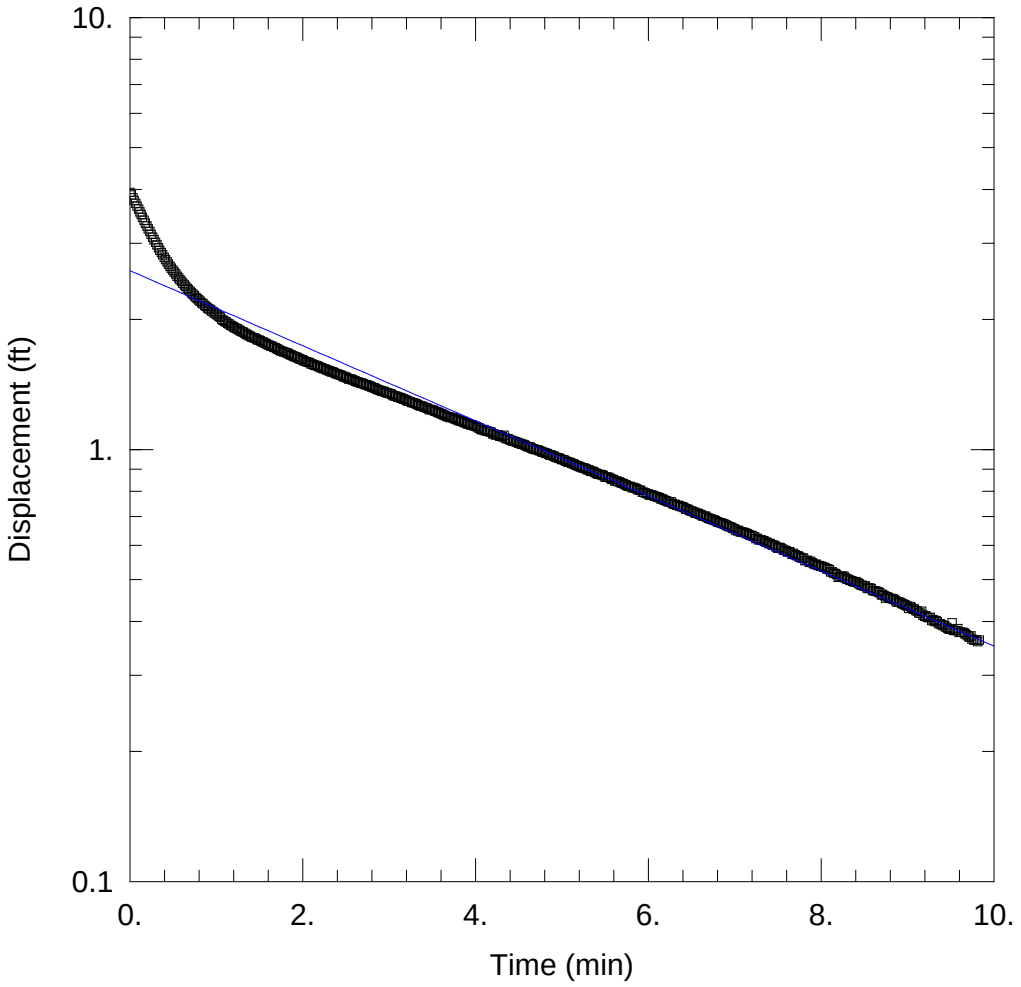
WELL DATA (STN-51)

Initial Displacement: 0.751 ft
Total Well Penetration Depth: 44.5 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 44.5 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.001973 cm/sec
y0 = 0.1537 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-51a.aqt
Date: 11/20/09 Time: 14:44:17

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-51a
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 22.7 ft Anisotropy Ratio (Kz/Kr): 1.

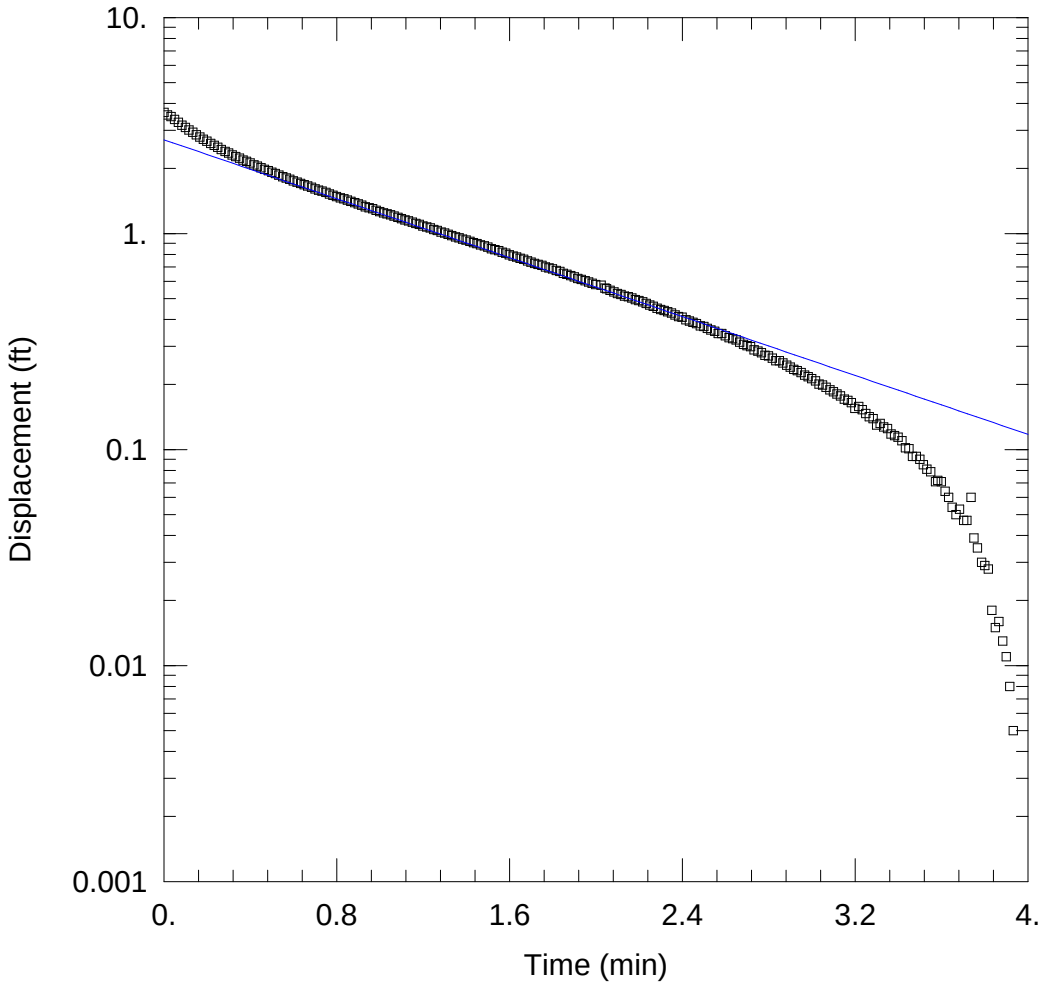
WELL DATA (STN-51a)

Initial Displacement: 3.934 ft Static Water Column Height: 2.2 ft
Total Well Penetration Depth: 5. ft Screen Length: 5. ft
Casing Radius: 0.0417 ft Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 5.306E-5 cm/sec y0 = 2.593 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-55.aqt
Date: 11/20/09 Time: 14:48:28

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-55
Test Date: 11/6/09

AQUIFER DATA

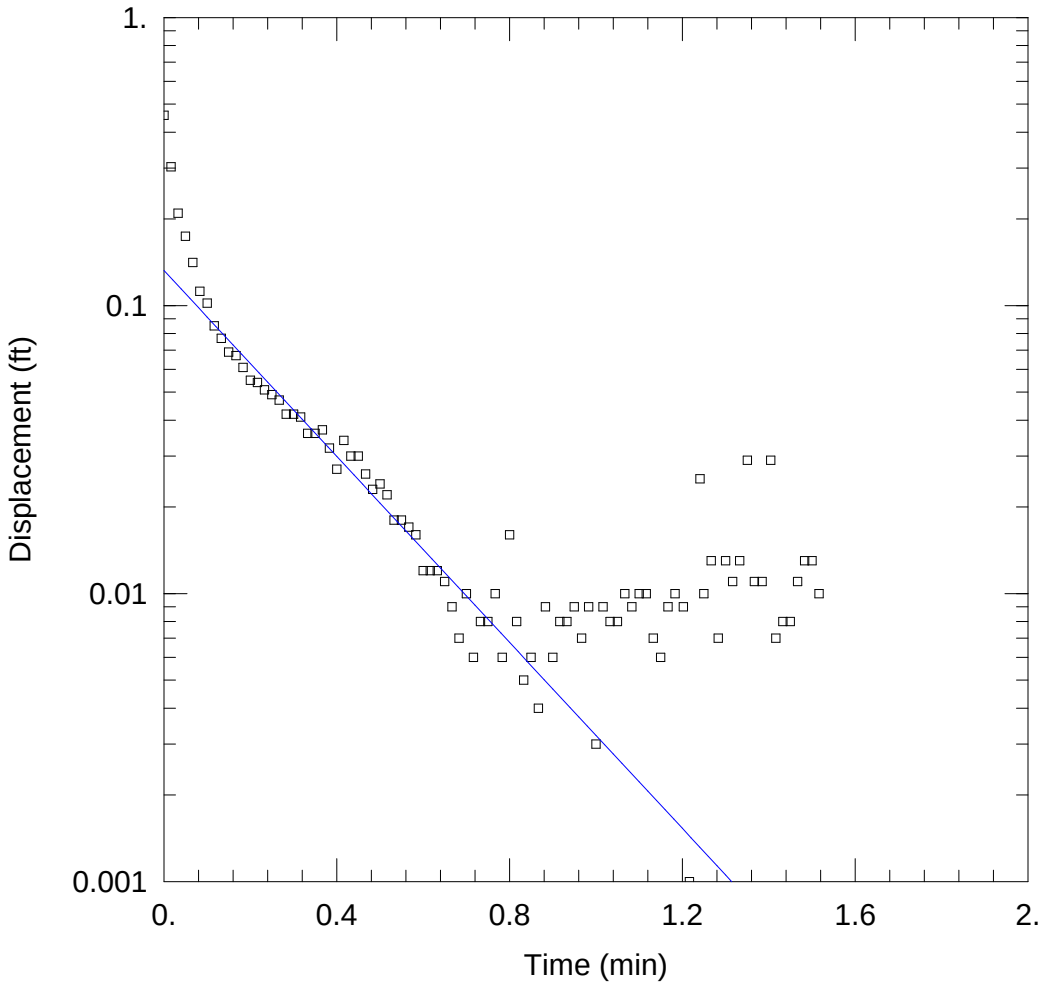
Saturated Thickness: 32.96 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (STN-55)

Initial Displacement: 3.633 ft
Total Well Penetration Depth: 27.16 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 27.16 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0002658 cm/sec
y0 = 2.715 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-55a.aqt
Date: 11/20/09 Time: 14:55:55

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-55a
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 13.13 ft Anisotropy Ratio (Kz/Kr): 1.

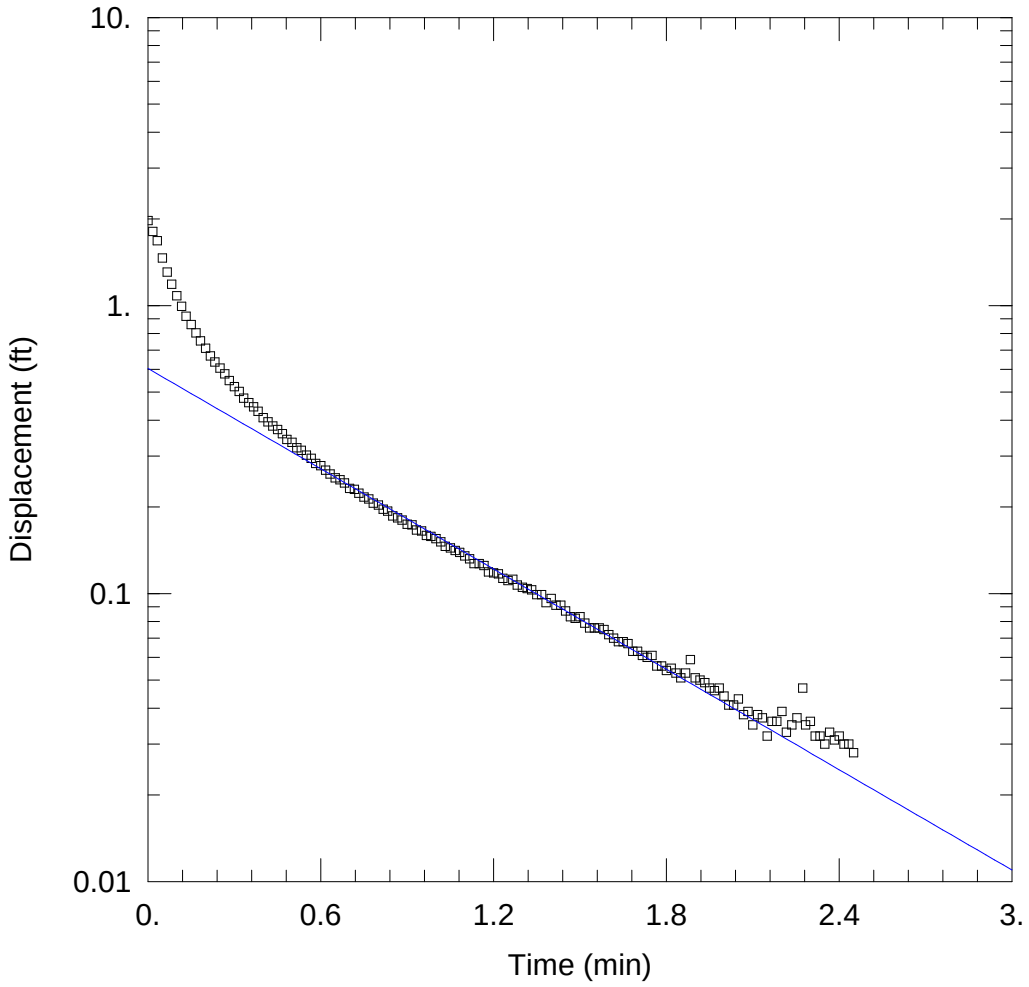
WELL DATA (STN-55a)

Initial Displacement: 0.458 ft
Total Well Penetration Depth: 13.13 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 13.13 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.001318 cm/sec
y0 = 0.1322 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-56.aqt
Date: 11/20/09 Time: 14:59:38

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-56
Test Date: 11/6/09

AQUIFER DATA

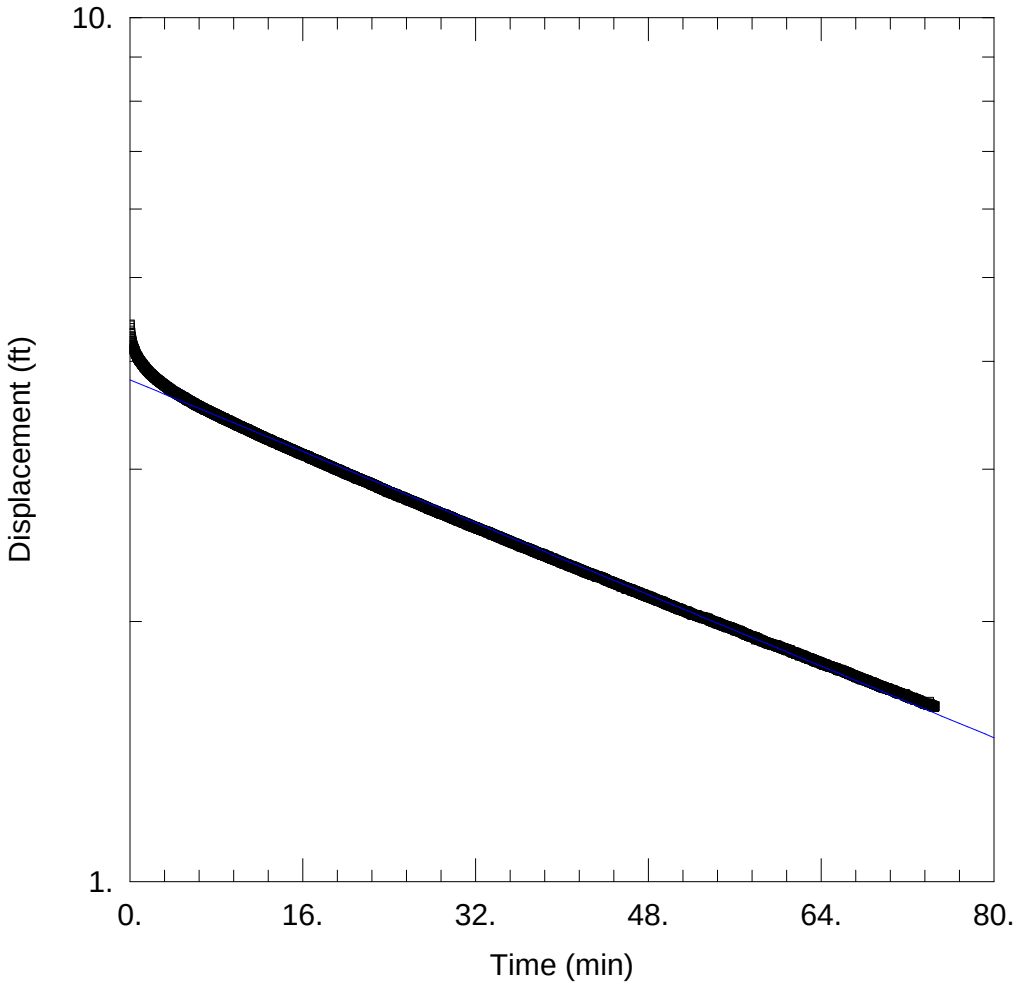
Saturated Thickness: 30.24 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (STN-56)

Initial Displacement: 1.971 ft
Total Well Penetration Depth: 30.04 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 30.04 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0005048 cm/sec
y0 = 0.6045 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-62.aqt
Date: 11/20/09 Time: 15:11:48

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-62
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 31.31 ft Anisotropy Ratio (Kz/Kr): 1.

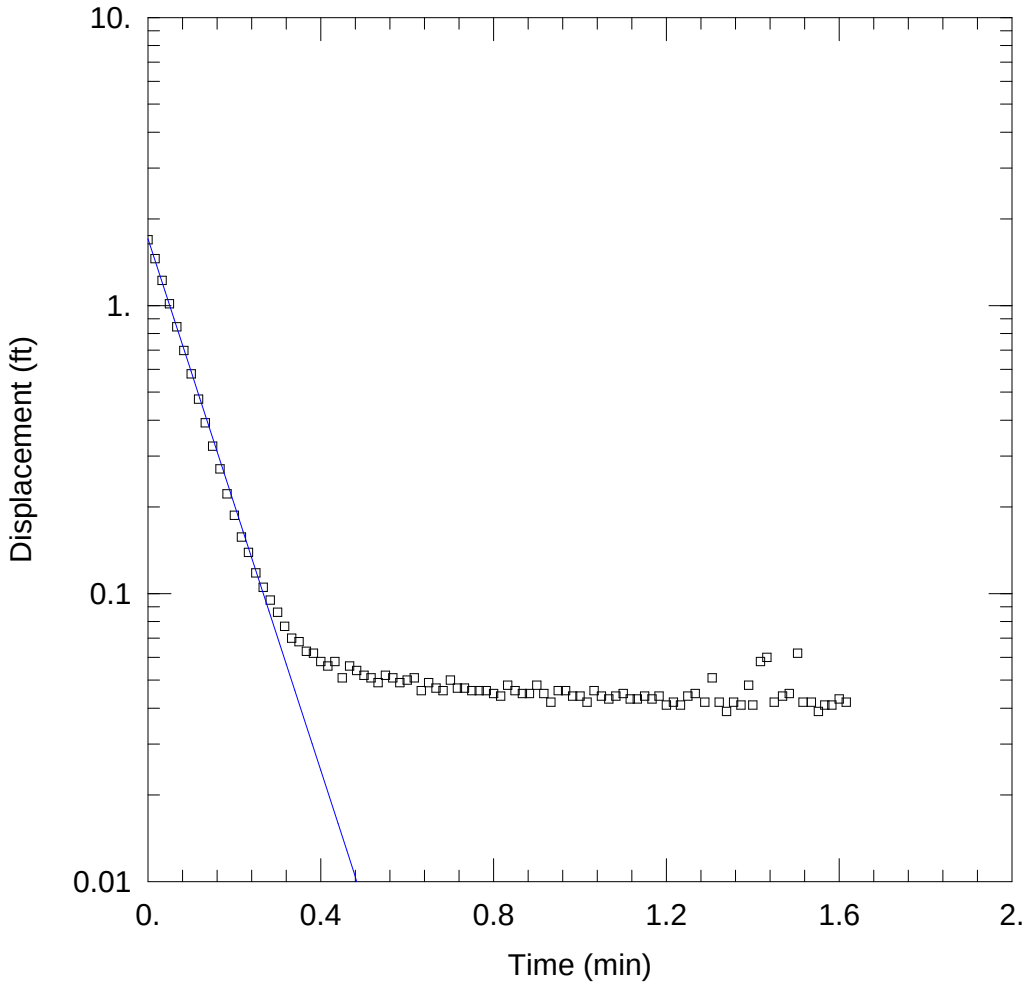
WELL DATA (STN-62)

Initial Displacement: 4.417 ft
Total Well Penetration Depth: 31.13 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 31.31 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 4.535E-6 cm/sec
y0 = 3.807 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-62a.aqt
Date: 11/20/09 Time: 15:09:55

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-62a
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 12.91 ft Anisotropy Ratio (Kz/Kr): 1.

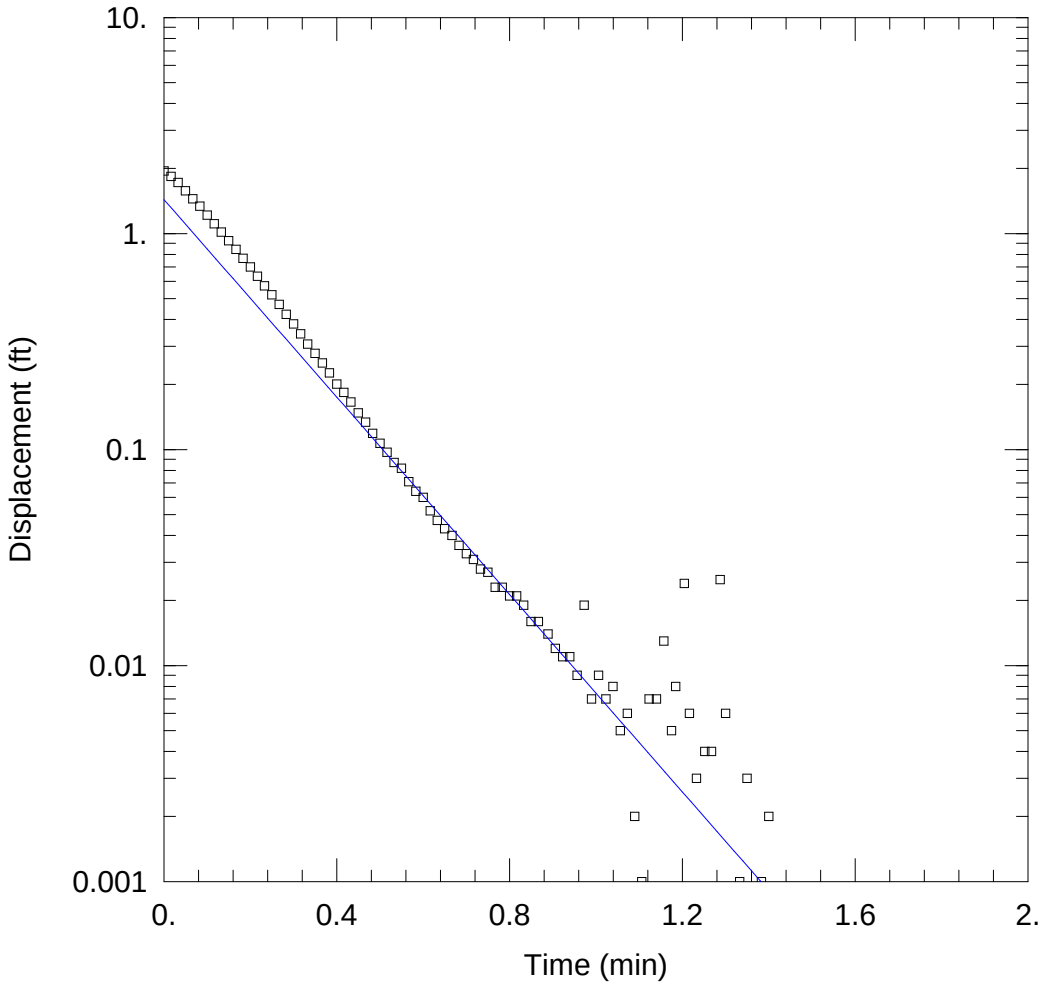
WELL DATA (STN-62a)

Initial Displacement: 1.69 ft
Total Well Penetration Depth: 12.91 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 12.91 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.003759 cm/sec
y0 = 1.704 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-63.aqt
Date: 11/23/09 Time: 08:44:01

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-63
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 34.85 ft Anisotropy Ratio (Kz/Kr): 1.

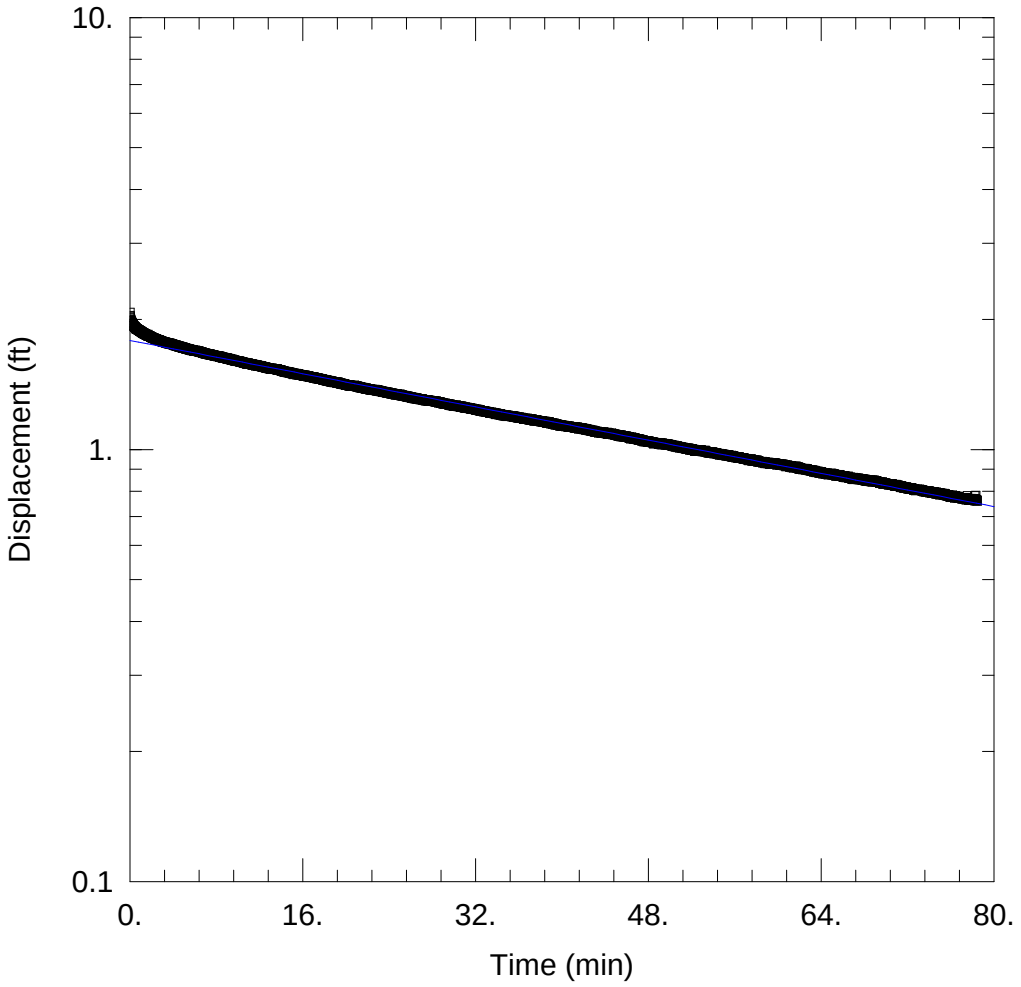
WELL DATA (STN-63)

Initial Displacement: 1.945 ft
Total Well Penetration Depth: 34.85 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 34.85 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.002119 cm/sec
y0 = 1.435 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-65.aqt
Date: 11/23/09 Time: 08:47:54

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-65
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 32.6 ft Anisotropy Ratio (Kz/Kr): 1.

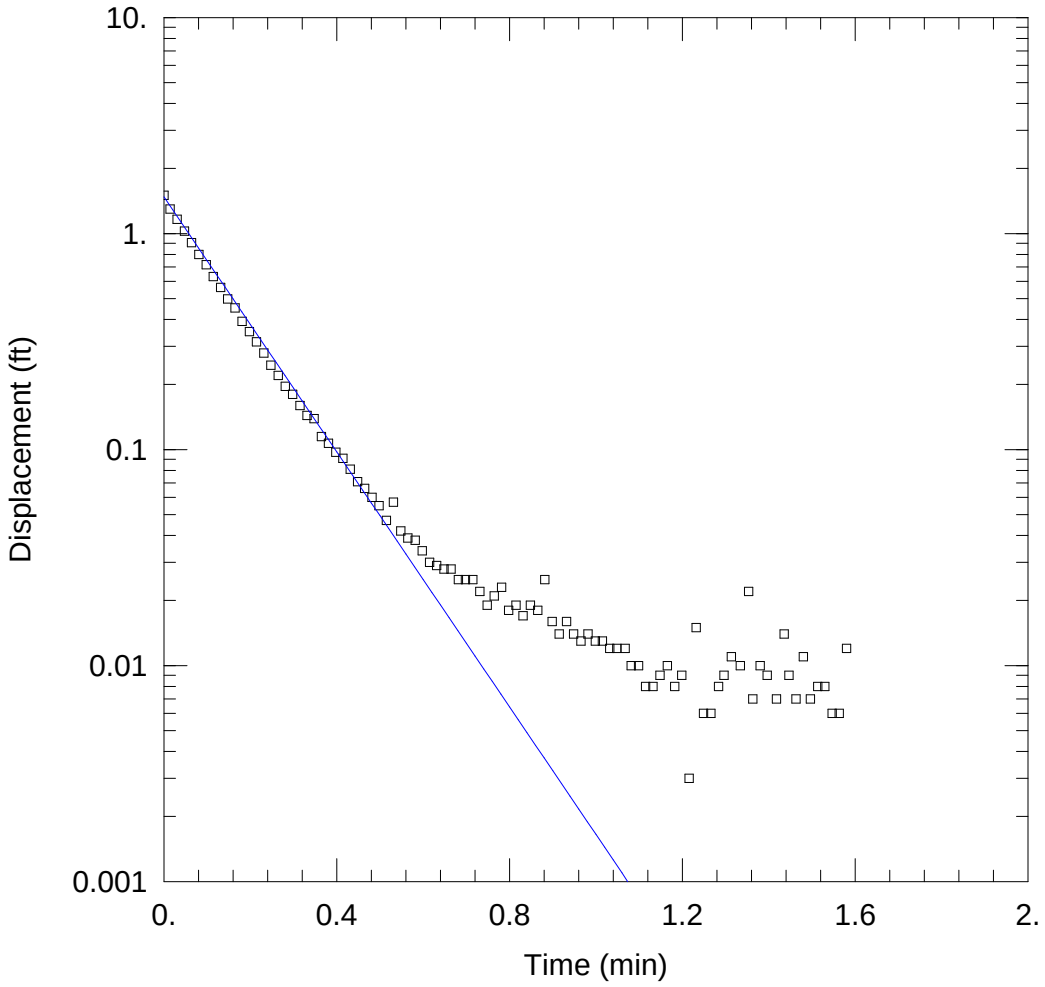
WELL DATA (STN-65)

Initial Displacement: 2.078 ft
Total Well Penetration Depth: 32.6 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 32.6 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 4.418E-6 cm/sec
y0 = 1.788 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-65a.aqt
Date: 11/23/09 Time: 08:52:28

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-65a
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 15.42 ft Anisotropy Ratio (Kz/Kr): 1.

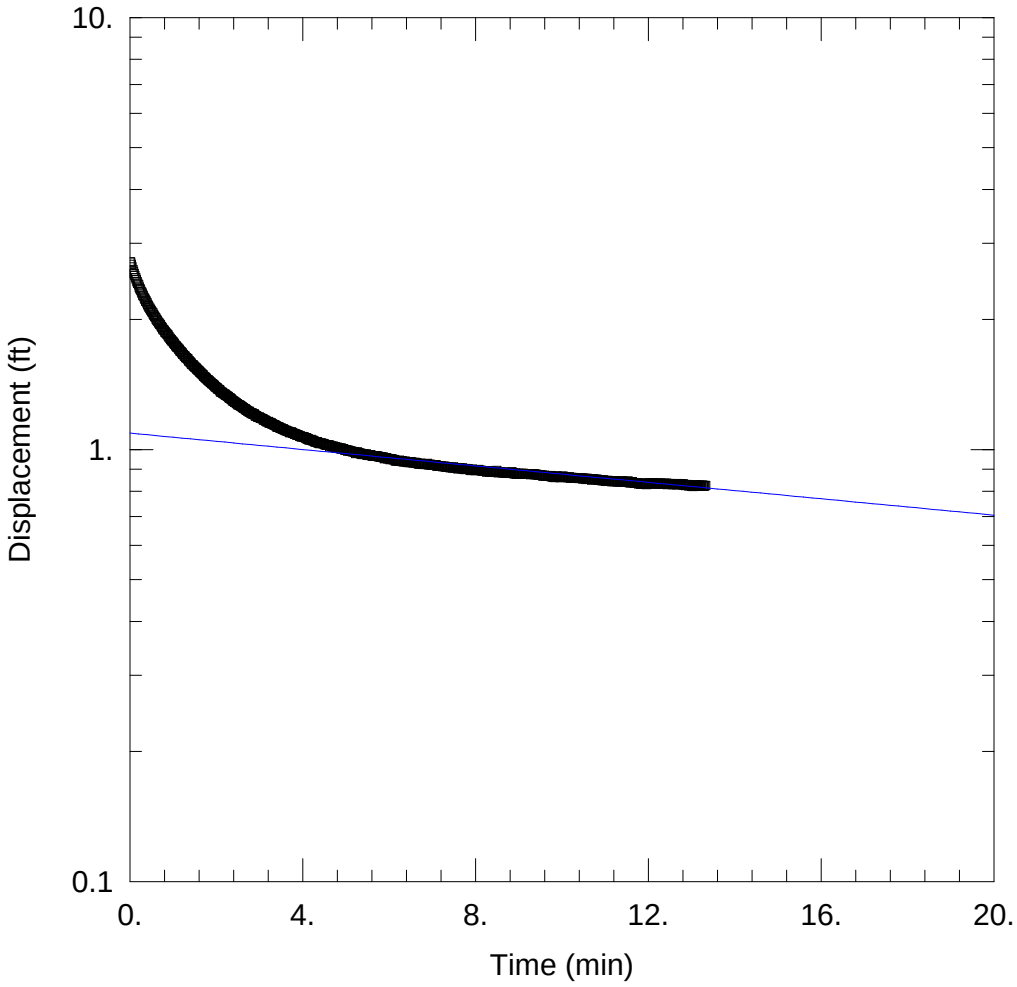
WELL DATA (STN-65a)

Initial Displacement: 1.502 ft
Total Well Penetration Depth: 15.22 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 15.22 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.002358 cm/sec
y0 = 1.475 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-66.aqt
Date: 11/23/09 Time: 09:19:08

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-66
Test Date: 11/6/09

AQUIFER DATA

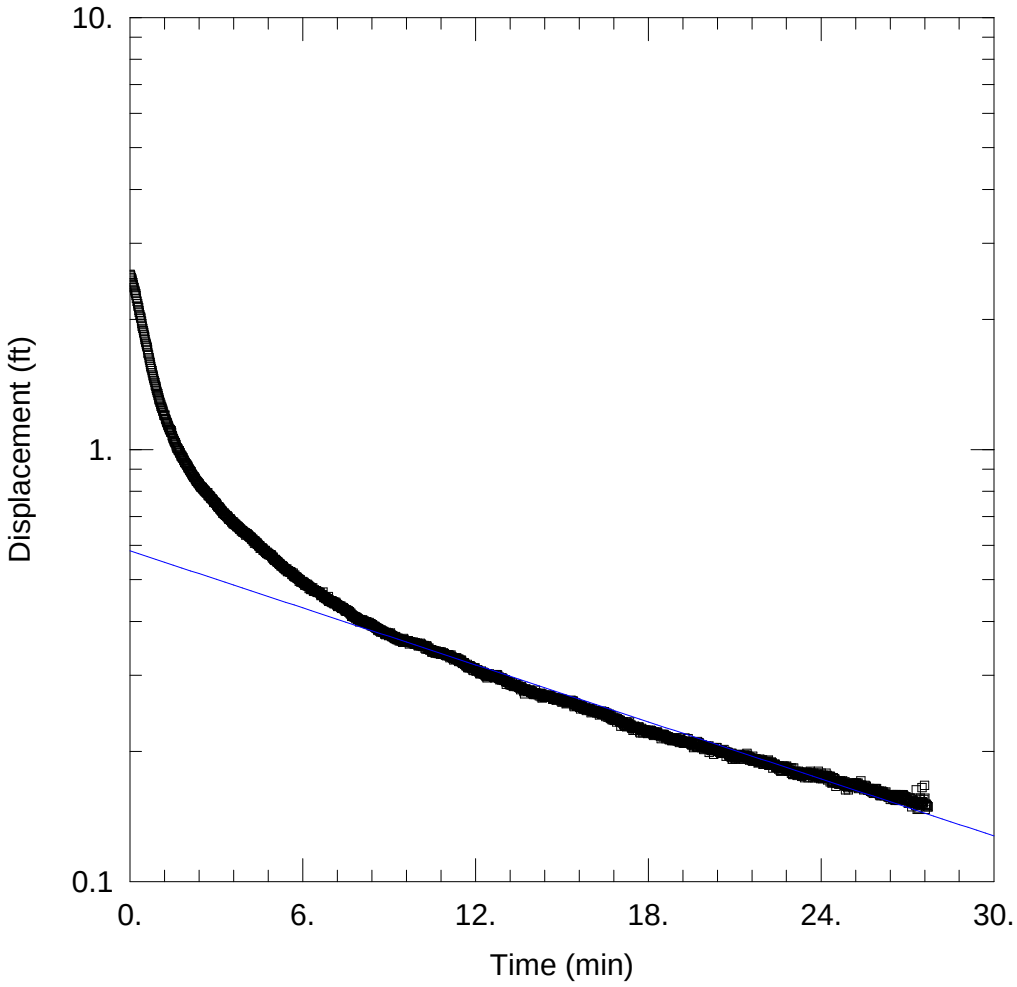
Saturated Thickness: 26.17 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (STN-66)

Initial Displacement: 2.718 ft
Total Well Penetration Depth: 26.17 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 26.17 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 8.5E-6 cm/sec
y0 = 1.091 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-67.aqt
Date: 11/23/09 Time: 09:24:25

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-67
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 5.59 ft Anisotropy Ratio (Kz/Kr): 1.

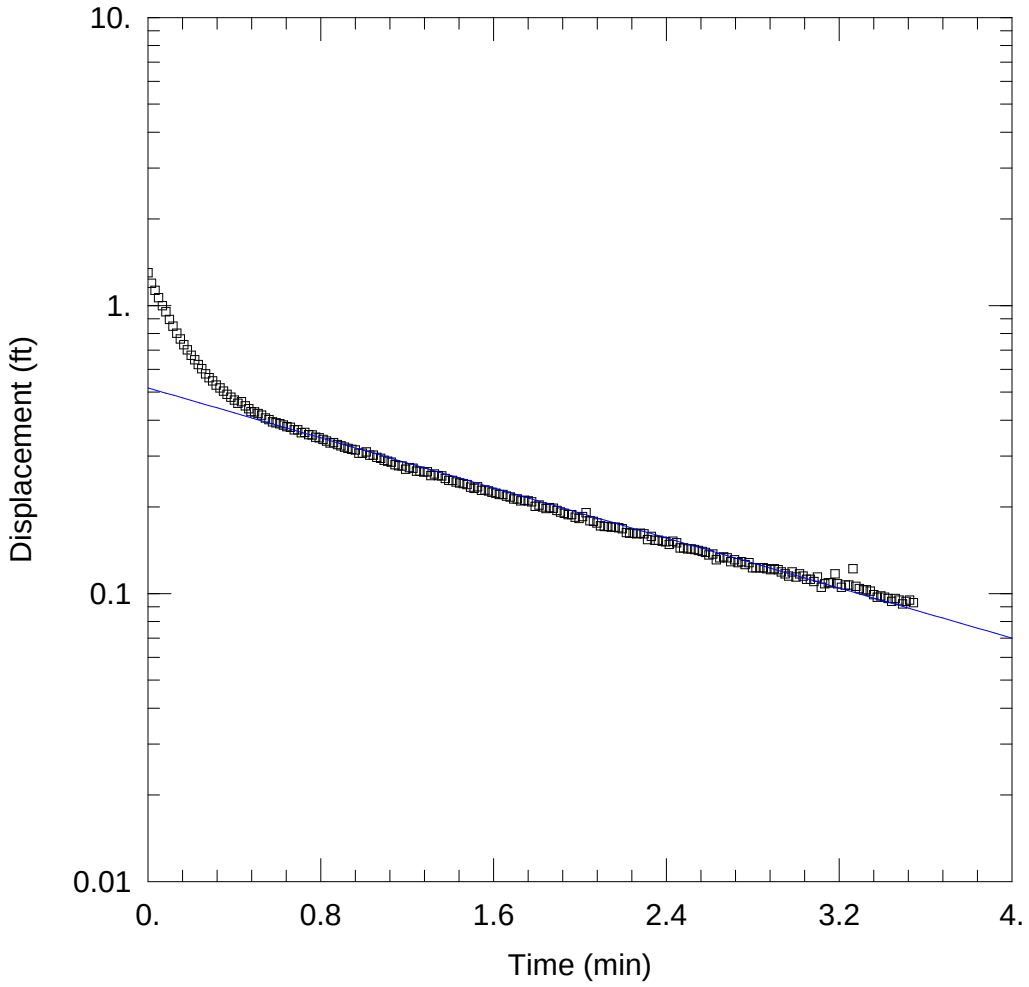
WELL DATA (STN-67)

Initial Displacement: 2.543 ft
Total Well Penetration Depth: 5.59 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 5.59 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 1.571E-5 cm/sec
y0 = 0.5827 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-68.aqt
Date: 11/23/09 Time: 09:28:23

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-68
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 25.81 ft Anisotropy Ratio (Kz/Kr): 1.

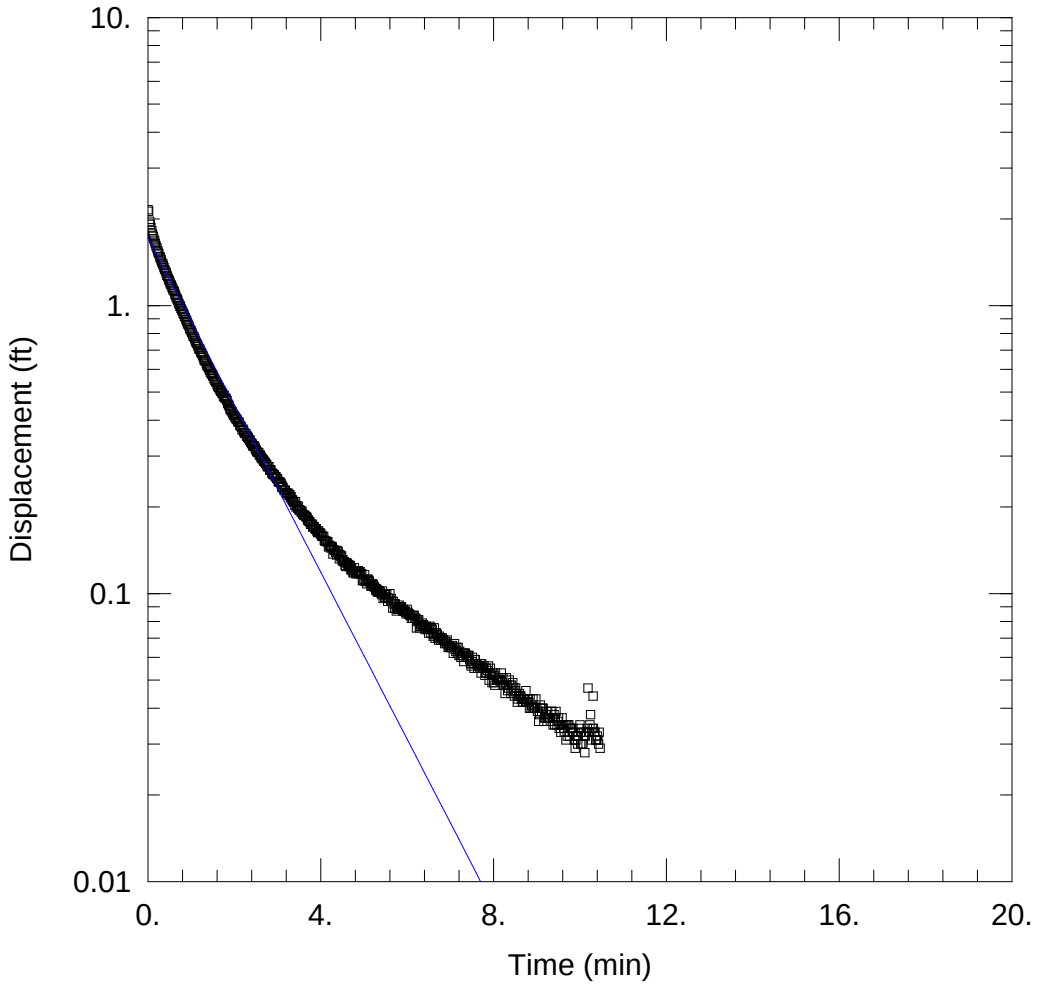
WELL DATA (STN-68)

Initial Displacement: 1.301 ft
Total Well Penetration Depth: 25.81 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 25.81 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0001942 cm/sec
y0 = 0.5176 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-88a.aqt
Date: 11/23/09 Time: 09:34:21

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-88a
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 18.26 ft Anisotropy Ratio (Kz/Kr): 1.

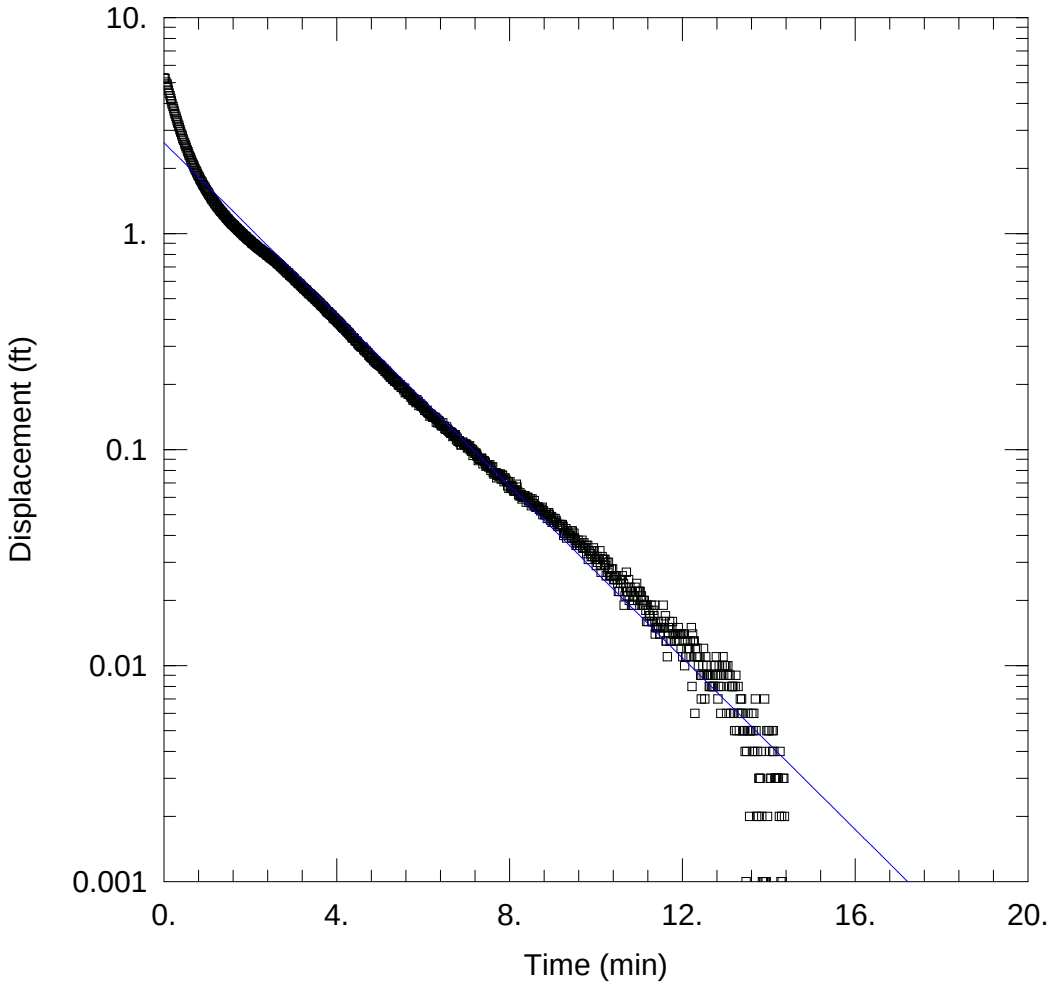
WELL DATA (STN-88a)

Initial Displacement: 2.152 ft
Total Well Penetration Depth: 6.26 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 6.26 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0001846 cm/sec
y0 = 1.714 ft



BULL RUN FOSSIL PLANT

Data Set: Z:\172679015\Slug Test\AQTESOLV Files\STN-89.aqt
Date: 11/23/09 Time: 09:38:23

PROJECT INFORMATION

Company: Stantec
Client: TVA
Project: 172679015
Location: Bull Run
Test Well: STN-89
Test Date: 11/6/09

AQUIFER DATA

Saturated Thickness: 13.03 ft Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (STN-89)

Initial Displacement: 5.249 ft
Total Well Penetration Depth: 12.03 ft
Casing Radius: 0.0417 ft
Static Water Column Height: 12.03 ft
Screen Length: 5. ft
Well Radius: 0.0417 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0001472 cm/sec
y0 = 2.632 ft

Appendix F

Laboratory Testing Results

- Attachment 1 – Natural Moisture Content Tests
- Attachment 2 – Soil Classification Tests
- Attachment 3 – Unit Weight (Density) Tests
- Attachment 4 – Permeability Tests
- Attachment 5 – Consolidated Undrained (CU) Tests
- Attachment 6 – Unconsolidated Undrained (UU) Tests
- Attachment 7 – Unconfined Compressive (UC) Tests
- Attachment 8 – Direct Simple Shear (DSS) Tests

Attachment 1

Natural Moisture Content Tests

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-1, 0.0'-1.5'	60°C	1218	10/19/09	Hom	3/8"			No	43.55	210.69	200.53	6.5
STN-1, 1.5'-3.0'	60°C	1219	10/19/09	Hom	3/8"			No	40.84	158.46	142.89	15.3
STN-1, 3.0'-4.5'	60°C	1220	10/19/09	Hom	3/8"			No	44.39	219.79	201.20	11.9
STN-1, 4.5'-6.0'	60°C	1221	10/19/09	Hom	3/8"			No	43.82	163.30	141.73	22.0
STN-1, 6.0'-7.5'	60°C	1223	10/19/09	Hom	No. 4			Yes	43.22	209.54	170.44	30.7
STN-1, 7.5'-9.0'	60°C	1224	10/19/09	Hom	3/4"			No	44.76	216.26	188.55	19.3
STN-1, 9.0'-10.5'	60°C	1225	10/19/09	Hom	3/8"			No	45.18	196.60	171.28	20.1
STN-1, 10.5'-12.0'	60°C	1226	10/19/09	Hom	No. 4			No	39.93	148.32	127.87	23.3
STN-1, 12.0'-13.5'	60°C	1227	10/19/09	Hom	3/8"			No	44.18	176.75	154.62	20.0
STN-1, 13.5'-15.0'	60°C	1228	10/19/09	Hom	No. 10			Yes	48.75	183.62	156.39	25.3
STN-1, 15.0'-16.5'	60°C	1229	10/19/09	Hom	No. 4			Yes	43.65	180.34	161.32	16.2
STN-1, 16.5'-18.0'	60°C	1230	10/19/09	Hom	No. 4			No	39.40	148.06	128.83	21.5
STN-1, 18.0'-19.5'	60°C	1231	10/19/09	Hom	No. 10			Yes	47.62	197.72	162.26	30.9
STN-1, 19.5'-21.0'	60°C	1232	10/19/09	Hom	No. 10			Yes	43.90	207.59	166.67	33.3
STN-1, 21.0'-22.5'	60°C	1233	10/19/09	Hom	No. 10			Yes	44.28	221.75	174.67	36.1
STN-1, 22.5'-24.0'	60°C	1234	10/19/09	Hom	No. 10			Yes	44.25	265.74	200.79	41.5
STN-1, 24.0'-25.5'	60°C	1235	10/19/09	Hom	No. 10			Yes	44.76	299.82	220.48	45.2
STN-1, 25.5'-27.0'	60°C	1236	10/19/09	Hom	No. 10			Yes	50.40	249.71	189.35	43.4
STN-1, 27.0'-28.5'	60°C	1237	10/19/09	Hom	No. 10			Yes	43.88	233.20	175.81	43.5
STN-1, 28.5'-30.0'	60°C	1238	10/19/09	Hom	No. 10			Yes	47.74	193.65	141.11	56.3
STN-1, 30.0'-31.5'	60°C	1239	10/19/09	Hom	No. 10			Yes	69.61	355.88	273.33	40.5
STN-1, 31.5'-33.0'	60°C	1240	10/19/09	Hom	No. 10			Yes	72.22	315.36	253.25	34.3
STN-1, 33.0'-34.5'	60°C	1241	10/19/09	Hom	3/8"			No	76.73	303.22	237.08	41.2
STN-1, 34.5'-36.0'	60°C	1242	10/19/09	Hom	3/8"			No	71.21	408.10	318.60	36.2
STN-1, 36.0'-37.5'	60°C	1243	10/19/09	Hom	3/8"			No	71.74	350.64	298.37	23.1
STN-1, 37.5'-39.0'	60°C	1244	10/19/09	Hom	3/8"			No	70.75	341.38	287.81	24.7
STN-1, 39.0'-40.5'	60°C	1245	10/19/09	Hom	3/4"			No	72.80	413.20	323.30	35.9
STN-1, 40.5'-42.0'	60°C	1246	10/19/09	Hom	3/8"			No	75.73	216.93	166.54	55.5

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-1, 42.0'-43.5'	60°C	1247	10/19/09	Hom	3/8"			No	73.29	387.27	286.43	47.3
STN-1, 43.5'-45.0'	60°C	1248	10/19/09	Hom	3/8"			No	72.71	313.78	240.16	44.0
STN-1, 45.0'-46.5'	60°C	1249	10/19/09	Hom	3/8"			No	74.10	340.06	265.34	39.1
STN-1, 46.5'-48.0'	60°C	1250	10/19/09	Hom	No. 4			Yes	41.27	194.47	151.66	38.8
STN-1, 48.0'-49.5'		1251	10/14/09	Hom	No. 10			Yes	71.86	294.55	262.30	16.9
STN-1, 49.5'-51.0'		1252	10/14/09	Hom	No. 10			Yes	69.36	347.62	304.20	18.5
STN-1, 51.0'-52.5'		1253	10/14/09	Hom	No. 4			Yes	70.81	346.90	299.70	20.6
STN-1, 52.5'-54.0'		1254	10/14/09	Hom	No. 10			Yes	53.21	338.71	287.47	21.9
STN-1, 54.0'-55.5'		1255	10/14/09	Hom	No. 10			Yes	73.52	404.00	337.54	25.2
STN-1, 55.5'-57.0'		1256	10/14/09	Hom	No. 10			Yes	22.43	87.82	74.97	24.5
STN-1, 57.0'-58.5'		1257	10/14/09	Hom	No. 10			Yes	21.46	86.02	72.85	25.6
STN-1, 58.5'-60.0'		1258	10/14/09	Hom	No. 10			Yes	20.63	96.37	81.53	24.4
STN-1, 60.0'-61.5'		1259	10/14/09	Hom	No. 10			Yes	19.79	102.62	86.21	24.7
STN-1, 61.5'-63.0'		1260	10/14/09	Hom	No. 10			Yes	21.85	104.75	87.06	27.1
STN-1, 63.0'-64.5'		1261	10/14/09	Hom	No. 10			Yes	21.05	83.26	70.13	26.8
STN-1, 64.5'-66.0'		1262	10/14/09	Hom	3/4"			No	22.29	96.39	90.18	9.1
STN-1, 66.0'-67.5'		1264	10/14/09	Hom	3/8"			No	20.68	117.97	98.49	25.0
STN-1, 67.5'-69.0'		1265	10/14/09	Hom	3/8"			No	22.75	103.29	77.84	46.2
STN-1, 69.0'-70.5'		1266	10/14/09	Hom	3/8"			No	18.78	72.05	58.00	35.8
STN-1, 70.5'-71.5'		1267	10/14/09	Hom	3/8"			No	21.45	85.54	79.55	10.3

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-2, 0.0'-1.5'	**60° C**	150	7/9/09	Hom	3/8"			No	21.26	84.68	69.88	30.4
STN-2, 1.5'-3.0'	**60° C**	151	7/9/09		3/8"			No	21.98	90.24	76.27	25.7
STN-2, 3.0'-4.5'	**60° C**	152	7/9/09		3/8"			No	21.97	75.89	66.43	21.3
STN-2, 4.5'-6.0'	**60° C**	153	7/9/09		No. 4			No	19.70	74.63	62.36	28.8
STN-2, 6.0'-7.5'	**60° C**	154	7/9/09		No. 4			No	21.59	102.15	86.97	23.2
STN-2, 7.5'-9.0'	**60° C**	155	7/9/09		No. 4			No	21.77	92.24	77.14	27.3
STN-2, 9.0'-10.5'	**60° C**	156	7/9/09		No. 4			No	19.25	88.67	71.81	32.1
STN-2, 10.5'-12.0'	**60° C**	157	7/9/09		1 1/2"			No	22.14	113.26	104.07	11.2
STN-2, 12.0'-13.5'	**60° C**	158	7/9/09		3/4"			No	22.58	127.73	119.77	8.2
STN-2, 13.5'-15.0'	**60° C**	159	7/9/09		3/4"			No	22.41	138.33	127.29	10.5
STN-2, 15.0'-16.5'	**60° C**	160	7/9/09		3/4"			No	24.48	148.77	129.41	18.5
STN-2, 16.5'-18.0'	**60° C**	161	7/9/09		3/8"			No	22.31	144.40	120.11	24.8
STN-2, 18.0'-19.5'	**60° C**	162	7/9/09		No. 10			Yes	15.62	105.23	83.85	31.3
STN-2, 19.5'-21.0'	**60° C**	163	7/9/09		No. 4			No	18.87	103.15	81.02	35.6
STN-2, 21.0'-22.5'	**60° C**	164	7/9/09		No. 4			No	22.50	135.33	105.84	35.4
STN-2, 22.5'-24.0'	**60° C**	165	7/9/09		3/8"			No	22.32	140.55	113.78	29.3
STN-2, 24.0'-25.5'	**60° C**	166	7/9/09		3/4"			No	22.54	122.67	104.01	22.9
STN-2, 25.5'-27.0'	**60° C**	167	7/9/09		3/4"			No	24.41	133.65	111.28	25.8
STN-2, 27.0'-28.5'	**60° C**	168	7/9/09		No. 10			Yes	23.06	130.42	91.04	57.9
STN-2, 28.5'-30.0'	**60° C**	169	7/9/09		3/8"			No	20.80	100.64	76.12	44.3
STN-2, 30.0'-31.5'	**60° C**	170	7/9/09		No. 10			Yes	20.76	112.59	84.72	43.6
STN-2, 31.5'-33.0'	**60° C**	171	7/9/09		No. 10			Yes	20.30	99.61	77.26	39.2
STN-2, 33.0'-34.5'		172	7/9/09	Hom	No. 10			Yes	20.71	113.94	97.98	20.7
STN-2, 34.5'-36.0'		173	7/9/09		3/4"			No	21.12	140.35	118.93	21.9
STN-2, 36.0'-37.5'		174	7/9/09		3/8"			No	19.12	113.80	95.98	23.2
STN-2, 37.5'-39.0'		175	7/9/09		3/8"			No	21.76	116.80	97.62	25.3
STN-2, 39.0'-40.5'		176	7/9/09		No. 10			Yes	22.67	151.98	124.45	27.0
STN-2, 40.5'-42.0'		177	7/9/09		3/4"			No	22.07	141.83	119.51	22.9
STN-2, 42.0'-43.5'		178	7/9/09		1 1/2"			No	19.37	118.36	100.58	21.9
STN-2, 43.5'-45.0'		179	7/9/09		3/4"			No	21.43	147.42	123.71	23.2
STN-2, 45.0'-46.5'		180	7/9/09		3/4"			No	22.17	137.92	120.42	17.8

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-2, 46.5'-48.0'	181	7/9/09		3/8"			No	21.10	121.35	104.49	20.2
STN-2,	181A	7/9/09		1 1/2"				15.53	127.62	108.07	21.1
STN-2, 48.0'-49.5'	182	7/9/09		1 1/2"			No	23.65	145.65	127.17	17.9
STN-2, 49.5'-51.0'	183	7/9/09		3/8"			No	20.87	115.02	84.52	47.9
STN-2, 51.0'-52.5' NO SAMPLE	184	7/9/09									
STN-2, 52.5'-54.0'	185	7/9/09		1 1/2"				20.96	110.67		-528.0
STN-2, 54.0'-55.5'	186	7/10/09		1 1/2"			No	43.86	281.13	252.92	13.5

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Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-3, 0.0'-1.5'	270	7/10/09		3/4"			No	49.49	217.69	201.82	10.4
STN-3, 1.5'-3.0'	271	7/10/09	Len	3/4"			No	48.51	248.91	215.37	20.1
STN-3, 3.0'-4.5'	272	7/10/09		3/8"			No	48.73	256.38	229.18	15.1
STN-3, 6.5'-8.0'	273	7/10/09		1 1/2"			No	43.81	254.52	219.76	19.8
STN-3, 8.0'-9.5'	274	7/10/09		3/4"			No	43.68	246.76	209.93	22.2
STN-3, 11.5'-13.0' No Sample **60° C**	275	7/10/09									
STN-3, 13.0'-14.5' No Sample **60° C**	276	7/10/09									
STN-3, 16.5'-17.5' **60° C**	277A	7/10/09		3/4"			No	50.30	260.13	197.98	42.1
STN-3, 17.5'-18.0' **60° C**	277B	7/10/09		No. 10			Yes	41.22	200.98	157.13	37.8
STN-3, 18.0'-19.5' **60° C**	278	7/10/09		No. 10			Yes	44.36	240.61	181.49	43.1
STN-3, 21.5'-23.0'	279	7/10/09		1 1/2"			No	43.86	234.72	218.83	9.1
STN-3, 23.0'-24.5'	280	7/10/09		1 1/2"			No	29.64	221.52	201.41	11.7
STN-3, 24.5'-26.0'	281	7/10/09		No. 10			Yes	40.29	265.58	225.49	21.6
STN-3, 26.0'-27.5' No Sample	282	7/10/09									
STN-3, 27.5'-29.0'	283	7/10/09		3/8"			No	43.56	299.60	255.75	20.7
STN-3, 29.0'-30.5'	284	7/10/09		No. 10			Yes	18.90	122.23	104.44	20.8
STN-3, 30.5'-32.0'	285	7/10/09		3/8"			No	16.62	133.03	112.51	21.4
STN-3, 32.0'-33.5'	286	7/10/09		3/8"			No	19.64	133.72	114.23	20.6
STN-3, 33.5'-35.0'	287	7/10/09		3/8"			No	21.42	118.09	99.73	23.4
STN-3, 35.0'-36.5'	288	7/10/09		No. 4			Yes	29.25	170.99	144.27	23.2
STN-3, 36.5'-38.0'	289	7/10/09		1 1/2"			No	44.93	326.79	285.94	16.9
STN-3, 38.0'-39.5' No Sample	290	7/10/09									
STN-3, 39.5'-40.8'	291	7/10/09		1 1/2"			No	43.94	274.11	217.85	32.4

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-5, 0.0'-1.5'		2681	10/22/09	Hom	3/8"			No	73.60	261.97	238.49	14.2
STN-5, 1.5'-3.0'	60° C	2682	10/22/09	Hom	3/4"			No	74.61	301.63	286.26	7.3
STN-5, 3.0'-4.5'	60° C	2683	10/22/09	Hom	3/4"			No	75.47	324.14	304.11	8.8
STN-5, 4.5'-6.0'	60° C	2684	10/22/09	Hom	3/8"			No	51.96	219.36	199.43	13.5
STN-5, 6.0'-7.5'	60° C	2685	10/22/09	Hom	3/8"			No	73.97	367.17	332.54	13.4
STN-5, 7.5'-9.0'	60° C	2686	10/22/09	Hom	3/8"			No	70.38	331.49	303.08	12.2
STN-5, 9.0'-10.5'	60° C	2687	10/22/09	Hom	3/8"			No	74.49	314.67	286.00	13.6
STN-5, 10.5'-12.0'	60° C	2688	10/22/09	Hom	3/8"			No	44.25	212.54	185.10	19.5
STN-5, 12.0'-13.5'	60° C	2689	10/22/09	Hom	No. 4			Yes	70.49	292.22	251.62	22.4
STN-5, 13.5'-15.0'	60° C	2690	10/22/09	Hom	No. 4			Yes	70.70	307.82	263.56	22.9
STN-5, 15.0'-16.5'	60° C	2691	10/22/09	Hom	No. 4			Yes	75.19	259.80	223.94	24.1
STN-5, 16.5'-18.0'	60° C	2692	10/22/09	Hom	No. 4			No	21.71	62.26	54.99	21.8
STN-5, 18.0'-19.5'	60° C	2693	10/22/09	Hom	No. 4			No	19.20	62.32	54.41	22.5
STN-5, 19.5'-21.0'	60° C	2694	10/22/09	Hom	3/8"			No	22.41	63.34	56.22	21.1
STN-5, 21.0'-22.5'	60° C	2695	10/22/09	Hom	3/8"			No	21.87	60.67	54.01	20.7
STN-5, 22.5'-24.0'	60° C	2696	10/22/09	Hom	3/8"			No	19.51	69.00	58.45	27.1
STN-5, 24.0'-25.5'	60° C	2697	10/22/09	Hom	No. 4			No	21.01	55.85	50.18	19.4
STN-5, 25.5'-27.0'	60° C	2698	10/22/09	Hom	No. 4			No	23.29	67.83	60.47	19.8
STN-5, 27.0'-28.5'	60° C	2699	10/22/09	Hom	No. 10			Yes	21.63	82.60	68.87	29.1
STN-5, 28.5'-30.0'	60° C	2700	10/22/09	Hom	No. 10			Yes	22.44	90.08	72.15	36.1
STN-5, 30.0'-31.5'	60° C	2701	10/22/09	Hom	No. 10			Yes	29.04	114.15	92.00	35.2
STN-5, 31.5'-33.0'	60° C	2702	10/22/09	Hom	No. 10			Yes	22.47	105.46	78.38	48.4
STN-5, 33.0'-34.5'	60° C	2703	10/22/09	Hom	No. 10			Yes	21.77	106.50	79.93	45.7
STN-5, 34.5'-36.0'	60° C	2704	10/22/09	Hom	No. 10			Yes	27.45	165.20	129.20	35.4
STN-5, 36.0'-37.5'	60° C	2706	10/22/09	Hom	No. 10			Yes	23.17	94.45	74.63	38.5
STN-5, 37.5'-39.0'	60° C	2707	10/22/09	Hom	No. 10			Yes	19.73	72.17	56.83	41.3
STN-5, 39.0'-40.5'	60° C	2708	10/22/09	Hom	No. 4			No	19.99	95.92	80.46	25.6
STN-5, 40.5'-42.0'	60° C	2709	10/22/09	Hom	3/4"			No	23.05	111.78	96.44	20.9
STN-5, 42.0'-43.5'	60° C	2710	10/22/09	Hom	No. 4			No	21.37	81.07	69.71	23.5
STN-5, 43.5'-45.0'	60° C	2711	10/22/09	Hom	3/8"			No	24.93	105.64	90.74	22.6
STN-5, 45.0'-46.5'	60° C	2712	10/22/09	Hom	3/8"			No	19.31	72.94	58.92	35.4

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-5, 46.5'-48.0'	60° C	2713	10/22/09	Hom	3/8"			No	21.60	88.35	70.37	36.9
STN-5, 48.0'-49.5'	60° C	2714	10/22/09	Hom	No. 4			No	21.69	105.60	81.55	40.2
STN-5, 49.5'-51.0'	60° C	2715	10/22/09	Hom	3/8"			No	21.53	109.14	87.32	33.2
STN-5, 51.0'-52.5'	60° C	2716	10/22/09	Hom	No. 4			No	20.55	91.50	72.91	35.5
STN-5, 52.5'-54.0'	60° C	2718	10/22/09	Hom	No. 10			Yes	22.38	56.86	47.63	36.6
STN-5, 54.0'-55.5'	60° C	2719	10/22/09	Hom	No. 10			Yes	19.38	84.82	66.78	38.1
STN-5, 55.5'-57.0'	60° C	2720	10/22/09	Hom	No. 10			Yes	19.80	70.91	56.02	41.1
STN-5, 57.0'-58.5'	60° C	2721	10/22/09	Hom	No. 10			Yes	22.10	107.68	87.70	30.5
STN-5, 58.5'-60.0'	60° C	2722	10/22/09	Hom	No. 10			Yes	21.54	96.14	79.96	27.7
STN-5, 60.0'-61.5'		2723	10/22/09	Hom	No. 10			Yes	23.38	98.15	87.86	16.0
STN-5, 61.5'-63.0'		2724	10/22/09	Hom	3/4"			No	22.93	140.42	126.11	13.9
STN-5, 63.0'-64.5'		2725	10/22/09	Hom	No. 10			Yes	22.97	119.56	103.29	20.3
STN-5, 64.5'-66.0'		2726	10/22/09	Hom	No. 10			Yes	21.71	109.07	93.80	21.2
STN-5, 66.0'-67.5'		2727	10/22/09	Hom	No. 10			Yes	21.52	112.05	95.85	21.8
STN-5, 67.5'-69.0'		2728	10/22/09	Hom	No. 10			Yes	26.25	124.36	107.30	21.0
STN-5, 69.0'-70.5'		2729	10/22/09	Hom	No. 10			Yes	22.17	107.47	91.50	23.0
STN-5, 70.5'-72.0'		2730	10/22/09	Hom	No. 10			Yes	21.11	91.41	78.72	22.0
STN-5, 72.0'-73.5'		2731	10/22/09	Hom	No. 4			No	21.62	112.57	96.57	21.3
STN-5, 73.5'-74.4'		2732	10/22/09	Hom	3/4"			No	21.87	104.75	97.01	10.3

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Moisture Content of Soil

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Project Name Bull Run Fossil Plant (TVA)

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Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-6, 0.0'-1.5'		647	8/4/09	Hom	3/4"			No	19.49	72.15	63.96	18.4
STN-6, 1.5'-3.0'		648	8/4/09	Hom	3/4"			No	22.11	100.54	93.61	9.7
STN-6, 3.0'-4.5'	60° C	649	8/4/09	Hom	3/8"			No	19.13	60.54	54.18	18.1
STN-6, 4.5'-6.0'	60° C	650	8/4/09	Hom	No. 4			No	23.07	85.41	75.07	19.9
STN-6, 6.0'-7.5'	60° C	651	8/4/09	Hom	No. 4			No	21.47	72.06	61.82	25.4
STN-6, 7.5'-9.0'	60° C	652	8/4/09	Hom	3/8"			No	21.15	77.72	67.61	21.8
STN-6, 9.0'-10.5'	60° C	653	8/4/09	Hom	No. 4			No	21.76	84.92	70.83	28.7
STN-6, 10.5'-12.0'	60° C	654	8/4/09	Hom	3/8"			No	22.96	102.20	89.15	19.7
STN-6, 12.0'-13.5'	60° C	655	8/4/09	Hom	3/8"			No	19.41	105.92	95.26	14.1
STN-6, 13.5'-15.0'	60° C	656	8/4/09	Hom	3/8"			No	23.23	128.91	117.17	12.5
STN-6, 15.0'-16.5'	60° C	657	8/4/09	Hom	3/8"			No	22.50	148.72	131.38	15.9
STN-6, 16.5'-18.0'	60° C	658	8/4/09	Hom	No. 10			Yes	21.66	111.76	92.04	28.0
STN-6, 18.0'-19.5'	60° C	659	8/4/09	Hom	No. 10			Yes	20.98	108.86	87.10	32.9
STN-6, 19.5'-21.0'	60° C	660	8/4/09	Hom	3/4"			No	19.91	94.08	84.79	14.3
STN-6, 21.0'-22.5'	60° C	661	8/4/09	Hom	3/8"			No	19.25	94.16	81.01	21.3
STN-6, 22.5'-24.0'	60° C	662	8/4/09	Hom	No. 4			No	19.43	115.78	97.39	23.6
STN-6, 24.0'-25.5'	60° C	663	8/4/09	Hom	No. 10			Yes	16.27	89.14	69.62	36.6
STN-6, 25.5'-27.0'	60° C	664	8/4/09	Hom	No. 4			No	22.22	116.12	92.85	32.9
STN-6, 27.0'-28.5'	60° C	665	8/4/09	Hom	No. 4			No	22.41	102.38	79.62	39.8
STN-6, 28.5'-30.0'	60° C	666	8/4/09	Hom	No. 4			No	21.07	92.63	72.49	39.2
STN-6, 30.0'-31.5'	No Sample 60° C	667	8/4/09									
STN-6, 31.5'-33.0'	60° C	668	8/4/09	Hom	No. 4			No	29.68	124.17	109.01	19.1
STN-6, 33.0'-34.5'		669	8/4/09	Hom	3/4"			No	21.51	121.54	108.18	15.4
STN-6, 34.5'-36.0'		670	8/4/09	Hom	3/4"			No	19.66	106.39	95.57	14.3
STN-6, 36.0'-37.5'		671	8/4/09	Hom	3/8"			No	27.43	166.77	145.12	18.4
STN-6, 37.5'-39.0'		672	8/5/09	Hom	No. 10			Yes	21.63	115.25	99.48	20.3
STN-6, 39.0'-40.5'		673	8/5/09	Hom	3/8"			No	18.74	127.56	110.40	18.7
STN-6, 40.5'-42.0'		674	8/5/09	Hom	3/8"			No	21.70	132.96	112.51	22.5
STN-6, 42.0'-43.5'		675	8/5/09	Hom	No. 4			No	24.45	133.21	113.46	22.2
STN-6, 43.5'-45.0'		676	8/5/09	Hom	No. 10			Yes	27.10	168.26	144.68	20.1
STN-6, 45.0'-46.5'		677	8/5/09	Hom	3/4"			No	28.27	171.18	145.38	22.0

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-6, 46.5'-48.0'	678	8/5/09	Hom	3/4"			No	22.98	129.50	116.70	13.7
STN-6, 48.0'-49.5'	679	8/5/09	Hom	3/4"			No	21.74	133.97	119.06	15.3
STN-6, 49.5'-50.8'	680	8/5/09	Hom	3/4"			No	21.25	99.05	91.45	10.8

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-7, 0.0'-1.5'	875	8/6/09	Hom	3/4"			No	43.95	232.13	215.14	9.9
STN-7, 1.5'-3.0'	876	8/6/09	Hom	3/4"			No	42.28	212.00	187.09	17.2
STN-7, 3.0'-4.5'	877	8/6/09	Hom	3/8"			No	43.67	233.92	200.64	21.2
STN-7, 4.5'-6.0'	878	8/6/09	Hom	3/8"			No	43.63	205.05	176.87	21.1
STN-7, 6.0'-7.5'	879	8/6/09	Hom	3/4"			No	45.36	241.59	209.40	19.6
STN-7, 7.5'-9.0'	880	8/6/09	Hom	3/4"			No	43.78	263.97	221.56	23.9
STN-7, 9.0'-10.5' **60° C**	881	8/6/09	Hom	No. 4			No	49.53	176.59	142.59	36.5
STN-7, 10.5'-12.0' **60° C**	882	8/6/09	Hom	3/8"			No	45.96	223.07	182.37	29.8
STN-7, 12.0'-13.5' **60° C**	883	8/6/09	Hom	3/4"			No	43.94	255.33	215.75	23.0
STN-7, 13.5'-15.0' **60° C**	884	8/6/09	Hom	3/8"			No	44.20	258.97	200.46	37.4
STN-7, 15.0'-16.5'	885	8/6/09	Hom	No. 4			Yes	43.75	258.65	206.03	32.4
STN-7, 16.5'-18.0'	886	8/6/09	Hom	3/8"			No	46.73	216.78	187.93	20.4
STN-7, 18.0'-19.5'	887	8/6/09	Hom	No. 4			Yes	44.49	231.88	196.98	22.9
STN-7, 19.5'-21.0'	888	8/14/09	Hom	3/8"			No	21.96	80.10	70.58	19.6
STN-7, 21.0'-22.5'	889	8/14/09	Hom	3/8"			No	24.71	109.98	96.03	19.6
STN-7, 22.5'-24.0'	890	8/17/09	Hom	3/4"			No	22.42	84.95	74.58	19.9
STN-7, 24.0'-25.5'	891	8/17/09		No. 4			No	29.64	109.11	96.11	19.6
STN-7, 25.5'-27.0'	892	8/7/09		No. 10			Yes	43.79	295.55	251.43	21.2
STN-7, 27.0'-28.5'	893	8/7/09		3/4"			No	44.07	300.63	253.70	22.4
STN-7, 28.5'-30.0'	894	8/7/09		3/8"			No	43.60	282.14	239.44	21.8
STN-7, 30.0'-31.5'	895	8/7/09		3/8"			No	43.67	296.50	251.51	21.6
STN-7, 31.5'-33.0'	896	8/7/09		No. 4			Yes	47.86	316.76	267.98	22.2
STN-7, 33.0'-34.5'	897	8/7/09		3/8"			No	44.00	300.46	253.88	22.2
STN-7, 34.5'-36.0'	898	8/7/09		3/8"			No	49.07	278.06	232.29	25.0
STN-7, 36.0'-37.5'	899	8/7/09	Len	No. 4			Yes	48.91	265.85	227.97	21.2
STN-7, 37.5'-39.0'	900	8/7/09	Len	No. 4			Yes	43.39	221.07	189.99	21.2
STN-7, 39.0'-40.5'	901	8/7/09		No. 10			Yes	44.44	275.63	235.28	21.1
STN-7, 40.5'-42.0'	902	8/7/09		3/4"			No	44.92	273.56	231.02	22.9
STN-7, 42.0'-43.1'	903A	8/7/09		3/4"			No	44.76	278.71	248.35	14.9
STN-7, 43.1'-43.5'	903B	8/7/09		No. 4			Yes	43.71	200.82	184.54	11.6
STN-7, 43.5'-44.3'	904	8/7/09		1 1/2"			No	43.54	185.32	171.23	11.0

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-8, 0.0'-1.5'	60° C	2922	10/21/09	Hom	3/8"			No	45.06	194.23	177.37	12.7
STN-8, 1.5'-3.0'	60° C	2923	10/21/09	Hom	No. 4			Yes	45.58	173.89	152.78	19.7
STN-8, 3.0'-4.5'	60° C	2924	10/21/09	Hom	3/8"			No	43.97	200.44	174.48	19.9
STN-8, 4.5'-6.0'	60° C	2925	10/21/09	Hom	3/4"			No	48.87	187.92	177.19	8.4
STN-8, 6.0'-7.5'	60° C	2927	10/21/09	Hom	3/4"			No	43.77	211.73	182.60	21.0
STN-8, 7.5'-9.0'	60° C	2928	10/21/09	Hom	No. 4			Yes	43.95	175.01	149.01	24.7
STN-8, 9.0'-10.5'	60° C	2929	10/21/09	Hom	3/8"			No	44.06	205.38	176.23	22.1
STN-8, 10.5'-12.0'	60° C	2930	10/21/09	Hom	No. 4			Yes	43.78	209.89	179.91	22.0
STN-8, 12.0'-13.5'	60° C	2931	10/21/09	Hom	No. 4			Yes	43.91	214.98	167.35	38.6
STN-8, 13.5'-15.0'	60° C	2932	10/21/09		3/8"			No	44.50	250.95	186.01	45.9
STN-8, 15.0'-16.5'	60° C	2933	10/21/09		3/8"			No	30.45	186.92	138.35	45.0
STN-8, 16.5'-18.0'	60° C	2934	10/21/09		No. 4			Yes	49.94	288.99	202.55	56.6
STN-8, 18.0'-19.5'	60° C	2935	10/21/09		No. 4			Yes	35.06	388.08	288.80	39.1
STN-8, 19.5'-21.0'	60° C	2936	10/21/09		No. 10			Yes	44.23	282.34	221.26	34.5
STN-8, 21.0'-22.5'	60° C	2937	10/21/09		3/8"			No	46.02	329.48	236.35	48.9
STN-8, 22.5'-24.0'	60° C	2939	10/21/09		3/4"			No	73.51	275.49	211.53	46.3
STN-8, 24.0'-25.5'	60° C	2940	10/21/09		3/8"			No	71.23	369.26	281.68	41.6
STN-8, 25.5'-27.0'	60° C	2941	10/21/09		3/8"			No	43.97	183.60	145.13	38.0
STN-8, 27.0'-28.5'	60° C	2942	10/21/09		1 1/2"	1	1 1/2"	No	44.02	342.05	263.94	35.5
STN-8, 28.5'-30.0'	60° C	2943	10/21/09		No. 10			Yes	68.76	431.30	322.72	42.8
STN-8, 30.0'-31.5'	60° C	2944	10/21/09		No. 4			Yes	72.33	408.30	313.05	39.6
STN-8, 31.5'-33.0'	60° C	2945	10/21/09		No. 4			Yes	74.03	560.50	425.86	38.3
STN-8, 33.0'-34.5'	60° C	2946	10/21/09		3/4"			No	74.93	442.50	329.96	44.1
STN-8, 34.5'-36.0'	60° C	2947	10/21/09		No. 4			Yes	72.85	507.30	388.62	37.6
STN-8, 36.0'-37.5'	60° C	2949	10/21/09		No. 4			Yes	74.16	441.70	341.68	37.4
STN-8, 37.5'-39.0'	60° C	2950	10/21/09		No. 4			Yes	45.22	346.76	263.04	38.4
STN-8, 39.0'-40.5'	60° C	2951	10/21/09	Str	No. 4			Yes	43.88	296.20	236.28	31.1
STN-8, 40.5'-42.0'		2952	10/22/09	Hom	3/8"			No	43.99	225.36	182.89	30.6
STN-8, 42.0'-43.5'		2953	10/22/09	Hom	No. 4			Yes	44.17	232.11	192.12	27.0
STN-8, 43.5'-45.0'		2954	10/22/09	Hom	No. 10			Yes	44.49	260.04	214.14	27.1
STN-8, 45.0'-46.5'		2955	10/22/09	Hom	No. 10			Yes	43.63	265.28	220.48	25.3

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-8, 46.5'-48.0'	2956	10/22/09	Hom	No. 10			Yes	50.32	258.45	220.44	22.3
STN-8, 48.0'-49.5'	2957	10/22/09	Hom	No. 10			Yes	44.37	248.35	211.50	22.0
STN-8, 49.5'-51.0'	2958	10/22/09	Hom	No. 10			Yes	48.00	300.55	250.34	24.8
STN-8, 51.0'-51.9'	2959	10/22/09	Hom	3/4"			No	46.06	268.01	237.64	15.9

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-9, 0.0'-1.5'	60° C	3027	10/12/09	Len	3/8"			No	49.04	259.11	228.19	17.3
STN-9, 1.5'-3.0'	60° C	3028	10/12/09		3/4"			No	44.26	272.59	246.82	12.7
STN-9, 3.0'-4.5'	60° C	3029	10/12/09		3/8"			No	30.69	211.18	184.89	17.0
STN-9, 4.5'-6.0'	60° C	3030	10/12/09		3/4"			No	22.10	101.04	86.32	22.9
STN-9, 6.0'-7.5'	60° C	3031	10/12/09		3/4"			No	21.62	106.10	97.17	11.8
STN-9, 7.5'-9.0'	60° C	3032	10/12/09		3/4"			No	21.15	85.64	80.37	8.9
STN-9, 9.0'-10.5'	60° C	3033	10/12/09		3/4"			No	22.89	83.26	75.19	15.4
STN-9, 10.5'-12.0'	60° C	3034	10/12/09		3/4"			No	19.52	87.32	79.70	12.7
STN-9, 12.0'-13.5'	60° C	3035	10/12/09		3/8"			No	19.68	83.97	70.92	25.5
STN-9, 13.5'-15.0'	60° C	3036	10/12/09		3/4"			No	22.85	109.23	96.57	17.2
STN-9, 15.0'-16.5'	60° C	3037	10/12/09		3/4"			No	19.98	79.05	67.82	23.5
STN-9, 16.5'-18.0'	60° C	3038	10/12/09		3/8"			No	19.84	76.68	68.47	16.9
STN-9, 18.0'-19.5'	60° C	3039	10/12/09		3/4"			No	20.09	71.54	63.64	18.1
STN-9, 19.5'-21.0'	60° C	3040	10/12/09		3/8"			No	20.21	65.54	57.86	20.4
STN-9, 21.0'-22.5'	60° C	3041	10/12/09		3/4"	1	3/4"	No	21.00	65.28	57.53	21.2
STN-9, 22.5'-24.0'	60° C	3042	10/12/09		3/4"			No	19.53	71.09	61.22	23.7
STN-9, 24.0'-25.5'	60° C	3043	10/12/09	Hom	No. 10			Yes	20.27	94.26	77.12	30.1
STN-9, 25.5'-27.0'	60° C	3044	10/12/09		No. 10			Yes	21.05	97.14	76.36	37.6
STN-9, 27.0'-28.5'	60° C	3045	10/12/09		No. 10			Yes	21.50	131.47	100.15	39.8
STN-9, 28.5'-30.0'	60° C	3046	10/12/09		No. 10			Yes	40.23	277.05	202.05	46.3
STN-9, 30.0'-31.5'	60° C	3048	10/12/09		No. 10			Yes	21.42	123.43	86.62	56.5
STN-9, 31.5'-33.0'	60° C	3049	10/12/09		No. 10			Yes	22.32	127.71	99.27	37.0
STN-9, 33.0'-34.5'	60° C	3050	10/12/09		3/8"			No	22.78	64.26	53.03	37.1
STN-9, 34.5'-36.0'	60° C	3051	10/12/09		3/4"			No	21.43	122.56	101.07	27.0
STN-9, 36.0'-37.5'	60° C	3052	10/12/09		No. 4			No	21.94	117.43	95.70	29.5
STN-9, 37.5'-39.0'	60° C	3053	10/12/09		3/4"			No	21.50	126.93	104.22	27.5
STN-9, 39.0'-40.5'	60° C	3054	10/12/09		No. 10			Yes	19.97	111.62	87.16	36.4
STN-9, 40.5'-42.0'	60° C	3055	10/12/09		No. 10			Yes	22.01	119.76	94.62	34.6
STN-9, 42.0'-43.5'	60° C	3056	10/12/09		No. 10			Yes	21.00	103.87	81.86	36.2
STN-9, 43.5'-45.0'	60° C	3057	10/12/09		No. 10			Yes	21.39	125.63	93.72	44.1
STN-9, 45.0'-46.5'	60° C	3058	10/12/09		No. 10			Yes	44.81	358.67	269.77	39.5

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-9, 46.5'-48.0'	60° C	3059	10/12/09		No. 10			Yes	43.94	389.57	280.03	46.4
STN-9, 48.0'-49.5'	60° C	3060	10/12/09		No. 10			Yes	49.23	386.55	270.29	52.6
STN-9, 49.5'-51.0'	60° C	3061	10/12/09		No. 4			Yes	43.65	383.75	277.52	45.4
STN-9, 51.0'-52.5'	60° C	3062	10/12/09		No. 4			Yes	49.84	400.50	298.60	41.0
STN-9, 52.5'-54.0'	60° C	3063	10/12/09	Len	No. 10			Yes	45.26	274.15	238.39	18.5
STN-9, 54.0'-55.5'		3064	10/12/09	Len	No. 10			Yes	49.99	308.41	265.34	20.0
STN-9, 55.5'-57.0'		3065	10/12/09	Len	No. 10			Yes	28.76	274.86	234.61	19.6
STN-9, 57.0'-58.5'		3066	10/12/09	Hom	No. 10			Yes	43.97	329.55	284.03	19.0
STN-9, 58.5'-60.0'		3068	10/12/09	Len	No. 10			Yes	44.06	315.78	271.76	19.3
STN-9, 60.0'-61.5'		3069	10/12/09	Len	No. 10			Yes	43.74	276.92	238.37	19.8
STN-9, 61.5'-63.0'		3070	10/12/09	Hom	No. 10			Yes	43.90	348.50	298.16	19.8
STN-9, 63.0'-64.5'		3071	10/12/09	Hom	No. 10			Yes	43.76	372.67	317.12	20.3
STN-9, 64.5'-66.0'		3072	10/12/09	Hom	No. 10			Yes	44.46	350.82	294.97	22.3
STN-9, 66.0'-67.5'		3073	10/12/09		No. 10			Yes	43.99	412.70	346.83	21.8
STN-9, 67.5'-69.0'		3074	10/12/09		No. 10			Yes	45.54	330.88	277.31	23.1
STN-9, 69.0'-70.5'		3075	10/12/09		No. 10			Yes	44.93	75.44	69.24	25.5
STN-9, 70.5'-72.0'		3076	10/12/09		1 1/2"	1	1 1/2"	No	45.31	421.00	363.61	18.0
STN-9, 72.0'-72.9'		3077	10/12/09		3/8"			No	39.57	275.01	248.77	12.5

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-10, 0.0'-1.5'	**60° C**	47	7/9/09	Hom	1 1/2"			No	25.26	117.32	108.79	10.2
STN-10, 1.5'-3.0'	**60° C**	48	7/9/09	Hom	3/4"			No	21.50	81.62	73.03	16.7
STN-10, 3.0'-4.5'	**60° C**	49	7/9/09	Hom	3/4"			No	21.04	67.14	58.89	21.8
STN-10, 4.5'-6.0'	**60° C**	50	7/9/09	Hom	3/4"			No	22.82	103.81	91.22	18.4
STN-10, 6.0'-7.5'	**60° C**	51	7/9/09	Hom	3/8"			No	21.62	106.40	92.14	20.2
STN-10, 7.5'-9.0'	**60° C**	52	7/9/09	Hom	3/8"			No	22.52	108.25	90.08	26.9
STN-10, 9.0'-10.5'	**60° C**	53	7/9/09	Hom	3/8"			No	18.94	80.98	62.40	42.8
STN-10, 10.5'-12.0'	**60° C**	54	7/9/09	Hom	3/8"			No	29.63	140.31	110.38	37.1
STN-10, 12.0'-13.5'	**60° C**	55	7/9/09	Hom	1 1/2"			No	20.83	106.47	87.67	28.1
STN-10, 13.5'-15.0'	**60° C**	56	7/9/09	Hom	1 1/2"			No	19.56	116.34	101.94	17.5
STN-10, 15.0'-16.5'	**60° C**	57	7/9/09	Hom	3/4"			No	21.03	117.68	107.29	12.0
STN-10, 16.5'-18.0'	**60° C**	58	7/9/09	Hom	3/4"			No	19.16	135.20	120.40	14.6
STN-10, 18.5'-20.0'	**60° C**	59	7/9/09	Hom	1 1/2"			No	21.68	116.39	98.20	23.8
STN-10, 20.0'-21.5'	**60° C**	60	7/9/09	Hom	1 1/2"			No	23.09	149.40	131.17	16.9
STN-10, 21.5'-23.0'	**60° C**	61	7/9/09	Hom	3/4"			No	21.32	119.47	105.99	15.9
STN-10, 23.0'-24.5'	**60° C**	62	7/9/09		3/8"			No	22.31	139.66	112.07	30.7
STN-10, 46.0'-47.5'		63	7/8/09		No. 4			Yes	22.40	144.79	122.69	22.0
STN-10, 47.5'-48.2'		64A	7/8/09		No. 4			No	19.93	126.42	107.70	21.3
STN-10, 48.2'-49.0'		64B	7/8/09		1 1/2"				18.82	125.09	111.75	14.4
STN-10, 49.0'-50.5'		65	7/8/09		1 1/2"			No	21.48	139.67	126.21	12.9

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-11, 0.0'-1.5'	66	7/8/09	Len	3/4"			No	19.79	104.41	90.45	19.8
STN-11, 1.5'-3.0'	67	7/8/09		3/4"			No	21.45	131.85	112.60	21.1
STN-11, 3.0'-4.5'	68	7/8/09		3/4"			No	20.39	116.28	100.41	19.8
STN-11, 6.5'-8.0'	69	7/8/09	Len	1 1/2"			No	19.93	129.36	109.21	22.6
STN-11, 8.0'-9.5'	70	7/8/09		3/4"			No	19.17	123.87	99.62	30.1
STN-11, 11.5'-13.0'	71	7/8/09		3/8"			No	21.92	137.43	104.48	39.9
STN-11, 13.0'-14.5' **60° C**	72	7/8/09		3/8"			No	21.66	138.37	103.61	42.4
STN-11, 14.5'-16.0'	73	7/8/09		3/8"			No	21.30	137.29	109.53	31.5
STN-11, 16.0'-17.5'	74	7/8/09	Len	No. 4			No	19.03	111.13	97.13	17.9
STN-11, 17.5'-19.0'	75	7/8/09	Str	No. 4			No	19.42	103.61	89.93	19.4
STN-11, 19.0'-20.5'	76	7/8/09	Hom	No. 4			No	18.97	107.61	92.10	21.2
STN-11, 22.5'-24.0'	77	7/8/09	Hom	3/8"			No	22.29	110.28	93.26	24.0
STN-11, 24.0'-25.5'	78	7/8/09	Hom	No. 4			No	21.94	128.95	106.24	26.9
STN-11, 27.5'-29.0' upper 1/2	79A	7/8/09	Hom	3/8"			No	21.98	119.41	98.93	26.6
STN-11, 27.5'-29.0' lower 1/2	79B	7/8/08	Hom	No. 4			No	21.37	115.03	94.43	28.2
STN-11, 29.0'-30.5'	80	7/8/09		No. 4			No	21.95	135.58	114.45	22.8
STN-11, 30.5'-32.0'	81	7/8/09		No. 4			No	21.70	140.33	117.79	23.5
STN-11, 32.0'-33.5'	82	7/8/09		No. 10			Yes	20.53	130.21	108.24	25.0
STN-11, 35.5'-37.0'	83	7/8/09		No. 10			Yes	20.15	119.90	97.84	28.4
STN-11, 37.0'-38.5'	84	7/8/09		No. 10			Yes	21.25	142.87	116.27	28.0
STN-11, 38.5'-40.0'	85	7/8/09		No. 4			No	19.59	114.37	94.00	27.4
STN-11, 40.0'-40.3'	86	7/8/09		1 1/2"			No	21.65	140.94	123.42	17.2

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-13, 0.0'-1.5'	60° C	1309	10/14/09		3/8"			No	287.69	582.90	529.00	22.3
STN-13, 1.5'-3.0'	60° C	1310	10/14/09	Str	3/4"			No	288.96	654.90	595.00	19.6
STN-13, 3.0'-4.5'	60° C	1311	11/3/09		1 1/2"	2	1 1/2"	No	43.76	168.46	153.05	14.1
STN-13, 4.5'-6.0'	60° C	1312	11/3/09		1 1/2"	1	1 1/2"	No	45.41	119.60	110.56	13.9
STN-13, 6.0'-7.5'	60° C	1313	11/3/09		3/4"			No	45.00	205.62	182.91	16.5
STN-13, 7.5'-9.0'	60° C	1314	11/3/09		3/4"			No	70.99	197.39	173.35	23.5
STN-13, 9.0'-10.5'	60° C	1315	11/3/09		3/4"			No	73.67	217.19	203.27	10.7
STN-13, 10.5'-12.0'	60° C	1316	11/3/09		3/4"			No	71.56	226.69	208.11	13.6
STN-13, 12.0'-13.5'	60° C	1317	11/3/09		3/4"			No	73.43	168.72	157.47	13.4
STN-13, 13.5'-15.0'	60° C	1318	11/3/09		3/4"			No	45.07	148.44	130.98	20.3
STN-13, 15.0'-16.5'	60° C	1319	11/3/09		3/8"			No	49.47	192.37	171.02	17.6
STN-13, 16.5'-18.0'	60° C	1320	11/3/09		3/8"			No	70.24	194.22	170.26	24.0
STN-13, 18.0'-19.5'	60° C	1321	11/3/09		3/8"			No	72.99	205.18	174.29	30.5
STN-13, 19.5'-21.0'	60° C	1322	11/3/09	Hom	No. 10			Yes	75.65	236.88	193.21	37.1
STN-13, 21.0'-22.5'	60° C	1323	11/3/09	Hom	No. 10			Yes	44.62	162.89	130.22	38.2
STN-13, 22.5'-24.0'	60° C	1324	11/3/09	Hom	No. 10			Yes	44.26	206.60	159.86	40.4
STN-13, 24.0'-25.5'	60° C	1325	10/14/09	Hom	No. 4			Yes	283.32	466.30	410.85	43.5
STN-13, 25.5'-27.0'	60° C	1326	10/14/09	Hom	No. 4			Yes	293.32	504.90	438.84	45.4
STN-13, 27.0'-28.5'	60° C	1327	10/14/09	Hom	No. 10			Yes	298.45	493.90	429.31	49.4
STN-13, 28.5'-30.0'	60° C	1328	10/14/09	Hom	No. 10			Yes	299.51	536.30	458.17	49.2
STN-13, 30.0'-31.5'	60° C	1329	10/14/09	Hom	No. 10			Yes	295.76	492.90	405.80	79.2
STN-13, 31.5'-33.0'	60° C	1331	10/14/09	Hom	No. 10			Yes	297.51	474.10	421.89	42.0
STN-13, 33.0'-34.5'	60° C	1332	10/14/09	Hom	No. 10			Yes	310.44	547.80	471.70	47.2
STN-13, 34.5'-36.0'	60° C	1333	10/14/09	Hom	No. 10			Yes	300.08	497.80	437.22	44.2
STN-13, 36.0'-37.5'	60° C	1334	10/15/09		No. 10			Yes	309.80	678.90	546.21	56.1
STN-13, 37.5'-39.0'	60° C	1335	10/15/09		No. 10			Yes	296.94	592.50	448.93	94.5
STN-13, 39.0'-40.5'	60° C	1336	10/15/09		No. 10			Yes	309.27	664.90	517.19	71.0
STN-13, 40.5'-42.0'	60° C	1337	10/15/09		No. 10			Yes	298.05	655.90	539.62	48.1
STN-13, 42.0'-43.5'	60° C	1338	10/15/09		No. 10			Yes	298.08	695.70	544.36	61.5
STN-13, 43.5'-45.0'	60° C	1339	10/15/09		No. 10			Yes	282.72	623.80	479.44	73.4
STN-13, 45.0'-46.5'	60° C	1340	10/15/09		No. 10			Yes	284.40	550.00	456.13	54.7

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-13, 46.5'-48.0'	60° C	1341	10/15/09		No. 10			Yes	296.40	565.60	473.46	52.0
STN-13, 48.0'-49.5'	60° C	1342	10/15/09		No. 4			Yes	297.06	712.40	565.09	55.0
STN-13, 49.5'-51.0'	60° C	1344	10/15/09		No. 10			Yes	298.31	444.20	398.89	45.0
STN-13, 51.0'-52.5'	60° C	1345	10/15/09		No. 10			Yes	296.96	542.70	467.02	44.5
STN-13, 52.5'-54.0'	60° C	1346	10/15/09		No. 10			Yes	288.60	511.20	442.81	44.3
STN-13, 54.0'-55.5'	60° C	1347	10/14/09	Hom	No. 10			Yes	300.25	633.10	563.78	26.3
STN-13, 55.5'-57.0'	60° C	1348	10/14/09	Hom	No. 10			Yes	292.48	680.40	602.02	25.3
STN-13, 57.0'-58.5'	60° C	1349	10/14/09	Hom	No. 10			Yes	294.53	745.20	649.47	27.0
STN-13, 58.5'-60.0'	60° C	1351	10/14/09	Hom	No. 10			Yes	286.89	575.20	509.65	29.4
STN-13, 60.0'-61.5'	60° C	1352	10/14/09	Hom	3/4"			No	297.81	605.10	542.04	25.8
STN-13, 61.5'-63.0'	60° C	1353	10/14/09	Len	No. 10			Yes	299.94	537.30	494.61	21.9
STN-13, 63.0'-64.5'	60° C	1354	10/14/09	Str	No. 4			Yes	289.88	624.40	546.67	30.3
STN-13, 64.5'-66.0'	60° C	1355	10/14/09		1 1/2"	3	1 1/2"	No	306.76	628.40	578.64	18.3
STN-13, 66.0'-67.5'	60° C	1356	10/14/09		1 1/2"	2	1 1/2"	No	300.09	664.20	625.50	11.9
STN-13, 67.5'-69.0'	60° C	1357	10/14/09		1 1/2"	1	1 1/2"	No	296.64	731.00	689.41	10.6

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-14, 0.0'-1.5'		1358	10/13/09		3/4"	5	3/4"	No	69.80	357.76	335.28	8.5
STN-14, 1.5'-3.0'		1359	10/13/09		1 1/2"	4	1 1/2"	No	70.61	293.03	279.19	6.6
STN-14, 3.0'-4.5'		1361	10/13/09	Len	1 1/2"	3	1 1/2"	No	71.62	225.65	211.58	10.1
STN-14, 4.5'-6.0'		1362	10/13/09	Len	3/4"			No	71.45	251.33	232.16	11.9
STN-14, 6.0'-7.5'		1363	10/13/09	Len	3/4"			No	69.09	300.72	271.46	14.5
STN-14, 7.5'-9.0'		1364	10/13/09	Len	1 1/2"	1	1 1/2"	No	70.77	345.72	310.41	14.7
STN-14, 9.0'-10.5'	60° C	1365	10/13/09		No. 4			Yes	20.92	300.44	261.67	16.1
STN-14, 10.5'-12.0'	60° C	1366	10/13/09		3/8"			No	70.49	355.26	306.09	20.9
STN-14, 12.0'-13.5'	60° C	1367	10/13/09		3/4"			No	71.49	357.48	317.02	16.5
STN-14, 13.5'-15.0'	60° C	1368	10/13/09		3/8"			No	43.73	276.50	239.37	19.0
STN-14, 15.0'-16.5'	60° C	1369	10/13/09		3/8"			No	47.35	241.72	211.40	18.5
STN-14, 16.5'-18.0'	60° C	1370	10/13/09		3/4"			No	40.54	215.54	195.52	12.9
STN-14, 18.0'-19.5'	60° C	1371	10/13/09		3/4"			No	39.44	223.63	198.08	16.1
STN-14, 19.5'-21.0'	60° C	1372	10/13/09		3/4"			No	71.96	408.70	381.54	8.8
STN-14, 21.0'-22.5'	60° C	1373	10/13/09		3/4"			No	74.54	432.90	385.89	15.1
STN-14, 22.5'-24.0'	60° C	1374	10/13/09		3/8"			No	75.70	417.90	372.64	15.2
STN-14, 24.0'-25.5'	60° C	1375	10/13/09		3/8"			No	75.95	477.00	420.05	16.6
STN-14, 25.5'-27.0'	60° C	1376	10/13/09		3/8"			No	76.62	423.00	374.54	16.3
STN-14, 27.0'-28.5'	60° C	1377	10/13/09		3/8"			No	72.75	384.02	321.99	24.9
STN-14, 28.5'-30.0'	60° C	1378	10/13/09		3/8"			No	71.39	335.33	295.17	17.9
STN-14, 30.0'-31.5'	60° C	1380	10/13/09		3/8"			No	72.68	358.49	311.75	19.6
STN-14, 31.5'-33.0'	60° C	1381	10/13/09		3/4"			No	70.40	302.32	264.77	19.3
STN-14, 33.0'-34.5'	60° C	1382	10/13/09		3/4"			No	70.96	304.59	267.25	19.0
STN-14, 34.5'-36.0'	60° C	1383	10/13/09	Hom	No. 10			Yes	74.88	340.55	266.27	38.8
STN-14, 36.0'-37.5'	60° C	1384	10/13/09	Hom	No. 10			Yes	73.93	450.40	336.60	43.3
STN-14, 37.5'-39.0'	60° C	1385	10/13/09		No. 10			Yes	73.52	504.40	388.91	36.6
STN-14, 39.0'-40.5'	60° C	1386	10/13/09		No. 10			Yes	71.58	440.70	340.00	37.5
STN-14, 40.5'-42.0'	60° C	1387	10/13/09		No. 10			Yes	74.33	474.90	292.41	83.7
STN-14, 42.0'-43.5'	60° C	1388	10/13/09		No. 10			Yes	75.37	486.60	313.90	72.4
STN-14, 43.5'-45.0'	60° C	1389	10/13/09		No. 10			Yes	70.84	513.40	379.56	43.4
STN-14, 45.0'-46.5'	60° C	1390	10/13/09		No. 4			Yes	71.21	373.62	256.76	63.0

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-14, 46.5'-48.0'	60° C	1391	10/13/09		No. 4			Yes	75.82	496.50	332.32	64.0
STN-14, 48.0'-49.5'	60° C	1392	10/13/09		No. 4			Yes	72.72	431.80	307.78	52.8
STN-14, 49.5'-51.0'	60° C	1393	10/13/09		No. 4			Yes	73.05	425.00	314.28	45.9
STN-14, 51.0'-52.5'	60° C	1394	10/13/09		No. 10			Yes	47.19	284.45	222.35	35.5
STN-14, 52.5'-54.0'	60° C	1395	10/13/09		No. 10			Yes	44.31	290.64	227.34	34.6
STN-14, 54.0'-55.5'	60° C	1396	10/13/09		No. 10			Yes	44.58	288.09	223.50	36.1
STN-14, 55.5'-57.0'	60° C	1397	10/13/09		No. 10			Yes	44.72	408.00	310.10	36.9
STN-14, 57.0'-58.5'	60° C	1398	10/13/09		No. 10			Yes	46.59	310.69	219.90	52.4
STN-14, 58.5'-60.0'	60° C	1399	10/13/09		No. 10			Yes	44.03	374.88	256.26	55.9
STN-14, 60.0'-61.5'	60° C	1400	10/13/09		No. 10			Yes	45.28	353.05	262.14	41.9
STN-14, 61.5'-63.0'	60° C	1401	10/13/09		No. 10			Yes	47.19	378.75	283.44	40.3
STN-14, 63.0'-64.5'	60° C	1402	10/13/09	Hom	No. 10			Yes	44.16	318.33	273.59	19.5
STN-14, 64.5'-66.0'		1403	10/13/09	Hom	No. 10			Yes	43.68	377.67	317.16	22.1
STN-14, 66.0'-67.5'		1404	10/13/09		No. 10			Yes	49.26	355.63	296.79	23.8
STN-14, 67.5'-69.0'		1405	10/13/09		No. 10			Yes	48.01	381.64	317.99	23.6
STN-14, 69.0'-70.5'		1406	10/13/09		No. 10			Yes	43.93	350.39	287.97	25.6
STN-14, 70.5'-72.0'		1407	10/13/09		No. 10			Yes	40.45	303.28	251.63	24.5
STN-14, 72.0'-73.5'		1408	10/13/09						44.12	459.80	378.94	24.2
STN-14, 73.5'-75.0'		1409	10/13/09		No. 10			Yes	44.17	412.20	342.38	23.4
STN-14, 75.0'-76.5'		1410	10/13/09		No. 10			Yes	45.10	408.00	333.71	25.7
STN-14, 76.5'-78.0'		1411	10/13/09		No. 10			Yes	44.46	362.14	292.42	28.1
STN-14, 78.0'-79.5'		1413	10/13/09		No. 10			Yes	43.83	414.10	332.52	28.3
STN-14, 79.5'-81.0'		1414	10/13/09		No. 10			Yes	44.95	327.26	255.97	33.8
STN-14, 81.0'-82.5'		1415	10/13/09		1 1/2"	1	1 1/2"	No	43.81	359.05	269.62	39.6
STN-14, 82.5'-84.0'		1416	10/13/09		1 1/2"	1	1 1/2"	No	49.10	364.70	303.83	23.9
STN-14, 84.0'-84.3'		1417	10/13/09		3/4"			No	43.70	279.85	258.54	9.9

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-15, 0.0'-1.5'	**60° C**	87	7/8/09		1 1/2"			No	21.64	90.66	79.63	19.0
STN-15, 1.5'-3.0'	**60° C**	88	7/8/09		3/8"			No	18.74	66.02	56.16	26.3
STN-15, 3.0'-4.5'	**60° C**	89	7/8/09		3/8"			No	21.29	91.42	74.83	31.0
STN-15, 4.5'-6.0'	**60° C**	90	7/9/09		3/4"			No	19.40	80.26	67.84	25.6
STN-15, 6.0'-7.5'	**60° C**	91	7/9/09		3/8"			No	19.40	91.23	78.14	22.3
STN-15, 7.5'-9.0'	**60° C**	92	7/9/09		3/4"			No	22.93	101.12	82.10	32.1
STN-15, 9.0'-10.5'	**60° C**	93	7/9/09		3/8"			No	22.02	95.23	74.39	39.8
STN-15, 10.5'-12.0'	**60° C**	94	7/9/09		3/8"			No	27.38	129.35	103.06	34.7
STN-15, 12.0'-13.5'	**60° C**	95	7/9/09		3/4"			No	22.12	103.69	87.61	24.6
STN-15, 13.5'-15.0'	**60° C**	96	7/9/09		3/4"			No	22.10	164.57	143.73	17.1
STN-15, 15.0'-16.5'	**60° C**	97	7/9/09		3/4"			No	18.71	120.89	101.88	22.9
STN-15, 16.5'-18.0'	**60° C**	98	7/9/09		3/8"			No	18.85	116.69	92.27	33.3
STN-15, 19.0'-20.5'	**60° C**	99	7/9/09		1 1/2"			No	21.79	138.23	119.81	18.8
STN-15, 20.5'-22.0'	**60° C**	100	7/9/09		3/4"			No	21.57	136.94	120.28	16.9
STN-15, 22.0'-23.5'	**60° C**	101	7/9/09		3/4"			No	22.16	139.05	124.94	13.7
STN-15, 23.5'-25.0'	**60° C**	102	7/9/09		1 1/2"			No	22.67	151.85	133.81	16.2
STN-15, 25.0'-26.5'	**60° C**	103	7/9/09		3/4"			No	22.82	136.80	116.75	21.3
STN-15, 26.5'-28.0' Jar rec'd broken	**60° C**	104	7/9/09		No. 4			No	22.92	107.93	85.84	35.1
STN-15, 28.0'-29.5'	**60° C**	105	7/9/09		No. 4			No	21.83	126.52	93.44	46.2
STN-15, 29.5'-31.0'	**60° C**	106	7/9/09		No. 4			No	21.56	100.64	73.52	52.2
STN-15, 31.0'-32.5'	**60° C**	107	7/9/09		No. 4			No	21.54	99.46	71.82	55.0
STN-15, 32.5'-34.0'		108	7/8/09	Len	3/8"			No	21.49	103.09	87.18	24.2
STN-15, 34.0'-35.5'		109	7/8/09	Len	3/4"			No	21.99	102.00	85.80	25.4
STN-15, 35.5'-37.0'		110	7/8/09	Hom	No. 4			No	22.13	105.74	90.04	23.1
STN-15, 37.0'-38.5'		111	7/8/09	Hom	No. 4			No	22.26	108.69	93.55	21.2
STN-15, 38.5'-40.0'		112	7/8/09	Hom	No. 10			Yes	22.76	108.54	92.75	22.6
STN-15, 40.0'-41.5'		113	7/8/09		No. 4			No	21.55	119.05	99.73	24.7
STN-15, 41.5'-43.0'		114	7/8/09		No. 4			No	22.26	114.77	97.32	23.2
STN-15, 43.0'-44.5'		115	7/8/09		No. 10			Yes	22.47	132.98	109.63	26.8
STN-15, 44.5'-46.0'		116	7/8/09		3/8"			No	24.07	124.32	103.13	26.8
STN-15, 46.0'-47.5'		117	7/8/09		No. 10			Yes	20.54	135.63	109.88	28.8

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded		Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
					Amount	Size					
STN-15, 47.5'-49.0'	118	7/8/09		1 1/2"			No	22.47	115.67	105.24	12.6
STN-15, 49.0'-50.5'	119	7/8/09		1 1/2"			No	22.61	140.43	125.90	14.1
STN-15, 50.5'-51.3'	120	7/8/09		1 1/2"			No	21.28	128.56	112.65	17.4

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Moisture Content of Soil

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Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-16, 0.0'-1.5'	121	7/8/09	Str	3/4"			No	22.46	133.23	119.73	13.9
STN-16, 1.5'-3.0'	122	7/8/09	Hom	3/8"			No	21.85	110.59	95.76	20.1
STN-16, 3.0'-4.5'	123	7/8/09	Hom	1 1/2"			No	22.47	123.04	107.99	17.6
STN-16, 4.5'-6.0'	124	7/8/09	Len	1 1/2"			No	21.06	115.52	99.28	20.8
STN-16, 6.0'-7.5'	125	7/8/09		1 1/2"	2	3/4"	No	22.03	131.34	109.99	24.3
STN-16, 7.5'-9.0' **60° C**	126	7/8/09		1 1/2"			No	21.86	139.58	115.63	25.5
STN-16, 9.0'-10.5' **60° C**	127	7/8/09		1 1/2"			No	21.04	125.57	101.38	30.1
STN-16, 10.5'-12.0'	128	7/8/09		No. 10			Yes	19.18	98.74	77.88	35.5
STN-16, 12.0'-13.5' **60° C**	129	7/8/09		No. 10			Yes	22.80	92.63	69.68	49.0
STN-16, 13.5'-15.0'	130	7/8/09		No. 10			Yes	21.24	108.39	79.65	49.2
STN-16, 15.0'-16.5'	131	7/9/09	Str	No. 4			No	20.80	88.16	70.55	35.4
STN-16, 16.5'-18.0'	132	7/9/09	Str	1 1/2"			No	19.29	100.42	84.86	23.7
STN-16, 18.0'-19.5' **60° C**	133	7/9/09	Str	No. 10			Yes	22.70	120.04	97.28	30.5
STN-16, 19.5'-21.0' **60° C**	134	7/9/09	Hom	No. 4			No	21.38	102.65	86.30	25.2
STN-16, 21.0'-22.5'	135	7/9/09	Len	No. 4			No	19.30	104.88	87.83	24.9
STN-16, 22.5'-24.0'	136	7/9/09	Len	3/8"			No	22.26	105.22	89.97	22.5
STN-16, 24.0'-25.5'	137	7/9/09	Len	No. 4			No	20.86	95.67	82.19	22.0
STN-16, 25.5'-27.0'	138	7/9/09	Hom	No. 10			Yes	21.50	104.16	88.13	24.1
STN-16, 27.0'-28.5'	139	7/9/09	Len	No. 4			No	19.28	89.73	75.75	24.8
STN-16, 28.5'-30.0'	140	7/9/09	Len	No. 4			No	20.44	94.76	80.24	24.3
STN-16, 30.0'-31.5'	141	7/9/09	Len	3/4"			No	20.77	103.84	86.81	25.8
STN-16, 31.5'-33.0'	142	7/9/09	Len	No. 4			No	21.99	112.21	94.43	24.5
STN-16, 33.0'-34.5'	143	7/9/09	Hom	No. 10			Yes	22.80	138.42	115.28	25.0
STN-16, 34.5'-36.0'	144	7/9/09	Hom	No. 10			Yes	21.05	127.15	105.86	25.1
STN-16, 36.0'-37.5'	145	7/9/09	Hom	No. 10			Yes	21.49	104.68	87.60	25.8
STN-16, 37.5'-39.0'	146	7/9/09	Hom	No. 10			Yes	19.39	110.87	92.10	25.8
STN-16, 39.0'-40.5'	147	7/9/09	Str	No. 4			No	22.02	143.12	113.48	32.4
STN-16, 40.5'-42.0'	148	7/9/09		1 1/2"			No	22.99	139.90	128.01	11.3
STN-16, 42.0'-42.7'	149	7/9/09		1 1/2"			No	19.34	116.72	104.23	14.7

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-18, 0.0'-1.5'		1486	10/19/09	Len	3/4"			No	47.73	323.06	284.99	16.0
STN-18, 1.5'-3.0'	60° C	1487	10/19/09	Str	3/4"			No	43.30	233.84	206.61	16.7
STN-18, 3.0'-4.5'	60° C	1488	10/19/09		3/4"			No	43.68	224.71	195.18	19.5
STN-18, 4.5'-6.0'	60° C	1489	10/19/09		3/8"			No	39.38	182.57	157.39	21.3
STN-18, 6.0'-7.5'	60° C	1490	10/19/09		3/4"			No	39.51	198.76	168.25	23.7
STN-18, 7.5'-9.0'	60° C	1491	10/19/09		3/4"			No	44.66	259.48	217.83	24.1
STN-18, 9.0'-10.5'	60° C	1493	10/19/09		1 1/2"	1	1 1/2"	No	43.82	284.75	260.26	11.3
STN-18, 10.5'-12.0'	60° C	1494	10/19/09		3/4"			No	45.15	239.25	200.67	24.8
STN-18, 12.0'-13.5'	60° C	1495	10/19/09		3/4"			No	49.38	301.30	265.01	16.8
STN-18, 13.5'-15.0'	60° C	1496	10/19/09		3/4"			No	44.92	298.09	265.82	14.6
STN-18, 15.0'-16.5'	60° C	1497	10/19/09		3/4"			No	43.75	335.53	286.47	20.2
STN-18, 16.5'-18.0'	60° C	1498	10/19/09		3/8"			No	48.31	368.51	292.70	31.0
STN-18, 18.0'-19.5'	60° C	1499	10/19/09		No. 4			Yes	48.02	424.60	332.01	32.6
STN-18, 19.5'-21.0'	60° C	1501	10/19/09		1 1/2"	1	1 1/2"	No	76.61	189.64	164.40	28.8
STN-18, 21.0'-22.5'	60° C	1502	10/19/09		1 1/2"	1	1 1/2"	No	71.39	277.54	232.45	28.0
STN-18, 22.5'-24.0'	60° C	1503	10/19/09		1 1/2"	1	1 1/2"	No	49.67	269.56	222.06	27.6
STN-18, 24.0'-25.5'	60° C	1504	10/19/09		3/4"			No	44.57	357.90	289.10	28.1
STN-18, 25.5'-27.0'	60° C	1505	10/19/09		3/4"			No	43.71	283.19	232.91	26.6
STN-18, 27.0'-28.5'	60° C	1506	10/19/09		1 1/2"	1	1 1/2"	No	46.63	255.52	216.21	23.2
STN-18, 28.5'-30.0'	60° C	1507	10/19/09		1 1/2"	1	1 1/2"	No	43.50	434.00	366.70	20.8
STN-18, 30.0'-31.5'	60° C	1508	10/19/09		1 1/2"	1	1 1/2"	No	39.50	340.22	284.28	22.9
STN-18, 31.5'-33.0'	60° C	1509	10/19/09		3/4"			No	43.54	231.85	181.98	36.0
STN-18, 33.0'-34.5'	60° C	1510	10/19/09		1 1/2"	1	1 1/2"	No	48.28	384.62	299.30	34.0
STN-18, 34.5'-36.0'	60° C	1511	10/19/09		3/4"			No	43.98	185.80	161.32	20.9
STN-18, 36.0'-37.5'	60° C	1512	10/20/09		3/4"			No	43.89	360.85	301.63	23.0
STN-18, 37.5'-39.0'		1513	10/20/09		3/4"			No	44.56	356.79	299.59	22.4
STN-18, 39.0'-40.5'		1515	10/20/09	Hom	No. 10			Yes	43.56	310.48	255.89	25.7
STN-18, 40.5'-42.0'		1516	10/20/09	Hom	No. 10			Yes	43.56	270.26	225.57	24.6
STN-18, 42.0'-43.5'		1517	10/20/09		3/8"			No	47.00	340.42	275.71	28.3
STN-18, 43.5'-45.0'		1518	10/20/09		No. 10			Yes	41.44	271.87	223.24	26.7
STN-18, 45.0'-46.5'		1519	10/20/09	Len	No. 4			Yes	44.67	351.80	293.13	23.6

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-18, 46.5'-48.0'	1520	10/20/09		3/8"			No	50.81	323.19	272.97	22.6
STN-18, 48.0'-49.5'	1521	10/20/09		3/4"			No	49.49	352.56	298.73	21.6
STN-18, 49.5'-51.0'	1522	10/20/09		3/4"			No	46.81	417.70	361.05	18.0
STN-18, 51.0'-52.5'	1523	10/20/09		1 1/2"	1	1 1/2"	No	44.38	381.87	335.94	15.8

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-19, 0.0'-1.5'	1524	10/9/09	Len	3/4"			No	21.71	103.44	91.30	17.4
STN-19, 1.5'-3.0'	1525	10/9/09	Len	3/8"			No	22.49	110.02	93.09	24.0
STN-19, 3.0'-4.5'	1526	10/9/09	Hom	3/4"			No	23.43	123.77	108.18	18.4
STN-19, 4.5'-6.0'	1527	10/9/09	Hom	3/8"			No	21.32	116.16	99.85	20.8
STN-19, 6.0'-7.5'	1528	10/9/09	Len	3/8"			No	21.55	116.33	99.22	22.0
STN-19, 7.5'-9.0'	1529	10/9/09		3/4"			No	21.60	123.56	102.51	26.0
STN-19, 9.0'-10.5' 60° C	1530	10/9/09		1 1/2"	1	1 1/2"	No	21.37	130.62	109.61	23.8
STN-19, 10.5'-12.0' 60° C	1531	10/9/09		3/4"	4	3/4"	No	21.47	124.83	107.66	19.9
STN-19, 12.0'-13.5'	1532	10/9/09		1 1/2"	2	1 1/2"	No	21.34	135.45	116.00	20.5
STN-19, 13.5'-15.0'	1533	10/9/09		1 1/2"	1	1 1/2"	No	21.63	124.99	108.80	18.6
STN-19, 15.0'-16.5'	1534	10/9/09		1 1/2"	1	1 1/2"	No	28.14	138.99	120.02	20.6
STN-19, 16.5'-18.0'	1535	10/9/09		1 1/2"	3	1 1/2"	No	21.56	144.55	122.21	22.2
STN-19, 18.0'-19.5'	1536	10/9/09		1 1/2"	1	1 1/2"	No	23.32	134.34	112.96	23.9
STN-19, 19.5'-21.0'	1537	10/9/09		3/8"			No	22.46	133.96	113.31	22.7
STN-19, 21.0'-22.5'	1538	10/9/09	Len	No. 10			Yes	22.01	116.92	97.42	25.9
STN-19, 22.5'-24.0'	1539	10/9/09	Hom	No. 10			Yes	21.74	112.47	95.24	23.4
STN-19, 24.0'-25.5'	1540	10/9/09	Hom	No. 10			Yes	21.45	109.59	94.16	21.2
STN-19, 25.5'-27.0'	1541	10/9/09	Hom	No. 10			Yes	22.89	116.49	99.99	21.4
STN-19, 27.0'-28.5'	1543	10/9/09	Hom	No. 10			Yes	29.26	141.47	122.53	20.3
STN-19, 28.5'-30.0'	1544	10/9/09	Len	No. 10			Yes	27.03	143.58	123.55	20.8
STN-19, 30.0'-31.5'	1545	10/9/09	Len	No. 10			Yes	20.97	127.98	110.20	19.9
STN-19, 31.5'-33.0'	1546	10/9/09		No. 10			Yes	23.34	149.22	124.02	25.0
STN-19, 33.0'-34.5'	1547	10/9/09	Len	No. 10			Yes	26.68	140.92	122.59	19.1
STN-19, 34.5'-36.0'	1548	10/9/09		No. 10			Yes	21.24	133.46	113.70	21.4
STN-19, 36.0'-37.5'	1549	10/12/09		No. 10			Yes	22.97	139.95	119.62	21.0
STN-19, 37.5'-39.0'	1550	10/12/09		No. 10			Yes	22.76	156.54	131.26	23.3
STN-19, 39.0'-40.5'	1551	10/12/09		3/4"			No	22.96	171.32	144.01	22.6
STN-19, 40.5'-42.0'	1552	10/12/09		1 1/2"	1	1 1/2"	No	19.21	120.33	107.29	14.8
STN-19, 42.0'-43.5'	1553	10/12/09		1 1/2"	1	1 1/2"	No	21.64	157.40	138.60	16.1
STN-19, 43.5'-44.8'	1554	10/12/09		1 1/2"	5	1 1/2"	No	21.99	139.21	125.08	13.7

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-20, 0.0'-1.5'	**60° C**	187	7/9/09	Str	3/8"			No	20.88	85.65	77.39	14.6
STN-20, 1.5'-3.0'	**60° C**	188	7/9/09		3/8"			No	19.14	71.39	63.50	17.8
STN-20, 3.0'-4.5'	**60° C**	189	7/9/09		3/8"			No	21.65	96.04	84.83	17.7
STN-20, 4.5'-6.0'	**60° C**	190	7/9/09		3/4"			No	20.84	74.87	68.58	13.2
STN-20, 6.0'-7.5'	**60° C**	191	7/9/09		3/8"			No	22.36	90.64	81.36	15.7
STN-20, 7.5'-9.0'	**60° C**	192	7/9/09		3/4"			No	19.99	75.75	68.41	15.2
STN-20, 9.0'-10.5'	**60° C**	193	7/9/09		3/4"			No	18.80	81.50	71.29	19.5
STN-20, 10.5'-12.0'	**60° C**	194	7/9/09		3/4"			No	21.45	104.28	90.44	20.1
STN-20, 12.0'-13.5'	**60° C**	195	7/9/09		3/4"			No	21.50	111.00	91.94	27.1
STN-20, 13.5'-15.0'	**60° C**	196	7/9/09		3/8"			No	22.08	131.17	105.19	31.3
STN-20, 15.0'-16.5'	**60° C**	197	7/9/09		3/8"			No	20.05	103.73	81.94	35.2
STN-20, 16.5'-18.0'	**60° C**	198	7/9/09		No. 4			No	18.76	95.51	73.96	39.0
STN-20, 18.0'-19.5'	**60° C**	199	7/9/09		No. 4			No	19.54	106.88	82.78	38.1
STN-20, 19.5'-21.0'	**60° C**	200	7/9/09		No. 10			Yes	19.21	114.58	89.02	36.6
STN-20, 21.0'-22.5'	**60° C**	201	7/9/09		No. 10			Yes	22.60	138.06	108.97	33.7
STN-20, 22.5'-24.0'	**60° C**	202	7/9/09		No. 10			Yes	20.94	108.05	81.88	42.9
STN-20, 26.0'-27.5'	**60° C**	203	7/9/09		No. 10			Yes	21.37	128.31	97.18	41.1
STN-20, 27.5'-29.0'	**60° C**	204	7/9/09		No. 10			Yes	19.02	105.35	81.27	38.7
STN-20, 31.0'-32.5'	**60° C**	205	7/9/09		No. 10			Yes	21.67	123.95	93.75	41.9
STN-20, 32.5'-34.0'	**60° C**	206	7/9/09		No. 10			Yes	20.13	109.05	83.02	41.4
STN-20, 34.0'-35.5'	**60° C**	207	7/9/09		No. 10			Yes	19.66	114.46	88.24	38.2
STN-20, 35.5'-37.0'	**60° C**	208	7/9/09		No. 10			Yes	21.42	130.83	99.76	39.7
STN-20, 37.0'-38.5'	**60° C**	209	7/9/09		No. 10			Yes	19.99	106.16	80.63	42.1
STN-20, 38.5'-40.0'	**60° C**	210	7/9/09		No. 10			Yes	21.62	113.05	89.08	35.5
STN-20, 40.0'-41.5'	**60° C**	211	7/9/09		No. 10			Yes	21.61	130.33	100.64	37.6
STN-20, 41.5'-42.2	**60° C**	212	7/9/09		No. 10			Yes	20.97	104.12	80.01	40.8
STN-20, 42.2'-43.0'	**60° C**	212A	7/9/09	Hom	No. 10			Yes	19.17	111.59	85.96	38.4
STN-20, 43.0'-44.5'		213	7/9/09	Hom	No. 10			Yes	19.59	97.53	80.41	28.1
STN-20, 46.5'-48.0'		214	7/9/09	Hom	No. 10			Yes	18.94	99.73	84.99	22.3
STN-20, 48.0'-49.5'		215	7/9/09	Hom	No. 10			Yes	19.54	105.03	89.63	22.0
STN-20, 51.5'-53.0'		216	7/9/09		3/4"			No	22.13	133.47	119.34	14.5

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-21, 0.0'-1.5'	60° C	217	7/9/09		1 1/2"			No	23.99	130.46	118.54	12.6
STN-21, 1.5'-3.0'	60° C	218	7/9/09		3/4"			No	20.90	100.86	87.76	19.6
STN-21, 3.0'-4.5'	60° C	219	7/9/09		3/4"			No	21.26	117.77	104.16	16.4
STN-21, 4.5'-6.0'	60° C	220	7/9/09		3/4"			No	22.49	128.48	105.67	27.4
STN-21, 6.0'-7.5'	60° C	221	7/9/09		3/4"			No	43.72	231.37	187.13	30.8
STN-21, 7.5'-9.0'	NO SAMPLE	222	7/9/09									
STN-21, 9.0'-10.5'	NO SAMPLE	223	7/9/09									
STN-21, 10.5'-12.0'	60° C	224	7/9/09		3/8"			No	46.59	292.35	213.46	47.3
STN-21, 12.0'-12.8'	60° C	225	7/9/09		3/4"			No	38.42	207.08	166.74	31.4
STN-21, 12.8'-13.5'	60° C	225A	7/9/09		No. 10			Yes	47.27	259.47	200.63	38.4
STN-21, 13.5'-15.0'	60° C	226	7/9/09		No. 10			Yes	48.06	258.68	201.00	37.7
STN-21, 15.0'-16.5'	60° C	227	7/9/09	Hom	No. 10			Yes	45.30	355.23	258.39	45.4
STN-21, 16.5'-18.0'	60° C	228	7/9/09		3/8"			No	47.17	253.96	196.70	38.3
STN-21, 18.0'-19.5'	60° C	229	7/9/09		No. 10			Yes	43.61	219.68	184.90	24.6
STN-21, 19.5'-21.0'	60° C	230	7/9/09	Hom	No. 10			Yes	44.24	288.93	241.19	24.2
STN-21, 21.0'-22.5'	60° C	231	7/9/09	Hom	No. 10			Yes	43.58	281.32	236.34	23.3
STN-21, 22.5'-24.0'	60° C	232	7/9/09	Hom	No. 10			Yes	44.46	335.55	285.97	20.5
STN-21, 24.0'-25.5'	60° C	233	7/9/09		No. 10			Yes	49.37	292.52	246.35	23.4
STN-21, 25.5'-27.0'		234	7/9/09		No. 10			Yes	44.20	268.39	224.46	24.4
STN-21, 27.0'-28.5'		235	7/9/09		No. 10			Yes	28.46	264.69	217.03	25.3
STN-21, 28.5'-30.0'		236	7/9/09		No. 10			Yes	39.76	272.90	230.18	22.4
STN-21, 30.0'-31.5'		237	7/9/09		No. 10			Yes	29.72	313.29	260.86	22.7
STN-21, 31.5'-33.0'		238	7/9/09		No. 10			Yes	43.69	306.72	255.82	24.0
STN-21, 33.0'-34.5'		239	7/9/09		No. 10			Yes	43.97	345.46	287.24	23.9
STN-21, 34.5'-36.0'		240	7/9/09		No. 10			Yes	46.44	318.86	263.91	25.3
STN-21, 36.0'-37.5'		241	7/9/09		No. 10			Yes	43.92	353.27	292.63	24.4
STN-21, 37.5'-39.0'		242	7/10/09		No. 10			Yes	44.48	303.65	250.87	25.6
STN-21, 39.0'-40.5'		243	7/10/09		No. 10			Yes	44.15	289.84	246.05	21.7
STN-21, 40.5'-41.2'		244A	7/10/09		No. 4			Yes	48.76	284.72	242.38	21.9
STN-21, 41.2'-42.0'		244B	7/10/09		1 1/2"			No	43.18	260.46	232.91	14.5
STN-21, 42.0'-43.5'		245	7/10/09		1 1/2"			No	43.90	321.51	290.01	12.8

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-21, 43.5'-44.5'	246A	7/10/09		1 1/2"			No	43.77	258.49	237.16	11.0
STN-21, 44.5'-45.0'	246B	7/10/09		No. 4			Yes	47.06	212.22	197.64	9.7

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-22, 0.0'-1.5'	247	7/10/09		3/4"			No	43.81	232.62	200.57	20.4
STN-22, 1.5'-3.0'	248	7/10/09		3/4"			No	46.66	251.00	221.91	16.6
STN-22, 3.0'-4.5'	249	7/10/09		3/4"			No	44.49	297.04	250.14	22.8
STN-22, 4.5'-6.0'	250	7/10/09	Len	3/8"			No	44.13	249.90	209.35	24.5
STN-22, 6.0'-7.5'	251	7/10/09	Hom	No. 4			Yes	44.35	300.69	251.83	23.5
STN-22, 7.5'-9.0'	252	7/10/09	Hom	No. 10			Yes	49.18	306.56	258.84	22.8
STN-22, 9.0'-10.5'	253	7/10/09	Hom	No. 10			Yes	44.44	288.54	245.23	21.6
STN-22, 10.5'-12.0'	254	7/10/09	Hom	No. 10			Yes	44.29	302.04	256.70	21.3
STN-22, 12.0'-13.5'	255	7/10/09	Hom	No. 10			Yes	44.06	297.87	251.69	22.2
STN-22, 13.5'-15.0'	256	7/10/09	Hom	No. 10			Yes	27.31	139.48	117.23	24.7
STN-22, 15.0'-16.5' No Sample	257	7/10/09									
STN-22, 16.5'-18.0'	258	7/10/09	Hom	1 1/2"			No	29.06	151.73	128.88	22.9
STN-22, 18.0'-19.5'	259	7/10/09	Hom	No. 10			Yes	17.97	128.06	108.25	21.9
STN-22, 19.5'-21.0'	260	7/10/09		No. 10			Yes	26.47	168.62	142.46	22.6
STN-22, 21.0'-22.5'	261	7/10/09		No. 10			Yes	27.14	173.69	145.98	23.3
STN-22, 22.5'-24.0'	262	7/10/09	Hom	No. 10			Yes	43.75	347.36	284.34	26.2
STN-22, 24.0'-25.5'	263	7/10/09	Hom	No. 10			Yes	44.17	324.24	270.08	24.0
STN-22, 25.5'-27.0'	264	7/10/09	Hom	No. 10			Yes	43.27	321.07	265.54	25.0
STN-22, 27.0'-28.5'	265	7/10/09		No. 10			Yes	28.62	269.89	215.06	29.4
STN-22, 28.5'-30.0'	266	7/10/09		No. 10			Yes	38.95	297.20	245.37	25.1
STN-22, 30.0'-31.5'	267	7/10/09		3/4"			No	39.02	268.87	224.55	23.9
STN-22, 31.5'-33.0'	268	7/10/09		1 1/2"			No	44.05	312.72	287.87	10.2
STN-22, 33.0'-34.5'	269	7/10/09		1 1/2"			No	49.51	307.57	285.84	9.2

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-23, 0.0'-1.5'		1681	9/24/09	Hom	3/8"			No	43.75	213.61	188.80	17.1
STN-23, 1.5'-3.0'		1682	9/24/09	Hom	3/8"			No	43.90	203.51	172.99	23.6
STN-23, 3.0'-4.5'		1684	9/24/09	Hom	3/4"			No	44.61	129.85	111.03	28.3
STN-23, 4.5'-6.0'		1685	9/24/09	Hom	3/4"			No	44.41	178.12	155.04	20.9
STN-23, 6.0'-7.5'		1686	9/24/09	Hom	3/4"			No	43.61	192.86	161.41	26.7
STN-23, 7.5'-9.0'		1687	9/24/09	Hom	3/4"			No	48.64	210.88	178.65	24.8
STN-23, 9.0'-10.5'		1688	9/24/09	Hom	3/8"			No	46.61	165.50	146.73	18.7
STN-23, 10.5'-12.0'	60° C	1689	9/25/09	Hom	3/4"			No	39.27	176.16	159.84	13.5
STN-23, 12.0'-13.5'	60° C	1690	9/25/09	Hom	3/4"			No	43.83	175.80	157.06	16.6
STN-23, 13.5'-15.0'	60° C	1691	9/25/09	Hom	3/8"			No	49.50	151.50	134.84	19.5
STN-23, 15.0'-16.5'	60° C	1692	9/25/09	Hom	3/8"			No	44.43	151.52	128.95	26.7
STN-23, 16.5'-18.0'	60° C	1693	9/25/09	Hom	No. 4			No	47.47	161.42	145.21	16.6
STN-23, 18.0'-19.5'	60° C	1694	9/25/09	Hom	3/8"			No	44.22	151.55	129.63	25.7
STN-23, 19.5'-21.0'	60° C	1695	9/25/09	Hom	No. 4			Yes	49.95	175.47	150.73	24.5
STN-23, 21.0'-22.5'	60° C	1696	9/25/09	Hom	No. 4			No	38.72	139.42	114.91	32.2
STN-23, 22.5'-24.0'	60° C	1697	9/25/09	Hom	No. 10			Yes	47.08	214.26	168.72	37.4
STN-23, 24.0'-25.5'	60° C	1698	9/25/09	Hom	No. 10			Yes	43.25	192.25	141.17	52.2
STN-23, 25.5'-27.0'	60° C	1699	9/25/09	Hom	No. 10			Yes	43.51	204.58	154.84	44.7
STN-23, 27.0'-28.5'	60° C	1700	9/25/09	Hom	No. 10			Yes	43.82	231.57	172.22	46.2
STN-23, 28.5'-30.0'	No Recovery	1701	10/1/09									
STN-23, 30.0'-31.5'	60° C	1702	9/25/09	Hom	No. 10			Yes	43.97	252.31	206.11	28.5
STN-23, 31.5'-33.0'	60° C	1703	9/25/09	Hom	No. 10			Yes	43.59	303.07	255.81	22.3
STN-23, 33.0'-34.5'	60° C	1705	9/25/09	Hom	No. 10			Yes	50.69	240.44	204.26	23.6
STN-23, 34.5'-36.0'	60° C	1706	9/25/09	Hom	No. 10			Yes	45.21	220.15	175.23	34.5
STN-23, 36.0'-37.5'	60° C	1707	9/25/09	Hom	No. 10			Yes	48.11	191.21	148.87	42.0
STN-23, 37.5'-39.0'	60° C	1708	9/25/09	Hom	No. 10			Yes	39.33	193.99	137.69	57.2
STN-23, 39.0'-40.5'	60° C	1709	9/25/09	Hom	3/8"			No	44.28	232.55	175.34	43.7
STN-23, 40.5'-42.0'	60° C	1710	9/25/09	Hom	3/8"			No	47.10	223.07	176.35	36.1
STN-23, 42.0'-43.5'	60° C	1711	9/25/09	Hom	No. 4			Yes	75.28	330.42	260.10	38.0
STN-23, 43.5'-45.0'	60° C	1712	9/25/09	Hom	No. 4			Yes	49.67	209.02	161.73	42.2
STN-23, 45.0'-46.5'	60° C	1713	9/25/09	Hom	3/8"			No	50.64	238.76	186.73	38.2

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-23, 46.5'-48.0'	60° C	1714	9/25/09	Hom	No. 4			Yes	71.43	323.74	260.31	33.6
STN-23, 48.0'-49.5'	60° C	1716	9/25/09	Hom	No. 10			Yes	44.28	239.81	192.14	32.2
STN-23, 49.5'-51.0'	60° C	1717	9/25/09	Hom	No. 10			Yes	70.06	311.17	250.04	34.0
STN-23, 51.0'-52.5'	60° C	1718	9/25/09	Hom	No. 10			Yes	70.61	284.22	228.29	35.5
STN-23, 52.5'-54.0'	60° C	1719	9/25/09	Hom	No. 10			Yes	71.45	282.69	225.01	37.6
STN-23, 54.0'-55.5'		1720	9/25/09	Hom	No. 10			Yes	45.71	202.86	172.40	24.0
STN-23, 55.5'-57.0'		1722	9/25/09	Hom	No. 10			Yes	44.02	222.58	185.04	26.6
STN-23, 57.0'-58.5'		1723	9/25/09	Hom	No. 4			Yes	71.71	224.95	196.58	22.7
STN-23, 58.5'-60.0'		1724	9/25/09	Hom	No. 4			Yes	44.32	208.40	177.44	23.3
STN-23, 60.0'-61.5'		1725	9/25/09	Hom	3/8"			No	74.97	288.33	250.48	21.6
STN-23, 61.5'-63.0'		1726	9/25/09	Hom	No. 4			Yes	71.46	329.23	283.66	21.5
STN-23, 63.0'-64.5'		1727	9/25/09	Hom	No. 4			Yes	72.15	343.92	297.78	20.4
STN-23, 64.5'-66.0'		1728	9/25/09	Hom	No. 4			Yes	70.10	320.80	268.84	26.1
STN-23, 66.0'-67.5'		1729	9/25/09	Hom	No. 4			Yes	75.33	356.96	296.69	27.2
STN-23, 67.5'-69.0'		1730	9/25/09	Hom	3/4"			No	70.00	385.30	339.42	17.0

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-24, 0.0'-1.5'	1731	10/5/09	Len	3/4"			No	43.78	310.15	262.51	21.8
STN-24, 1.5'-3.0'	1732	10/5/09	Len	3/8"			No	45.13	290.93	250.69	19.6
STN-24, 3.0'-4.5'	1733	10/5/09	Len	No. 4			Yes	46.25	290.32	248.41	20.7
STN-24, 4.5'-6.0'	1734	10/5/09	Len	No. 4			Yes	39.57	225.27	191.71	22.1
STN-24, 6.0'-7.5'	1735	10/5/09	Len	No. 4			Yes	45.18	314.59	265.38	22.3
STN-24, 7.5'-9.0'	1736	10/5/09	Len	No. 4			Yes	44.27	303.43	255.46	22.7
STN-24, 9.0'-10.5'	1737	10/5/09	Len	3/4"	2	3/4"	No	49.35	286.69	239.01	25.1
STN-24, 10.5'-12.0'	1738	10/5/09	Len	No. 4			Yes	43.96	283.84	232.00	27.6
STN-24, 12.0'-13.5'	1739	10/5/09	Len	3/4"	1	3/4"	No	47.71	351.01	290.56	24.9
STN-24, 13.5'-15.0' 60° C	1740	10/5/09		3/8"			No	44.31	351.99	260.25	42.5
STN-24, 15.0'-16.5' 60° C	1742	10/5/09		No. 4			Yes	46.11	285.09	209.69	46.1
STN-24, 16.5'-18.0' 60° C	1743	10/5/09		3/4"			No	43.95	142.23	110.73	47.2
STN-24, 18.0'-19.5' 60° C	1744	10/5/09		3/4"			No	43.86	163.34	128.05	41.9
STN-24, 19.5'-21.0' 60° C	1745	10/5/09		3/8"			No	43.98	208.48	153.84	49.7
STN-24, 21.0'-22.5' 60° C	1746	10/5/09		3/8"			No	46.09	208.88	165.84	35.9
STN-24, 22.5'-24.0' 60° C	1747	10/5/09		No. 4			Yes	49.97	318.85	264.56	25.3
STN-24, 24.0'-25.5'	1749	10/5/09	Len	No. 10			Yes	43.29	246.97	208.51	23.3
STN-24, 25.5'-27.0'	1750	10/5/09		No. 4			Yes	44.98	282.11	237.68	23.1
STN-24, 27.0'-28.5'	1751	10/5/09		No. 4			Yes	46.93	334.39	275.90	25.5
STN-24, 28.5'-30.0'	1752	10/5/09		No. 10			Yes	43.88	349.99	291.62	23.6
STN-24, 30.0'-31.5'	1753	10/5/09	Len	No. 10			Yes	47.66	290.04	240.16	25.9
STN-24, 31.5'-33.0'	1754	10/5/09	Hom	No. 4			Yes	43.71	299.55	248.68	24.8
STN-24, 33.0'-34.5'	1755	10/5/09	Hom	No. 10			Yes	34.87	294.60	231.06	32.4
STN-24, 34.5'-36.0'	1756	10/5/09	Hom	No. 10			Yes	40.19	231.52	183.77	33.3
STN-24, 36.0'-37.5'	1757	10/5/09	Hom	No. 10			Yes	43.68	317.78	253.53	30.6
STN-24, 37.5'-39.0'	1758	10/5/09	Hom	No. 10			Yes	43.81	277.27	226.33	27.9
STN-24, 39.0'-40.5'	1759	10/5/09	Hom	No. 10			Yes	49.27	294.23	243.78	25.9
STN-24, 40.5'-42.0'	1760	10/5/09	Hom	No. 10			Yes	44.06	325.09	275.21	21.6
STN-24, 42.0'-43.5'	1762	10/5/09	Hom	1 1/2"	1	1 1/2"	No	46.12	329.44	282.28	20.0
STN-24, 43.5'-44.5'	1763	10/5/09	Hom	3/4"			No	43.97	295.28	268.26	12.0

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-25, 0.0'-1.5'	60° C	1764	10/2/09	Hom	3/8"			No	74.45	246.50	222.86	15.9
STN-25, 1.5'-3.0'	60° C	1765	10/2/09	Hom	No. 4			Yes	47.04	181.41	158.69	20.3
STN-25, 3.0'-4.5'	60° C	1766	10/2/09	Hom	No. 4			No	45.07	160.74	136.50	26.5
STN-25, 4.5'-6.0'	60° C	1767	10/2/09	Hom	3/8"			No	69.68	216.23	189.46	22.3
STN-25, 6.0'-7.5'	60° C	1768	10/2/09	Hom	No. 4			No	40.34	151.43	127.62	27.3
STN-25, 7.5'-9.0'	60° C	1769	10/2/09	Hom	No. 4			No	45.42	149.57	133.22	18.6
STN-25, 9.0'-10.5'	60° C	1770	10/2/09	Hom	No. 4			Yes	74.61	291.87	253.21	21.6
STN-25, 10.5'-12.0'	60° C	1771	10/2/09	Hom	No. 4			Yes	73.17	280.60	232.90	29.9
STN-25, 12.0'-13.5'	60° C	1772	10/2/09	Hom	3/8"			No	43.74	166.87	143.01	24.0
STN-25, 13.5'-15.0'	60° C	1773	10/2/09	Hom	No. 4			Yes	74.64	264.49	219.19	31.3
STN-25, 15.0'-16.5'	60° C	1774	10/2/09	Hom	No. 4			No	43.87	191.85	142.07	50.7
STN-25, 16.5'-18.0'	60° C	1775	10/2/09	Hom	3/8"			No	71.31	255.30	196.50	47.0
STN-25, 18.0'-19.5'	60° C	1776	10/2/09	Hom	3/8"			No	46.51	223.36	173.42	39.4
STN-25, 19.5'-21.0'	60° C	1777	10/2/09	Hom	3/8"			No	73.76	294.42	225.78	45.2
STN-25, 21.0'-22.5'	60° C	1778	10/2/09	Hom	3/8"			No	44.32	219.73	166.97	43.0
STN-25, 22.5'-24.0'	60° C	1779	10/2/09	Hom	3/8"			No	74.93	329.94	267.15	32.7
STN-25, 24.0'-25.5'	60° C	1780	10/2/09	Hom	No. 4			Yes	43.57	266.14	207.39	35.9
STN-25, 25.5'-27.0'		1782	10/2/09	Hom	No. 10			Yes	70.30	322.17	266.55	28.3
STN-25, 27.0'-28.5'		1783	10/2/09	Hom	No. 10			Yes	74.23	188.94	163.70	28.2
STN-25, 28.5'-30.0'		1784	10/2/09	Hom	No. 10			Yes	70.52	214.76	178.17	34.0
STN-25, 30.0'-31.5'		1785	10/2/09	Hom	No. 10			Yes	75.44	364.27	235.67	80.3
STN-25, 31.5'-33.0'	60° C	1786	10/2/09	Hom	No. 4			Yes	72.81	259.34	177.68	77.9
STN-25, 33.0'-34.5'	60° C	1787	10/2/09	Hom	No. 10			Yes	72.84	270.84	179.79	85.1
STN-25, 34.5'-36.0'	60° C	1788	10/2/09	Hom	No. 10			Yes	75.78	244.06	188.34	49.5
STN-25, 36.0'-37.5'	60° C	1789	10/5/09		No. 10			Yes	74.24	317.18	225.34	60.8
STN-25, 37.5'-39.0'	60° C	1790	10/5/09		3/4"			No	72.15	399.82	290.24	50.2
STN-25, 39.0'-40.5'	60° C	1791	10/5/09		No. 4			Yes	71.20	412.30	286.22	58.6
STN-25, 40.5'-42.0'	60° C	1792	10/5/09		No. 4			Yes	48.59	235.90	181.57	40.9
STN-25, 42.0'-43.5'		1793	10/5/09	Len	No. 10			Yes	21.81	127.47	104.80	27.3
STN-25, 43.5'-45.0'		1794	10/5/09	Len	No. 10			Yes	22.58	117.24	97.55	26.3
STN-25, 45.0'-46.5'		1795	10/5/09	Hom	No. 10			Yes	20.74	100.50	84.62	24.9

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-25, 46.5'-48.0'	1796	10/5/09	Hom	No. 10			Yes	22.76	114.05	91.55	32.7
STN-25, 48.0'-49.5'	1797	10/5/09	Hom	No. 10			Yes	20.34	95.08	79.71	25.9
STN-25, 49.5'-51.0'	1798	10/5/09	Hom	No. 10			Yes	22.61	138.45	114.90	25.5
STN-25, 51.0'-52.5'	1799	10/5/09	Hom	No. 10			Yes	21.13	117.91	99.53	23.4
STN-25, 52.5'-54.0'	1800	10/5/09	Hom	No. 10			Yes	19.60	123.22	104.63	21.9
STN-25, 54.0'-55.5'	1801	10/5/09	Len	No. 4			No	22.32	133.80	114.07	21.5
STN-25, 55.5'-57.0'	1802	10/5/09	Str	No. 4			No	21.46	125.33	106.05	22.8
STN-25, 57.0'-58.5'	1803	10/5/09	Str	3/4"			No	22.01	137.10	114.92	23.9
STN-25, 58.5'-60.0'	1804	10/5/09		1 1/2"	1	1 1/2"	No	18.65	116.01	100.11	19.5

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-26, 0.0'-1.5'		1805	9/23/09	Hom	3/4"			No	74.05	218.51	194.78	19.7
STN-26, 1.5'-3.0'	60° C	1806	9/23/09	Hom	3/8"			No	70.73	289.61	251.65	21.0
STN-26, 3.0'-4.5'	60° C	1807	9/23/09	Hom	No. 4			Yes	73.76	323.14	268.20	28.3
STN-26, 4.5'-6.0'	60° C	1808	9/23/09	Hom	No. 10			Yes	74.16	345.67	282.60	30.3
STN-26, 6.0'-7.5'	60° C	1809	9/23/09	Hom	3/8"			No	75.37	302.45	273.84	14.4
STN-26, 7.5'-9.0'	60° C	1810	9/23/09	Hom	3/4"			No	70.48	279.04	248.16	17.4
STN-26, 9.0'-10.5'	60° C	1812	9/23/09	Hom	3/8"			No	44.73	156.62	141.86	15.2
STN-26, 10.5'-12.0'	60° C	1813	9/23/09	Hom	3/8"			No	43.84	206.18	166.30	32.6
STN-26, 12.0'-13.5'	60° C	1814	9/23/09	Hom	3/8"			No	43.67	244.22	181.26	45.8
STN-26, 13.5'-15.0'	60° C	1815	9/23/09	Hom	No. 10			Yes	44.61	204.47	160.22	38.3
STN-26, 15.0'-16.5'	60° C	1816	9/23/09	Hom	No. 10			Yes	43.97	210.11	150.53	55.9
STN-26, 16.5'-18.0'		1818	9/23/09	Hom	No. 10			Yes	39.13	214.23	170.89	32.9
STN-26, 18.0'-19.5'		1819	9/23/09	Hom	No. 10			Yes	49.93	236.59	174.17	50.2
STN-26, 19.5'-21.0'		1820	9/23/09	Hom	No. 10			Yes	44.42	294.77	219.36	43.1
STN-26, 21.0'-22.5'		1821	9/23/09	Hom	No. 4			No	49.12	191.84	142.37	53.1
STN-26, 22.5'-24.0'		1822	9/23/09	Hom	No. 4			Yes	43.76	247.00	166.56	65.5
STN-26, 24.0'-25.5'		1823	9/23/09	Hom	No. 10			Yes	43.46	203.03	146.15	55.4
STN-26, 25.5'-27.0'		1824	9/23/09	Hom	3/8"			No	46.11	179.86	151.41	27.0
STN-26, 27.0'-28.5'		1825	9/23/09	Hom	No. 4			Yes	43.21	258.53	213.31	26.6
STN-26, 28.5'-30.0'		1826	9/23/09	Hom	No. 4			Yes	46.22	260.34	212.87	28.5
STN-26, 30.0'-31.5'		1828	9/23/09	Hom	3/4"			No	43.70	283.00	237.00	23.8
STN-26, 31.5'-33.0'		1829	9/23/09	Hom	3/8"			No	43.32	269.89	215.14	31.9
STN-26, 33.0'-34.5'		1830	9/23/09	Len	3/8"			No	44.01	256.93	218.55	22.0
STN-26, 34.5'-36.0'		1831	9/23/09	Len	No. 4			Yes	47.74	244.43	208.84	22.1
STN-26, 36.0'-37.5'		1832	9/23/09	Hom	No. 4			Yes	46.14	239.34	206.24	20.7
STN-26, 37.5'-39.0'		1833	9/24/09	Hom	No. 10			Yes	44.04	258.52	221.74	20.7
STN-26, 39.0'-40.5'		1834	9/24/09	Hom	No. 10			Yes	45.42	295.72	248.07	23.5
STN-26, 40.5'-42.0'		1835	9/24/09	Hom	No. 10			Yes	44.34	277.25	233.16	23.4
STN-26, 42.0'-43.5'		1836	9/24/09	Hom	No. 10			Yes	43.58	279.70	235.92	22.8
STN-26, 43.5'-45.0'		1837	9/24/09	Hom	No. 4			Yes	45.98	326.86	272.56	24.0
STN-26, 45.0'-46.5'		1838	9/24/09	Hom	No. 10			Yes	44.52	382.83	314.65	25.2

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded		Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
					Amount	Size					
STN-26, 46.5'-48.0'	1839	9/24/09	Hom	No. 10			Yes	47.63	308.07	255.20	25.5
STN-26, 48.0'-49.5'	1841	9/24/09	Hom	No. 10			Yes	46.62	335.19	276.88	25.3
STN-26, 49.5'-51.0'	1842	9/24/09	Hom	3/8"			No	48.63	271.63	228.04	24.3
STN-26, 51.0'-52.5'	1843	9/24/09	Hom	3/4"			No	44.19	298.77	274.31	10.6
STN-26, 52.5'-53.0'	1844	9/24/09	Hom	3/8"			No	44.38	213.91	200.42	8.6

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-27, 0.0'-1.5'	60° C	1845	10/23/09	Hom	3/4"			No	22.70	86.03	76.90	16.8
STN-27, 1.5'-3.0'	60° C	1846	10/23/09	Hom	No. 4			No	21.69	74.67	65.10	22.0
STN-27, 3.0'-4.5'	60° C	1847	10/23/09	Hom	3/8"			No	20.78	68.21	61.33	17.0
STN-27, 4.5'-6.0'	60° C	1848	10/23/09	Hom	3/8"			No	21.48	71.23	64.23	16.4
STN-27, 6.0'-7.5'	60° C	1849	10/23/09	Hom	No. 4			No	20.27	68.54	59.37	23.5
STN-27, 7.5'-9.0'	60° C	1850	10/23/09	Hom	No. 4			No	22.03	69.48	60.66	22.8
STN-27, 9.0'-10.5'	60° C	1851	10/23/09	Hom	3/8"			No	22.51	79.33	70.36	18.7
STN-27, 10.5'-12.0'	60° C	1852	10/23/09	Hom	3/4"			No	21.79	89.48	81.21	13.9
STN-27, 12.0'-13.5'	60° C	1853	10/23/09	Hom	3/8"			No	23.17	86.55	75.25	21.7
STN-27, 13.5'-15.0'	60° C	1854	10/23/09	Hom	No. 4			No	22.67	88.41	77.51	19.9
STN-27, 15.0'-16.5'	60° C	1855	10/23/09	Hom	3/4"			No	22.65	104.42	94.67	13.5
STN-27, 16.5'-18.0'	60° C	1856	10/23/09	Hom	No. 4			No	22.47	76.72	64.80	28.2
STN-27, 18.0'-19.5'	60° C	1857	10/23/09	Hom	No. 10			Yes	22.18	75.90	62.85	32.1
STN-27, 19.5'-21.0'	60° C	1858	10/23/09	Hom	No. 4			No	23.83	79.40	67.23	28.0
STN-27, 21.0'-22.5'	60° C	1859	10/23/09	Hom	3/8"			No	19.88	66.61	52.71	42.3
STN-27, 22.5'-24.0'	60° C	1860	10/23/09	Hom	3/8"			No	23.50	97.83	76.88	39.2
STN-27, 24.0'-25.5'	60° C	1861	10/23/09	Hom	No. 4			No	22.06	110.34	81.34	48.9
STN-27, 25.5'-27.0'	60° C	1862	10/23/09	Hom	No. 10			Yes	22.38	95.03	75.07	37.9
STN-27, 27.0'-28.5'	60° C	1864	10/23/09	Hom	No. 10			Yes	71.57	144.16	119.55	51.3
STN-27, 28.5'-30.0'	60° C	1865	10/23/09	Hom	No. 10			Yes	70.62	229.35	186.34	37.2
STN-27, 30.0'-31.5'	60° C	1866	10/23/09	Hom	No. 10			Yes	69.79	165.31	140.18	35.7
STN-27, 31.5'-33.0'	60° C	1867	10/23/09	Hom	No. 10			Yes	71.44	169.78	126.42	78.9
STN-27, 33.0'-34.5'	60° C	1868	10/23/09	Hom	No. 10			Yes	69.09	226.30	171.49	53.5
STN-27, 34.5'-36.0'	60° C	1869	10/23/09	Hom	No. 10			Yes	70.77	224.48	180.78	39.7
STN-27, 36.0'-37.5'	60° C	1870	10/23/09	Hom	No. 10			Yes	44.02	204.42	157.68	41.1
STN-27, 37.5'-39.0'	60° C	1872	10/23/09	Hom	No. 10			Yes	43.69	129.88	105.50	39.4
STN-27, 39.0'-40.5'	60° C	1873	10/23/09	Hom	No. 10			Yes	49.24	134.97	112.44	35.6
STN-27, 40.5'-42.0'	60° C	1874	10/23/09	Hom	No. 4			Yes	47.98	222.78	186.67	26.0
STN-27, 42.0'-43.5'		1875	10/23/09	Hom	No. 4			Yes	40.69	191.57	160.82	25.6
STN-27, 43.5'-45.0'		1876	10/23/09	Hom	No. 4			Yes	44.66	239.24	206.39	20.3
STN-27, 45.0'-46.5'		1877	10/23/09	Hom	No. 4			Yes	44.64	232.82	199.12	21.8

Laboratory Document
Prepared by : JW
Approved by : TLK

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-27, 46.5'-48.0'	1878	10/23/09	Hom	No. 10			Yes	44.89	248.11	213.45	20.6
STN-27, 48.0'-49.5'	1879	10/23/09	Hom	No. 4			Yes	74.45	285.69	250.50	20.0
STN-27, 49.5'-51.0'	1880	10/23/09	Hom	No. 10			Yes	74.91	334.96	291.16	20.3
STN-27, 51.0'-52.5'	1881	10/23/09	Hom	No. 10			Yes	74.80	401.80	344.20	21.4
STN-27, 52.5'-54.0'	1882	10/23/09	Hom	No. 10			Yes	69.70	303.91	258.69	23.9
STN-27, 54.0'-55.5'	1883	10/23/09	Hom	No. 4			Yes	75.33	221.88	191.07	26.6
STN-27, 55.5'-57.0'	1884	10/23/09	Hom	No. 4			Yes	73.29	340.68	285.70	25.9
STN-27, 57.0'-58.5'	1885	10/23/09	Hom	No. 10			Yes	77.43	370.35	309.97	26.0
STN-27, 58.5'-60.0'	1886	10/23/09	Hom	No. 10			Yes	74.32	359.78	306.37	23.0
STN-27, 60.0'-61.5'	1887	10/23/09	Hom	No. 4			Yes	71.34	336.27	286.30	23.2
STN-27, 61.5'-63.0'	1888	10/23/09	Hom	3/8"			No	69.06	378.01	322.19	22.1
STN-27, 63.0'-64.5'	1889	10/23/09	Hom	3/4"			No	75.19	396.73	371.01	8.7
STN-27, 64.5'-66.0'	1890	10/23/09	Hom	3/4"			No	70.95	381.52	354.55	9.5

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Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-28, 0.0'-1.5'	60° C	1891	10/6/09	Str	3/4"	1	3/4"	No	69.79	294.93	256.91	20.3
STN-28, 1.5'-3.0'	60° C	1892	10/6/09		3/8"			No	71.35	373.37	320.47	21.2
STN-28, 3.0'-4.5'	60° C	1893	10/6/09		3/8"			No	73.32	316.36	270.17	23.5
STN-28, 4.5'-6.0'	60° C	1894	10/6/09		No. 4			Yes	70.94	408.70	338.14	26.4
STN-28, 6.0'-7.5'	60° C	1895	10/6/09	Hom	No. 10			Yes	73.58	332.23	278.53	26.2
STN-28, 7.5'-9.0'	60° C	1896	10/6/09		No. 4			Yes	68.89	301.43	252.40	26.7
STN-28, 9.0'-10.5'	60° C	1897	10/6/09		3/8"			No	69.36	281.28	231.91	30.4
STN-28, 10.5'-12.0'	60° C	1898	10/6/09		3/4"	2	3/4"	No	21.55	118.84	95.82	31.0
STN-28, 12.0'-13.5'	60° C	1899	10/6/09		3/4"	1	3/4"	No	21.40	116.27	88.61	41.2
STN-28, 13.5'-15.0'	60° C	1900	10/6/09		3/8"			No	21.41	125.81	96.03	39.9
STN-28, 15.0'-16.5'	60° C	1901	10/6/09		No. 4			No	21.82	110.55	83.86	43.0
STN-28, 16.5'-18.0'	60° C	1902	10/6/09		No. 10			Yes	21.39	121.94	94.39	37.7
STN-28, 18.0'-19.5'	60° C	1903	10/6/09		3/4"	1	3/4"	No	21.54	132.34	103.27	35.6
STN-28, 19.5'-21.0'	60° C	1904	10/6/09		No. 4			No	21.42	115.65	85.70	46.6
STN-28, 21.0'-22.5'	60° C	1905	10/6/09		3/8"			No	21.56	127.06	101.09	32.7
STN-28, 22.5'-24.0'	60° C	1906	10/6/09		3/8"			No	21.19	115.72	83.78	51.0
STN-28, 24.0'-25.5'	60° C	1907	10/6/09		No. 4			No	21.60	118.01	84.62	53.0
STN-28, 25.5'-27.0'	60° C	1909	10/6/09		No. 4			No	21.20	90.95	65.00	59.2
STN-28, 27.0'-28.5'	60° C	1910	10/6/09		3/8"			No	21.57	66.22	52.74	43.2
STN-28, 28.5'-30.0'	60° C	1911	10/6/09	Hom	No. 10			Yes	21.41	116.52	95.51	28.4
STN-28, 30.0'-31.5'		1912	10/6/09	Hom	No. 10			Yes	21.41	111.05	91.73	27.5
STN-28, 31.5'-33.0'		1913	10/6/09	Len	No. 10			Yes	21.77	107.88	89.72	26.7
STN-28, 33.0'-34.5'		1914	10/6/09	Len	No. 10			Yes	22.42	106.61	90.74	23.2
STN-28, 34.5'-36.0'		1915	10/6/09		No. 10			Yes	21.65	114.07	98.20	20.7
STN-28, 36.0'-37.5'		1916	10/6/09	Len	No. 10			Yes	21.49	118.06	100.82	21.7
STN-28, 37.5'-39.0'		1917	10/6/09	Len	No. 10			Yes	21.49	126.00	106.89	22.4
STN-28, 39.0'-40.5'		1918	10/6/09	Len	No. 10			Yes	21.52	123.03	103.65	23.6
STN-28, 40.5'-42.0'		1919	10/6/09		No. 10			Yes	21.48	132.28	111.02	23.7
STN-28, 42.0'-43.5'		1920	10/6/09		No. 4			No	21.53	144.58	121.40	23.2
STN-28, 43.5'-45.0'		1921	10/6/09		No. 4			No	21.53	136.29	114.04	24.1
STN-28, 45.0'-46.5'		1922	10/6/09	Hom	No. 10			Yes	21.78	137.95	115.89	23.4

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Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

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Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-28, 46.5'-48.0'	1923	10/6/09	Hom	No. 10			Yes	21.76	158.34	131.17	24.8
STN-28, 48.0'-49.5'	1924	10/6/09		3/8"			No	21.27	148.33	123.49	24.3
STN-28, 49.5'-51.0'	1925	10/6/09		1 1/2"	1	1 1/2"	No	21.61	120.60	107.99	14.6
STN-28, 51.0'-52.2'	1926	10/6/09		3/4"	2	3/4"	No	21.50	122.30	110.39	13.4

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-29, 0.0'-1.5'	60° C	1927	10/5/09	Str	3/8"			No	22.71	92.30	85.46	10.9
STN-29, 1.5'-3.0'	60° C	1928	10/5/09		3/8"			No	18.75	86.59	77.22	16.0
STN-29, 3.0'-4.5'	60° C	1929	10/5/09		3/4"			No	21.43	94.89	86.86	12.3
STN-29, 4.5'-6.0'	60° C	1930	10/5/09		3/4"			No	21.59	113.71	101.99	14.6
STN-29, 6.0'-7.5'	60° C	1931	10/5/09		3/8"			No	22.25	95.29	83.85	18.6
STN-29, 7.5'-9.0'	60° C	1932	10/5/09		3/4"			No	22.27	102.77	91.44	16.4
STN-29, 9.0'-10.5'	60° C	1933	10/5/09		1 1/2"	1	1 1/2"	No	22.55	117.94	100.31	22.7
STN-29, 10.5'-12.0'	60° C	1934	10/5/09		3/4"			No	19.63	106.18	87.75	27.1
STN-29, 12.0'-13.5'	60° C	1935	10/5/09		No. 4			No	20.86	106.34	80.64	43.0
STN-29, 13.5'-15.0'	60° C	1936	10/5/09		No. 10			Yes	18.81	90.04	67.70	45.7
STN-29, 15.0'-16.5'	60° C	1937	10/5/09		No. 10			Yes	21.19	98.40	73.75	46.9
STN-29, 16.5'-18.0'	60° C	1938	10/5/09		No. 10			Yes	23.18	132.32	101.71	39.0
STN-29, 18.0'-19.5'	60° C	1939	10/5/09		No. 10			Yes	23.51	139.39	107.66	37.7
STN-29, 19.5'-21.0'	60° C	1940	10/5/09		3/8"			No	20.86	90.55	64.19	60.8
STN-29, 21.0'-22.5'	60° C	1941	10/5/09		No. 10			Yes	21.70	94.20	68.51	54.9
STN-29, 22.5'-24.0'	60° C	1942	10/5/09		No. 10			Yes	18.88	94.15	67.47	54.9
STN-29, 24.0'-25.5'	60° C	1943	10/5/09		3/4"			No	18.85	86.11	63.45	50.8
STN-29, 25.5'-27.0'	60° C	1944	10/5/09		3/8"			No	21.69	110.71	78.04	58.0
STN-29, 27.0'-28.5'	60° C	1945	10/5/09		3/8"			No	21.99	122.60	94.30	39.1
STN-29, 28.5'-30.0'	60° C	1946	10/5/09	Len	3/8"			No	21.56	131.84	107.96	27.6
STN-29, 30.0'-31.5'		1948	10/5/09	Len	No. 4			Yes	26.28	155.30	128.52	26.2
STN-29, 31.5'-33.0'		1949	10/5/09	Hom	No. 10			Yes	21.38	139.94	117.38	23.5
STN-29, 33.0'-34.5'		1950	10/5/09	Hom	No. 10			Yes	21.62	131.24	110.59	23.2
STN-29, 34.5'-36.0'		1951	10/5/09		1 1/2"	1	1 1/2"	No	21.34	114.11	94.93	26.1
STN-29, 36.0'-37.5'		1952	10/5/09		1 1/2"	1	1 1/2"	No	19.98	118.49	96.76	28.3
STN-29, 37.5'-38.4'		1953	10/5/09		3/4"	1	3/4"	No	20.24	101.07	89.70	16.4

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-30, 0.0'-1.5'	60° C	1978	10/9/09	Hom	3/8"			No	43.84	208.67	178.20	22.7
STN-30, 1.5'-3.0'	60° C	1979	10/9/09	Hom	3/8"			No	44.92	142.23	126.27	19.6
STN-30, 3.0'-4.5'	60° C	1980	10/9/09	Hom	No. 4			Yes	39.50	161.32	139.99	21.2
STN-30, 4.5'-6.0'	60° C	1981	10/9/09	Hom	No. 4			Yes	43.84	178.17	154.65	21.2
STN-30, 6.0'-7.5'	60° C	1982	10/9/09	Hom	3/8"			No	75.90	232.31	204.87	21.3
STN-30, 7.5'-9.0'	60° C	1983	10/9/09	Hom	No. 4			Yes	76.58	230.25	197.87	26.7
STN-30, 9.0'-10.5'	60° C	1984	10/9/09	Hom	3/8"			No	49.38	185.41	163.17	19.5
STN-30, 10.5'-12.0'	60° C	1985	10/9/09	Hom	3/8"			No	45.15	157.08	135.07	24.5
STN-30, 12.0'-13.5'	60° C	1986	10/9/09	Hom	3/8"			No	44.39	149.36	128.40	24.9
STN-30, 13.5'-15.0'	60° C	1987	10/9/09	Hom	3/8"			No	41.13	144.89	113.66	43.1
STN-30, 15.0'-16.5'	60° C	1988	10/9/09	Hom	No. 4			No	44.18	180.80	138.53	44.8
STN-30, 16.5'-18.0'	60° C	1989	10/9/09	Hom	3/8"			No	43.76	179.44	136.08	47.0
STN-30, 18.0'-19.5'	60° C	1990	10/9/09	Hom	No. 4			Yes	49.44	226.62	167.86	49.6
STN-30, 19.5'-21.0'	60° C	1991	10/9/09	Hom	No. 4			Yes	47.45	233.56	168.03	54.3
STN-30, 21.0'-22.5'	60° C	1992	10/9/09	Hom	No. 10			Yes	73.88	299.74	221.60	52.9
STN-30, 22.5'-24.0'	60° C	1993	10/9/09	Hom	No. 10			Yes	70.35	232.87	188.65	37.4
STN-30, 24.0'-25.5'	60° C	1994	10/9/09	Hom	No. 4			No	45.00	167.09	131.78	40.7
STN-30, 25.5'-27.0'	60° C	1996	10/9/09	Hom	No. 4			Yes	46.23	220.63	171.88	38.8
STN-30, 27.0'-28.5'	60° C	1997	10/9/09	Hom	No. 10			Yes	72.46	185.19	151.47	42.7
STN-30, 28.5'-30.0'	60° C	1998	10/9/09	Hom	No. 10			Yes	72.10	279.87	228.64	32.7
STN-30, 30.0'-31.5'	60° C	1999	10/9/09	Hom	No. 10			Yes	72.27	288.57	234.39	33.4
STN-30, 31.5'-33.0'	60° C	2000	10/9/09	Hom	No. 4			Yes	44.56	203.19	164.43	32.3
STN-30, 33.0'-34.5'	60° C	2001	10/9/09	Hom	No. 10			Yes	70.42	274.14	205.81	50.5
STN-30, 34.5'-36.0'		2002	10/9/09	Hom	No. 10			Yes	74.98	288.92	221.80	45.7
STN-30, 36.0'-37.5'		2003	10/9/09	Hom	No. 10			Yes	70.72	209.55	163.30	50.0
STN-30, 37.5'-39.0'		2004	10/9/09	Hom	No. 10			Yes	44.83	222.10	162.98	50.0
STN-30, 39.0'-40.5'		2006	10/9/09	Hom	No. 10			No	70.39	86.85	81.50	48.2
STN-30, 40.5'-42.0'		2007	10/9/09	Hom	No. 10			Yes	72.11	291.20	236.35	33.4
STN-30, 42.0'-43.5'		2008	10/9/09	Hom	No. 10			Yes	71.99	329.58	251.49	43.5
STN-30, 43.5'-45.0'		2009	10/9/09	Hom	No. 10			Yes	69.60	267.09	212.91	37.8
STN-30, 45.0'-46.5'		2010	10/9/09	Hom	No. 10			Yes	47.79	180.14	148.38	31.6

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded		Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
					Amount	Size					
STN-30, 46.5'-48.0'	2011	10/9/09	Hom	No. 10			Yes	47.74	228.43	189.81	27.2
STN-30, 48.0'-49.5'	2012	10/9/09	Hom	No. 4			Yes	49.28	217.80	183.79	25.3
STN-30, 49.5'-51.0'	2013	10/9/09	Hom	No. 4			Yes	43.74	177.99	152.33	23.6
STN-30, 51.0'-52.5'	2014	10/9/09	Hom	No. 10			Yes	43.32	234.14	196.39	24.7
STN-30, 52.5'-54.0'	2015	10/9/09	Hom	No. 4			Yes	43.94	228.76	188.62	27.7
STN-30, 54.0'-55.5'	2016	10/12/09	Hom	No. 10			Yes	44.13	209.43	173.07	28.2
STN-30, 55.5'-57.0'	2017	10/12/09	Hom	No. 10			Yes	43.87	263.94	218.01	26.4
STN-30, 57.0'-58.5'	2018	10/12/09	Hom	1 1/2"	2	1 1/2"	No	44.98	271.03	229.66	22.4
STN-30, 58.5'-59.2'	2019	10/12/09	Hom	1 1/2"	2	1 1/2"	No	47.04	232.04	207.59	15.2

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-31, 0.0'-1.5'	60° C	2020	10/13/09	Str	3/4"			No	69.74	319.55	281.09	18.2
STN-31, 1.5'-3.0'	60° C	2021	10/13/09		3/8"			No	74.37	305.34	262.32	22.9
STN-31, 3.0'-4.5'	60° C	2022	10/13/09		3/4"	1	3/4"	No	74.13	303.83	260.51	23.2
STN-31, 4.5'-6.0'	60° C	2023	10/13/09		3/8"			No	68.88	300.91	259.83	21.5
STN-31, 6.0'-7.5'	60° C	2024	10/13/09		3/4"			No	75.11	334.10	284.09	23.9
STN-31, 7.5'-9.0'	60° C	2025	10/13/09		3/8"			No	74.77	355.95	306.55	21.3
STN-31, 9.0'-10.5'	60° C	2026	10/13/09		No. 4			Yes	74.73	344.12	288.65	25.9
STN-31, 10.5'-12.0'	60° C	2028	10/13/09		No. 4			Yes	73.21	292.92	239.06	32.5
STN-31, 12.0'-13.5'	60° C	2029	10/13/09		3/8"			No	71.32	290.78	235.25	33.9
STN-31, 13.5'-15.0'	60° C	2030	10/13/09		3/4"			No	74.81	387.64	276.84	54.8
STN-31, 15.0'-16.5'	60° C	2031	10/13/09		No. 10			Yes	77.94	388.49	304.97	36.8
STN-31, 16.5'-18.0'	60° C	2032	10/13/09		No. 10			Yes	77.13	387.08	297.73	40.5
STN-31, 18.0'-19.5'	60° C	2033	10/13/09		No. 10			Yes	73.95	521.20	399.49	37.4
STN-31, 19.5'-21.0'	60° C	2034	10/13/09		No. 10			Yes	74.68	391.30	302.07	39.2
STN-31, 21.0'-22.5'	60° C	2035	10/13/09		No. 10			Yes	74.22	497.70	380.03	38.5
STN-31, 22.5'-24.0'	60° C	2036	10/13/09		No. 10			Yes	73.71	494.10	377.87	38.2
STN-31, 24.0'-25.5'	60° C	2037	10/13/09		No. 10			Yes	21.49	48.62	41.99	32.3
STN-31, 25.5'-27.0'	60° C	2039	10/13/09		No. 10			Yes	21.52	123.34	98.22	32.8
STN-31, 27.0'-28.5'	60° C	2040	10/13/09		No. 10			Yes	21.53	119.67	92.37	38.5
STN-31, 28.5'-30.0'	60° C	2041	10/14/09		No. 10			Yes	21.50	111.43	78.77	57.0
STN-31, 30.0'-31.5'	60° C	2042	10/14/09		No. 10			Yes	21.33	116.61	88.06	42.8
STN-31, 31.5'-33.0'	60° C	2043	10/14/09		No. 10			Yes	21.61	113.12	79.13	59.1
STN-31, 33.0'-34.5'	60° C	2044	10/14/09		No. 10			Yes	21.49	109.10	71.07	76.7
STN-31, 34.5'-36.0'	60° C	2045	10/14/09		No. 10			Yes	21.53	117.58	83.91	54.0
STN-31, 36.0'-37.5'	60° C	2047	10/14/09		No. 10			Yes	20.64	114.80	84.60	47.2
STN-31, 37.5'-39.0'	60° C	2048	10/14/09		No. 10			Yes	19.28	91.21	67.22	50.0
STN-31, 39.0'-40.5'	60° C	2049	10/14/09		No. 10			Yes	18.90	94.87	70.81	46.3
STN-31, 40.5'-42.0'	60° C	2050	10/14/09		3/8"			No	21.58	132.34	99.39	42.3
STN-31, 42.0'-43.5'	60° C	2051	10/14/09		No. 10			Yes	22.09	120.42	92.10	40.5
STN-31, 43.5'-45.0'	60° C	2052	10/14/09		No. 10			Yes	19.16	106.55	82.18	38.7
STN-31, 45.0'-46.5'	60° C	2053	10/14/09		3/8"			No	22.20	132.77	107.76	29.2

Laboratory Document
Prepared by : JW
Approved by : TLK

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-31, 46.5'-48.0'	60° C	2054	10/14/09		3/4"			No	21.95	136.20	110.25	29.4
STN-31, 48.0'-49.5'	60° C	2055	10/14/09		3/4"			No	21.82	113.62	89.87	34.9
STN-31, 49.5'-51.0'	60° C	2056	10/14/09	Len	No. 10			Yes	19.43	99.03	81.93	27.4
STN-31, 51.0'-52.5'	60° C	2057	10/14/09	Hom	No. 10			Yes	21.47	131.61	107.67	27.8
STN-31, 52.5'-54.0'	60° C	2058	10/14/09		3/4"			No	21.61	132.60	106.89	30.1
STN-31, 54.0'-55.5'	60° C	2059	10/14/09	Hom	No. 10			Yes	284.11	527.40	477.52	25.8
STN-31, 55.5'-57.0'	60° C	2060	10/14/09	Hom	No. 4			Yes	293.41	471.70	437.00	24.2
STN-31, 57.0'-58.5'	60° C	2061	10/14/09	Hom	No. 4			Yes	309.87	494.40	441.74	39.9
STN-31, 58.5'-60.0'	60° C	2062	10/14/09	Hom	No. 4			Yes	292.53	534.50	509.09	11.7

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Moisture Content of Soil

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Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-32, 0.0'-1.5'	292	7/10/09	Str	1 1/2"			No	48.14	161.92	142.84	20.1
STN-32, 1.5'-3.0'	293	7/10/09	Hom	3/4"			No	43.50	107.80	97.13	19.9
STN-32, 3.0'-4.5'	294	7/10/09	Len	3/4"			No	44.28	159.76	136.06	25.8
STN-32, 6.5'-8.0'	295	7/10/09	Hom	3/4"			No	43.82	173.36	150.02	22.0
STN-32, 8.0'-9.5'	296	7/10/09	Str	3/4"			No	43.85	159.04	142.31	17.0
STN-32, 9.5'-11.0'	297	7/10/09	Str	3/4"			No	46.08	166.39	145.94	20.5
STN-32, 11.0'-12.5'	298	7/10/09	Hom	No. 10			Yes	44.27	165.67	145.06	20.4
STN-32, 12.5'-14.0'	299	7/10/09	Hom	No. 10			Yes	43.65	196.06	166.03	24.5
STN-32, 14.0'-15.5'	300	7/10/09	Str	3/8"			No	43.99	154.17	134.89	21.2
STN-32, 17.5'-19.0'	301	7/10/09	Str	3/4"			No	48.46	165.63	140.00	28.0
STN-32, 21.0'-22.5'	302	7/10/09	Hom	1 1/2"			No	44.57	189.70	158.56	27.3
STN-32, 22.5'-24.0'	303	7/10/09	Hom	No. 10			Yes	43.49	185.00	157.81	23.8
STN-32, 26.0'-27.5'	304	7/10/09		No. 10			Yes	49.54	177.83	155.86	20.7
STN-32, 27.5'-29.0'	305	7/10/09		No. 10			Yes	43.73	207.19	179.28	20.6
STN-32, 29.0'-30.5'	306	7/10/09		No. 10			Yes	43.87	122.95	106.40	26.5
STN-32, 30.5'-32.0'	307	7/10/09		No. 10			Yes	47.75	205.99	177.68	21.8
STN-32, 32.0'-33.5'	308	7/10/09		No. 10			Yes	41.02	228.38	191.56	24.5
STN-32, 33.5'-35.0'	309	7/10/09		No. 10			Yes	46.27	170.95	151.28	18.7
STN-32, 35.0'-36.5'	310	7/10/09		No. 10			Yes	45.25	236.99	206.06	19.2
STN-32, 36.5'-38.0'	311	7/10/09		No. 10			Yes	47.51	210.67	184.39	19.2
STN-32, 38.0'-39.5'	312	8/17/09		No. 10			Yes	21.85	89.20	78.34	19.2
STN-32, 39.5'-41.0'	313	8/17/09		No. 10			Yes	21.73	95.10	83.11	19.5
STN-32, 41.0'-42.5'	314	8/17/09		No. 10			Yes	22.63	97.48	87.50	15.4
STN-32, 42.5'-44.0'	315	8/17/09		1 1/2"			No	20.12	86.98	77.72	16.1
STN-32, 44.0'-44.5'	316	8/17/09		3/4"			No	22.29	94.25	87.97	9.6

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-33, 0.0'-1.5'	60° C	2091	10/16/09	Str	3/8"			No	49.68	248.94	218.90	17.8
STN-33, 1.5'-3.0'	60° C	2092	10/16/09		3/4"			No	44.21	207.32	184.13	16.6
STN-33, 3.0'-4.5'	60° C	2093	10/16/09		3/4"			No	49.56	243.22	214.33	17.5
STN-33, 4.5'-6.0'	60° C	2094	10/16/09		3/4"			No	47.51	236.69	212.43	14.7
STN-33, 6.0'-7.5'	60° C	2095	10/16/09		3/4"			No	47.66	254.12	215.40	23.1
STN-33, 7.5'-9.0'	60° C	2096	10/16/09		3/4"			No	44.68	253.50	217.86	20.6
STN-33, 9.0'-10.5'	60° C	2097	10/16/09		No. 4			Yes	46.62	257.42	214.96	25.2
STN-33, 10.5'-12.0'	60° C	2098	10/16/09		3/4"			No	40.68	206.05	180.07	18.6
STN-33, 12.0'-13.5'	60° C	2099	10/16/09		3/4"			No	44.91	233.92	203.52	19.2
STN-33, 13.5'-15.0'	60° C	2100	10/16/09		3/4"			No	44.52	253.50	218.11	20.4
STN-33, 15.0'-16.5'	60° C	2101	10/16/09		3/4"			No	44.03	253.94	224.25	16.5
STN-33, 16.5'-18.0'	60° C	2102	10/16/09		3/4"			No	43.88	227.94	198.40	19.1
STN-33, 18.0'-19.5'	60° C	2103	10/16/09		3/4"			No	46.92	213.20	184.53	20.8
STN-33, 19.5'-21.0'	60° C	2104	10/16/09		3/4"			No	44.25	230.79	198.32	21.1
STN-33, 21.0'-22.5'	60° C	2105	10/16/09		3/8"			No	50.06	212.35	180.90	24.0
STN-33, 22.5'-24.0'	60° C	2106	10/16/09		No. 10			Yes	46.69	237.59	175.14	48.6
STN-33, 24.0'-25.5'	60° C	2107	10/16/09	Hom	No. 10			Yes	46.43	259.73	198.16	40.6
STN-33, 25.5'-27.0'	60° C	2108	10/16/09		No. 10			Yes	45.42	278.05	211.07	40.4
STN-33, 27.0'-28.5'	60° C	2109	10/16/09		No. 10			Yes	44.33	291.83	222.27	39.1
STN-33, 28.5'-30.0'	60° C	2110	10/16/09		No. 10			Yes	45.43	282.03	210.32	43.5
STN-33, 30.0'-31.5'	60° C	2111	10/16/09		No. 10			Yes	29.85	268.53	197.98	42.0
STN-33, 31.5'-33.0'	60° C	2112	10/16/09		No. 10			Yes	43.96	314.89	236.14	41.0
STN-33, 33.0'-34.5'	60° C	2113	10/16/09		No. 10			Yes	49.14	259.14	195.56	43.4
STN-33, 34.5'-36.0'	60° C	2114	10/16/09		No. 10			Yes	44.36	341.04	260.89	37.0
STN-33, 36.0'-37.5'	60° C	2115	10/16/09		No. 10			Yes	47.24	310.89	245.35	33.1
STN-33, 37.5'-39.0'	60° C	2116	10/16/09		No. 10			Yes	43.62	371.54	273.39	42.7
STN-33, 39.0'-40.5'	60° C	2117	10/16/09		No. 10			Yes	47.43	296.96	229.27	37.2
STN-33, 40.5'-42.0'	60° C	2118	10/16/09		No. 10			Yes	44.24	320.68	234.31	45.4
STN-33, 42.0'-43.5'	60° C	2119	10/16/09		3/4"			No	44.12	266.46	189.61	52.8
STN-33, 43.5'-45.0'	60° C	2120	10/16/09		No. 4			Yes	44.36	252.66	157.80	83.6
STN-33, 45.0'-46.5'	60° C	2121	10/16/09		No. 10			Yes	43.75	289.35	168.09	97.5

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-33, 46.5'-48.0'	60° C	2122	10/16/09		No. 10			Yes	43.25	233.49	151.83	75.2
STN-33, 48.0'-49.5'	60° C	2124	10/16/09		No. 10			Yes	47.30	172.57	132.55	46.9
STN-33, 49.5'-51.0'	60° C	2125	10/16/09		No. 10			Yes	43.92	276.46	205.64	43.8
STN-33, 51.0'-52.5'	60° C	2126	10/16/09		No. 10			Yes	48.42	208.95	157.81	46.8
STN-33, 52.5'-54.0'	60° C	2127	10/16/09		3/8"			No	43.52	261.62	190.64	48.2
STN-33, 54.0'-55.5'	60° C	2128	10/16/09		No. 10			Yes	44.36	309.41	229.79	42.9
STN-33, 55.5'-57.0'	60° C	2129	10/16/09		No. 10			Yes	43.83	279.72	206.77	44.8
STN-33, 57.0'-58.5'	60° C	2130	10/16/09		No. 10			Yes	43.51	321.29	238.09	42.8
STN-33, 58.5'-60.0'	60° C	2131	10/16/09		No. 10			Yes	44.22	367.81	275.08	40.2
STN-33, 60.0'-61.5'	60° C	2133	10/19/09	Hom	No. 10			Yes	45.70	218.45	169.49	39.6
STN-33, 61.5'-63.0'	60° C	2134	10/19/09	Hom	No. 10			Yes	44.37	206.17	165.15	34.0
STN-33, 63.0'-64.5'		2135	10/19/09	Hom	No. 10			Yes	43.75	170.51	145.43	24.7
STN-33, 64.5'-66.0'		2136	10/19/09	Hom	No. 10			Yes	43.86	232.54	192.91	26.6
STN-33, 66.0'-67.5'		2137	10/19/09	Hom	No. 10			Yes	49.22	251.71	206.69	28.6
STN-33, 67.5'-69.0'		2138	10/19/09	Hom	3/4"			No	44.06	240.48	209.26	18.9
STN-33, 69.0'-70.4'		2139	10/19/09	Hom	3/4"			No	75.90	291.27	263.67	14.7

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-34, 0.0'-1.5'	60° C	317	7/17/09	Str	3/4"			No	45.40	191.74	161.69	25.8
STN-34, 1.5'-3.0'	60° C	318	7/17/09		No. 4			No	41.76	134.50	115.80	25.3
STN-34, 3.0'-4.5'	60° C	319	7/17/09		3/8"			No	43.59	139.75	118.57	28.2
STN-34, 4.5'-6.0'	60° C	320	7/17/09		3/8"			No	43.82	127.60	112.18	22.6
STN-34, 6.0'-7.5'	60° C	321	7/17/09		No. 10			Yes	44.01	142.57	123.89	23.4
STN-34, 7.5'-9.0'	60° C	322	7/17/09		3/8"			No	44.01	170.74	148.16	21.7
STN-34, 9.0'-10.5'	60° C	323	7/17/09		3/4"			No	44.29	166.60	142.59	24.4
STN-34, 10.5'-12.0'	60° C	324	7/17/09		3/4"			No	49.83	169.28	145.51	24.8
STN-34, 12.0'-13.5'	60° C	325	7/17/09		3/4"			No	44.41	204.24	161.35	36.7
STN-34, 13.5'-15.0'	60° C	326	7/17/09		3/4"			No	43.03	157.57	132.22	28.4
STN-34, 15.0'-16.5'	60° C	327	7/17/09		3/8"			No	38.38	193.92	130.94	68.0
STN-34, 16.5'-18.0'	60° C	328	7/17/09		3/8"			No	39.35	209.39	137.50	73.2
STN-34, 18.0'-19.5'	60° C	329	7/17/09		3/4"			No	44.42	225.66	168.45	46.1
STN-34, 19.5'-21.0'	60° C	330	7/17/09		3/4"			No	43.44	184.51	160.77	20.2
STN-34, 21.0'-22.5'	60° C	331	7/17/09		3/8"			No	49.21	204.33	146.06	60.2
STN-34, 22.5'-24.0'	60° C	332	7/17/09		3/8"			No	48.60	170.68	135.50	40.5
STN-34, 24.0'-25.5'	60° C	333	7/17/09		3/4"			No	44.50	209.13	175.52	25.7
STN-34, 25.5'-27.0'	60° C	334	7/17/09		No. 4			Yes	44.06	240.99	203.84	23.3
STN-34, 27.0'-28.5'	60° C	335	7/17/09		No. 10			Yes	47.01	126.44	113.88	18.8
STN-34, 28.5'-30.0'	60° C	336	7/17/09		No. 10			Yes	43.92	162.46	97.84	119.8
STN-34, 30.0'-31.5'	60° C	337	7/17/09		No. 10			Yes	44.05	164.30	123.64	51.1
STN-34, 31.5'-33.0'	60° C	338	7/17/09		No. 10			Yes	44.28	207.08	162.34	37.9
STN-34, 33.0'-34.5'	No Sample	339	7/17/09									
STN-34, 34.5'-36.0'	No Sample	340	7/17/09									
STN-34, 36.0'-37.5'	60° C	341	7/17/09		No. 10			Yes	43.74	221.42	181.82	28.7
STN-34, 37.5'-39.0'	60° C	342	7/17/09		No. 10			Yes	44.02	170.24	141.05	30.1
STN-34, 39.0'-40.5'	60° C	343	7/17/09		3/8"			No	45.27	132.76	112.63	29.9
STN-34, 40.5'-42.0'	60° C	344	7/17/09		No. 4			Yes	43.66	175.82	145.17	30.2
STN-34, 42.0'-43.5'		345	7/17/09	Hom	No. 10			Yes	43.52	160.57	138.26	23.5
STN-34, 43.5'-45.0'		346	7/17/09	Hom	No. 10			Yes	43.60	148.28	144.18	4.1
STN-34, 45.0'-46.5'		347	7/17/09	Hom	No. 10			Yes	43.85	146.43	126.95	23.4

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-34, 46.5'-48.0'	348	7/17/09	Hom	No. 10			Yes	46.02	167.23	143.19	24.7
STN-34, 48.0'-49.5'	349	7/17/09		No. 10			Yes	50.01	156.93	136.28	23.9
STN-34, 49.5'-51.0'	350	7/17/09		No. 10			Yes	46.33	177.21	151.69	24.2
STN-34, 51.0'-52.5'	351	7/17/09		No. 10			Yes	49.44	236.55	197.77	26.1
STN-34, 52.5'-54.0'	352	7/17/09		No. 10			Yes	49.28	246.96	208.74	24.0
STN-34, 54.0'-55.5'	353	7/17/09						46.97	239.01	200.10	25.4
STN-34, 55.5'-57.0' No Sample	354	7/14/09									
STN-34, 57.0'-58.5' No Sample	355	7/14/09									
STN-34, 58.5'-60.0' No Sample	356	7/14/09									
STN-34, 60.0'-61.5' No Sample	357	7/14/09									
STN-34, 61.5'-62.5' No Sample	358	7/14/09									

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-35, 0.0'-1.5'	359	7/10/09	Hom	3/4"			No	72.77	298.38	258.84	21.3
STN-35, 1.5'-3.0'	360	7/10/09	Len	3/8"			No	71.43	266.25	227.02	25.2
STN-35, 3.0'-4.5'	361	7/10/09	Len	3/8"			No	43.72	195.41	165.62	24.4
STN-35, 4.5'-6.0'	362	7/10/09	Len	3/8"			No	40.58	213.86	178.75	25.4
STN-35, 6.0'-7.5'	363	7/10/09		3/4"			No	43.79	212.53	177.42	26.3
STN-35, 7.5'-9.0'	364	7/10/09	Len	3/8"			No	48.59	251.13	210.38	25.2
STN-35, 9.0'-10.5'	365	7/10/09	Len	3/8"			No	47.60	260.79	213.22	28.7
STN-35, 10.5'-12.0'	366	7/10/09	Len	3/8"			No	71.09	276.23	230.41	28.8
STN-35, 12.0'-13.5'	367	7/10/09		1 1/2"			No	74.28	274.65	238.57	22.0
STN-35, 13.5'-15.0'	368	7/10/09		1 1/2"			No	71.44	227.37	206.58	15.4
STN-35, 15.0'-16.5'	369	7/10/09		3/4"			No	72.63	295.35	249.77	25.7
STN-35, 16.5'-18.0'	370	7/10/09	Hom	3/4"			No	69.64	281.24	237.58	26.0
STN-35, 18.0'-19.5'	371	7/10/09	Hom	No. 4			Yes	70.99	286.51	243.73	24.8
STN-35, 19.5'-21.0'	372	7/10/09	Hom	1 1/2"			No	68.93	287.70	248.61	21.8
STN-35, 21.0'-22.5'	373	7/10/09	Hom	No. 10			Yes	72.85	239.99	207.87	23.8
STN-35, 22.5'-24.0'	374	7/10/09	Hom	No. 10			Yes	74.57	273.67	237.37	22.3
STN-35, 24.0'-25.5'	375	7/10/09	Hom	No. 10			Yes	70.77	241.86	208.27	24.4
STN-35, 25.5'-27.0'	376	7/10/09	Hom	No. 10			Yes	71.46	278.78	243.07	20.8
STN-35, 27.0'-28.5'	377	7/10/09	Hom	No. 10			Yes	71.41	318.50	276.62	20.4
STN-35, 28.5'-30.0'	378	7/10/09		No. 10			Yes	70.67	276.85	235.20	25.3
STN-35, 30.0'-31.5'	379	7/10/09		No. 10			Yes	73.85	281.12	239.64	25.0
STN-35, 31.5'-33.0'	380	7/10/09		No. 10			Yes	71.13	313.11	264.33	25.2
STN-35, 33.0'-34.5'	381	7/10/09		No. 10			Yes	73.75	345.91	291.80	24.8
STN-35, 34.5'-36.0'	382	7/10/09		No. 4			Yes	69.55	211.52	184.09	23.9
STN-35, 36.0'-37.5'	383	7/22/09	Hom	No. 10			Yes	43.49	243.79	198.66	29.1
STN-35, 37.5'-39.0'	384	7/22/09	Hom	No. 10			Yes	44.33	314.21	257.11	26.8
STN-35, 39.0'-40.5'	385	7/22/09	Len	No. 10			Yes	43.97	212.70	179.30	24.7
STN-35, 40.5'-42.0'	386	7/22/09	Hom	No. 10			Yes	43.81	234.44	193.57	27.3
STN-35, 42.0'-43.5'	387	7/22/09	Hom	3/8"			No	49.64	209.13	182.94	19.6
STN-35, 43.5'-44.7'	388	7/22/09	Hom	3/8"			No	44.44	237.58	217.73	11.5

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded		Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
					Amount	Size					
STN-36, 0.0'-1.5'	389	7/22/09	Hom	No. 4			Yes	43.88	205.48	168.02	30.2
STN-36, 1.5'-3.0'	390	7/22/09	Hom	No. 10			Yes	45.08	202.63	173.65	22.5
STN-36, 3.0'-4.5'	391	7/22/09	Hom	No. 10			Yes	48.66	213.43	186.01	20.0
STN-36, 4.5'-6.0'	392	7/22/09	Hom	No. 4			Yes	43.76	225.52	198.48	17.5
STN-36, 6.0'-7.5'	393	7/22/09	Hom	3/8"			No	44.50	181.15	154.82	23.9
STN-36, 7.5'-9.0'	394	7/22/09	Hom	No. 10			Yes	43.90	323.15	263.73	27.0
STN-36, 9.0'-10.5'	395	7/22/09	Hom	No. 4			Yes	47.31	324.39	266.09	26.6
STN-36, 10.5'-12.0'	396	7/22/09	Hom	No. 4			Yes	40.41	211.81	180.22	22.6
STN-36, 12.0'-13.5'	397	7/24/09	Hom	No. 4			Yes	39.21	176.68	151.61	22.3
STN-36, 13.5'-15.0'	398	7/24/09	Hom	No. 4			Yes	39.44	220.37	186.01	23.4
STN-36, 15.0'-16.5'	399	7/24/09	Hom	No. 4			Yes	43.56	277.18	232.41	23.7
STN-36, 16.5'-18.0'	400	7/24/09	Hom	No. 4			Yes	44.27	231.05	197.04	22.3
STN-36, 18.0'-19.5'	401	7/24/09	Hom	No. 4			Yes	48.96	285.12	244.42	20.8
STN-36, 19.5'-21.0'	402	7/24/09	Hom	No. 4			Yes	44.10	283.15	238.15	23.2
STN-36, 21.0'-22.5'	403	7/27/09	Hom	No. 10			Yes	43.69	273.54	226.90	25.5
STN-36, 22.5'-24.0'	404	7/27/09	Hom	No. 10			Yes	47.28	308.04	251.69	27.6
STN-36, 24.0'-25.5'	405	7/27/09	Hom	No. 10			Yes	43.95	248.08	205.33	26.5
STN-36, 25.5'-27.0'	406	7/27/09	Hom	No. 10			Yes	49.07	264.65	220.07	26.1
STN-36, 27.0'-28.5'	407	7/27/09	Hom	No. 10			Yes	43.88	359.32	293.93	26.2
STN-36, 28.5'-30.0'	408	7/27/09	Hom	No. 10			Yes	47.08	357.19	294.35	25.4
STN-36, 30.0'-31.5'	409	7/27/09	Hom	No. 10			Yes	43.67	331.73	276.01	24.0
STN-36, 31.5'-33.0'	410	7/27/09		No. 10			Yes	40.59	322.45	264.76	25.7
STN-36, 33.0'-34.5'	411	7/27/09		No. 10			Yes	43.27	345.00	285.18	24.7
STN-36, 34.5'-36.0'	412	7/27/09		3/8"			No	40.35	336.49	278.76	24.2

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded		Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
					Amount	Size					
STN-38, 0.0'-1.5'	413	7/27/09	Len	3/8"			No	39.11	229.69	192.70	24.1
STN-38, 1.5'-3.0'	414	7/27/09	Len	No. 10			Yes	46.51	158.39	139.34	20.5
STN-38, 3.0'-4.5'	415	7/27/09	Len	3/8"			No	43.95	244.82	203.32	26.0
STN-38, 4.5'-6.0'	416	7/27/09	Len	3/8"			No	43.77	228.53	191.34	25.2
STN-38, 6.0'-7.5'	417	7/27/09	Len	3/8"			No	43.96	267.89	221.78	25.9
STN-38, 7.5'-9.0'	418	7/27/09	Len	3/4"			No	47.87	264.35	222.60	23.9
STN-38, 9.0'-10.5'	419	7/27/09	Len	3/8"			No	49.45	307.05	254.55	25.6
STN-38, 10.5'-12.0'	420	7/27/09	Len	3/8"			No	49.47	245.02	203.71	26.8
STN-38, 12.0'-13.5'	421	7/27/09	Len	3/8"			No	43.41	288.65	230.72	30.9
STN-38, 13.5'-15.0'	422	7/27/09	Len	3/8"			No	49.56	281.64	230.42	28.3
STN-38, 15.0'-16.5'	423	7/27/09	Str	3/8"			No	50.39	303.37	253.46	24.6
STN-38, 16.5'-18.0'	424	7/27/09	Len	No. 4			Yes	44.14	275.03	227.20	26.1
STN-38, 18.0'-19.5'	425	7/27/09	Str	3/8"			No	47.25	267.53	224.40	24.3
STN-38, 19.5'-21.0'	426	7/27/09	Str	No. 10			Yes	45.19	306.90	252.93	26.0
STN-38, 21.0'-22.5'	427	7/27/09	Str	No. 10			Yes	44.09	271.03	222.70	27.1
STN-38, 22.5'-24.0'	428	7/27/09	Hom	No. 10			Yes	40.07	248.77	204.84	26.7
STN-38, 24.0'-25.5'	429	7/27/09	Lam	No. 10			Yes	43.97	280.57	232.97	25.2
STN-38, 25.5'-27.0'	430	7/27/09	Str	No. 10			Yes	47.10	342.62	282.39	25.6
STN-38, 27.0'-28.5'	431	7/27/09	Str	No. 10			Yes	43.77	187.89	155.02	29.5
STN-38, 28.5'-30.0'	432	7/27/09	Str	No. 10			Yes	45.03	317.27	264.35	24.1
STN-38, 30.0'-31.5'	433	7/27/09	Hom	No. 10			Yes	48.57	339.17	272.92	29.5
STN-38, 31.5'-33.0'	434	7/27/09	Hom	No. 10			Yes	44.41	299.97	243.61	28.3
STN-38, 33.0'-34.5'	435	7/27/09	Hom	No. 10			Yes	43.83	305.39	256.38	23.1
STN-38, 34.5'-36.0'	436	7/27/09	Hom	No. 10			Yes	43.82	372.63	312.58	22.3
STN-38, 36.0'-37.5'	437	7/27/09	Hom	No. 10			Yes	43.70	368.91	304.76	24.6
STN-38, 37.5'-39.0'	438	7/27/09	Hom	No. 10			Yes	43.92	314.86	264.91	22.6
STN-38, 39.0'-40.5'	439	7/27/09	Lam	No. 10			Yes	43.56	347.15	292.91	21.8
STN-38, 40.5'-42.0'	440	7/27/09	Lam	No. 10			Yes	49.62	358.64	309.92	18.7
STN-38, 42.0'-43.5'	441	7/27/09	Str	No. 4			Yes	44.26	371.38	314.54	21.0
STN-38, 43.5'-44.3'	442	7/27/09	Len	3/4"			No	41.72	327.56	289.55	15.3

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-39, 0.0'-1.5'	60° C	2270	10/6/09	Str	3/8"			No	44.39	277.97	235.71	22.1
STN-39, 1.5'-3.0'	60° C	2271	10/6/09		3/8"			No	47.43	227.82	207.60	12.6
STN-39, 3.0'-4.5'	60° C	2272	10/6/09		3/4"			No	48.14	278.64	248.16	15.2
STN-39, 4.5'-6.0'	60° C	2273	10/6/09		3/8"			No	49.11	243.96	217.21	15.9
STN-39, 6.0'-7.5'	60° C	2274	10/6/09		3/8"			No	43.73	260.46	232.73	14.7
STN-39, 7.5'-9.0'	60° C	2275	10/6/09		3/4"			No	43.36	240.72	214.76	15.1
STN-39, 9.0'-10.5'	60° C	2276	10/6/09		1 1/2"	1	1 1/2"	No	43.97	231.96	203.08	18.2
STN-39, 10.5'-12.0'	60° C	2277	10/6/09		3/4"			No	43.77	289.52	255.47	16.1
STN-39, 12.0'-13.5'	60° C	2278	10/6/09		3/4"			No	50.09	241.20	203.93	24.2
STN-39, 13.5'-15.0'	60° C	2279	10/6/09		No. 4			Yes	44.00	237.62	203.15	21.7
STN-39, 15.0'-16.5'	60° C	2280	10/6/09		3/8"			No	48.93	246.29	215.62	18.4
STN-39, 16.5'-18.0'	60° C	2281	10/6/09		3/4"			No	43.43	260.06	232.47	14.6
STN-39, 18.0'-19.5'	60° C	2282	10/6/09		3/4"			No	44.62	280.41	231.18	26.4
STN-39, 19.5'-21.0'	60° C	2283	10/6/09		3/4"			No	43.80	267.55	225.23	23.3
STN-39, 21.0'-22.5'	60° C	2284	10/6/09		3/4"			No	49.25	293.33	231.15	34.2
STN-39, 22.5'-24.0'	60° C	2285	10/6/09		No. 10			Yes	47.34	258.82	203.01	35.9
STN-39, 24.0'-25.5'	60° C	2286	10/6/09		No. 10			Yes	69.48	314.88	238.88	44.9
STN-39, 25.5'-27.0'	60° C	2287	10/6/09		No. 10			Yes	73.42	263.49	214.32	34.9
STN-39, 27.0'-28.5'	60° C	2288	10/6/09		No. 10			Yes	71.12	240.18	183.68	50.2
STN-39, 28.5'-30.0'	60° C	2289	10/6/09		No. 4			No	74.44	204.52	164.16	45.0
STN-39, 30.0'-31.5'	60° C	2291	10/6/09		No. 10			Yes	70.25	139.73	122.49	33.0
STN-39, 31.5'-33.0'	60° C	2292	10/6/09		No. 10			Yes	70.29	206.46	175.17	29.8
STN-39, 33.0'-34.5'	60° C	2293	10/6/09		No. 10			Yes	70.37	349.45	268.69	40.7
STN-39, 34.5'-36.0'	60° C	2294	10/6/09		No. 10			Yes	71.68	367.39	287.47	37.0
STN-39, 36.0'-37.5'	60° C	2295	10/6/09		No. 10			Yes	75.00	303.34	233.81	43.8
STN-39, 37.5'-39.0'	60° C	2296	10/6/09		No. 10			Yes	50.82	312.29	238.35	39.4
STN-39, 39.0'-40.5'	60° C	2297	10/6/09		No. 4			Yes	43.33	367.86	263.25	47.6
STN-39, 40.5'-42.0'	60° C	2298	10/6/09		No. 10			Yes	47.11	279.94	215.52	38.3
STN-39, 42.0'-43.5'	60° C	2299	10/6/09		No. 10			Yes	45.19	271.46	190.62	55.6
STN-39, 43.5'-45.0'	60° C	2300	10/6/09		No. 10			Yes	70.64	291.04	217.81	49.8
STN-39, 45.0'-46.5'	60° C	2301	10/6/09		No. 10			Yes	73.02	273.05	210.22	45.8

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-39, 46.5'-48.0' 60° C	2302	10/6/09		No. 10			Yes	76.10	380.15	325.33	22.0
STN-39, 48.0'-49.5'	2304	10/6/09	Hom	No. 10			Yes	71.13	217.69	192.94	20.3
STN-39, 49.5'-51.0'	2305	10/6/09	Len	No. 10			Yes	43.78	191.87	166.23	20.9
STN-39, 51.0'-52.5'	2306	10/6/09	Hom	No. 10			Yes	69.81	294.22	255.50	20.9
STN-39, 52.5'-54.0'	2307	10/6/09	Hom	No. 10			Yes	70.61	310.90	271.47	19.6
STN-39, 54.0'-55.5'	2308	10/6/09	Hom	No. 10			Yes	75.11	399.15	344.85	20.1
STN-39, 55.5'-57.0'	2309	10/6/09	Hom	No. 10			Yes	69.11	387.17	333.91	20.1
STN-39, 57.0'-58.5'	2310	10/6/09	Hom	No. 10			Yes	70.77	373.30	316.32	23.2
STN-39, 58.5'-60.0'	2311	10/6/09		No. 10			Yes	70.45	405.40	339.01	24.7
STN-39, 60.0'-61.5'	2312	10/6/09		No. 10			Yes	47.48	332.98	276.28	24.8
STN-39, 61.5'-63.0'	2313	10/6/09	Hom	No. 10			Yes	71.44	334.02	282.88	24.2
STN-39, 63.0'-64.5'	2314	10/6/09		No. 10			Yes	71.61	420.20	353.07	23.9
STN-39, 64.5'-66.0'	2315	10/6/09		No. 10			Yes	40.56	252.33	208.27	26.3
STN-39, 66.0'-67.5'	2316	10/6/09	Len	No. 10			Yes	75.42	321.59	271.90	25.3
STN-39, 67.5'-69.0'	2317	10/6/09		1 1/2"	2	3/4"	No	71.75	368.52	314.10	22.5
STN-39, 69.0'-70.5'	2318	10/6/09		1 1/2"	1	3/4"	No	70.31	312.14	282.90	13.8
STN-39, 70.5'-72.0'	2319	10/6/09		3/4"	2	3/4"	No	74.41	428.00	372.41	18.7
STN-39, 72.0'-73.5'	2320	10/6/09		1 1/2"	1	1 1/2"	No	71.45	371.34	332.33	15.0

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-40, 0.0'-1.5'		2321	10/15/09	Hom	3/4"			No	284.28	475.80	451.23	14.7
STN-40, 1.5'-3.0'		2322	10/15/09	Str	1 1/2"	1	1 1/2"	No	294.59	608.50	569.84	14.0
STN-40, 3.0'-4.5'	60° C	2323	10/15/09		3/8"			No	296.67	506.70	471.91	19.9
STN-40, 4.5'-6.0'	60° C	2324	10/15/09		3/8"			No	283.87	548.00	499.20	22.7
STN-40, 6.0'-7.5'	60° C	2325	10/15/09		3/8"			No	295.70	525.30	483.20	22.5
STN-40, 7.5'-9.0'	60° C	2326	10/15/09		No. 4			Yes	285.62	542.10	493.21	23.6
STN-40, 9.0'-10.5'	60° C	2327	10/15/09		3/4"			No	299.16	559.40	515.32	20.4
STN-40, 10.5'-12.0'	60° C	2328	10/15/09		3/8"			No	299.57	543.90	499.89	22.0
STN-40, 12.0'-13.5'	60° C	2329	10/15/09		3/8"			No	292.27	529.10	485.63	22.5
STN-40, 13.5'-15.0'	60° C	2330	10/15/09		3/8"			No	291.97	505.20	447.02	37.5
STN-40, 15.0'-16.5'	60° C	2332	10/15/09		3/8"			No	295.17	501.40	423.47	60.7
STN-40, 16.5'-18.0'	60° C	2333	10/15/09		3/8"			No	296.99	493.70	410.76	72.9
STN-40, 18.0'-19.5'	60° C	2334	10/15/09		No. 4			Yes	282.59	628.10	498.53	60.0
STN-40, 19.5'-21.0'	60° C	2335	10/15/09		3/4"			No	286.09	570.00	461.46	61.9
STN-40, 21.0'-22.5'	60° C	2336	10/15/09		No. 10			Yes	310.50	579.90	495.67	45.5
STN-40, 22.5'-24.0'	60° C	2337	10/15/09		No. 10			Yes	295.52	523.50	453.81	44.0
STN-40, 24.0'-25.5'	60° C	2338	10/15/09		3/8"			No	288.37	467.40	409.29	48.1
STN-40, 25.5'-27.0'	60° C	2339	10/15/09		No. 10			Yes	294.81	493.90	428.76	48.6
STN-40, 27.0'-28.5'	60° C	2340	10/15/09		No. 10			Yes	288.94	603.90	525.15	33.3
STN-40, 28.5'-30.0'	60° C	2341	10/15/09		No. 10			Yes	289.77	594.90	509.88	38.6
STN-40, 30.0'-31.5'	60° C	2342	10/15/09		No. 10			Yes	300.25	562.80	467.21	57.3
STN-40, 31.5'-33.0'	60° C	2343	10/15/09		No. 10			Yes	300.43	593.10	493.40	51.7
STN-40, 33.0'-34.5'	60° C	2344	10/15/09		3/4"			No	300.29	612.20	515.21	45.1
STN-40, 34.5'-36.0'	60° C	2345	10/15/09		3/8"			No	296.55	577.40	497.76	39.6
STN-40, 36.0'-37.5'	60° C	2346	10/15/09		No. 10			Yes	309.13	602.20	516.32	41.4
STN-40, 37.5'-39.0'	60° C	2347	10/15/09		No. 10			Yes	284.00	616.20	518.27	41.8
STN-40, 39.0'-40.5'	60° C	2348	10/15/09		3/8"			No	297.12	685.80	569.76	42.6
STN-40, 40.5'-42.0'	60° C	2349	10/15/09		3/8"			No	307.54	690.20	582.18	39.3
STN-40, 42.0'-43.5'	60° C	2350	10/15/09		3/8"			No	285.44	673.30	574.04	34.4
STN-40, 43.5'-45.0'		2351	10/16/09	Hom	No. 10			Yes	293.49	522.70	472.96	27.7
STN-40, 45.0'-46.5'	No Recovery	2352	10/19/09									

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-40, 46.5'-48.0'	2353	10/16/09	Hom	No. 10			Yes	294.38	560.60	501.85	28.3
STN-40, 48.0'-49.5'	2354	10/16/09	Hom	No. 10			Yes	291.67	521.60	469.97	29.0
STN-40, 49.5'-51.0'	2355	10/16/09	Hom	No. 10			Yes	295.08	499.00	445.43	35.6
STN-40, 51.0'-52.5'	2356	10/16/09	Hom	No. 10			Yes	296.23	554.50	493.88	30.7
STN-40, 52.5'-54.0'	2357	10/16/09	Hom	No. 10			Yes	286.41	483.10	435.85	31.6
STN-40, 54.0'-55.5'	2358	10/16/09	Hom	No. 10			Yes	294.90	568.80	500.18	33.4
STN-40, 55.5'-57.0'	2360	10/16/09	Hom	No. 10			Yes	300.22	453.40	418.93	29.0
STN-40, 57.0'-58.5'	2361	10/16/09	Hom	No. 10			Yes	292.84	396.61	373.72	28.3
STN-40, 58.5'-60.0'	2362	10/16/09	Hom	No. 10			Yes	296.61	458.20	427.57	23.4
STN-40, 60.0'-61.5'	2363	10/16/09	Hom	No. 10			Yes	294.16	507.20	453.15	34.0
STN-40, 61.5'-62.8'	2364	10/16/09		1 1/2"	1	1 1/2"	No	293.13	556.50	526.97	12.6

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-41, 0.0'-1.5'	443	7/27/09	Len	3/8"			No	30.01	265.33	225.47	20.4
STN-41, 1.5'-3.0'	444	7/27/09	Len	3/8"			No	44.46	399.68	321.10	28.4
STN-41, 3.0'-4.5'	445	7/28/09	Len	3/8"			No	44.10	280.80	226.05	30.1
STN-41, 4.5'-6.0'	446	7/28/09	Len	3/8"			No	43.52	282.08	239.31	21.8
STN-41, 6.0'-7.5'	447	7/28/09	Len	3/8"			No	50.72	272.97	229.13	24.6
STN-41, 7.5'-9.0'	448	7/28/09	Len	3/8"			No	46.94	308.40	260.48	22.4
STN-41, 9.0'-10.5'	449	7/28/09	Len	3/8"			No	44.99	281.33	227.73	29.3
STN-41, 10.5'-12.0'	450	7/28/09	Len	3/8"			No	47.38	282.24	233.42	26.2
STN-41, 12.0'-13.5'	451	7/28/09	Len	3/8"			No	49.94	332.72	268.59	29.3
STN-41, 13.5'-15.0' **60° C**	452	7/28/09	Hom	3/8"			No	44.34	252.83	195.31	38.1
STN-41, 15.0'-16.5'	453	7/28/09	Hom	1 1/2"			No	44.05	183.19	174.25	6.9
STN-41, 16.5'-18.0'	454	7/28/09	Hom	1 1/2"			No	43.86	227.39	201.26	16.6
STN-41, 18.0'-19.5'	455	7/28/09	Len	3/8"			No	49.08	356.25	289.10	28.0
STN-41, 19.5'-21.0'	456	7/28/09	Str	No. 4			Yes	48.92	227.95	192.66	24.6
STN-41, 21.0'-22.5'	457	7/28/09	Hom	No. 10			Yes	47.33	232.97	194.99	25.7
STN-41, 22.5'-24.0'	458	7/28/09	Hom	No. 10			Yes	48.95	188.32	159.29	26.3
STN-41, 24.0'-25.5'	459	7/28/09	Hom	No. 10			Yes	39.19	218.15	180.48	26.7
STN-41, 25.5'-27.0'	460	7/28/09	Hom	3/4"			No	43.43	297.65	245.80	25.6
STN-41, 27.0'-28.5'	461	7/28/09	Str	No. 10			Yes	43.38	331.63	272.59	25.8
STN-41, 28.5'-30.0'	462	7/28/09	Str	No. 10			Yes	47.65	345.44	283.40	26.3
STN-41, 30.0'-31.5' No Recovery	463	7/28/09									
STN-41, 31.5'-33.0'	464	7/28/09	Hom	No. 10			Yes	39.36	271.22	221.10	27.6
STN-41, 33.0'-34.5'	465	7/28/09	Hom	No. 10			Yes	43.80	334.29	271.39	27.6
STN-41, 34.5'-36.0'	466	7/28/09	Hom	No. 10			Yes	44.19	141.97	122.90	24.2
STN-41, 36.0'-37.5'	467	7/28/09	Hom	No. 10			Yes	28.66	260.40	212.49	26.1
STN-41, 37.5'-39.0'	468	7/28/09	Hom	No. 10			Yes	44.10	353.20	285.27	28.2
STN-41, 39.0'-40.5'	469	7/28/09	Hom	3/8"			No	46.69	337.66	215.68	72.2
STN-41, 40.5'-42.0'	470	7/28/09	Hom	3/8"			No	44.07	345.72	287.87	23.7
STN-41, 42.0'-43.5'	471	7/28/09	Len	3/4"			No	43.73	349.70	297.49	20.6
STN-41, 43.5'-45.0'	472	7/28/09	Len	3/8"			No	43.55	306.35	271.06	15.5

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-43, 0.0'-1.5'		2395	10/8/09	Str	1 1/2"	2	3/4"	No	48.86	254.83	220.32	20.1
STN-43, 1.5'-3.0'	60° C	2396	10/8/09		No. 4			Yes	43.54	263.12	229.84	17.9
STN-43, 3.0'-4.5'	60° C	2397	10/8/09		No. 4			Yes	48.05	254.42	214.50	24.0
STN-43, 4.5'-6.0'	60° C	2399	10/8/09		3/8"			No	43.97	143.49	123.26	25.5
STN-43, 6.0'-7.5'	60° C	2400	10/8/09		3/8"			No	43.80	250.17	208.27	25.5
STN-43, 7.5'-9.0'	60° C	2401	10/8/09		No. 4			Yes	49.49	257.59	210.16	29.5
STN-43, 9.0'-10.5'	60° C	2402	10/8/09		3/8"			No	44.46	256.32	219.76	20.9
STN-43, 10.5'-12.0'	60° C	2403	10/8/09		3/8"			No	39.32	217.03	185.74	21.4
STN-43, 12.0'-13.5'	60° C	2404	10/8/09		3/8"			No	43.68	275.88	234.16	21.9
STN-43, 13.5'-15.0'	60° C	2405	10/8/09		1 1/2"	1	1 1/2"	No	46.55	279.62	236.40	22.8
STN-43, 15.0'-16.5'	60° C	2406	10/8/09		1 1/2"	1	1 1/2"	No	41.07	224.30	191.55	21.8
STN-43, 16.5'-18.0'	60° C	2407	10/8/09		3/4"			No	48.16	310.82	274.83	15.9
STN-43, 18.0'-19.5'	60° C	2408	10/8/09		3/8"			No	39.27	274.36	249.99	11.6
STN-43, 19.5'-21.0'	60° C	2409	10/8/09		3/8"			No	43.99	368.57	333.50	12.1
STN-43, 21.0'-22.5'		2410	10/8/09		3/8"			No	49.36	463.30	419.17	11.9
STN-43, 22.5'-24.0'		2411	10/8/09		3/8"			No	44.81	382.86	347.12	11.8
STN-43, 24.0'-25.5'		2412	10/8/09		3/4"	1	3/4"	No	44.16	325.30	293.28	12.9
STN-43, 25.5'-27.0'		2413	10/8/09		3/8"			No	30.09	311.20	282.52	11.4
STN-43, 27.0'-28.5'		2414	10/8/09		3/8"			No	43.38	424.60	384.67	11.7
STN-43, 28.5'-30.0'		2415	10/8/09		3/8"			No	44.63	348.81	317.15	11.6
STN-43, 30.0'-31.5'	No Recovery	2416	10/8/09									
STN-43, 31.5'-33.0'		2417	10/8/09		3/8"			No	71.36	468.90	428.17	11.4
STN-43, 33.0'-34.5'		2418	10/8/09		3/8"			No	73.55	506.50	461.77	11.5
STN-43, 34.5'-36.0'		2419	10/8/09		3/8"			No	72.53	481.20	438.56	11.6
STN-43, 36.0'-37.5'		2420	10/8/09		3/4"			No	49.99	369.41	340.83	9.8
STN-43, 37.5'-39.0'		2421	10/8/09		3/8"			No	75.06	508.40	465.22	11.1
STN-43, 39.0'-40.5'	60° C	2423	10/8/09		No. 10			Yes	71.86	226.28	185.25	36.2
STN-43, 40.5'-42.0'	No Sample	2424	10/8/09									
STN-43, 42.0'-43.5'	60° C	2425	10/8/09		No. 10			Yes	76.29	342.96	274.08	34.8
STN-43, 43.5'-45.0'	60° C	2427	10/8/09		3/8"			No	70.42	255.25	219.83	23.7
STN-43, 45.0'-46.5'	60° C	2428	10/8/09		3/4"			No	70.73	352.07	325.59	10.4

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-43, 46.5'-48.0' 60° C	2429	10/8/09	Hom	No. 10			Yes	71.66	297.08	257.01	21.6
STN-43, 48.0'-49.5'	2430	10/9/09	Hom	No. 10			Yes	50.77	245.15	208.97	22.9
STN-43, 49.5'-51.0'	2431	10/9/09	Hom	No. 10			Yes	44.37	182.83	156.89	23.1
STN-43, 51.0'-52.5'	2432	10/9/09	Hom	No. 10			Yes	44.85	261.73	219.56	24.1
STN-43, 52.5'-54.0'	2433	10/9/09	Str	No. 10			Yes	72.69	329.90	278.66	24.9
STN-43, 54.0'-55.5'	2434	10/9/09	Len	No. 10			Yes	74.02	249.96	215.83	24.1
STN-43, 55.5'-57.0'	2435	10/9/09	Hom	No. 10			Yes	72.33	350.06	296.49	23.9
STN-43, 57.0'-58.5'	2436	10/9/09	Hom	No. 10			Yes	68.61	313.13	261.00	27.1
STN-43, 58.5'-60.0'	2437	10/9/09	Len	No. 10			Yes	74.92	291.40	232.69	37.2
STN-43, 60.0'-61.4'	2438	10/9/09		1 1/2"	1	1 1/2"	No	74.17	396.09	355.14	14.6

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-44, 0.0'-1.5'		2439	10/7/09	Str	3/4"			No	43.77	289.44	243.79	22.8
STN-44, 1.5'-3.0'	60° C	2440	10/7/09		3/4"			No	50.98	274.57	235.71	21.0
STN-44, 3.0'-4.5'	60° C	2441	10/7/09		3/8"			No	43.80	244.99	216.60	16.4
STN-44, 4.5'-6.0'	60° C	2442	10/7/09		3/4"			No	41.24	244.89	216.77	16.0
STN-44, 6.0'-7.5'	60° C	2443	10/7/09		3/4"			No	44.93	247.47	219.58	16.0
STN-44, 7.5'-9.0'	60° C	2444	10/7/09		3/4"			No	43.28	246.33	216.96	16.9
STN-44, 9.0'-10.5'	60° C	2445	10/7/09		3/8"			No	43.84	279.60	246.66	16.2
STN-44, 10.5'-12.0'	60° C	2447	10/7/09		3/4"			No	44.37	250.74	217.30	19.3
STN-44, 12.0'-13.5'	60° C	2448	10/7/09		3/4"			No	40.63	203.76	177.54	19.2
STN-44, 13.5'-15.0'	60° C	2449	10/7/09		3/4"			No	43.57	258.75	224.87	18.7
STN-44, 15.0'-16.5'	60° C	2450	10/7/09		3/8"			No	50.10	268.77	226.18	24.2
STN-44, 16.5'-18.0'	60° C	2451	10/7/09		No. 4			Yes	44.16	274.27	228.64	24.7
STN-44, 18.0'-19.5'	60° C	2452	10/7/09		3/8"			No	47.52	275.55	228.02	26.3
STN-44, 19.5'-21.0'	60° C	2453	10/7/09		3/8"			No	48.42	277.75	232.32	24.7
STN-44, 21.0'-22.5'	60° C	2454	10/7/09		3/4"			No	39.25	227.83	180.17	33.8
STN-44, 22.5'-24.0'	60° C	2455	10/8/09		3/4"			No	39.76	209.66	165.15	35.5
STN-44, 24.0'-25.5'	60° C	2456	10/8/09		1 1/2"	1	1 1/2"	No	45.14	267.53	227.65	21.9
STN-44, 25.5'-27.0'	60° C	2457	10/8/09	Str	3/8"			No	43.63	274.55	210.26	38.6
STN-44, 27.0'-28.5'	60° C	2458	10/8/09	Str	3/8"			No	44.68	246.55	190.79	38.2
STN-44, 28.5'-30.0'	60° C	2459	10/8/09	Str	No. 4			Yes	44.14	258.09	204.72	33.2
STN-44, 30.0'-31.5'	60° C	2460	10/8/09	Str	No. 4			Yes	44.18	242.65	191.57	34.7
STN-44, 31.5'-33.0'	60° C	2461	10/8/09	Str	No. 4			Yes	43.93	249.52	205.88	26.9
STN-44, 33.0'-34.5'	60° C	2462	10/8/09	Str	No. 4			Yes	43.61	309.12	241.31	34.3
STN-44, 34.5'-36.0'	60° C	2463	10/8/09	Str	No. 4			Yes	43.84	268.48	197.54	46.2
STN-44, 36.0'-37.5'	60° C	2464	10/8/09	Str	No. 4			Yes	44.61	284.76	229.37	30.0
STN-44, 37.5'-39.0'	60° C	2465	10/8/09	Str	No. 4			Yes	50.28	362.76	279.37	36.4
STN-44, 39.0'-40.5'	60° C	2466	10/8/09	Str	No. 10			Yes	48.95	358.11	272.75	38.1
STN-44, 40.5'-42.0'	60° C	2467	10/8/09	Str	No. 4			Yes	46.61	270.85	207.51	39.4
STN-44, 42.0'-43.5'	60° C	2468	10/8/09	Str	No. 10			Yes	44.23	312.64	232.14	42.8
STN-44, 43.5'-45.0'	60° C	2469	10/8/09	Str	No. 10			Yes	43.56	244.42	179.50	47.8
STN-44, 45.0'-46.5'	60° C	2470	10/8/09	Str	No. 10			Yes	43.52	308.45	239.33	35.3

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-44, 46.5'-48.0' 60° C	2471	10/8/09	Hom	No. 10			Yes	46.98	309.25	261.53	22.2
STN-44, 48.0'-49.5' 60° C	2472	10/8/09	Hom	No. 10			Yes	43.52	302.18	250.57	24.9
STN-44, 49.5'-51.0'	2473	10/8/09	Hom	3/4"	1	3/4"	No	45.34	315.55	263.60	23.8
STN-44, 51.0'-52.5'	2474	10/8/09	Hom	No. 10			Yes	39.62	250.96	212.08	22.5
STN-44, 52.5'-54.0'	2475	10/8/09	Hom	No. 4			Yes	45.39	299.77	253.27	22.4
STN-44, 54.0'-55.5'	2476	10/8/09	Hom	No. 10			Yes	43.89	296.83	249.64	22.9
STN-44, 55.5'-57.0'	2477	10/8/09	Len	No. 10			Yes	44.14	325.50	273.06	22.9
STN-44, 57.0'-58.5'	2478	10/8/09	Hom	No. 10			Yes	44.09	328.12	275.50	22.7
STN-44, 58.5'-60.0'	2479	10/8/09	Hom	No. 10			Yes	44.06	320.37	273.81	20.3
STN-44, 60.0'-61.5'	2480	10/8/09	Hom	No. 10			Yes	70.25	355.28	305.68	21.1
STN-44, 61.5'-63.0'	2481	10/8/09	Hom	No. 10			Yes	71.71	330.43	290.27	18.4
STN-44, 63.0'-64.5'	2482	10/8/09	Hom	3/4"	1	3/4"	No	69.30	393.13	337.65	20.7
STN-44, 64.5'-66.0'	2483	10/8/09		3/4"	3	3/4"	No	70.40	428.90	366.29	21.2
STN-44, 66.0'-66.1'	2484	10/8/09		3/4"			No	71.19	151.60	143.14	11.8

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-45, 0.0'-1.5'		2485	9/28/09	Hom	3/8"			No	70.49	184.83	166.07	19.6
STN-45, 1.5'-3.0'	60° C	2486	9/28/09	Hom	3/8"			No	71.23	222.66	193.13	24.2
STN-45, 3.0'-4.5'	60° C	2487	9/28/09	Hom	3/8"			No	70.38	255.58	219.63	24.1
STN-45, 4.5'-6.0'	60° C	2488	9/28/09	Hom	No. 4			Yes	68.66	229.29	197.92	24.3
STN-45, 6.0'-7.5'	60° C	2489	9/28/09	Hom	No. 4			Yes	70.21	279.68	238.95	24.1
STN-45, 7.5'-9.0'	60° C	2490	9/28/09	Hom	3/8"			No	46.58	209.65	179.67	22.5
STN-45, 9.0'-10.5'	60° C	2491	9/28/09	Hom	3/4"			No	40.53	180.01	157.21	19.5
STN-45, 10.5'-12.0'	60° C	2492	9/28/09	Hom	3/8"			No	44.26	200.46	169.18	25.0
STN-45, 12.0'-13.5'	60° C	2493	9/28/09	Hom	3/8"			No	47.02	203.83	175.08	22.5
STN-45, 13.5'-15.0'	60° C	2494	9/28/09	Hom	3/8"			No	44.15	224.65	194.54	20.0
STN-45, 15.0'-16.5'	60° C	2495	9/28/09	Hom	3/8"			No	39.58	196.20	166.53	23.4
STN-45, 16.5'-18.0'	60° C	2496	9/28/09	Hom	3/4"			No	41.04	195.45	159.52	30.3
STN-45, 18.0'-19.5'	60° C	2497	9/28/09	Hom	3/8"			No	43.81	214.89	170.78	34.7
STN-45, 19.5'-21.0'	60° C	2498	9/28/09	Hom	No. 4			Yes	50.09	236.46	175.12	49.1
STN-45, 21.0'-22.5'	No Recovery	2499	10/1/09									
STN-45, 22.5'-24.0'	60° C	2501	9/28/09	Hom	3/8"			No	43.91	181.63	156.53	22.3
STN-45, 24.0'-25.5'	60° C	2502	9/28/09	Hom	3/8"			No	44.20	167.03	136.23	33.5
STN-45, 25.5'-27.0'	60° C	2503	9/28/09	Hom	3/8"			No	44.42	274.53	217.17	33.2
STN-45, 27.0'-28.5'	60° C	2504	9/28/09	Hom	No. 10			Yes	45.91	215.99	176.41	30.3
STN-45, 28.5'-30.0'	60° C	2505	9/28/09	Hom	No. 4			Yes	43.33	206.28	148.84	54.4
STN-45, 30.0'-31.5'	60° C	2506	9/28/09	Hom	No. 4			Yes	48.16	299.80	234.38	35.1
STN-45, 31.5'-33.0'	60° C	2507	9/28/09	Hom	No. 10			Yes	43.76	255.55	192.19	42.7
STN-45, 33.0'-34.5'	60° C	2508	9/28/09	Hom	No. 4			Yes	73.90	319.29	236.11	51.3
STN-45, 34.5'-36.0'	60° C	2509	9/28/09	Hom	No. 10			Yes	71.33	264.49	196.88	53.9
STN-45, 36.0'-37.5'	60° C	2510	9/28/09	Hom	No. 10			Yes	43.85	360.34	270.15	39.9
STN-45, 37.5'-39.0'	60° C	2511	9/28/09	Hom	No. 10			Yes	43.82	279.00	232.15	24.9
STN-45, 39.0'-40.5'	60° C	2512	9/28/09	Hom	No. 10			Yes	43.76	212.34	173.20	30.2
STN-45, 40.5'-42.0'	60° C	2513	9/28/09	Hom	No. 10			Yes	49.25	217.16	180.14	28.3
STN-45, 42.0'-43.5'	60° C	2514	9/28/09	Hom	No. 10			Yes	44.08	204.92	167.88	29.9
STN-45, 43.5'-45.0'	60° C	2515	9/28/09	Hom	No. 4			Yes	70.65	261.98	222.25	26.2
STN-45, 45.0'-46.5'	60° C	2516	9/28/09	Hom	No. 10			Yes	47.68	203.01	170.25	26.7

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-45, 46.5'-48.0'	60° C	2517	9/28/09	Hom	No. 10			Yes	70.24	305.27	258.04	25.1
STN-45, 48.0'-49.5'	60° C	2518	9/28/09	Hom	No. 10			Yes	69.46	292.00	248.92	24.0
STN-45, 49.5'-51.0'	60° C	2519	9/28/09	Len	No. 10			Yes	44.99	285.91	238.70	24.4
STN-45, 51.0'-52.5'		2520	9/28/09	Hom	No. 10			Yes	71.09	385.14	322.41	25.0
STN-45, 52.5'-54.0'		2521	9/28/09	Hom	No. 4			Yes	43.68	287.87	239.46	24.7
STN-45, 54.0'-55.5'		2522	9/28/09	Hom	No. 10			Yes	43.95	154.11	131.22	26.2
STN-45, 55.5'-57.0'		2523	9/28/09	Hom	3/8"			No	43.83	249.30	220.80	16.1
STN-45, 57.0'-58.2'		2524	9/28/09	Hom	3/4"			No	44.57	220.07	194.08	17.4

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-46, 0.0'-1.5'		2525	10/2/09		3/8"			No	43.97	93.32	80.20	36.2
STN-46, 1.5'-3.0'	60° C	2526	10/2/09		1 1/2"	1	1 1/2"	No	45.29	73.95	67.35	29.9
STN-46, 3.0'-4.5'	60° C	2527	10/2/09		3/4"			No	44.26	294.00	221.82	40.7
STN-46, 4.5'-6.0'	60° C	2528	10/2/09		3/8"			No	43.55	95.80	78.70	48.6
STN-46, 6.0'-7.5'	60° C	2529	10/2/09		3/8"			No	46.64	263.33	194.38	46.7
STN-46, 7.5'-9.0'	60° C	2530	10/2/09		No. 10			Yes	47.64	265.93	202.67	40.8
STN-46, 9.0'-10.5'	60° C	2531	10/2/09		No. 4			Yes	44.06	250.71	182.38	49.4
STN-46, 10.5'-12.0'	60° C	2532	10/2/09		No. 4			Yes	45.28	319.48	239.16	41.4
STN-46, 12.0'-13.5'	60° C	2533	10/2/09		No. 4			Yes	48.63	324.17	243.07	41.7
STN-46, 13.5'-15.0'	60° C	2534	10/2/09		No. 10			Yes	44.17	295.18	217.48	44.8
STN-46, 15.0'-16.5'	60° C	2535	10/2/09		No. 10			Yes	43.61	268.55	204.26	40.0
STN-46, 16.5'-18.0'	60° C	2536	10/2/09		No. 4			Yes	43.64	269.44	200.26	44.2
STN-46, 18.0'-19.5'	60° C	2537	10/2/09		No. 10			Yes	46.52	335.54	236.70	52.0
STN-46, 19.5'-21.0'	60° C	2538	10/2/09		No. 10			Yes	44.35	343.35	245.30	48.8
STN-46, 21.0'-22.5'	60° C	2539	10/2/09		No. 4			No	44.29	113.87	95.04	37.1
STN-46, 22.5'-24.0'	60° C	2540	10/2/09		No. 4			Yes	44.39	310.11	246.72	31.3
STN-46, 24.0'-25.5'		2541	10/5/09	Hom	No. 10			Yes	21.67	126.71	104.04	27.5
STN-46, 25.5'-27.0'		2542	10/5/09	Hom	No. 10			Yes	22.65	100.68	83.15	29.0
STN-46, 27.0'-28.5'		2543	10/5/09	Hom	No. 10			Yes	21.46	113.91	92.52	30.1
STN-46, 28.5'-30.0'		2544	10/5/09	Hom	No. 10			Yes	21.77	106.50	86.81	30.3
STN-46, 30.0'-31.5'		2545	10/5/09	Hom	No. 10			Yes	21.40	112.54	92.70	27.8
STN-46, 31.5'-33.0'		2546	10/5/09	Hom	No. 10			Yes	21.54	109.64	91.49	25.9
STN-46, 33.0'-34.5'		2548	10/5/09	Hom	No. 10			Yes	20.24	94.33	79.77	24.5
STN-46, 34.5'-36.0'		2549	10/5/09	Hom	No. 10			Yes	15.50	107.10	88.84	24.9
STN-46, 36.0'-37.5'		2550	10/5/09	Hom	No. 10			Yes	21.50	123.47	104.02	23.6
STN-46, 37.5'-39.0'		2551	10/5/09	Hom	No. 10			Yes	21.49	136.80	114.46	24.0
STN-46, 39.0'-40.5'		2552	10/5/09		No. 4			No	21.43	129.82	106.96	26.7
STN-46, 40.5'-41.9'		2553	10/5/09		1 1/2"	2	1 1/2"	No	23.11	140.72	116.84	25.5

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-47, 0.0'-1.5'		2554	9/28/09	Hom	3/8"			No	46.96	171.88	146.97	24.9
STN-47, 1.5'-3.0'	60° C	2555	9/28/09	Hom	3/8"			No	45.34	168.99	151.56	16.4
STN-47, 3.0'-4.5'	60° C	2556	9/28/09	Hom	No. 4			Yes	73.92	197.65	177.32	19.7
STN-47, 4.5'-6.0'	60° C	2557	9/28/09	Hom	3/8"			No	74.85	279.37	249.35	17.2
STN-47, 6.0'-7.5'	60° C	2558	9/28/09	Hom	No. 4			Yes	43.86	192.56	169.53	18.3
STN-47, 7.5'-9.0'	60° C	2559	9/28/09	Hom	No. 4			No	43.63	146.93	131.62	17.4
STN-47, 9.0'-10.5'	60° C	2560	9/28/09	Hom	No. 10			Yes	69.27	242.69	212.94	20.7
STN-47, 10.5'-12.0'	60° C	2561	9/28/09	Hom	3/8"			No	69.25	237.43	209.28	20.1
STN-47, 12.0'-13.5'	60° C	2563	9/28/09	Hom	3/8"			No	44.10	194.87	168.82	20.9
STN-47, 13.5'-15.0'	60° C	2564	9/28/09	Hom	3/8"			No	43.49	237.82	203.45	21.5
STN-47, 15.0'-16.5'	60° C	2565	9/28/09	Hom	No. 4			Yes	75.07	236.22	208.16	21.1
STN-47, 16.5'-18.0'	60° C	2566	9/28/09	Hom	No. 4			Yes	72.66	270.65	233.65	23.0
STN-47, 18.0'-19.5'	60° C	2567	9/28/09	Hom	No. 4			Yes	73.49	264.57	227.94	23.7
STN-47, 19.5'-21.0'	60° C	2568	9/28/09	Hom	3/4"			No	43.50	206.75	177.21	22.1
STN-47, 21.0'-22.5'	60° C	2569	9/30/09	Hom	3/8"			No	43.83	222.56	188.69	23.4
STN-47, 22.5'-24.0'	60° C	2570	9/30/09	Hom	3/8"			No	44.06	206.41	163.27	36.2
STN-47, 24.0'-25.5'	60° C	2571	9/30/09	Hom	No. 4			Yes	43.52	221.56	179.60	30.8
STN-47, 25.5'-27.0'	60° C	2572	9/30/09	Hom	No. 4			Yes	43.22	204.96	160.55	37.9
STN-47, 27.0'-28.5'	60° C	2573	9/30/09	Hom	3/8"			No	47.32	194.74	156.16	35.4
STN-47, 28.5'-30.0'	60° C	2574	9/30/09	Hom	No. 10			Yes	43.49	201.96	156.99	39.6
STN-47, 30.0'-31.5'	60° C	2575	9/30/09	Hom	3/8"			No	43.87	264.45	205.66	36.3
STN-47, 31.5'-33.0'	60° C	2576	9/30/09	Hom	No. 10			Yes	44.19	242.70	182.79	43.2
STN-47, 33.0'-34.5'	60° C	2577	9/30/09	Hom	3/4"			No	44.48	198.39	158.36	35.2
STN-47, 34.5'-36.0'	60° C	2578	9/30/09	Hom	No. 4			Yes	72.79	283.66	235.57	29.5
STN-47, 36.0'-37.5'	60° C	2579	9/30/09	Hom	3/4"			No	75.36	350.99	289.15	28.9
STN-47, 37.5'-39.0'	60° C	2580	9/30/09	Hom	No. 10			Yes	73.21	375.60	303.14	31.5
STN-47, 39.0'-40.5'	60° C	2581	9/30/09	Hom	No. 10			Yes	44.17	288.52	224.89	35.2
STN-47, 40.5'-42.0'	60° C	2582	9/30/09	Hom	No. 10			Yes	75.45	324.46	260.08	34.9
STN-47, 42.0'-43.5'	60° C	2583	9/30/09	Hom	3/8"			No	72.44	316.45	237.73	47.6
STN-47, 43.5'-45.0'	60° C	2584	9/30/09	Hom	3/8"			No	48.14	222.25	154.96	63.0
STN-47, 45.0'-46.5'	60° C	2585	9/30/09	Hom	3/8"			No	72.33	291.78	215.67	53.1

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-47, 46.5'-48.0'	60° C	2586	9/30/09	Hom	No. 4			Yes	43.70	208.14	152.47	51.2
STN-47, 48.0'-49.5'	60° C	2587	9/30/09	Hom	No. 10			Yes	43.70	234.92	181.57	38.7
STN-47, 49.5'-51.0'	60° C	2588	9/30/09	Hom	No. 10			Yes	48.88	274.48	190.70	59.1
STN-47, 51.0'-52.5'		2589	9/30/09	Hom	No. 10			Yes	44.02	195.72	163.21	27.3
STN-47, 52.5'-54.0'		2590	9/30/09	Hom	No. 10			Yes	44.84	226.14	188.55	26.2
STN-47, 54.0'-55.5'		2591	10/1/09	Hom	No. 4			Yes	44.24	232.72	193.37	26.4
STN-47, 55.5'-57.0'		2592	10/1/09	Hom	No. 10			Yes	44.85	280.22	237.12	22.4
STN-47, 57.0'-58.5'		2593	10/1/09	Hom	No. 10			Yes	43.37	264.93	227.29	20.5
STN-47, 58.5'-60.0'		2595	10/1/09	Hom	No. 4			Yes	43.69	207.43	178.78	21.2
STN-47, 60.0'-61.5'		2596	10/1/09	Hom	No. 10			Yes	44.46	195.75	168.90	21.6
STN-47, 61.5'-63.0'		2597	10/1/09	Hom	No. 10			Yes	49.56	197.29	173.31	19.4
STN-47, 63.0'-64.5'		2598	10/1/09	Hom	No. 10			Yes	43.81	293.02	245.30	23.7
STN-47, 64.5'-66.0'		2599	10/1/09	Hom	No. 10			Yes	48.21	262.59	221.27	23.9
STN-47, 66.0'-67.5'		2600	10/1/09	Hom	No. 10			Yes	43.54	270.62	225.91	24.5
STN-47, 67.5'-69.0'		2601	10/1/09		No. 4			Yes	47.72	300.45	250.83	24.4
STN-47, 69.0'-69.9'		2602	10/1/09		3/4"	2	3/4"	No	43.95	234.21	210.97	13.9

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-48, 0.0'-1.5'		2603	10/1/09	Hom	3/4"	2	3/4"	No	48.80	212.41	176.16	28.5
STN-48, 1.5'-3.0'	60° C	2604	10/1/09		No. 10			Yes	44.27	176.35	153.43	21.0
STN-48, 3.0'-4.5'	60° C	2605	10/1/09		No. 10			Yes	47.19	247.92	216.02	18.9
STN-48, 4.5'-6.0'	60° C	2606	10/1/09		No. 4			Yes	27.76	234.64	196.94	22.3
STN-48, 6.0'-7.5'	60° C	2607	10/1/09		No. 10			Yes	22.03	106.63	91.35	22.0
STN-48, 7.5'-9.0'	60° C	2608	10/1/09		No. 10			Yes	21.49	87.69	75.68	22.2
STN-48, 9.0'-10.5'	60° C	2609	10/1/09		No. 10			Yes	19.06	86.98	71.69	29.1
STN-48, 10.5'-12.0'	60° C	2610	10/1/09	Hom	No. 10			Yes	19.22	88.58	73.40	28.0
STN-48, 12.0'-13.5'	60° C	2611	10/1/09		3/8"			No	19.50	88.35	76.16	21.5
STN-48, 13.5'-15.0'	60° C	2612	10/1/09		3/8"	1	3/8"	No	21.49	108.15	89.69	27.1
STN-48, 15.0'-16.5'	60° C	2613	10/1/09		No. 4			No	19.23	95.40	77.11	31.6
STN-48, 16.5'-18.0'	60° C	2614	10/1/09		No. 4			No	21.09	95.86	77.04	33.6
STN-48, 18.0'-19.5'	60° C	2615	10/1/09		3/8"			No	18.76	90.44	72.48	33.4
STN-48, 19.5'-21.0'	60° C	2617	10/1/09		3/4"			No	20.98	101.51	75.60	47.4
STN-48, 21.0'-22.5'	60° C	2618	10/1/09		3/4"			No	21.74	99.55	75.94	43.6
STN-48, 22.5'-24.0'	60° C	2619	10/1/09		No. 4			No	21.77	103.65	81.42	37.3
STN-48, 24.0'-25.5'	60° C	2620	10/1/09		No. 10			Yes	21.28	115.39	90.44	36.1
STN-48, 25.5'-27.0'	60° C	2621	10/1/09		No. 10			Yes	21.61	115.26	91.38	34.2
STN-48, 27.0'-28.5'	60° C	2622	10/1/09		No. 10			Yes	20.23	122.37	99.12	29.5
STN-48, 28.5'-30.0'	60° C	2623	10/1/09		No. 10			Yes	20.12	113.01	88.52	35.8
STN-48, 30.0'-31.5'	60° C	2624	10/1/09		No. 4			No	20.40	95.41	66.20	63.8
STN-48, 31.5'-33.0'	60° C	2626	10/1/09		No. 10			Yes	21.62	114.95	82.69	52.8
STN-48, 33.0'-34.5'	60° C	2627	10/1/09		No. 10			Yes	21.52	102.00	73.74	54.1
STN-48, 34.5'-36.0'	60° C	2628	10/1/09		No. 4			No	21.89	90.62	67.66	50.2
STN-48, 36.0'-37.5'	60° C	2629	10/1/09		No. 4			No	20.86	93.93	63.12	72.9
STN-48, 37.5'-39.0'	60° C	2630	10/1/09		No. 10			Yes	18.65	86.88	62.82	54.5
STN-48, 39.0'-40.5'	60° C	2631	10/1/09		3/8"			No	20.73	91.70	64.41	62.5
STN-48, 40.5'-42.0'	60° C	2632	10/1/09		3/4"			No	22.58	128.76	92.57	51.7
STN-48, 42.0'-43.5'	60° C	2634	10/1/09		No. 10			Yes	21.78	123.12	99.13	31.0
STN-48, 43.5'-45.0'	60° C	2635	10/1/09		No. 10			Yes	21.01	111.61	89.39	32.5
STN-48, 45.0'-46.5'		2636	10/1/09	Hom	No. 10			Yes	22.58	116.22	97.64	24.8

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Approved by : TLK

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-48, 46.5'-48.0'	2637	10/1/09	Len	No. 10			Yes	23.28	126.84	104.94	26.8
STN-48, 48.0'-49.5'	2638	10/1/09	Hom	No. 10			Yes	21.71	110.86	95.12	21.4
STN-48, 49.5'-51.0'	2639	10/1/09	Hom	No. 10			Yes	19.18	92.76	79.08	22.8
STN-48, 51.0'-52.5'	2640	10/1/09	Len	No. 10			Yes	21.45	110.29	93.77	22.8
STN-48, 52.5'-54.0'	2641	10/1/09	Hom	No. 10			Yes	21.92	113.59	95.85	24.0
STN-48, 54.0'-55.5'	2643	10/1/09	Hom	No. 10			Yes	21.36	110.13	93.53	23.0
STN-48, 55.5'-57.0'	2644	10/1/09		No. 10			Yes	22.30	138.72	116.62	23.4
STN-48, 57.0'-58.5'	2645	10/1/09	Hom	No. 4	2	1 1/2"	No	21.75	132.87	110.76	24.8
STN-48, 58.5'-60.0'	2646	10/1/09	Len	1 1/2"	2	1 1/2"	No	22.00	86.17	72.54	27.0
STN-48, 60.0'-60.4'	2647	10/1/09		1 1/2"			No	21.04	101.63	94.86	9.2

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-49, 0.0'-1.5'		2648	10/1/09	Hom	1 1/2"	1	1 1/2"	No	19.61	76.33	61.57	35.2
STN-49, 1.5'-3.0'		2649	10/1/09		1 1/2"	1	1 1/2"	No	18.76	106.64	85.03	32.6
STN-49, 3.0'-4.5'		2650	10/1/09		No. 4			No	20.72	105.81	85.75	30.8
STN-49, 4.5'-6.0'	60° C	2652	10/1/09		No. 10			Yes	19.34	105.34	78.00	46.6
STN-49, 6.0'-7.5'	60° C	2653	10/1/09		No. 10			Yes	21.41	127.31	95.70	42.5
STN-49, 7.5'-9.0'	60° C	2654	10/1/09		No. 10			Yes	21.46	115.82	84.33	50.1
STN-49, 9.0'-10.5'	60° C	2655	10/1/09		No. 10			Yes	23.44	117.65	91.73	38.0
STN-49, 10.5'-12.0'	60° C	2656	10/1/09		3/4"	1	3/4"	No	22.55	130.91	100.51	39.0
STN-49, 12.0'-13.5'	60° C	2657	10/1/09		No. 4			No	22.46	110.40	79.04	55.4
STN-49, 13.5'-15.0'	60° C	2659	10/1/09		3/8"			No	21.45	91.45	63.14	67.9
STN-49, 15.0'-16.5'	60° C	2660	10/1/09		3/8"			No	21.63	105.18	74.08	59.3
STN-49, 16.5'-18.0'	60° C	2661	10/1/09		No. 4			No	21.50	112.32	84.06	45.2
STN-49, 18.0'-19.5'	60° C	2662	10/1/09		3/4"			No	21.42	111.88	83.99	44.6
STN-49, 19.5'-21.0'	60° C	2663	10/1/09		No. 4			No	22.51	110.67	79.30	55.2
STN-49, 21.0'-22.5'	60° C	2664	10/1/09		3/8"			No	21.49	82.61	62.61	48.6
STN-49, 22.5'-24.0'	60° C	2665	10/1/09		No. 4			No	21.42	107.67	78.54	51.0
STN-49, 24.0'-25.5'	60° C	2666	10/1/09		No. 4			No	22.04	122.54	90.54	46.7
STN-49, 25.5'-27.0'	60° C	2667	10/1/09		No. 10			Yes	22.16	134.14	102.95	38.6
STN-49, 27.0'-28.5'		2668	10/2/09	Hom	No. 10			Yes	21.45	99.68	83.76	25.5
STN-49, 28.5'-30.0'		2669	10/2/09	Hom	No. 10			Yes	21.51	110.02	92.45	24.8
STN-49, 30.0'-31.5'		2671	10/2/09	Len	3/8"			No	21.42	107.19	90.13	24.8
STN-49, 31.5'-33.0'		2672	10/2/09	Len	No. 4			No	22.99	114.90	98.66	21.5
STN-49, 33.0'-34.5'		2673	10/2/09	Hom	No. 4			No	20.95	93.93	79.72	24.2
STN-49, 34.5'-36.0'		2674	10/2/09	Len	No. 4			No	22.60	119.79	100.70	24.4
STN-49, 36.0'-37.5'		2675	10/2/09	Hom	3/8"			No	21.55	133.03	111.71	23.6
STN-49, 37.5'-39.0'		2676	10/2/09		No. 4			No	21.49	145.59	120.68	25.1
STN-49, 39.0'-40.5'		2677	10/2/09	Len	No. 4			No	21.57	141.29	116.22	26.5
STN-49, 40.5'-42.0'		2678	10/2/09		3/4"			No	21.28	143.73	123.37	19.9
STN-49, 42.0'-43.5'		2679	10/2/09		1 1/2"			No	21.35	153.88	134.54	17.1
STN-49, 43.5'-44.2'		2680	10/2/09		3/4"			No	21.38	130.92	119.66	11.5

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-50, 0.0'-1.5'		2733	10/19/09	Hom	3/8"			No	21.35	88.40	77.03	20.4
STN-50, 1.5'-3.0'	60° C	2734	10/19/09	Hom	3/8"			No	22.36	76.15	67.67	18.7
STN-50, 3.0'-4.5'	60° C	2735	10/19/09	Hom	No. 4			No	21.48	78.32	68.52	20.8
STN-50, 4.5'-6.0'	60° C	2736	10/19/09	Hom	No. 4			No	19.03	66.60	60.11	15.8
STN-50, 6.0'-7.5'	60° C	2737	10/19/09	Hom	No. 10			Yes	20.97	62.74	53.93	26.7
STN-50, 7.5'-9.0'	60° C	2738	10/19/09	Hom	No. 10			Yes	22.07	73.76	63.31	25.3
STN-50, 9.0'-10.5'	60° C	2739	10/19/09	Hom	No. 10			Yes	21.53	84.55	64.61	46.3
STN-50, 10.5'-12.0'	60° C	2740	10/19/09	Hom	3/8"			No	23.90	84.62	73.73	21.9
STN-50, 12.0'-13.5'	60° C	2741	10/19/09	Hom	3/8"			No	19.12	62.63	53.69	25.9
STN-50, 13.5'-15.0'	60° C	2742	10/19/09	Hom	No. 4			No	22.59	73.46	64.09	22.6
STN-50, 15.0'-16.5'	60° C	2743	10/19/09	Hom	No. 4			No	21.58	75.05	64.27	25.3
STN-50, 16.5'-18.0'	60° C	2744	10/19/09	Hom	No. 4			No	23.46	68.17	55.01	41.7
STN-50, 18.0'-19.5'	60° C	2745	10/19/09	Hom	No. 4			No	21.54	72.03	56.81	43.2
STN-50, 19.5'-21.0'	60° C	2746	10/19/09	Hom	3/8"			No	22.44	85.71	68.27	38.1
STN-50, 21.0'-22.5'	60° C	2747	10/19/09	Hom	3/8"			No	21.91	82.21	67.16	33.3
STN-50, 22.5'-24.0'	60° C	2748	10/19/09	Hom	No. 4			No	22.79	98.16	76.06	41.5
STN-50, 24.0'-25.5'	60° C	2749	10/19/09	Hom	No. 4			Yes	44.88	194.75	157.67	32.9
STN-50, 25.5'-27.0'	60° C	2750	10/19/09	Hom	No. 10			Yes	43.49	204.06	156.99	41.5
STN-50, 27.0'-28.5'	60° C	2751	10/19/09	Hom	No. 10			Yes	43.82	231.56	179.70	38.2
STN-50, 28.5'-30.0'	60° C	2752	10/19/09	Hom	No. 10			Yes	44.23	170.89	135.37	39.0
STN-50, 30.0'-31.5'	60° C	2754	10/19/09	Hom	No. 10			Yes	43.86	131.30	92.33	80.4
STN-50, 31.5'-33.0'	60° C	2755	10/19/09	Hom	No. 10			Yes	49.09	237.55	173.74	51.2
STN-50, 33.0'-34.5'	60° C	2756	10/19/09	Hom	No. 10			Yes	43.40	192.74	131.35	69.8
STN-50, 34.5'-36.0'	60° C	2757	10/19/09	Hom	No. 10			Yes	48.24	185.70	132.77	62.6
STN-50, 36.0'-37.5'	60° C	2758	10/20/09		No. 10			Yes	49.79	209.45	143.77	69.9
STN-50, 37.5'-39.0'	60° C	2759	10/20/09		No. 10			Yes	44.14	200.20	142.86	58.1
STN-50, 39.0'-40.5'	60° C	2760	10/20/09		No. 10			Yes	44.05	189.81	140.62	50.9
STN-50, 40.5'-42.0'	60° C	2761	10/20/09		No. 10			Yes	47.54	178.81	133.65	52.4
STN-50, 42.0'-43.5'	60° C	2762	10/20/09		No. 10			Yes	47.60	165.69	124.88	52.8
STN-50, 43.5'-45.0'	60° C	2763	10/20/09		No. 10			Yes	50.36	193.61	149.54	44.4
STN-50, 45.0'-46.5'	60° C	2765	10/20/09		No. 10			Yes	43.80	138.12	108.56	45.6

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-50, 46.5'-48.0' 60° C	2766	10/20/09		No. 10			Yes	51.86	99.84	86.11	40.1
STN-50, 48.0'-49.5' 60° C	2767	10/20/09	Hom	No. 10			Yes	43.79	177.62	148.81	27.4
STN-50, 49.5'-51.0'	2768	10/20/09	Hom	No. 10			Yes	44.27	188.62	155.92	29.3
STN-50, 51.0'-52.5'	2769	10/20/09	Hom	No. 4			No	39.87	132.19	110.61	30.5
STN-50, 52.5'-54.0'	2771	10/20/09	Hom	3/4"			No	51.40	128.07	112.07	26.4
STN-50, 54.0'-55.5'	2772	10/20/09	Len	No. 4			No	43.86	162.04	136.73	27.3
STN-50, 55.5'-57.0'	2773	10/20/09	Len	No. 4			Yes	47.65	177.00	153.62	22.1
STN-50, 57.0'-58.5'	2774	10/20/09		3/4"			No	45.02	177.21	153.24	22.1
STN-50, 58.5'-60.0'	2775	10/20/09		3/4"			No	41.45	153.91	133.32	22.4
STN-50, 60.0'-60.2'	2776	10/20/09		3/4"			No	75.79	127.78	121.72	13.2

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-51, 0.0'-1.5'		473	7/29/09	Hom	3/8"			No	44.88	192.85	167.43	20.7
STN-51, 1.5'-3.0'		474	7/29/09	Hom	3/8"			No	44.45	225.82	193.32	21.8
STN-51, 3.0'-4.5'		475	7/29/09	Hom	3/8"			No	44.00	240.38	200.17	25.7
STN-51, 6.5'-8.0'		476	7/29/09	Hom	3/8"			No	47.65	273.39	229.99	23.8
STN-51, 8.0'-9.5'	**60° C**	477	7/29/09	Hom	3/8"			No	44.33	234.97	201.25	21.5
STN-51, 11.5'-13.0'	**60° C**	479	7/29/09	Hom	3/8"			No	46.96	230.34	192.67	25.9
STN-51, 13.0'-14.5'	**60° C**	480	7/29/09	Hom	3/4"			No	43.49	279.55	222.26	32.0
STN-51, 14.5'-16.0'	**60° C**	481	7/29/09	Hom	3/4"			No	40.18	228.71	211.73	9.9
STN-51, 16.0'-17.5'		482	7/29/09	Hom	3/4"			No	48.57	255.17	211.46	26.8
STN-51, 17.5'-19.0'		483	7/29/09	Hom	No. 4			Yes	39.73	181.36	150.74	27.6
STN-51, 21.0'-22.5'		484	7/29/09	Hom	No. 4			Yes	44.70	255.30	220.88	19.5
STN-51, 22.5'-24.0'		485	7/29/09	Hom	No. 4			Yes	44.26	236.78	203.38	21.0
STN-51, 26.0'-27.5'		486	7/29/09	Hom	No. 4			Yes	29.77	234.29	196.35	22.8
STN-51, 27.5'-29.0'		487	7/29/09	Hom	No. 10			Yes	46.66	244.44	209.53	21.4
STN-51, 29.0'-30.5'		488	7/29/09	Hom	No. 10			Yes	39.29	191.41	162.36	23.6
STN-51, 30.5'-32.0'		489	7/29/09	Hom	No. 10			Yes	43.67	302.40	251.76	24.3
STN-51, 32.0'-33.5'		490	7/29/09	Hom	No. 4			Yes	47.97	366.88	267.15	45.5
STN-51, 33.5'-35.0'		491	7/29/09	Hom	No. 10			Yes	43.94	260.71	213.12	28.1
STN-51, 35.0'-36.5'		492	7/29/09	Hom	No. 4			Yes	34.68	331.74	273.98	24.1
STN-51, 36.5'-38.0'		493	7/29/09	Hom	No. 10			Yes	43.72	307.86	258.88	22.8
STN-51, 38.0'-39.5'		494	7/29/09	Hom	No. 10			Yes	43.38	252.84	211.14	24.9
STN-51, 39.5'-41.0'		495	7/29/09	Hom	3/8"			No	44.28	246.92	206.14	25.2
STN-51, 41.0'-42.5'		496	7/29/09	Hom	No. 10			Yes	43.86	274.42	224.59	27.6
STN-51, 42.5'-44.0'		497	7/29/09	Hom	No. 10			Yes	43.65	247.44	204.04	27.1
STN-51, 44.0'-45.5'		499	8/17/09		No. 10			Yes	44.07	196.34	164.87	26.1
STN-51, 45.5'-47.0'		500	8/17/09		No. 10			Yes	48.26	194.30	163.62	26.6
STN-51, 47.0'-48.5'		501	8/17/09		No. 10			Yes	49.70	203.77	170.55	27.5
STN-51, 48.5'-50.0'		502	8/17/09		3/4"			No	44.41	215.94	198.02	11.7

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-52, 0.0'-1.5'	503	7/29/09	Hom	3/8"			No	44.05	222.32	194.75	18.3
STN-52, 1.5'-3.0'	504	7/29/09	Len	3/8"			No	43.88	238.33	211.49	16.0
STN-52, 3.0'-4.5'	505	7/29/09	Str	3/8"			No	46.42	261.35	191.70	47.9
STN-52, 4.5'-6.0'	506	7/29/09	Hom	3/8"			No	46.30	221.32	193.97	18.5
STN-52, 6.0'-7.5'	507	7/29/09	Hom	3/8"			No	43.67	243.11	208.53	21.0
STN-52, 7.5'-9.0'	508	7/29/09	Len	3/8"			No	49.44	247.98	211.11	22.8
STN-52, 9.0'-10.5'	509	7/29/09	Hom	No. 4			Yes	44.27	225.42	188.06	26.0
STN-52, 10.5'-12.0'	510	7/29/09	Len	No. 4			Yes	49.18	217.69	174.84	34.1
STN-52, 12.0'-13.5'	511	7/29/09	Hom	3/4"			No	46.48	239.84	196.68	28.7
STN-52, 13.5'-15.0'	512	7/29/09	Hom	3/4"			No	47.65	207.30	195.17	8.2
STN-52, 15.0'-16.5'	513	7/29/09	Hom	No. 4			Yes	44.37	227.07	191.23	24.4
STN-52, 16.5'-18.0'	514	7/29/09	Hom	3/8"			No	47.20	249.99	209.74	24.8
STN-52, 18.0'-19.5'	515	7/29/09	Hom	3/8"			No	48.60	262.49	216.71	27.2
STN-52, 19.5'-21.0'	516	7/29/09	Hom	No. 10			Yes	44.09	233.62	197.00	23.9
STN-52, 21.0'-22.5'	517	7/29/09	Hom	No. 4			Yes	44.77	249.09	208.97	24.4
STN-52, 22.5'-24.0'	518	7/29/09	Hom	No. 10			Yes	43.80	223.24	187.73	24.7
STN-52, 24.0'-25.5'	519	7/29/09	Hom	No. 10			Yes	47.58	268.60	221.69	26.9
STN-52, 25.5'-27.0'	520	7/29/09	Hom	No. 10			Yes	43.62	285.73	238.01	24.5
STN-52, 27.0'-28.5'	521	7/30/09	Hom	No. 10			Yes	48.14	229.57	194.95	23.6
STN-52, 28.5'-30.0'	522	7/30/09	Hom	No. 10			Yes	41.04	199.40	168.43	24.3
STN-52, 30.0'-31.5'	523	7/30/09	Hom	No. 10			Yes	43.55	262.19	217.46	25.7
STN-52, 31.5'-33.0'	524	7/30/09	Hom	No. 10			Yes	47.35	248.74	203.99	28.6
STN-52, 33.0'-34.5'	525	7/30/09	Hom	No. 10			Yes	43.62	296.47	243.13	26.7
STN-52, 34.5'-36.0'	526	7/31/09	Hom	No. 10			Yes	47.35	248.01	204.62	27.6
STN-52, 36.0'-37.5'	527	7/31/09	Hom	No. 10			Yes	40.16	232.21	191.65	26.8
STN-52, 37.5'-39.0'	528	7/31/09	Hom	No. 10			Yes	38.94	269.36	219.06	27.9
STN-52, 39.0'-40.5'	529	7/31/09	Hom	No. 10			Yes	43.70	271.25	225.34	25.3
STN-52, 40.5'-42.0'	530	7/31/09	Hom	No. 10			Yes	39.01	272.95	227.20	24.3
STN-52, 42.0'-43.5'	531	7/31/09	Hom	No. 10			Yes	44.01	319.24	261.88	26.3
STN-52, 43.5'-45.0'	532	7/31/09	Hom	3/8"			No	46.50	328.69	281.15	20.3

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-53, 0.0'-1.5'	3122	10/9/09	Hom	3/4"			No	74.12	304.22	274.22	15.0
STN-53, 1.5'-3.0'	3123	10/9/09	Hom	No. 10			Yes	73.65	297.54	266.32	16.2
STN-53, 3.0'-4.5'	3124	10/9/09	Hom	No. 10			Yes	74.02	250.77	220.21	20.9
STN-53, 4.5'-6.0'	3125	10/9/09	Hom	3/8"			No	44.04	199.97	174.45	19.6
STN-53, 6.0'-7.5'	3126	10/9/09	Hom	3/4"			No	44.29	184.61	160.29	21.0
STN-53, 7.5'-9.0'	3127	10/12/09	Hom	No. 10			Yes	72.22	361.90	299.41	27.5
STN-53, 9.0'-10.5'	3128	10/12/09	Hom	No. 10			Yes	71.37	356.19	304.14	22.4
STN-53, 10.5'-12.0'	3129	10/12/09	Hom	No. 10			Yes	72.92	349.02	296.75	23.4
STN-53, 12.0'-13.5'	3130	10/12/09	Hom	No. 10			Yes	40.69	253.42	214.81	22.2
STN-53, 13.5'-15.0'	3131	10/12/09	Hom	No. 10			Yes	49.51	314.73	264.15	23.6
STN-53, 15.0'-16.5'	3132	10/12/09	Len	No. 4			Yes	49.13	293.91	247.25	23.6
STN-53, 16.5'-18.0'	3133	10/12/09	Hom	No. 10			Yes	70.44	404.40	341.97	23.0
STN-53, 18.0'-19.5'	3134	10/12/09	Hom	No. 10			Yes	21.71	123.86	104.02	24.1
STN-53, 19.5'-21.0'	3135	10/12/09	Hom	No. 10			Yes	72.70	418.70	350.68	24.5
STN-53, 21.0'-22.5'	3136	10/12/09	Hom	No. 10			Yes	43.96	317.07	260.13	26.3
STN-53, 22.5'-24.0'	3138	10/12/09	Hom	No. 10			Yes	21.55	99.35	82.08	28.5
STN-53, 24.0'-25.5'	3139	10/12/09	Hom	No. 10			Yes	21.64	117.69	97.26	27.0
STN-53, 25.5'-27.0'	3140	10/12/09	Hom	No. 10			Yes	21.55	131.10	107.02	28.2
STN-53, 27.0'-28.5'	3141	10/12/09	Hom	No. 10			Yes	21.68	133.38	110.98	25.1
STN-53, 28.5'-30.0'	3142	10/12/09	Hom	No. 10			Yes	73.50	446.10	373.07	24.4
STN-53, 30.0'-31.5'	3143	10/12/09	Hom	No. 10			Yes	71.21	466.41	384.11	26.3
STN-53, 31.5'-33.0'	3144	10/12/09		No. 10			Yes	43.92	352.86	290.65	25.2
STN-53, 33.0'-34.5'	3145	10/12/09		No. 4			Yes	43.73	320.39	263.81	25.7
STN-53, 34.5'-36.0'	3147	10/12/09		3/8"			No	46.00	229.21	193.03	24.6
STN-53, 36.0'-37.5'	3148	10/12/09		3/8"			No	43.94	166.39	145.20	20.9
STN-53, 37.5'-39.0'	3149	10/12/09		1 1/2"	2	1 1/2"	No	34.90	294.37	258.15	16.2

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-54, 0.0'-1.5'	60° C	3091	10/8/09		3/4"			No	19.28	84.09	79.72	7.2
STN-54, 1.5'-3.0'	60° C	3092	10/8/09		3/4"			No	23.10	101.96	90.41	17.2
STN-54, 3.0'-4.5'	60° C	3093	10/8/09		3/8"			No	19.62	95.23	75.06	36.4
STN-54, 4.5'-6.0'	60° C	3094	10/8/09		No. 4			No	22.13	110.74	87.61	35.3
STN-54, 6.0'-7.5'	60° C	3095	10/8/09		3/4"			No	21.06	100.83	86.44	22.0
STN-54, 7.5'-9.0'	60° C	3096	10/8/09		3/4"			No	21.93	123.02	106.63	19.4
STN-54, 9.0'-10.5'	60° C	3097	10/8/09		3/8"			No	19.74	93.42	76.29	30.3
STN-54, 10.5'-12.0'	60° C	3099	10/8/09		No. 4			No	24.69	127.54	101.93	33.2
STN-54, 12.0'-13.5'	60° C	3100	10/8/09		1 1/2"	1	1 1/2"	No	21.55	102.43	82.41	32.9
STN-54, 13.5'-15.0'	60° C	3101	10/8/09		3/4"			No	22.87	129.53	99.76	38.7
STN-54, 15.0'-16.5'	60° C	3102	10/8/09		No. 4			No	20.85	111.78	83.50	45.1
STN-54, 16.5'-18.0'	60° C	3103	10/8/09		3/4"			No	23.01	120.66	91.92	41.7
STN-54, 18.0'-19.5'	60° C	3104	10/8/09		3/8"			No	22.08	103.28	82.32	34.8
STN-54, 19.5'-21.0'	60° C	3105	10/8/09		3/8"			No	21.57	108.44	79.21	50.7
STN-54, 21.0'-22.5'	60° C	3106	10/8/09		1 1/2"	1	1 1/2"	No	17.49	121.88	87.48	49.1
STN-54, 22.5'-24.0'	60° C	3107	10/8/09		3/8"			No	22.40	109.06	82.89	43.3
STN-54, 24.0'-25.5'	60° C	3108	10/8/09		No. 10			Yes	19.46	86.16	58.90	69.1
STN-54, 25.5'-27.0'	60° C	3109	10/9/09	Str	No. 10			Yes	21.40	101.12	78.10	40.6
STN-54, 27.0'-28.5'		3110	10/9/09	Str	No. 10			Yes	21.20	87.05	72.72	27.8
STN-54, 28.5'-30.0'		3111	10/9/09	Len	No. 4			No	20.93	107.49	89.13	26.9
STN-54, 30.0'-31.5'		3112	10/9/09	Hom	No. 10			Yes	24.17	127.60	106.52	25.6
STN-54, 31.5'-33.0'		3113	10/9/09	Hom	No. 10			Yes	15.69	98.13	81.52	25.2
STN-54, 33.0'-34.5'		3114	10/9/09	Hom	No. 10			Yes	21.41	113.18	95.39	24.0
STN-54, 34.5'-36.0'		3115	10/9/09	Hom	No. 10			Yes	21.40	116.41	97.43	25.0
STN-54, 36.0'-37.5'		3116	10/9/09	Hom	No. 10			Yes	21.48	123.39	103.70	23.9
STN-54, 37.5'-39.0'		3117	10/9/09	Hom	No. 10			Yes	23.54	123.93	104.49	24.0
STN-54, 39.0'-40.5'		3118	10/9/09	Hom	No. 10			Yes	21.50	126.53	104.63	26.3
STN-54, 40.5'-42.0'		3119	10/9/09	Hom	No. 10			Yes	22.32	134.83	112.52	24.7
STN-54, 42.0'-43.5'		3120	10/9/09	Hom	No. 4			No	22.52	146.63	120.48	26.7
STN-54, 43.5'-44.8'		3121	10/9/09	Hom	1 1/2"	1	1 1/2"	No	22.69	147.65	126.60	20.3

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-55, 0.0'-1.5'	533	7/31/09	Hom	No. 4			Yes	70.76	295.00	261.44	17.6
STN-55, 1.5'-3.0'	534	7/31/09	Hom	3/8"			No	70.43	314.16	265.85	24.7
STN-55, 3.0'-4.5'	536	7/31/09	Hom	3/4"	1	3/4"	No	70.50	233.08	203.12	22.6
STN-55, 4.5'-6.0'	537	7/31/09	Hom	3/8"			No	72.58	200.88	173.75	26.8
STN-55, 6.0'-7.5'	538	7/31/09	Hom	3/8"			No	70.68	202.56	176.74	24.3
STN-55, 7.5'-9.0'	539	7/31/09	Hom	3/8"			No	70.82	267.69	228.94	24.5
STN-55, 9.0'-10.5'	540	7/31/09	Hom	3/8"			No	71.69	335.88	284.67	24.0
STN-55, 10.5'-12.0'	541	7/31/09	Hom	3/8"			No	75.30	351.63	295.29	25.6
STN-55, 12.0'-13.5'	542	7/31/09	Hom	3/4"			No	69.94	305.27	255.97	26.5
STN-55, 13.5'-15.0' **60° C**	543	7/31/09	Hom	3/8"			No	74.69	336.78	265.65	37.2
STN-55, 15.0'-16.5' **60° C**	544	7/31/09	Hom	3/4"			No	74.15	432.70	344.20	32.8
STN-55, 16.5'-18.0'	545	7/31/09	Hom	3/8"			No	43.66	277.62	228.78	26.4
STN-55, 18.0'-19.5'	546	7/31/09	Hom	3/8"			No	48.57	251.47	210.32	25.4
STN-55, 19.5'-21.0'	547	7/31/09	Hom	3/8"			No	75.94	267.47	225.17	28.3
STN-55, 21.0'-22.5'	548	7/31/09	Hom	3/8"			No	71.34	264.10	222.74	27.3
STN-55, 22.5'-24.0'	549	7/31/09	Hom	3/8"			No	71.36	306.22	260.68	24.1
STN-55, 24.0'-25.5'	550	7/31/09	Hom	No. 4			Yes	69.12	304.59	255.14	26.6
STN-55, 25.5'-27.0'	551	7/31/09	Hom	No. 4			Yes	75.19	339.19	290.16	22.8
STN-55, 27.0'-28.5'	552	7/31/09	Hom	No. 4			Yes	70.84	361.80	307.59	22.9
STN-55, 28.5'-30.0'	553	7/31/09	Hom	No. 4			Yes	70.79	374.79	317.03	23.5
STN-55, 30.0'-31.5'	554	7/31/09	Hom	No. 4			Yes	70.45	389.96	326.15	25.0
STN-55, 31.5'-33.0'	556	7/31/09	Hom	No. 4			Yes	68.72	369.05	309.11	24.9
STN-55, 33.0'-34.5'	557	7/31/09	Hom	No. 4			Yes	69.54	348.63	292.34	25.3
STN-55, 34.5'-36.0'	558	7/31/09	Hom	No. 4			Yes	71.67	440.90	364.67	26.0
STN-55, 36.0'-37.5'	559	7/31/09	Hom	No. 4			Yes	73.99	441.00	365.62	25.8
STN-55, 37.5'-39.0'	560	7/31/09	Hom	No. 4			Yes	70.07	429.00	357.75	24.8
STN-55, 39.0'-40.5'	561	7/31/09	Hom	No. 4			Yes	53.19	438.90	366.48	23.1
STN-55, 40.5'-42.0'	562	7/31/09	Hom	3/8"			No	71.06	380.41	322.06	23.2
STN-55, 42.0'-43.5'	563	7/31/09	Hom	1 1/2"			No	74.96	325.34	297.41	12.6
STN-55, 43.5'-45.0'	564	7/31/09	Hom	1 1/2"	2	1 1/2"	No	69.67	277.97	252.48	13.9
STN-55, 45.0'-46.4'	565	7/31/09	Hom	3/4"			No	76.43	297.46	270.90	13.7

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-56, 0.0'-1.5'	566	8/12/09	Hom	3/4"			No	71.31	275.91	236.67	23.7
STN-56, 1.5'-3.0'	567	8/11/09	Hom	No. 4			Yes	68.60	289.18	251.81	20.4
STN-56, 3.0'-4.5'	568	8/11/09	Hom	No. 4			Yes	70.18	273.80	237.40	21.8
STN-56, 4.5'-6.0'	569	8/11/09	Hom	No. 4			Yes	71.66	269.27	233.37	22.2
STN-56, 6.0'-7.5'	570	8/11/09	Hom	No. 4			Yes	71.65	350.20	294.97	24.7
STN-56, 7.5'-9.0'	571	8/11/09	Hom	No. 4			Yes	70.97	299.00	252.79	25.4
STN-56, 9.0'-10.5'	572	8/11/09	Hom	3/8"			No	70.92	292.92	253.85	21.4
STN-56, 10.5'-12.0'	574	8/11/09	Hom	No. 4			Yes	70.33	297.56	254.83	23.2
STN-56, 12.0'-13.5'	575	8/11/09	Hom	No. 4			Yes	70.96	255.84	218.34	25.4
STN-56, 13.5'-15.0'	576	8/11/09	Hom	No. 4			Yes	72.04	236.05	203.92	24.4
STN-56, 15.0'-16.5'	577	8/11/09	Hom	No. 4			Yes	71.32	284.58	245.96	22.1
STN-56, 16.5'-18.0'	578	8/11/09	Hom	No. 4			Yes	69.68	278.24	234.77	26.3
STN-56, 18.0'-19.5'	579	8/11/09	Hom	No. 4			Yes	70.33	272.43	231.08	25.7
STN-56, 19.5'-21.0'	580	8/11/09		No. 4			Yes	69.91	287.42	245.59	23.8
STN-56, 21.0'-22.5'	581	8/11/09		No. 10			Yes	73.99	309.06	267.75	21.3
STN-56, 22.5'-24.0'	582	8/11/09		No. 10			Yes	69.05	263.44	228.98	21.5
STN-56, 24.0'-25.5'	583	8/11/09		No. 10			Yes	72.66	250.26	216.93	23.1
STN-56, 25.5'-27.0'	584	8/11/09		No. 10			Yes	73.62	277.75	236.01	25.7
STN-56, 27.0'-28.5'	585	8/11/09		No. 10			Yes	73.04	292.26	251.09	23.1
STN-56, 28.5'-30.0'	586	8/11/09		No. 4			Yes	73.70	285.02	246.29	22.4
STN-56, 30.0'-31.5'	587	8/11/09		No. 10			Yes	74.71	270.77	234.01	23.1
STN-56, 31.5'-33.0'	588	8/11/09		No. 10			Yes	74.81	248.33	215.02	23.8
STN-56, 33.0'-34.5'	589	8/11/09		1 1/2"			No	74.20	253.40	250.55	1.6
STN-56, 34.5'-36.0'	590	8/11/09		1 1/2"			No	73.49	281.02	255.43	14.1
STN-56, 36.0'-37.5'	591	8/11/09		1 1/2"			No	74.07	205.84	192.28	11.5

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-58, 0.0'-1.5'	592	7/31/09	Hom	3/8"			No	70.89	294.19	255.80	20.8
STN-58, 1.5'-3.0'	593	7/31/09	Hom	3/8"			No	71.31	284.16	245.60	22.1
STN-58, 3.0'-4.5'	594	7/31/09	Hom	No. 4			Yes	72.45	285.40	243.33	24.6
STN-58, 4.5'-6.0'	595	7/31/09	Hom	No. 4			Yes	69.85	311.73	266.55	23.0
STN-58, 6.0'-7.5'	596	7/31/09	Hom	3/8"			No	69.24	334.36	279.96	25.8
STN-58, 7.5'-9.0'	597	7/31/09	Hom	3/8"			No	70.32	328.39	276.50	25.2
STN-58, 9.0'-10.5'	598	7/31/09	Hom	3/8"			No	73.94	315.27	268.86	23.8
STN-58, 10.5'-12.0'	599	7/31/09	Hom	3/8"			No	68.98	305.24	255.59	26.6
STN-58, 12.0'-13.5'	600	7/31/09	Hom	3/4"			No	69.63	315.42	264.83	25.9
STN-58, 13.5'-15.0' **60° C**	601	7/31/09	Hom	3/4"			No	72.09	310.90	250.04	34.2
STN-58, 15.0'-16.5' **60° C**	602	7/31/09	Hom	3/8"			No	71.96	298.55	236.56	37.7
STN-58, 16.5'-18.0' **60° C**	603	7/31/09	Str	No. 4			Yes	71.47	325.71	258.64	35.8
STN-58, 18.0'-19.5'	604	7/31/09	Hom	No. 4			Yes	74.94	228.54	187.91	36.0
STN-58, 19.5'-21.0'	605	7/31/09	Hom	No. 4			Yes	72.55	318.58	258.78	32.1
STN-58, 21.0'-22.5'	606	7/31/09	Hom	3/8"			No	72.65	345.18	278.86	32.2
STN-58, 22.5'-24.0'	607	7/31/09	Hom	No. 4			Yes	69.58	266.87	225.36	26.6
STN-58, 24.0'-25.5'	609	7/31/09	Hom	No. 4			Yes	73.87	273.03	233.89	24.5
STN-58, 25.5'-27.0'	610	7/31/09	Hom	No. 4			Yes	70.78	225.85	196.69	23.2
STN-58, 27.0'-28.5'	611	7/31/09	Hom	No. 4			Yes	74.25	262.62	228.96	21.8
STN-58, 28.5'-30.0'	612	7/31/09	Hom	No. 4			Yes	47.56	325.11	273.30	23.0
STN-58, 30.0'-31.5'	613	7/31/09	Hom	No. 10			Yes	74.45	380.17	320.83	24.1
STN-58, 31.5'-33.0'	614	7/31/09	Hom	No. 10			Yes	70.70	344.06	294.64	22.1
STN-58, 33.0'-34.5'	615	7/31/09	Hom	No. 10			Yes	74.59	339.05	289.64	23.0
STN-58, 34.5'-36.0'	616	7/31/09	Hom	No. 10			Yes	72.84	411.90	344.71	24.7
STN-58, 36.0'-37.5'	617	7/31/09	Hom	No. 10			Yes	68.95	381.49	322.29	23.4
STN-58, 37.5'-39.0'	618	7/31/09	Hom	No. 10			Yes	71.46	390.66	330.71	23.1
STN-58, 39.0'-40.5'	619	7/31/09	Hom	No. 10			Yes	71.05	408.70	344.53	23.5
STN-58, 40.5'-42.0'	620	7/31/09	Hom	3/8"			No	76.65	335.42	285.34	24.0
STN-58, 42.0'-43.5'	621	7/31/09	Hom	No. 10			Yes	69.29	321.50	271.51	24.7
STN-58, 43.5'-45.0'	622	7/31/09	Len	3/4"			No	75.74	291.85	266.30	13.4
STN-58, 45.0'-46.5'	623	7/31/09	Str	No. 4			Yes	70.75	292.48	234.43	35.5

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-58, 46.5'-47.3'	624	7/31/09	Hom	1 1/2"			No	74.99	301.43	262.24	20.9

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-59, 0.0'-1.5'	625	8/12/09	Hom	3/4"			No	19.24	63.58	55.73	21.5
STN-59, 1.5'-3.0'	626	8/12/09	Hom	3/4"			No	21.65	78.99	68.96	21.2
STN-59, 3.0'-4.5'	627	8/12/09	Hom	No. 4			No	20.63	82.50	72.15	20.1
STN-59, 6.5'-8.0'	629	8/12/09	Hom	No. 4			No	21.47	76.19	63.41	30.5
STN-59, 8.0'-9.5'	630	8/12/09	Hom	No. 4			No	21.58	84.27	71.44	25.7
STN-59, 9.5'-11.0'	631	8/12/09	Hom	No. 4			No	22.11	75.69	66.43	20.9
STN-59, 11.0'-12.5'	632	8/12/09		No. 4			No	19.96	68.83	58.60	26.5
STN-59, 14.5'-16.0'	633	8/12/09	Hom	No. 4			No	22.12	74.59	62.42	30.2
STN-59, 16.0'-17.5'	634	8/12/09	Hom	No. 4			No	23.17	100.44	85.27	24.4
STN-59, 17.5'-19.0'	635	8/12/09	Hom	No. 4			No	21.49	93.39	78.28	26.6
STN-59, 21.0'-22.5'	636	8/12/09		No. 4			No	20.75	86.20	74.04	22.8
STN-59, 22.5'-24.0'	637	8/12/09		No. 4			No	23.00	96.84	82.33	24.5
STN-59, 24.0'-25.5'	638	8/12/09		No. 4			No	18.95	83.27	71.53	22.3
STN-59, 25.5'-27.0'	640	8/12/09		No. 10			Yes	22.72	80.79	70.61	21.3
STN-59, 27.0'-28.5'	641	8/12/09		No. 10			Yes	20.33	77.96	67.65	21.8
STN-59, 28.5'-30.0'	642	8/12/09		No. 10			Yes	18.82	90.64	78.39	20.6
STN-59, 30.0'-31.5'	643	8/12/09		No. 10			Yes	18.91	81.42	70.66	20.8
STN-59, 31.5'-33.0'	644	8/12/09		3/8"			No	22.04	86.57	74.70	22.5
STN-59, 35.0'-36.5'	645	8/12/09		3/4"			No	20.83	94.04	85.06	14.0
STN-59, 36.5'-38.0'	646	8/12/09		1 1/2"			No	19.30	80.66	74.18	11.8

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-59, 0.0'-1.5'	625	8/12/09	Hom	3/4"			No	19.24	63.58	55.73	21.5
STN-59, 1.5'-3.0'	626	8/12/09	Hom	3/4"			No	21.65	78.99	68.96	21.2
STN-59, 3.0'-4.5'	627	8/12/09	Hom	No. 4			No	20.63	82.50	72.15	20.1
STN-59, 6.5'-8.0'	629	8/12/09	Hom	No. 4			No	21.47	76.19	63.41	30.5
STN-59, 8.0'-9.5'	630	8/12/09	Hom	No. 4			No	21.58	84.27	71.44	25.7
STN-59, 9.5'-11.0'	631	8/12/09	Hom	No. 4			No	22.11	75.69	66.43	20.9
STN-59, 11.0'-12.5'	632	8/12/09		No. 4			No	19.96	68.83	58.60	26.5
STN-59, 14.5'-16.0'	633	8/12/09	Hom	No. 4			No	22.12	74.59	62.42	30.2
STN-59, 16.0'-17.5'	634	8/12/09	Hom	No. 4			No	23.17	100.44	85.27	24.4
STN-59, 17.5'-19.0'	635	8/12/09	Hom	No. 4			No	21.49	93.39	78.28	26.6
STN-59, 21.0'-22.5'	636	8/12/09		No. 4			No	20.75	86.20	74.04	22.8
STN-59, 22.5'-24.0'	637	8/12/09		No. 4			No	23.00	96.84	82.33	24.5
STN-59, 24.0'-25.5'	638	8/12/09		No. 4			No	18.95	83.27	71.53	22.3
STN-59, 25.5'-27.0'	640	8/12/09		No. 10			Yes	22.72	80.79	70.61	21.3
STN-59, 27.0'-28.5'	641	8/12/09		No. 10			Yes	20.33	77.96	67.65	21.8
STN-59, 28.5'-30.0'	642	8/12/09		No. 10			Yes	18.82	90.64	78.39	20.6
STN-59, 30.0'-31.5'	643	8/12/09		No. 10			Yes	18.91	81.42	70.66	20.8
STN-59, 31.5'-33.0'	644	8/12/09		3/8"			No	22.04	86.57	74.70	22.5
STN-59, 35.0'-36.5'	645	8/12/09		3/4"			No	20.83	94.04	85.06	14.0
STN-59, 36.5'-38.0'	646	8/12/09		1 1/2"			No	19.30	80.66	74.18	11.8

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-60, 0.0'-1.5'	681	8/12/09	Hom	3/4"			No	22.45	81.94	70.34	24.2
STN-60, 1.5'-3.0'	683	8/12/09	Hom	3/4"			No	21.05	80.43	68.10	26.2
STN-60, 3.0'-4.5'	684	8/12/09	Hom	3/4"			No	21.68	96.28	81.64	24.4
STN-60, 4.5'-6.0'	685	8/12/09	Hom	3/4"			No	22.70	97.74	82.80	24.9
STN-60, 6.0'-7.5'	686	8/12/09	Hom	3/8"			No	21.88	87.97	75.17	24.0
STN-60, 7.5'-9.0'	687	8/12/09	Hom	No. 4			No	21.18	69.26	59.11	26.8
STN-60, 9.0'-10.5'	688	8/12/09	Hom	1 1/2"			No	22.85	74.81	64.53	24.7
STN-60, 10.5'-12.0'	689	8/12/09	Hom	No. 4			No	22.19	73.20	63.35	23.9
STN-60, 12.0'-13.5'	690	8/12/09	Hom	No. 4			No	22.24	91.76	77.33	26.2
STN-60, 13.5'-15.0'	691	8/12/09	Hom	No. 4			No	22.52	89.09	76.25	23.9
STN-60, 15.0'-16.5'	692	8/12/09	Hom	No. 4			No	22.15	91.88	77.09	26.9
STN-60, 16.5'-18.0'	693	8/12/09	Hom	No. 4			No	18.84	83.28	71.11	23.3
STN-60, 18.0'-19.5'	694	8/12/09	Hom	No. 4			No	20.45	83.02	70.45	25.1
STN-60, 19.5'-21.0'	695	8/12/09	Hom	No. 4			No	21.17	68.83	60.33	21.7
STN-60, 21.0'-22.5'	696	8/12/09		No. 4			No	22.75	80.91	66.88	31.8
STN-60, 22.5'-24.0'	697	8/12/09	Hom	No. 4			No	21.86	92.45	77.81	26.2
STN-60, 24.0'-25.5'	698	8/12/09	Hom	No. 4			No	22.89	80.91	67.83	29.1
STN-60, 25.5'-27.0'	699	8/12/09	Hom	No. 4			No	21.08	87.41	74.77	23.5
STN-60, 27.0'-28.5'	700	8/13/09	Hom	No. 4			No	21.09	66.63	57.83	24.0
STN-60, 28.5'-30.0' No Recovery	701	8/13/09									
STN-60, 30.0'-31.5'	702	8/13/09	Hom	No. 4			No	19.32	77.97	66.41	24.5
STN-60, 31.5'-33.0'	703	8/13/09	Hom	No. 4			No	19.34	89.41	76.68	22.2
STN-60, 33.0'-34.5'	704	8/13/09		No. 4			No	19.12	76.60	66.81	20.5
STN-60, 34.5'-36.0'	705	8/13/09		No. 4			No	23.50	88.68	78.77	17.9
STN-60, 36.0'-37.5'	707	8/13/09		No. 4			No	21.93	83.42	72.73	21.0
STN-60, 37.5'-39.0'	708	8/13/09		No. 4			No	18.69	89.87	78.30	19.4
STN-60, 39.0'-40.5'	709	8/13/09		No. 4			No	20.80	78.81	68.61	21.3
STN-60, 40.5'-42.0'	710	8/13/09		No. 4			No	20.39	74.12	64.18	22.7
STN-60, 42.0'-43.5'	711	8/13/09		No. 4			No	18.92	77.77	66.29	24.2
STN-60, 43.5'-45.0'	712	8/13/09		1 1/2"			No	22.16	100.92	88.01	19.6
STN-60, 45.0'-46.5'	713	8/13/09		1 1/2"			No	23.12	92.34	82.87	15.8

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-60, 46.5'-48.0'	714	8/13/09		1 1/2"			No	21.97	97.64	88.85	13.1

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-61, 0.0'-1.5'	715	8/5/09	Hom	3/8"			No	19.05	77.98	66.38	24.5
STN-61, 1.5'-3.0'	716	8/5/09	Hom	No. 4			No	19.52	84.24	71.71	24.0
STN-61, 3.0'-4.5'	717	8/5/09	Hom	No. 4			No	29.01	122.27	104.22	24.0
STN-61, 4.5'-6.0'	718	8/5/09	Hom	No. 4			No	26.40	120.03	100.38	26.6
STN-61, 6.0'-7.5'	719	8/5/09	Hom	No. 4			No	22.89	107.32	89.78	26.2
STN-61, 7.5'-9.0'	720	8/5/09	Hom	No. 4			No	21.71	105.42	87.63	27.0
STN-61, 9.0'-10.5'	721	8/5/09	Hom	No. 10			Yes	25.27	110.25	91.89	27.6
STN-61, 10.5'-12.0'	722	8/5/09	Hom	No. 4			No	22.91	93.77	79.76	24.6
STN-61, 12.0'-13.5'	723	8/5/09	Hom	No. 4			No	17.68	122.90	102.05	24.7
STN-61, 13.5'-15.0'	724	8/5/09	Hom	No. 10			Yes	23.30	85.84	72.55	27.0
STN-61, 15.0'-16.5'	725	8/5/09	Hom	No. 4			No	22.30	106.62	89.26	25.9
STN-61, 16.5'-18.0'	726	8/5/09	Len	No. 10			Yes	23.10	91.55	78.76	23.0
STN-61, 18.0'-19.5'	727	8/5/09	Hom	No. 10			Yes	44.03	275.88	235.06	21.4
STN-61, 19.5'-21.0'	728	8/6/09	Hom	No. 10			Yes	44.06	274.46	233.73	21.5
STN-61, 21.0'-22.5'	729	8/6/09	Hom	No. 10			Yes	46.39	358.45	300.33	22.9
STN-61, 22.5'-24.0'	731	8/6/09	Hom	No. 10			Yes	48.61	276.63	233.89	23.1
STN-61, 24.0'-25.5'	732	8/6/09	Hom	No. 10			Yes	44.31	306.54	258.22	22.6
STN-61, 25.5'-27.0'	733	8/6/09	Hom	No. 10			Yes	47.75	318.79	269.25	22.4
STN-61, 27.0'-28.5'	734	8/6/09	Hom	No. 10			Yes	46.46	319.87	268.11	23.4
STN-61, 28.5'-30.0'	735	8/6/09	Hom	No. 10			Yes	49.38	302.37	255.01	23.0
STN-61, 30.0'-31.5'	736	8/6/09	Hom	No. 10			Yes	44.25	340.11	285.04	22.9
STN-61, 31.5'-33.0'	737	8/6/09	Hom	No. 10			Yes	47.69	315.96	264.85	23.5
STN-61, 33.0'-34.5'	738	8/6/09	Hom	No. 10			Yes	43.54	304.16	254.64	23.5
STN-61, 34.5'-36.0'	739	8/6/09	Hom	3/4"			No	44.18	335.51	290.24	18.4
STN-61, 36.0'-37.5'	740	8/6/09	Hom	3/4"			No	46.21	287.11	256.40	14.6
STN-61, 37.5'-39.0'	741	8/6/09	Hom	3/4"			No	49.11	235.38	204.68	19.7
STN-61, 39.0'-40.4'	742	8/6/09	Hom	3/4"			No	43.93	245.56	213.72	18.8

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-62, 0.0'-1.5'	743	8/17/09		3/4"			No	19.66	80.29	72.79	14.1
STN-62, 1.5'-3.0' No Recovery	744	8/17/09									
STN-62, 3.0'-4.5'	745	8/17/09		3/4"			No	15.70	79.73	65.66	28.2
STN-62, 6.5'-8.0'	746	8/17/09		3/8"			No	22.70	89.09	76.34	23.8
STN-62, 8.0'-9.5'	747	8/17/09	Hom	3/4"			No	21.83	79.69	68.37	24.3
STN-62, 11.5'-13.0'	748	8/17/09	Hom	3/4"			No	19.04	74.38	63.25	25.2
STN-62, 13.0'-14.0'	749	8/17/09	Hom	3/8"			No	21.20	89.27	74.77	27.1
STN-62, 14.0'-14.5'	751	8/17/09		No. 4			No	20.18	61.89	52.30	29.9
STN-62, 14.5'-16.0' **60° C**	752	8/17/09		1 1/2"			No	19.49	89.15	74.41	26.8
STN-62, 16.0'-17.5'	753	8/17/09		3/4"			No	20.98	70.44	57.87	34.1
STN-62, 17.5'-19.0'	754	8/17/09		1 1/2"			No	21.41	84.69	67.97	35.9
STN-62, 19.0'-20.5'	755	8/17/09		1 1/2"			No	24.02	68.75	54.89	44.9
STN-62, 20.5'-22.0'	756	8/17/09		3/8"			No	19.10	70.21	60.42	23.7
STN-62, 22.0'-23.5'	757	8/17/09		1 1/2"			No	44.52	157.08	131.82	28.9
STN-62, 25.5'-27.0'	758	8/17/09		No. 10			Yes	43.64	170.88	141.18	30.4
STN-62, 27.0'-28.5'	759	8/17/09	Hom	No. 10			Yes	44.45	158.70	134.59	26.7
STN-62, 28.5'-30.0'	760	8/17/09	Hom	No. 10			Yes	43.40	184.24	156.00	25.1
STN-62, 30.0'-31.5'	761	8/17/09		No. 10			Yes	44.28	176.18	149.47	25.4
STN-62, 31.5'-33.0'	762	8/17/09		3/4"			No	44.07	165.06	143.48	21.7
STN-62, 33.0'-34.5'	763	8/17/09		No. 10			Yes	44.54	233.48	195.91	24.8
STN-62, 34.5'-36.0'	764	8/17/09		No. 10			Yes	43.85	198.56	168.69	23.9
STN-62, 36.0'-37.5'	765	8/17/09		No. 10			Yes	49.38	171.35	148.24	23.4
STN-62, 37.5'-39.0'	766	8/17/09		No. 10			Yes	44.53	169.76	146.71	22.6
STN-62, 41.0'-42.5'	767	8/17/09		No. 10			Yes	47.12	234.82	199.07	23.5
STN-62, 42.5'-44.0'	768	8/17/09		No. 10			Yes	44.30	202.70	173.74	22.4
STN-62, 44.0'-45.5'	769	8/17/09		3/8"			No	21.02	102.00	94.42	10.3
STN-62, 45.5'-46.7'	770	8/17/09		3/4"			No	43.95	191.52	169.54	17.5

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded		Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
					Amount	Size					
STN-63, 0.0'-1.5'	771	8/7/09		3/4"			No	47.86	230.99	195.04	24.4
STN-63, 1.5'-3.0'	772	8/7/09		3/4"			No	29.79	183.65	156.94	21.0
STN-63, 3.0'-4.5'	773	8/7/09	Len	No. 4			Yes	44.11	245.78	208.99	22.3
STN-63, 4.5'-6.0'	774	8/7/09	Hom	No. 4			Yes	47.20	237.28	202.05	22.8
STN-63, 6.0'-7.5'	776	8/7/09	Len	3/4"			No	43.70	174.44	147.30	26.2
STN-63, 7.5'-9.0'	777	8/7/09	Len	3/8"			No	48.71	233.01	200.73	21.2
STN-63, 9.0'-10.5'	778	8/7/09	Len	3/8"			No	43.76	180.31	155.93	21.7
STN-63, 10.5'-12.0'	779	8/10/09	Hom	1 1/2"			No	43.81	141.68	123.07	23.5
STN-63, 12.0'-13.5'	780	8/10/09	Hom	3/4"			No	30.06	118.05	100.53	24.9
STN-63, 13.5'-15.0'	781	8/10/09	Hom	3/4"			No	46.60	151.32	130.42	24.9
STN-63, 15.0'-16.5'	782	8/10/09	Hom	3/4"			No	47.65	171.10	148.54	22.4
STN-63, 16.5'-18.0'	783	8/10/09	Hom	No. 10			Yes	43.67	159.86	135.32	26.8
STN-63, 18.0'-19.5'	784	8/10/09	Hom	No. 10			Yes	73.44	250.46	215.53	24.6
STN-63, 19.5'-21.0'	785	8/10/09	Hom	No. 4			No	39.74	136.52	117.76	24.0
STN-63, 21.0'-22.5'	786	8/10/09	Hom	No. 4			No	40.97	131.45	114.03	23.8
STN-63, 22.5'-24.0'	787	8/10/09	Hom	No. 4			No	43.58	160.11	138.09	23.3
STN-63, 24.0'-25.5'	788	8/10/09	Len	No. 4			Yes	71.38	296.12	249.86	25.9
STN-63, 25.5'-27.0'	789	8/10/09	Len	No. 4			Yes	69.72	299.29	254.23	24.4
STN-63, 27.0'-28.5'	790	8/10/09	Len	No. 4			Yes	70.01	324.35	273.33	25.1
STN-63, 28.5'-30.0'	791	8/10/09	Len	No. 4			Yes	72.07	333.67	284.62	23.1
STN-63, 30.0'-31.5'	792	8/10/09	Hom	No. 4			Yes	74.63	306.28	263.02	23.0
STN-63, 31.5'-33.0'	793	8/10/09	Hom	No. 4			Yes	73.03	340.76	291.28	22.7
STN-63, 33.0'-34.5'	794	8/10/09	Hom	No. 4			Yes	72.13	353.43	298.74	24.1
STN-63, 34.5'-36.0'	796	8/10/09	Hom	3/4"			No	70.80	214.26	183.46	27.3
STN-63, 36.0'-37.5'	797	8/10/09	Hom	1 1/2"			No	71.84	175.13	161.54	15.2
STN-63, 37.5'-39.0'	798	8/10/09	Hom	1 1/2"			No	69.82	162.16	148.93	16.7

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-65, 0.0'-1.5'	799	8/10/09	Hom	3/4"			No	70.18	202.14	179.74	20.4
STN-65, 1.5'-3.0'	800	8/10/09	Hom	3/4"			No	70.75	201.37	176.68	23.3
STN-65, 3.0'-4.5'	802	8/10/09	Hom	3/4"			No	68.88	226.80	196.50	23.7
STN-65, 4.5'-6.0'	803	8/10/09	Hom	3/4"			No	69.75	290.74	250.97	21.9
STN-65, 6.0'-7.5'	804	8/10/09	Hom	3/8"			No	76.37	236.80	203.45	26.2
STN-65, 7.5'-9.0' **No Recovery**	805	8/10/09									
STN-65, 9.0'-10.5'	806	8/10/09	Hom	3/8"			No	74.10	241.18	210.98	22.1
STN-65, 10.5'-12.0' **60° C**	807	8/18/09	Hom	3/4"			No	53.30	272.29	233.16	21.8
STN-65, 12.0'-13.5' **60° C**	808	8/18/09	Len	3/4"			No	71.20	158.30	138.76	28.9
STN-65, 13.5'-15.0' **60° C**	809	8/18/09	Len	No. 4			Yes	75.00	265.15	216.38	34.5
STN-65, 15.0'-16.5' **60° C**	810	8/18/09	Hom	No. 4			Yes	49.05	195.12	158.29	33.7
STN-65, 16.5'-18.0' **60° C**	811	8/18/09	Hom	3/4"			No	47.36	114.50	92.80	47.8
STN-65, 18.0'-19.5' **60° C**	812	8/18/09	Len	No. 4			Yes	43.50	184.64	144.13	40.3
STN-65, 19.5'-21.0'	813	8/11/09	Len	No. 4			No	44.01	135.76	118.47	23.2
STN-65, 21.0'-22.5'	814	8/11/09	Len	No. 4			No	44.15	157.41	130.42	31.3
STN-65, 22.5'-24.0'	815	8/11/09	Len	3/4"			No	75.10	274.50	235.64	24.2
STN-65, 24.0'-25.5'	816	8/11/09	Hom	No. 4			Yes	70.92	271.51	237.14	20.7
STN-65, 25.5'-27.0'	817	8/11/09	Hom	No. 4			Yes	44.35	175.17	150.55	23.2
STN-65, 27.0'-28.5'	818	8/11/09	Hom	No. 4			Yes	71.50	281.96	239.33	25.4
STN-65, 28.5'-30.0'	819	8/11/09	Hom	No. 4			Yes	75.87	263.49	224.62	26.1
STN-65, 30.0'-31.5'	821	8/11/09	Hom	No. 4			Yes	70.63	282.49	238.99	25.8
STN-65, 31.5'-33.0'	822	8/11/09	Hom	No. 4			Yes	45.64	178.80	150.24	27.3
STN-65, 33.0'-34.5'	823	8/11/09	Hom	No. 4			Yes	76.82	289.45	241.71	29.0
STN-65, 34.5'-36.0'	824	8/11/09	Hom	No. 4			Yes	69.51	240.23	205.23	25.8
STN-65, 36.0'-37.5'	825	8/11/09	Hom	No. 4			Yes	70.56	269.22	229.31	25.1
STN-65, 37.5'-39.0'	826	8/11/09	Hom	No. 4			No	43.64	171.73	140.14	32.7
STN-65, 39.0'-40.5'	827	8/11/09	Hom	No. 4			Yes	74.53	273.04	230.55	27.2
STN-65, 40.5'-42.0'	828	8/11/09	Hom	3/4"			No	70.30	248.80	196.03	42.0
STN-65, 42.0'-43.0'	829	8/11/09	Hom	3/8"			No	73.59	252.28	230.97	13.5

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded		Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
					Amount	Size					
STN-66, 0.0'-1.5'	830	8/13/09	Hom	No. 4			Yes	43.57	185.38	156.76	25.3
STN-66, 1.5'-3.0'	831	8/13/09	Hom	No. 4			Yes	43.93	195.05	167.19	22.6
STN-66, 3.0'-4.5'	832	8/13/09	Hom	No. 4			Yes	43.64	224.97	189.08	24.7
STN-66, 4.5'-6.0'	833	8/13/09	Hom	No. 4			Yes	48.21	173.51	149.50	23.7
STN-66, 6.0'-7.5'	834	8/13/09	Hom	No. 4			Yes	44.00	250.50	210.27	24.2
STN-66, 7.5'-9.0'	835	8/13/09	Hom	No. 4			Yes	44.18	190.37	163.07	23.0
STN-66, 9.0'-10.5'	836	8/13/09	Hom	No. 4			Yes	44.29	211.67	178.28	24.9
STN-66, 10.5'-12.0'	837	8/13/09	Hom	No. 4			Yes	43.38	223.38	191.39	21.6
STN-66, 12.0'-13.5'	839	8/13/09	Hom	No. 4			No	43.59	133.50	116.84	22.7
STN-66, 13.5'-15.0'	840	8/13/09	Hom	No. 4			No	44.29	166.68	141.54	25.9
STN-66, 15.0'-16.5'	841	8/13/09	Hom	No. 4			Yes	47.41	213.02	185.17	20.2
STN-66, 16.5'-18.0'	842	8/13/09	Hom	No. 4			Yes	44.79	196.63	165.11	26.2
STN-66, 18.0'-19.5'	843	8/13/09	Hom	No. 4			Yes	44.85	208.70	176.49	24.5
STN-66, 19.5'-21.0'	844	8/13/09	Hom	No. 4			Yes	44.34	176.99	151.04	24.3
STN-66, 21.0'-22.5'	845	8/13/09	Hom	No. 4			Yes	49.81	227.23	192.78	24.1
STN-66, 22.5'-24.0'	846	8/13/09	Hom	No. 4			Yes	43.39	204.53	172.60	24.7
STN-66, 24.0'-25.5'	847	8/13/09	Hom	No. 4			No	43.75	149.76	129.99	22.9
STN-66, 25.5'-27.0'	848	8/13/09	Hom	No. 4			Yes	43.56	180.57	155.18	22.7
STN-66, 27.0'-28.5'	849	8/13/09	Hom	No. 4			Yes	44.92	239.02	202.08	23.5
STN-66, 28.5'-30.0'	850	8/13/09	Hom	No. 4			Yes	44.49	194.12	161.58	27.8
STN-66, 30.0'-31.5'	852	8/13/09	Hom	No. 4			Yes	48.30	196.14	163.57	28.3
STN-66, 31.5'-33.0'	853	8/13/09	Hom	3/8"			No	43.81	161.95	123.47	48.3
STN-66, 33.0'-34.3'	854	8/13/09	Hom	1 1/2"			No	47.82	208.42	188.62	14.1

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-67, 0.0'-1.5'	2842	10/2/09	Hom	3/8"			No	21.64	97.13	87.02	15.5
STN-67, 1.5'-3.0'	2843	10/2/09	Hom	3/8"			No	19.58	59.16	53.16	17.9
STN-67, 3.0'-4.5'	2844	10/2/09	Hom	3/8"			No	21.46	89.21	71.28	36.0
STN-67, 6.5'-8.0'	2845	10/2/09	Hom	3/8"			No	21.49	91.06	77.70	23.8
STN-67, 8.0'-9.5'	2846	10/2/09	Hom	3/8"			No	21.59	81.44	70.74	21.8
STN-67, 11.5'-13.0'	2847	10/2/09	Len	No. 4			No	21.43	94.65	78.09	29.2
STN-67, 13.0'-14.5' 60° C	2848	10/8/09	Hom	3/4"			No	20.23	95.57	78.04	30.3
STN-67, 14.5'-16.0'	2849	10/2/09	Hom	3/4"			No	21.53	111.15	104.33	8.2
STN-67, 16.0'-17.5'	2850	10/2/09	Hom	3/4"			No	21.54	117.98	96.95	27.9
STN-67, 17.5'-19.0'	2851	10/2/09	Hom	3/8"			No	21.47	83.89	71.11	25.7
STN-67, 21.0'-22.5'	2852	10/2/09	Hom	No. 4			Yes	44.22	205.93	175.17	23.5
STN-67, 22.5'-24.0'	2854	10/2/09	Hom	No. 4			Yes	43.88	195.83	167.30	23.1
STN-67, 26.0'-27.5'	2855	10/2/09	Hom	No. 10			Yes	49.11	201.99	169.32	27.2
STN-67, 27.5'-29.0'	2856	10/2/09	Hom	No. 10			Yes	40.64	176.60	148.15	26.5
STN-67, 29.0'-30.5'	2857	10/2/09	Hom	No. 10			Yes	49.49	228.72	192.35	25.5

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded		Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
					Amount	Size					
STN-68, 0.0'-1.5'	855	8/13/09		3/8"			No	29.77	145.36	122.29	24.9
STN-68, 1.5'-3.0'	856	8/13/09	Hom	3/4"			No	48.79	205.73	178.02	21.4
STN-68, 3.0'-4.5'	857	8/13/09	Hom	No. 10			Yes	44.31	212.49	181.46	22.6
STN-68, 4.5'-6.0'	859	8/13/09	Hom	No. 10			Yes	47.24	150.77	132.33	21.7
STN-68, 6.0'-7.5'	860	8/13/09	Hom	No. 10			Yes	43.97	147.67	128.59	22.5
STN-68, 7.5'-9.0'	861	8/13/09	Hom	No. 10			Yes	43.73	225.59	192.09	22.6
STN-68, 11.0'-12.5'	862	8/13/09	Hom	No. 10			Yes	44.08	199.03	166.11	27.0
STN-68, 12.5'-14.0'	863	8/13/09	Hom	No. 10			Yes	43.74	176.41	150.76	24.0
STN-68, 14.0'-15.5'	864	8/13/09	Hom	No. 10			Yes	48.96	180.42	154.46	24.6
STN-68, 15.5'-17.0'	865	8/13/09	Hom	No. 10			Yes	72.49	240.32	207.69	24.1
STN-68, 17.0'-18.5'	866	8/13/09	Hom	No. 10			Yes	75.57	301.92	257.83	24.2
STN-68, 18.5'-20.0'	867	8/13/09	Hom	No. 10			Yes	78.05	249.63	214.82	25.5
STN-68, 22.0'-23.5'	868	8/13/09	Hom	No. 10			Yes	73.62	282.30	237.42	27.4
STN-68, 23.5'-25.0'	869	8/13/09	Hom	No. 10			Yes	73.10	319.20	269.85	25.1
STN-68, 27.0'-28.5'	870	8/13/09	Hom	No. 10			Yes	72.40	292.74	250.51	23.7
STN-68, 28.5'-30.0'	871	8/13/09		No. 10			Yes	72.52	292.32	248.96	24.6
STN-68, 32.0'-33.5'	872	8/13/09	Hom	No. 10			Yes	70.40	298.58	250.76	26.5
STN-68, 33.5'-35.0'	873	8/13/09	Hom	No. 10			Yes	47.49	233.36	191.32	29.2
STN-68, 35.0'-36.2'	874	8/13/09		1 1/2"			No	28.84	165.43	146.25	16.3

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-70, 0.0'-1.5'	905	8/11/09	Hom	3/4"			No	70.36	280.01	252.25	15.3
STN-70, 1.5'-3.0'	906	8/11/09		3/4"			No	71.97	204.69	181.85	20.8
STN-70, 3.0'-4.5'	908	8/11/09		1 1/2"			No	75.08	254.12	218.08	25.2
STN-70, 4.5'-6.0'	909	8/11/09		3/4"			No	74.37	211.92	194.21	14.8
STN-70, 6.0'-7.5'	910	8/11/09	Hom	3/4"			No	76.47	264.06	231.13	21.3
STN-70, 7.5'-9.0'	911	8/11/09		3/4"			No	70.12	283.68	245.47	21.8
STN-70, 9.0'-10.5'	912	8/11/09	Hom	3/4"			No	71.18	238.61	212.95	18.1
STN-70, 10.5'-12.0'	913	8/11/09	Hom	No. 4			Yes	72.76	280.25	240.07	24.0
STN-70, 12.0'-13.5'	914	8/11/09	Hom	No. 4			Yes	70.35	236.98	202.60	26.0
STN-70, 13.5'-15.0'	915	8/11/09	Hom	No. 4			Yes	72.21	282.83	239.44	25.9
STN-70, 15.0'-16.5'	916	8/11/09	Hom	No. 4			Yes	72.82	261.73	223.94	25.0
STN-70, 16.5'-18.0'	917	8/11/09	Hom	No. 4			Yes	74.20	223.40	196.73	21.8
STN-70, 18.0'-19.5'	918	8/11/09	Hom	No. 4			Yes	73.87	270.79	233.31	23.5
STN-70, 19.5'-21.0'	919	8/11/09	Hom	No. 4			Yes	74.67	251.62	296.56	-20.3
STN-70, 21.0'-22.5'	920	8/11/09	Hom	No. 4			Yes	73.21	287.90	245.18	24.8
STN-70, 22.5'-23.5' **60° C**	921A	8/11/09	Hom	3/8"			No	76.71	306.19	253.21	30.0
STN-70, 23.5'-24.0'	921B	8/11/09	Hom	3/8"			No	71.28	130.31	116.88	29.5
STN-70, 24.0'-24.5'	922A	8/11/09	Hom	3/8"			No	74.64	146.58	127.31	36.6
STN-70, 24.5'-25.5'	922B	8/12/09	Hom	3/8"			No	69.23	240.47	197.93	33.1
STN-70, 25.5'-26.7'	923A	8/12/09	Hom	3/4"			No	73.88	194.19	164.99	32.0
STN-70, 26.7'-27.0'	923B	8/12/09						74.92	191.49	173.83	17.9
STN-70, 27.0'-28.5' No Recovery	924	8/12/09									
STN-70, 28.5'-30.0'	925	8/12/09		3/8"			No	69.27	241.08	198.10	33.4
STN-70, 30.0'-31.5'	926	8/12/09	Hom	No. 4			Yes	75.77	262.49	219.47	29.9
STN-70, 31.5'-33.0'	928	8/12/09	Hom	No. 4			Yes	75.89	317.02	268.22	25.4
STN-70, 33.0'-34.5'	929	8/12/09		No. 4			Yes	69.96	258.81	217.25	28.2
STN-70, 34.5'-36.0'	930	8/12/09		No. 4			No	72.07	199.15	168.54	31.7
STN-70, 36.0'-37.5'	931	8/12/09	Hom	No. 4			Yes	73.64	280.19	237.87	25.8
STN-70, 37.5'-39.0'	932	8/12/09		No. 10			Yes	72.60	273.40	230.42	27.2
STN-70, 39.0'-40.5'	933	8/12/09		No. 10			Yes	72.70	285.25	238.29	28.4
STN-70, 40.5'-42.0'	935	8/12/09		3/8"			No	75.10	266.73	226.77	26.3

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-70, 42.0'-43.5'	936	8/12/09		1 1/2"			No	39.24	202.96	183.05	13.8
STN-70, 43.5'-45.0' No Recovery	937	8/12/09									

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Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-71, 0.0'-1.5'	**60° C**	938	8/17/09		3/4"			No	23.63	74.15	61.23	34.4
STN-71, 1.5'-3.0'	**60° C**	939	8/17/09		3/4"			No	21.60	64.12	50.63	46.5
STN-71, 3.0'-4.5'	**60° C**	940	8/17/09		3/4"			No	22.27	83.71	62.43	53.0
STN-71, 4.5'-6.0'	**60° C**	941	8/17/09		3/4"			No	19.38	82.39	60.41	53.6
STN-71, 6.0'-7.5'	**60° C**	942	8/17/09		No. 4			No	21.95	119.79	87.26	49.8
STN-71, 7.5'-9.0'	**60° C**	943	8/17/09		3/4"			No	19.92	86.30	60.27	64.5
STN-71, 9.0'-10.5'		944	8/17/09		3/4"			No	23.43	89.90	77.25	23.5
STN-71, 10.5'-12.0'	Not Found	945	8/17/09									
STN-71, 12.0'-13.5'		946	8/17/09		1 1/2"			No	19.17	78.00	66.56	24.1
STN-71, 13.5'-15.0'	**60° C**	947	8/17/09		3/8"			No	29.06	88.27	66.91	56.4
STN-71, 15.0'-16.5'	**60° C**	948	8/17/09		3/4"			No	21.55	124.96	90.87	49.2
STN-71, 16.5'-18.0'	**60° C**	949	8/17/09		3/8"			No	20.16	92.37	64.94	61.3
STN-71, 18.0'-19.5'	**60° C**	950	8/17/09		1 1/2"			No	21.56	73.19	56.63	47.2
STN-71, 19.5'-21.0'	**60° C**	951	8/17/09		3/4"			No	22.00	134.72	110.21	27.8
STN-71, 21.0'-22.5'		952	8/17/09		1 1/2"			No	16.40	92.32	75.21	29.1
STN-71, 22.5'-24.0'		953	8/17/09		1 1/2"			No	19.38	83.72	70.82	25.1
STN-71, 24.0'-25.5'		954	8/17/09		1 1/2"			No	23.45	97.94	84.09	22.8
STN-71, 25.5'-27.0'		955	8/17/09		1 1/2"			No	22.50	106.05	89.80	24.1
STN-71, 27.0'-28.5'		956	8/14/09		1 1/2"			No	26.27	110.63	98.81	16.3
STN-71, 28.5'-30.0'		957	8/14/09		1 1/2"			No	22.69	114.37	101.28	16.7
STN-71, 30.0'-31.5'		958	8/14/09		1 1/2"			No	21.40	77.05	63.12	33.4
STN-71, 31.5'-33.0'		959	8/14/09		3/4"			No	22.69	87.87	73.88	27.3
STN-71, 33.0'-34.5'		960	8/14/09		3/4"			No	20.15	86.75	69.22	35.7
STN-71, 34.5'-36.0'		961	8/14/09		1 1/2"			No	15.70	65.73	51.17	41.0
STN-71, 36.0'-37.5'		962	8/14/09		No. 4			No	23.01	76.61	62.35	36.2
STN-71, 37.5'-39.0'		963	8/14/09		1 1/2"			No	29.57	104.61	91.04	22.1
STN-71, 39.0'-40.5'		964	8/14/09		3/4"			No	23.24	83.76	69.46	30.9
STN-71, 40.5'-42.0'		965	8/14/09		3/4"			No	21.06	72.65	58.68	37.1
STN-71, 42.0'-43.5'		966	8/14/09		1 1/2"			No	22.82	97.76	89.43	12.5
STN-71, 43.5'-44.3'		967	8/17/09						23.03	92.67	86.65	9.5

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Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-87, 0.0'-1.5'	60° C	2960	10/6/09	Str	3/4"			No	21.67	101.73	84.61	27.2
STN-87, 1.5'-3.0'	60° C	2961	10/6/09		1 1/2"	1	1 1/2"	No	21.44	96.66	85.01	18.3
STN-87, 3.0'-4.5'	60° C	2962	10/6/09		3/8"			No	21.61	97.71	86.13	17.9
STN-87, 4.5'-6.0'	60° C	2963	10/6/09		3/4"	1	3/4"	No	21.44	96.98	87.21	14.9
STN-87, 6.0'-7.5'	60° C	2964	10/6/09		3/4"	1	3/4"	No	21.51	99.42	87.18	18.6
STN-87, 7.5'-9.0'	60° C	2965	10/6/09		3/4"	2	3/4"	No	21.47	98.91	83.85	24.1
STN-87, 9.0'-10.5'	60° C	2966	10/6/09		3/8"			No	21.94	98.33	84.30	22.5
STN-87, 10.5'-12.0'	60° C	2967	10/6/09		3/8"			No	22.76	90.17	76.87	24.6
STN-87, 12.0'-13.5'	60° C	2968	10/6/09		3/4"	2	3/4"	No	21.68	87.80	76.84	19.9
STN-87, 13.5'-15.0'	60° C	2969	10/6/09		3/8"			No	22.93	82.15	71.73	21.4
STN-87, 15.0'-16.5'	60° C	2970	10/6/09		No. 4			No	22.13	105.45	86.46	29.5
STN-87, 16.5'-18.0'	60° C	2971	10/6/09		3/8"			No	21.85	93.55	75.31	34.1
STN-87, 18.0'-19.5'	60° C	2972	10/6/09		3/8"			No	22.27	102.38	81.50	35.3
STN-87, 19.5'-21.0'	60° C	2973	10/6/09		3/8"			No	27.27	123.19	94.18	43.4
STN-87, 21.0'-22.5'	60° C	2974	10/6/09		3/8"			No	18.88	93.45	70.04	45.8
STN-87, 22.5'-24.0'	60° C	2975	10/6/09		3/8"			No	28.92	121.17	93.99	41.8
STN-87, 24.0'-25.5'	60° C	2976	10/6/09		1 1/2"	1	1 1/2"	No	19.25	107.13	81.05	42.2
STN-87, 25.5'-27.0'	60° C	2977	10/6/09		No. 10			Yes	20.61	112.11	86.81	38.2
STN-87, 27.0'-28.5'	60° C	2978	10/6/09		No. 10			Yes	21.75	107.18	83.15	39.1
STN-87, 28.5'-30.0'	60° C	2979	10/6/09		No. 10			Yes	20.06	101.11	71.16	58.6
STN-87, 30.0'-31.5'	60° C	2980	10/6/09		No. 10			Yes	21.20	108.79	81.29	45.8
STN-87, 31.5'-33.0'	60° C	2981	10/6/09		No. 4			No	22.87	106.75	76.57	56.2
STN-87, 33.0'-34.5'	60° C	2982	10/6/09		No. 10			Yes	44.52	342.52	244.14	49.3
STN-87, 34.5'-36.0'	60° C	2983	10/6/09		No. 10			Yes	39.81	286.39	208.07	46.5
STN-87, 36.0'-37.5'	No Recovery	2984	11/8/09									
STN-87, 37.5'-39.0'	60° C	2985	10/7/09		No. 10			Yes	47.45	183.28	142.19	43.4
STN-87, 39.0'-40.5'	60° C	2986	10/7/09		No. 10			Yes	46.66	233.70	175.44	45.2
STN-87, 40.5'-42.0'	60° C	2987	10/7/09		No. 10			Yes	49.12	318.45	238.16	42.5
STN-87, 42.0'-43.5'	60° C	2988	10/7/09	Str	No. 10			Yes	46.47	278.66	220.82	33.2
STN-87, 43.5'-45.0'		2989	10/7/09	Hom	No. 10			Yes	43.94	241.57	194.95	30.9
STN-87, 45.0'-46.5'		2990	10/7/09	Hom	1 1/2"	1	1 1/2"	No	49.80	308.59	248.95	29.9

Laboratory Document
Prepared by : JW
Approved by : TLK

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-87, 46.5'-48.0'	2991	10/7/09	Hom	No. 10			Yes	71.33	362.63	299.56	27.6
STN-87, 48.0'-49.5'	2993	10/7/09	Hom	No. 10			Yes	74.85	276.25	235.49	25.4
STN-87, 49.5'-51.0'	2994	10/7/09	Hom	No. 10			Yes	72.66	302.52	258.74	23.5
STN-87, 51.0'-52.5'	2995	10/7/09	Hom	No. 10			Yes	43.67	240.96	204.63	22.6
STN-87, 52.5'-54.0'	2996	10/7/09	Len	No. 10			Yes	73.92	316.08	272.31	22.1
STN-87, 54.0'-55.5'	2997	10/7/09	Hom	No. 10			Yes	76.62	423.80	356.49	24.1
STN-87, 55.5'-57.0'	2998	10/7/09		No. 10			Yes	44.50	345.63	284.48	25.5
STN-87, 57.0'-58.5'	2999	10/7/09		No. 10			Yes	70.33	465.80	388.30	24.4
STN-87, 58.5'-59.5'	3000	10/7/09		3/8"			No	49.25	305.52	256.26	23.8

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source	Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-88, 30.0'-31.5'	3001	10/15/09	Hom	No. 10			Yes	296.36	641.50	566.77	27.6
STN-88, 31.5'-33.0'	3002	10/15/09	Hom	No. 10			Yes	286.29	614.10	549.62	24.5
STN-88, 33.0'-34.5'	3003	10/15/09	Hom	No. 10			Yes	296.71	556.30	506.85	23.5
STN-88, 34.5'-36.0'	3004	10/15/09	Hom	No. 10			Yes	296.96	660.80	588.63	24.7
STN-88, 36.0'-37.5'	3005	10/15/09	Hom	No. 10			Yes	300.28	679.90	612.73	21.5
STN-88, 37.5'-39.0'	3006	10/15/09	Hom	No. 10			Yes	285.24	744.10	650.12	25.8
STN-88, 39.0'-40.5'	3007	10/15/09		No. 10			Yes	298.13	704.40	619.63	26.4
STN-88, 40.5'-42.0'	3008	10/15/09		No. 10			Yes	283.22	751.30	656.82	25.3
STN-88, 42.0'-43.5'	3009	10/15/09		No. 10			Yes	284.26	700.90	622.07	23.3
STN-88, 43.5'-44.9'	3010	10/15/09		1 1/2"	2	1 1/2"	No	283.80	510.40	484.42	12.9

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-89, 0.0'-1.5'	60° C	3011	10/7/09		3/4"			No	53.15	327.82	303.80	9.6
STN-89, 2.5'-4.0'	60° C	3012	10/7/09		3/4"			No	43.78	230.00	208.11	13.3
STN-89, 5.0'-6.5'	60° C	3013	10/7/09		3/4"			No	70.71	502.00	455.88	12.0
STN-89, 7.5'-9.0'	60° C	3014	10/7/09		3/4"			No	44.21	276.77	261.54	7.0
STN-89, 10.0'-11.5'	60° C	3015	10/7/09		3/4"			No	43.75	297.91	279.01	8.0
STN-89, 12.5'-14.0'	60° C	3016	10/7/09		3/4"			No	70.40	431.70	381.01	16.3
STN-89, 15.0'-16.5'	60° C	3017	10/7/09		3/8"			No	44.50	298.63	245.58	26.4
STN-89, 17.5'-19.0'	60° C	3018	10/7/09		3/4"			No	71.24	395.93	346.62	17.9
STN-89, 20.0'-21.5'	60° C	3019	10/7/09		3/4"			No	74.52	422.30	364.01	20.1
STN-89, 22.5'-24.0'	60° C	3020	10/7/09		No. 10			Yes	70.63	392.76	309.56	34.8
STN-89, 25.0'-26.5'	60° C	3021	10/7/09	Hom	No. 10			Yes	75.46	255.72	205.27	38.9
STN-89, 27.5'-29.0'	60° C	3022	10/7/09		No. 10			Yes	38.80	275.18	214.44	34.6
STN-89, 30.0'-31.5'	60° C	3024	10/7/09		No. 10			Yes	47.16	246.83	195.69	34.4
STN-89, 32.5'-34.0'	60° C	3025	10/7/09		No. 10			Yes	47.45	301.52	235.56	35.1
STN-89, 35.0'-36.5'	60° C	3026	10/7/09		No. 10			Yes	49.64	350.66	277.10	32.3

Stantec

Moisture Content of Soil

ASTM D 2216

Project Name Bull Run Fossil Plant (TVA)

Project Number 172679015

Tested By BWT

Test Method ASTM

Maximum Particle Size in Sample	No. 10	No. 4	3/8"	3/4"	1 1/2"	3"
Recommended Minimum Mass (g)	20	100	500	2,500	10,000	50,000

Material Type: Stratified, Laminated, Lensed, Homogeneous

Source		Lab ID	Date Tested	Material Type	Maximum Particle Size	Material Excluded Amount	Material Excluded Size	Pass Min. Mass? (Y/N)	Can Weight (g)	Wet Soil & Can Weight (g)	Dry Soil & CanWeight (g)	Moisture Content (%)
STN-90, 0.0'-1.5'	60° C	3078	10/15/09		3/8"			No	283.93	608.90	551.55	21.4
STN-90, 2.5'-4.0'	60° C	3079	10/15/09		3/4"			No	299.84	710.00	651.55	16.6
STN-90, 5.0'-6.5'	60° C	3080	10/15/09		3/4"			No	300.75	615.60	581.26	12.2
STN-90, 7.5'-9.0'	60° C	3081	10/15/09		3/4"			No	295.25	688.80	632.64	16.6
STN-90, 10.0'-11.5'	60° C	3083	10/15/09		3/4"			No	286.00	552.90	523.00	12.6
STN-90, 12.5'-14.0'	60° C	3084	10/15/09		3/4"			No	288.45	552.10	512.54	17.7
STN-90, 15.0'-16.5'	60° C	3085	10/15/09		3/4"			No	296.15	657.70	612.81	14.2
STN-90, 17.5'-19.0'	60° C	3086	10/15/09	Str	3/4"			No	289.24	569.90	489.91	39.9
STN-90, 20.0'-21.5'	60° C	3087	10/15/09		3/4"			No	289.71	556.60	517.93	16.9
STN-90, 22.5'-24.0'	60° C	3088	10/15/09		3/8"			No	289.19	597.40	525.73	30.3
STN-90, 25.0'-26.5'	60° C	3089	10/15/09	Hom	No. 10			Yes	292.93	594.10	517.11	34.3
STN-90, 27.5'-29.0'	60° C	3090	10/15/09		No. 10			Yes	293.63	683.10	525.00	68.3

Attachment 2
Soil Classification Tests

Particle Size Distribution Report ASTM D422

% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	12.0	69.2	18.8

SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
	STN-29P	24.4-25.0 ft	10/21/09	ML	Gray ASH			

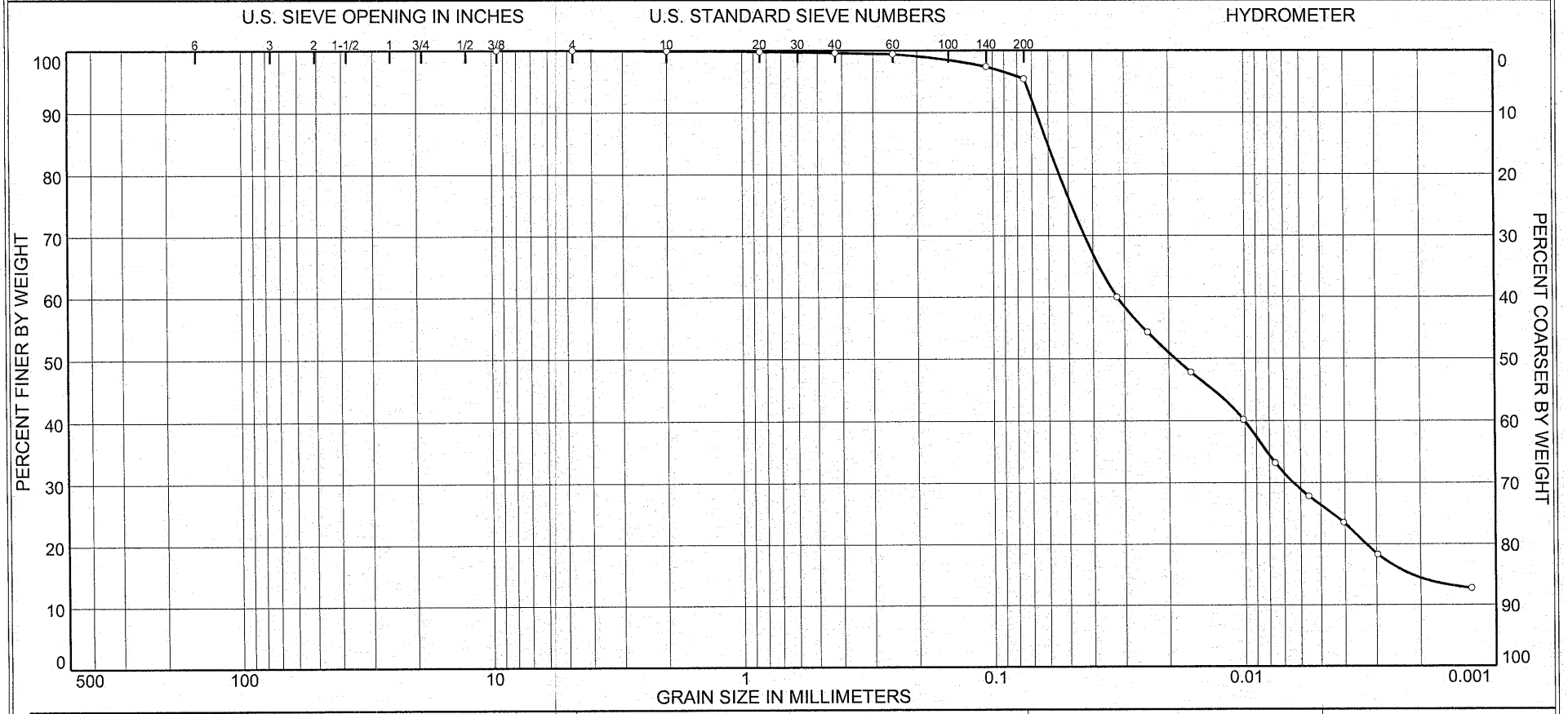
Client Stantec Consulting Services

Project Bull Run Fossil Plant

Project No. GTX-1494 Lab no.

GeoTesting Express Inc.

Particle Size Distribution Report ASTM D422



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	4.6	69.0	26.4

SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
	STN-34P	24.7-25.3 ft	10/22/09	ML	Gray ASH			

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Project No. GTX-1494 Lab no.

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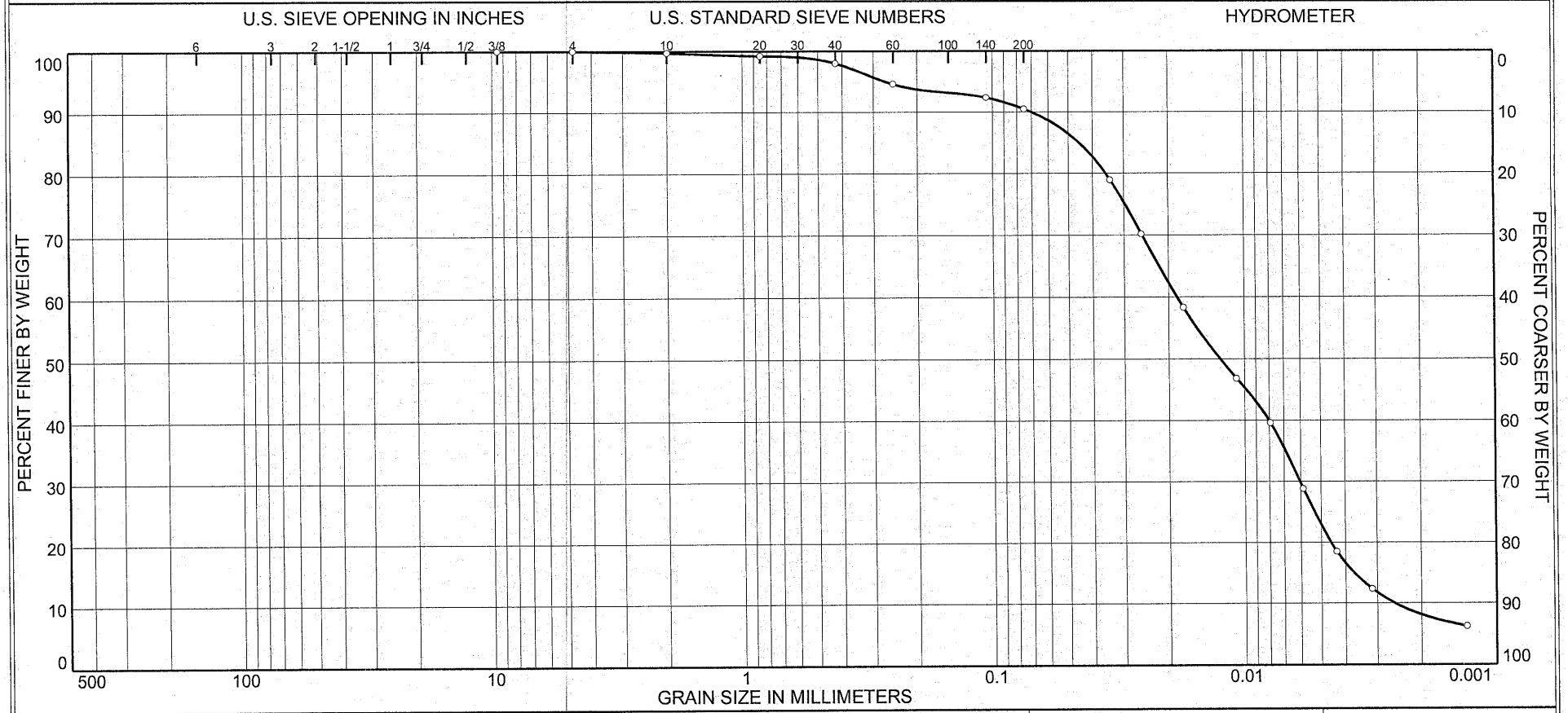
Particle Size Distribution Report ASTM D422



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	9.5	67.6	22.9

SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
	STN-34P	38.2-38.8 ft	10/23/09	ML	Gray ASH			

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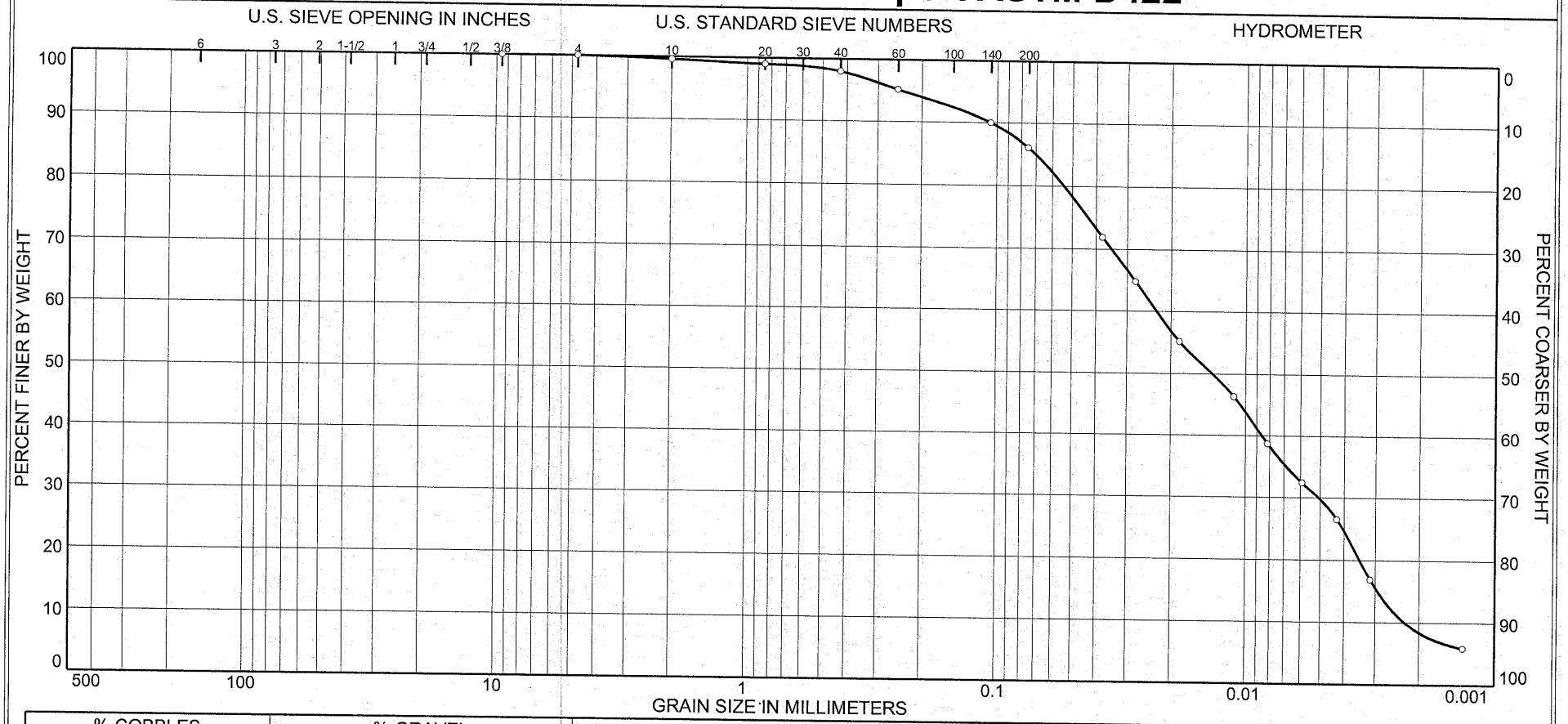
Project No. GTX-1494 Lab no.

GeoTesting Express Inc.

Particle Size Distribution Report ASTM D422



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	13.9	56.4	29.7

SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
	STN-34P	41.4-42.0 ft	10/22/09	ML	Gray ASH			

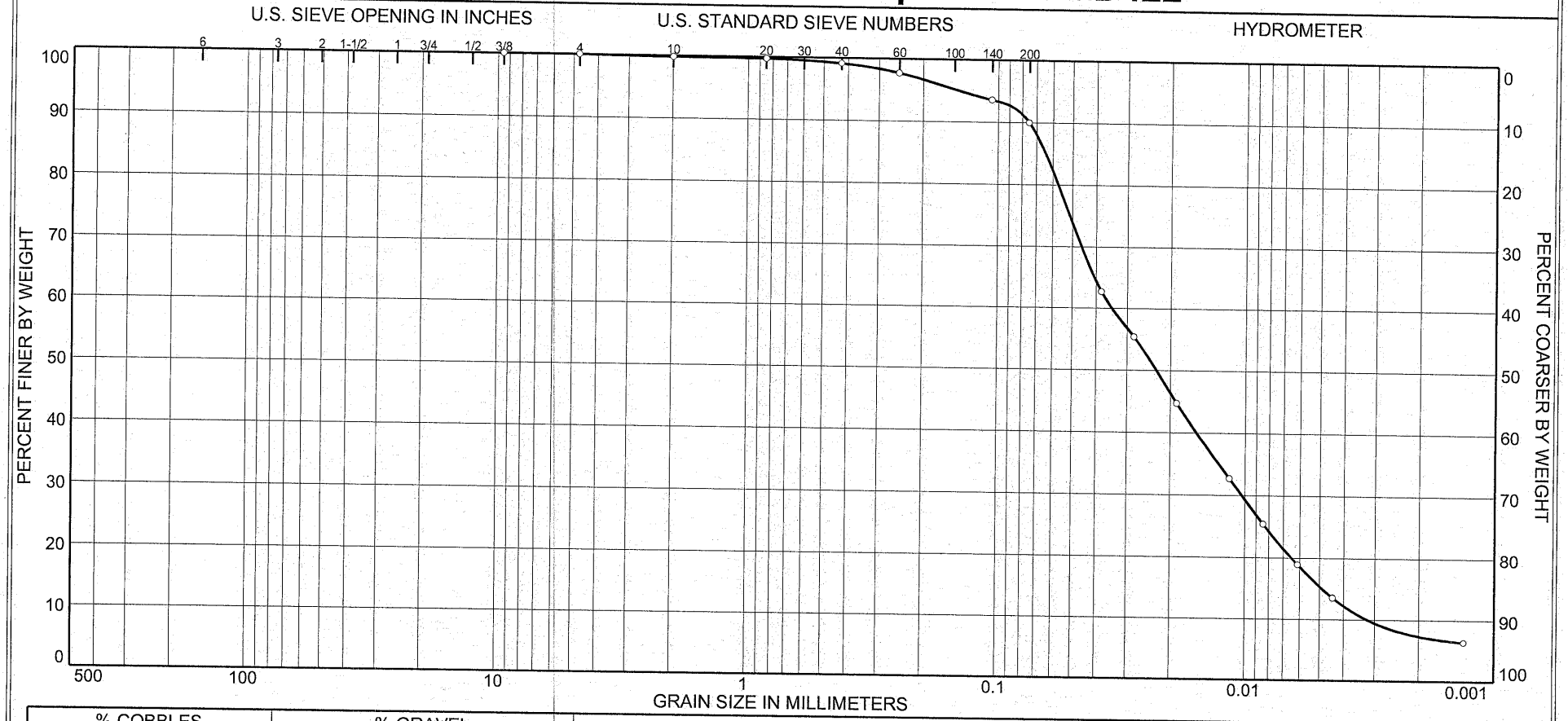
Client Stantec Consulting Services

Project Bull Run Fossil Plant

Project No. GTX-1494 Lab no.

GeoTesting Express Inc.

Particle Size Distribution Report ASTM D422



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	10.0	74.7	15.3

SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
	STN-46P	7.5-8 ft	10/21/09	ML	Gray ASH			

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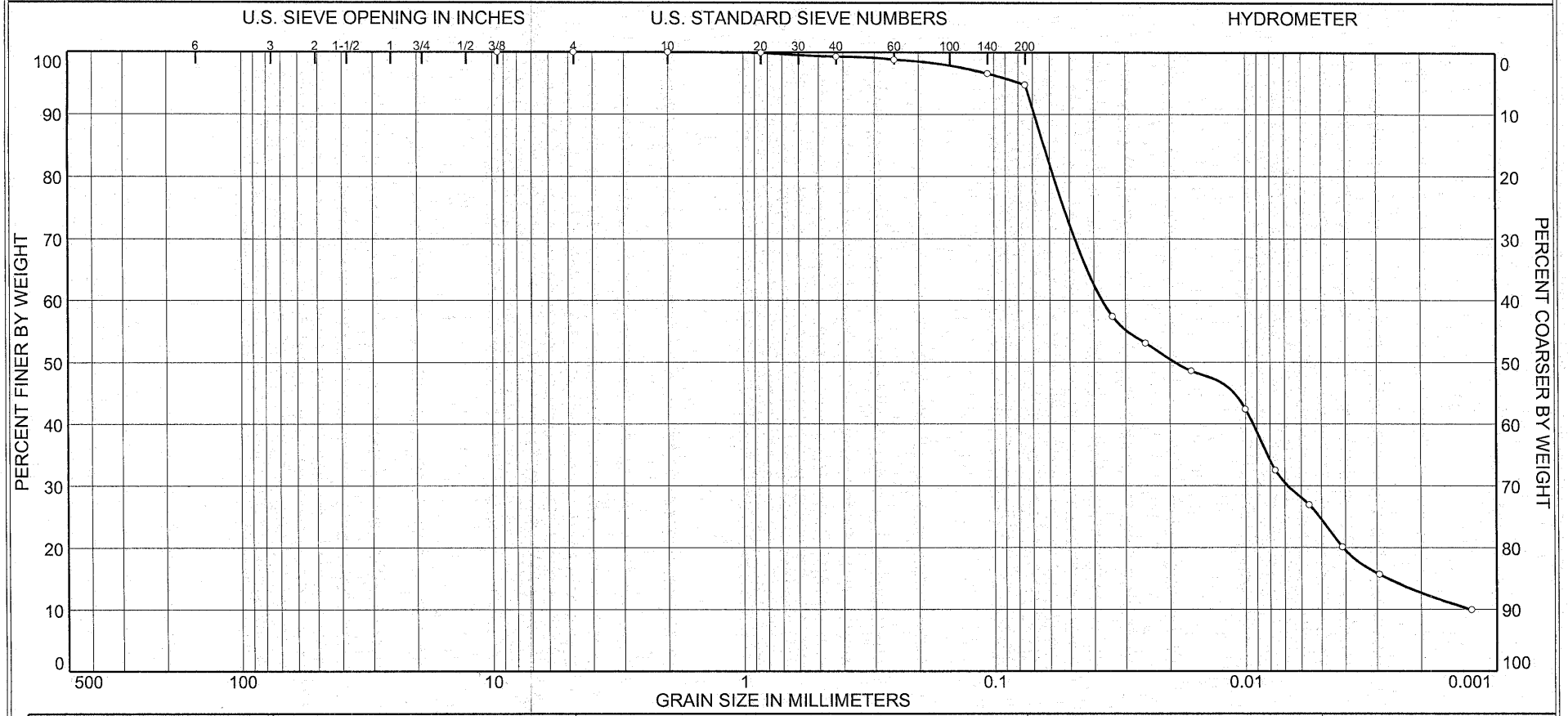
Project Bull Run Fossil Plant

Project No. GTX-1494 Lab no.

GeoTesting Express Inc.

Particle Size Distribution Report ASTM D422



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	5.2	70.3	24.5

SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
	STN-46P	9.5-10 ft	10/22/09	ML	Gray ASH			

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Project Bull Run Fossil Plant

Project No. GTX-1494 Lab no.

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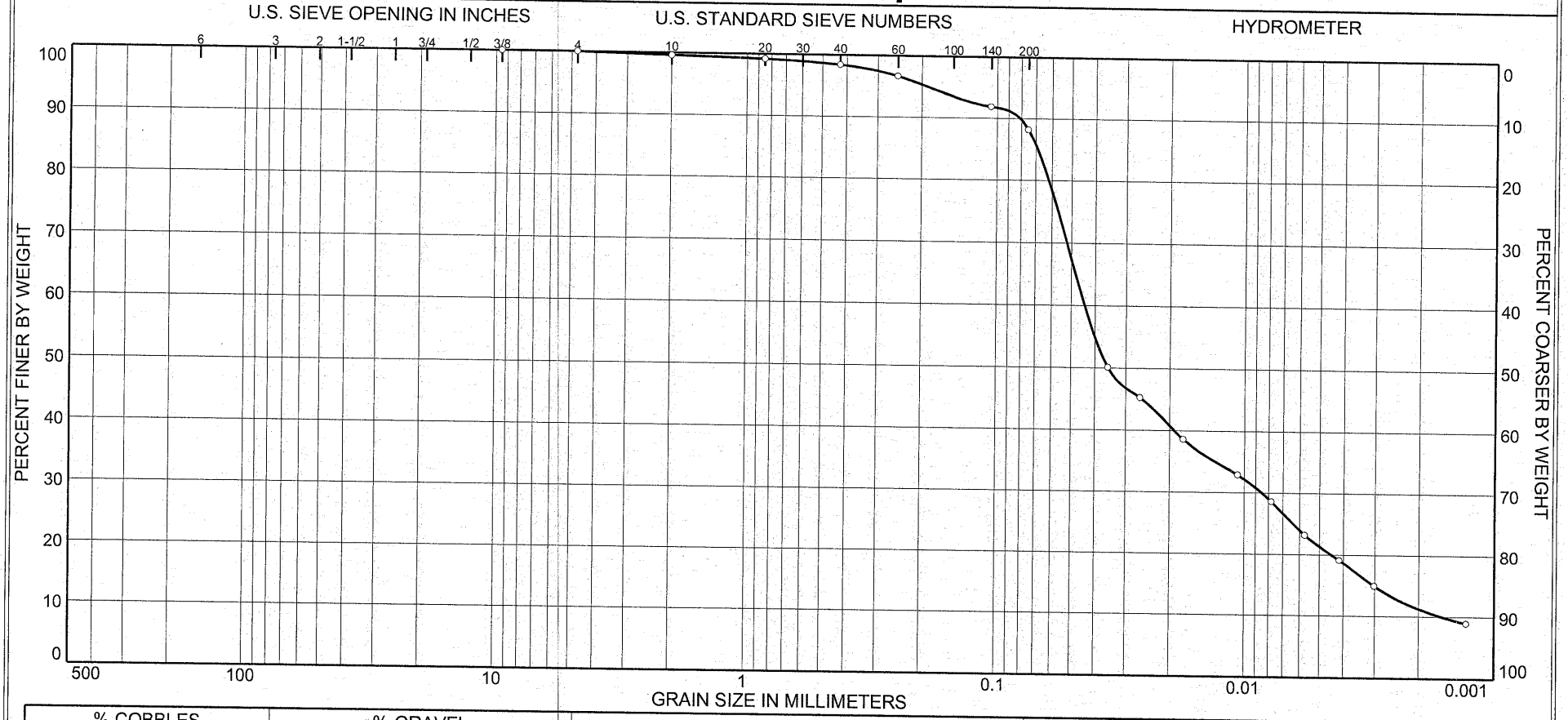
Particle Size Distribution Report ASTM D422



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	11.8	66.9	21.3

SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
	STN-49P	10-10.7 ft	10/22/09	ML	Gray ASH			

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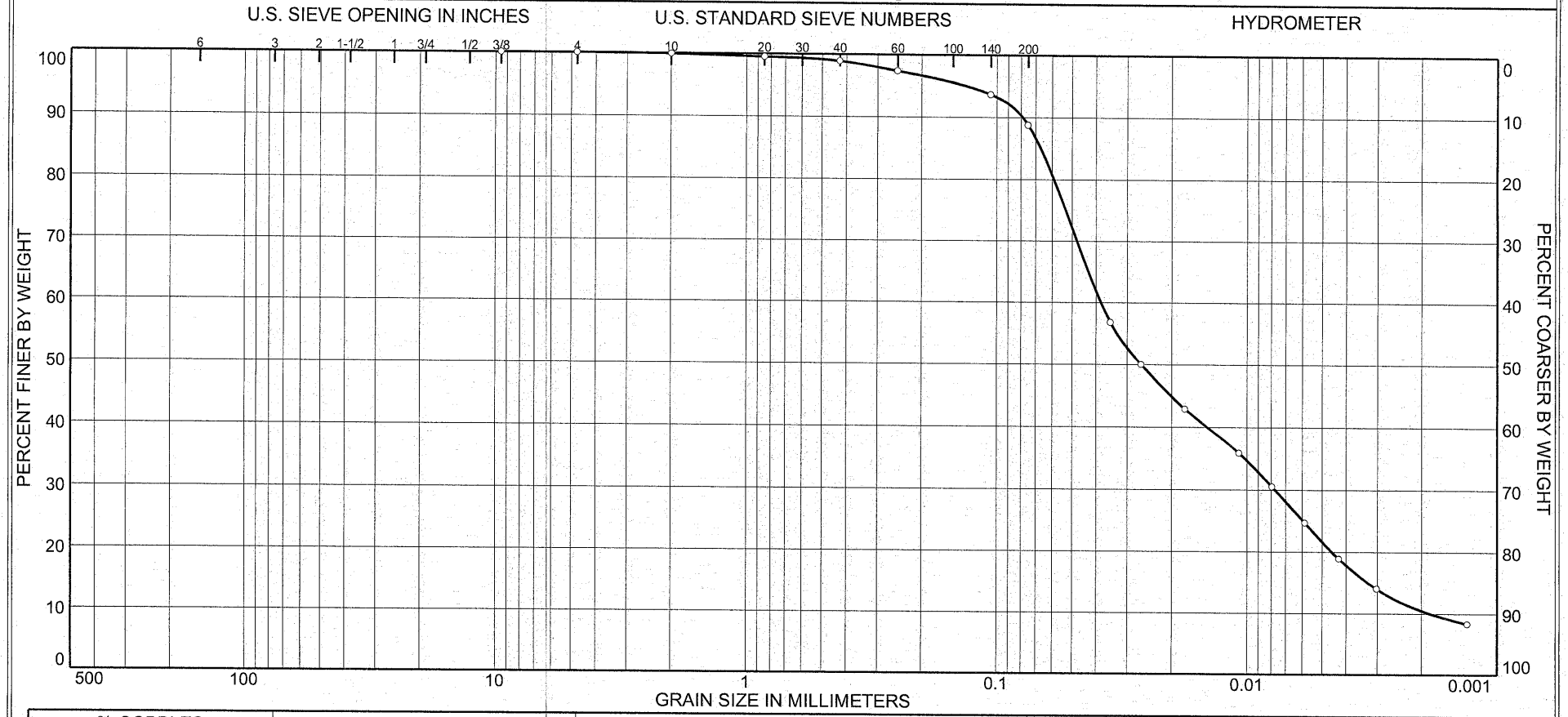
Project Bull Run Fossil Plant

Project No. GTX-1494 Lab no.

GeoTesting Express Inc.

Particle Size Distribution Report ASTM D422



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	11.2	67.1	21.7

SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
	STN-49P	14.7-15.4 ft	10/22/09	ML	Gray ASH			

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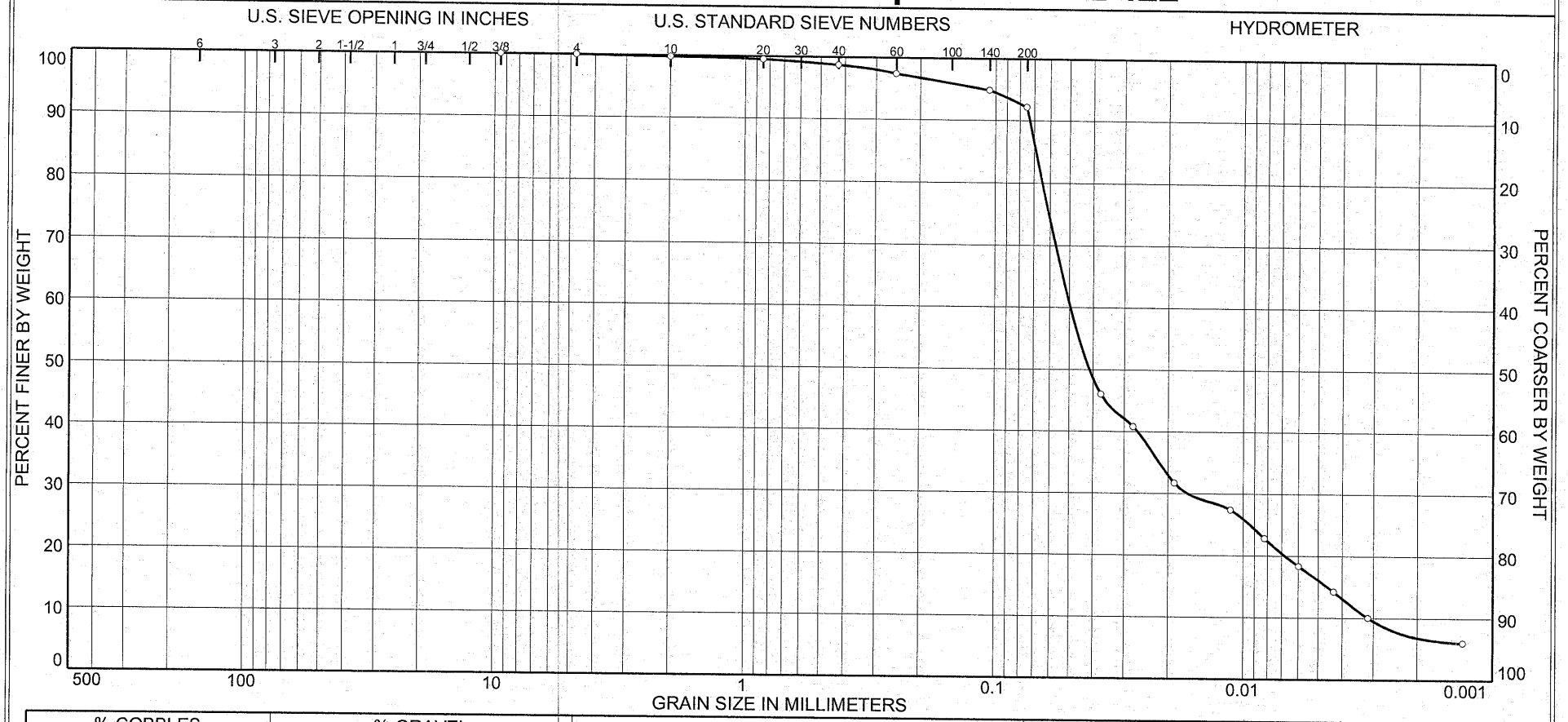
Project Bull Run Fossil Plant

Project No. GTX-1494 Lab no.

GeoTesting Express Inc.

Particle Size Distribution Report ASTM D422



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	7.8	76.2	16.0

SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
	STN-49P	22.7-23.4 ft	10/22/09	ML	Gray ASH			

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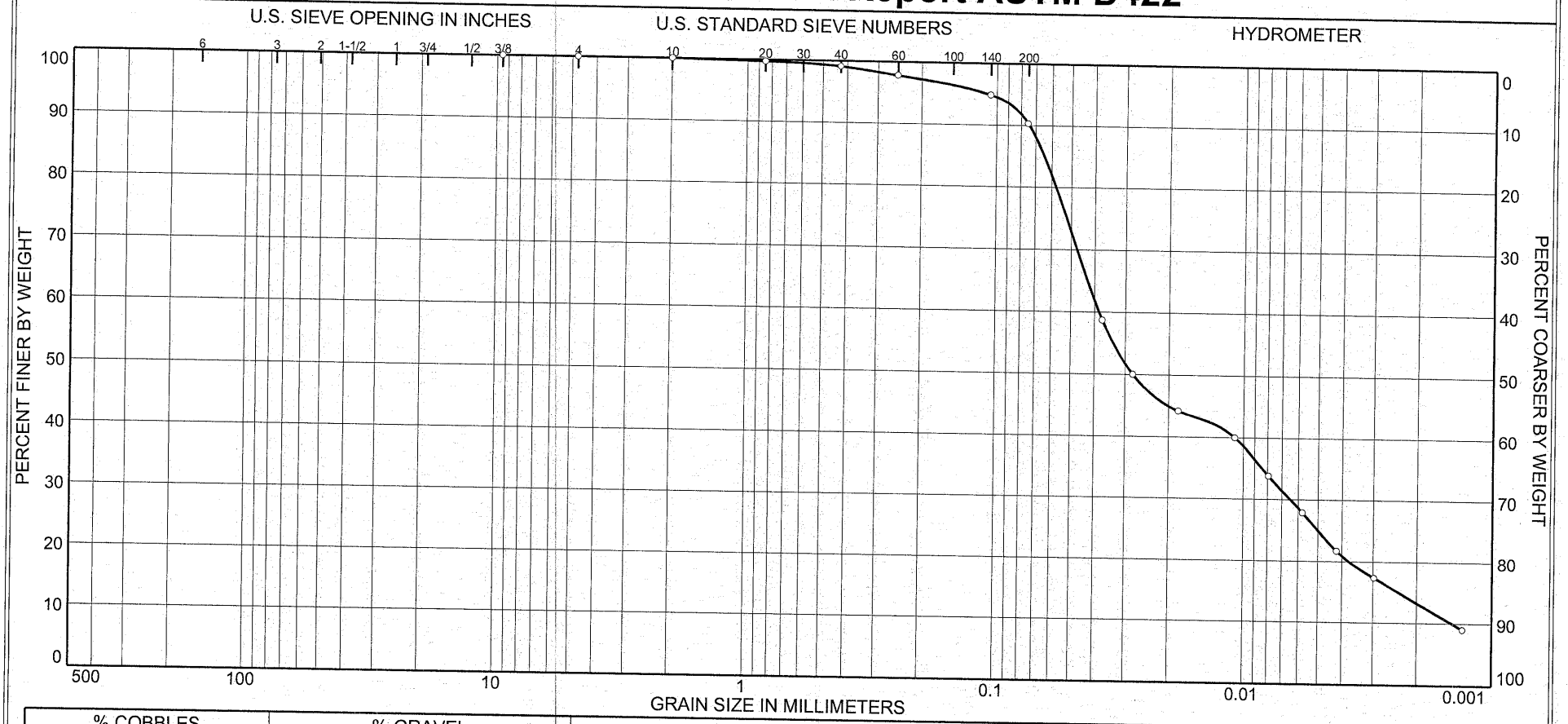
Project Bull Run Fossil Plant

Project No. GTX-1494 Lab no.

GeoTesting Express Inc.

Particle Size Distribution Report ASTM D422



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	9.7	65.3	25.0

SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
	STN-88	7.3-8.0 ft	10/23/09	ML	Gray ASH			

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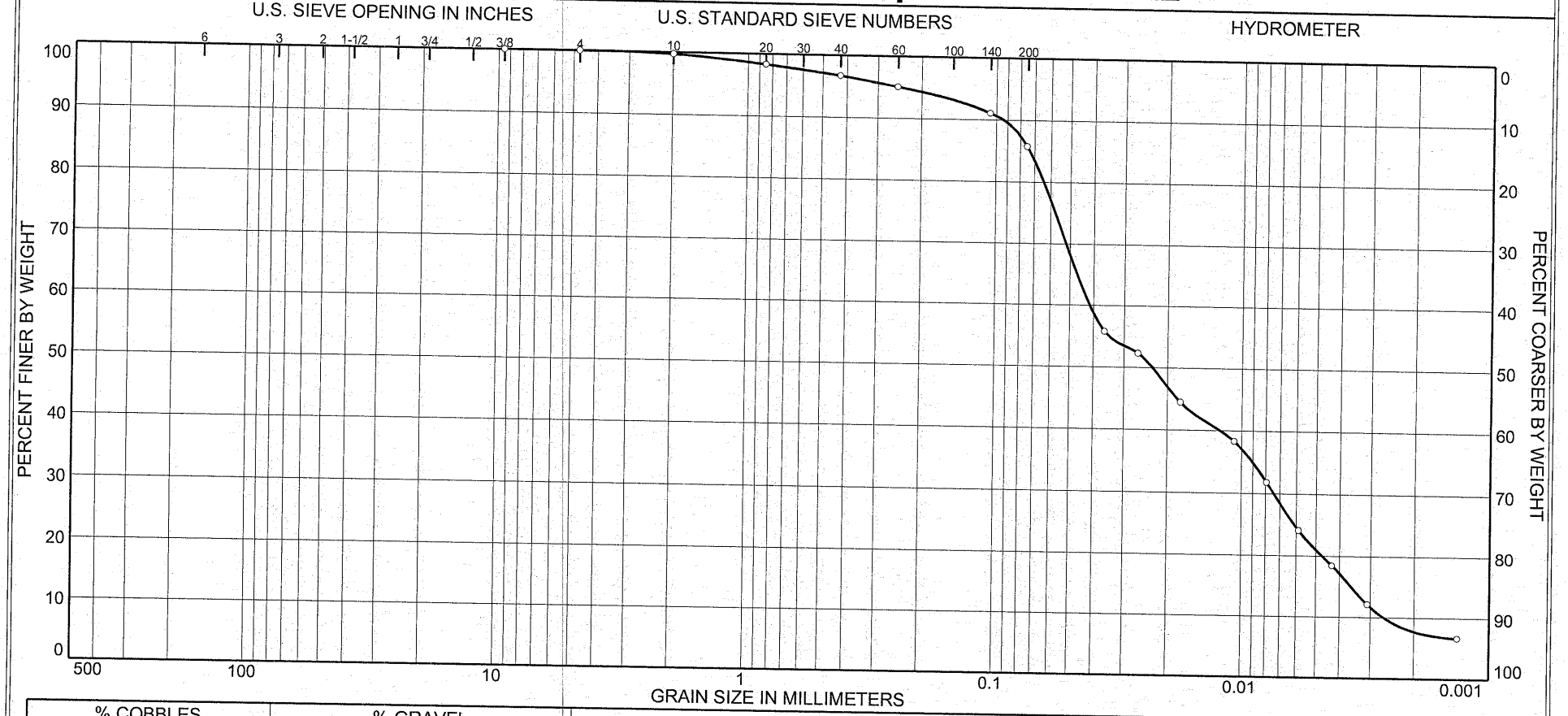
Project Bull Run Fossil Plant

Project No. GTX-1494 Lab no.

GeoTesting Express Inc.

Particle Size Distribution Report ASTM D422



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	14.2	64.8	21.0

SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
	STN-88	11.4-12 ft	10/23/09	ML	Gray ASH			

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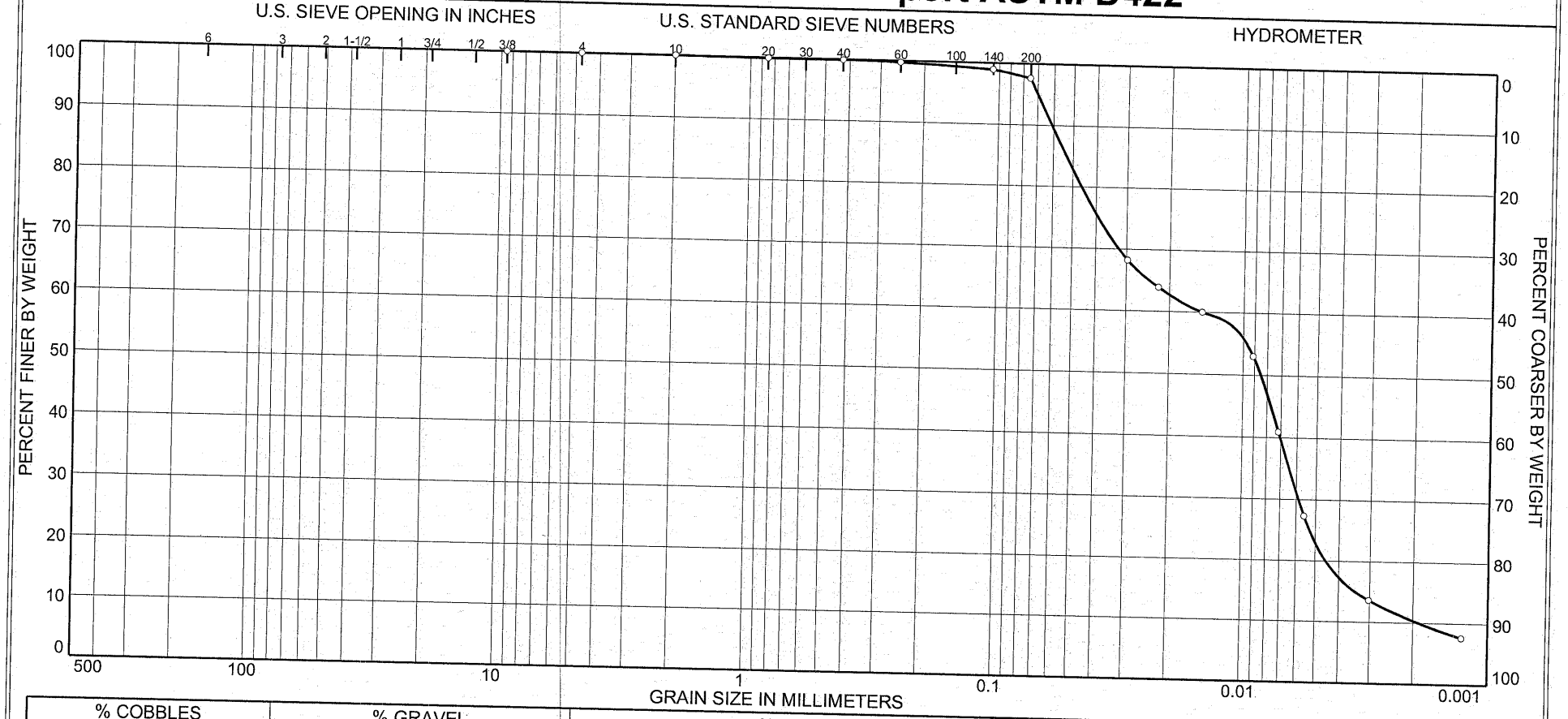
Project Bull Run Fossil Plant

Project No. GTX-1494 Lab no.

GeoTesting Express Inc.

Particle Size Distribution Report ASTM D422



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	2.4	74.6	23.0

SOURCE	SAMPLE #	DEPTH/ELEV.	DATE SAMPLED	USCS	MATERIAL DESCRIPTION	NM %	LL	PL
	STN-29P	19-19.8 ft	10/22/09	ML	Gray ASH			

Client Stantec Consulting Services

Project Bull Run Fossil Plant

Project No. GTX-1494 Lab no.

GeoTesting Express Inc.

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Project Number: 172679015
Source: STN-1, 6.0'-7.5', 7.5'-9.0'
Lab ID: 1222

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: JF
Test Date: 06-22-2009
Date Received: 08-21-2009

Maximum Particle size: 3/8" Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	100.0
No. 4	95.1
No. 10	86.4

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

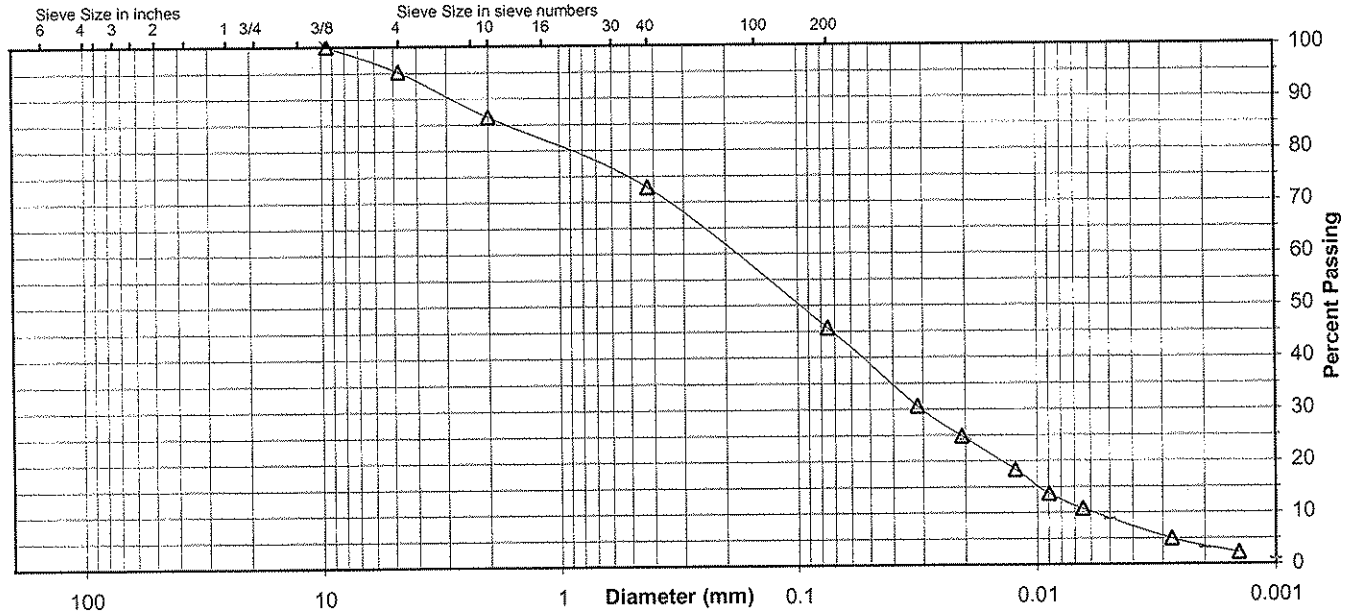
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	72.8
No. 200	45.6
0.02 mm	24.1
0.005 mm	8.8
0.002 mm	3.2
0.001 mm	1.0

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	4.9	8.7	13.6	27.2	36.8	8.8
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	13.6			13.6	27.2	42.4	3.2



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-1, 66.0'-67.5', 67.5'-69.0'

Project Number: 172679015
Lab ID: 1263

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Rounded
Particle Hardness: Hard and Durable

Tested By: JF
Test Date: 10-20-2009
Date Received: 08-21-2009

Maximum Particle size: 3/4" Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	100.0
3/8"	94.9
No. 4	90.1
No. 10	84.9

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

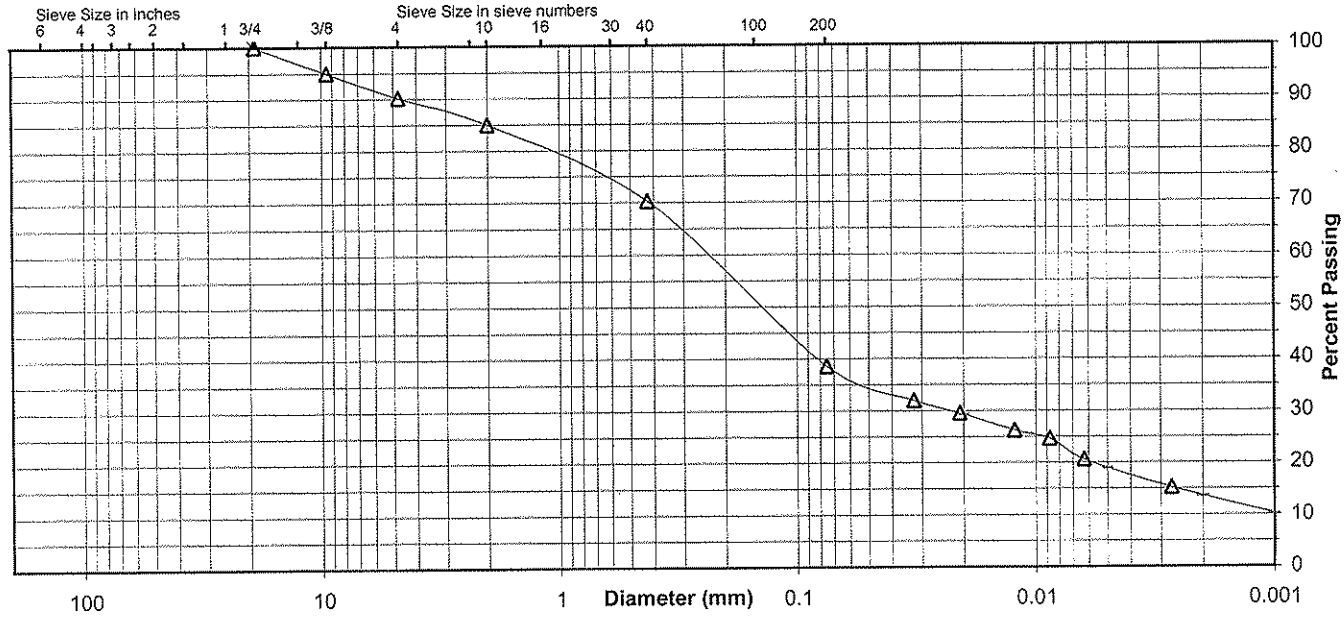
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	70.3
No. 200	38.6
0.02 mm	29.3
0.005 mm	18.9
0.002 mm	13.5
0.001 mm	10.1

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	9.9	5.2	14.6	31.7	19.7	18.9
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	15.1			14.6	31.7	25.1	13.5



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-13, 31.5'-33.0', 33.0'-34.5', 34.5'-36.0'

Project Number: 172679015
Lab ID: 1330

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: N/A
Particle Hardness: N/A

Tested By: JF
Test Date: 10-19-2009
Date Received: 08-21-2009

Maximum Particle size: No. 10 Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	
No. 4	
No. 10	100.0

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

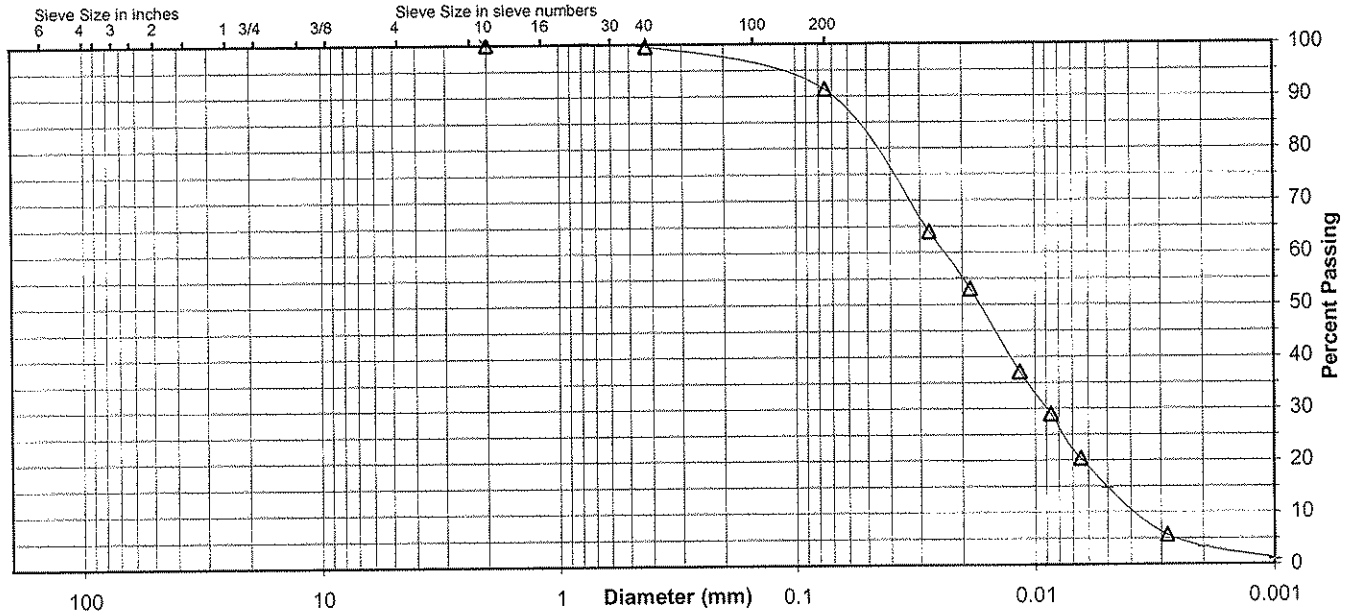
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	99.5
No. 200	91.3
0.02 mm	55.1
0.005 mm	14.7
0.002 mm	3.4
0.001 mm	1.0

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.0	0.0	0.5	8.2	76.6	14.7
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.0			0.5	8.2	87.9	3.4



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-13, 49.5'-51.0', 51.0'-52.5', 52.5'-54.0'

Project Number: 172679015
Lab ID: 1343

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: N/A
Particle Hardness: N/A

Tested By: JF
Test Date: 10-26-2009
Date Received: 08-21-2009

Maximum Particle size: No. 10 Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	
No. 4	
No. 10	100.0

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

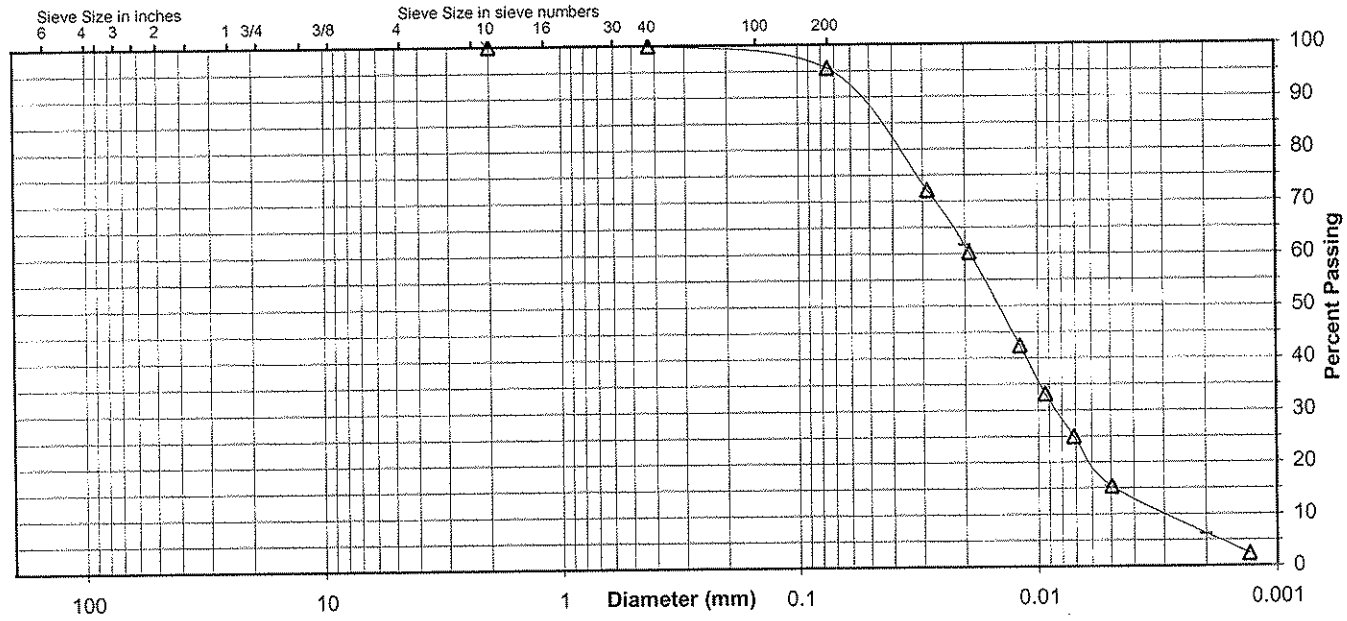
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	99.9
No. 200	95.6
0.02 mm	61.7
0.005 mm	15.3
0.002 mm	6.2
0.001 mm	0.0

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.0	0.0	0.1	4.3	80.3	15.3
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.0			0.1	4.3	89.4	6.2



Comments

Reviewed By

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-13, 58.5'-60.0', 60.0'-61.5', 61.5'-63.0'	Lab ID	1350
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-4-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	100.0
3/8"	9.5	99.5
No. 4	4.75	99.0
No. 10	2	98.0
No. 40	0.425	96.7
No. 200	0.075	70.1
	0.02	46.0
	0.005	29.5
	0.002	22.0
estimated	0.001	18.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	1.0	2.0
Coarse Sand	1.0	1.3
Medium Sand	1.3	---
Fine Sand	26.6	26.6
Silt	40.6	48.1
Clay	29.5	22.0

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	30
Plastic Limit:	18
Plasticity Index:	12
Activity Index:	0.55

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL

Group Name: Lean clay with sand

AASHTO Classification: A-6 (6)

Comments:

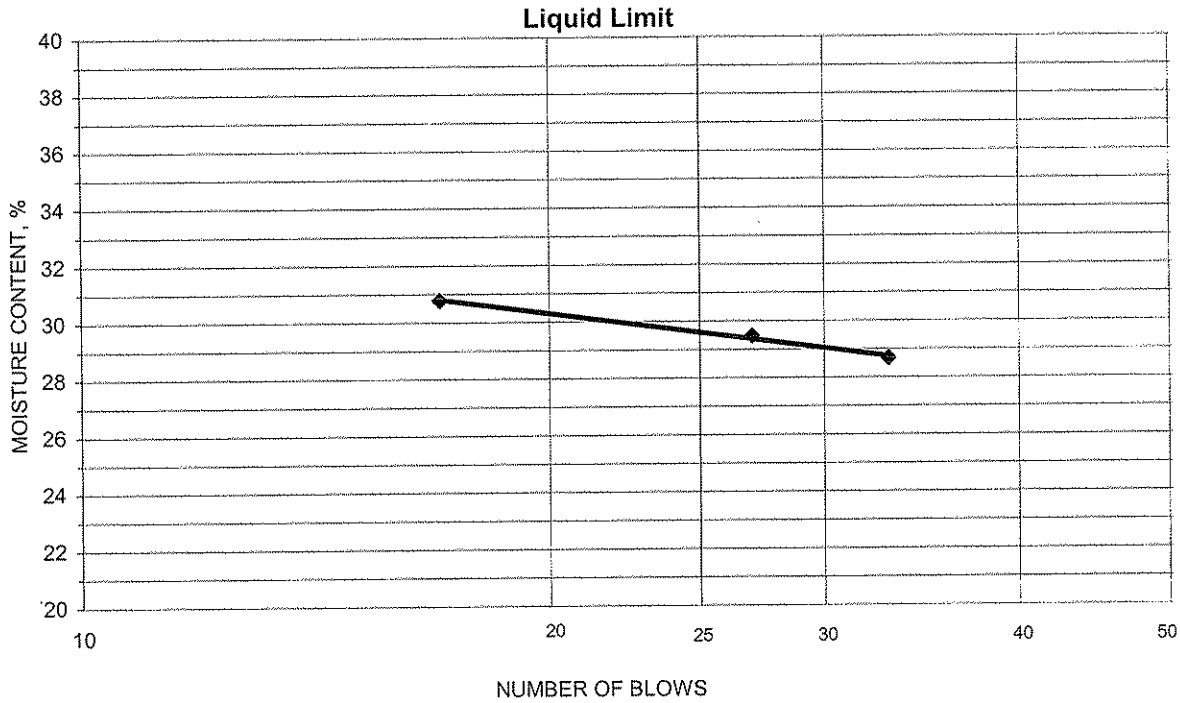
Reviewed by:

Stantec

ATTERBERG LIMITS

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Source	STN-13, 58.5'-60.0', 60.0'-61.5', 61.5'-63.0'	Lab ID	1350
		% + No. 40	3
Tested By	MC	Test Method	ASTM D 4318 Method A
Test Date	10-23-2009	Prepared	Dry
		Date Received	08-21-2009

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
17.98	16.34	11.01	17	30.8	30
18.86	17.13	11.26	27	29.5	
19.09	17.35	11.28	33	28.7	



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
18.35	17.23	11.06	18.2	18	12
18.43	17.30	11.15	18.4		

Remarks: _____

Reviewed By _____

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-13, 58.5'-60.0', 60.0'-61.5', 61.5'-63.0'

Project Number: 172679015
Lab ID: 1350

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: JF
Test Date: 10-19-2009
Date Received: 08-21-2009

Maximum Particle size: 3/4" Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	100.0
3/8"	99.5
No. 4	99.0
No. 10	98.0

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

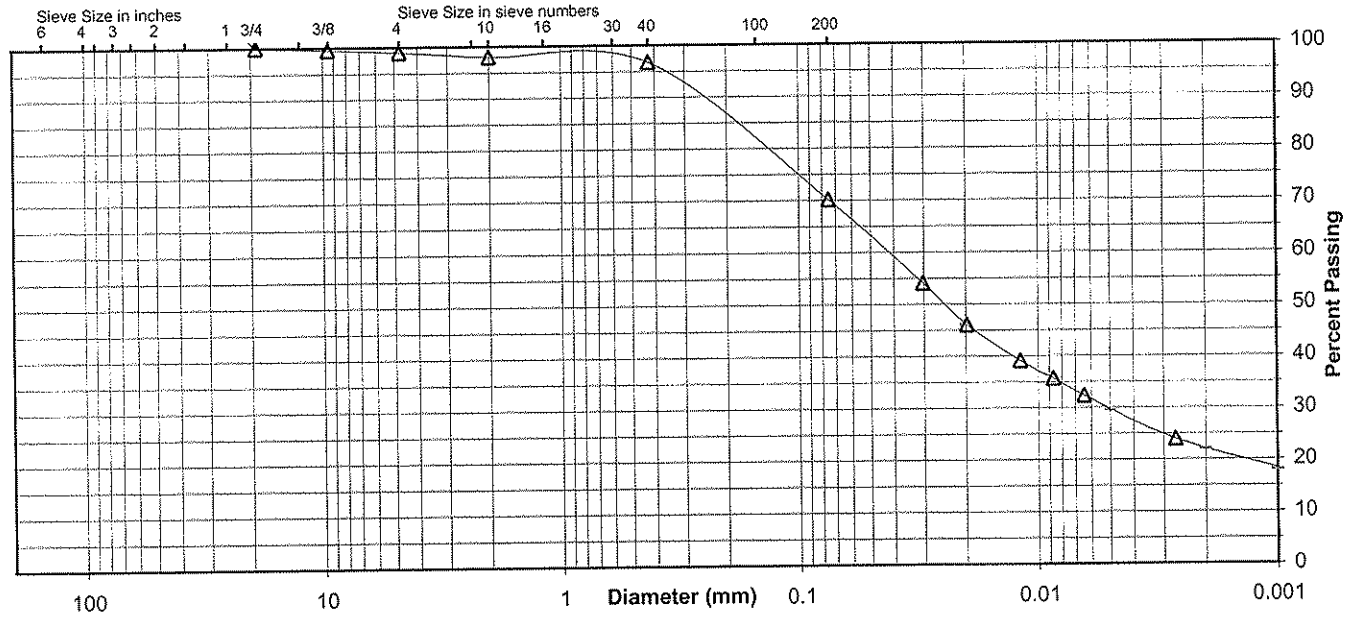
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	96.7
No. 200	70.1
0.02 mm	46.0
0.005 mm	29.5
0.002 mm	22.0
0.001 mm	18.0

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	1.0	1.0	1.3	26.6	40.6	29.5
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	2.0			1.3	26.6	48.1	22.0



Comments

Reviewed By

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-14, 3.0'-4.5', 4.5'-6.0', 6.0'-7.5'	Lab ID	1360
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-4-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	100.0
3/4"	19	91.3
3/8"	9.5	78.7
No. 4	4.75	69.7
No. 10	2	56.1
No. 40	0.425	46.9
No. 200	0.075	38.2
	0.02	30.3
	0.005	20.8
	0.002	15.6
estimated	0.001	13.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	30.3	43.9
Coarse Sand	13.6	9.2
Medium Sand	9.2	---
Fine Sand	8.7	8.7
Silt	17.4	22.6
Clay	20.8	15.6

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit: 37
Plastic Limit: 20
Plasticity Index: 17
Activity Index: 1.06

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Estimated

Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.70

Classification

Unified Group Symbol: SC
Group Name: Clayey sand with gravel

AASHTO Classification: A-6 (2)

Comments:

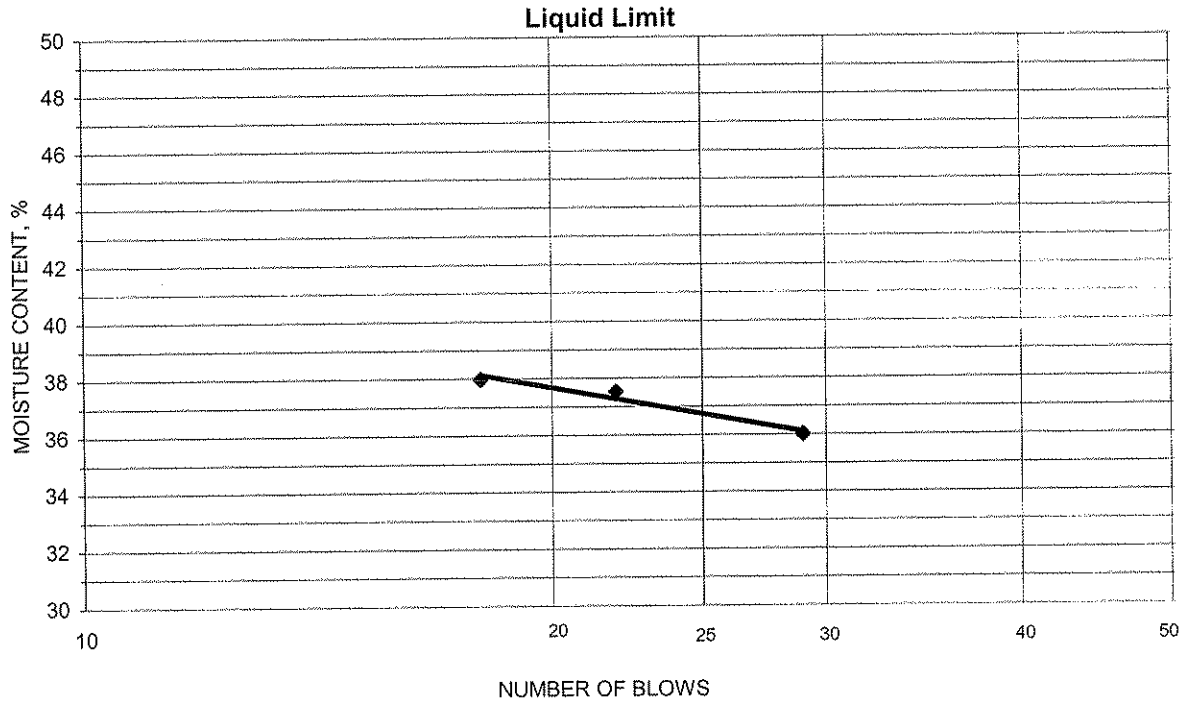
Reviewed by:

Stantec

ATTERBERG LIMITS

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Source	STN-14, 3.0'-4.5', 4.5'-6.0', 6.0'-7.5'	Lab ID	1360
		% + No. 40	53
Tested By	MC	Test Method	ASTM D 4318 Method A
Test Date	10-23-2009	Prepared	Dry
		Date Received	08-21-2009

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
18.73	16.70	11.06	29	36.0	
18.70	16.64	11.15	22	37.5	
18.74	16.64	11.11	18	38.0	37



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
18.47	17.22	10.90	19.8	20	17
18.48	17.24	10.90	19.6		

Remarks: _____

Reviewed By _____

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-14, 3.0'-4.5', 4.5'-6.0', 6.0'-7.5'

Project Number: 172679015
Lab ID: 1360

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: ford
Test Date: 10-14-2009
Date Received: 08-21-2009

Maximum Particle size: 1" Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	100.0
3/4"	91.3
3/8"	78.7
No. 4	69.7
No. 10	56.1

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

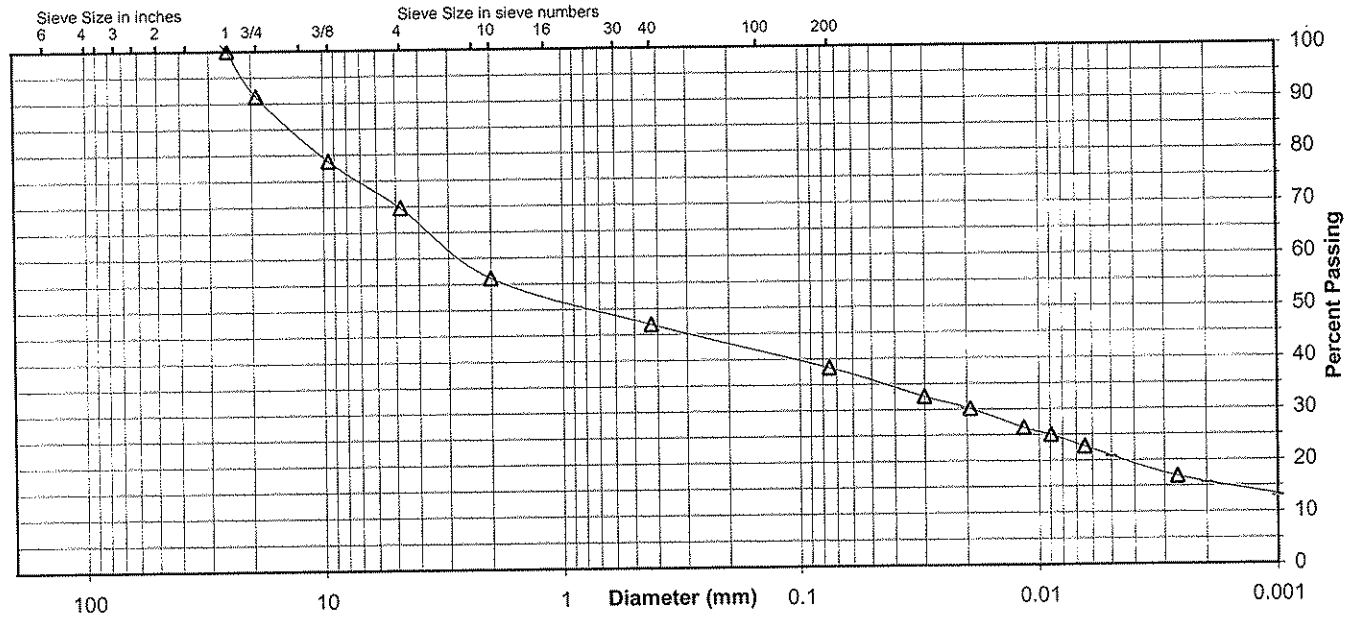
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	46.9
No. 200	38.2
0.02 mm	30.3
0.005 mm	20.8
0.002 mm	15.6
0.001 mm	13.0

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	8.7	21.6	13.6	9.2	8.7	17.4	20.8
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	43.9			9.2	8.7	22.6	15.6



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-14, 30.0'-31.5', 31.5'-33.0'

Project Number: 172679015
Lab ID: 1379

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: ford
Test Date: 10-14-2009
Date Received: 08-21-2009

Maximum Particle size: 3/8" Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	100.0
No. 4	99.2
No. 10	94.2

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

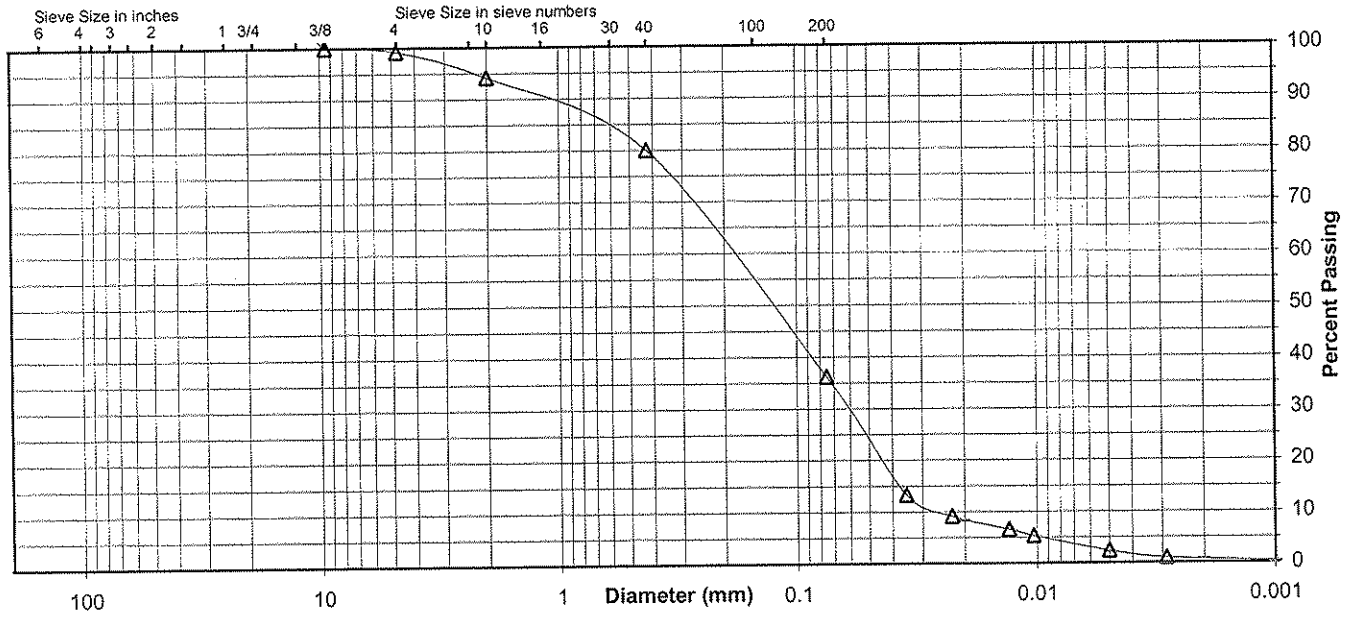
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	80.0
No. 200	36.1
0.02 mm	8.3
0.005 mm	2.2
0.002 mm	0.8
0.001 mm	0.0

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	0.8	5.0	14.2	43.9	33.9	2.2
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	5.8			14.2	43.9	35.3	0.8



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-14, 78.0'-79.5', 79.5'-81.0'

Project Number: 172679015
Lab ID: 1412

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: N/A
Particle Hardness: N/A

Tested By: ford
Test Date: 10-14-2009
Date Received: 08-21-2009

Maximum Particle size: No. 10 Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	
No. 4	
No. 10	100.0

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

Specific Gravity: 2.7

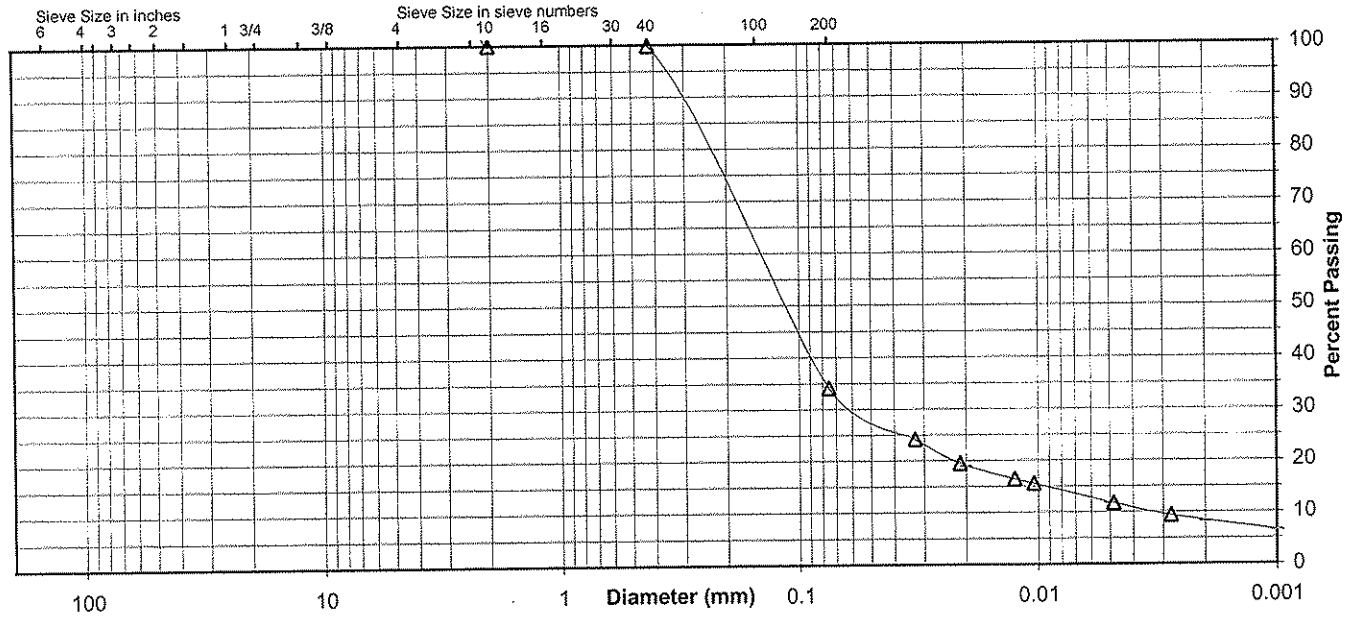
Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	99.8
No. 200	34.1
0.02 mm	18.9
0.005 mm	11.8
0.002 mm	8.2
0.001 mm	6.5

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	0.0	0.0	0.2	65.7	22.3	11.8

	Gravel	Coarse Sand	Fine Sand	Silt	Clay
AASHTO	0.0	0.2	65.7	25.9	8.2



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-15, 29.5'-31.0', 31.0'-32.5'

Project Number: 172679015
Lab ID: 1437

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: CM
Test Date: 10-08-2009
Date Received: 08-21-2009

Maximum Particle size: 3/8" Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	100.0
No. 4	100.0
No. 10	99.9

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

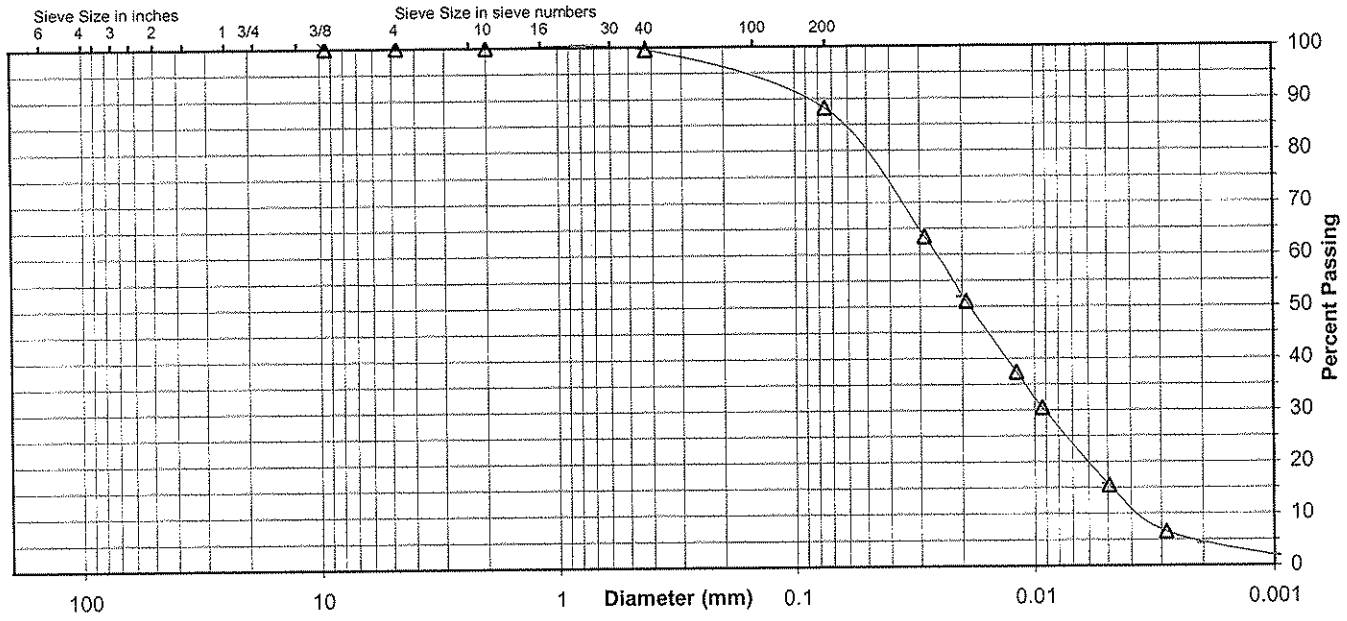
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	99.5
No. 200	88.2
0.02 mm	51.9
0.005 mm	15.7
0.002 mm	4.3
0.001 mm	2.0

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	0.0	0.1	0.4	11.3	72.5	15.7
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.1			0.4	11.3	83.9	4.3



Comments

Reviewed By

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-15, 35.5'-37.0', 37.0'-38.5', 38.5'-40.0'	Lab ID	1442
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-4-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	
No. 4	4.75	100.0
No. 10	2	99.8
No. 40	0.425	99.0
No. 200	0.075	90.5
	0.02	60.9
	0.005	37.8
	0.002	29.5
estimated	0.001	26.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.2
Coarse Sand	0.2	0.8
Medium Sand	0.8	---
Fine Sand	8.5	8.5
Silt	52.7	61.0
Clay	37.8	29.5

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	34
Plastic Limit:	19
Plasticity Index:	15
Activity Index:	0.50

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL
Group Name: Lean clay

AASHTO Classification: A-6 (13)

Comments:

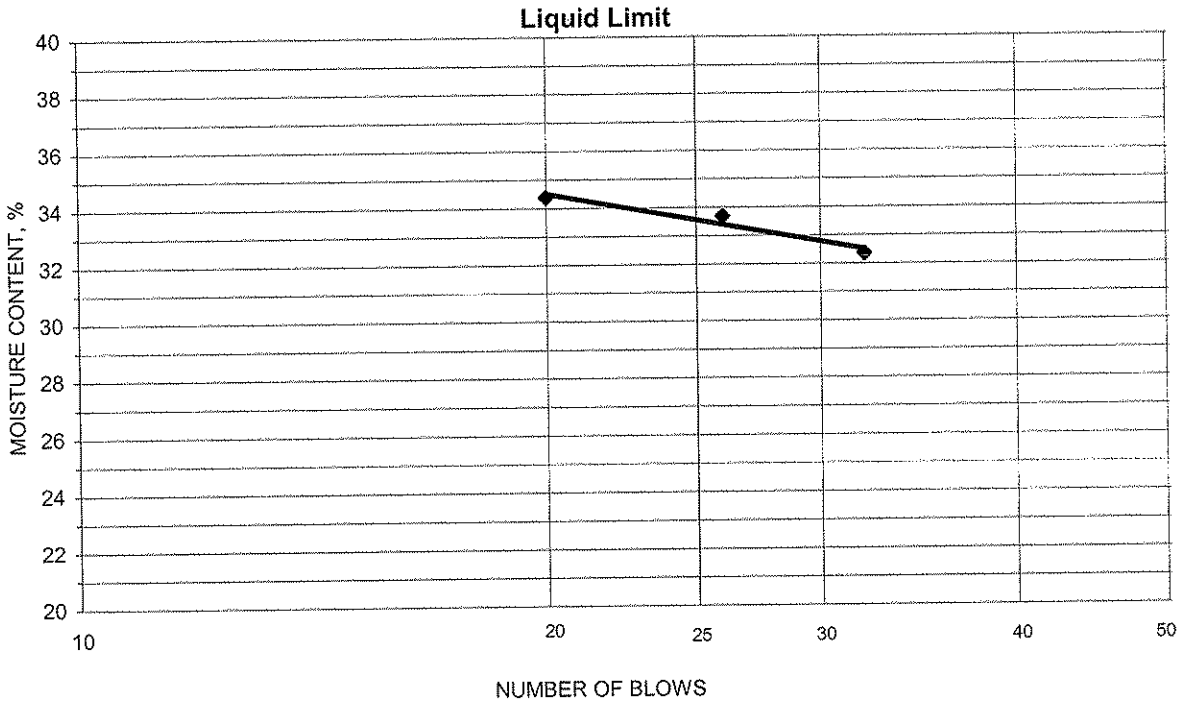
Reviewed by:

Stantec

ATTERBERG LIMITS

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Source	STN-15, 35.5'-37.0', 37.0'-38.5', 38.5'-40.0'	Lab ID	1442
		% + No. 40	1
Tested By	MC	Test Method	ASTM D 4318 Method A
Test Date	10-12-2009	Prepared	Dry
		Date Received	08-21-2009

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
20.63	18.33	11.64	20	34.4	34
19.33	17.35	11.47	26	33.7	
19.97	17.89	11.46	32	32.3	



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
19.11	17.90	11.53	19.0	19	15
18.77	17.59	11.17	18.4		

Remarks: _____

Reviewed By _____

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-15, 35.5'-37.0', 37.0'-38.5', 38.5'-40.0'

Project Number: 172679015
Lab ID: 1442

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: Ford
Test Date: 10-09-2009
Date Received: 08-21-2009

Maximum Particle size: No. 4 Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	
No. 4	100.0
No. 10	99.8

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

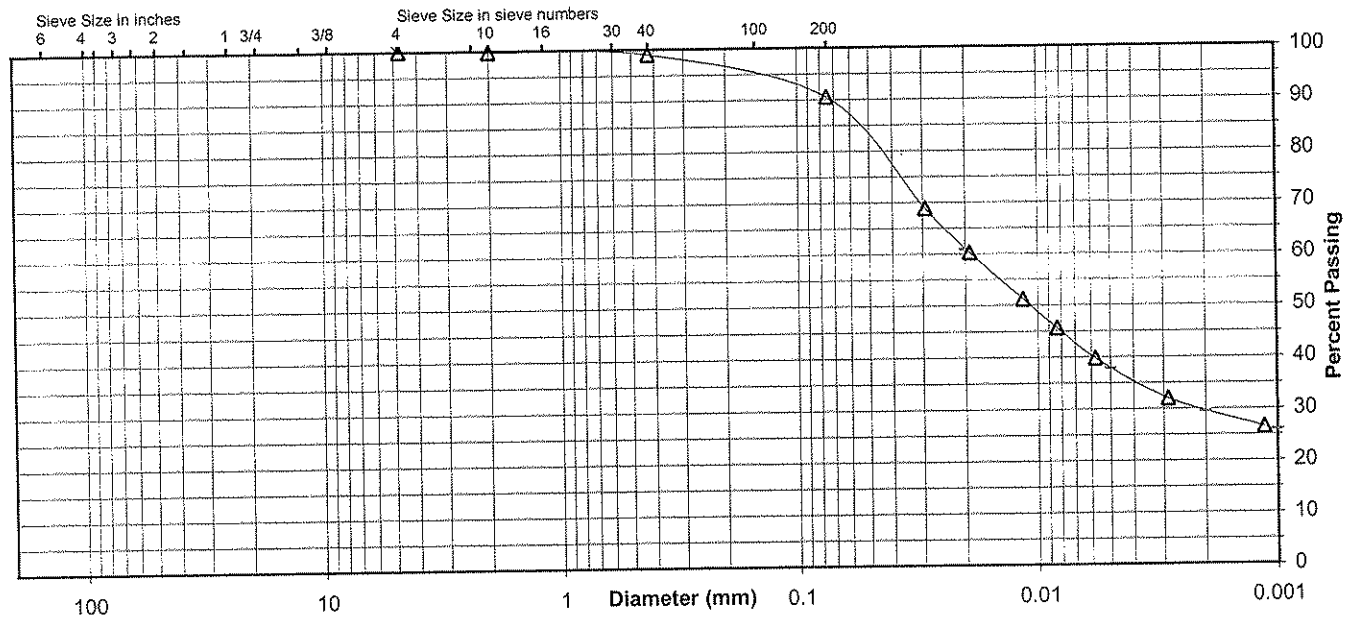
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	99.0
No. 200	90.5
0.02 mm	60.9
0.005 mm	37.8
0.002 mm	29.5
0.001 mm	26.0

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.0	0.2	0.8	8.5	52.7	37.8
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.2			0.8	8.5	61.0	29.5



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-18, 9.0'-10.5', 10.5'-12.0'

Project Number: 172679015
Lab ID: 1492

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: JF
Test Date: 10-22-2009
Date Received: 08-21-2009

Maximum Particle size: 1" Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	100.0
3/4"	97.2
3/8"	91.0
No. 4	83.6
No. 10	71.3

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

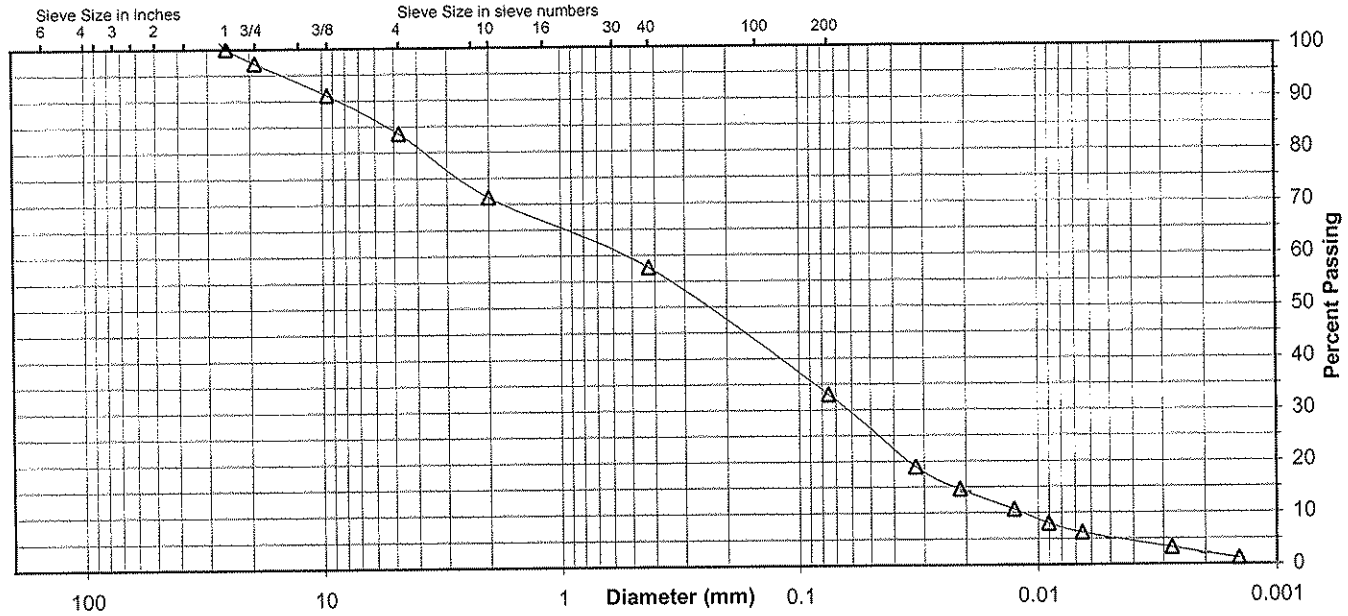
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	57.6
No. 200	33.0
0.02 mm	14.1
0.005 mm	5.0
0.002 mm	2.1
0.001 mm	0.0

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	2.8	13.6	12.3	13.7	24.6	28.0	5.0
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	28.7			13.7	24.6	30.9	2.1



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-18, 19.5'-21.0', 21.0'-22.5'

Project Number: 172679015
Lab ID: 1500

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: JF
Test Date: 10-22-2009
Date Received: 08-21-2009

Maximum Particle size: 1" Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	100.0
3/4"	91.8
3/8"	91.0
No. 4	88.2
No. 10	86.1

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

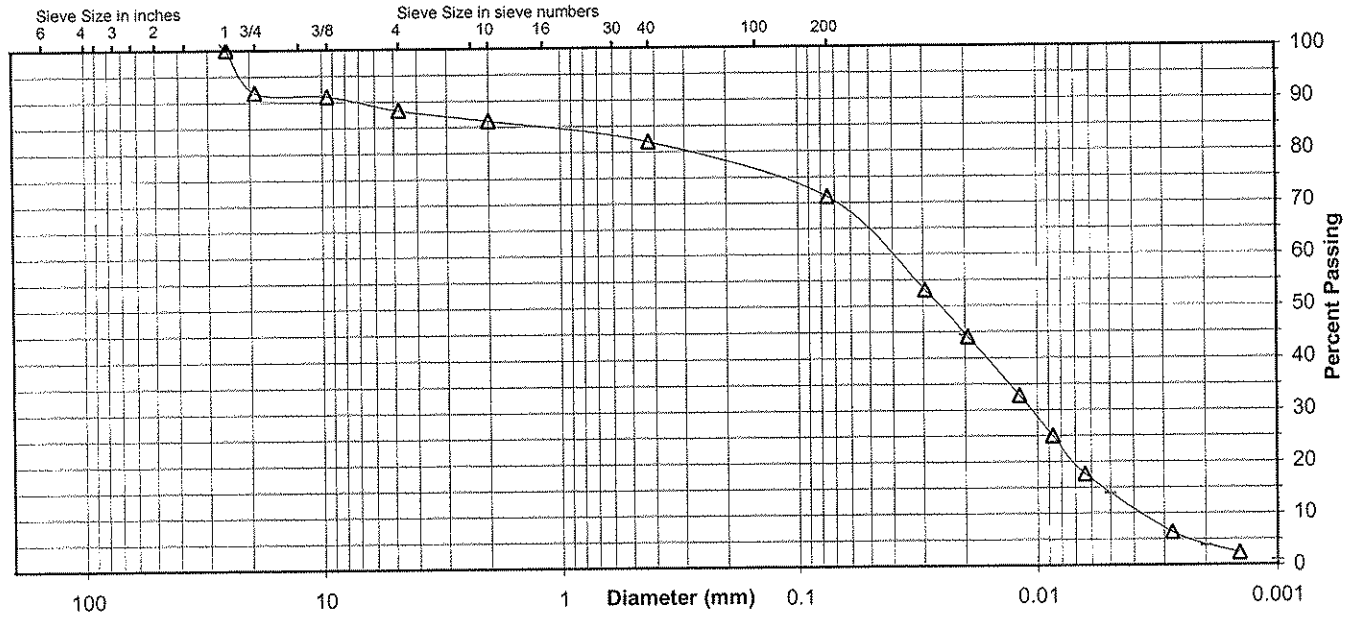
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	81.9
No. 200	71.1
0.02 mm	44.4
0.005 mm	13.9
0.002 mm	3.8
0.001 mm	1.0

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	8.2	3.6	2.1	4.2	10.8	57.2	13.9
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	13.9			4.2	10.8	67.3	3.8



Comments

Reviewed By

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-18, 39.0'-40.5', 40.5'-42.0', 42.0'-43.5'	Lab ID	1514
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-4-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Atterberg Limits

Test Method: ASTM D 4318 Method A

Prepared: Dry

Liquid Limit:	35
Plastic Limit:	20
Plasticity Index:	15
Activity Index:	0.54

Particle Size Analysis

Preparation Method: ASTM D 421

Gradation Method: ASTM D 422

Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	100.0
No. 4	4.75	99.9
No. 10	2	99.7
No. 40	0.425	98.6
No. 200	0.075	88.9
	0.02	61.5
	0.005	36.2
	0.002	27.7
estimated	0.001	20.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.1	0.3
Coarse Sand	0.2	1.1
Medium Sand	1.1	---
Fine Sand	9.7	9.7
Silt	52.7	61.2
Clay	36.2	27.7

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL

Group Name: Lean clay

AASHTO Classification: A-6 (13)

Comments:

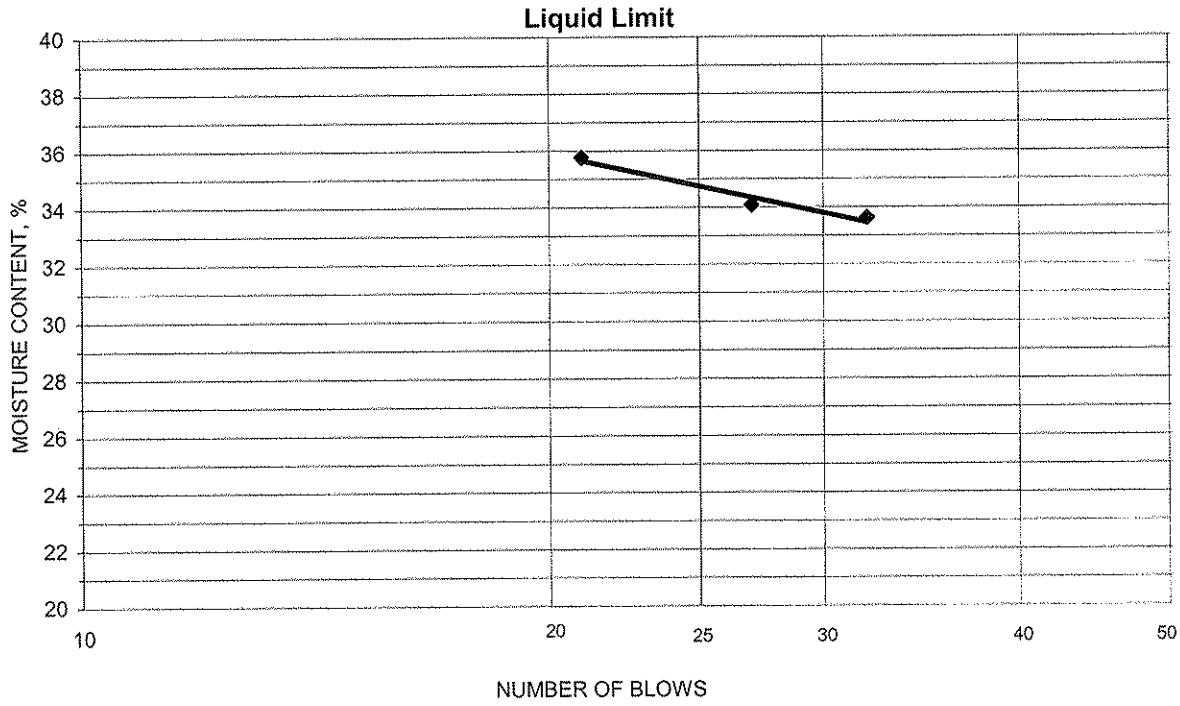
Reviewed by:

Stantec

ATTERBERG LIMITS

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Source	STN-18, 39.0'-40.5', 40.5'-42.0', 42.0'-43.5'	Lab ID	1514
		% + No. 40	1
Tested By	MC	Test Method	ASTM D 4318 Method A
Test Date	10-23-2009	Prepared	Dry
		Date Received	08-21-2009

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
18.84	16.87	11.01	32	33.6	35
18.57	16.71	11.25	27	34.1	
18.82	16.76	11.00	21	35.8	



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
18.73	17.50	11.17	19.4	20	15
18.48	17.25	11.04	19.8		

Remarks: _____

Reviewed By _____

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-18, 39.0'-40.5', 40.5'-42.0', 42.0'-43.5'

Project Number: 172679015
Lab ID: 1514

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: JF
Test Date: 10-22-2009
Date Received: 08-21-2009

Maximum Particle size: 3/8" Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	100.0
No. 4	99.9
No. 10	99.7

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

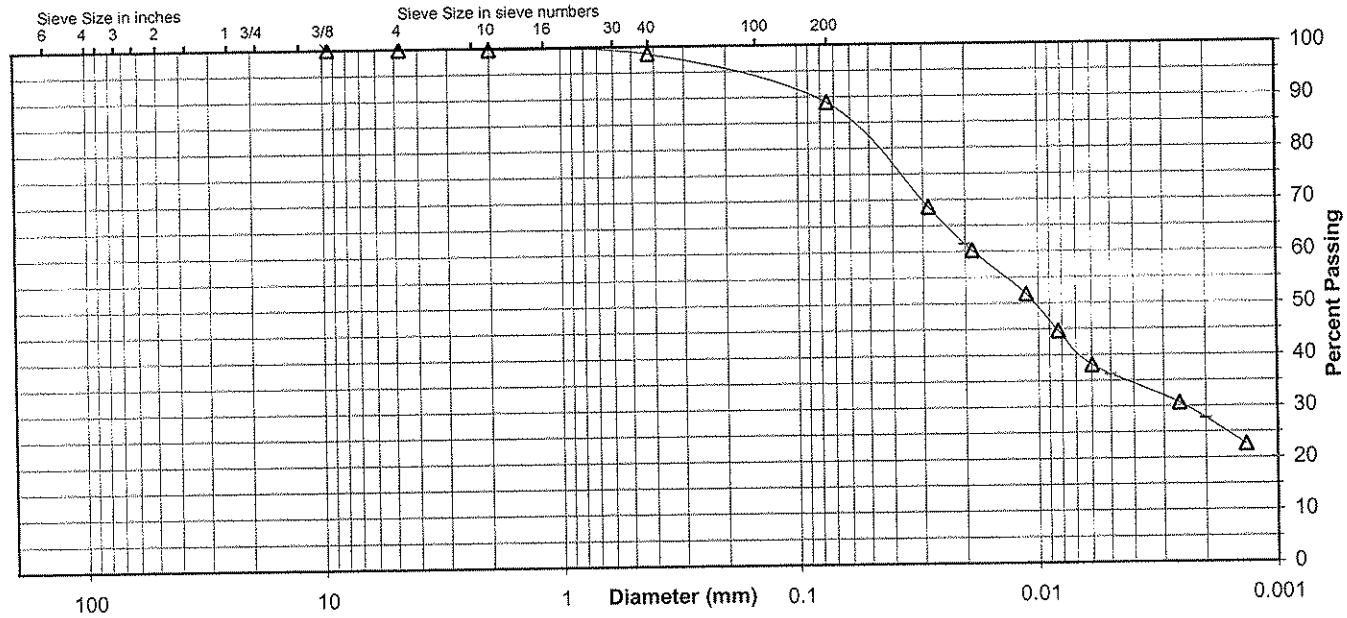
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	98.6
No. 200	88.9
0.02 mm	61.5
0.005 mm	36.2
0.002 mm	27.7
0.001 mm	20.0

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.1	0.2	1.1	9.7	52.7	36.2
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.3			1.1	9.7	61.2	27.7



Comments

Reviewed By

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-19, 27.0'-28.5', 28.5'-30.0', 30.0'-31.5'	Lab ID	1542
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-4-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	
No. 4	4.75	100.0
No. 10	2	99.5
No. 40	0.425	99.2
No. 200	0.075	77.8
	0.02	47.8
	0.005	31.1
	0.002	25.7
estimated	0.001	25.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.5
Coarse Sand	0.5	0.3
Medium Sand	0.3	---
Fine Sand	21.4	21.4
Silt	46.7	52.1
Clay	31.1	25.7

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	31
Plastic Limit:	18
Plasticity Index:	13
Activity Index:	0.50

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL

Group Name: Lean clay with sand

AASHTO Classification: A-6 (9)

Comments:

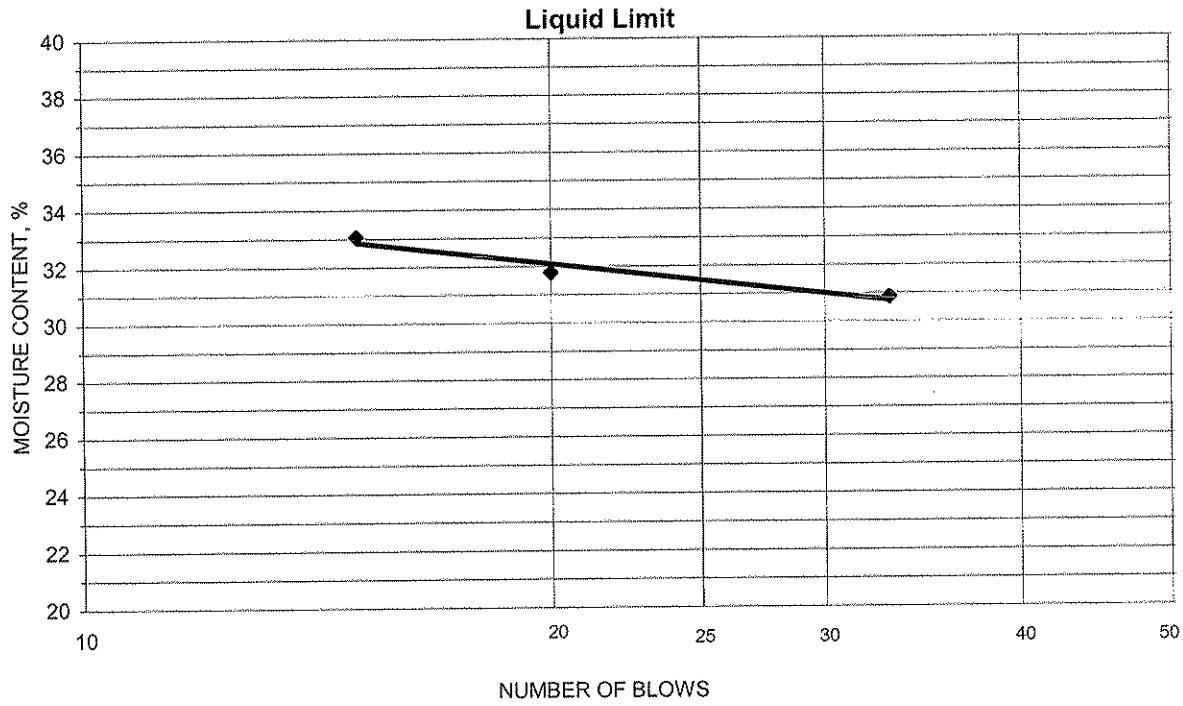
Reviewed by:

Stantec

ATTERBERG LIMITS

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Source	STN-19, 27.0'-28.5', 28.5'-30.0', 30.0'-31.5'	Lab ID	1542
		% + No. 40	1
Tested By	MC	Test Method	ASTM D 4318 Method A
Test Date	10-23-2009	Prepared	Dry
		Date Received	08-21-2009

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
19.06	17.19	11.13	33	30.9	31
18.85	16.89	10.72	20	31.8	
18.93	16.93	10.88	15	33.1	



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
18.61	17.47	11.26	18.4	18	13
18.49	17.35	11.15	18.4		

Remarks: _____

Reviewed By _____

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-19, 27.0'-28.5', 28.5'-30.0', 30.0'-31.5'

Project Number: 172679015
Lab ID: 1542

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Rounded
Particle Hardness: Hard and Durable

Tested By: CM
Test Date: 10-13-2009
Date Received: 08-21-2009

Maximum Particle size: No. 4 Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	
No. 4	100.0
No. 10	99.5

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

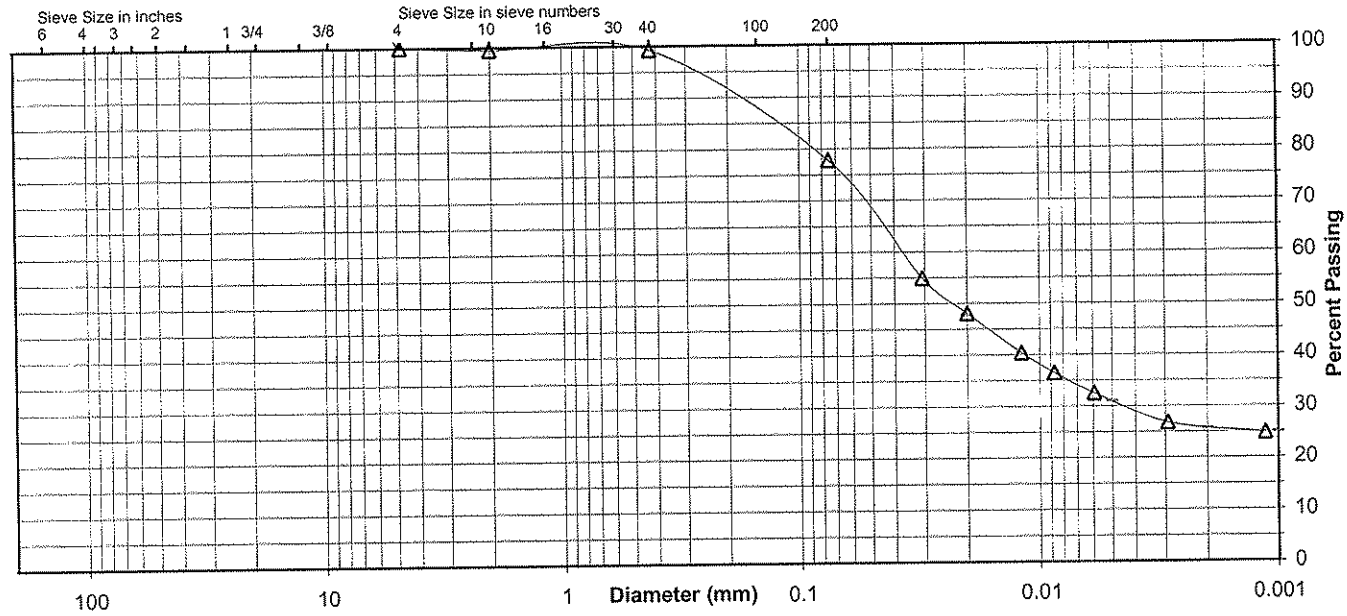
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	99.2
No. 200	77.8
0.02 mm	47.8
0.005 mm	31.1
0.002 mm	25.7
0.001 mm	25.0

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.0	0.5	0.3	21.4	46.7	31.1
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.5			0.3	21.4	52.1	25.7



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-21, 6.0'-7.5'

Project Number: 172679015
Lab ID: 1629

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: CM
Test Date: 10-12-2009
Date Received: 08-21-2009

Maximum Particle size: 3/4" Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	100.0
3/8"	98.8
No. 4	92.7
No. 10	85.4

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

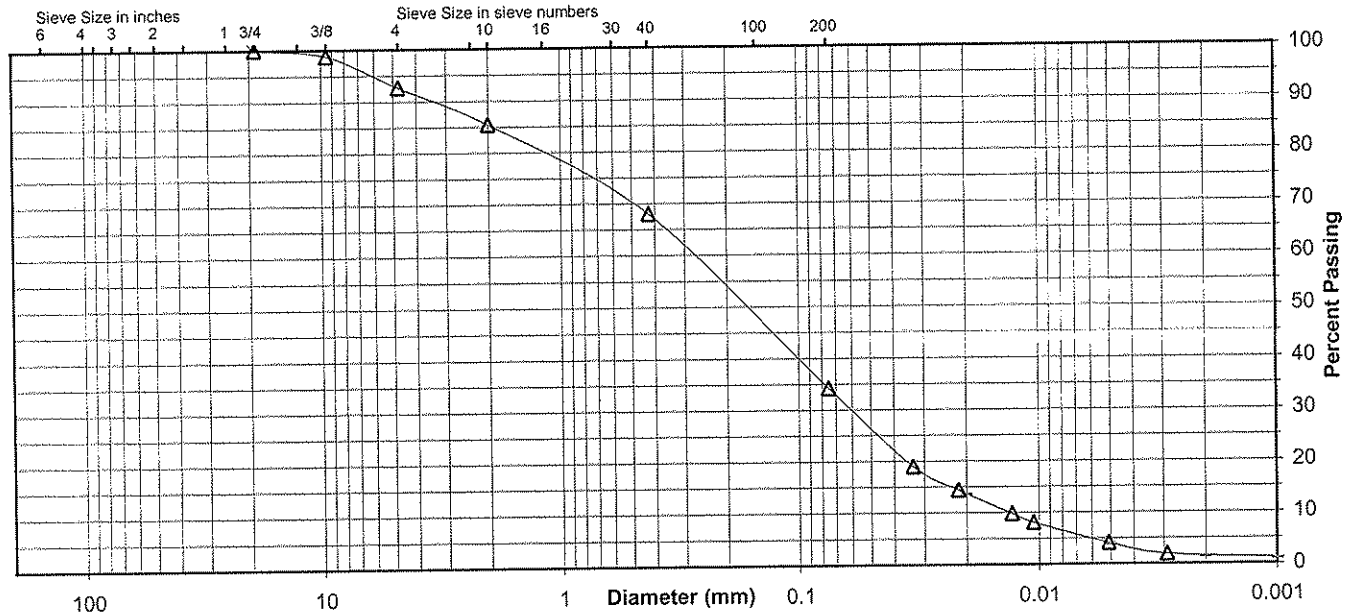
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	68.0
No. 200	34.2
0.02 mm	13.6
0.005 mm	3.8
0.002 mm	1.4
0.001 mm	1.0

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	7.3	7.3	17.4	33.8	30.4	3.8
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	14.6			17.4	33.8	32.8	1.4



Comments

Reviewed By

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-21, 19.5'-21.0', 21.0'-22.5', 22.5'-24.0'	Lab ID	1638
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-4-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Atterberg Limits

Test Method: ASTM D 4318 Method A

Prepared: Dry

Liquid Limit:	41
Plastic Limit:	21
Plasticity Index:	20
Activity Index:	0.57

Particle Size Analysis

Preparation Method: ASTM D 421

Gradation Method: ASTM D 422

Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	
No. 4	4.75	100.0
No. 10	2	100.0
No. 40	0.425	99.9
No. 200	0.075	93.9
	0.02	67.9
	0.005	44.7
	0.002	35.1
estimated	0.001	32.0

Plus 3 in. material, not included: 0 (%)

Range	ASTM (%)	AASHTO (%)
Gravel	0.0	0.0
Coarse Sand	0.0	0.1
Medium Sand	0.1	---
Fine Sand	6.0	6.0
Silt	49.2	58.8
Clay	44.7	35.1

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL

Group Name: Lean clay

AASHTO Classification: A-7-6 (20)

Comments:

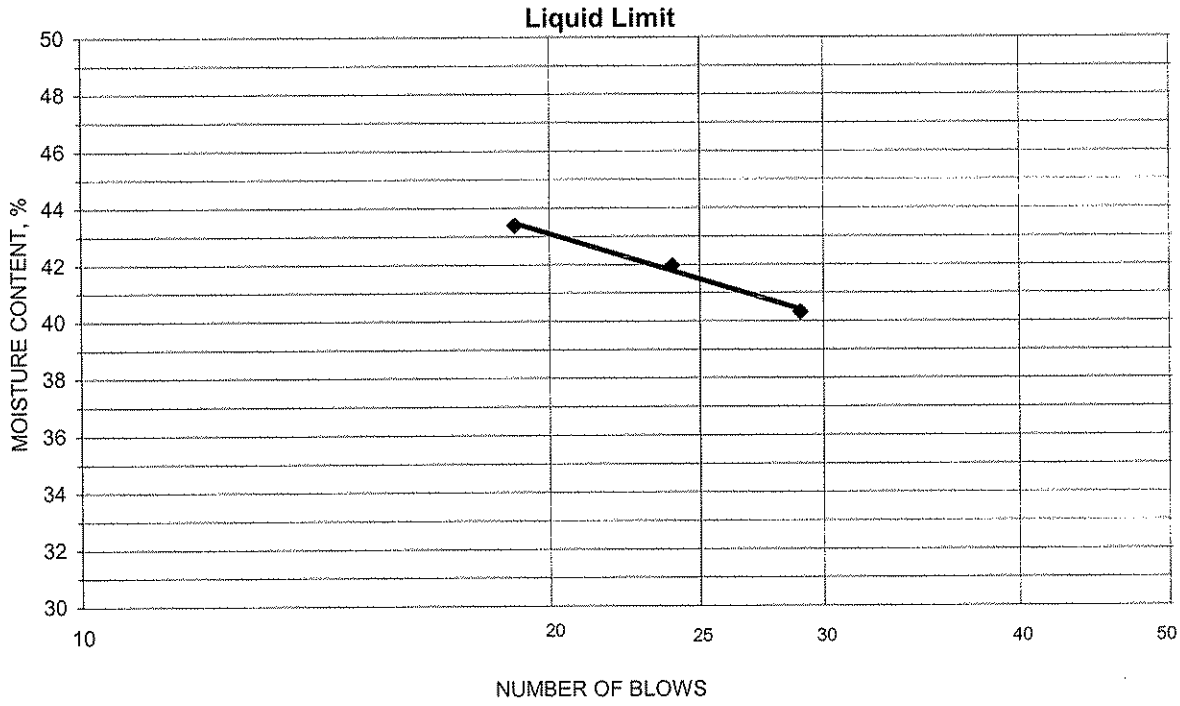
Reviewed by:

Stantec

ATTERBERG LIMITS

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Source	STN-21, 19.5'-21.0', 21.0'-22.5', 22.5'-24.0'	Lab ID	1638
		% + No. 40	0
Tested By	MC	Test Method	ASTM D 4318 Method A
Test Date	10-23-2009	Prepared	Dry
		Date Received	08-21-2009

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
19.99	17.64	11.81	29	40.3	
18.69	16.58	11.55	24	41.9	
18.84	16.61	11.47	19	43.4	41



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
18.82	17.52	11.45	21.4	21	20
18.81	17.55	11.44	20.6		

Remarks: _____

Reviewed By _____

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-21, 19.5'-21.0', 21.0'-22.5', 22.5'-24.0'

Project Number: 172679015
Lab ID: 1638

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Rounded
Particle Hardness: Hard and Durable

Tested By: AP
Test Date: 10-08-2009
Date Received: 08-21-2009

Maximum Particle size: No. 4 Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	
No. 4	100.0
No. 10	100.0

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

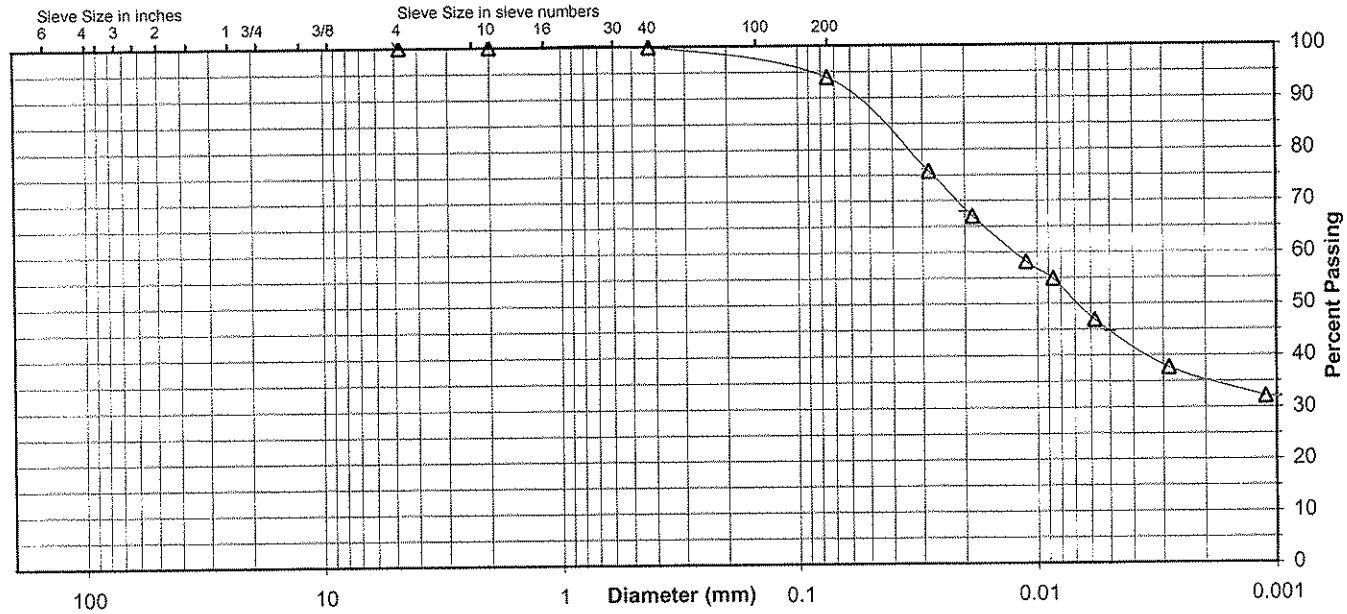
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	99.9
No. 200	93.9
0.02 mm	67.9
0.005 mm	44.7
0.002 mm	35.1
0.001 mm	32.0

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	0.0	0.0	0.1	6.0	49.2	44.7
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.0			0.1	6.0	58.8	35.1



Comments

Reviewed By

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-22, 16.5'-18.0', 18.0'-19.5', 19.5'-21.0'	Lab ID	1668
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-4-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	100.0
3/4"	19	96.0
3/8"	9.5	96.0
No. 4	4.75	95.9
No. 10	2	95.6
No. 40	0.425	95.3
No. 200	0.075	76.4
	0.02	45.8
	0.005	30.0
	0.002	23.8
estimated	0.001	19.5

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	4.1	4.4
Coarse Sand	0.3	0.3
Medium Sand	0.3	---
Fine Sand	18.9	18.9
Silt	46.4	52.6
Clay	30.0	23.8

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	30
Plastic Limit:	17
Plasticity Index:	13
Activity Index:	0.54

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL

Group Name: Lean clay with sand

AASHTO Classification: A-6 (8)

Comments:

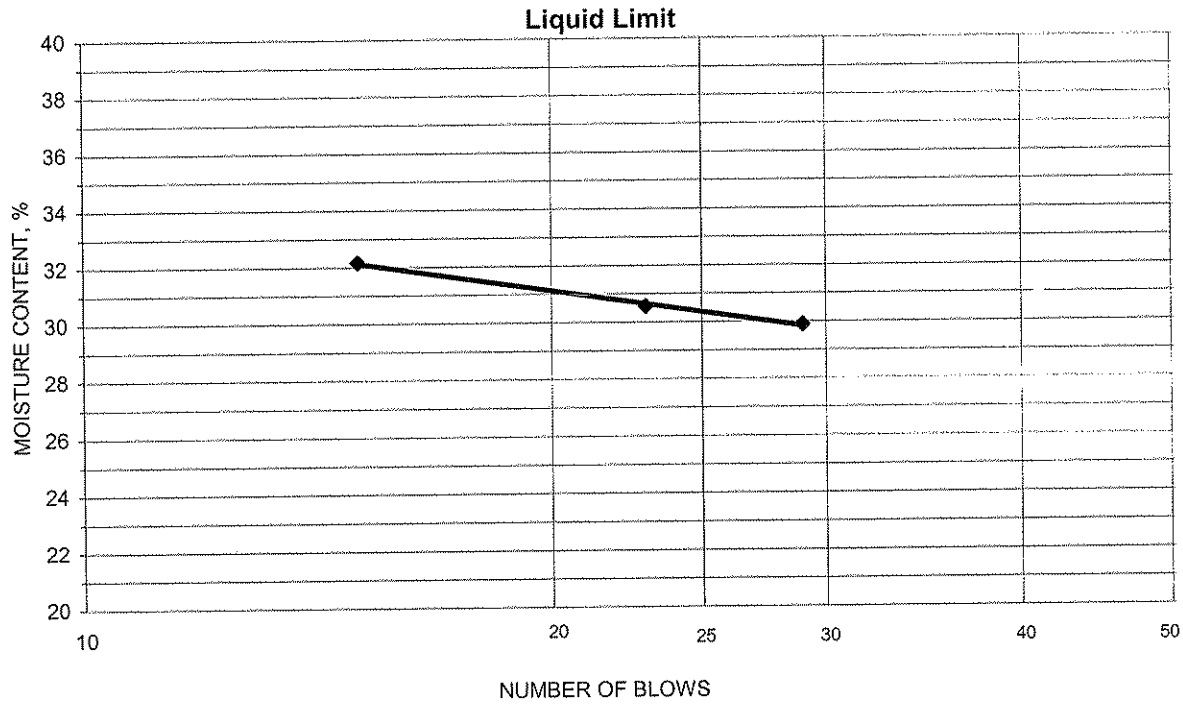
Reviewed by:

Stantec

ATTERBERG LIMITS

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Source	STN-22, 16.5'-18.0', 18.0'-19.5', 19.5'-21.0'	Lab ID	1668
		% + No. 40	5
Tested By	MC	Test Method	ASTM D 4318 Method A
Test Date	10-12-2009	Prepared	Dry
		Date Received	08-21-2009

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
19.39	17.45	10.96	29	29.9	30
18.28	16.52	10.76	23	30.6	
19.59	17.51	11.04	15	32.1	



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
19.04	17.91	11.26	17.0	17	13
18.79	17.65	11.01	17.2		

Remarks: _____

Reviewed By _____

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-22, 16.5'-18.0', 18.0'-19.5', 19.5'-21.0'

Project Number: 172679015
Lab ID: 1668

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Rounded
Particle Hardness: Hard and Durable

Tested By: AP
Test Date: 10-08-2009
Date Received: 08-21-2009

Maximum Particle size: 1" Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	100.0
3/4"	96.0
3/8"	96.0
No. 4	95.9
No. 10	95.6

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

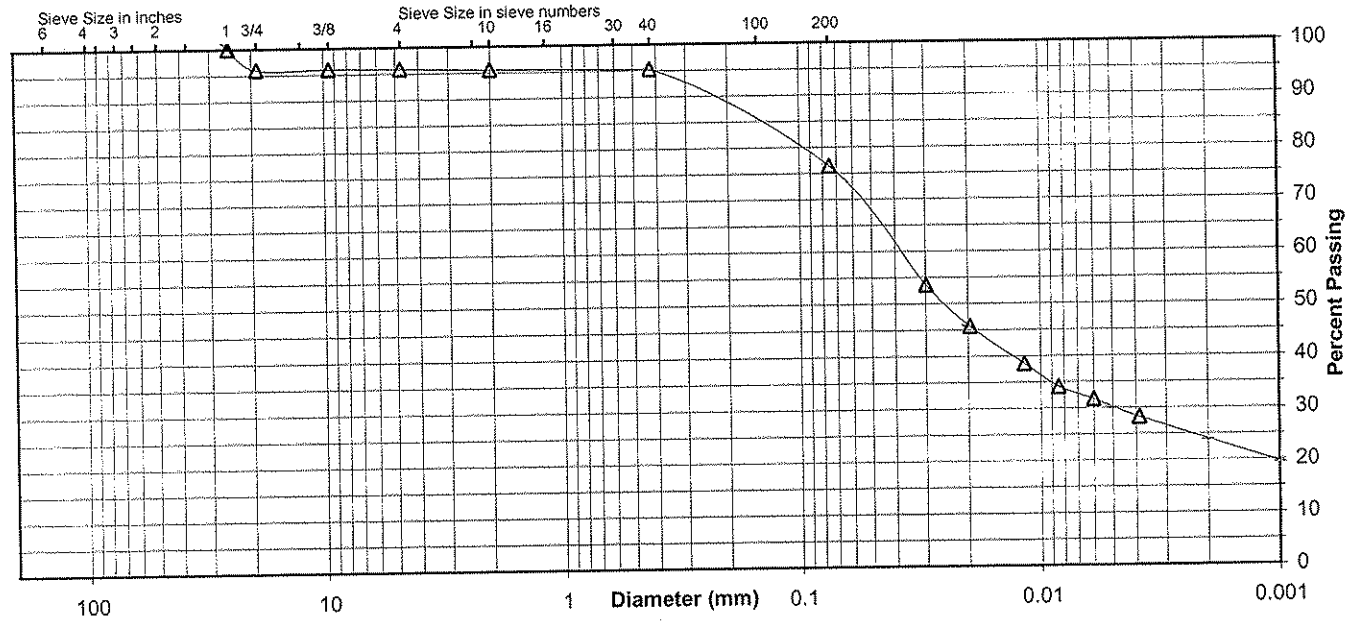
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	95.3
No. 200	76.4
0.02 mm	45.8
0.005 mm	30.0
0.002 mm	23.8
0.001 mm	19.5

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	4.0	0.1	0.3	0.3	18.9	46.4	30.0
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	4.4			0.3	18.9	52.6	23.8



Comments

Reviewed By

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-23, 3.0'-4.5', 4.5'-6.0', 6.0'-7.5'	Lab ID	1683
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-4-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	100.0
3/4"	19	95.2
3/8"	9.5	90.5
No. 4	4.75	86.3
No. 10	2	78.0
No. 40	0.425	72.3
No. 200	0.075	65.7
	0.02	58.2
	0.005	46.0
	0.002	39.4
estimated	0.001	37.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	13.7	22.0
Coarse Sand	8.3	5.7
Medium Sand	5.7	---
Fine Sand	6.6	6.6
Silt	19.7	26.3
Clay	46.0	39.4

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	57
Plastic Limit:	23
Plasticity Index:	34
Activity Index:	0.87

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CH
Group Name: Sandy fat clay

AASHTO Classification: A-7-6 (21)

Comments:

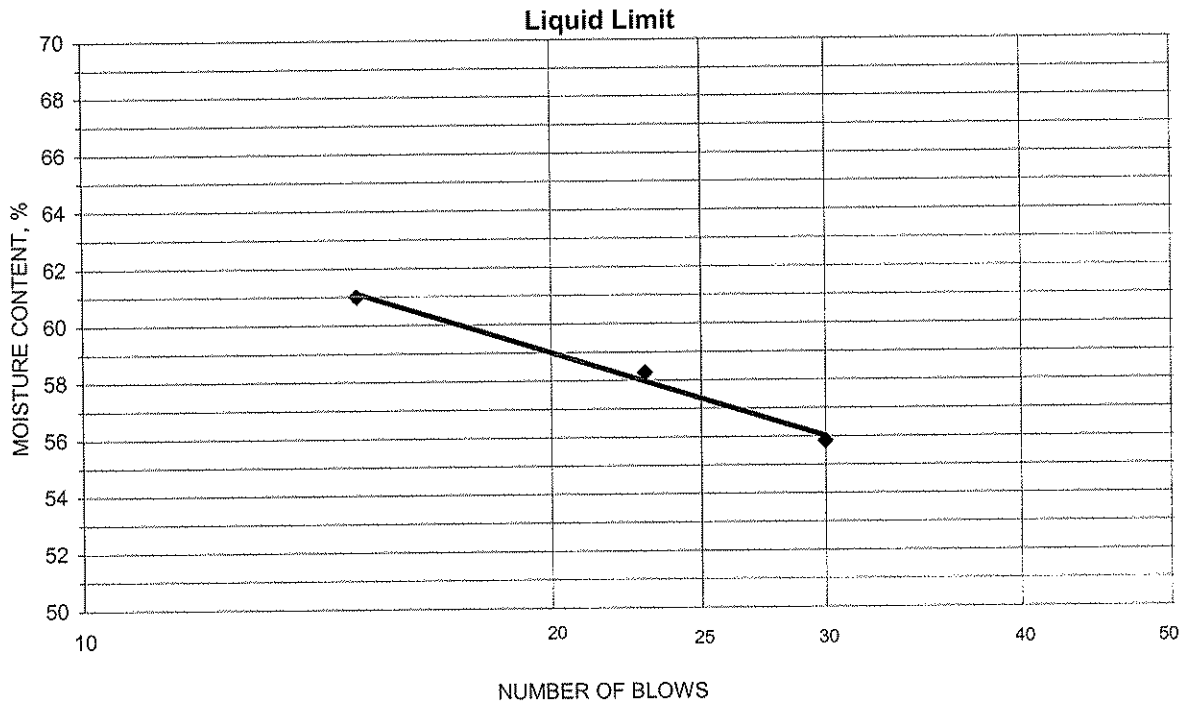
Reviewed by:

Stantec

ATTERBERG LIMITS

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Source	STN-23, 3.0'-4.5', 4.5'-6.0', 6.0'-7.5'	Lab ID	1683
		% + No. 40	28
Tested By	MC	Test Method	ASTM D 4318 Method A
Test Date	10-23-2009	Prepared	Dry
		Date Received	08-21-2009

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
18.38	15.84	11.29	30	55.8	57
18.37	15.76	11.28	23	58.3	
18.67	15.84	11.20	15	61.0	



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
18.54	17.17	11.28	23.3	23	34
18.50	17.13	11.23	23.2		

Remarks: _____

Reviewed By _____

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-23, 3.0'-4.5', 4.5'-6.0', 6.0'-7.5'

Project Number: 172679015
Lab ID: 1683

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Angular
Particle Hardness: Soft

Tested By: JF
Test Date: 09-30-2009
Date Received: 08-21-2009

Maximum Particle size: 1" Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	100.0
3/4"	95.2
3/8"	90.5
No. 4	86.3
No. 10	78.0

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

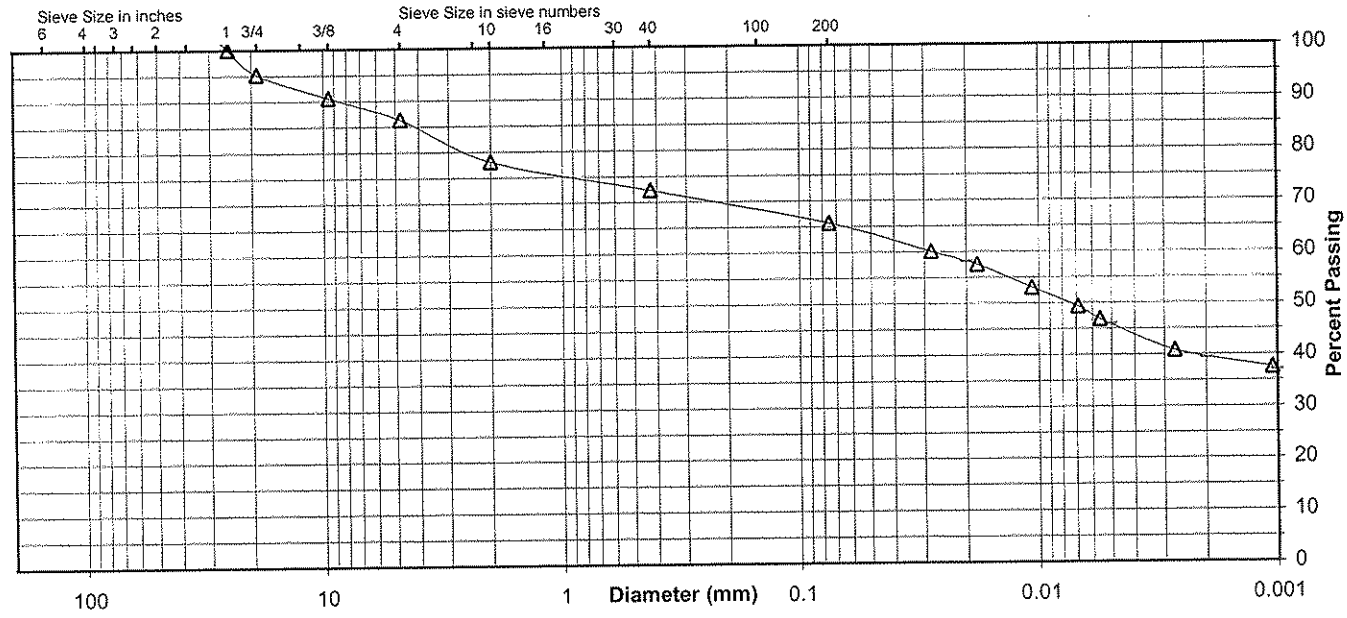
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	72.3
No. 200	65.7
0.02 mm	58.2
0.005 mm	46.0
0.002 mm	39.4
0.001 mm	37.0

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	4.8	8.9	8.3	5.7	6.6	19.7	46.0
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	22.0			5.7	6.6	26.3	39.4



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-23, 33.0'-34.5', 34.5'-36.0', 36.0'-37.5'

Project Number: 172679015
Lab ID: 1704

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Rounded
Particle Hardness: Hard and Durable

Tested By: AP
Test Date: 10-08-2009
Date Received: 08-21-2009

Maximum Particle size: 3/8" Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	100.0
No. 4	99.9
No. 10	99.9

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

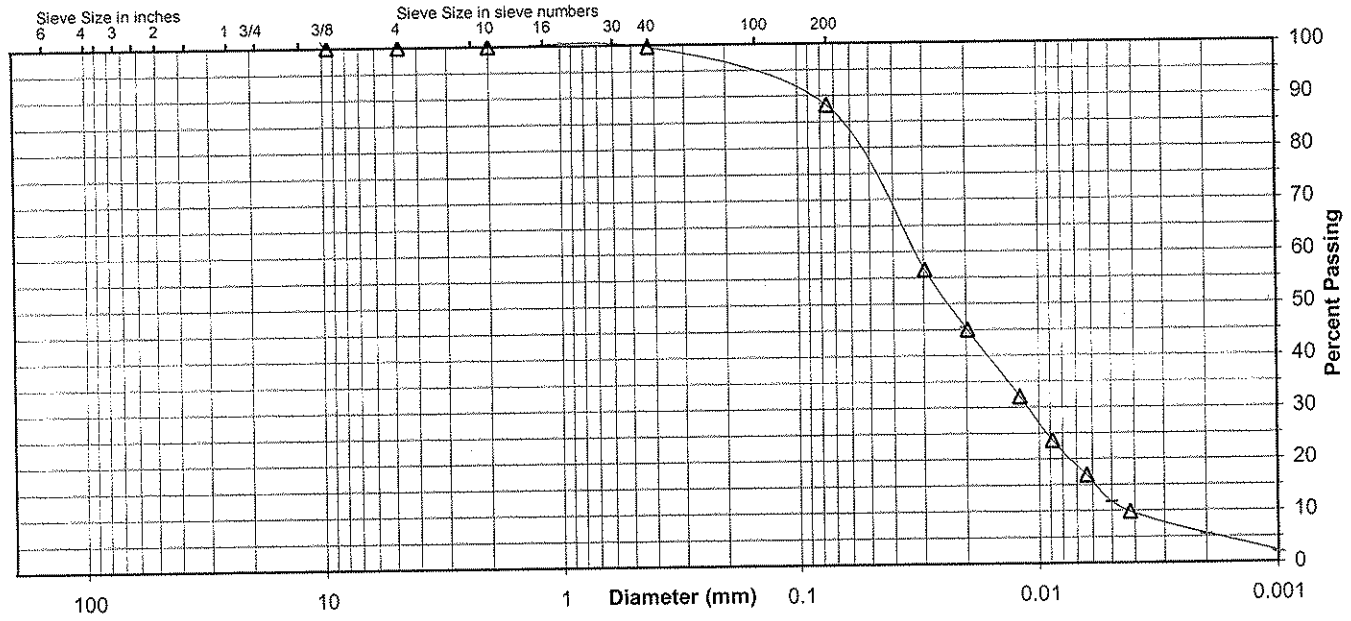
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	99.7
No. 200	88.2
0.02 mm	45.4
0.005 mm	11.7
0.002 mm	5.4
0.001 mm	2.0

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	0.1	0.0	0.2	11.5	76.5	11.7
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.1			0.2	11.5	82.8	5.4



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-23, 48.0'-49.5', 49.5'-51.0', 51.0'-52.5'

Project Number: 172679015
Lab ID: 1715

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: JF
Test Date: 10-01-2009
Date Received 08-21-2009

Maximum Particle size: 3/8" Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	100.0
No. 4	99.9
No. 10	99.8

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

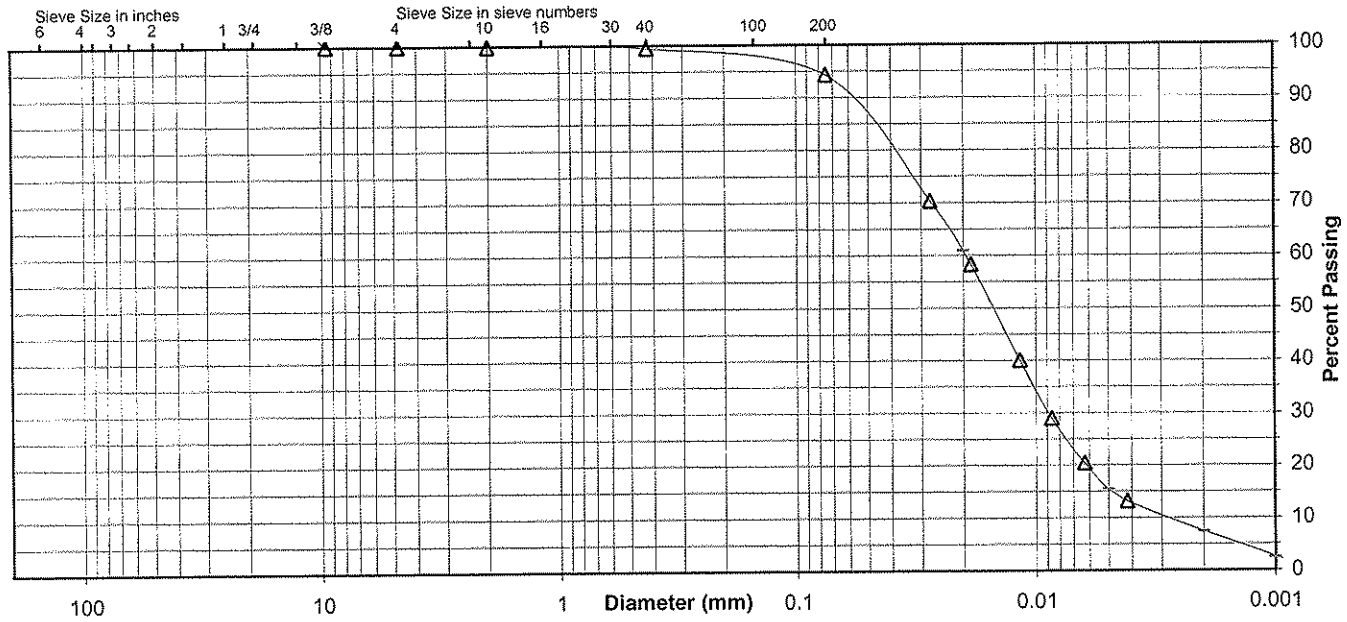
Specific Gravity 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	99.5
No. 200	94.3
0.02 mm	60.9
0.005 mm	15.5
0.002 mm	7.4
0.001 mm	2.5

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.1	0.1	0.3	5.2	78.8	15.5
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.2			0.3	5.2	86.9	7.4



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-24, 15.0'-16.5', 16.5'-18.0'

Project Number: 172679015
Lab ID: 1741

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Need! Input-Sieve
Particle Hardness: Need! Input-Sieve

Tested By: CM
Test Date: 10-09-2009
Date Received 08-21-2009

Maximum Particle size: 3/4" Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	100.0
3/8"	96.3
No. 4	91.5
No. 10	76.8

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

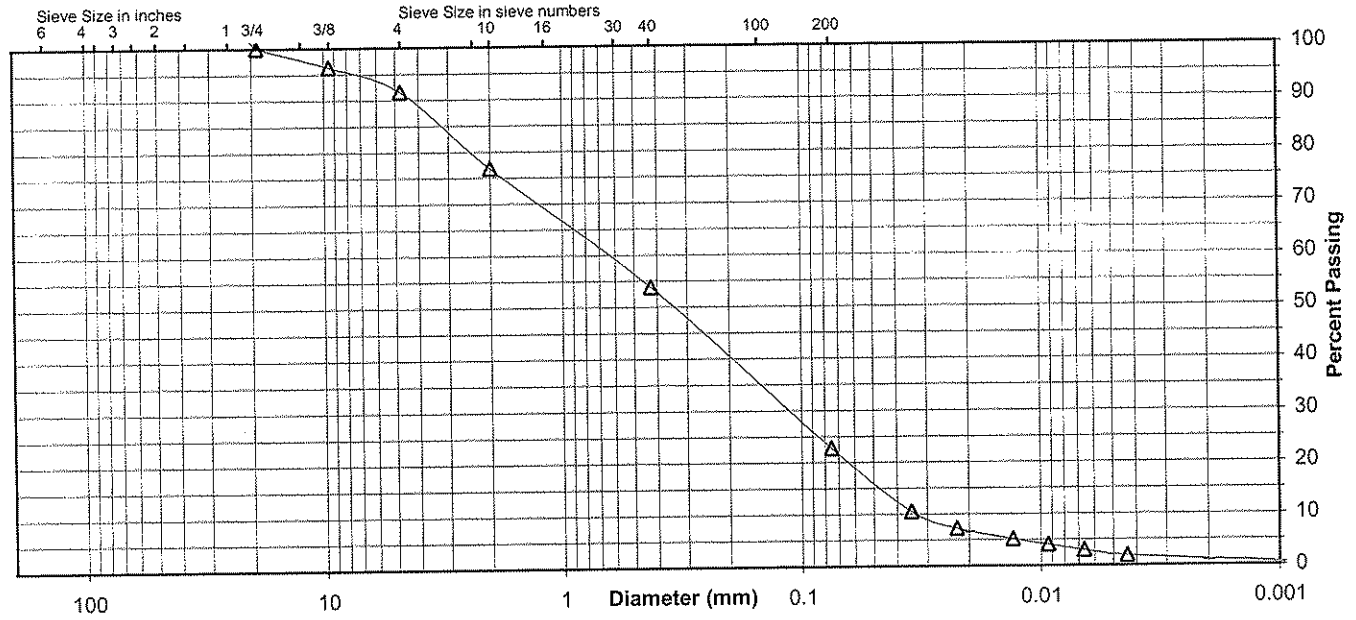
Specific Gravity 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	53.8
No. 200	22.7
0.02 mm	6.6
0.005 mm	2.1
0.002 mm	1.0
0.001 mm	0.5

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	8.5	14.7	23.0	31.1	20.6	2.1
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	23.2			23.0	31.1	21.7	1.0



Comments

Reviewed By

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-24, 24.0'-25.5', 25.5'-27.0', 27.0'-28.5'	Lab ID	1748
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-4-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Atterberg Limits

Test Method: ASTM D 4318 Method A

Prepared: Dry

Liquid Limit:	32
Plastic Limit:	17
Plasticity Index:	15
Activity Index:	0.54

Particle Size Analysis

Preparation Method: ASTM D 421

Gradation Method: ASTM D 422

Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	
No. 4	4.75	100.0
No. 10	2	99.7
No. 40	0.425	98.7
No. 200	0.075	79.0
	0.02	49.8
	0.005	34.1
	0.002	28.1
estimated	0.001	25.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.3
Coarse Sand	0.3	1.0
Medium Sand	1.0	---
Fine Sand	19.7	19.7
Silt	44.9	50.9
Clay	34.1	28.1

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL

Group Name: Lean clay with sand

AASHTO Classification: A-6 (10)

Comments:

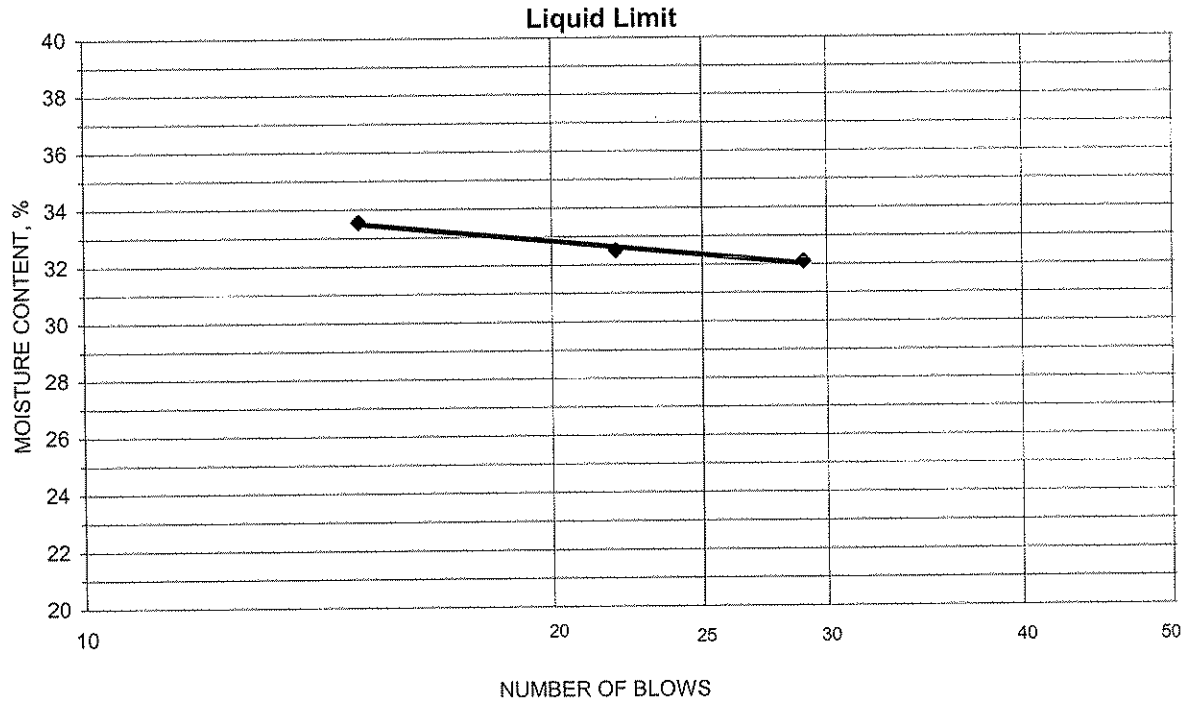
Reviewed by:

Stantec

ATTERBERG LIMITS

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Source	STN-24, 24.0'-25.5', 25.5'-27.0', 27.0'-28.5'	Lab ID	1748
		% + No. 40	1
Tested By	MC	Test Method	ASTM D 4318 Method A
Test Date	10-23-2009	Prepared	Dry
		Date Received	08-21-2009

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
18.92	17.04	11.18	29	32.1	
18.43	16.60	10.97	22	32.5	
19.94	17.74	11.18	15	33.5	32



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
18.55	17.46	11.06	17.0	17	15
18.63	17.54	11.20	17.2		

Remarks: _____

Reviewed By _____

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-24, 24.0'-25.5', 25.5'-27.0', 27.0'-28.5'

Project Number: 172679015
Lab ID: 1748

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: CM
Test Date: 10-08-2009
Date Received: 08-21-2009

Maximum Particle size: No. 4 Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	
No. 4	100.0
No. 10	99.7

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

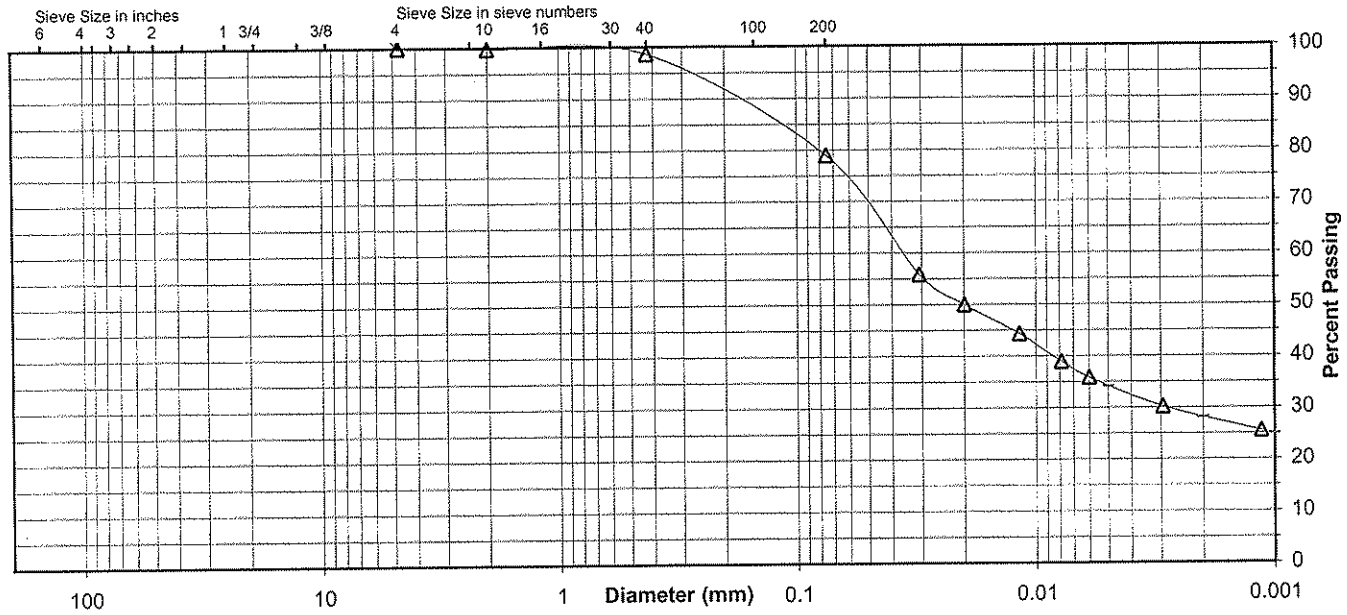
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	98.7
No. 200	79.0
0.02 mm	49.8
0.005 mm	34.1
0.002 mm	28.1
0.001 mm	25.0

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.0	0.3	1.0	19.7	44.9	34.1
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.3			1.0	19.7	50.9	28.1



Comments

Reviewed By

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-25, 25.5'-27.0', 27.0'-28.5', 28.5'-30.0'	Lab ID	1781
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-4-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	
No. 4	4.75	100.0
No. 10	2	100.0
No. 40	0.425	99.6
No. 200	0.075	96.2
	0.02	69.6
	0.005	21.8
	0.002	9.9
estimated	0.001	2.8

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.0
Coarse Sand	0.0	0.4
Medium Sand	0.4	---
Fine Sand	3.4	3.4
Silt	74.4	86.3
Clay	21.8	9.9

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit: ---
Plastic Limit: Non Plastic
Plasticity Index: ---
Activity Index: N/A

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Estimated

Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.70

Classification

Unified Group Symbol: ML
Group Name: Silt

AASHTO Classification: A-4 (0)

Comments:

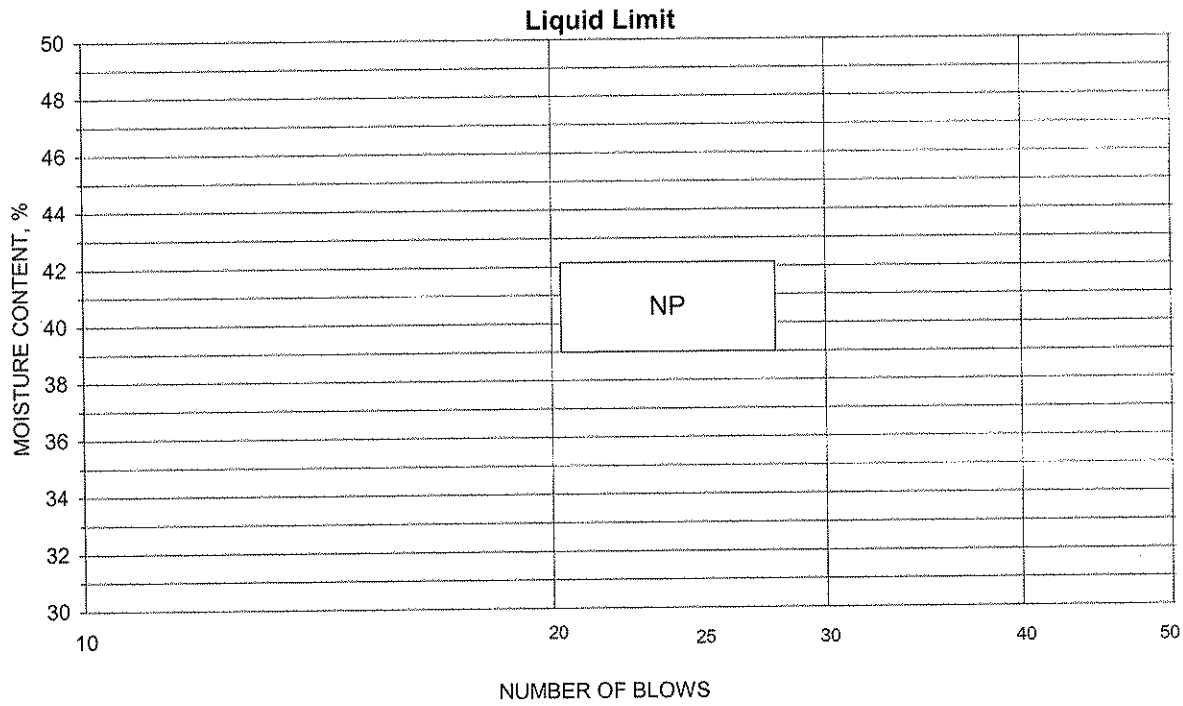
Reviewed by:

Stantec

ATTERBERG LIMITS

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Source	STN-25, 25.5'-27.0', 27.0'-28.5', 28.5'-30.0'	Lab ID	1781
		% + No. 40	0
Tested By	MC	Test Method	ASTM D 4318 Method A
Test Date	10-22-2009	Prepared	Dry
		Date Received	08-21-2009

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index

Remarks: _____

Reviewed By _____

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-25, 25.5'-27.0', 27.0'-28.5', 28.5'-30.0'

Project Number: 172679015
Lab ID: 1781

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Rounded
Particle Hardness: Hard and Durable

Tested By: AP
Test Date: 10-08-2009
Date Received: 08-21-2009

Maximum Particle size: No. 4 Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	
No. 4	100.0
No. 10	100.0

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

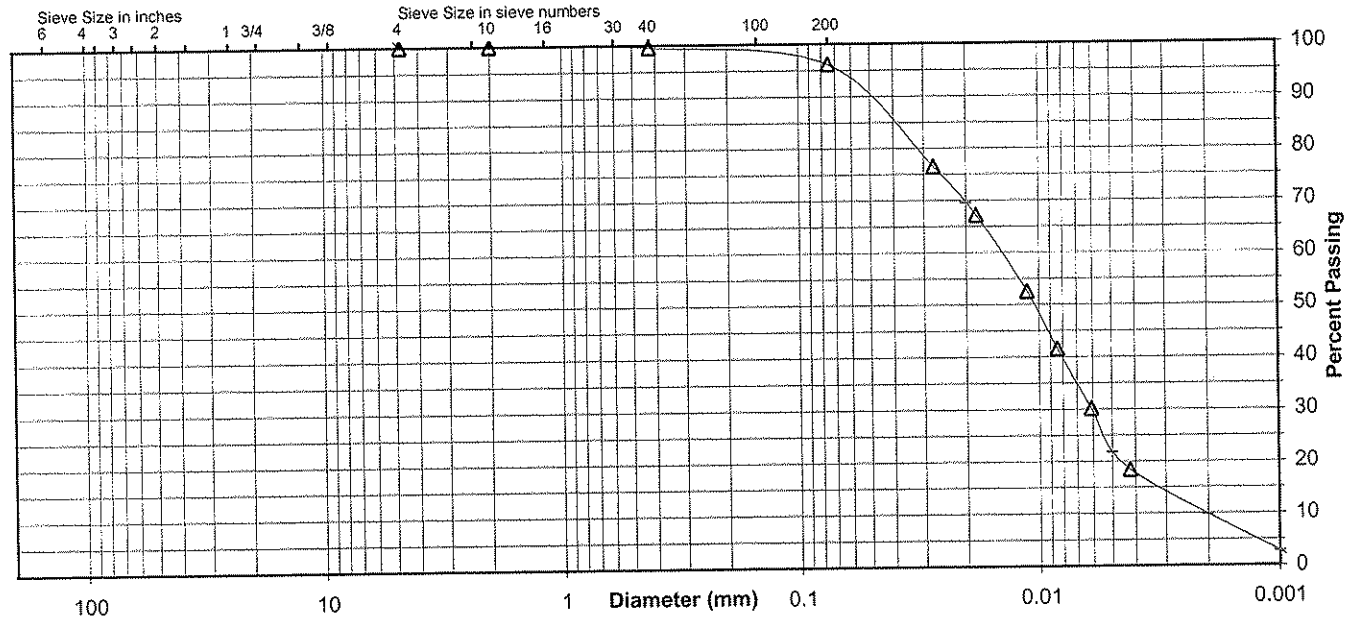
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	99.6
No. 200	96.2
0.02 mm	69.6
0.005 mm	21.8
0.002 mm	9.9
0.001 mm	2.8

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	0.0	0.0	0.4	3.4	74.4	21.8
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.0			0.4	3.4	86.3	9.9



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-26, 9.0'-10.5', 10.5'-12.0'

Project Number: 172679015
Lab ID: 1811

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: bwt
Test Date: 09-24-2009
Date Received: 08-21-2009

Maximum Particle size: 3/4" Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	100.0
3/8"	95.4
No. 4	88.8
No. 10	76.6

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

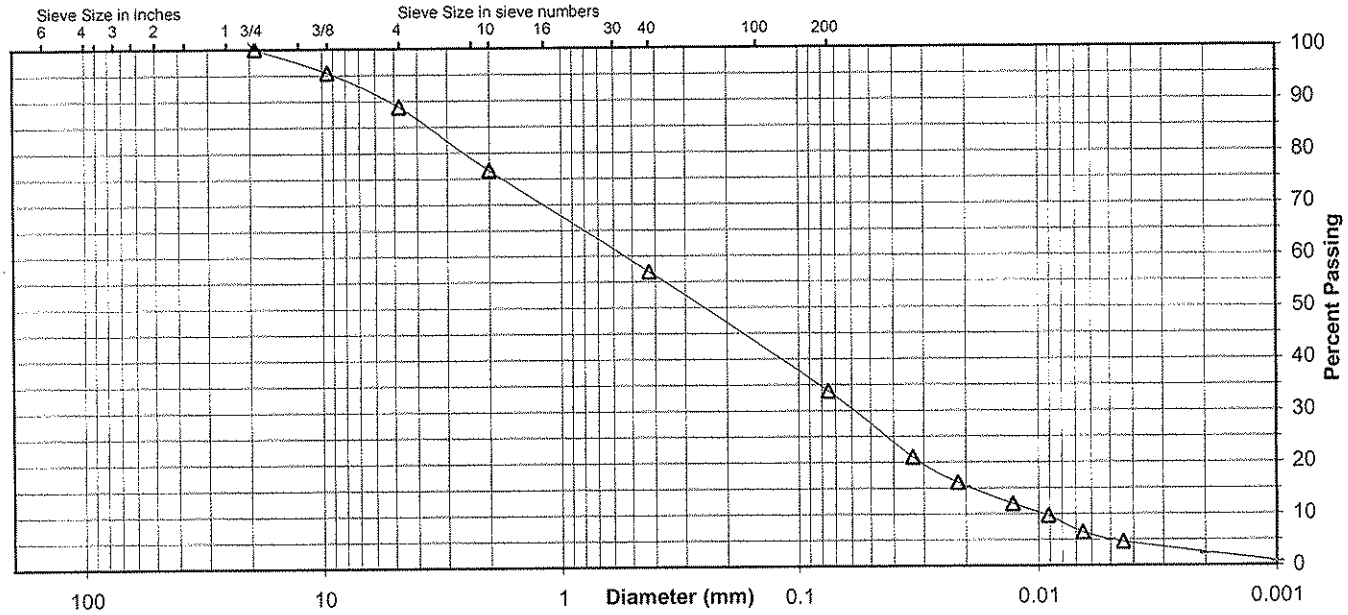
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	56.9
No. 200	33.8
0.02 mm	15.3
0.005 mm	5.0
0.002 mm	2.3
0.001 mm	0.8

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	11.2	12.2	19.7	23.1	28.8	5.0
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	23.4			19.7	23.1	31.5	2.3



Comments

Reviewed By

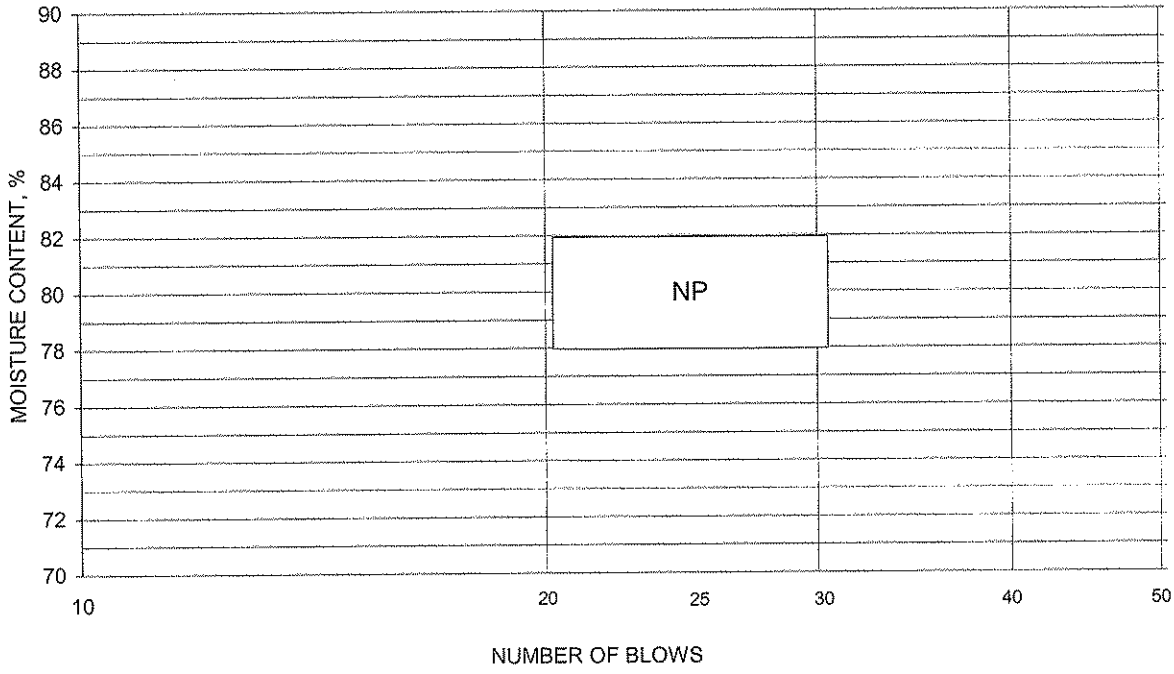
Stantec

ATTERBERG LIMITS

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Source	STN-26, 16.5'-18.0'	Lab ID	1817
Tested By	MC	Test Method	ASTM D 4318 Method A
% + No. 40	20		
Test Date	10-22-2009	Prepared	Dry
Date Received	08-21-2009		

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit

Liquid Limit



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index

Remarks: _____

Reviewed By _____

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-26, 30.0'-31.5', 31.5'-33.0', 33.0'-34.5'	Lab ID	1827
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-4-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	
No. 4	4.75	100.0
No. 10	2	99.2
No. 40	0.425	93.1
No. 200	0.075	80.6
	0.02	52.0
	0.005	31.7
	0.002	24.1
estimated	0.001	19.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.8
Coarse Sand	0.8	6.1
Medium Sand	6.1	---
Fine Sand	12.5	12.5
Silt	48.9	56.5
Clay	31.7	24.1

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	31
Plastic Limit:	18
Plasticity Index:	13
Activity Index:	0.54

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL

Group Name: Lean clay with sand

AASHTO Classification: A-6 (9)

Comments:

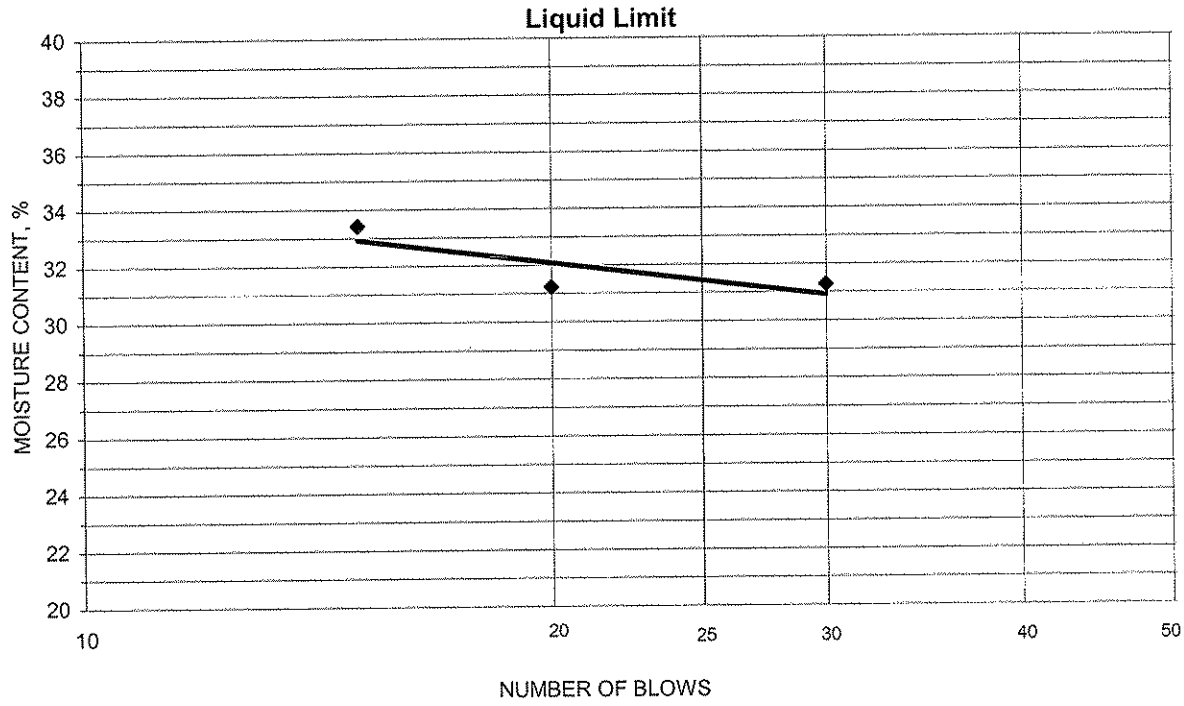
Reviewed by:

Stantec

ATTERBERG LIMITS

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Source	STN-26, 30.0'-31.5', 31.5'-33.0', 33.0'-34.5'	Lab ID	1827
		% + No. 40	7
Tested By	CSM	Test Method	ASTM D 4318 Method A
Test Date	09-29-2009	Prepared	Dry
		Date Received	08-21-2009

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
24.39	21.29	11.36	20	31.2	31
21.97	19.17	10.79	15	33.4	
20.57	18.36	11.29	30	31.3	



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
19.86	18.55	11.26	18.0	18	13
19.52	18.27	11.24	17.8		

Remarks: _____

Reviewed By _____

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-26, 30.0'-31.5', 31.5'-33.0', 33.0'-34.5'

Project Number: 172679015
Lab ID: 1827

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: JF
Test Date: 09-28-2009
Date Received: 08-21-2009

Maximum Particle size: No. 4 Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	
No. 4	100.0
No. 10	99.2

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

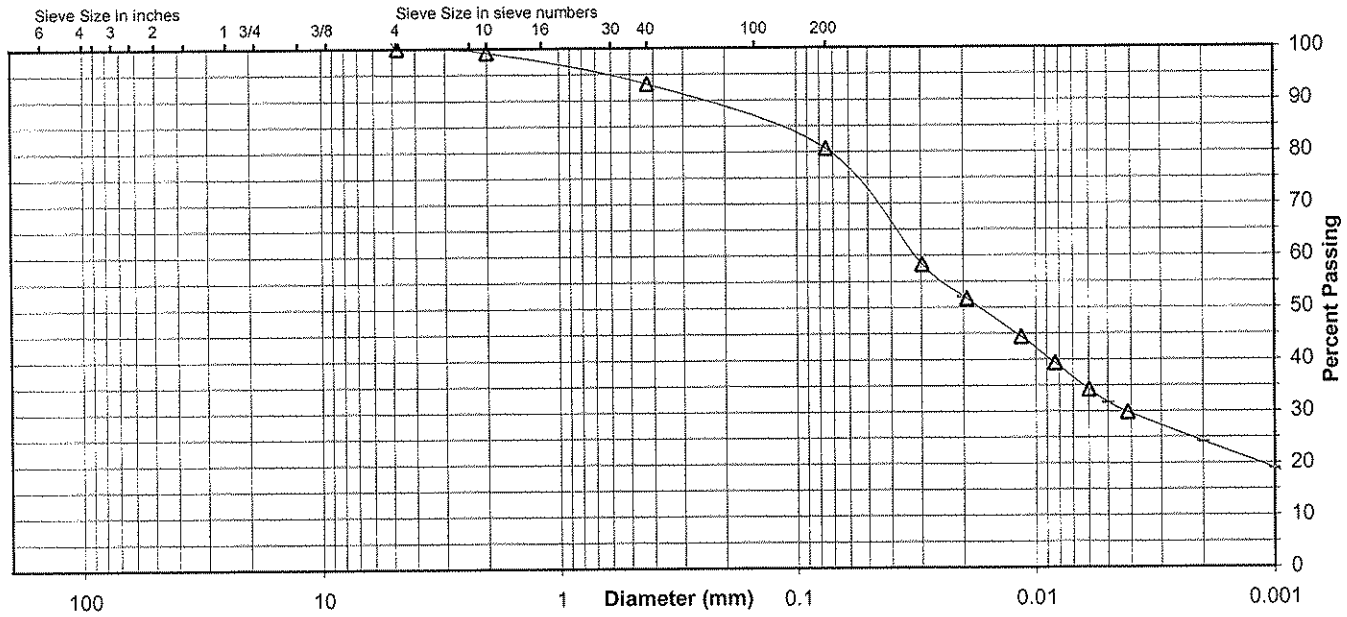
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	93.1
No. 200	80.6
0.02 mm	52.0
0.005 mm	31.7
0.002 mm	24.1
0.001 mm	19.0

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.0	0.8	6.1	12.5	48.9	31.7
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.8			6.1	12.5	56.5	24.1



Comments

Reviewed By

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-26, 48.0'-49.5', 49.5'-51.0'	Lab ID	1840
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-4-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	100.0
No. 4	4.75	99.7
No. 10	2	99.7
No. 40	0.425	99.4
No. 200	0.075	53.4
	0.02	29.4
	0.005	17.7
	0.002	14.0
estimated	0.001	11.0

Plus 3 in. material, not included: 0 (%)

Range	ASTM (%)	AASHTO (%)
Gravel	0.3	0.3
Coarse Sand	0.0	0.3
Medium Sand	0.3	---
Fine Sand	46.0	46.0
Silt	35.7	39.4
Clay	17.7	14.0

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit: 22
Plastic Limit: 18
Plasticity Index: 4
Activity Index: 0.29

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Estimated

Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.70

Classification

Unified Group Symbol: CL-ML
Group Name: Sandy silty clay

AASHTO Classification: A-4 (0)

Comments:

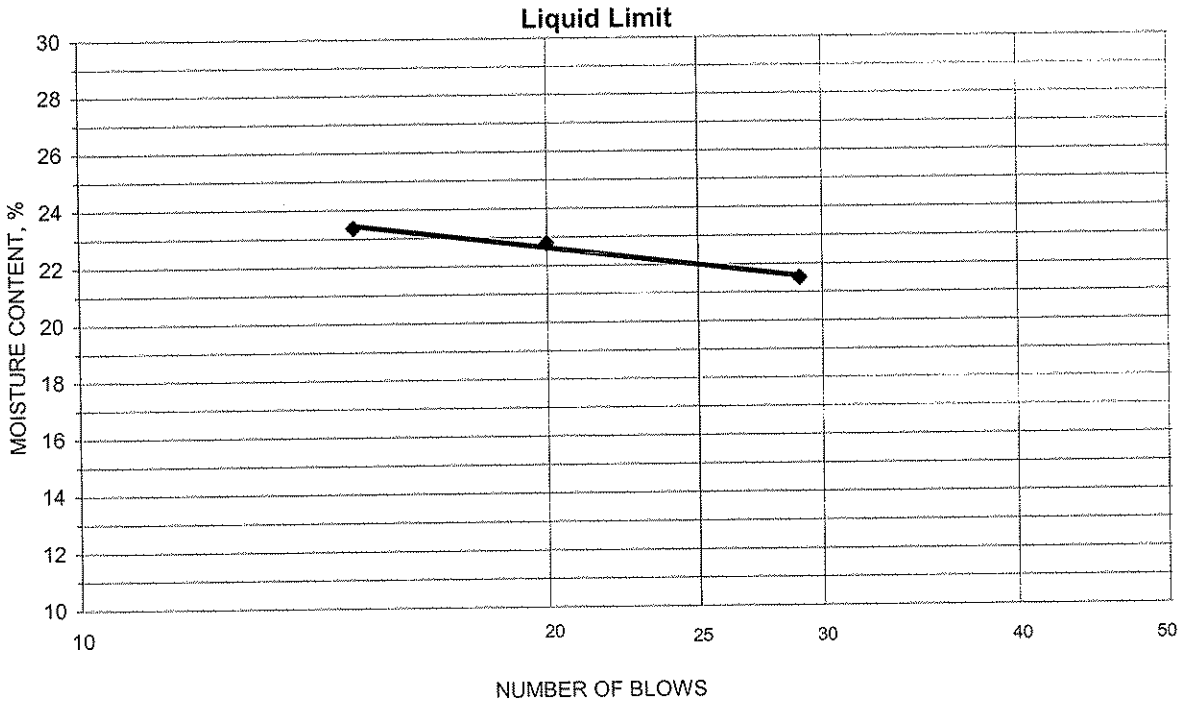
Reviewed by:

Stantec

ATTERBERG LIMITS

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Source	STN-26, 48.0'-49.5', 49.5'-51.0'	Lab ID	1840
		% + No. 40	1
Tested By	MC	Test Method	ASTM D 4318 Method A
Test Date	10-22-2009	Prepared	Dry
		Date Received	08-21-2009

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
21.39	19.50	11.41	15	23.4	22
20.86	19.12	11.48	20	22.8	
22.79	20.78	11.43	29	21.5	



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
18.89	17.77	11.40	17.6	18	4
18.96	17.84	11.44	17.5		

Remarks: _____

Reviewed By _____

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-26, 48.0'-49.5', 49.5'-51.0'

Project Number: 172679015
Lab ID: 1840

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Angular
Particle Hardness: Soft

Tested By: JF
Test Date: 09-29-2009
Date Received: 08-21-2009

Maximum Particle size: 3/8" Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	100.0
No. 4	99.7
No. 10	99.7

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

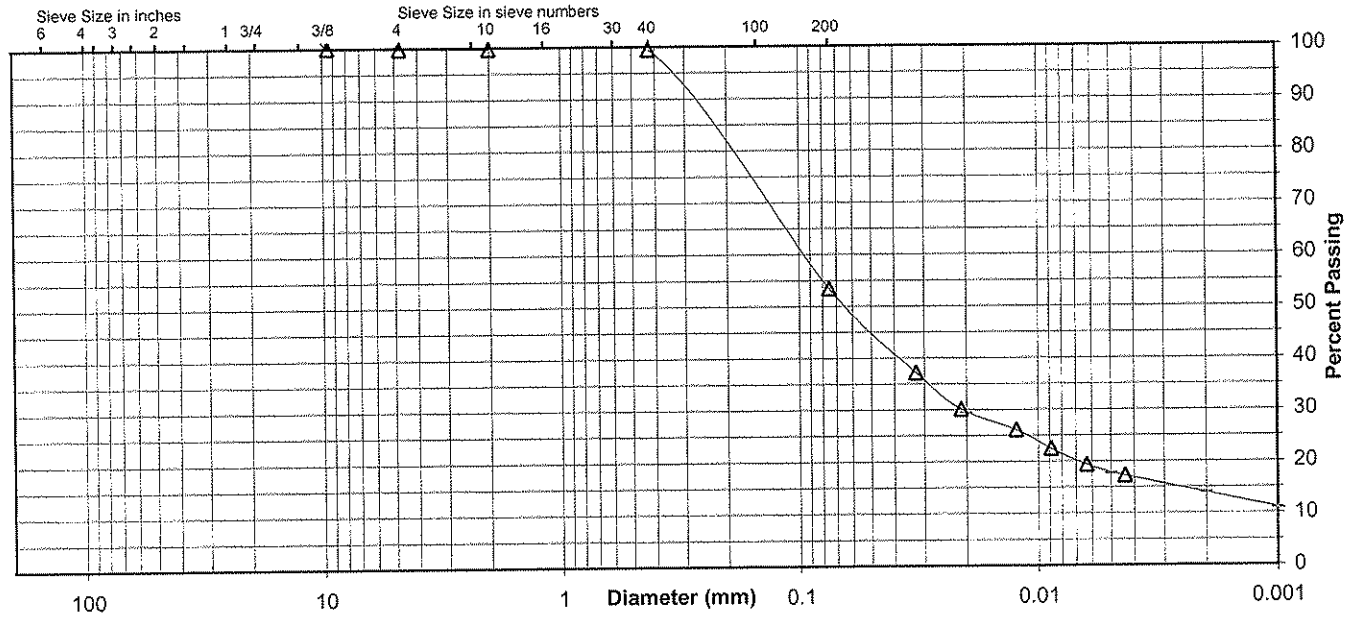
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	99.4
No. 200	53.4
0.02 mm	29.4
0.005 mm	17.7
0.002 mm	14.0
0.001 mm	11.0

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.3	0.0	0.3	46.0	35.7	17.7
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.3			0.3	46.0	39.4	14.0



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-27, 37.5'-39.0', 39.0'-40.5'

Project Number: 172679015
Lab ID: 1871

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Rounded
Particle Hardness: Hard and Durable

Tested By: JF
Test Date: 10-26-2009
Date Received: 08-21-2009

Maximum Particle size: 3/8" Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	100.0
No. 4	99.9
No. 10	99.8

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

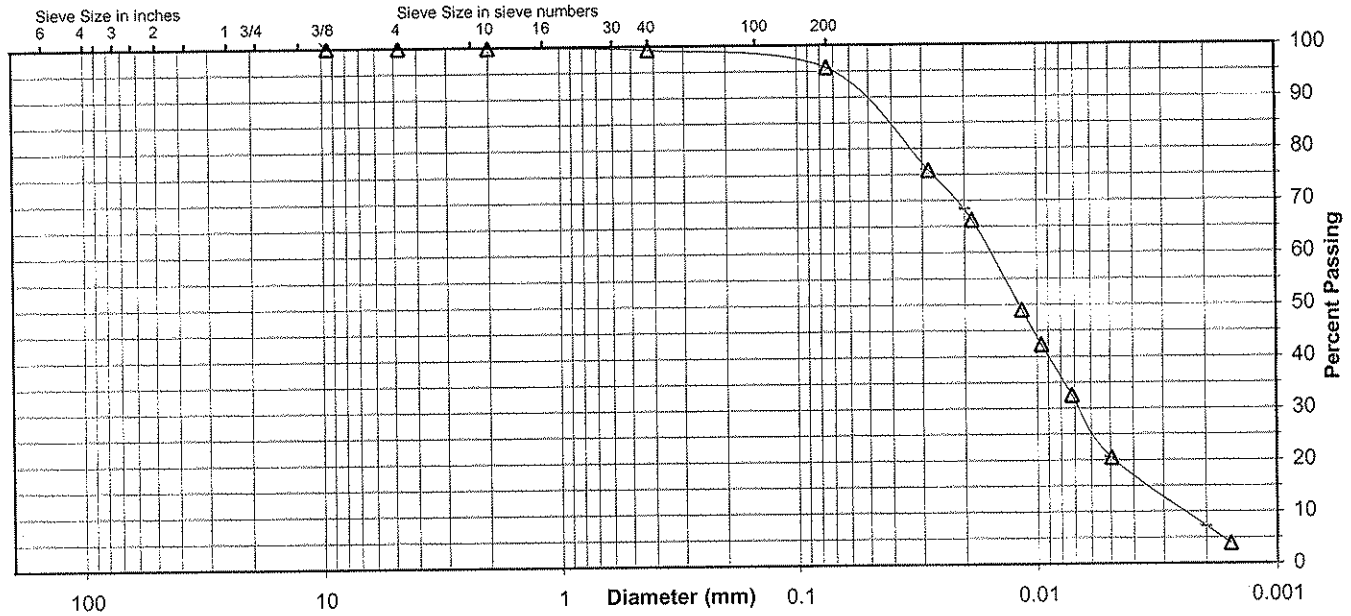
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	99.3
No. 200	95.7
0.02 mm	68.4
0.005 mm	20.6
0.002 mm	7.2
0.001 mm	0.0

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	0.1	0.1	0.5	3.6	75.1	20.6
	Gravel			Coarse Sand	Fine Sand	Silt	Clay
AASHTO	0.2			0.5	3.6	88.5	7.2



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-28, 25.5'-27.0', 27.0'-28.5'

Project Number: 172679015
Lab ID: 1908

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Rounded
Particle Hardness: Hard and Durable

Tested By: CM
Test Date: 10-08-2009
Date Received: 08-21-2009

Maximum Particle size: No. 4 Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	
No. 4	100.0
No. 10	99.4

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

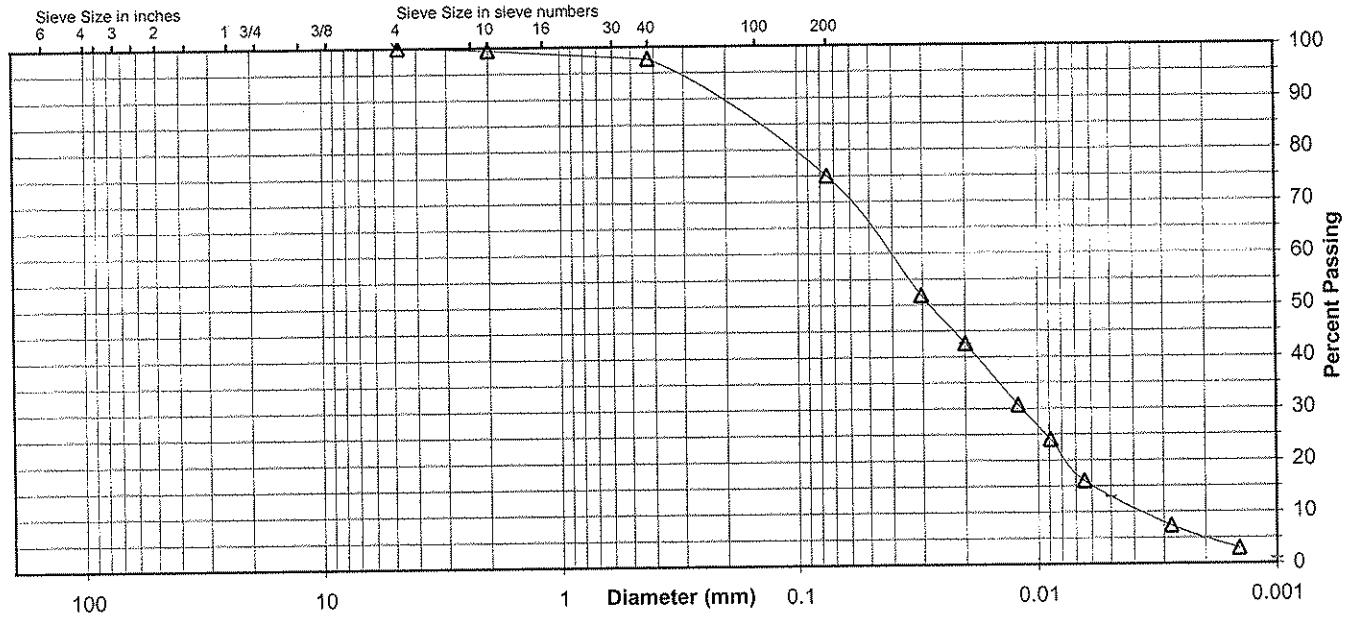
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	97.7
No. 200	74.9
0.02 mm	42.5
0.005 mm	13.0
0.002 mm	4.9
0.001 mm	1.0

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.0	0.6	1.7	22.8	61.9	13.0
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.6			1.7	22.8	70.0	4.9



Comments

Reviewed By

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-29, 30.0'-31.5', 31.5'-33.0', 33.0'-34.5'	Lab ID	1947
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-4-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	
No. 4	4.75	100.0
No. 10	2	99.9
No. 40	0.425	98.5
No. 200	0.075	90.9
	0.02	61.6
	0.005	38.2
	0.002	29.1
estimated	0.001	22.0

Plus 3 in. material, not included: 0 (%)

Range	ASTM (%)	AASHTO (%)
Gravel	0.0	0.1
Coarse Sand	0.1	1.4
Medium Sand	1.4	---
Fine Sand	7.6	7.6
Silt	52.7	61.8
Clay	38.2	29.1

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	30
Plastic Limit:	17
Plasticity Index:	13
Activity Index:	0.45

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL
Group Name: Lean clay

AASHTO Classification: A-6 (11)

Comments:

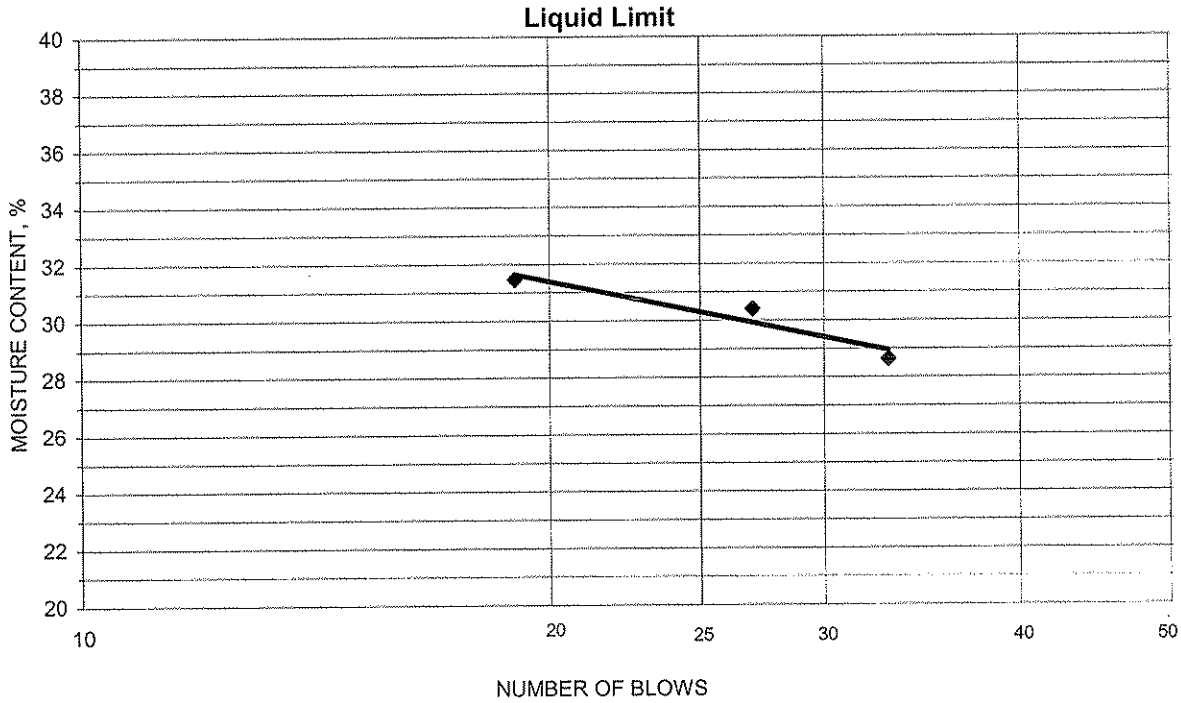
Reviewed by:

Stantec

ATTERBERG LIMITS

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Source	STN-29, 30.0'-31.5', 31.5'-33.0', 33.0'-34.5'	Lab ID	1947
		% + No. 40	1
Tested By	MC	Test Method	ASTM D 4318 Method A
Test Date	10-12-2009	Prepared	Dry
		Date Received	08-21-2009

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
20.65	18.52	11.08	33	28.6	
21.08	18.80	11.30	27	30.4	
19.78	17.71	11.13	19	31.5	30



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
18.68	17.58	10.93	16.5	17	13
18.75	17.65	11.08	16.7		

Remarks: _____

Reviewed By _____

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-29, 30.0'-31.5', 31.5'-33.0', 33.0'-34.5'

Project Number: 172679015
Lab ID: 1947

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Rounded
Particle Hardness: Hard and Durable

Tested By: AP
Test Date: 10-08-2009
Date Received: 08-21-2009

Maximum Particle size: No. 4 Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	
No. 4	100.0
No. 10	99.9

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

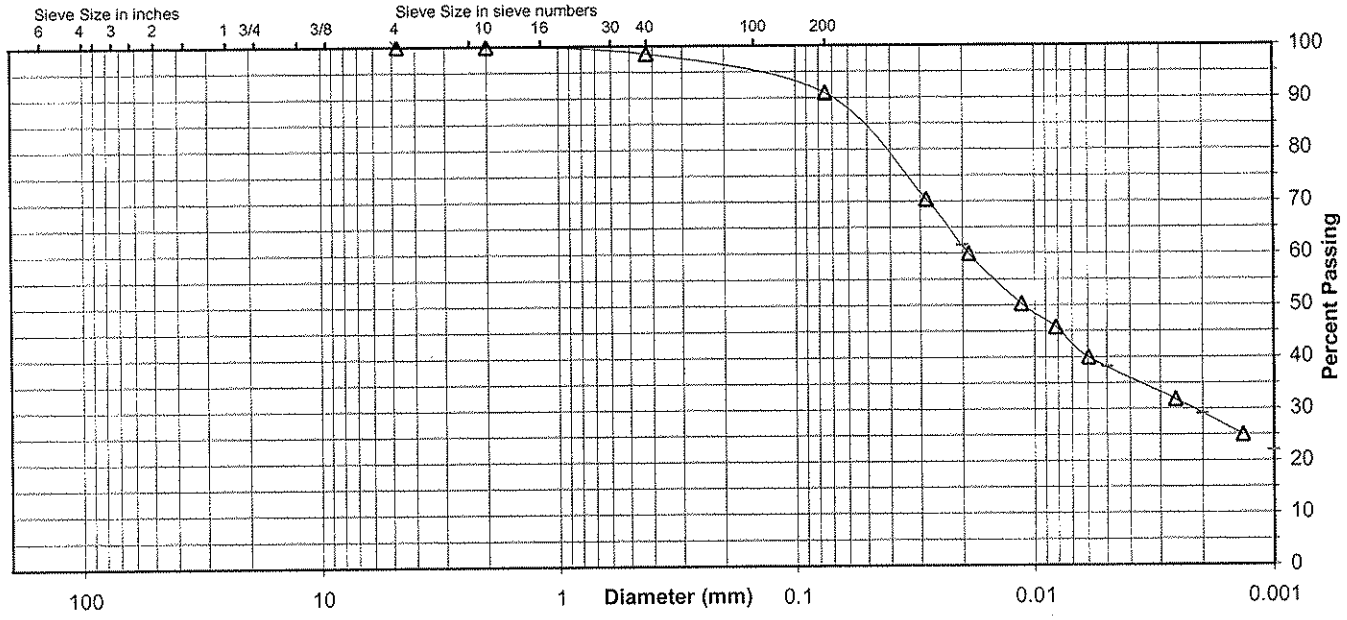
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	98.5
No. 200	90.9
0.02 mm	61.6
0.005 mm	38.2
0.002 mm	29.1
0.001 mm	22.0

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	0.0	0.1	1.4	7.6	52.7	38.2
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.1			1.4	7.6	61.8	29.1



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-30, 25.5'-27.0', 27.0'-28.5'

Project Number: 172679015
Lab ID: 1995

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Angular
Particle Hardness: Hard and Durable

Tested By: CM
Test Date: 10-12-2009
Date Received: 08-21-2009

Maximum Particle size: 3/8" Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	100.0
No. 4	99.9
No. 10	98.5

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

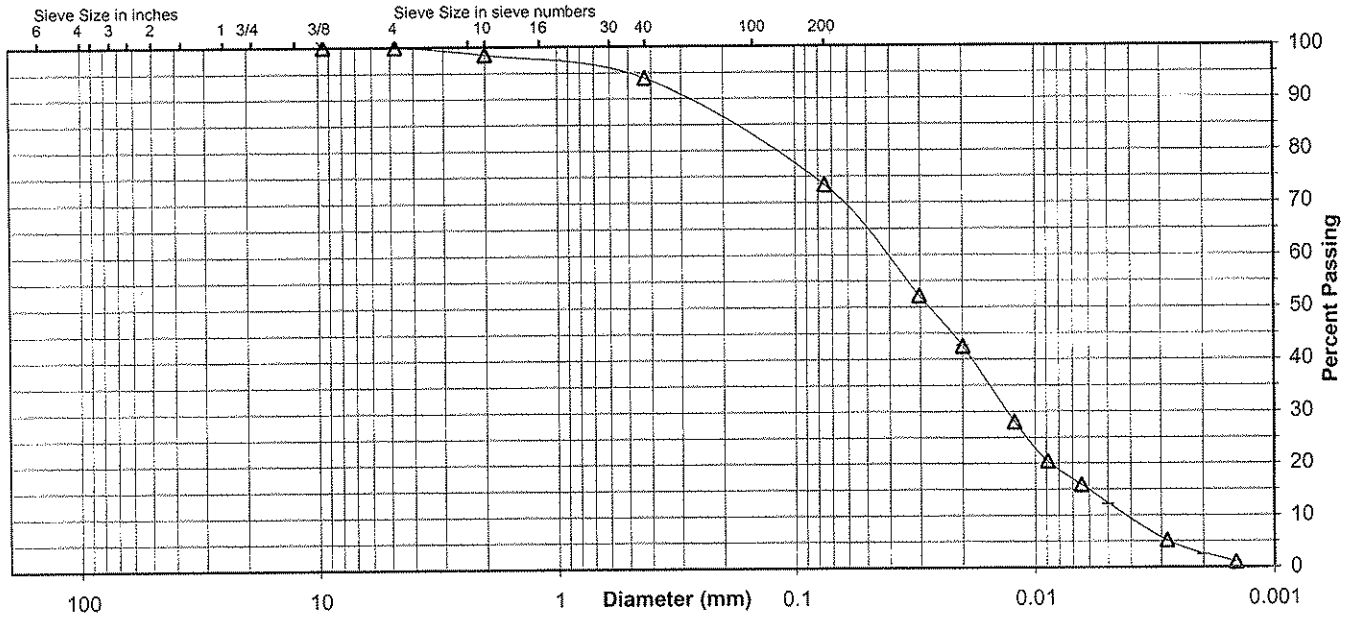
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	94.0
No. 200	73.4
0.02 mm	42.6
0.005 mm	12.2
0.002 mm	2.5
0.001 mm	0.0

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	0.1	1.4	4.5	20.6	61.2	12.2
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	1.5			4.5	20.6	70.9	2.5



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-30, 39.0'-40.5', 40.5'-42.0', 42.0'-43.5'

Project Number: 172679015
Lab ID: 2005

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: N/A
Particle Hardness: N/A

Tested By: CM
Test Date: 10-12-2009
Date Received: 08-21-2009

Maximum Particle size: No. 10 Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	
No. 4	
No. 10	100.0

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

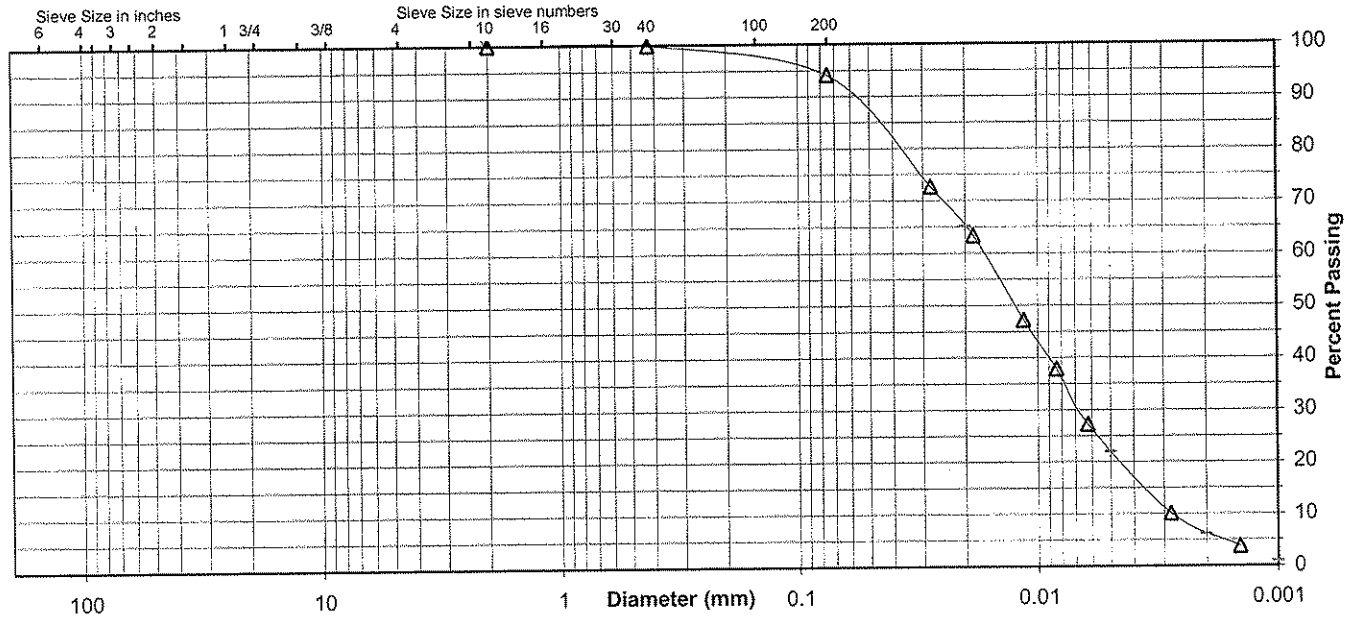
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	99.9
No. 200	94.1
0.02 mm	65.2
0.005 mm	22.0
0.002 mm	6.2
0.001 mm	1.0

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.0	0.0	0.1	5.8	72.1	22.0
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.0			0.1	5.8	87.9	6.2



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-31, 10.5'-12.0', 12.0'-13.5'

Project Number: 172679015
Lab ID: 2027

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Angular
Particle Hardness: Soft

Tested By: ford
Test Date: 10-14-2009
Date Received: 08-21-2009

Maximum Particle size: 3/8" Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	100.0
No. 4	99.2
No. 10	94.9

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

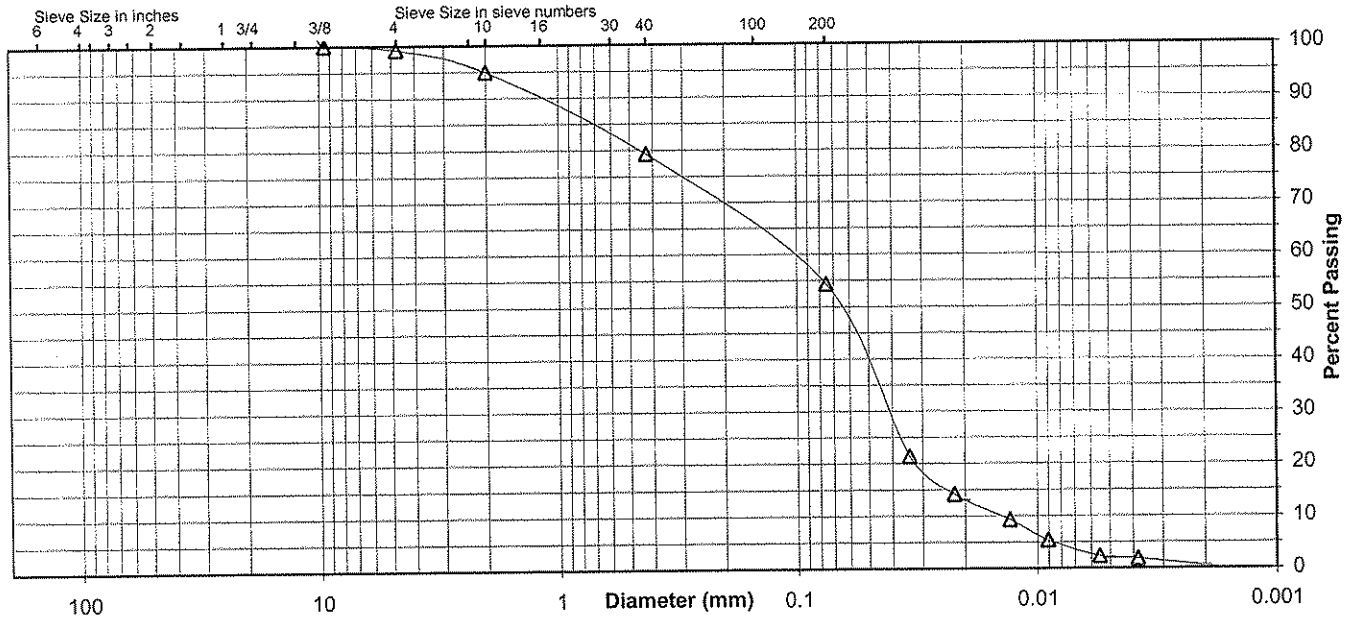
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	79.3
No. 200	54.3
0.02 mm	13.0
0.005 mm	2.0
0.002 mm	0.5
0.001 mm	0.0

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.8	4.3	15.6	25.0	52.3	2.0
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	5.1			15.6	25.0	53.8	0.5



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-31, 25.5'-27.0', 27.0'-28.5'

Project Number: 172679015
Lab ID: 2038

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: N/A
Particle Hardness: N/A

Tested By: ford
Test Date: 10-14-2009
Date Received: 08-21-2009

Maximum Particle size: No. 10 Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	
No. 4	
No. 10	100.0

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

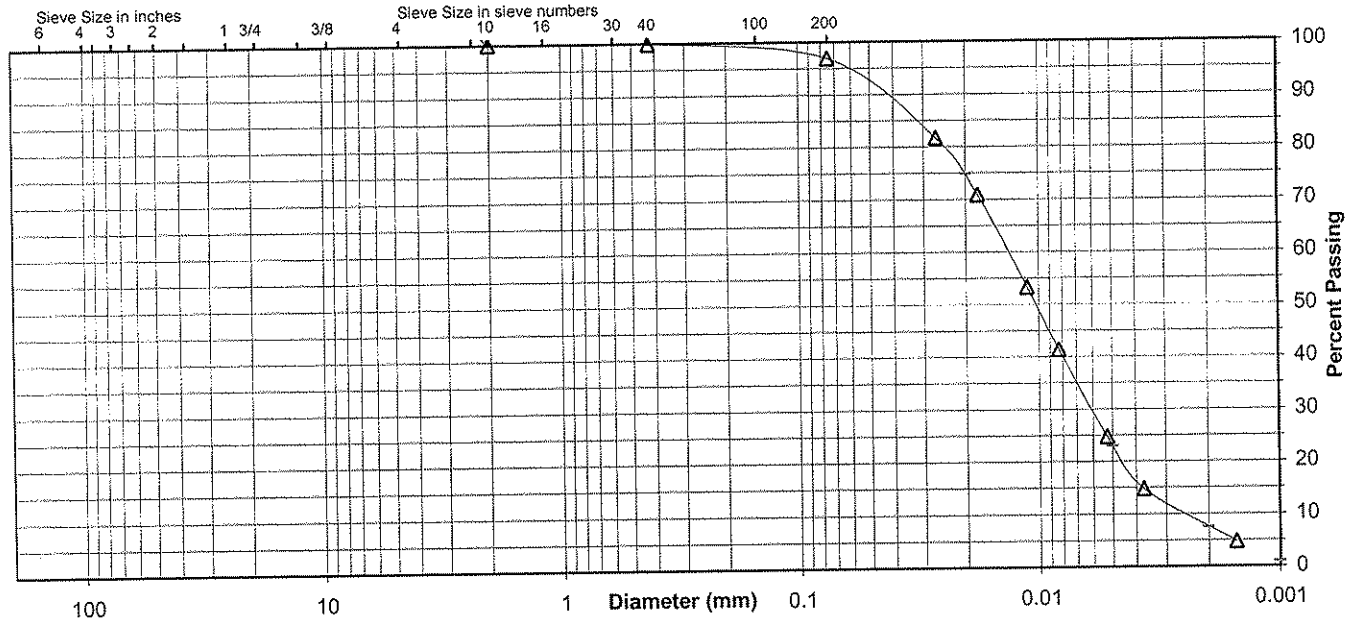
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	99.9
No. 200	96.9
0.02 mm	74.9
0.005 mm	23.0
0.002 mm	7.5
0.001 mm	1.0

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	0.0	0.0	0.1	3.0	73.9	23.0
	Gravel			Coarse Sand	Fine Sand	Silt	Clay
AASHTO	0.0			0.1	3.0	89.4	7.5



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-31, 36.0'-37.5', 37.5'-39.0'

Project Number: 172679015
Lab ID: 2046

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: N/A
Particle Hardness: N/A

Tested By: JF
Test Date: 10-19-2009
Date Received: 08-21-2009

Maximum Particle size: No. 10 Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	
No. 4	
No. 10	100.0

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

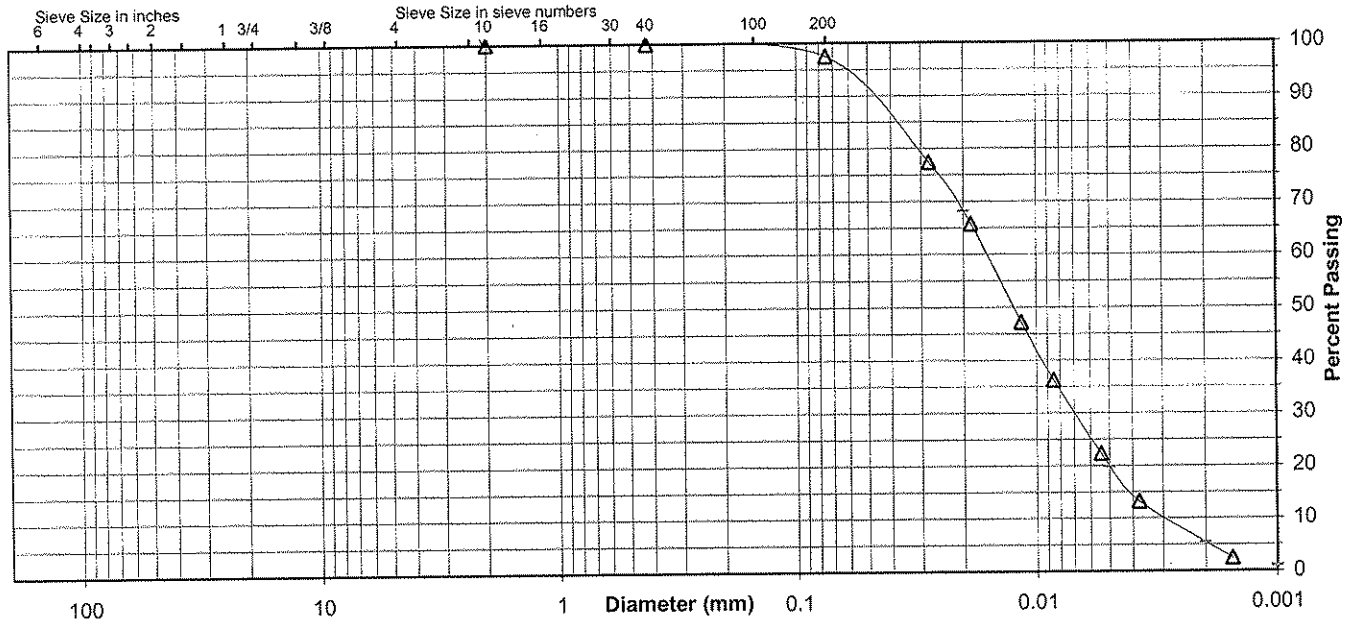
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	100.0
No. 200	97.5
0.02 mm	68.2
0.005 mm	19.8
0.002 mm	5.5
0.001 mm	1.0

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.0	0.0	0.0	2.5	77.7	19.8
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.0			0.0	2.5	92.0	5.5



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-33, 48.0'-49.5', 49.5'-51.0'

Project Number: 172679015
Lab ID: 2123

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: N/A
Particle Hardness: N/A

Tested By: JF
Test Date: 10-26-2009
Date Received: 08-21-2009

Maximum Particle size: No. 10 Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	
No. 4	
No. 10	100.0

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

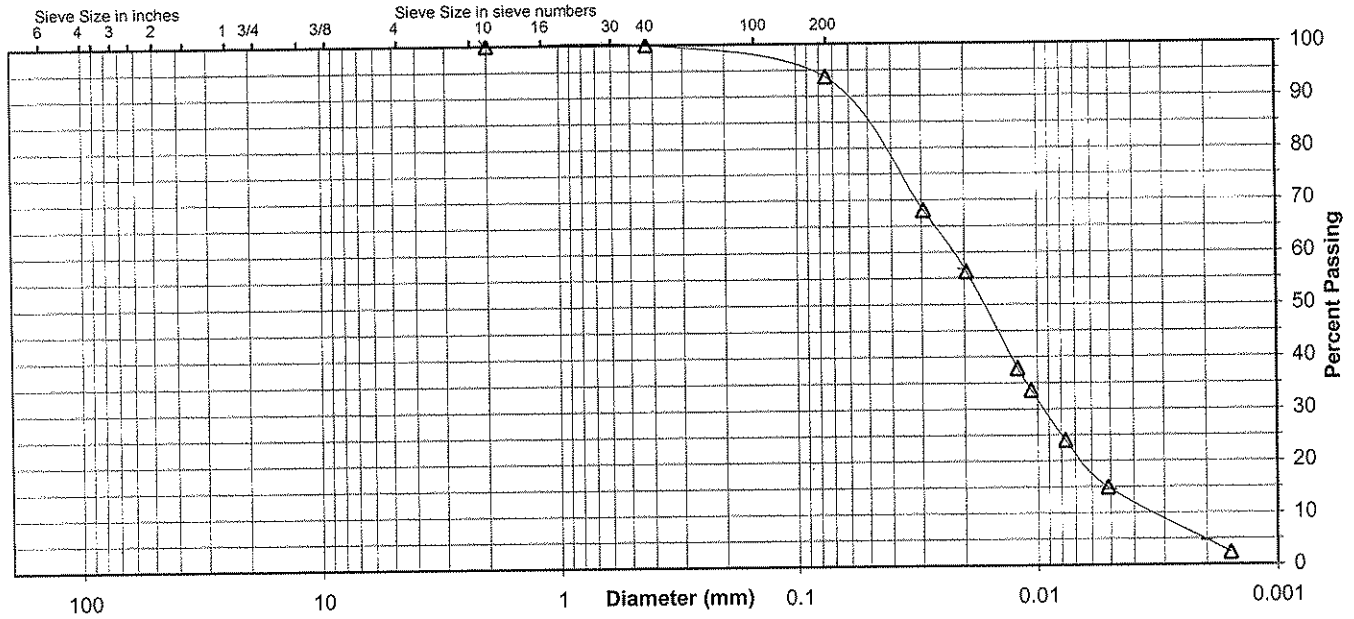
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	100.0
No. 200	93.7
0.02 mm	56.8
0.005 mm	14.5
0.002 mm	4.7
0.001 mm	0.0

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.0	0.0	0.0	6.3	79.2	14.5
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.0			0.0	6.3	89.0	4.7



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-33, 60.0'-61.5', 61.5'-63.0'

Project Number: 172679015
Lab ID: 2132

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: N/A
Particle Hardness: N/A

Tested By: JF
Test Date: 10-22-2009
Date Received: 08-21-2009

Maximum Particle size: No. 10 Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	
No. 4	
No. 10	100.0

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

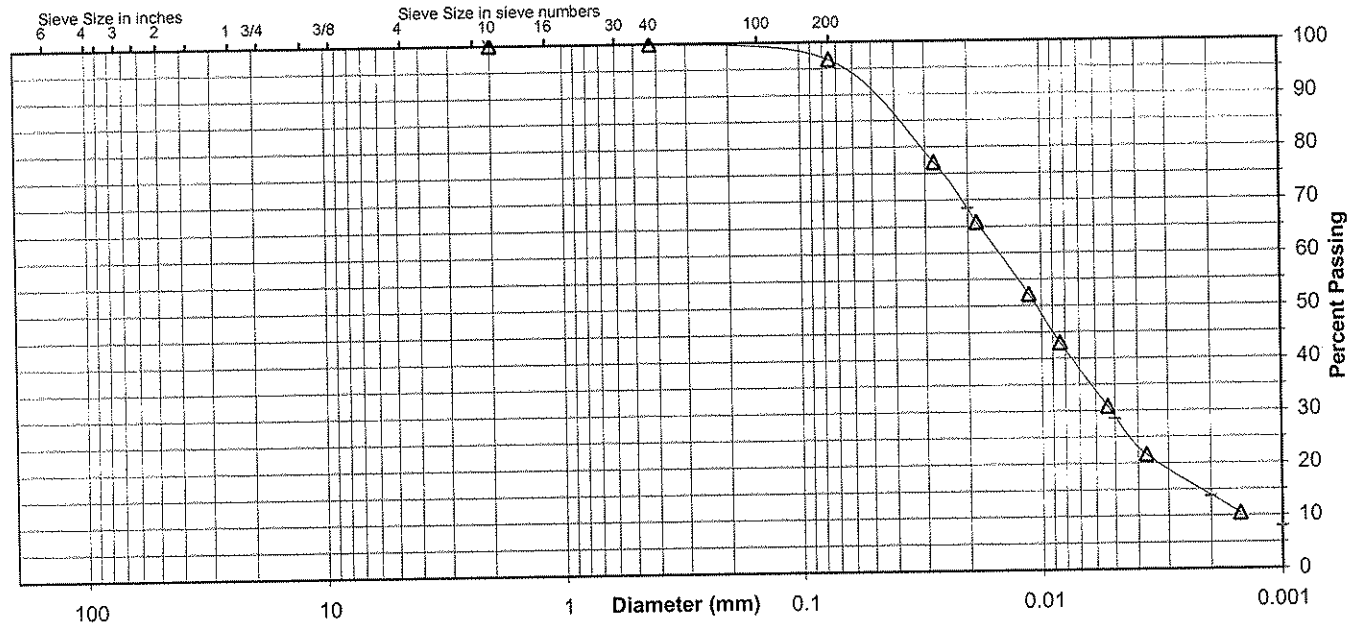
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	99.9
No. 200	96.7
0.02 mm	68.4
0.005 mm	28.5
0.002 mm	13.7
0.001 mm	8.0

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.0	0.0	0.1	3.2	68.2	28.5
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.0			0.1	3.2	83.0	13.7



Comments

Reviewed By

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-35, 22.5'-24.0', 24.0'-25.5', 25.5'-27.0'	Lab ID	2198
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-4-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	
No. 4	4.75	
No. 10	2	100.0
No. 40	0.425	100.0
No. 200	0.075	93.3
	0.02	70.5
	0.005	45.3
	0.002	34.8
estimated	0.001	28.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.0
Coarse Sand	0.0	0.0
Medium Sand	0.0	---
Fine Sand	6.7	6.7
Silt	48.0	58.5
Clay	45.3	34.8

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit: 43
Plastic Limit: 19
Plasticity Index: 24
Activity Index: 0.69

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Estimated

Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.70

Classification

Unified Group Symbol: CL
Group Name: Lean clay

AASHTO Classification: A-7-6 (23)

Comments:

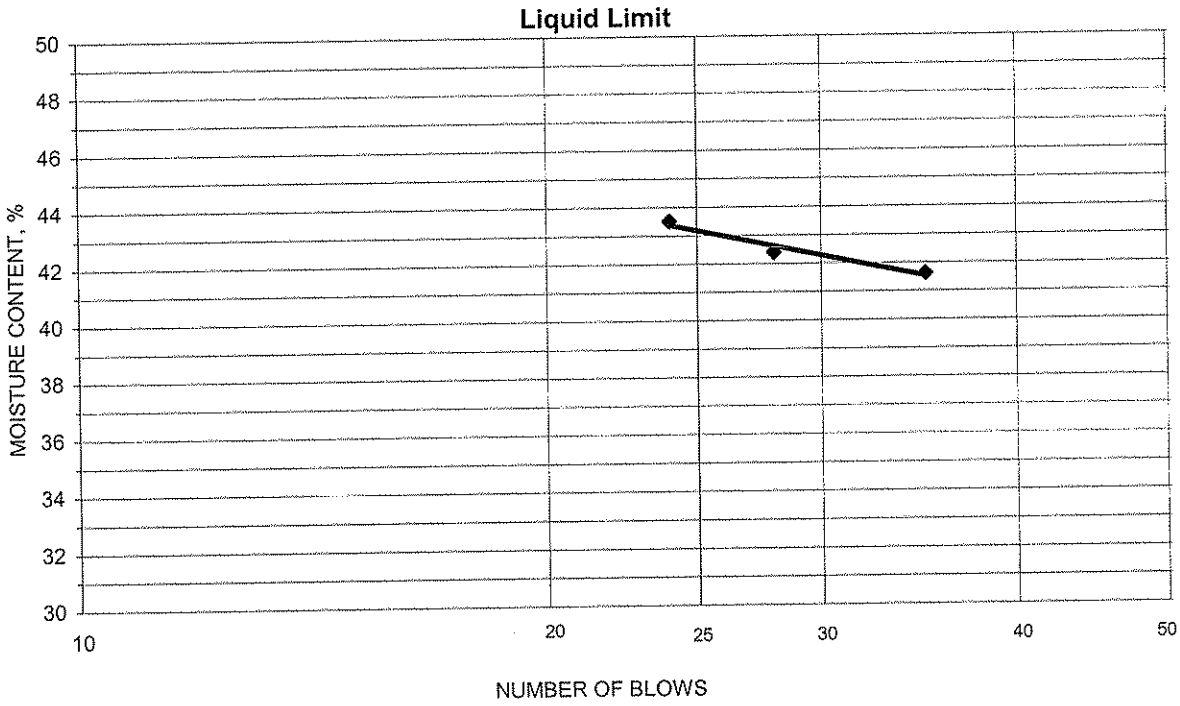
Reviewed by:

Stantec

ATTERBERG LIMITS

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Source	STN-35, 22.5'-24.0', 24.0'-25.5', 25.5'-27.0'	Lab ID	2198
		% + No. 40	0
Tested By	CSM	Test Method	ASTM D 4318 Method A
Test Date	10-12-2009	Prepared	Dry
		Date Received	08-21-2009

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
20.11	17.43	10.99	35	41.6	43
22.71	19.23	11.02	28	42.4	
21.67	18.52	11.28	24	43.5	



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
18.67	17.43	11.05	19.4	19	24
18.43	17.26	11.09	19.0		

Remarks: _____

Reviewed By _____

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-35, 22.5'-24.0', 24.0'-25.5', 25.5'-27.0'

Project Number: 172679015
Lab ID: 2198

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: N/A
Particle Hardness: N/A

Tested By: Ford
Test Date: 10-09-2009
Date Received: 08-21-2009

Maximum Particle size: No. 10 Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	
No. 4	
No. 10	100.0

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

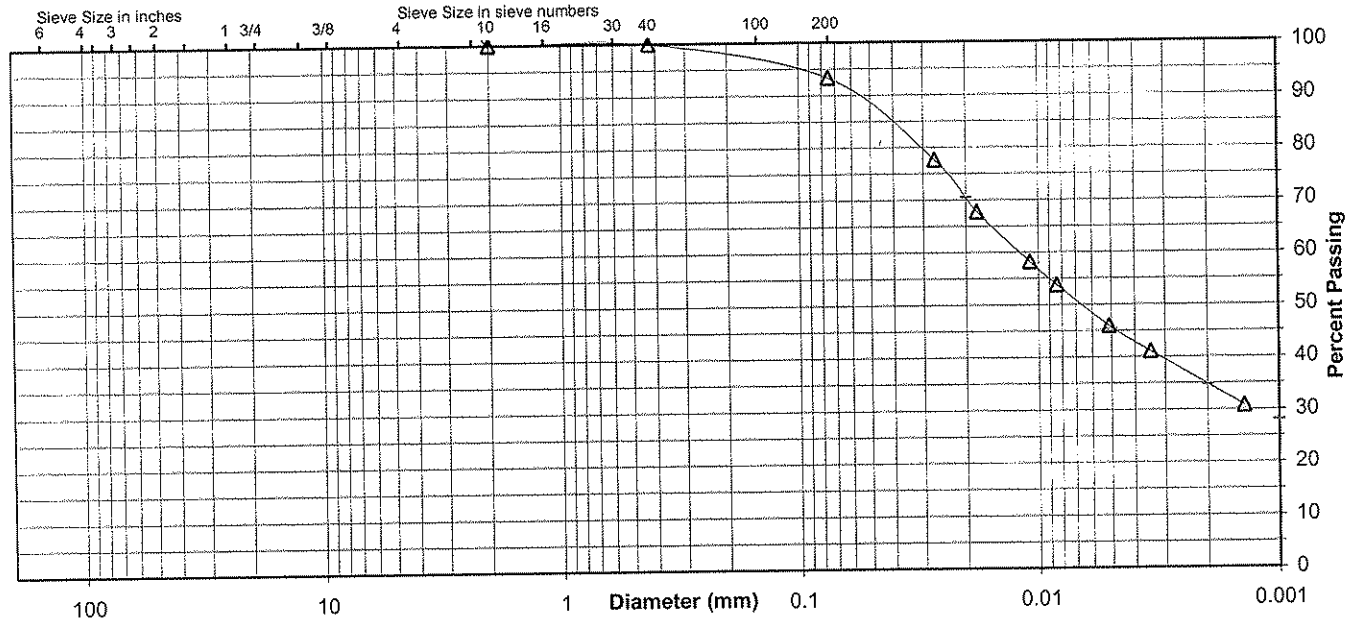
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	100.0
No. 200	93.3
0.02 mm	70.5
0.005 mm	45.3
0.002 mm	34.8
0.001 mm	28.0

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.0	0.0	0.0	6.7	48.0	45.3
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.0			0.0	6.7	58.5	34.8



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-35, 31.5'-33.0', 33.0'-34.5'

Project Number: 172679015
Lab ID: 2205

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: N/A
Particle Hardness: N/A

Tested By: Ford
Test Date: 10-09-2009
Date Received: 08-21-2009

Maximum Particle size: No. 10 Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	
No. 4	
No. 10	100.0

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

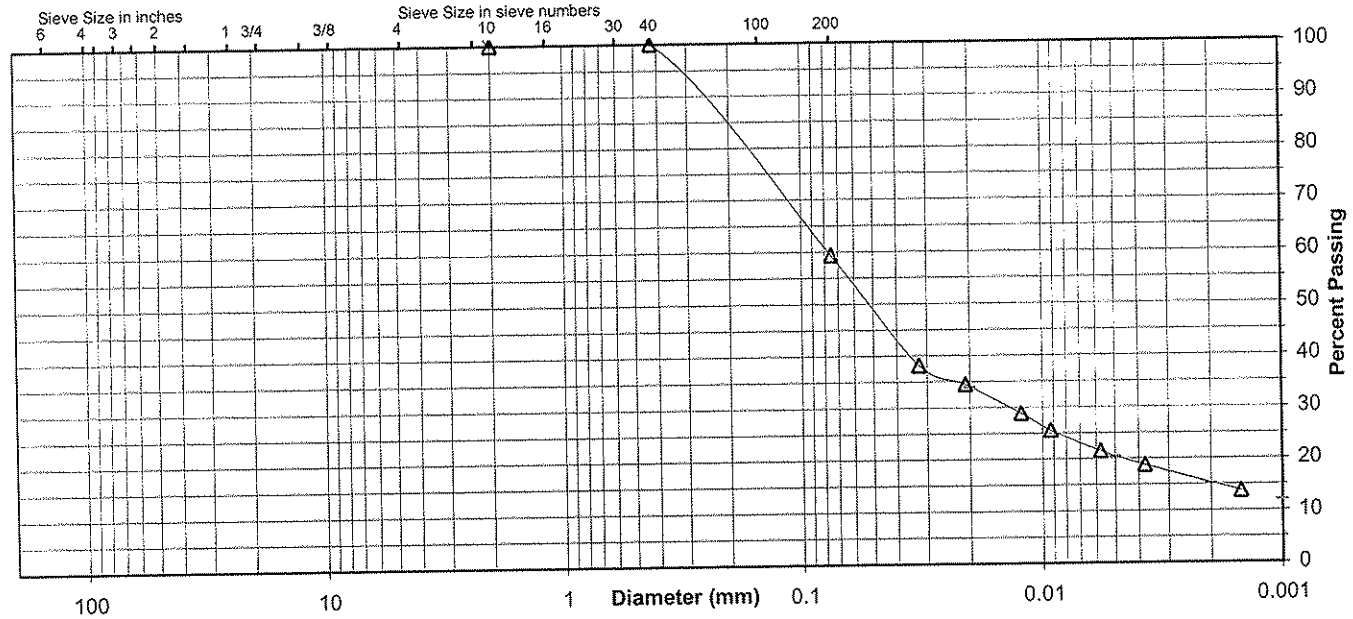
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	100.0
No. 200	59.3
0.02 mm	33.9
0.005 mm	20.4
0.002 mm	15.1
0.001 mm	12.0

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	0.0	0.0	0.0	40.7	38.9	20.4
	Gravel			Coarse Sand	Fine Sand	Silt	Clay
AASHTO	0.0			0.0	40.7	44.2	15.1



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-39, 30.0'-31.5', 31.5'-33.0'

Project Number: 172679015
Lab ID: 2290

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Rounded
Particle Hardness: Hard and Durable

Tested By: CM
Test Date: 10-08-2009
Date Received: 08-21-2009

Maximum Particle size: No. 4 Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	
No. 4	100.0
No. 10	100.0

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

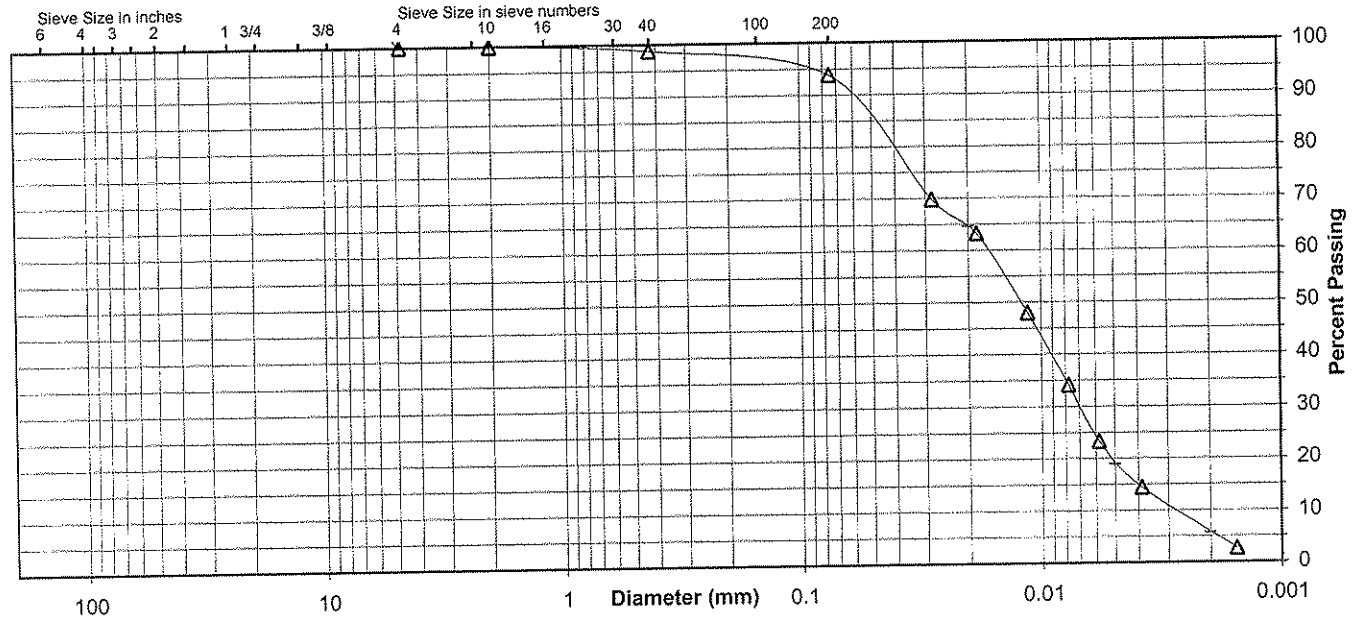
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	98.8
No. 200	93.8
0.02 mm	64.6
0.005 mm	18.9
0.002 mm	5.7
0.001 mm	0.0

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.0	0.0	1.2	5.0	74.9	18.9
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.0			1.2	5.0	88.1	5.7



Comments

Reviewed By

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-39, 30.0'-31.5', 31.5'-33.0'

Project Number: 172679015
Lab ID: 2290

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: Rounded
Particle Hardness: Hard and Durable

Tested By: CM
Test Date: 10-08-2009
Date Received: 08-21-2009

Maximum Particle size: No. 4 Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	
No. 4	100.0
No. 10	100.0

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

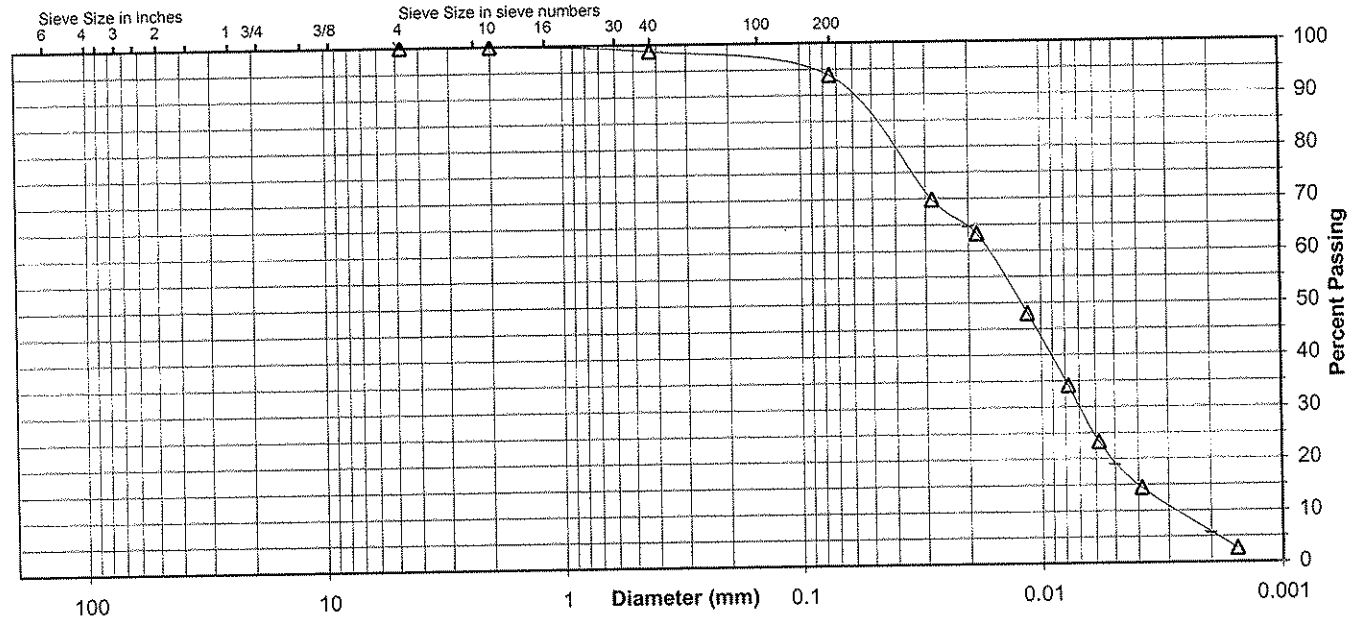
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	98.8
No. 200	93.8
0.02 mm	64.6
0.005 mm	18.9
0.002 mm	5.7
0.001 mm	0.0

Particle Size Distribution

ASTM	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
	0.0	0.0	0.0	1.2	5.0	74.9	18.9
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.0			1.2	5.0	88.1	5.7



Comments

Reviewed By

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-39, 48.0'-49.5', 49.5'-51.0', 51.0'-52.5'	Lab ID	2303
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	10-4-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	
No. 4	4.75	
No. 10	2	100.0
No. 40	0.425	100.0
No. 200	0.075	80.4
	0.02	51.7
	0.005	34.4
	0.002	26.3
estimated	0.001	21.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.0
Coarse Sand	0.0	0.0
Medium Sand	0.0	---
Fine Sand	19.6	19.6
Silt	46.0	54.1
Clay	34.4	26.3

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit: 31
Plastic Limit: 19
Plasticity Index: 12
Activity Index: 0.46

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Estimated

Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.70

Classification

Unified Group Symbol: CL
Group Name: Lean clay with sand

AASHTO Classification: A-6 (8)

Comments:

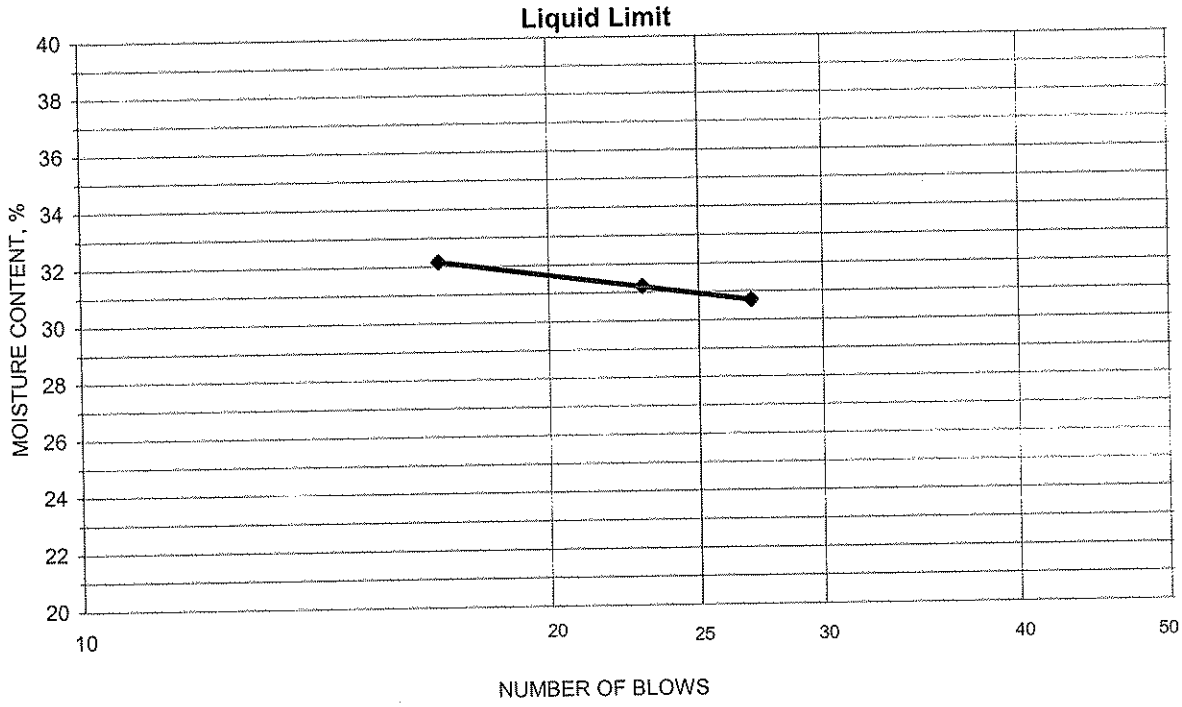
Reviewed by:

Stantec

ATTERBERG LIMITS

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Source	STN-39, 48.0'-49.5', 49.5'-51.0', 51.0'-52.5'	Lab ID	2303
		% + No. 40	0
Tested By	MC	Test Method	ASTM D 4318 Method A
Test Date	10-22-2009	Prepared	Dry
		Date Received	08-21-2009

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Number of Blows	Water Content (%)	Liquid Limit
19.91	17.92	11.73	17	32.1	31
19.12	17.12	10.71	23	31.2	
19.34	17.41	11.12	27	30.7	



PLASTIC LIMIT AND PLASTICITY INDEX

Wet Soil and Tare Mass (g)	Dry Soil and Tare Mass (g)	Tare Mass (g)	Water Content (%)	Plastic Limit	Plasticity Index
18.81	17.58	11.10	19.0	19	12
18.69	17.48	11.03	18.8		

Remarks: _____

Reviewed By _____

Stantec

Particle-Size Analysis of Soils
ASTM D 422

Project Name: Bull Run Fossil Plant (TVA)
Source: STN-39, 48.0'-49.5', 49.5'-51.0', 51.0'-52.5'

Project Number: 172679015
Lab ID: 2303

Sieve analysis for the Portion Coarser than the No. 10 Sieve

Test Method: ASTM D 422
Prepared using: ASTM D 421

Particle Shape: N/A
Particle Hardness: N/A

Tested By: CM
Test Date: 10-08-2009
Date Received: 08-21-2009

Maximum Particle size: No. 10 Sieve

Sieve Size	% Passing
3"	
2"	
1 1/2"	
1"	
3/4"	
3/8"	
No. 4	
No. 10	100.0

Analysis for the portion Finer than the No. 10 Sieve

Analysis Based on: Total Sample

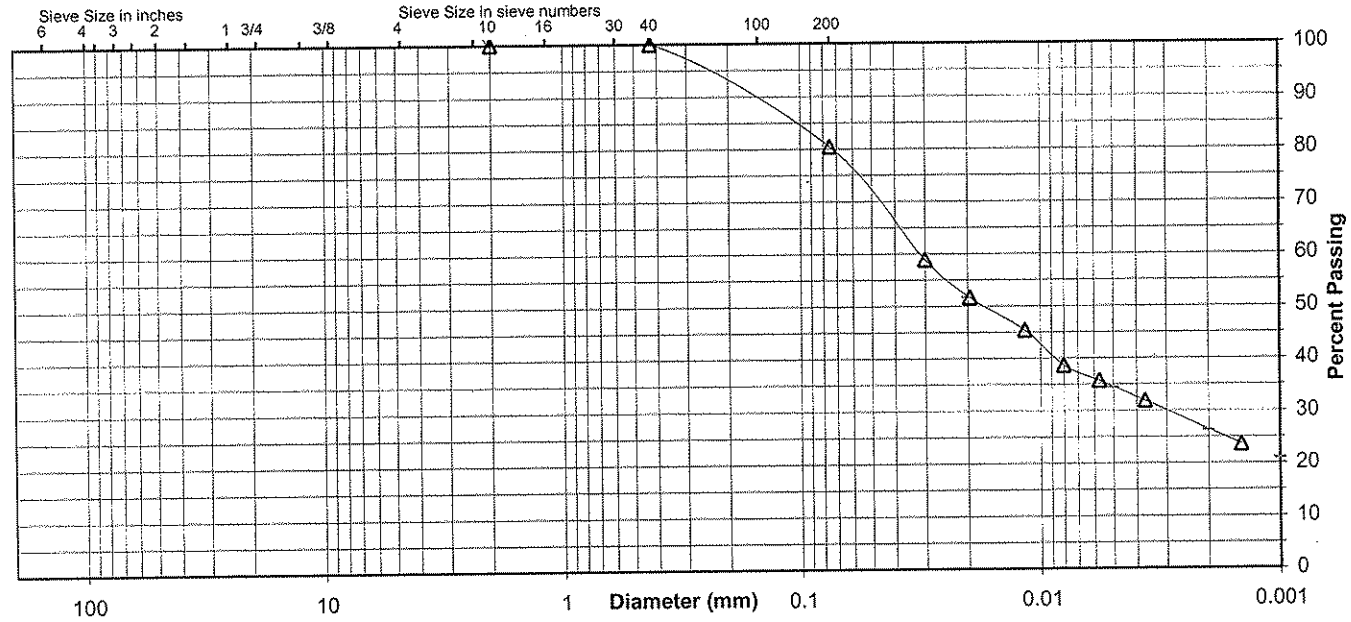
Specific Gravity: 2.7

Dispersed using: Apparatus A - Mechanical, for 1 minute

No. 40	100.0
No. 200	80.4
0.02 mm	51.7
0.005 mm	34.4
0.002 mm	26.3
0.001 mm	21.0

Particle Size Distribution

	Coarse Gravel	Fine Gravel	C. Sand	Medium Sand	Fine Sand	Silt	Clay
ASTM	0.0	0.0	0.0	0.0	19.6	46.0	34.4
AASHTO	Gravel			Coarse Sand	Fine Sand	Silt	Clay
	0.0			0.0	19.6	54.1	26.3



Comments

Reviewed By

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-10, 33.8'-34.3'	Lab ID	6C
County	Clinton, Tennessee	Date Received	7-7-09
Sample Type	ST	Date Reported	10-29-09

Test Results

Natural Moisture Content

Test Method: ASTM D 2216

Moisture Content (%): 21.1

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	100.0
No. 4	4.75	99.9
No. 10	2	99.9
No. 40	0.425	99.5
No. 200	0.075	77.8
	0.02	46.8
	0.005	29.0
	0.002	22.5
estimated	0.001	18.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.1	0.1
Coarse Sand	0.0	0.4
Medium Sand	0.4	---
Fine Sand	21.7	21.7
Silt	48.8	55.3
Clay	29.0	22.5

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	31
Plastic Limit:	16
Plasticity Index:	15
Activity Index:	0.68

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Test Method: ASTM D 854
Prepared: Dry

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL

Group Name: Lean clay with sand

AASHTO Classification: A-6 (10)

Comments:

Reviewed by:

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-10, 40.6'-41.1'	Lab ID	10A
County	Clinton, Tennessee	Date Received	7-7-09
Sample Type	ST	Date Reported	10-29-09

Test Results

Natural Moisture Content

Test Method: ASTM D 2216

Moisture Content (%): 27.3

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	100.0
No. 4	4.75	99.7
No. 10	2	99.6
No. 40	0.425	99.0
No. 200	0.075	67.7
	0.02	43.2
	0.005	28.1
	0.002	20.7
estimated	0.001	15.0

Plus 3 in. material, not included: 0 (%)

Range	ASTM (%)	AASHTO (%)
Gravel	0.3	0.4
Coarse Sand	0.1	0.6
Medium Sand	0.6	---
Fine Sand	31.3	31.3
Silt	39.6	47.0
Clay	28.1	20.7

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit: 28
Plastic Limit: 16
Plasticity Index: 12
Activity Index: 0.57

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Test Method: ASTM D 854
Prepared: Dry

Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.70

Classification

Unified Group Symbol: CL
Group Name: Sandy lean clay

AASHTO Classification: A-6 (6)

Comments:

Reviewed by: KDG

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-10, 45.2'-45.7'	Lab ID	12B
County	Clinton, Tennessee	Date Received	7-7-09
Sample Type	ST	Date Reported	10-29-09

Test Results

Natural Moisture Content

Test Method: ASTM D 2216

Moisture Content (%): 20.7

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	100.0
No. 4	4.75	99.6
No. 10	2	99.6
No. 40	0.425	97.4
No. 200	0.075	37.9
	0.02	23.1
	0.005	15.1
	0.002	12.0
estimated	0.001	11.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.4	0.4
Coarse Sand	0.0	2.2
Medium Sand	2.2	---
Fine Sand	59.5	59.5
Silt	22.8	25.9
Clay	15.1	12.0

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit: ---
Plastic Limit: Non Plastic
Plasticity Index: ---
Activity Index: N/A

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Test Method: ASTM D 854
Prepared: Dry

Particle Size: No.10
Specific Gravity at 20° Celsius: 2.68

Classification

Unified Group Symbol: SM
Group Name: Silty sand

AASHTO Classification: A-4 (0)

Comments:

Reviewed by:

1132

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-51, 5.1'-5.6'	Lab ID	31B
County	Clinton, Tennessee	Date Received	7-7-09
Sample Type	ST	Date Reported	10-29-09

Test Results

Natural Moisture Content

Test Method: ASTM D 2216

Moisture Content (%): 21.8

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	
No. 4	4.75	100.0
No. 10	2	98.6
No. 40	0.425	80.2
No. 200	0.075	68.0
	0.02	41.4
	0.005	27.9
	0.002	22.0
estimated	0.001	17.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	1.4
Coarse Sand	1.4	18.4
Medium Sand	18.4	---
Fine Sand	12.2	12.2
Silt	40.1	46.0
Clay	27.9	22.0

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit: 46
Plastic Limit: 29
Plasticity Index: 17
Activity Index: 0.77

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Test Method: ASTM D 854
Prepared: Dry

Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.75

Classification

Unified Group Symbol: ML
Group Name: Sandy silt

AASHTO Classification: A-7-6 (11)

Comments:

Reviewed by: KDG

11359

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-51, 10.1'-10.6'	Lab ID	32B
County	Clinton, Tennessee	Date Received	7-7-09
Sample Type	ST	Date Reported	10-29-09

Test Results

Natural Moisture Content

Test Method: ASTM D 2216

Moisture Content (%): 23.3

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	100.0
3/8"	9.5	98.4
No. 4	4.75	96.4
No. 10	2	92.2
No. 40	0.425	76.5
No. 200	0.075	63.5
	0.02	36.0
	0.005	24.6
	0.002	21.9
estimated	0.001	19.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	3.6	7.8
Coarse Sand	4.2	15.7
Medium Sand	15.7	---
Fine Sand	13.0	13.0
Silt	38.9	41.6
Clay	24.6	21.9

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit: 37
Plastic Limit: 23
Plasticity Index: 14
Activity Index: 0.64

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Test Method: ASTM D 854
Prepared: Dry

Particle Size: No.10
Specific Gravity at 20° Celsius: 2.71

Classification

Unified Group Symbol: CL
Group Name: Sandy lean clay

AASHTO Classification: A-6 (7)

Comments:

Reviewed by:

Laboratory Document
Prepared By: MW
Approved BY: TLK

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-59, 19.7'-20.2'	Lab ID	37B
County	Clinton, Tennessee	Date Received	7-7-09
Sample Type	ST	Date Reported	10-29-09

Test Results

Natural Moisture Content

Test Method: ASTM D 2216

Moisture Content (%): 27.3

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	
No. 4	4.75	100.0
No. 10	2	100.0
No. 40	0.425	100.0
No. 200	0.075	98.6
	0.02	83.1
	0.005	55.8
	0.002	42.5
estimated	0.001	33.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.0
Coarse Sand	0.0	0.0
Medium Sand	0.0	---
Fine Sand	1.4	1.4
Silt	42.8	56.1
Clay	55.8	42.5

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit: 51
Plastic Limit: 25
Plasticity Index: 26
Activity Index: 0.62

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Test Method: ASTM D 854
Prepared: Dry

Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.73

Classification

Unified Group Symbol: CH/CL
Group Name: Fat clay

AASHTO Classification: A-7-6 (30)

Comments:

Reviewed by:

1139

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-68, 20.0'-20.5'	Lab ID	44
County	Clinton, Tennessee	Date Received	7-7-09
Sample Type	ST	Date Reported	10-29-09

Test Results

Natural Moisture Content

Test Method: ASTM D 2216

Moisture Content (%): 23.4

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	
No. 4	4.75	
No. 10	2	100.0
No. 40	0.425	99.9
No. 200	0.075	97.5
	0.02	78.8
	0.005	40.9
	0.002	30.6
estimated	0.001	24.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.0
Coarse Sand	0.0	0.1
Medium Sand	0.1	---
Fine Sand	2.4	2.4
Silt	56.6	66.9
Clay	40.9	30.6

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit: 37
Plastic Limit: 22
Plasticity Index: 15
Activity Index: 0.48

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Test Method: ASTM D 854
Prepared: Dry

Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.68

Classification

Unified Group Symbol: CL
Group Name: Lean clay

AASHTO Classification: A-6 (16)

Comments:

Reviewed by:

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-19, 27.0'-28.5', 28.5'-30.0', 30.0'-31.5'	Lab ID	1542
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-4-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	
No. 4	4.75	100.0
No. 10	2	99.5
No. 40	0.425	99.2
No. 200	0.075	77.8
	0.02	47.8
	0.005	31.1
	0.002	25.7
estimated	0.001	25.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.5
Coarse Sand	0.5	0.3
Medium Sand	0.3	---
Fine Sand	21.4	21.4
Silt	46.7	52.1
Clay	31.1	25.7

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit: 31
Plastic Limit: 18
Plasticity Index: 13
Activity Index: 0.50

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Estimated

Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.70

Classification

Unified Group Symbol: CL
Group Name: Lean clay with sand

AASHTO Classification: A-6 (9)

Comments:

Reviewed by:

1184

Stantec

Summary of Soil Tests

Project Name: Bull Run Fossil Plant (TVA) — Project Number: 172679015
Source: STN-18, 39.0'-40.5', 40.5'-42.0', 42.0'-43.5' — Lab ID: 1514

County: Clinton, Tennessee — Date Received: 8-21-09
Sample Type: SPT Comp — Date Reported: 11-4-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	100.0
No. 4	4.75	99.9
No. 10	2	99.7
No. 40	0.425	98.6
No. 200	0.075	88.9
	0.02	61.5
	0.005	36.2
	0.002	27.7
estimated	0.001	20.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.1	0.3
Coarse Sand	0.2	1.1
Medium Sand	1.1	---
Fine Sand	9.7	9.7
Silt	52.7	61.2
Clay	36.2	27.7

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit: 35
Plastic Limit: 20
Plasticity Index: 15
Activity Index: 0.54

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Estimated

Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.70

Classification

Unified Group Symbol: CL
Group Name: Lean clay

AASHTO Classification: A-6 (13)

Comments:

Reviewed by:

1184

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-16, 13.5'-15.0', 15.0'-16.5', 16.5'-18.0'	Lab ID	1464
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-6-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	100.0
3/8"	9.5	96.8
No. 4	4.75	92.1
No. 10	2	83.0
No. 40	0.425	70.4
No. 200	0.075	60.4
	0.02	41.5
	0.005	17.0
	0.002	7.2
estimated	0.001	3.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	7.9	17.0
Coarse Sand	9.1	12.6
Medium Sand	12.6	---
Fine Sand	10.0	10.0
Silt	43.4	53.2
Clay	17.0	7.2

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit: ---
Plastic Limit: Non Plastic
Plasticity Index: ---
Activity Index: N/A

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Estimated

Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.70

Classification

Unified Group Symbol: ML
Group Name: Sandy silt

AASHTO Classification: A-4 (0)

Comments:

Reviewed by:

11184

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-15, 35.5'-37.0', 37.0'-38.5', 38.5'-40.0'	Lab ID	1442
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-4-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	
No. 4	4.75	100.0
No. 10	2	99.8
No. 40	0.425	99.0
No. 200	0.075	90.5
	0.02	60.9
	0.005	37.8
	0.002	29.5
estimated	0.001	26.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.2
Coarse Sand	0.2	0.8
Medium Sand	0.8	---
Fine Sand	8.5	8.5
Silt	52.7	61.0
Clay	37.8	29.5

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit: 34
Plastic Limit: 19
Plasticity Index: 15
Activity Index: 0.50

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Estimated

Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.70

Classification

Unified Group Symbol: CL
Group Name: Lean clay

AASHTO Classification: A-6 (13)

Comments:

Reviewed by:

1184

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-14, 3.0'-4.5', 4.5'-6.0', 6.0'-7.5'	Lab ID	1360
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-4-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	100.0
3/4"	19	91.3
3/8"	9.5	78.7
No. 4	4.75	69.7
No. 10	2	56.1
No. 40	0.425	46.9
No. 200	0.075	38.2
	0.02	30.3
	0.005	20.8
	0.002	15.6
estimated	0.001	13.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	30.3	43.9
Coarse Sand	13.6	9.2
Medium Sand	9.2	---
Fine Sand	8.7	8.7
Silt	17.4	22.6
Clay	20.8	15.6

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	37
Plastic Limit:	20
Plasticity Index:	17
Activity Index:	1.06

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: SC
Group Name: Clayey sand with gravel

AASHTO Classification: A-6 (2)

Comments:

Reviewed by:

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-13, 58.5'-60.0', 60.0'-61.5', 61.5'-63.0'	Lab ID	1350
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-4-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	100.0
3/8"	9.5	99.5
No. 4	4.75	99.0
No. 10	2	98.0
No. 40	0.425	96.7
No. 200	0.075	70.1
	0.02	46.0
	0.005	29.5
	0.002	22.0
estimated	0.001	18.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	1.0	2.0
Coarse Sand	1.0	1.3
Medium Sand	1.3	---
Fine Sand	26.6	26.6
Silt	40.6	48.1
Clay	29.5	22.0

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	30
Plastic Limit:	18
Plasticity Index:	12
Activity Index:	0.55

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL
Group Name: Lean clay with sand

AASHTO Classification: A-6 (6)

Comments:

Reviewed by:

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-11, 19.0'-20.5'	Lab ID	1298
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT	Date Reported	11-6-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	
No. 4	4.75	100.0
No. 10	2	100.0
No. 40	0.425	97.9
No. 200	0.075	85.3
	0.02	57.2
	0.005	35.2
	0.002	24.8
estimated	0.001	19.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.0
Coarse Sand	0.0	2.1
Medium Sand	2.1	---
Fine Sand	12.6	12.6
Silt	50.1	60.5
Clay	35.2	24.8

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	36
Plastic Limit:	20
Plasticity Index:	16
Activity Index:	0.64

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL

Group Name: Lean clay

AASHTO Classification: A-6 (13)

Comments:

Reviewed by:

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-11, 0.0'-1.5', 1.5'-3.0', 3.0'-4.5'	Lab ID	1287
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-6-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	100.0
3/8"	9.5	93.8
No. 4	4.75	84.1
No. 10	2	70.7
No. 40	0.425	47.1
No. 200	0.075	36.1
	0.02	24.1
	0.005	15.2
	0.002	11.3
estimated	0.001	8.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	15.9	29.3
Coarse Sand	13.4	23.6
Medium Sand	23.6	---
Fine Sand	11.0	11.0
Silt	20.9	24.8
Clay	15.2	11.3

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit: 36
Plastic Limit: 23
Plasticity Index: 13
Activity Index: 1.18

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Estimated

Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.70

Classification

Unified Group Symbol: SC
Group Name: Clayey sand with gravel

AASHTO Classification: A-6 (1)

Comments:

Reviewed by:

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-9, 58.5'-60.0', 60.0'-61.5'	Lab ID	3067
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-9-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	100.0
No. 4	4.75	100.0
No. 10	2	99.9
No. 40	0.425	99.4
No. 200	0.075	64.0
	0.02	39.2
	0.005	24.6
	0.002	17.1
estimated	0.001	10.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.1
Coarse Sand	0.1	0.5
Medium Sand	0.5	---
Fine Sand	35.4	35.4
Silt	39.4	46.9
Clay	24.6	17.1

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	26
Plastic Limit:	16
Plasticity Index:	10
Activity Index:	0.59

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL

Group Name: Sandy lean clay

AASHTO Classification: A-4 (4)

Comments:

Reviewed by:

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-7, 36.0'-37.5', 37.5'-39.0', 39.0'-40.5'	Lab ID	2883
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-9-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	100.0
No. 4	4.75	99.9
No. 10	2	99.8
No. 40	0.425	98.5
No. 200	0.075	62.1
	0.02	39.6
	0.005	24.8
	0.002	18.1
estimated	0.001	12.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.1	0.2
Coarse Sand	0.1	1.3
Medium Sand	1.3	---
Fine Sand	36.4	36.4
Silt	37.3	44.0
Clay	24.8	18.1

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	27
Plastic Limit:	15
Plasticity Index:	12
Activity Index:	0.67

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL

Group Name: Sandy lean clay

AASHTO Classification: A-6 (5)

Comments:

Reviewed by:

1134

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-7, 18.0'-19.5', 19.5'-21.0', 21.0'-22.5'	Lab ID	2870
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-6-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	100.0
3/8"	9.5	99.2
No. 4	4.75	98.7
No. 10	2	89.7
No. 40	0.425	88.5
No. 200	0.075	71.9
	0.02	46.0
	0.005	31.6
	0.002	23.8
estimated	0.001	18.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	1.3	10.3
Coarse Sand	9.0	1.2
Medium Sand	1.2	---
Fine Sand	16.6	16.6
Silt	40.3	48.1
Clay	31.6	23.8

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	32
Plastic Limit:	18
Plasticity Index:	14
Activity Index:	0.58

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL

Group Name: Lean clay with sand

AASHTO Classification: A-6 (8)

Comments:

Reviewed by:

11189

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-3, 29.0'-30.5', 30.5'-32.0'	Lab ID	1969
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-6-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	
No. 4	4.75	
No. 10	2	100.0
No. 40	0.425	98.6
No. 200	0.075	56.3
	0.02	38.9
	0.005	24.0
	0.002	13.7
estimated	0.001	2.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.0
Coarse Sand	0.0	1.4
Medium Sand	1.4	---
Fine Sand	42.3	42.3
Silt	32.3	42.6
Clay	24.0	13.7

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	26
Plastic Limit:	15
Plasticity Index:	11
Activity Index:	0.79

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL

Group Name: Sandy lean clay

AASHTO Classification: A-6 (3)

Comments:

Reviewed by:

1184

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-3, 3.0'-4.5', 6.5'-8.0', 8.0'-9.5'	Lab ID	1956
County	Clinton, Tennessee	Date Received	8-21-09
Sample Type	SPT Comp	Date Reported	11-6-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	100.0
3/8"	9.5	94.9
No. 4	4.75	89.9
No. 10	2	73.0
No. 40	0.425	57.8
No. 200	0.075	47.3
	0.02	33.8
	0.005	22.2
	0.002	12.8
estimated	0.001	4.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	10.1	27.0
Coarse Sand	16.9	15.2
Medium Sand	15.2	---
Fine Sand	10.5	10.5
Silt	25.1	34.5
Clay	22.2	12.8

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	35
Plastic Limit:	23
Plasticity Index:	12
Activity Index:	0.92

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: SC
Group Name: Clayey sand

AASHTO Classification: A-6 (3)

Comments:

Reviewed by:

1184

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-70, 40.5'-42.0', 42.0'-43.5'	Lab ID	934
County	Clinton, Tennessee	Date Received	7-14-09
Sample Type	SPT Comp	Date Reported	9-25-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	100.0
3/8"	9.5	91.3
No. 4	4.75	87.6
No. 10	2	84.6
No. 40	0.425	78.6
No. 200	0.075	49.2
	0.02	28.1
	0.005	17.4
	0.002	13.0
estimated	0.001	10.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	12.4	15.4
Coarse Sand	3.0	6.0
Medium Sand	6.0	---
Fine Sand	29.4	29.4
Silt	31.8	36.2
Clay	17.4	13.0

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	26
Plastic Limit:	17
Plasticity Index:	9
Activity Index:	0.69

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: SC
Group Name: Clayey sand

AASHTO Classification: A-4 (1)

Comments:

Reviewed by: RJ

1033

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-70, 31.5'-33.0', 33.0'-34.5', 34.5'-36.0'	Lab ID	927
County	Clinton, Tennessee	Date Received	7-14-09
Sample Type	SPT Comp	Date Reported	9-25-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	100.0
3/4"	19	98.9
3/8"	9.5	98.9
No. 4	4.75	98.7
No. 10	2	82.6
No. 40	0.425	82.2
No. 200	0.075	79.5
	0.02	60.5
	0.005	40.4
	0.002	31.5
estimated	0.001	26.0

Plus 3 in. material, not included: 0 (%)

Range	ASTM (%)	AASHTO (%)
Gravel	1.3	17.4
Coarse Sand	16.1	0.4
Medium Sand	0.4	---
Fine Sand	2.7	2.7
Silt	39.1	48.0
Clay	40.4	31.5

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	48
Plastic Limit:	21
Plasticity Index:	27
Activity Index:	0.84

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL

Group Name: Lean clay with sand

AASHTO Classification: A-7-6 (22)

Comments:

Reviewed by: RJ

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-70, 3.0'-4.5', 4.5'-6.0', 6.0'-7.5'	Lab ID	907
County	Clinton, Tennessee	Date Received	7-14-09
Sample Type	SPT Comp	Date Reported	9-25-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	100.0
3/8"	9.5	98.8
No. 4	4.75	93.8
No. 10	2	79.0
No. 40	0.425	62.9
No. 200	0.075	52.4
	0.02	29.2
	0.005	20.5
	0.002	16.6
estimated	0.001	13.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	6.2	21.0
Coarse Sand	14.8	16.1
Medium Sand	16.1	---
Fine Sand	10.5	10.5
Silt	31.9	35.8
Clay	20.5	16.6

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	32
Plastic Limit:	21
Plasticity Index:	11
Activity Index:	0.65

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol:	CL
Group Name:	Sandy lean clay
AASHTO Classification:	A-6 (3)

Comments:

Reviewed by: RJ

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-68, 4.5'-6.0', 6.0'-7.5', 7.5'-9.0'	Lab ID	858
County	Clinton, Tennessee	Date Received	7-14-09
Sample Type	SPT Comp	Date Reported	9-25-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	
No. 4	4.75	
No. 10	2	100.0
No. 40	0.425	99.8
No. 200	0.075	96.4
	0.02	77.5
	0.005	50.4
	0.002	39.4
estimated	0.001	32.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.0
Coarse Sand	0.0	0.2
Medium Sand	0.2	---
Fine Sand	3.4	3.4
Silt	46.0	57.0
Clay	50.4	39.4

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit: 45
Plastic Limit: 22
Plasticity Index: 23
Activity Index: 0.59

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Estimated

Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.70

Classification

Unified Group Symbol: CL
Group Name: Lean clay

AASHTO Classification: A-7-6 (24)

Comments:

Reviewed by: RJ

1033

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-66, 30.0'-31.5', 31.5'-33.0'	Lab ID	851
County	Clinton, Tennessee	Date Received	7-14-09
Sample Type	SPT Comp	Date Reported	9-25-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	100.0
3/4"	19	97.6
3/8"	9.5	97.1
No. 4	4.75	95.2
No. 10	2	91.6
No. 40	0.425	83.3
No. 200	0.075	65.3
	0.02	45.9
	0.005	26.6
	0.002	19.0
estimated	0.001	13.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	4.8	8.4
Coarse Sand	3.6	8.3
Medium Sand	8.3	---
Fine Sand	18.0	18.0
Silt	38.7	46.3
Clay	26.6	19.0

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	38
Plastic Limit:	23
Plasticity Index:	15
Activity Index:	0.79

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL
Group Name: Sandy lean clay

AASHTO Classification: A-6 (8)

Comments:

Reviewed by: RJ

1033

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-66, 12.0'-13.5', 13.5'-15.0', 15.0'-16.5'	Lab ID	838
County	Clinton, Tennessee	Date Received	7-14-09
Sample Type	SPT Comp	Date Reported	9-25-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	
No. 4	4.75	
No. 10	2	100.0
No. 40	0.425	99.7
No. 200	0.075	95.4
	0.02	75.8
	0.005	51.3
	0.002	40.2
estimated	0.001	32.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.0
Coarse Sand	0.0	0.3
Medium Sand	0.3	---
Fine Sand	4.3	4.3
Silt	44.1	55.2
Clay	51.3	40.2

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	45
Plastic Limit:	22
Plasticity Index:	23
Activity Index:	0.58

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol:	CL
Group Name:	Lean clay
AASHTO Classification:	A-7-6 (24)

Comments:

Reviewed by: RJ

1033

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-65, 30.0'-31.5', 31.5'-33.0', 33.0'-34.5'	Lab ID	820
County	Clinton, Tennessee	Date Received	7-14-09
Sample Type	SPT Comp	Date Reported	9-25-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	
No. 4	4.75	100.0
No. 10	2	99.3
No. 40	0.425	99.1
No. 200	0.075	96.3
	0.02	75.5
	0.005	41.5
	0.002	29.4
estimated	0.001	21.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.7
Coarse Sand	0.7	0.2
Medium Sand	0.2	---
Fine Sand	2.8	2.8
Silt	54.8	66.9
Clay	41.5	29.4

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	39
Plastic Limit:	23
Plasticity Index:	16
Activity Index:	0.55

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol:	CL
Group Name:	Lean clay
AASHTO Classification:	A-6 (17)

Comments:

Reviewed by: RJ

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Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-65, 3.0'-4.5', 4.5'-6.0', 6.0'-7.5'	Lab ID	801
County	Clinton, Tennessee	Date Received	7-14-09
Sample Type	SPT Comp	Date Reported	9-25-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	100.0
3/8"	9.5	97.7
No. 4	4.75	94.0
No. 10	2	87.2
No. 40	0.425	64.9
No. 200	0.075	53.4
	0.02	30.6
	0.005	20.2
	0.002	16.7
estimated	0.001	15.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	6.0	12.8
Coarse Sand	6.8	22.3
Medium Sand	22.3	---
Fine Sand	11.5	11.5
Silt	33.2	36.7
Clay	20.2	16.7

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	36
Plastic Limit:	23
Plasticity Index:	13
Activity Index:	0.76

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol:	CL
Group Name:	Sandy lean clay
AASHTO Classification:	A-6 (4)

Comments:

Reviewed by: RJ

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-63, 34.5'-36.0', 36.0'-37.5', 37.5'-39.0'	Lab ID	795
County	Clinton, Tennessee	Date Received	7-14-09
Sample Type	SPT Comp	Date Reported	9-25-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	100.0
1"	25	97.4
3/4"	19	97.4
3/8"	9.5	82.7
No. 4	4.75	67.3
No. 10	2	52.2
No. 40	0.425	41.1
No. 200	0.075	26.3
	0.02	14.5
	0.005	8.4
	0.002	6.2
estimated	0.001	5.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	32.7	47.8
Coarse Sand	15.1	11.1
Medium Sand	11.1	---
Fine Sand	14.8	14.8
Silt	17.9	20.1
Clay	8.4	6.2

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit: 25
Plastic Limit: 19
Plasticity Index: 6
Activity Index: 1.00

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Estimated

Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.70

Classification

Unified Group Symbol: SC-SM
Group Name: Silty, clayey sand with gravel

AASHTO Classification: A-2-4 (0)

Comments:

Reviewed by: RJ

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Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-63, 6.0'-7.5', 7.5'-9.0', 9.0'-10.5'	Lab ID	775
County	Clinton, Tennessee	Date Received	7-14-09
Sample Type	SPT Comp	Date Reported	9-25-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	100.0
3/8"	9.5	99.0
No. 4	4.75	97.8
No. 10	2	96.6
No. 40	0.425	94.9
No. 200	0.075	84.0
	0.02	63.4
	0.005	42.0
	0.002	33.0
estimated	0.001	27.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	2.2	3.4
Coarse Sand	1.2	1.7
Medium Sand	1.7	---
Fine Sand	10.9	10.9
Silt	42.0	51.0
Clay	42.0	33.0

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	39
Plastic Limit:	20
Plasticity Index:	19
Activity Index:	0.58

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL

Group Name: Lean clay with sand

AASHTO Classification: A-6 (16)

Comments:

Reviewed by: RJ

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-61, 22.5'-24.0', 24.0'-25.5', 25.5'-27.0'	Lab ID	730
County	Clinton, Tennessee	Date Received	7-14-09
Sample Type	SPT Comp	Date Reported	9-25-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	100.0
No. 4	4.75	99.9
No. 10	2	99.7
No. 40	0.425	99.5
No. 200	0.075	45.1
	0.02	25.9
	0.005	17.7
	0.002	13.3
estimated	0.001	10.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.1	0.3
Coarse Sand	0.2	0.2
Medium Sand	0.2	---
Fine Sand	54.4	54.4
Silt	27.4	31.8
Clay	17.7	13.3

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	21
Plastic Limit:	18
Plasticity Index:	3
Activity Index:	0.23

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol:	SM
Group Name:	Silty sand
AASHTO Classification:	A-4 (0)

Comments:

Reviewed by: RJ

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-60, 1.5'-3.0', 3.0'-4.5', 4.5'-6.0'	Lab ID	682
County	Clinton, Tennessee	Date Received	7-14-09
Sample Type	SPT Comp	Date Reported	9-25-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	100.0
3/8"	9.5	99.0
No. 4	4.75	98.5
No. 10	2	97.0
No. 40	0.425	82.2
No. 200	0.075	72.8
	0.02	47.2
	0.005	33.9
	0.002	28.1
estimated	0.001	24.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	1.5	3.0
Coarse Sand	1.5	14.8
Medium Sand	14.8	---
Fine Sand	9.4	9.4
Silt	38.9	44.7
Clay	33.9	28.1

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	41
Plastic Limit:	23
Plasticity Index:	18
Activity Index:	0.64

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL

Group Name: Lean clay with sand

AASHTO Classification: A-7-6 (12)

Comments:

Reviewed by: RJ

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-59, 6.5'-8.0', 8.0'-9.5'	Lab ID	628
County	Clinton, Tennessee	Date Received	7-14-09
Sample Type	SPT Comp	Date Reported	9-25-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	
No. 4	4.75	100.0
No. 10	2	99.9
No. 40	0.425	99.1
No. 200	0.075	93.5
	0.02	80.3
	0.005	53.9
	0.002	40.1
estimated	0.001	33.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.1
Coarse Sand	0.1	0.8
Medium Sand	0.8	---
Fine Sand	5.6	5.6
Silt	39.6	53.4
Clay	53.9	40.1

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit: 48
Plastic Limit: 23
Plasticity Index: 25
Activity Index: 0.63

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3): N/A
Maximum Dry Density (kg/m^3): N/A
Optimum Moisture Content (%): N/A
Over Size Correction %: N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%): N/A
Compacted Dry Density (lb/ft^3): N/A
Compacted Moisture Content (%): N/A

Specific Gravity

Estimated

Particle Size: No. 10
Specific Gravity at 20° Celsius: 2.70

Classification

Unified Group Symbol: CL
Group Name: Lean clay

AASHTO Classification: A-7-6 (26)

Comments:

Reviewed by: RJ

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Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-58, 24.0'-25.5', 25.5'-27.0', 27.0'-28.5'	Lab ID	608
County	Clinton, Tennessee	Date Received	7-14-09
Sample Type	SPT Comp	Date Reported	9-25-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	100.0
No. 4	4.75	100.0
No. 10	2	99.9
No. 40	0.425	99.8
No. 200	0.075	89.1
	0.02	65.3
	0.005	44.5
	0.002	34.9
estimated	0.001	30.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.1
Coarse Sand	0.1	0.1
Medium Sand	0.1	---
Fine Sand	10.7	10.7
Silt	44.6	54.2
Clay	44.5	34.9

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	38
Plastic Limit:	19
Plasticity Index:	19
Activity Index:	0.54

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol:	CL
Group Name:	Lean clay
AASHTO Classification:	A-6 (17)

Comments:

Reviewed by: RJ

1083

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-56, 10.5'-12.0', 12.0'-13.5', 13.5'-15.0'	Lab ID	573
County	Clinton, Tennessee	Date Received	7-14-09
Sample Type	SPT Comp	Date Reported	9-25-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	100.0
3/8"	9.5	99.6
No. 4	4.75	99.6
No. 10	2	99.6
No. 40	0.425	99.4
No. 200	0.075	93.1
	0.02	71.8
	0.005	49.0
	0.002	36.4
estimated	0.001	29.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.4	0.4
Coarse Sand	0.0	0.2
Medium Sand	0.2	---
Fine Sand	6.3	6.3
Silt	44.1	56.7
Clay	49.0	36.4

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	47
Plastic Limit:	22
Plasticity Index:	25
Activity Index:	0.69

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL
Group Name: Lean clay

AASHTO Classification: A-7-6 (25)

Comments:

Reviewed by: RJ

1033

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-55, 31.5'-33.0', 33.0'-34.5', 34.5'-36.0'	Lab ID	555
County	Clinton, Tennessee	Date Received	7-14-09
Sample Type	SPT Comp	Date Reported	9-25-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	
3/4"	19	
3/8"	9.5	
No. 4	4.75	100.0
No. 10	2	100.0
No. 40	0.425	99.9
No. 200	0.075	59.7
	0.02	37.5
	0.005	25.3
	0.002	20.6
estimated	0.001	18.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	0.0	0.0
Coarse Sand	0.0	0.1
Medium Sand	0.1	---
Fine Sand	40.2	40.2
Silt	34.4	39.1
Clay	25.3	20.6

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	27
Plastic Limit:	17
Plasticity Index:	10
Activity Index:	0.48

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol:	CL
Group Name:	Sandy lean clay
AASHTO Classification:	A-4 (3)

Comments:

Reviewed by: RJ

10332

Stantec

Summary of Soil Tests

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-55, 3.0'-4.5', 4.5'-6.0', 6.0'-7.5'	Lab ID	535
County	Clinton, Tennessee	Date Received	7-14-09
Sample Type	SPT Comp	Date Reported	9-25-09

Test Results

Natural Moisture Content

Test Not Performed

Moisture Content (%): N/A

Particle Size Analysis

Preparation Method: ASTM D 421
Gradation Method: ASTM D 422
Hydrometer Method: ASTM D 422

Particle Size		%
Sieve Size	(mm)	Passing
3"	75	
2"	50	
1 1/2"	37.5	
1"	25	100.0
3/4"	19	96.7
3/8"	9.5	95.9
No. 4	4.75	91.5
No. 10	2	87.8
No. 40	0.425	70.6
No. 200	0.075	59.7
	0.02	36.4
	0.005	25.6
	0.002	21.5
estimated	0.001	19.0

Plus 3 in. material, not included: 0 (%)

	ASTM	AASHTO
Range	(%)	(%)
Gravel	8.5	12.2
Coarse Sand	3.7	17.2
Medium Sand	17.2	---
Fine Sand	10.9	10.9
Silt	34.1	38.2
Clay	25.6	21.5

Atterberg Limits

Test Method: ASTM D 4318 Method A
Prepared: Dry

Liquid Limit:	43
Plastic Limit:	24
Plasticity Index:	19
Activity Index:	0.86

Moisture-Density Relationship

Test Not Performed

Maximum Dry Density (lb/ft^3):	N/A
Maximum Dry Density (kg/m^3):	N/A
Optimum Moisture Content (%):	N/A
Over Size Correction %:	N/A

California Bearing Ratio

Test Not Performed

Bearing Ratio (%):	N/A
Compacted Dry Density (lb/ft^3):	N/A
Compacted Moisture Content (%):	N/A

Specific Gravity

Estimated

Particle Size:	No. 10
Specific Gravity at 20° Celsius:	2.70

Classification

Unified Group Symbol: CL
Group Name: Sandy lean clay

AASHTO Classification: A-7-6 (9)

Comments:

Reviewed by: RJ

535

Attachment 3
Unit Weight (Density)
Tests

Stantec

Unconfined Compressive Strength of Cohesive Soil

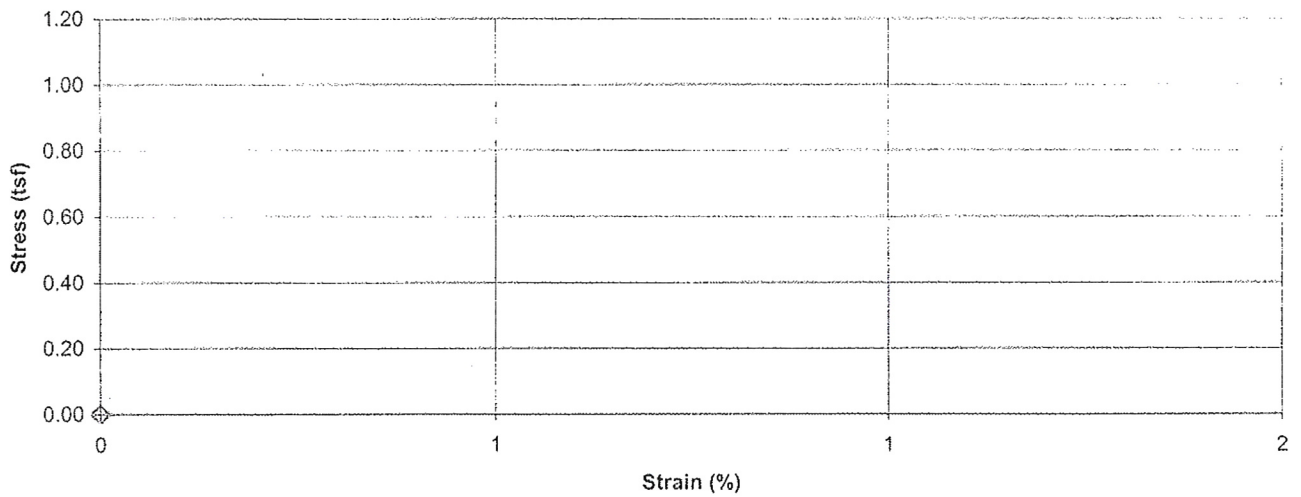
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-25P, 26.0'-28.0' | Lab ID: 990A
Visual Description: Silt with Sand (ML), gray, moist, firm, fly ash
Recovered: 1.9'
Test Interval: 26.0' - 26.5'

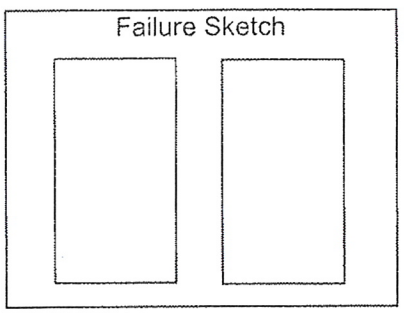
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/30/2009
Date Tested: N/A

Initial Wet Density (pcf)	111.0	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	26.7		
Initial Dry Density (pcf)	87.6		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.012	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.866	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments: Initial mc determined using 60° C oven

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-25P, 26.0'-28.0' | Lab ID: 990B
Visual Description: Silt with Sand (ML), gray, moist, firm, fly ash

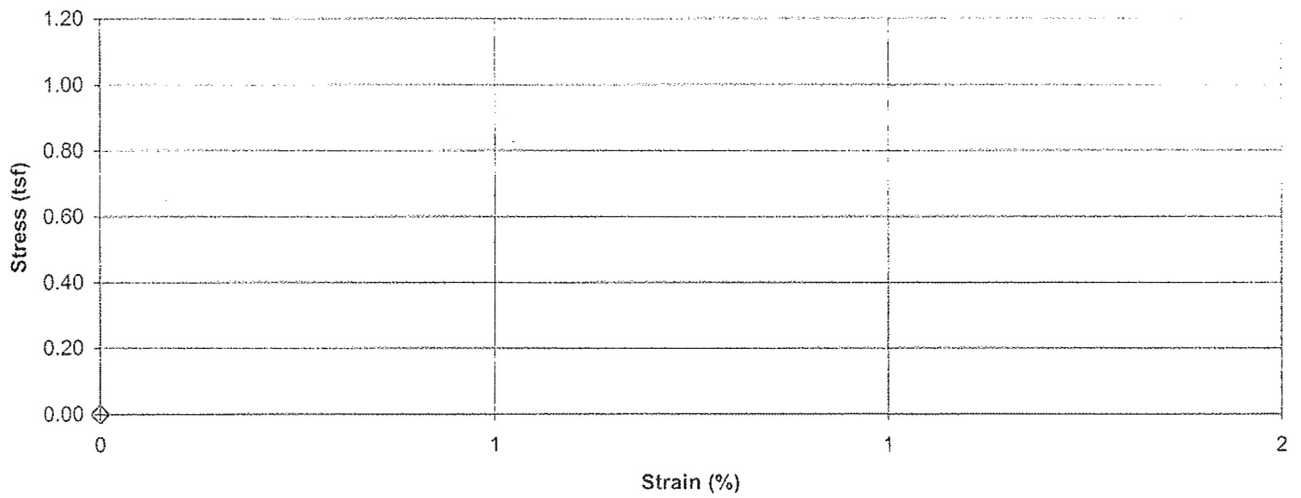
Recovered: 1.9'
Test Interval: 26.6' - 27.1'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

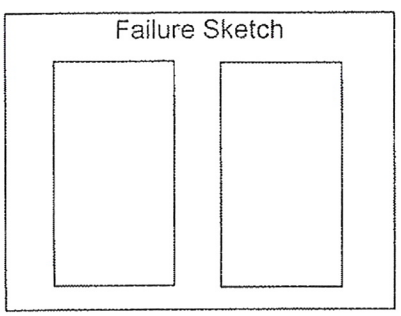
Date Extruded: 09/30/2009
Date Tested: N/A

Initial Wet Density (pcf)	108.3	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	29.8		
Initial Dry Density (pcf)	83.5		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.997	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.856	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments: Initial mc determined using 60° C oven

Reviewed By:

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-25P, 26.0'-28.0' | Lab ID: 990C
Visual Description: Silt with Sand (ML), gray, moist, firm, fly ash

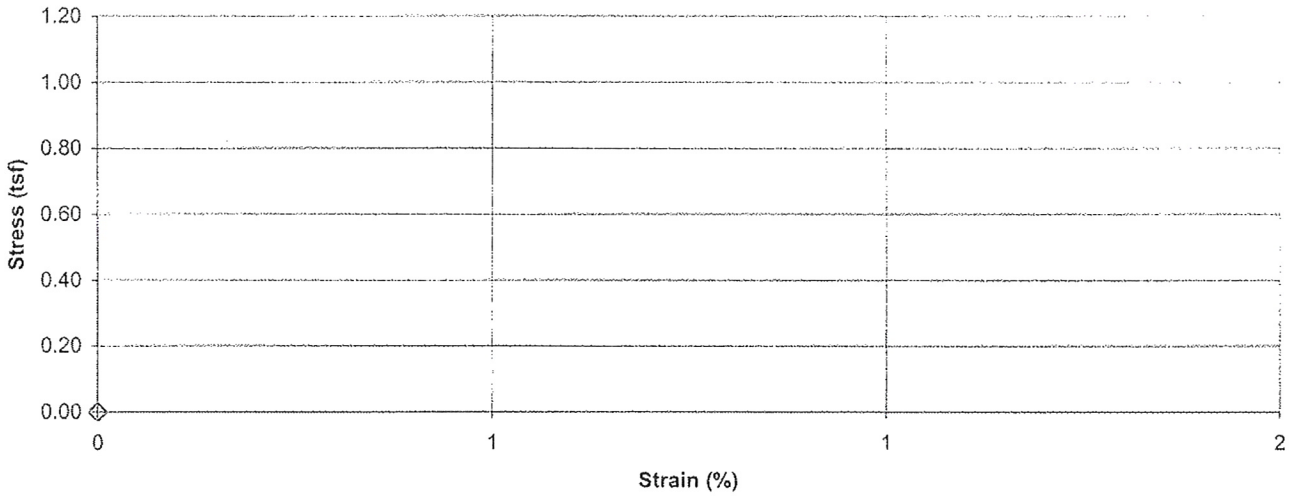
Recovered: 1.9'
Test Interval: 27.2' - 27.7'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

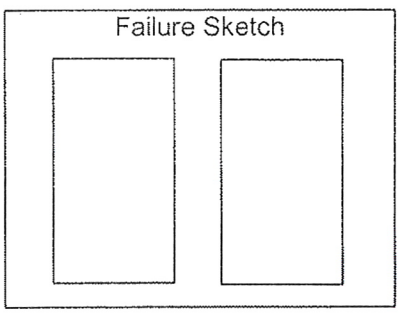
Date Extruded: 09/30/2009
Date Tested: N/A

Initial Wet Density (pcf)	103.8	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	34.8		
Initial Dry Density (pcf)	77.0		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.053	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.862	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments: Initial mc determined using 60° C oven

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

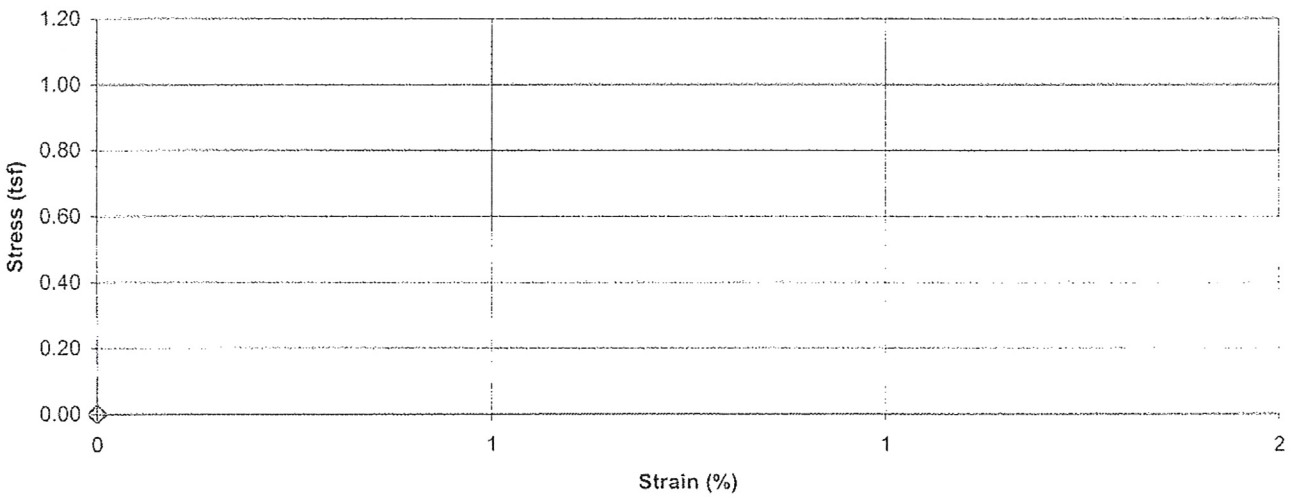
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-25P, 42.0'-44.0' | Lab ID: 991A
Visual Description: Lean Clay with Sand (CL), gray brown, moist, firm
Recovered: 1.6'
Test Interval: 42.2' - 42.7'

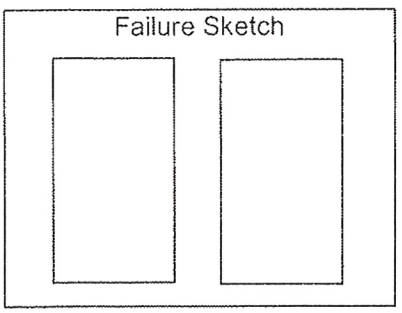
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/11/2009
Date Tested: N/A

Initial Wet Density (pcf)	121.7	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	24.4		
Initial Dry Density (pcf)	97.9		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.297	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.842	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.2	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments: Fracture at 42.2'

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-25P, 42.0'-44.0' | Lab ID: 991B
Visual Description: Lean Clay (CL), gray brown, moist, firm

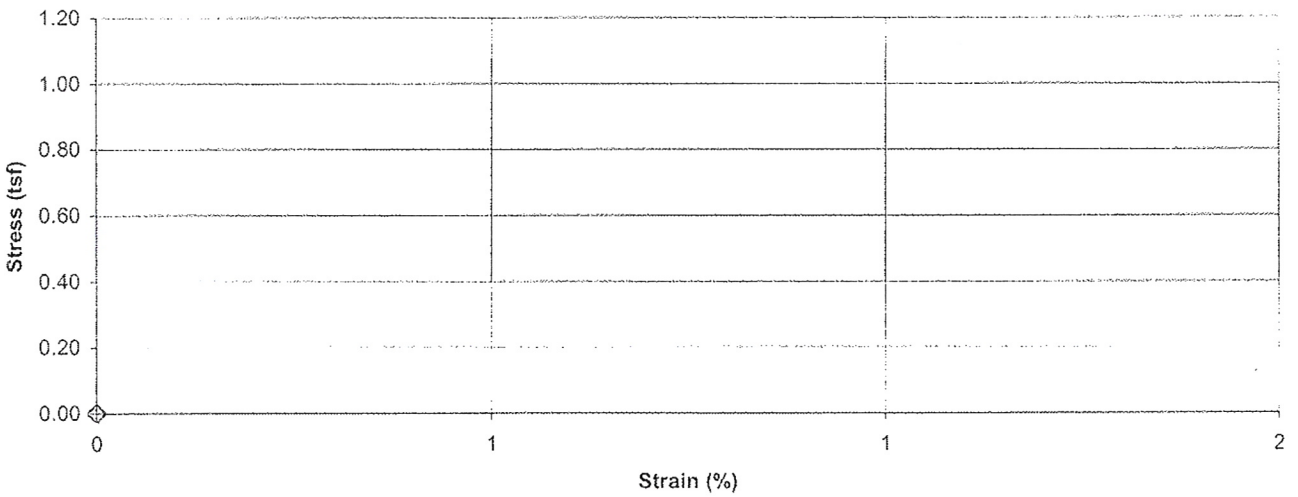
Recovered: 1.6'
Test Interval: 43.0' - 43.5'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

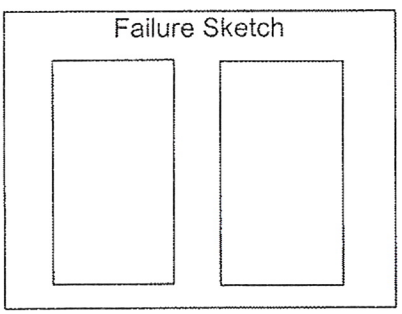
Date Extruded: 09/11/2009
Date Tested: N/A

Initial Wet Density (pcf)	127.2	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	24.6		
Initial Dry Density (pcf)	102.1		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.920	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.871	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

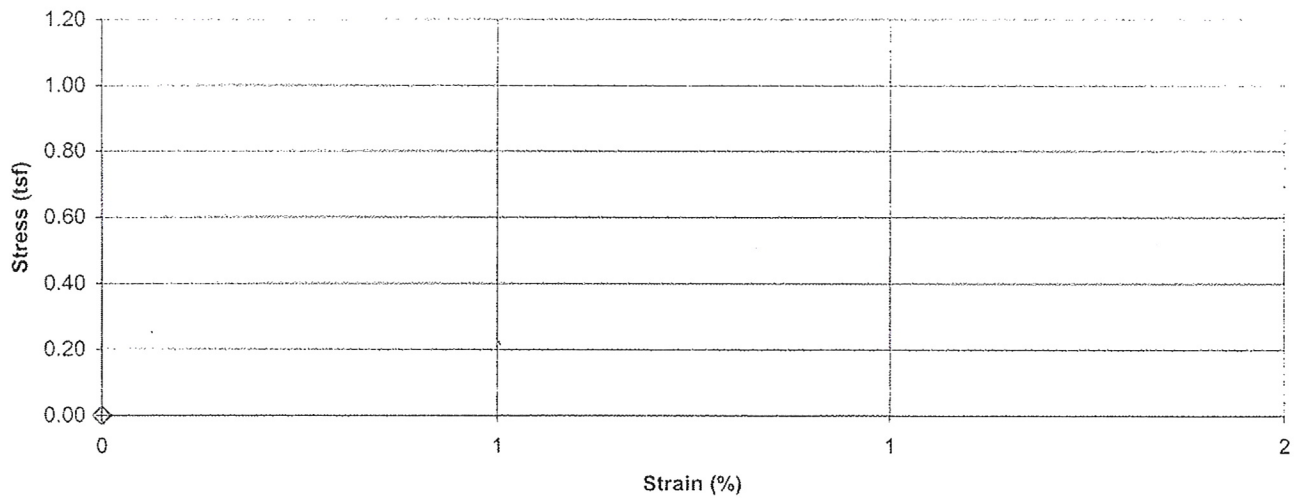
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-25P, 44.0'-46.0' | Lab ID: 992A
Visual Description: Lean Clay (CL), gray brown, moist, firm
(44.0'-44.4', Poorly Graded Sand (SP), black, moist, soft to firm, bottom ash) | Recovered: 1.5'
Test Interval: 44.4' - 44.9'

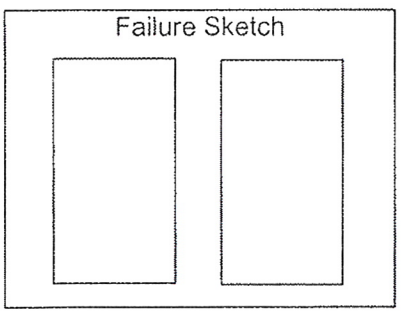
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A | Date Extruded: 09/11/2009 | Date Tested: N/A

Initial Wet Density (pcf)	124.9		
Initial Moisture Content (%)	24.3	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	100.5		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.805	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.868	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.0	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

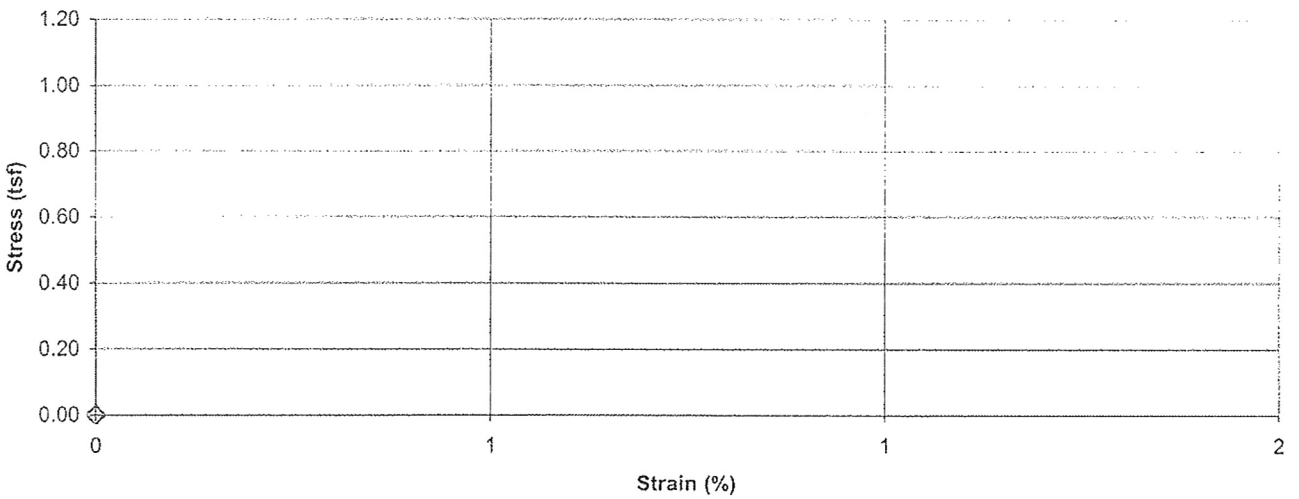
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-25P, 44.0'-46.0' | Lab ID: 992B
Visual Description: Lean Clay (CL), gray brown, moist, firm
Recovered: 1.5'
Test Interval: 44.9' - 45.4'

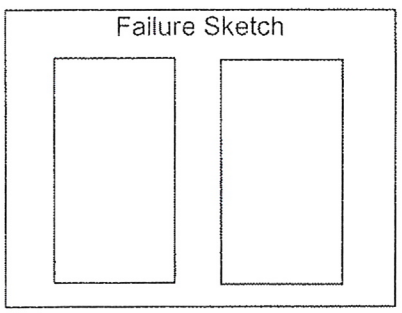
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/11/2009
Date Tested: N/A

Initial Wet Density (pcf)	125.6	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	28.4		
Initial Dry Density (pcf)	97.8		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.993	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.864	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

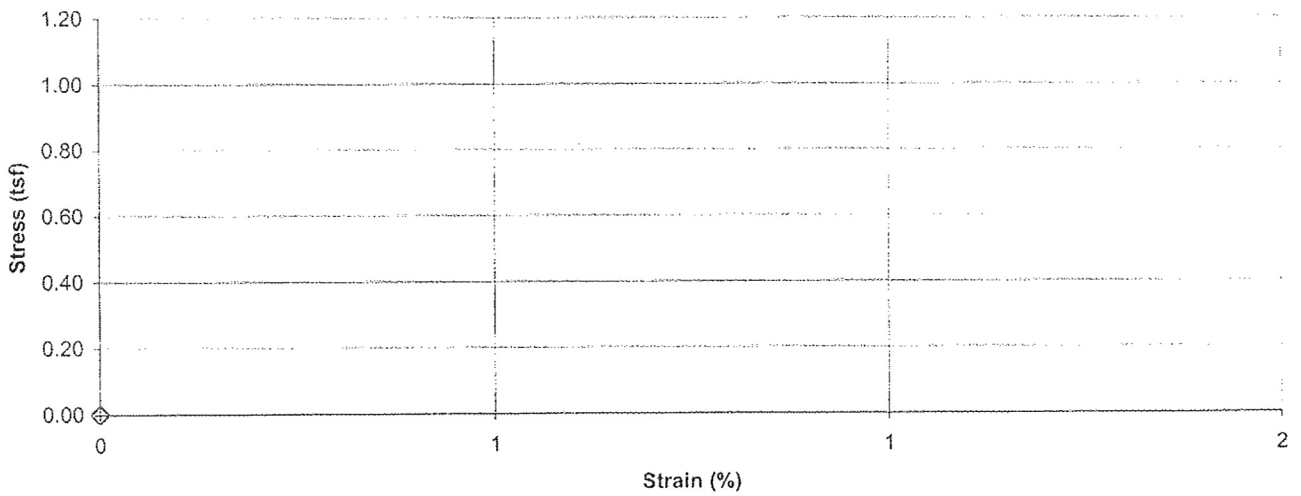
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-25P, 46.0'-48.0' | Lab ID: 993A
Visual Description: Lean Clay (CL), gray, moist, firm
Recovered: 1.2'
Test Interval: 46.2' - 46.7'

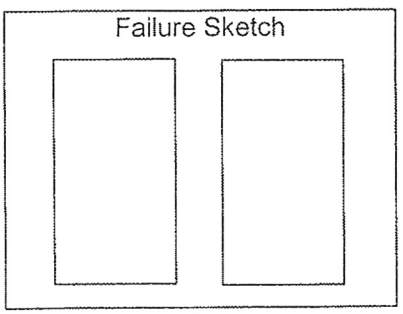
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/11/2009
Date Tested: N/A

Initial Wet Density (pcf)	119.8	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	29.5		
Initial Dry Density (pcf)	92.5		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.820	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.870	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.0	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments: Gouge/fracture at 46.2'

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-25P, 46.0'-48.0' | Lab ID: 993B
Visual Description: Lean Clay (CL), gray, moist, firm

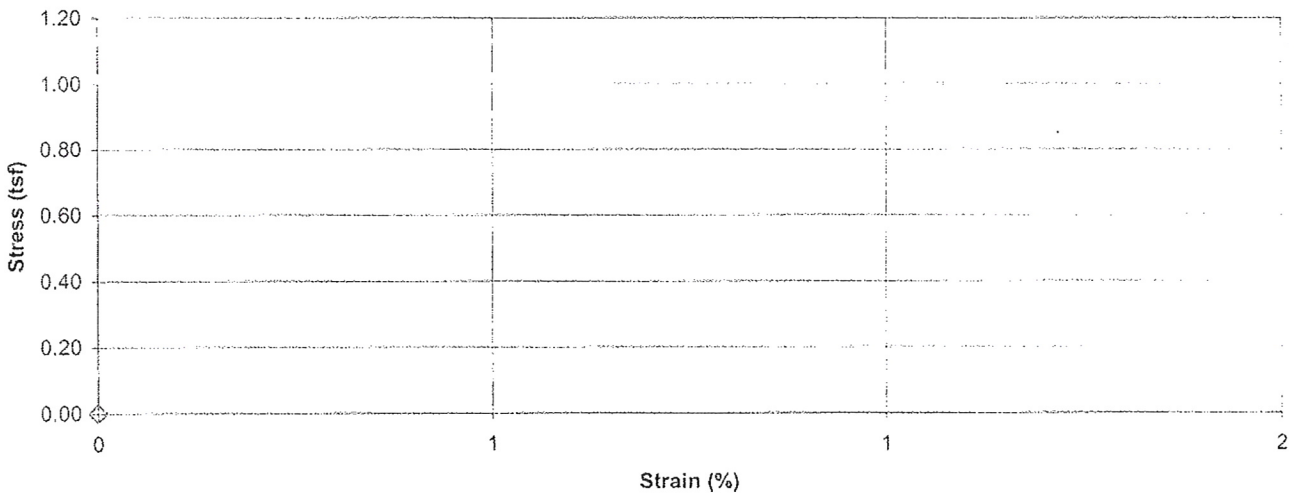
Recovered: 1.2'
Test Interval: 46.7' - 47.2'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

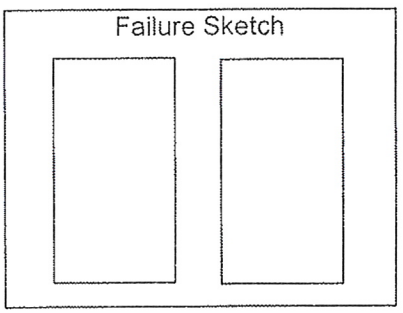
Date Extruded: 09/11/2009
Date Tested: N/A

Initial Wet Density (pcf)	123.7	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	24.9		
Initial Dry Density (pcf)	99.1		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.731	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.875	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.0	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

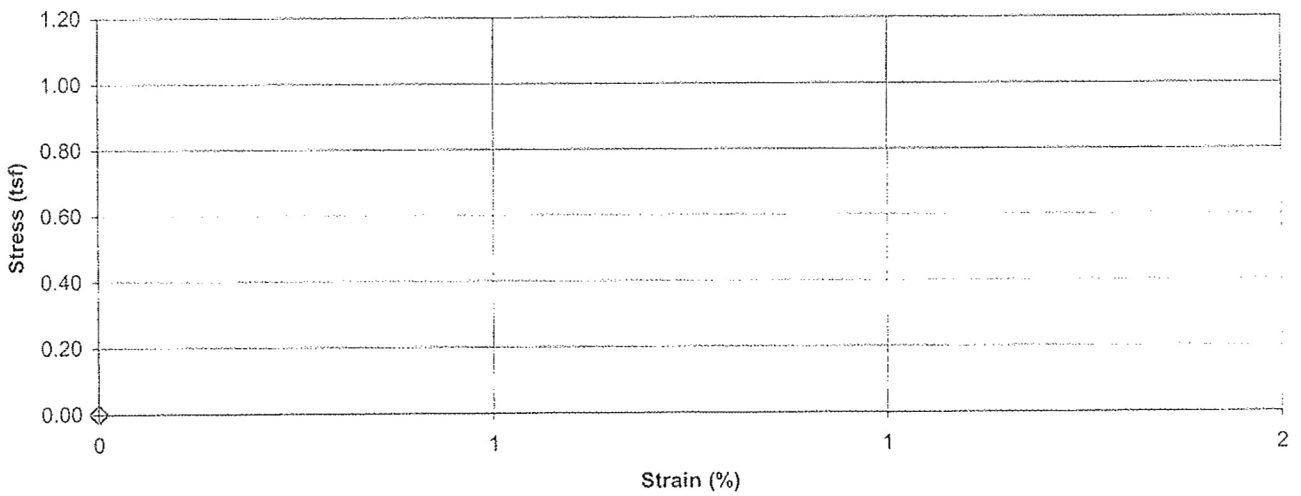
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-25P, 48.0'-50.0' | Lab ID: 994A
Visual Description: Lean Clay (CL), gray brown, moist, firm
Recovered: 1.6'
Test Interval: 48.0' - 48.5'

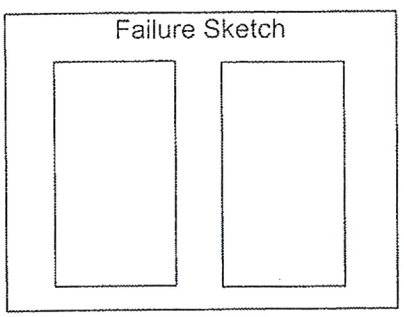
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/11/2009
Date Tested: N/A

Initial Wet Density (pcf)	128.6	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	23.9		
Initial Dry Density (pcf)	103.8		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.965	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.876	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

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Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-25P, 48.0'-50.0' | Lab ID: 994B
Visual Description: Lean Clay (CL), brown, moist, firm

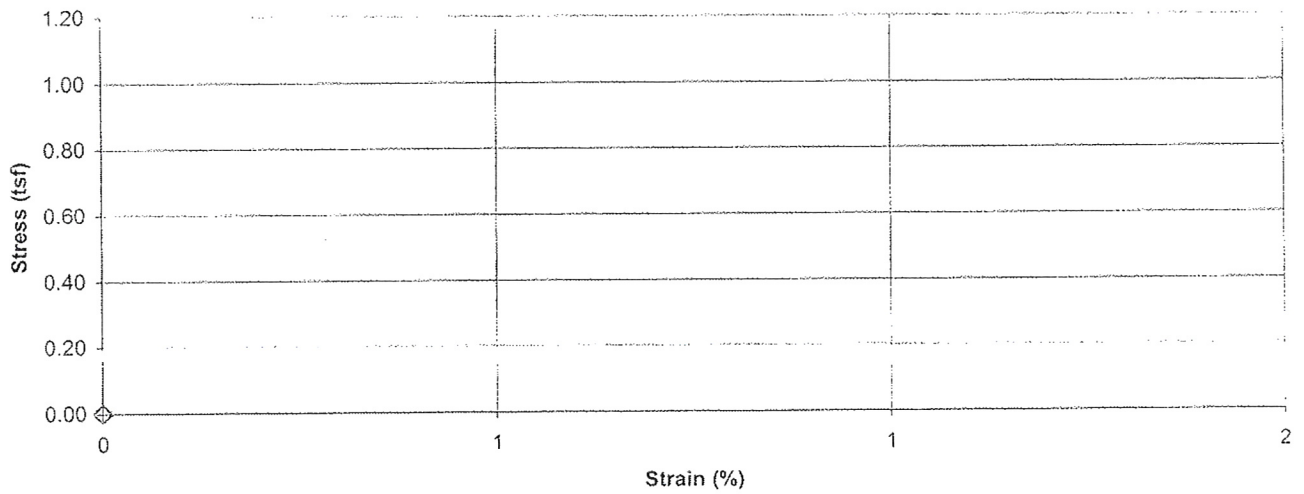
Recovered: 1.6'
Test Interval: 48.5' - 49.0'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

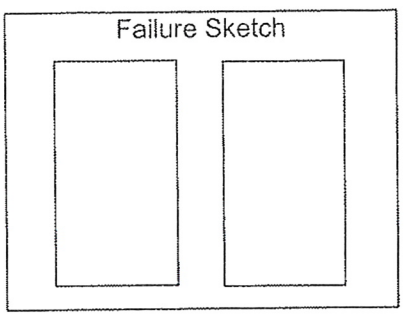
Date Extruded: 09/11/2009
Date Tested: N/A

Initial Wet Density (pcf)	129.3	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	21.9		
Initial Dry Density (pcf)	106.1		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.986	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.878	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

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Unconfined Compressive Strength of Cohesive Soil

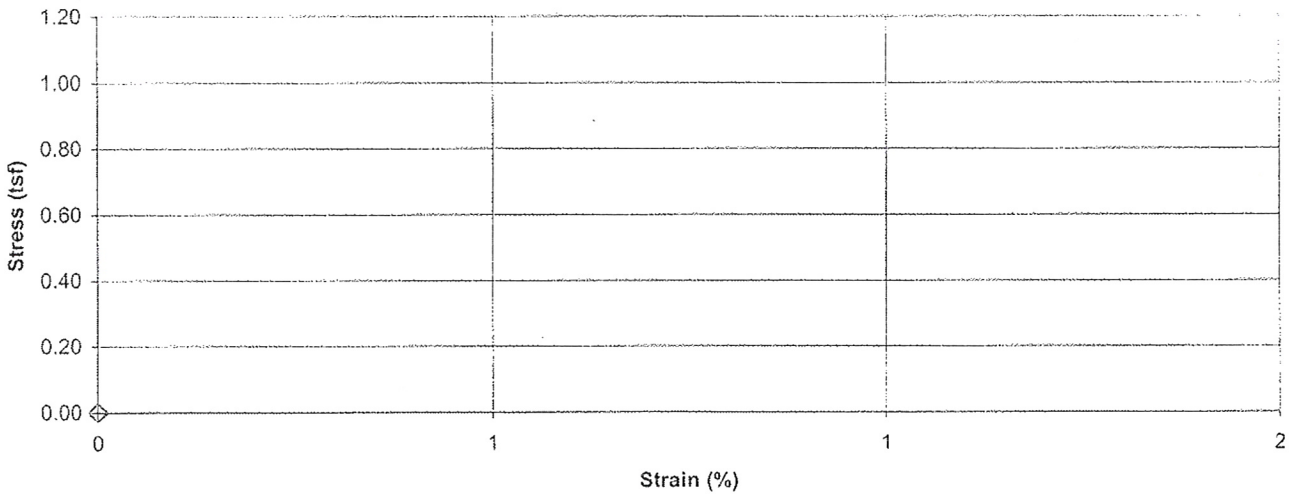
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-25P, 48.0'-50.0' | Lab ID: 994C
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.6'
Test Interval: 49.0' - 49.5'

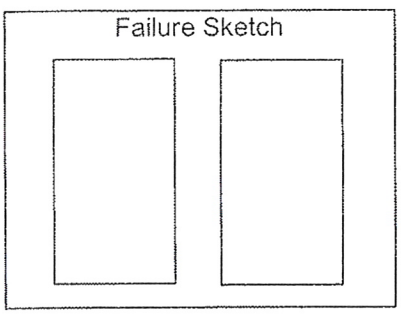
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/11/2009
Date Tested: N/A

Initial Wet Density (pcf)	128.0	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	22.7		
Initial Dry Density (pcf)	104.3		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.018	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.860	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1672

Stantec

Unconfined Compressive Strength of Cohesive Soil

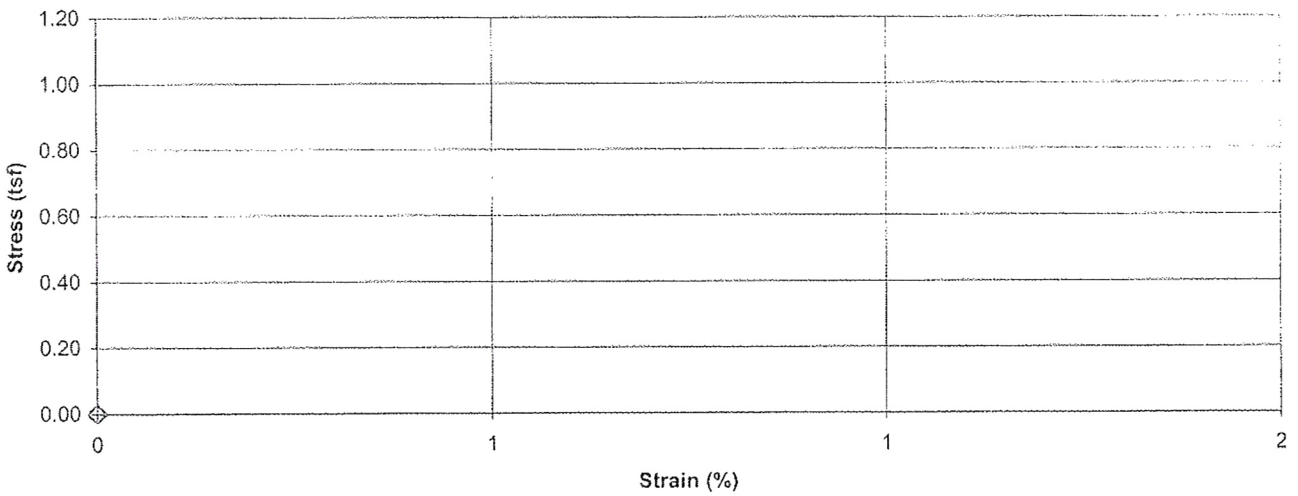
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-25P, 50.0'-52.0' | Lab ID: 995A
Visual Description: Lean Clay with Sand (CL), brown, moist, firm
Recovered: 1.8'
Test Interval: 50.0' - 50.3'

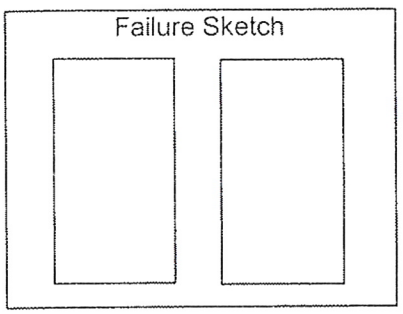
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/11/2009
Date Tested: N/A

Initial Wet Density (pcf)	N/A		
Initial Moisture Content (%)	23.4	Initial MC Taken	Before Test, From Center of Specimen
Initial Dry Density (pcf)	N/A		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	N/A	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	N/A	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	N/A	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments: Unable to obtain specimen due to fractures at 50.2' and 50.3'

Reviewed By: \

1072

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Unconfined Compressive Strength of Cohesive Soil

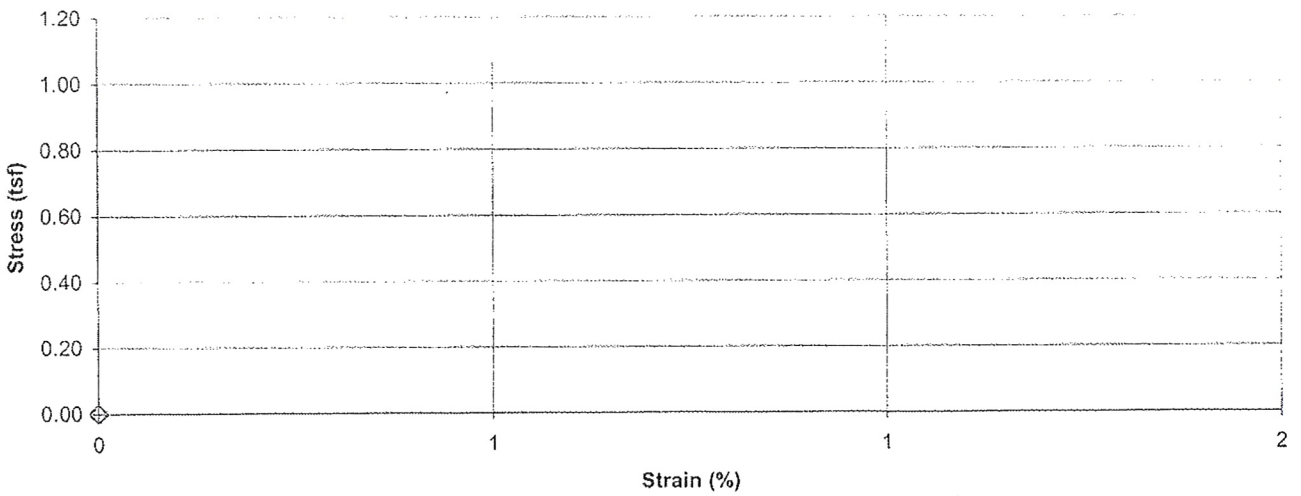
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-25P, 50.0'-52.0' | Lab ID: 995B
Visual Description: Sandy Lean Clay (CL), brown, moist, firm
Recovered: 1.8'
Test Interval: 50.3' - 50.8'

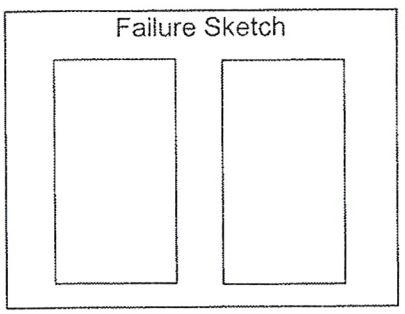
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/11/2009
Date Tested: N/A

Initial Wet Density (pcf)	121.5	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	22.6		
Initial Dry Density (pcf)	99.1		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.937	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.873	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-25P, 50.0'-52.0' | Lab ID: 995C
Visual Description: Sandy Lean Clay (CL), brown, moist, firm

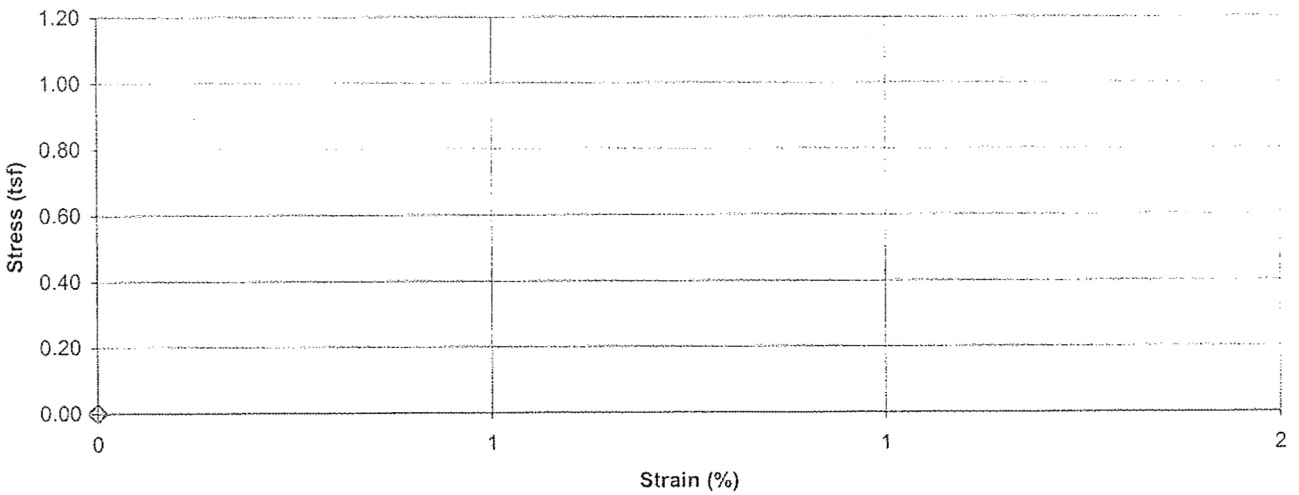
Recovered: 1.8'
Test Interval: 51.3' - 51.8'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

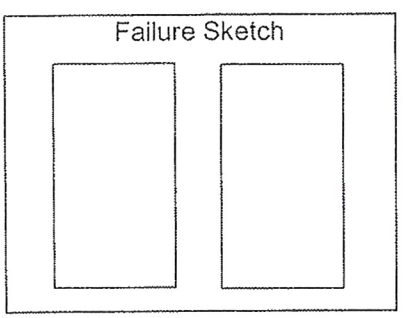
Date Extruded: 09/11/2009
Date Tested: N/A

Initial Wet Density (pcf)	126.6		
Initial Moisture Content (%)	22.4	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	103.5		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.123	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.879	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

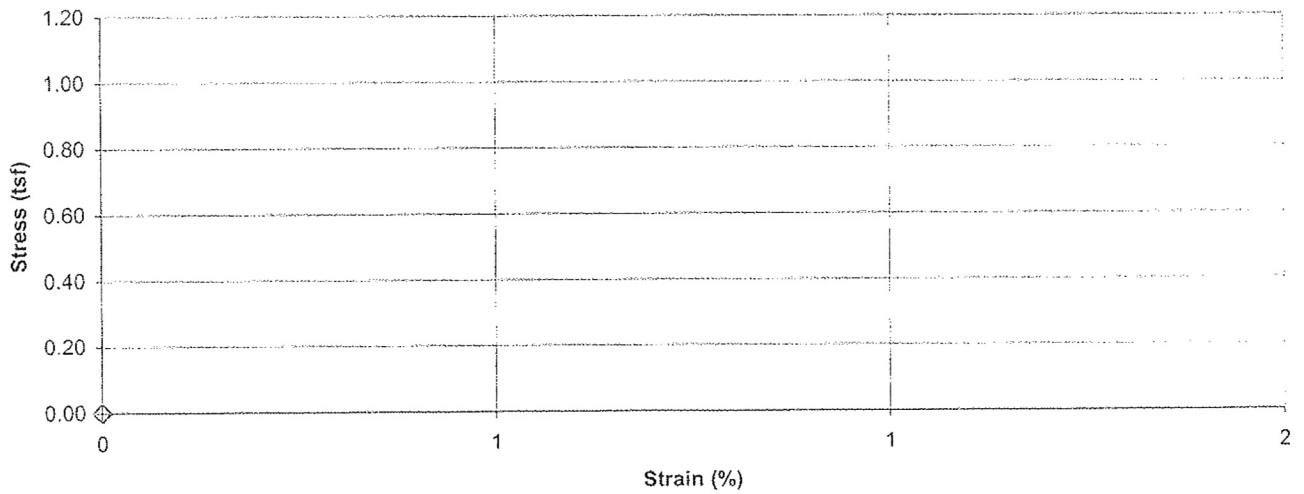
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-25P, 52.0'-54.0' | Lab ID: 996A
Visual Description: Lean Clay with Sand (CL), brown, wet, soft
Recovered: 1.2'
Test Interval: 52.0' - 52.5'

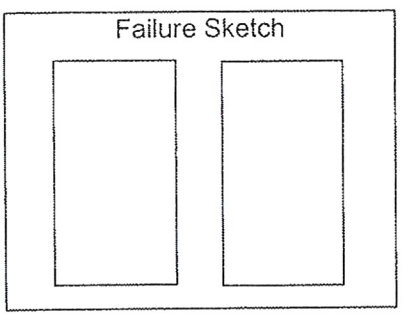
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/14/2009
Date Tested: N/A

Initial Wet Density (pcf)	N/A		
Initial Moisture Content (%)	34.8	Initial MC Taken	Before Test, From Center of Specimen
Initial Dry Density (pcf)	N/A		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	N/A	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	N/A	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	N/A	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments: No test specimen obtained due to fractures throughout.

Reviewed By: [signature]

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

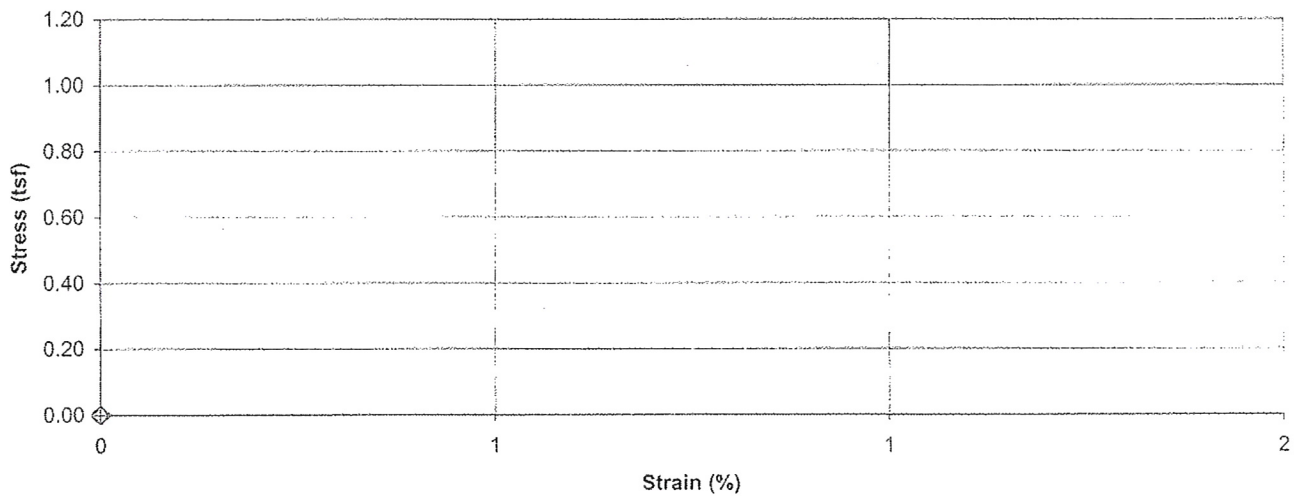
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-25P, 52.0'-54.0' | Lab ID: 996B
Visual Description: lean Clay with Sand (CL), brown, moist, soft
Recovered: 1.2'
Test Interval: 52.6' - 53.1'

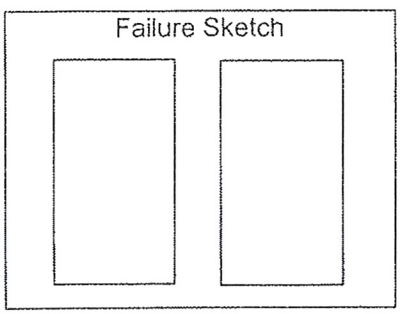
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/14/2009
Date Tested: N/A

Initial Wet Density (pcf)	122.7	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	20.7		
Initial Dry Density (pcf)	101.7		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.048	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.885	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

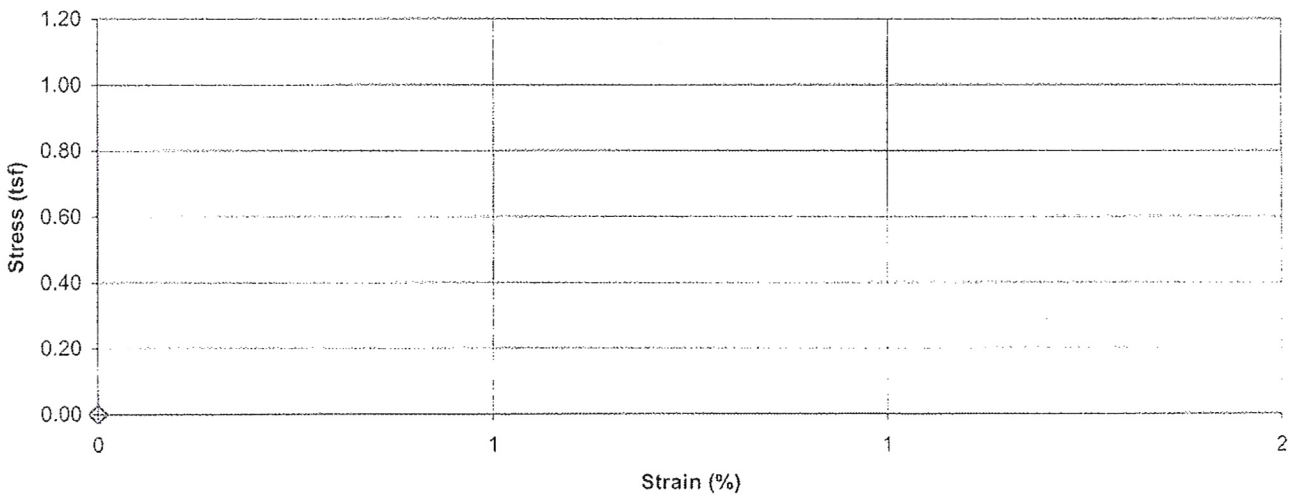
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-29P, 29.0'-31.0' | Lab ID: 1004
Visual Description: Silt (ML), gray, moist, firm, fly ash
Recovered: 1.4'
Test Interval: 29.0' - 29.5'

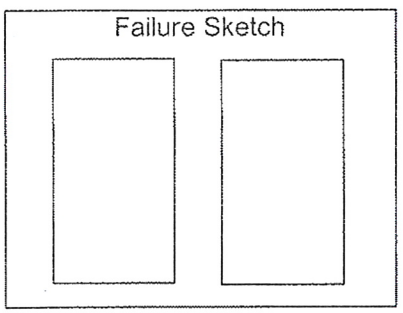
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/30/2009
Date Tested: N/A

Initial Wet Density (pcf)	118.9	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	30.6		
Initial Dry Density (pcf)	91.1		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.988	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.860	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments: Initial mc determined using 60° C oven

Reviewed By:

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-29P, 29.0'-31.0' | Lab ID: 1004B
Visual Description: Silt (ML), gray, moist, firm, fly ash

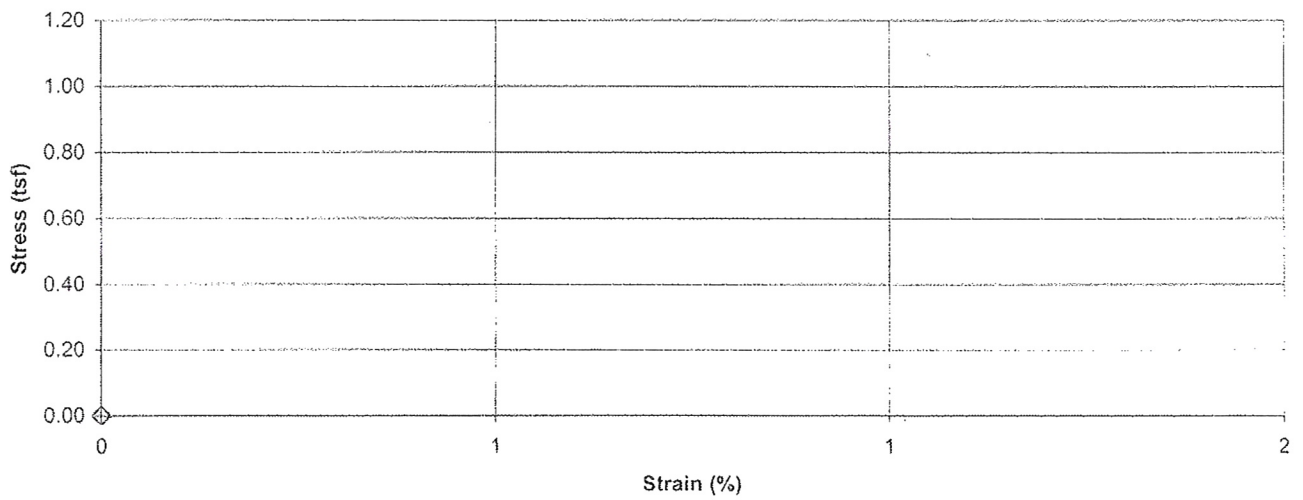
Recovered: 1.4'
Test Interval: 29.6' - 30.1'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

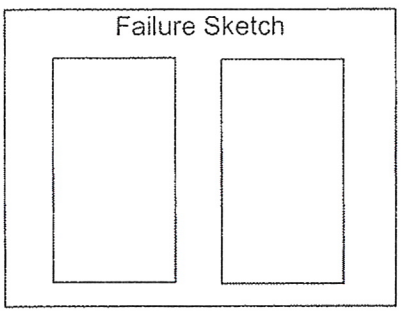
Date Extruded: 09/30/2009
Date Tested: N/A

Initial Wet Density (pcf)	117.3	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	32.0		
Initial Dry Density (pcf)	88.9		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.945	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.858	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments: Initial mc determined using a 60° C oven

Reviewed By:

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-29P, 31.0'-33.0' | Lab ID: 1005A
Visual Description: Silt (ML), gray, moist, soft

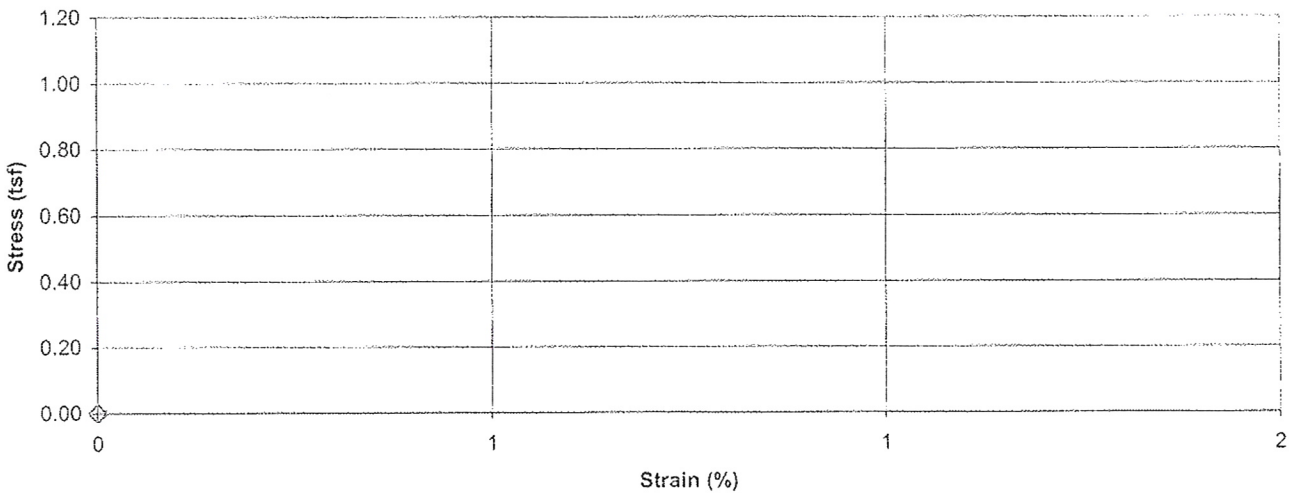
Recovered: 1.4'
Test Interval: 31.0' - 31.5'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

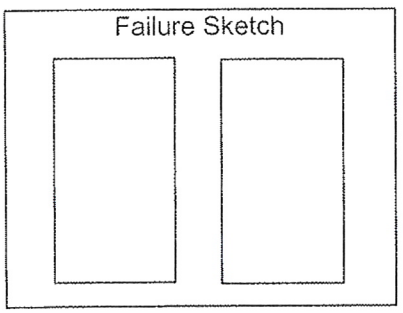
Date Extruded: 09/14/2009
Date Tested: N/A

Initial Wet Density (pcf)	N/A		
Initial Moisture Content (%)	35.5	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	N/A		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	N/A	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	N/A	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	N/A	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments: Unable to obtain specimen due to fracture
Saved in bag

Reviewed By: [signature]

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-29P, 31.0'-33.0' | Lab ID: 1005B
Visual Description: Silt (ML), gray, moist, firm

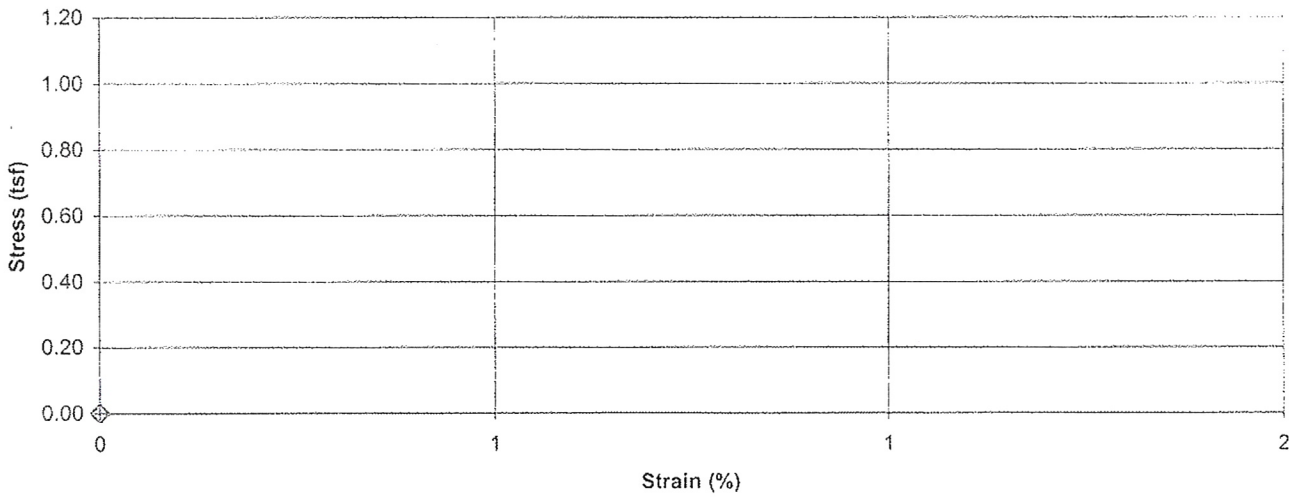
Recovered: 1.4'
Test Interval: 31.6' - 32.0'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

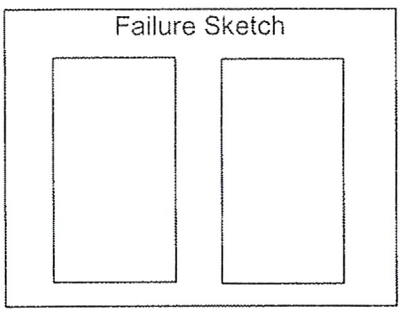
Date Extruded: 09/14/2009
Date Tested: N/A

Initial Wet Density (pcf)	124.8	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	26.9		
Initial Dry Density (pcf)	98.4		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.025	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.856	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

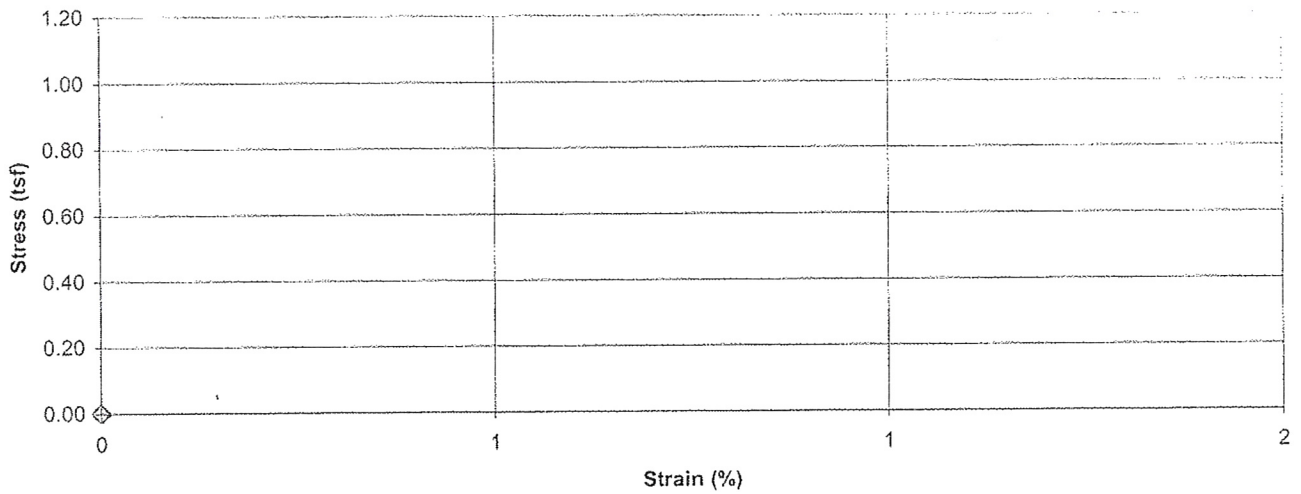
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-29P, 33.0'-35.0' | Lab ID: 1006A
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.4'
Test Interval: 33.0' - 33.5'

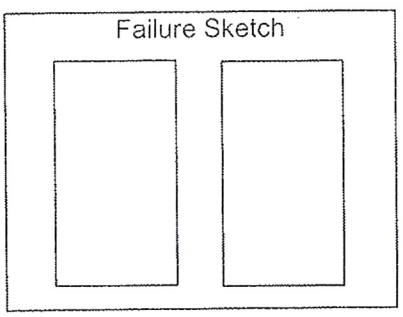
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/14/2009
Date Tested: N/A

Initial Wet Density (pcf)	125.4	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	25.8		
Initial Dry Density (pcf)	99.6		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.946	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.857	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-29P, 33.0'-35.0' | Lab ID: 1006B
Visual Description: Lean Clay (CL), brown, moist, firm

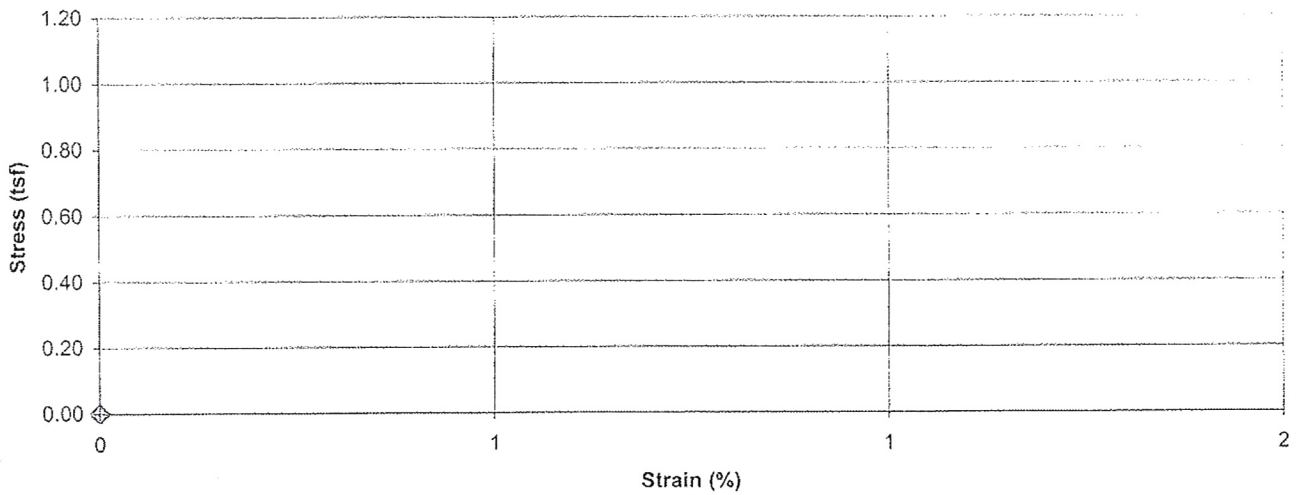
Recovered: 1.4'
Test Interval: 33.6' - 34.1'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

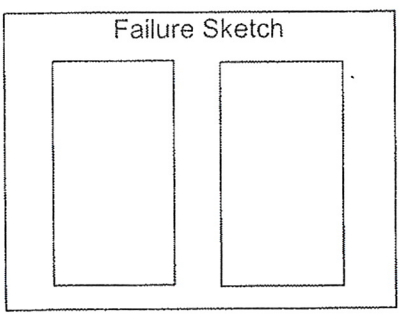
Date Extruded: 09/14/2009
Date Tested: N/A

Initial Wet Density (pcf)	128.7	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	22.7		
Initial Dry Density (pcf)	104.9		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.020	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.863	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

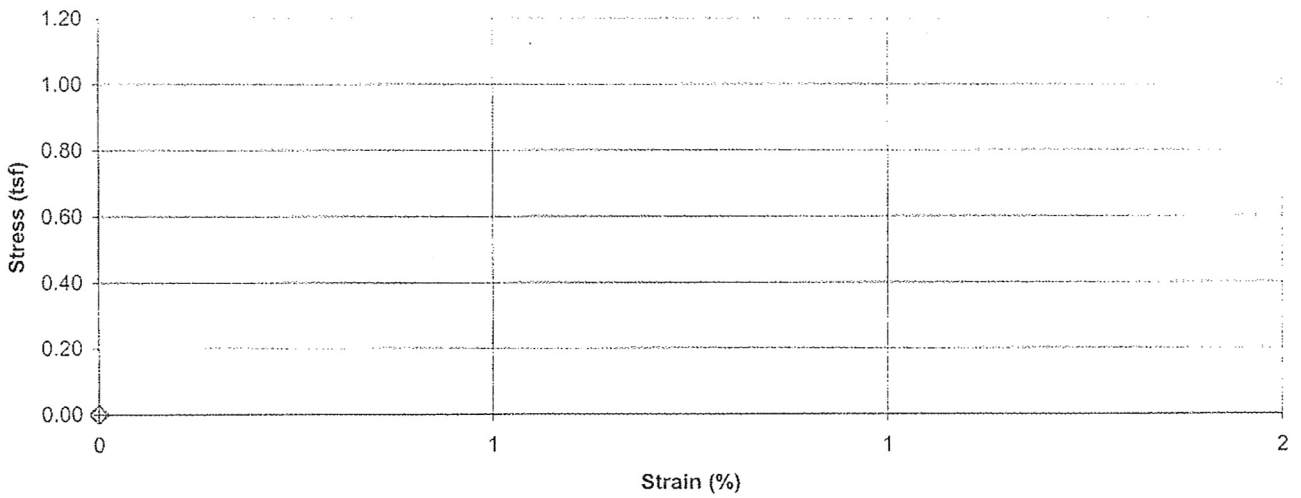
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-34P, 44.0'-46.0' | Lab ID: 1025
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 0.9'
Test Interval: 44.0' - 44.5'

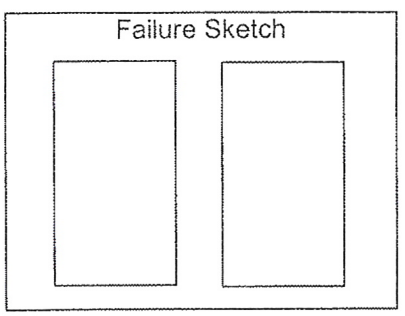
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/14/2009
Date Tested: N/A

Initial Wet Density (pcf)	127.2	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	23.4		
Initial Dry Density (pcf)	103.1		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.029	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.866	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

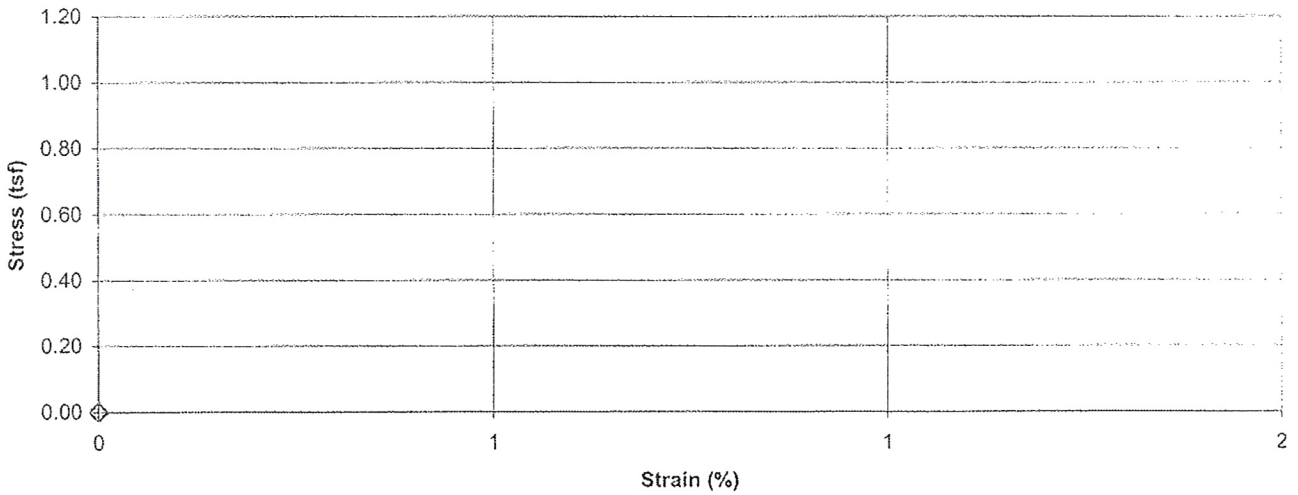
Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

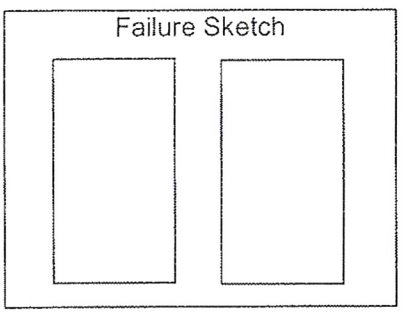
Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-34P, 46.0'-48.0'	Lab ID	1026
Visual Description	Silt (ML), gray, wet, soft		
		Recovered	0.4'
		Test Interval	46.0' - 46.4'
Specimen Type:	Undisturbed	LL	N/A
		PL	N/A
		PI	N/A
		Date Extruded	09/14/2009
		Date Tested	N/A

Initial Wet Density (pcf)	N/A		
Initial Moisture Content (%)	49.3	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	N/A		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	N/A	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	N/A	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	N/A	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf) N/A

Torvane Reading (kg/cm^2) N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

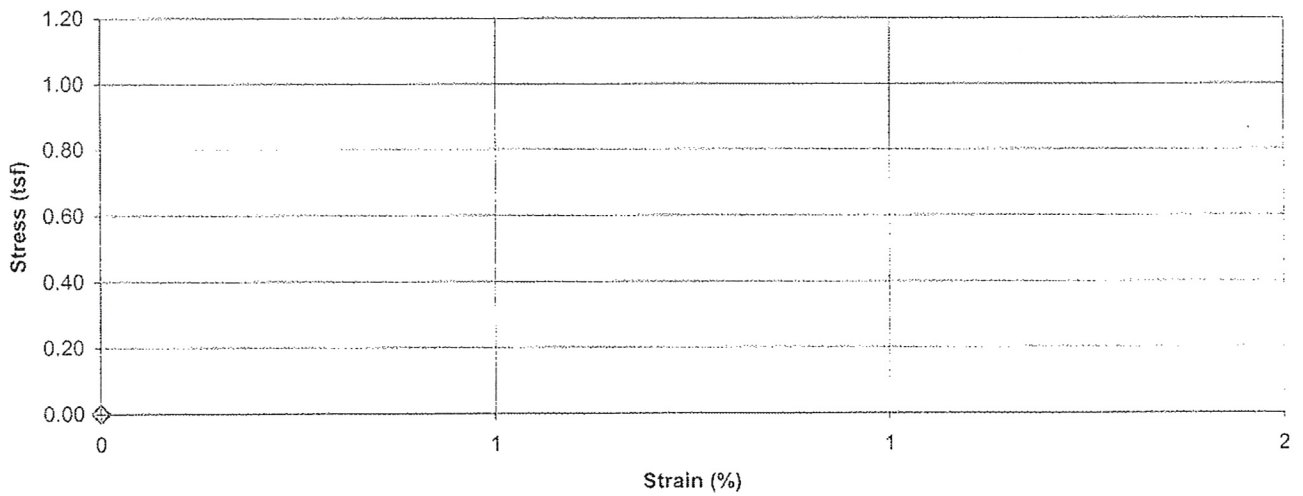
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-34P, 50.0'-52.0' | Lab ID: 1027A
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.3'
Test Interval: 50.0' - 50.5'

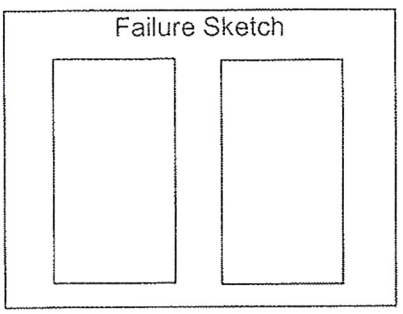
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/14/2009
Date Tested: N/A

Initial Wet Density (pcf)	126.6	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	25.1		
Initial Dry Density (pcf)	101.2		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.025	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.881	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

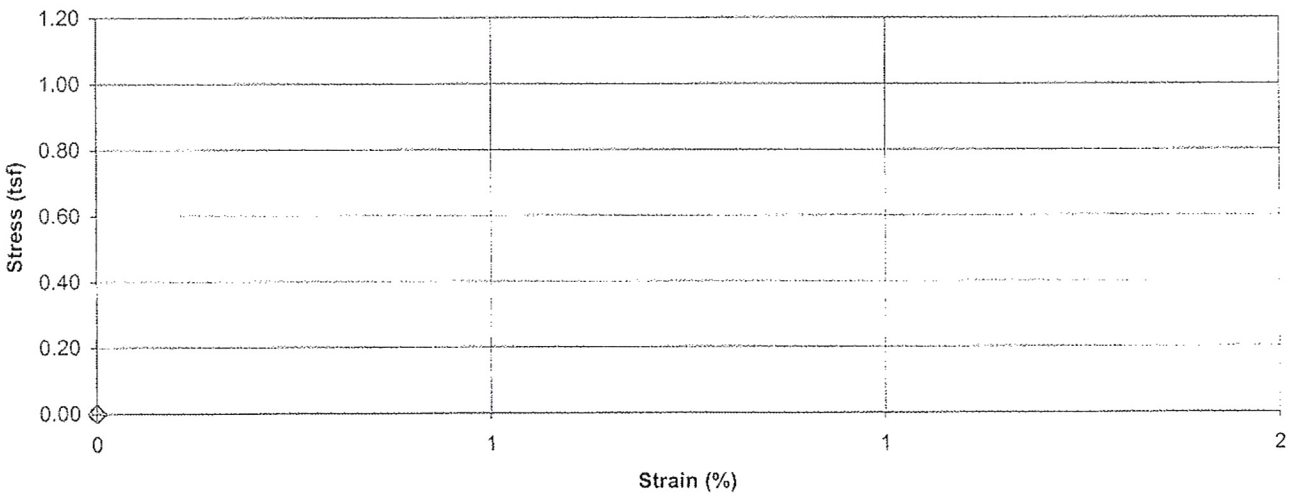
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-34P, 50.0'-52.0' | Lab ID: 1027B
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.3'
Test Interval: 50.6' - 51.1'

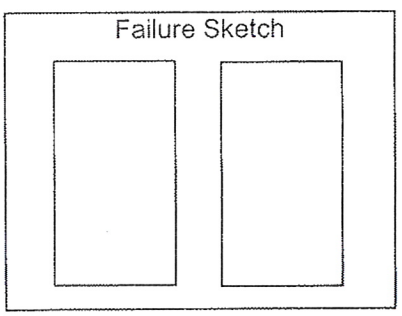
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/14/2009
Date Tested: N/A

Initial Wet Density (pcf)	126.4	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	23.4		
Initial Dry Density (pcf)	102.4		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.027	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.878	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

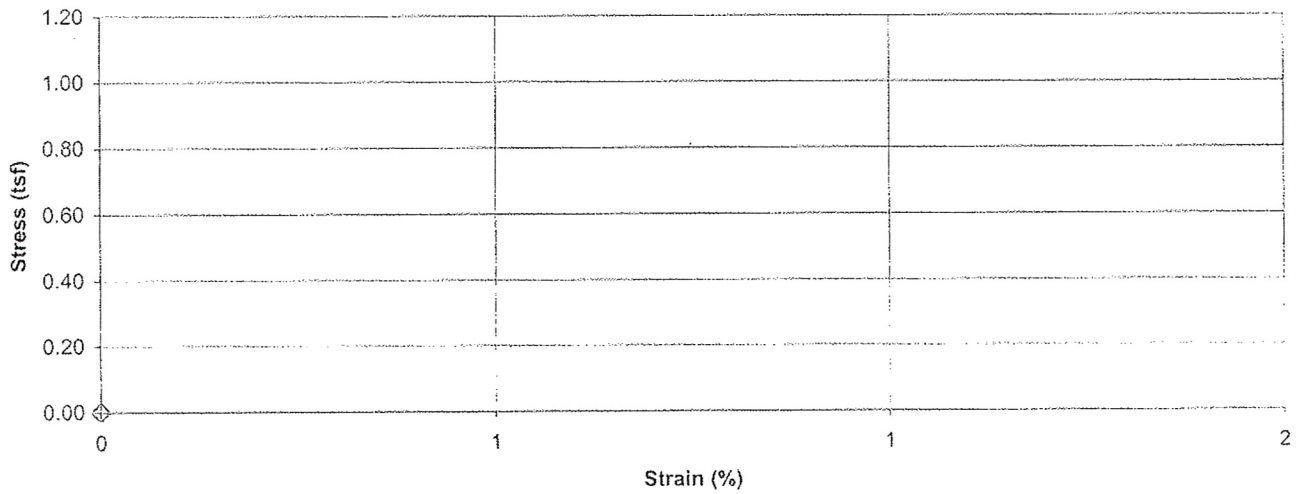
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-34P, 52.0'-54.0' | Lab ID: 1028A
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.4'
Test Interval: 52.0' - 52.5'

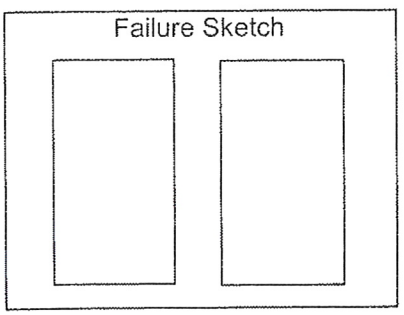
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/14/2009
Date Tested: N/A

Initial Wet Density (pcf)	125.6	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	28.4		
Initial Dry Density (pcf)	97.7		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.009	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.878	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

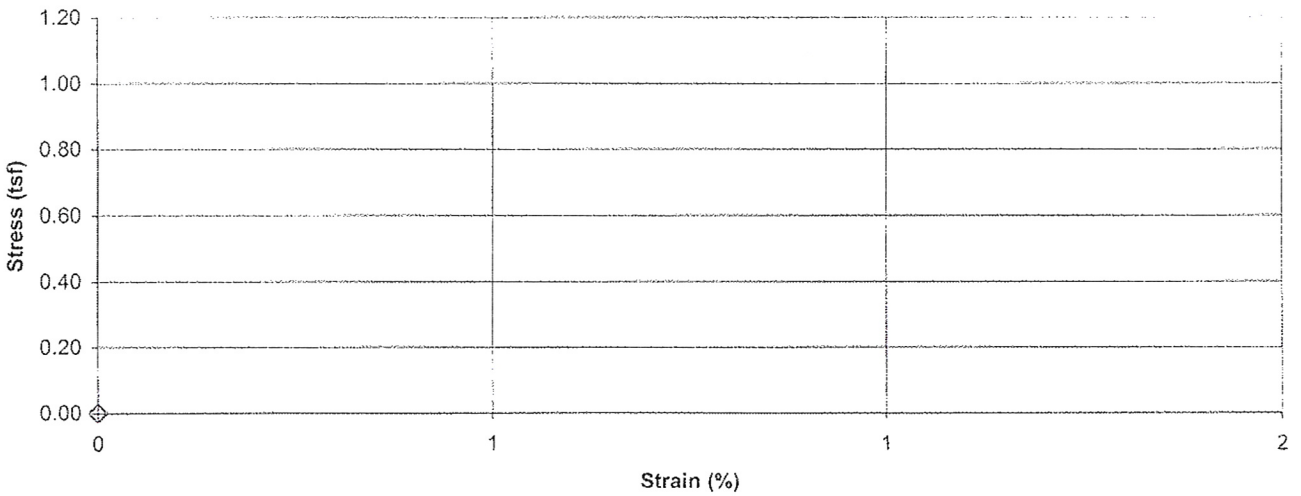
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-34P, 52.0'-54.0' | Lab ID: 1028B
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.4'
Test Interval: 52.6' - 53.1'

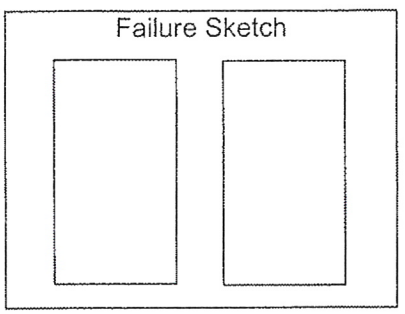
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/14/2009
Date Tested: N/A

Initial Wet Density (pcf)	124.8		
Initial Moisture Content (%)	24.7	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	100.1		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.040	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.880	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

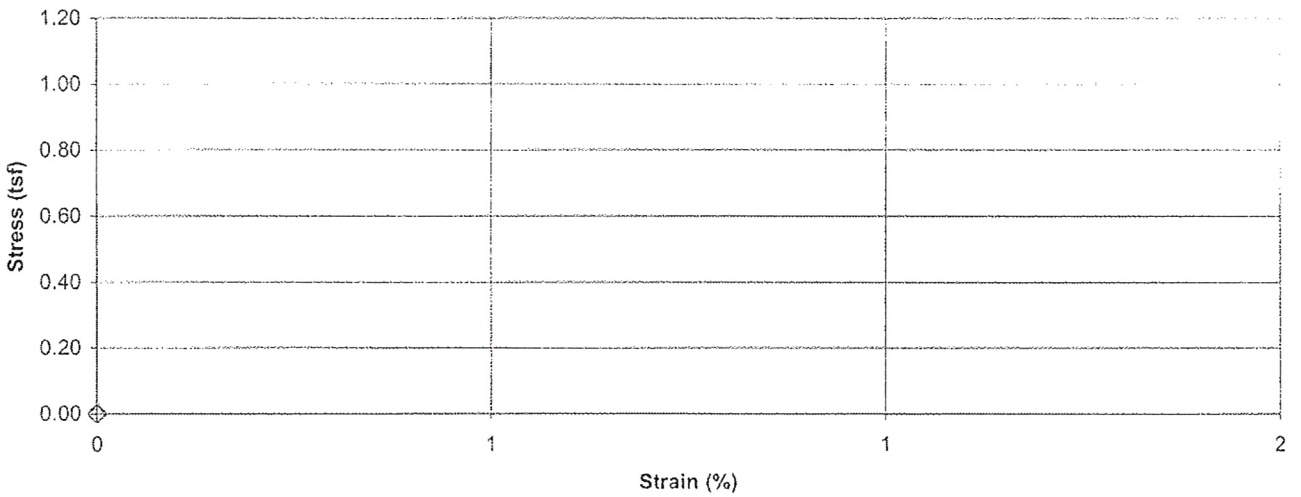
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-34P, 54.0'-56.0' | Lab ID: 1029A
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.4'
Test Interval: 54.0' - 54.5'

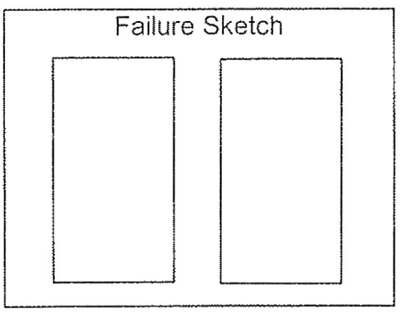
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/14/2009
Date Tested: N/A

Initial Wet Density (pcf)	126.9	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	22.3		
Initial Dry Density (pcf)	103.8		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.042	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.866	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-34P, 54.0'-56.0' | Lab ID: 1029B
Visual Description: Lean Clay (CL), brown, moist, firm

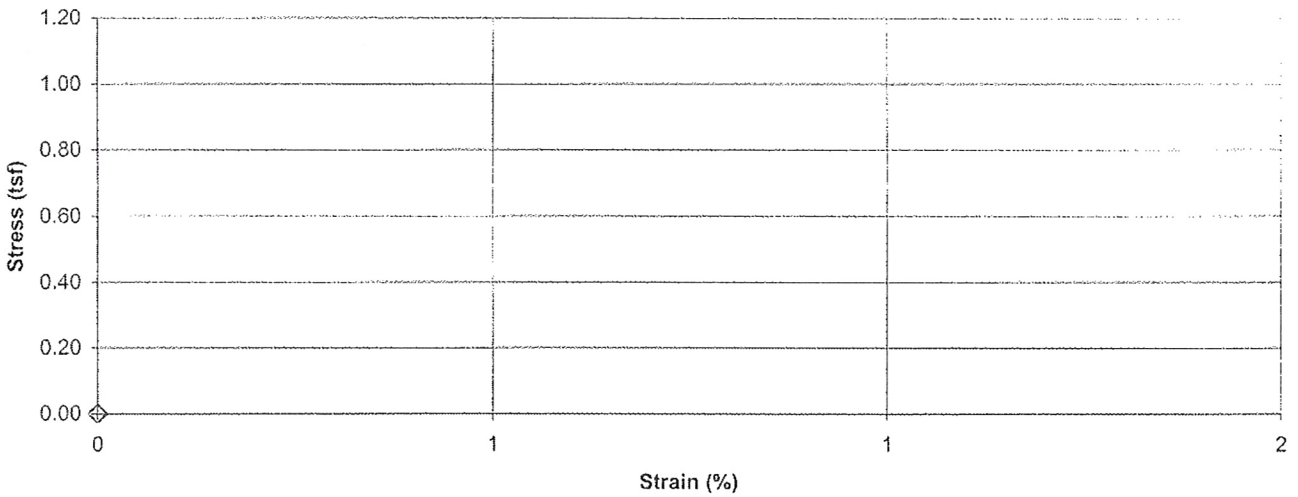
Recovered: 1.4'
Test Interval: 54.6' - 55.1'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

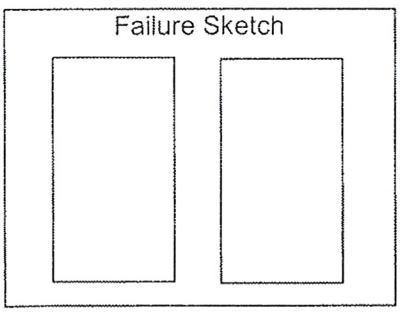
Date Extruded: 09/14/2009
Date Tested: N/A

Initial Wet Density (pcf)	127.4	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	21.3		
Initial Dry Density (pcf)	105.1		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.011	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.866	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

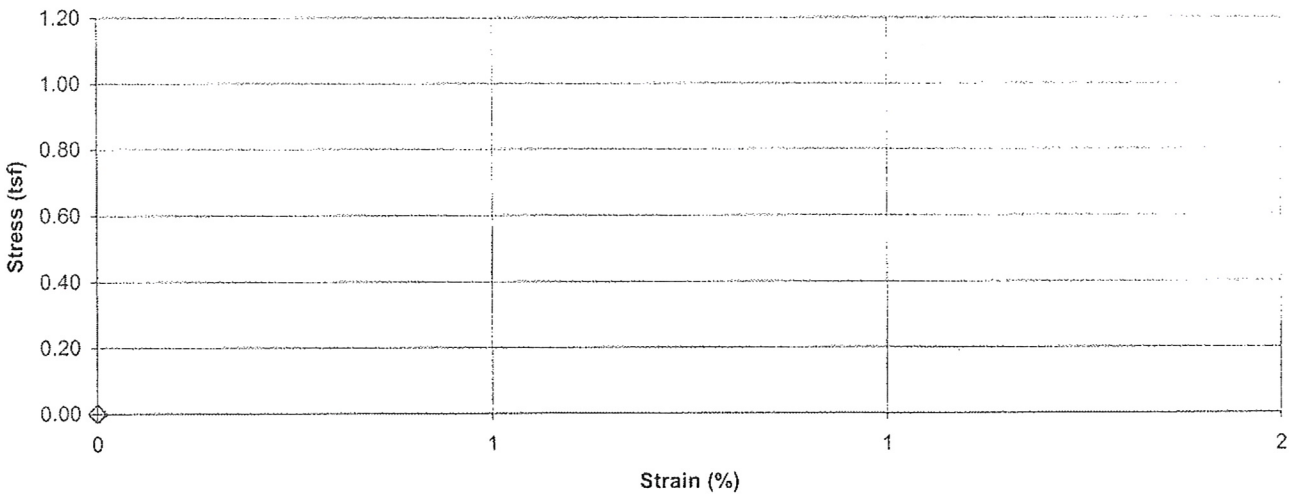
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-34P, 56.0'-58.0' | Lab ID: 1030A
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.9'
Test Interval: 56.0' - 56.5'

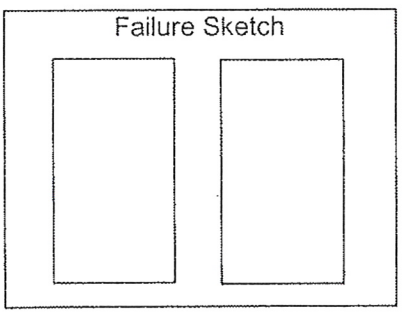
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/30/2009
Date Tested: N/A

Initial Wet Density (pcf)	122.8	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	21.0		
Initial Dry Density (pcf)	101.5		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.006	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.878	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

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Unconfined Compressive Strength of Cohesive Soil

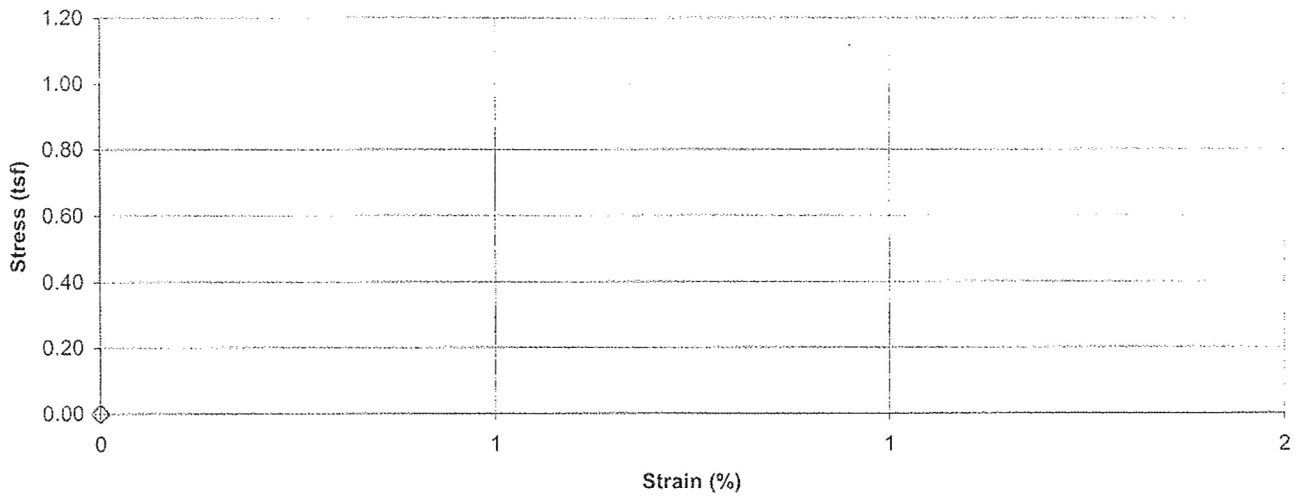
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-34P, 56.0'-58.0' | Lab ID: 1030B
Visual Description: Sandy Lean Clay (CL), brown, moist, firm
Recovered: 1.9'
Test Interval: 56.6' - 57.1'

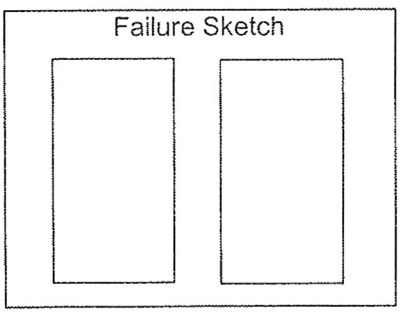
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/30/2009
Date Tested: N/A

Initial Wet Density (pcf)	130.5	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	19.7		
Initial Dry Density (pcf)	109.0		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.002	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.861	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

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Unconfined Compressive Strength of Cohesive Soil

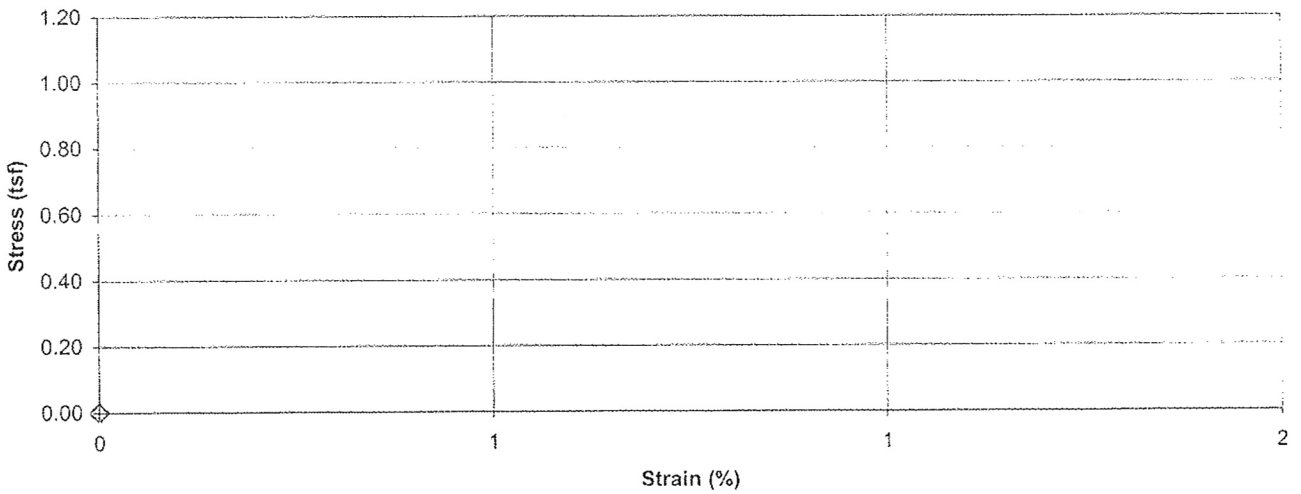
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-34P, 56.0'-58.0' | Lab ID: 1030C
Visual Description: Sandy Lean Clay (CL), brown, moist, firm (57.2'-57.4')
Poorly Graded Sand (SP), brown, moist, firm (57.4'-57.7') | Recovered: 1.9'
Test Interval: 57.2' - 57.7'

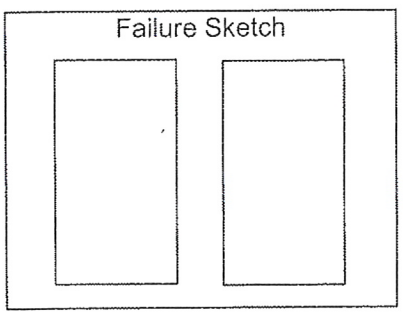
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A | Date Extruded: 09/30/2009 | Date Tested: N/A

Initial Wet Density (pcf)	122.3	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	20.5		
Initial Dry Density (pcf)	101.5		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.004	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.857	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-46P, 0.0'-2.0' | Lab ID: 1031
Visual Description: Fat Clay with Gravel (CH), red brown, moist, firm
Recovered: 0.6'
Test Interval: 0.0' - 0.5'

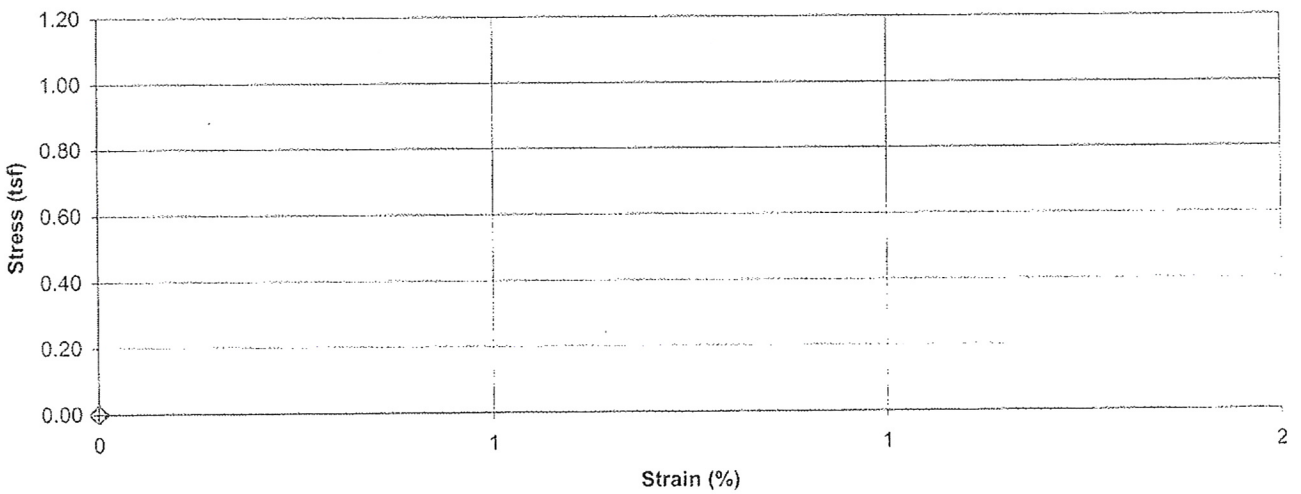
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/16/2009
Date Tested: N/A

Initial Wet Density (pcf)	111.2
Initial Moisture Content (%)	30.7
Initial Dry Density (pcf)	85.1
At Test Moisture Content (%)	N/A
At Test Dry Density (pcf)	N/A
Specific Gravity	N/A
Degree of Saturation (%)	N/A
Average Height (in)	6.063
Average Diameter (in)	2.881
Height to Diameter Ratio	2.1

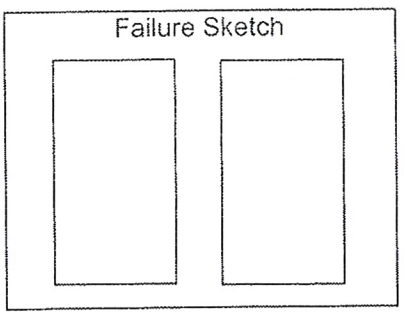
Initial MC Taken: Before Test, From Trimmings
At Test MC Taken: N/A

Unconfined Compressive Strength (tsf)	N/A
Undrained Shear Strength (tsf)	N/A
Strain at Maximum Stress (%)	N/A
Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By: [illegible]

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Unconfined Compressive Strength of Cohesive Soil

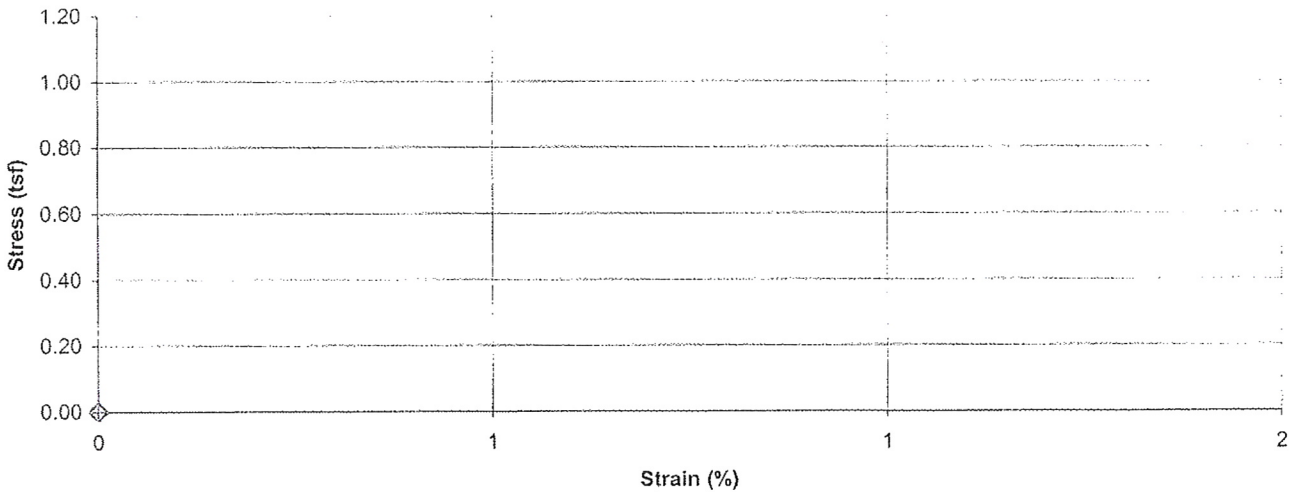
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-51P, 32.0'-34.0' | Lab ID: 1066A
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.2'
Test Interval: 32.0' - 32.5'

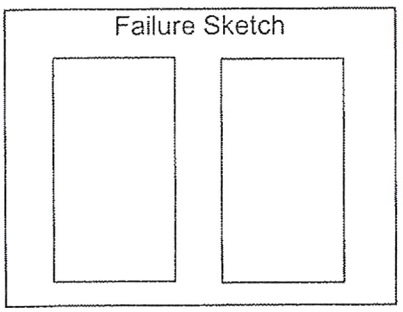
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/16/2009
Date Tested: N/A

Initial Wet Density (pcf)	126.0	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	26.0		
Initial Dry Density (pcf)	100.0		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.038	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.860	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By: 1

1072

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Unconfined Compressive Strength of Cohesive Soil

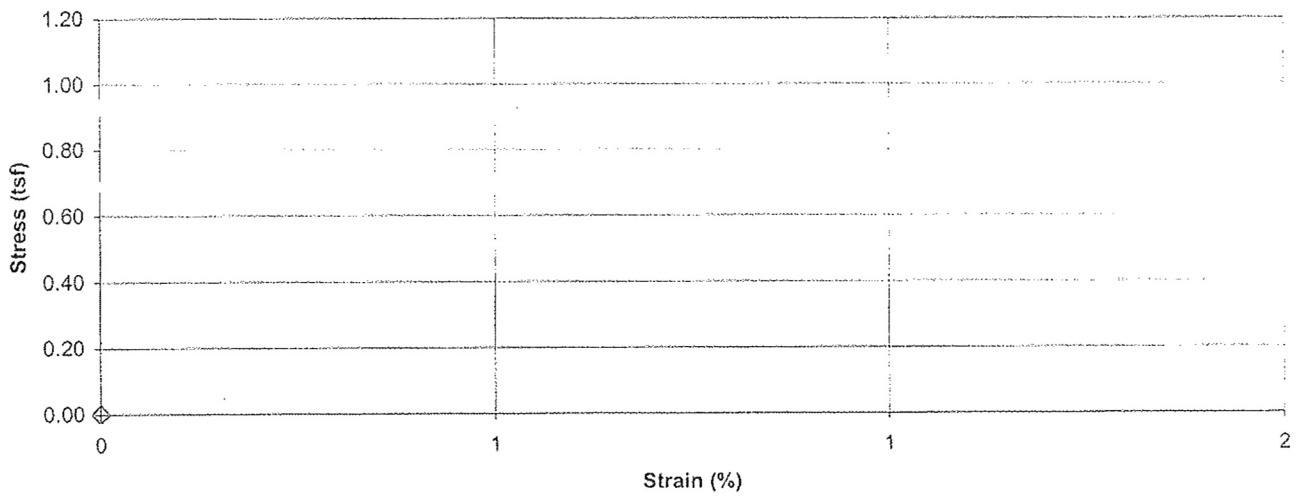
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-51P, 32.0'-34.0' | Lab ID: 1066B
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.2'
Test Interval: 32.6' - 33.1'

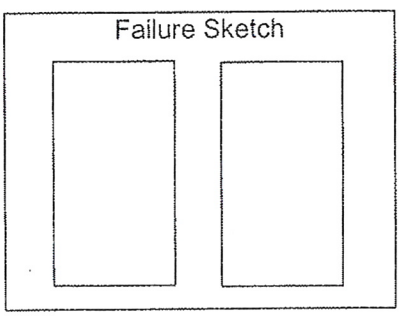
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/16/2009
Date Tested: N/A

Initial Wet Density (pcf)	124.5	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	24.2		
Initial Dry Density (pcf)	100.3		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.036	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.860	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-51P, 34.0'-36.0' | Lab ID: 1067A
Visual Description: Lean Clay (CL), brown, moist, firm

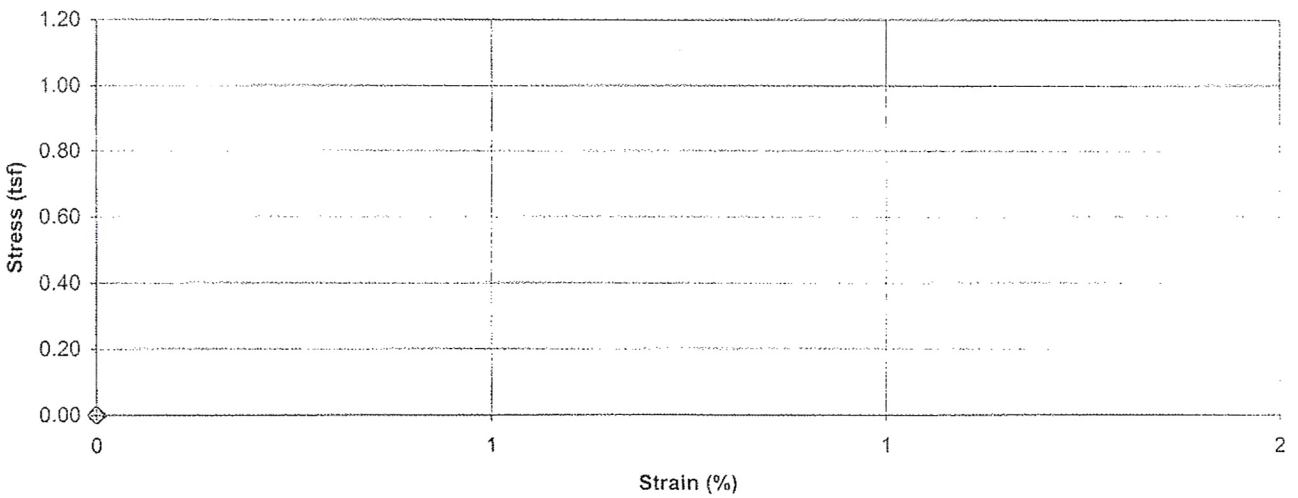
Recovered: 1.3'
Test Interval: 34.0' - 34.5'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

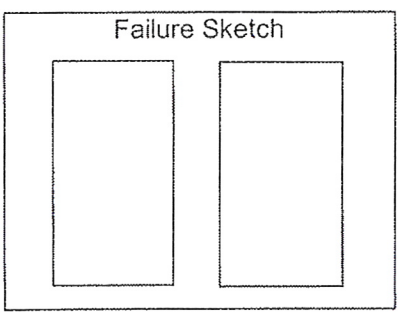
Date Extruded: 09/16/2009
Date Tested: N/A

Initial Wet Density (pcf)	129.1	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	21.9		
Initial Dry Density (pcf)	105.9		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.012	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.869	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments:

Reviewed By:

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

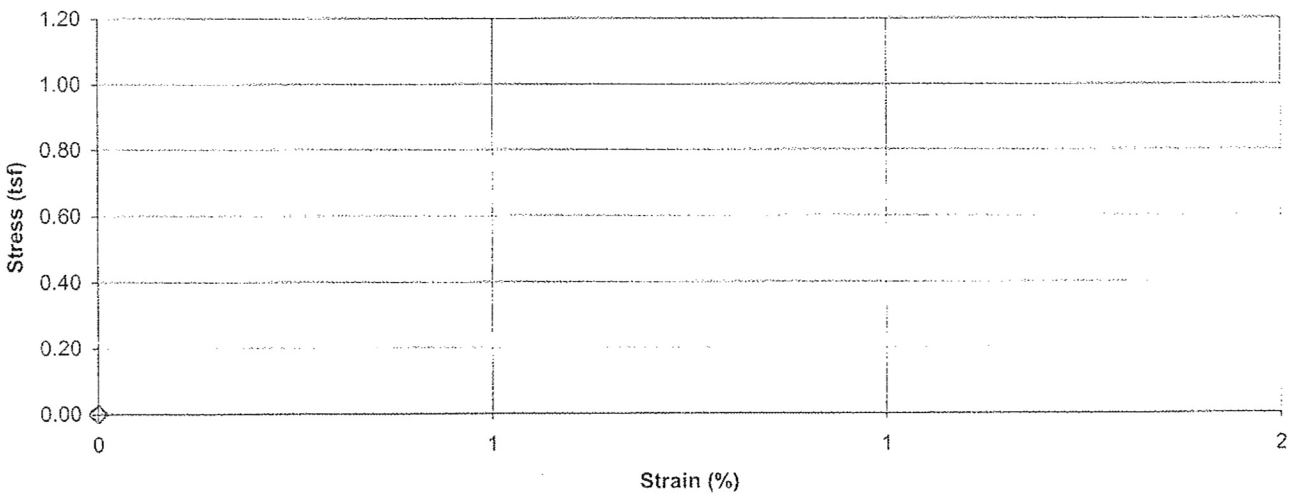
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-51P, 34.0'-36.0' | Lab ID: 1067B
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.3'
Test Interval: 34.6' - 35.1'

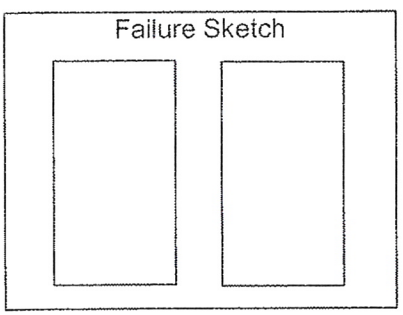
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/16/2009
Date Tested: N/A

Initial Wet Density (pcf)	127.2	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	23.3		
Initial Dry Density (pcf)	103.2		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.025	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.885	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

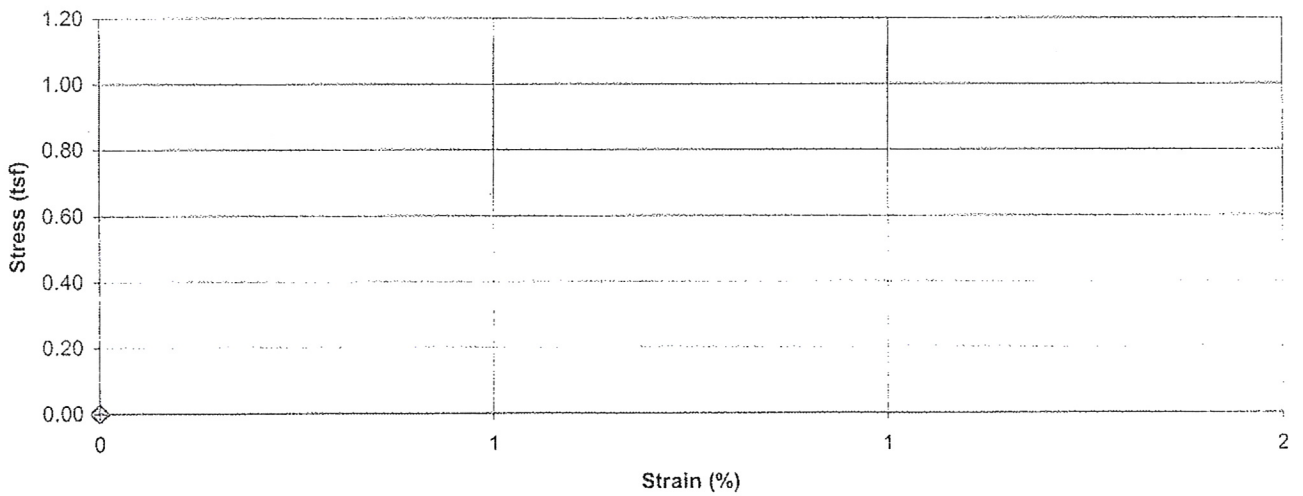
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-51P, 36.0'-38.0' | Lab ID: 1068A
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.7'
Test Interval: 36.0' - 36.5'

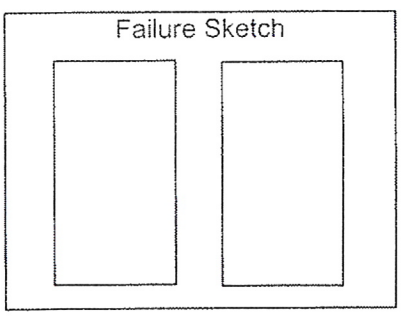
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/16/2009
Date Tested: N/A

Initial Wet Density (pcf)	125.9		
Initial Moisture Content (%)	23.1	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	102.3		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.037	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.888	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

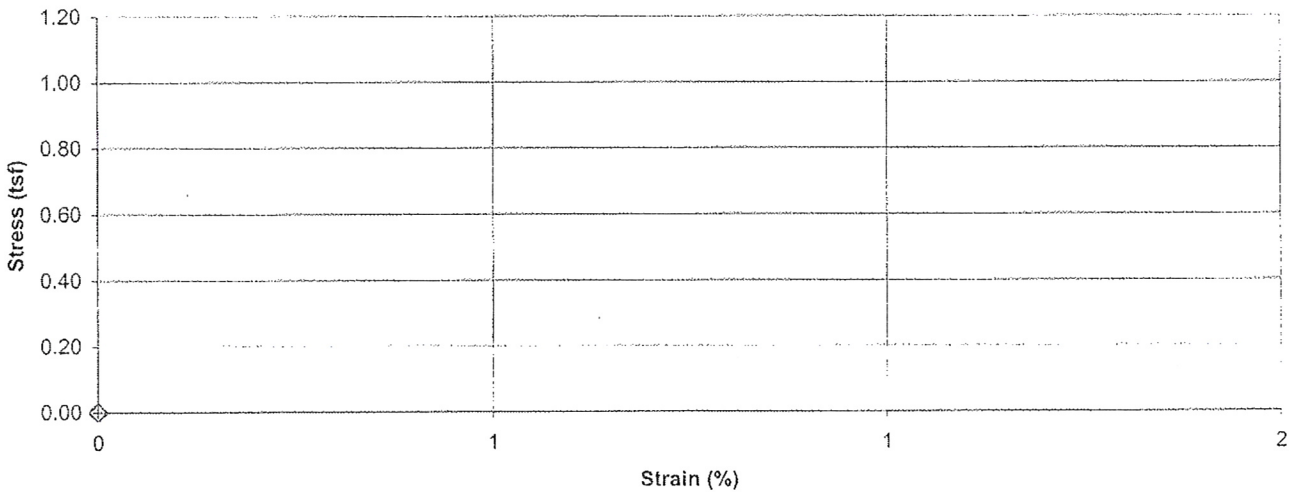
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-51P, 36.0'-38.0' | Lab ID: 1068B
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.7'
Test Interval: 36.6' - 37.1'

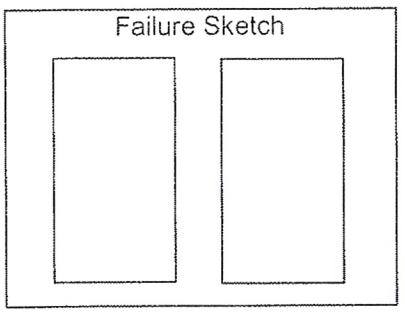
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/16/2009
Date Tested: N/A

Initial Wet Density (pcf)	123.1		
Initial Moisture Content (%)	23.5	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	99.7		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.056	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.879	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

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Stantec

Unconfined Compressive Strength of Cohesive Soil

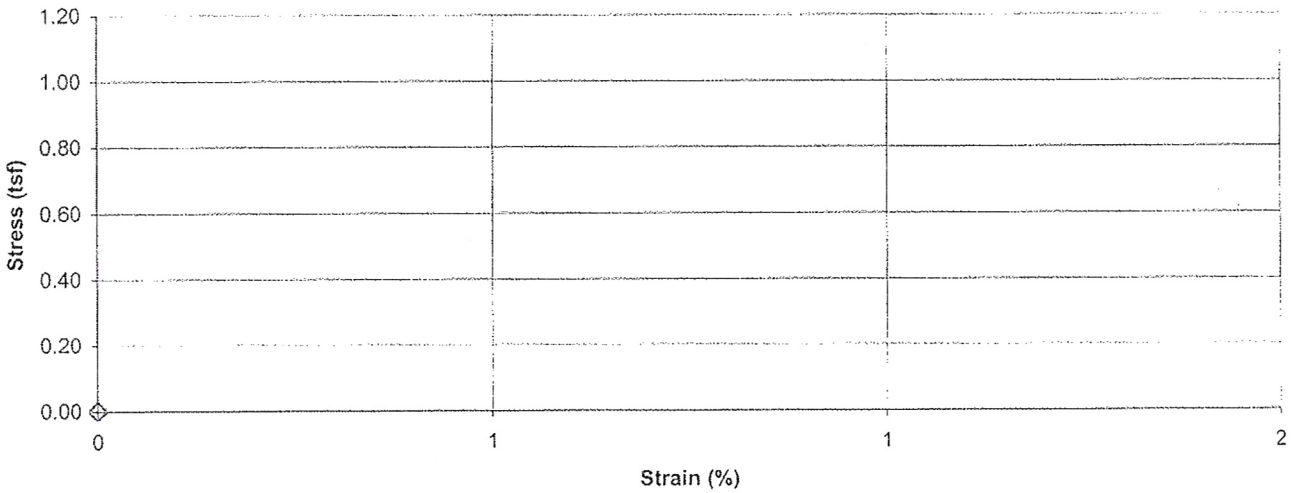
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-51P, 36.0'-38.0' | Lab ID: 1068C
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.7'
Test Interval: 37.2' - 37.7'

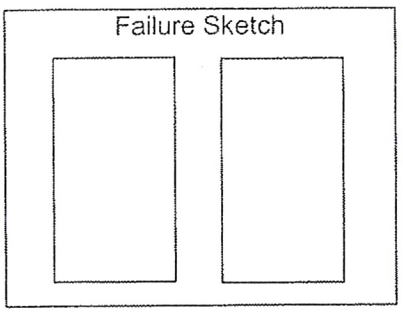
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/16/2009
Date Tested: N/A

Initial Wet Density (pcf)	124.9	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	25.9		
Initial Dry Density (pcf)	99.2		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.012	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.887	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

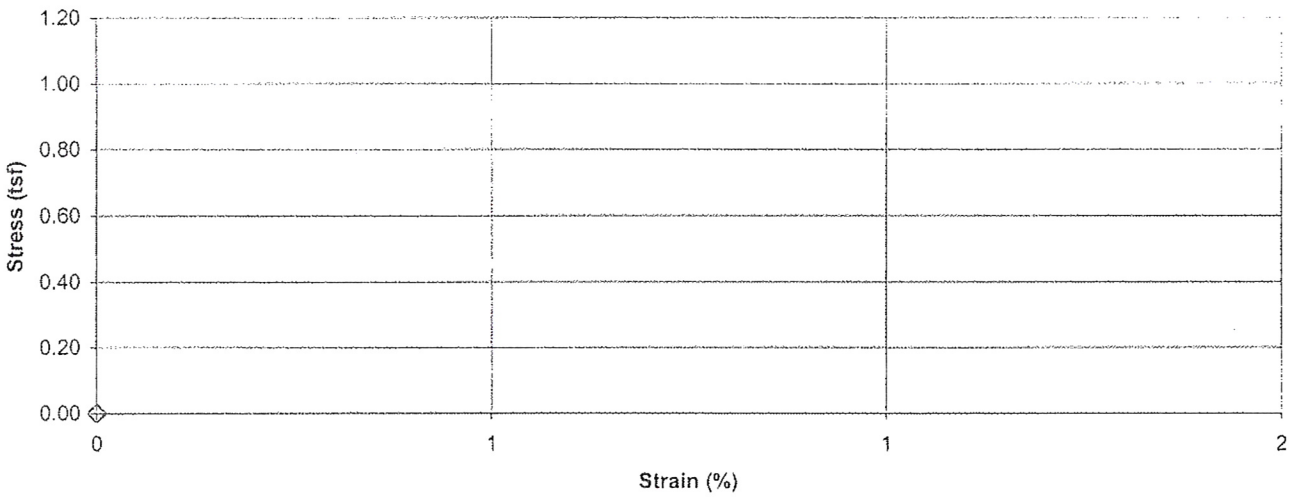
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-56P, 20.0'-22.0' | Lab ID: 1069A
Visual Description: Sandy Lean Clay (CL), brown, moist, firm
Recovered: 1.4'
Test Interval: 20.0' - 20.5'

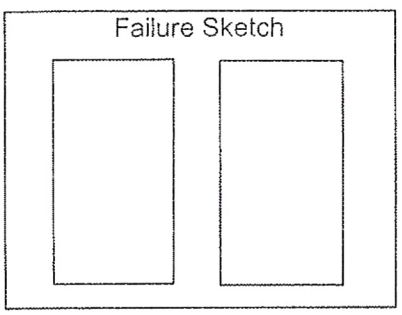
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/16/2009
Date Tested: N/A

Initial Wet Density (pcf)	127.9	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	22.6		
Initial Dry Density (pcf)	104.3		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.985	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.880	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments:

Reviewed By:

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-56P, 20.0'-22.0' | Lab ID: 1069A
Visual Description: Sandy Lean Clay (CL), brown, moist, firm

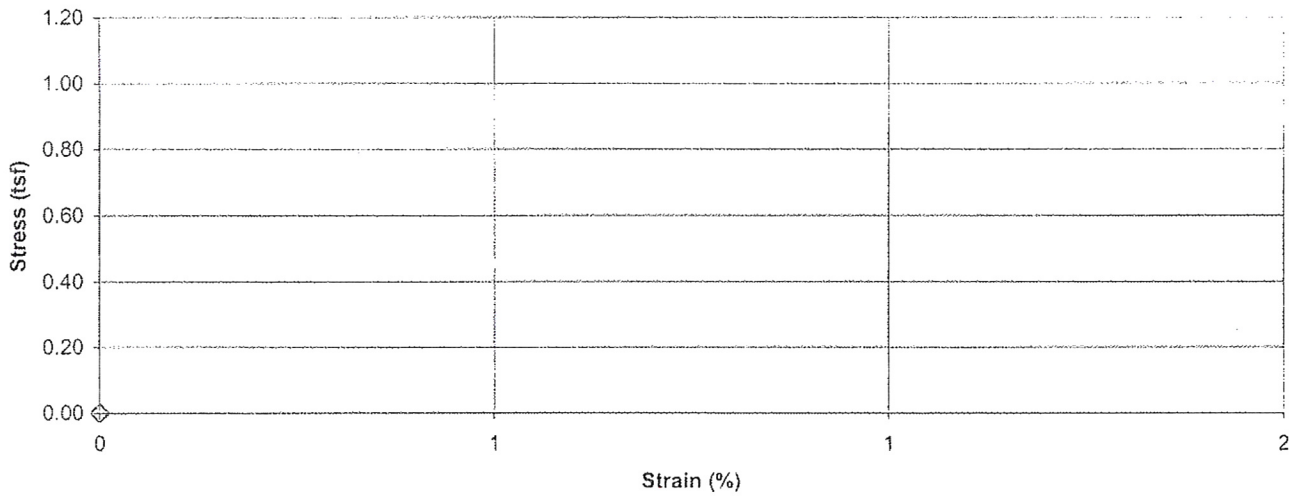
Recovered: 1.4'
Test Interval: 20.0' - 20.5'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

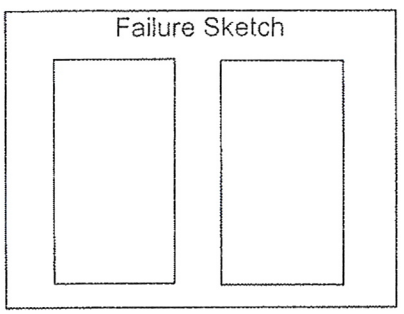
Date Extruded: 09/16/2009
Date Tested: N/A

Initial Wet Density (pcf)	127.9	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	22.6		
Initial Dry Density (pcf)	104.3		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.985	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.880	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-56P, 20.0'-22.0' | Lab ID: 1069B
Visual Description: Sandy Lean Clay (CL), brown, moist, firm

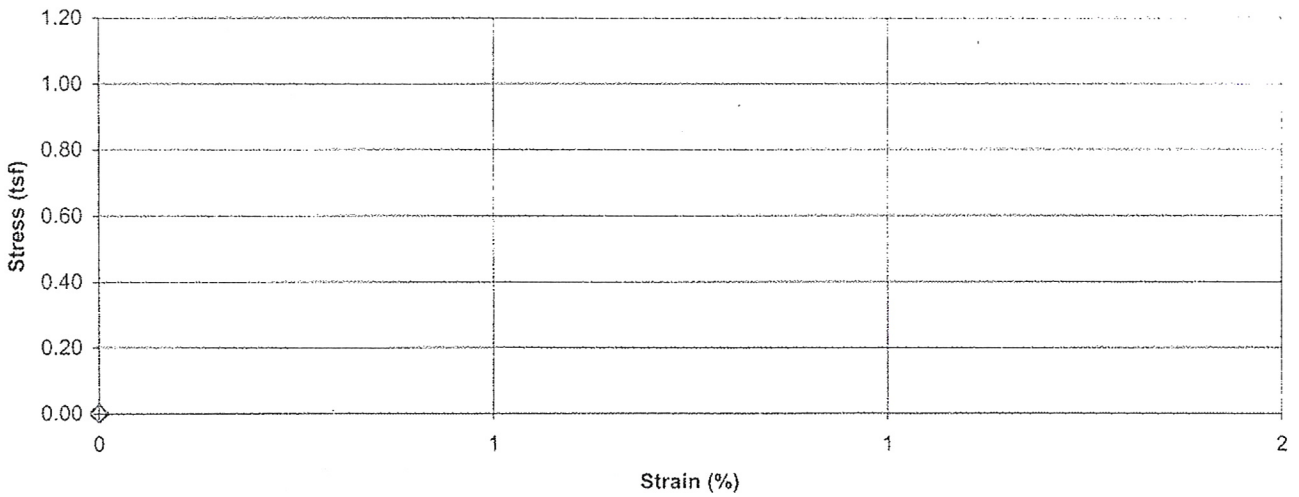
Recovered: 1.4'
Test Interval: 20.6' - 21.1'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

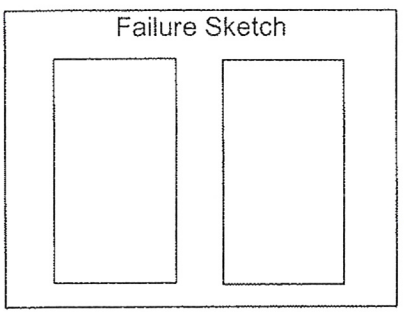
Date Extruded: 09/16/2009
Date Tested: N/A

Initial Wet Density (pcf)	126.3	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	22.7		
Initial Dry Density (pcf)	102.9		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.005	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.856	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

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Unconfined Compressive Strength of Cohesive Soil

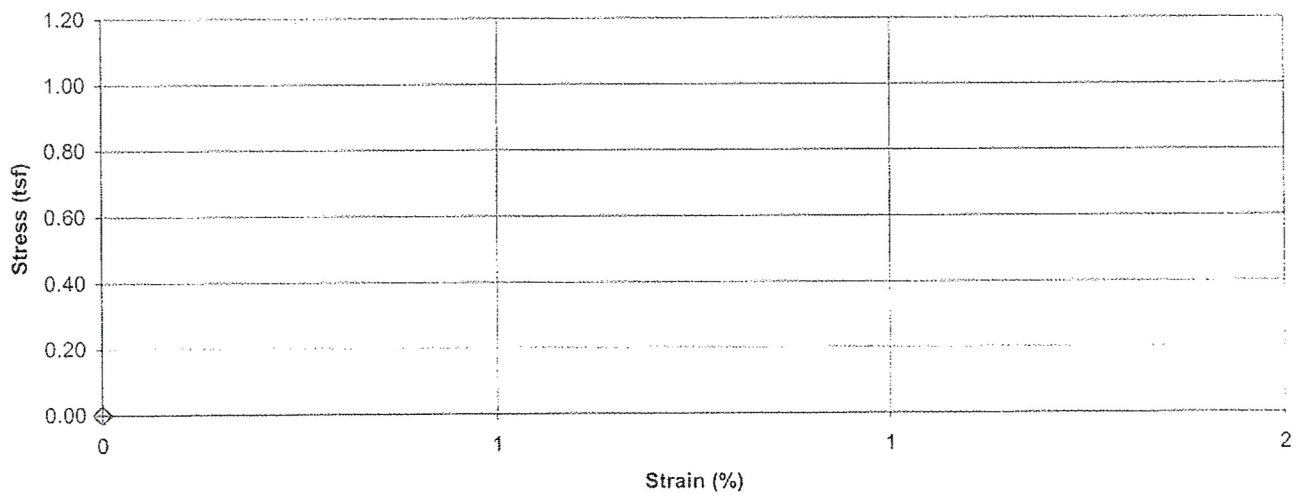
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-56P, 22.0'-24.0' | Lab ID: 1070A
Visual Description: Sandy Lean Clay (CL), brown, moist, firm
Recovered: 1.4'
Test Interval: 22.0' - 22.5'

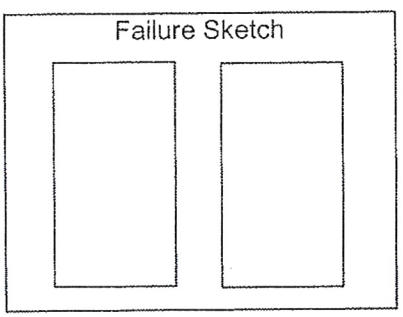
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/16/2009
Date Tested: N/A

Initial Wet Density (pcf)	125.7	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	23.4		
Initial Dry Density (pcf)	101.9		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.016	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.861	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

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Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-56P, 22.0'-24.0' | Lab ID: 1070B
Visual Description: Sandy Lean Clay (CL), brown, moist, firm

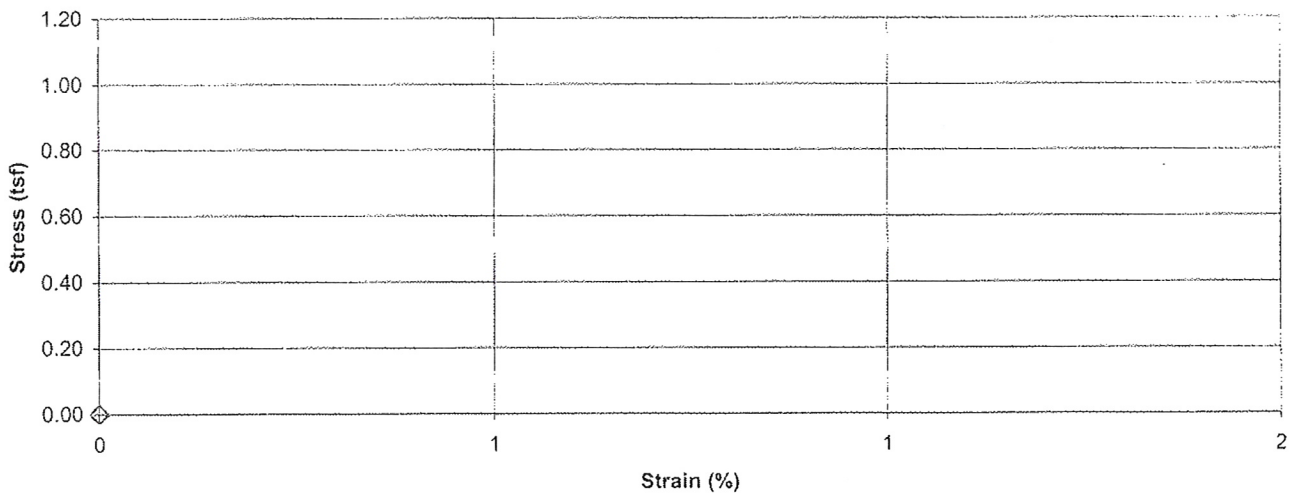
Recovered: 1.4'
Test Interval: 22.6' - 23.1'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

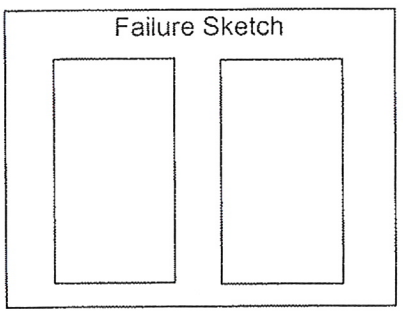
Date Extruded: 09/16/2009
Date Tested: N/A

Initial Wet Density (pcf)	126.0	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	23.7		
Initial Dry Density (pcf)	101.8		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.993	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.861	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By: i

1072

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Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-56P, 24.0'-26.0' | Lab ID: 1071A
Visual Description: Sandy Lean Clay (CL), brown, moist, firm
Recovered: 1.4'
Test Interval: 24.0' - 24.5'

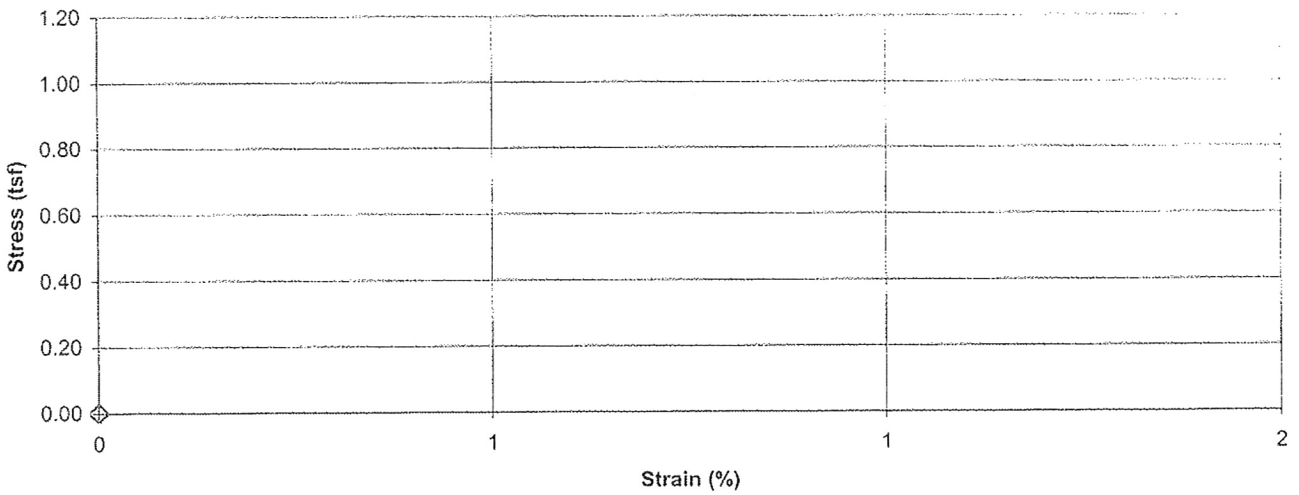
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/16/2009
Date Tested: N/A

Initial Wet Density (pcf)	N/A
Initial Moisture Content (%)	24.6
Initial Dry Density (pcf)	N/A
At Test Moisture Content (%)	N/A
At Test Dry Density (pcf)	N/A
Specific Gravity	N/A
Degree of Saturation (%)	N/A
Average Height (in)	N/A
Average Diameter (in)	N/A
Height to Diameter Ratio	N/A

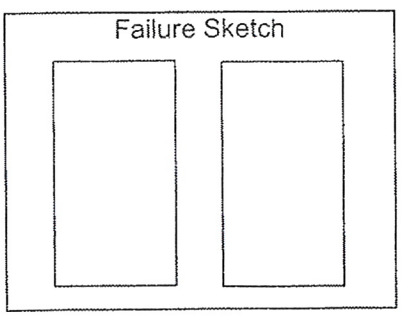
Initial MC Taken: Before Test, From Center of Specimen
At Test MC Taken: N/A

Unconfined Compressive Strength (tsf)	N/A
Undrained Shear Strength (tsf)	N/A
Strain at Maximum Stress (%)	N/A
Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments: Unable to obtain test specimen due to fractures throughout. Saved in a bag

Reviewed By: [signature]

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

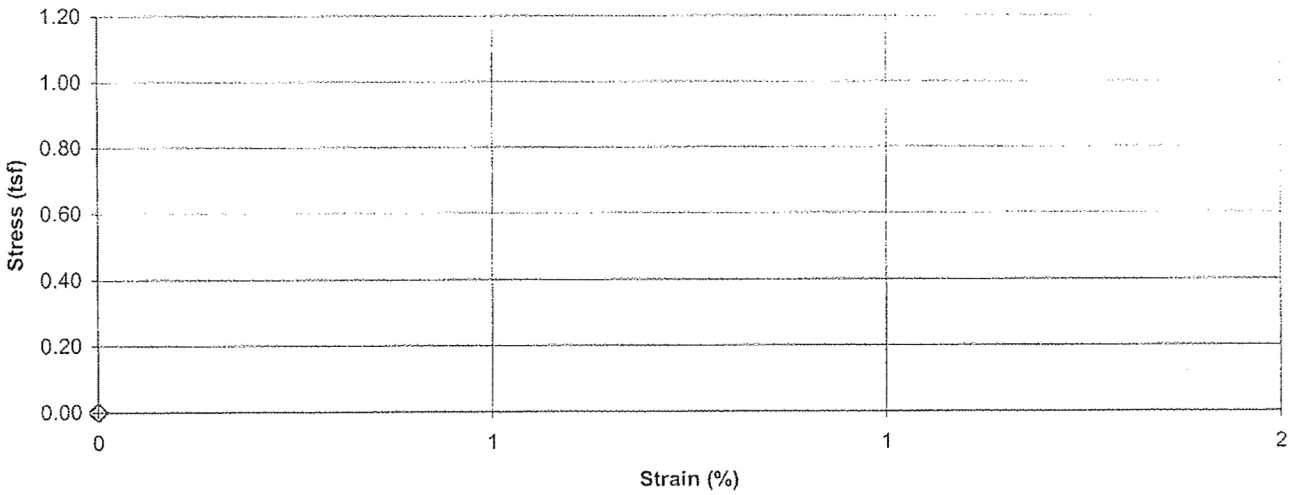
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-56P, 24.0'-26.0' | Lab ID: 1071B
Visual Description: Sandy Lean Clay (CL), brown, moist, firm
Recovered: 1.4'
Test Interval: 24.6' - 25.1'

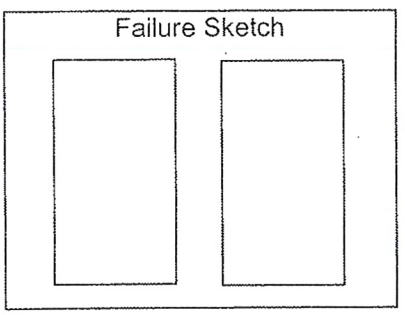
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/16/2009
Date Tested: N/A

Initial Wet Density (pcf)	123.5	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	26.2		
Initial Dry Density (pcf)	97.8		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.959	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.861	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

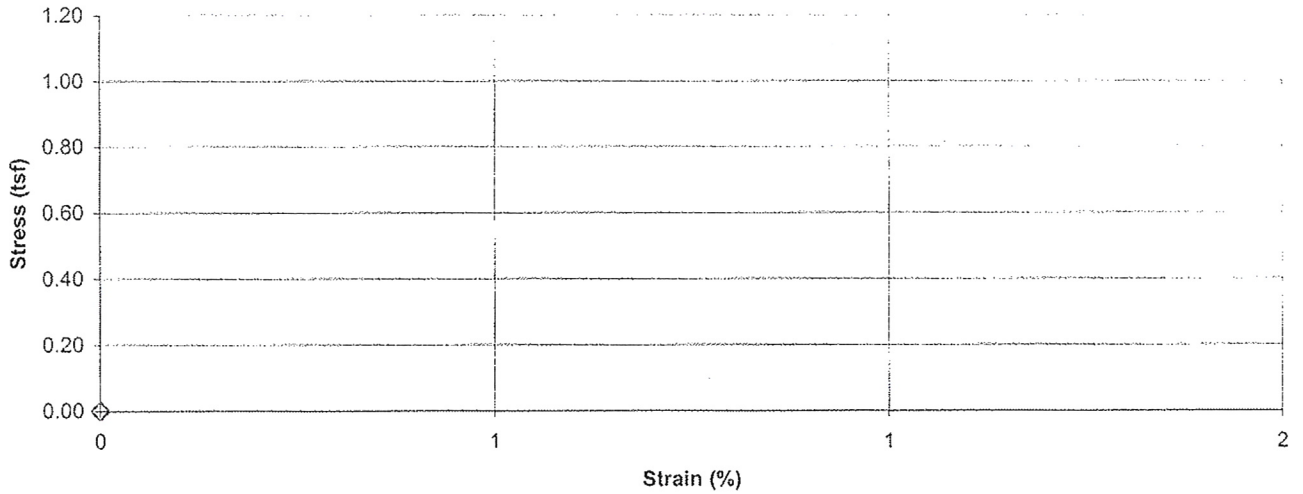
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-56P, 26.0'-28.0' | Lab ID: 1072A
Visual Description: Sandy Lean Clay (CL), brown, moist, firm
Recovered: 1.7'
Test Interval: 26.0' - 26.5'

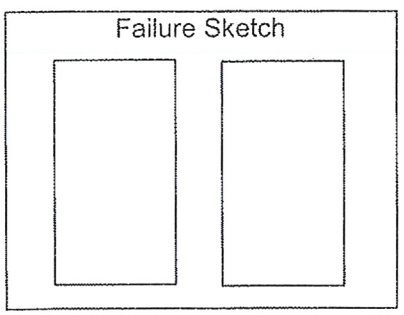
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/28/2009
Date Tested: N/A

Initial Wet Density (pcf)	124.1	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	24.5		
Initial Dry Density (pcf)	99.6		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.007	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.855	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

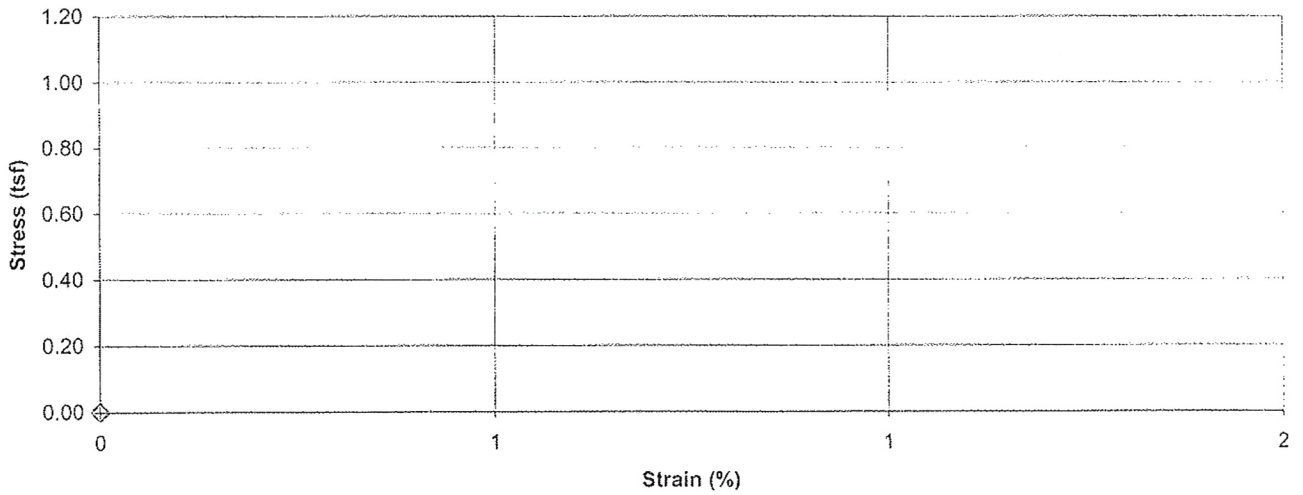
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-56P, 26.0'-28.0' | Lab ID: 1072B
Visual Description: Sandy Lean Clay (CL), brown, moist, firm
Recovered: 1.7'
Test Interval: 26.6' - 27.1'

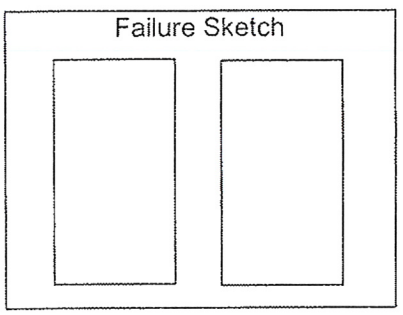
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/28/2009
Date Tested: N/A

Initial Wet Density (pcf)	122.5	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	27.2		
Initial Dry Density (pcf)	96.3		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.005	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.876	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

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Unconfined Compressive Strength of Cohesive Soil

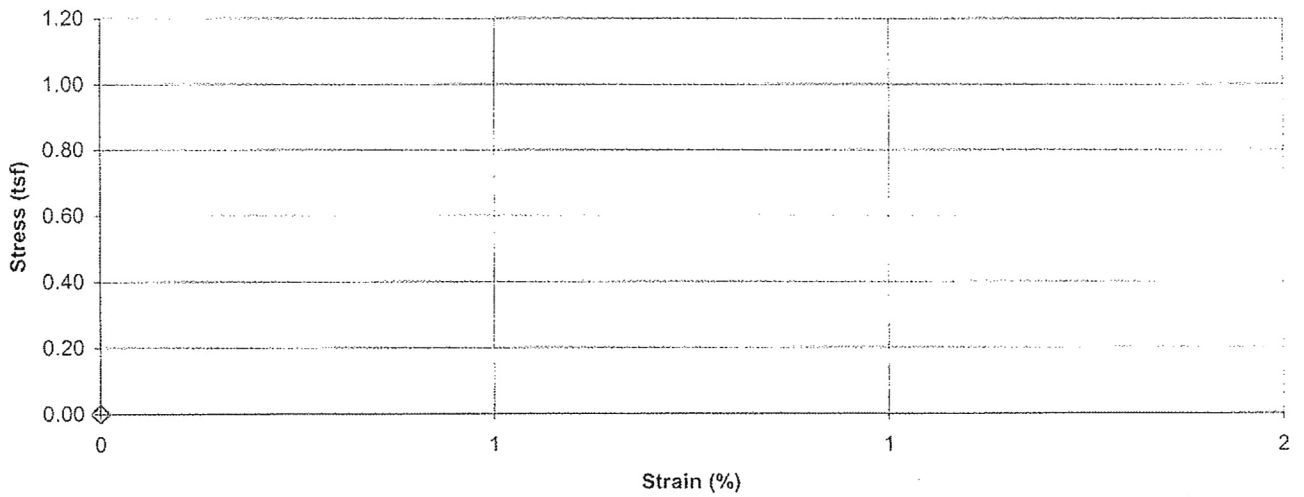
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-56P, 26.0'-28.0' | Lab ID: 1072C
Visual Description: Sandy Lean Clay (CL), brown, moist, firm
Recovered: 1.7'
Test Interval: 27.2' - 27.7'

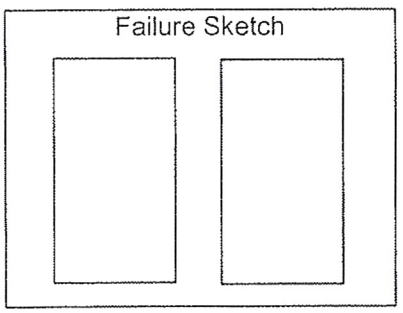
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/28/2009
Date Tested: N/A

Initial Wet Density (pcf)	147.2	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	27.1		
Initial Dry Density (pcf)	115.8		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.988	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.860	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

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Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-56P, 28.0'-30.0' | Lab ID: 1073A
Visual Description: Sandy Lean Clay (CL), brown, moist, firm

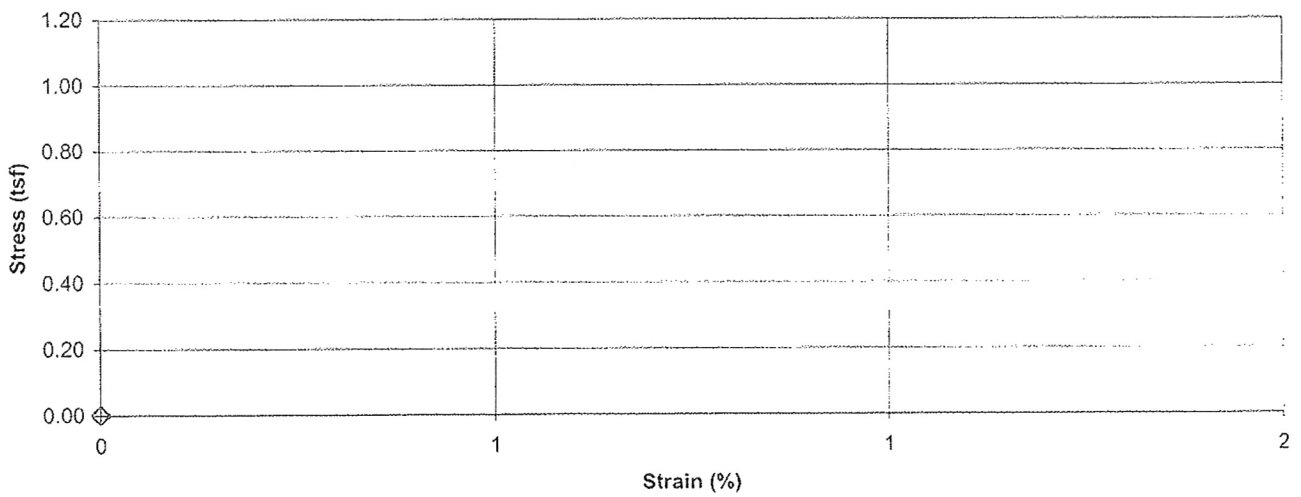
Recovered: 1.4'
Test Interval: 28.0' - 28.5'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

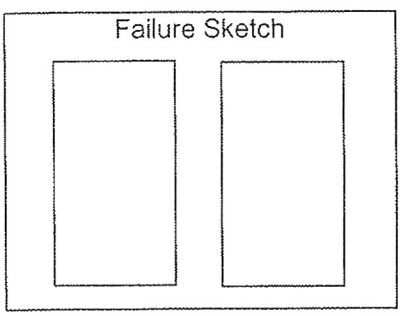
Date Extruded: 09/28/2009
Date Tested: N/A

Initial Wet Density (pcf)	124.4	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	26.2		
Initial Dry Density (pcf)	98.6		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.079	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.865	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

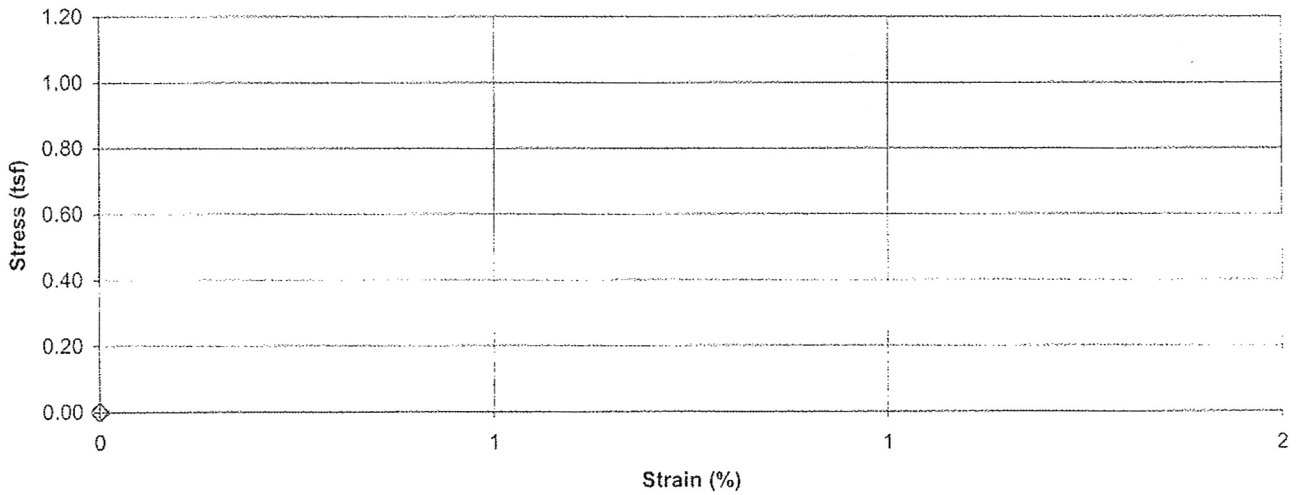
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-56P, 28.0'-30.0' | Lab ID: 1073B
Visual Description: Sandy Lean Clay (CL), brown, moist, firm
Recovered: 1.4'
Test Interval: 28.6' - 29.1'

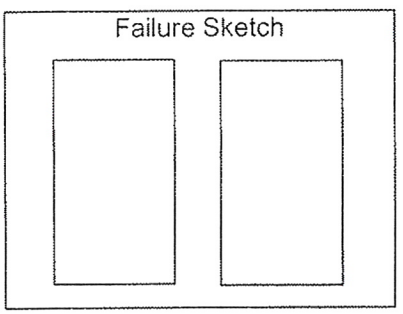
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/28/2009
Date Tested: N/A

Initial Wet Density (pcf)	122.2	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	26.7		
Initial Dry Density (pcf)	96.4		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.054	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.864	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1072

Stantec

Unconfined Compressive Strength of Cohesive Soil

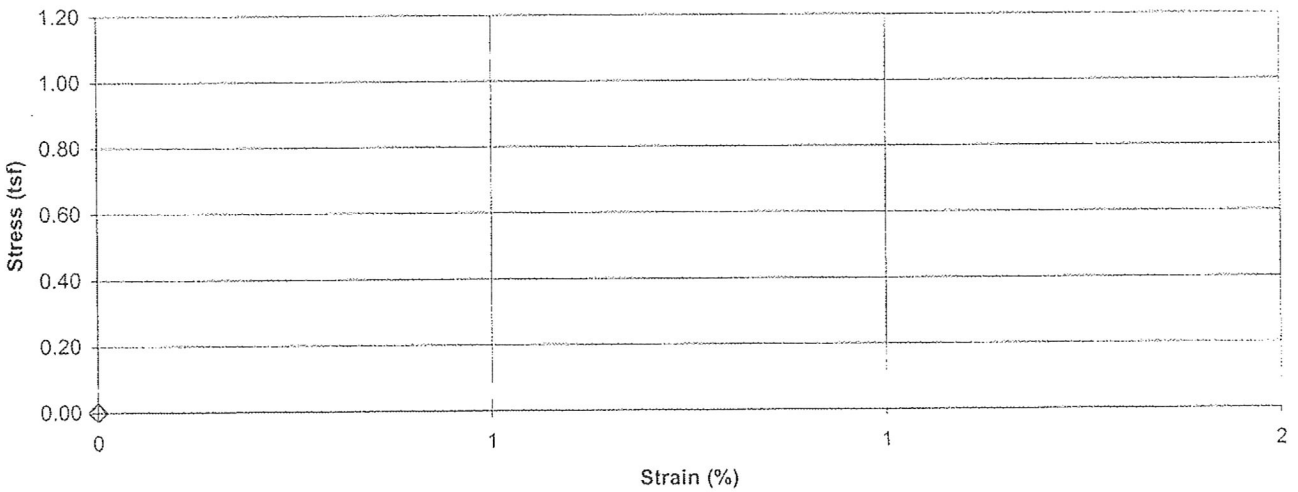
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-67, 4.5'-6.5' | Lab ID: 1074A
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.2'
Test Interval: 4.5' - 5.0'

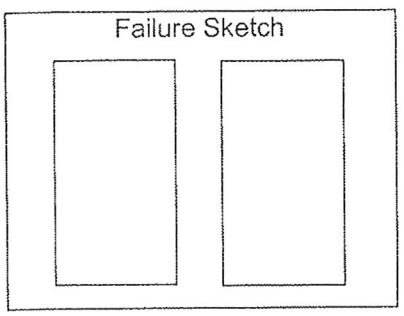
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/28/2009
Date Tested: N/A

Initial Wet Density (pcf)	123.7	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	22.1		
Initial Dry Density (pcf)	101.3		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.027	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.883	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

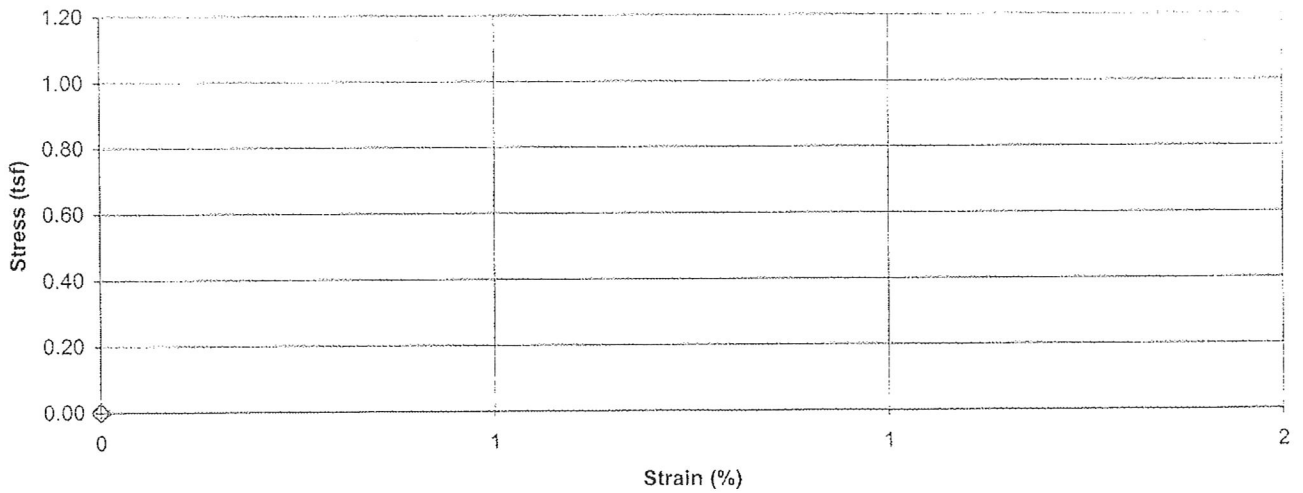
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-67, 4.5'-6.5' | Lab ID: 1074B
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.2'
Test Interval: 5.1' - 5.6'

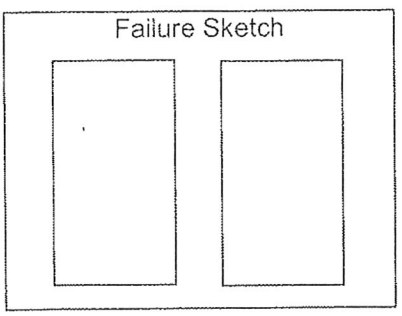
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/28/2009
Date Tested: N/A

Initial Wet Density (pcf)	125.9	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	23.1		
Initial Dry Density (pcf)	102.3		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.026	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.889	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

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Stantec

Unconfined Compressive Strength of Cohesive Soil

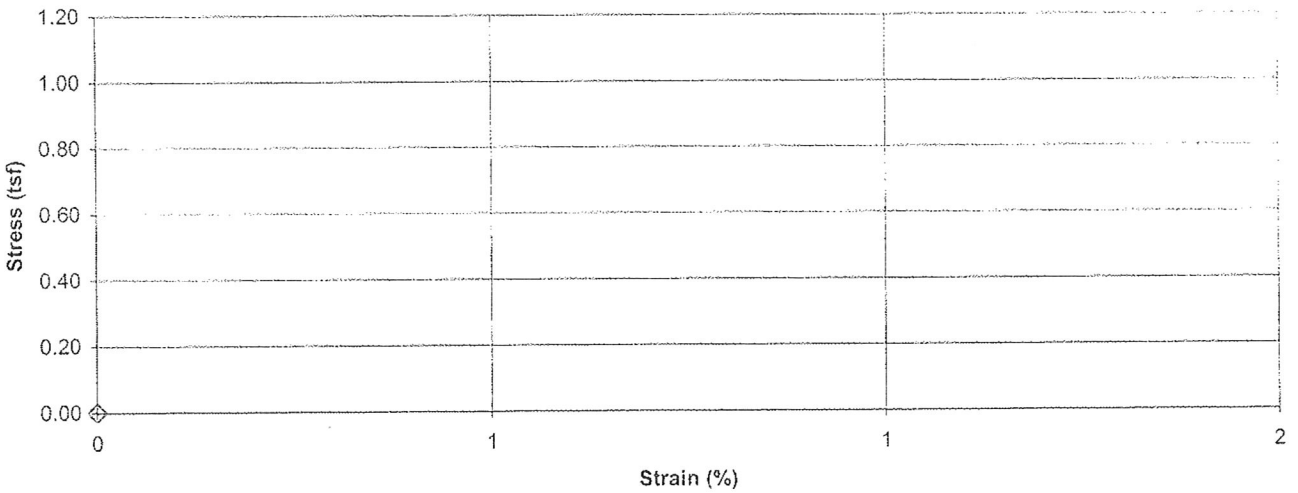
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-67, 9.5'-11.5' | Lab ID: 1075
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 0.7'
Test Interval: 9.5' - 10.0'

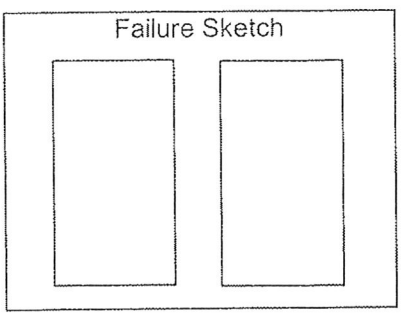
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/29/2009
Date Tested: N/A

Initial Wet Density (pcf)	119.9	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	25.2		
Initial Dry Density (pcf)	95.8		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.029	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.887	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-67, 19.0'-21.0' | Lab ID: 1076
Visual Description: Lean Clay (CL), gray, moist, firm

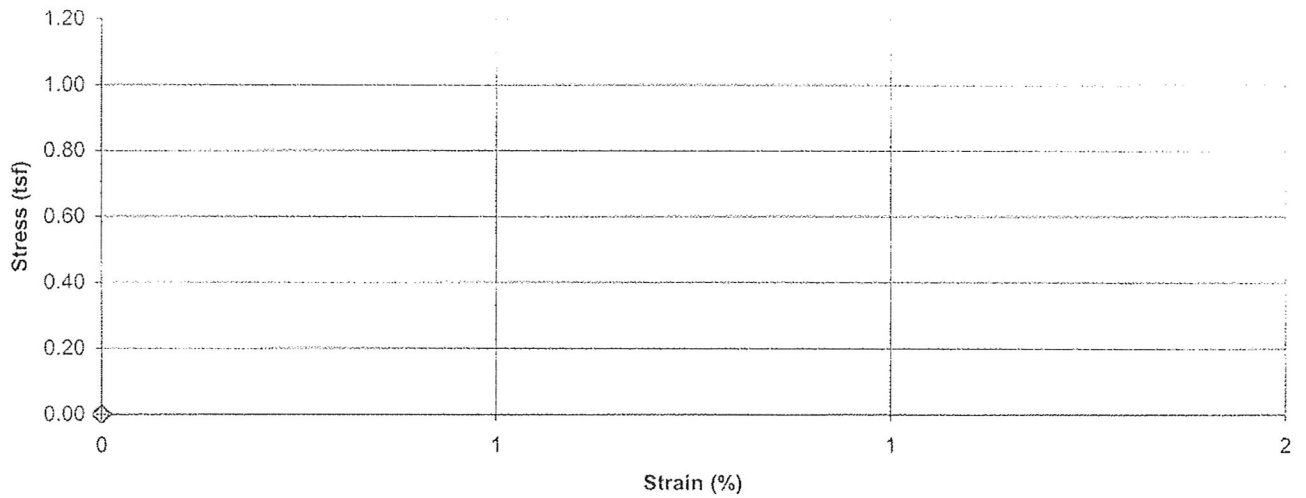
Recovered: 0.8'
Test Interval: 19.0' - 19.5'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

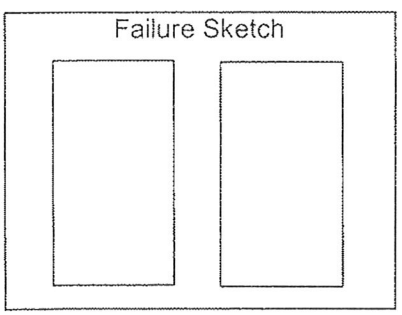
Date Extruded: 09/29/2009
Date Tested: N/A

Initial Wet Density (pcf)	123.3	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	25.8		
Initial Dry Density (pcf)	98.0		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.030	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.871	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-67, 24.0'-26.0' | Lab ID: 1077A
Visual Description: Lean Clay (CL), gray, moist, firm

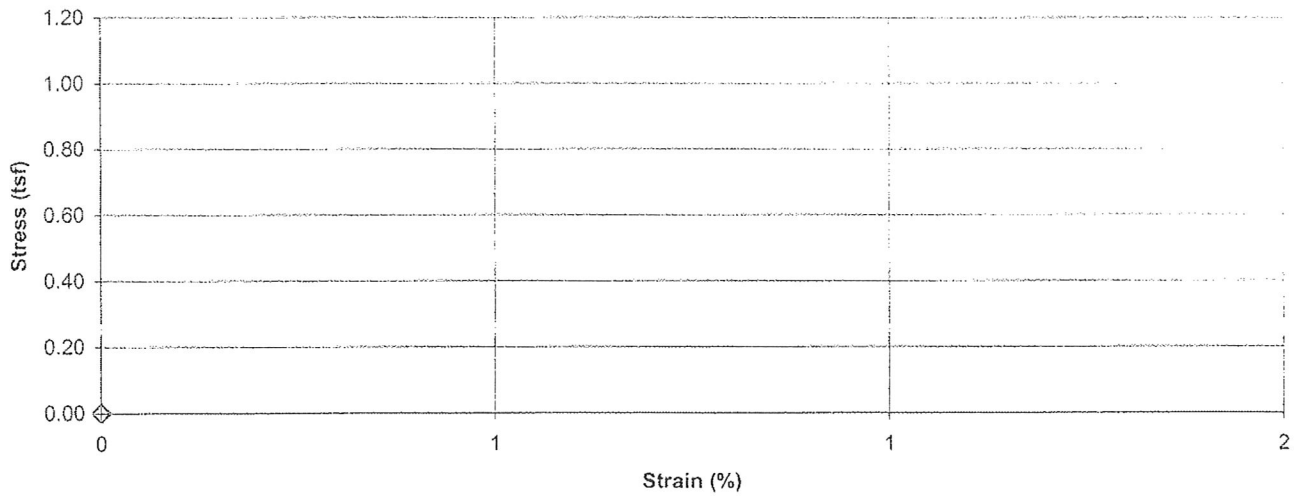
Recovered: 1.4'
Test Interval: 24.0' - 24.5'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

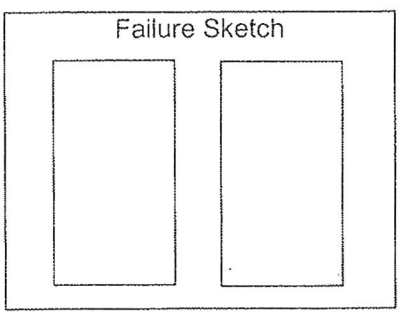
Date Extruded: 09/29/2009
Date Tested: N/A

Initial Wet Density (pcf)	122.4	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	23.2		
Initial Dry Density (pcf)	99.4		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.032	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.885	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

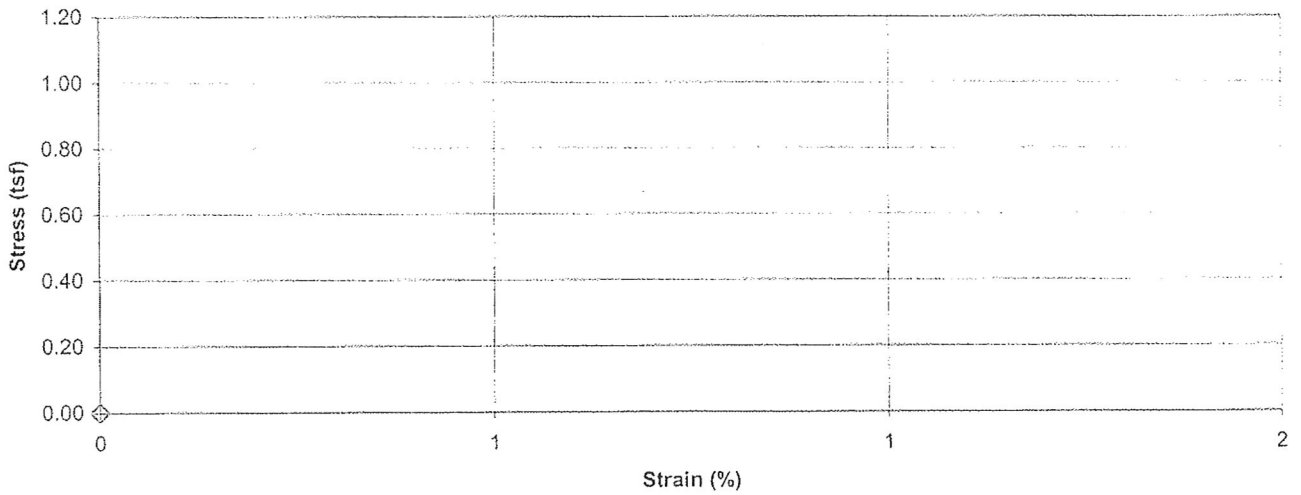
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-67, 24.0'-26.0' | Lab ID: 1077B
Visual Description: Lean Clay (CL), gray, moist, firm
Recovered: 1.4'
Test Interval: 24.6' - 25.1'

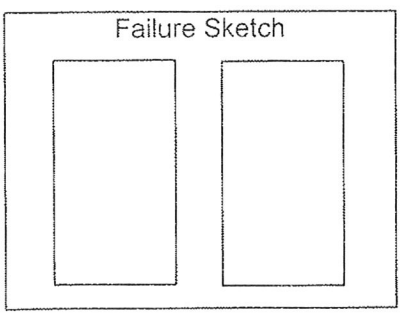
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/29/2009
Date Tested: N/A

Initial Wet Density (pcf)	122.4	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	24.7		
Initial Dry Density (pcf)	98.2		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.030	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.878	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

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Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-88, 0.0'-2.0' | Lab ID: 1078
Visual Description: Fat Clay (CH), red brown, moist, firm

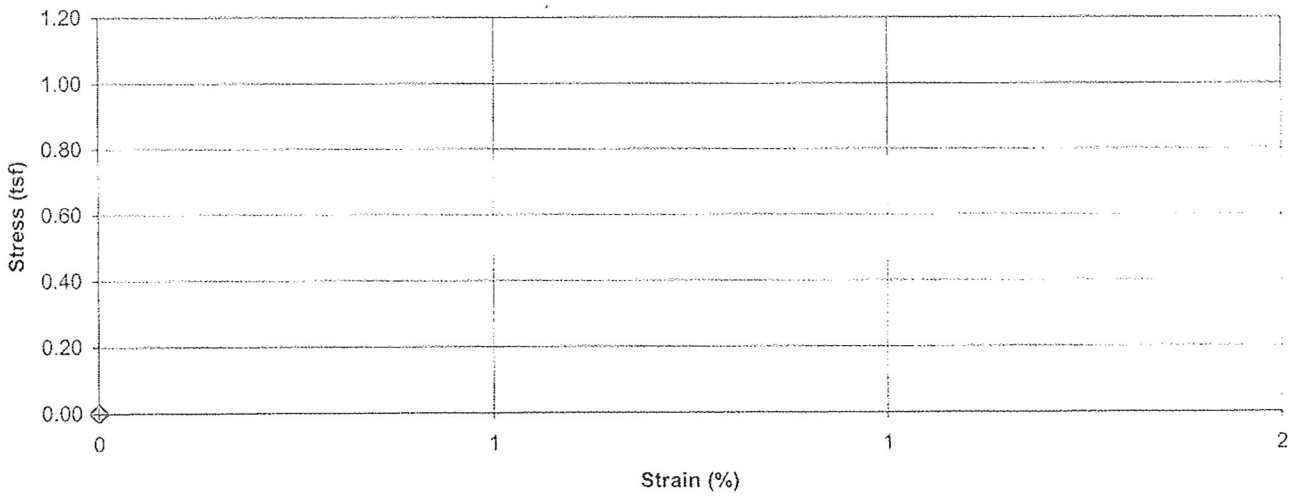
Recovered: 0.8'
Test Interval: 0' - 0.5'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

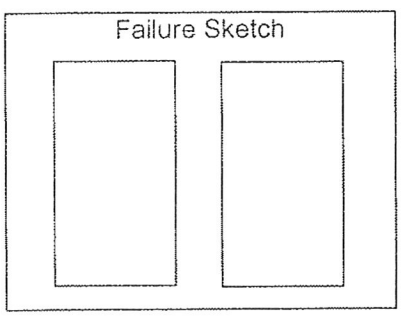
Date Extruded: 09/30/2009
Date Tested: N/A

Initial Wet Density (pcf)	114.2	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	39.6		
Initial Dry Density (pcf)	81.8		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.025	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.884	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

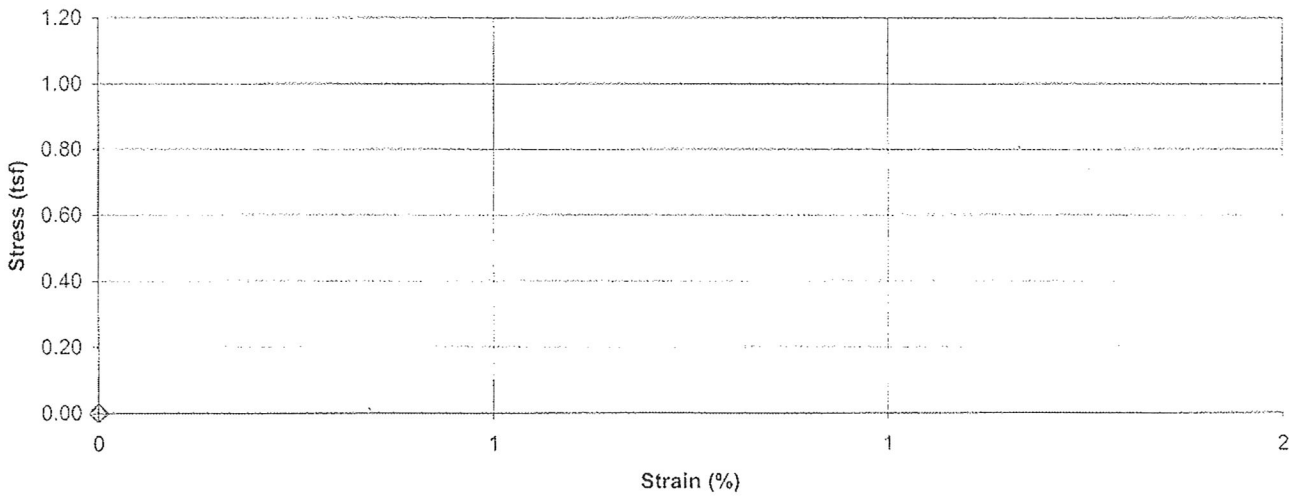
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-88, 22.0'-24.0' | Lab ID: 1089A
Visual Description: Sandy Silt (ML), gray, moist, soft, fly ash
Recovered: 1.9'
Test Interval: 22.0' - 22.5'

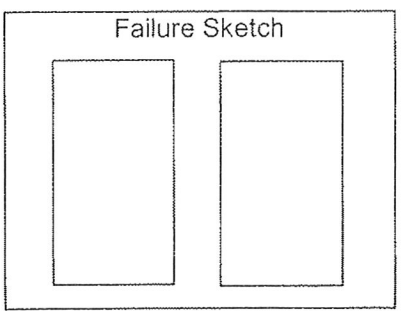
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/29/2009
Date Tested: N/A

Initial Wet Density (pcf)	104.1	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	43.9		
Initial Dry Density (pcf)	72.3		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.979	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.815	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A
Comments: initial mc determined using 60° C oven

Reviewed By: _____

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-88, 22.0'-24.0' | Lab ID: 1089B
Visual Description: Sandy Silt (ML), gray, moist, soft, fly ash

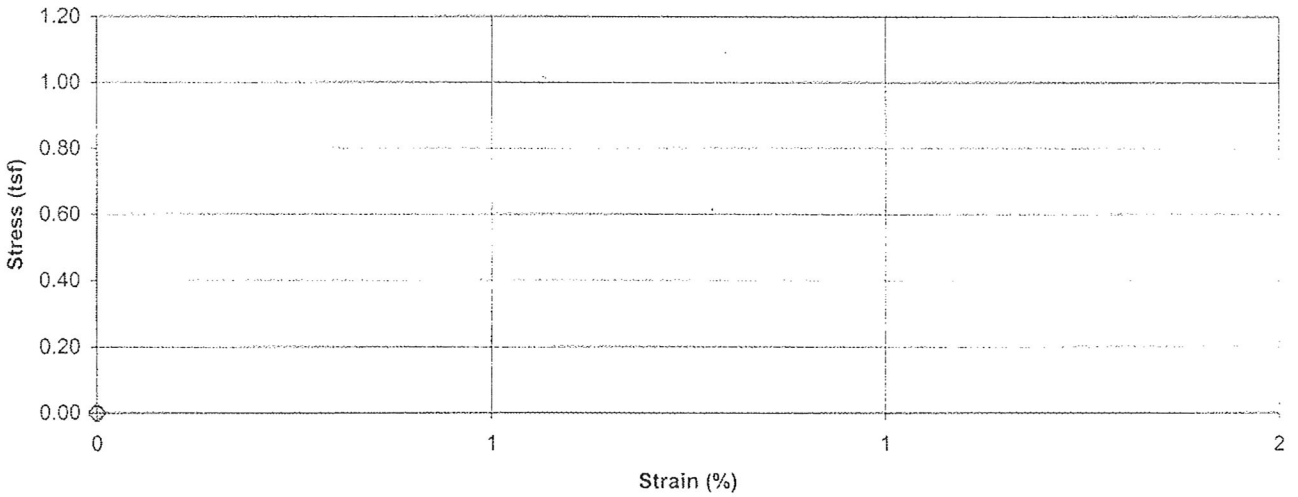
Recovered: 1.9'
Test Interval: 22.6' - 23.1'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

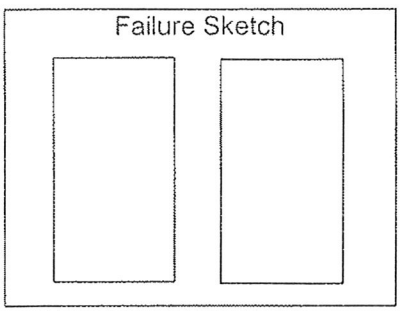
Date Extruded: 09/29/2009
Date Tested: N/A

Initial Wet Density (pcf)	105.6		
Initial Moisture Content (%)	34.8	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	78.3		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.846	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.807	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments: Initial mc determined using 60° C oven

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-88, 22.0'-24.0' | Lab ID: 1089C
Visual Description: Sandy Silt (ML), gray, moist, firm, fly ash

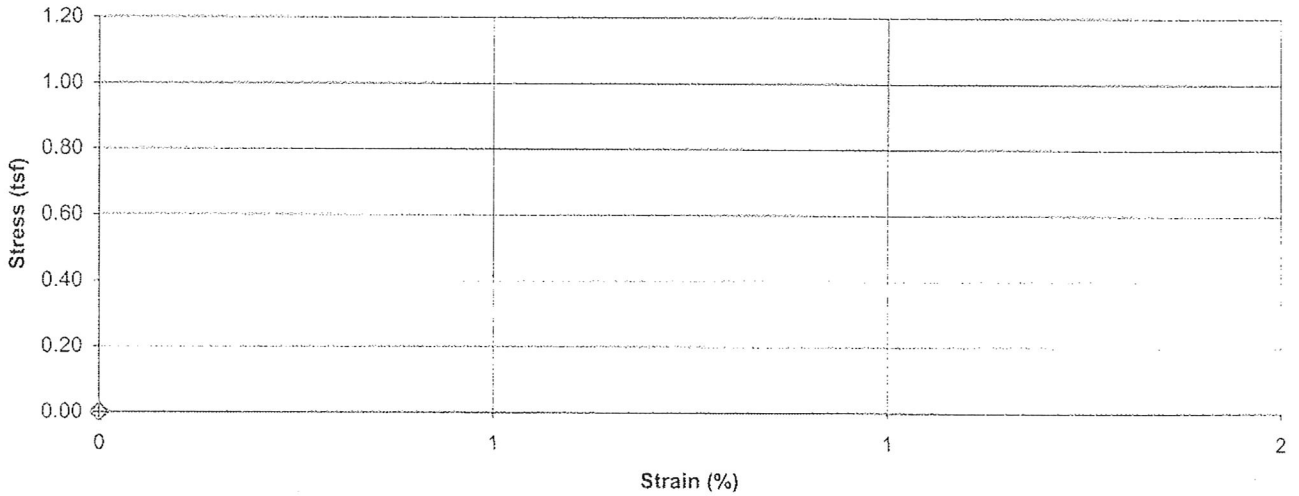
Recovered: 1.9'
Test Interval: 23.2' - 23.7'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

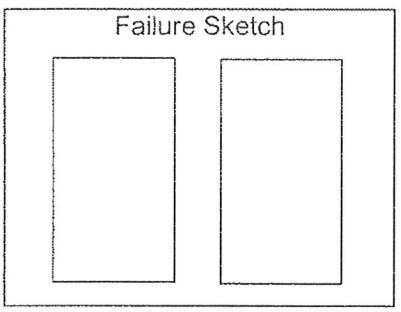
Date Extruded: 09/29/2009
Date Tested: N/A

Initial Wet Density (pcf)	114.6		
Initial Moisture Content (%)	33.5	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	85.8		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.885	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.862	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments: Initial mc determined using 60° C oven

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-88, 24.0'-26.0' | Lab ID: 1090A
Visual Description: Lean Clay (CL), Gray, moist, firm

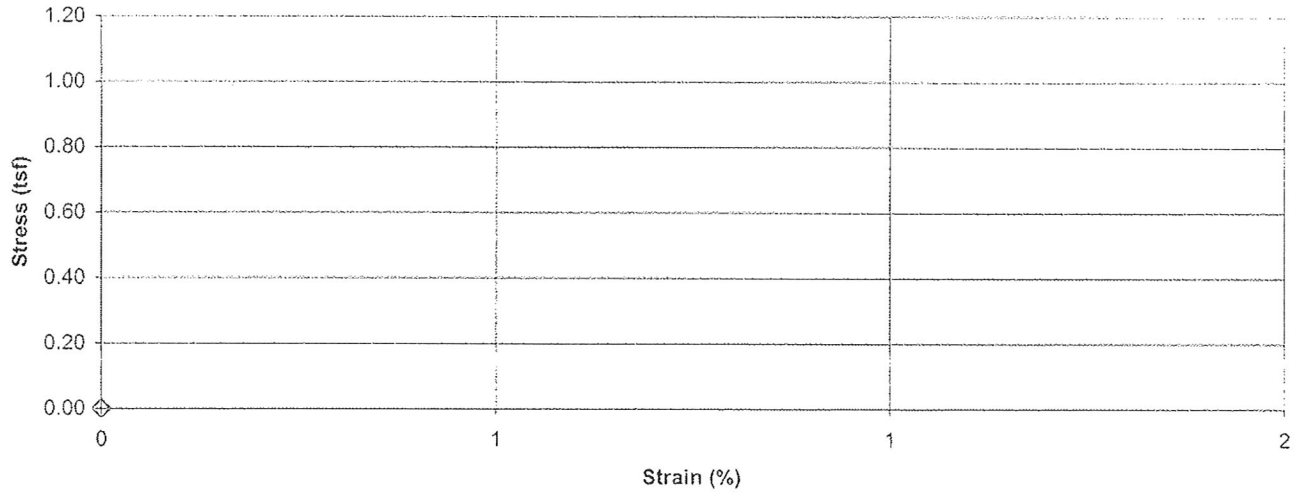
Recovered: 1.4'
Test Interval: 24.0' - 24.5'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

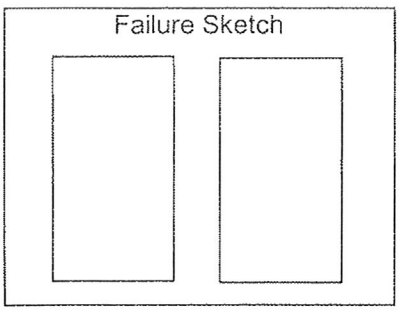
Date Extruded: 09/29/2009
Date Tested: N/A

Initial Wet Density (pcf)	116.2		
Initial Moisture Content (%)	31.6	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	88.3		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.905	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.875	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments: initial mc determined using a 60° C oven

Reviewed By: [signature]

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-88, 24.0'-26.0' | Lab ID: 1090B
Visual Description: Lean Clay (CL), gray, moist, firm

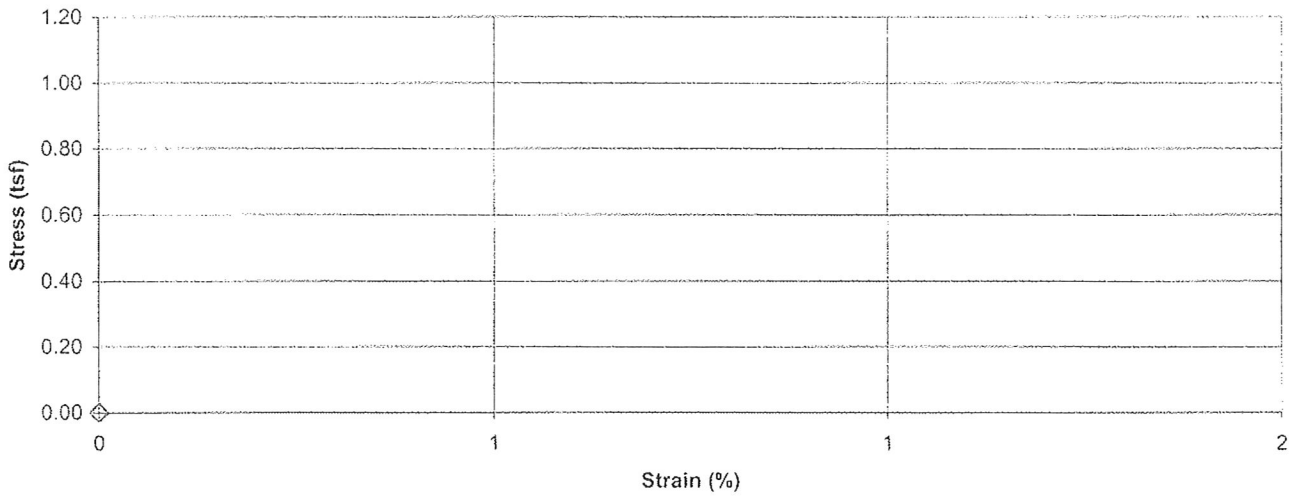
Recovered: 1.4'
Test Interval: 24.6' - 25.1'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

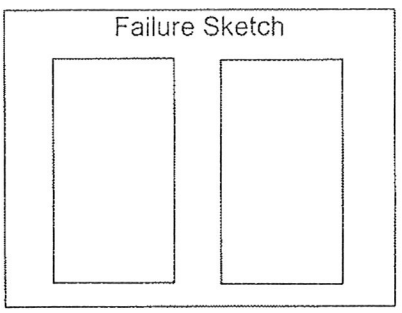
Date Extruded: 09/29/2009
Date Tested: N/A

Initial Wet Density (pcf)	116.9		
Initial Moisture Content (%)	28.2	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	91.2		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.040	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.855	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments: initial mc determined using a 60° C oven

Reviewed By: [signature]

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-88, 26.0'-28.0' | Lab ID: 1091A
Visual Description: Lean Clay (CL), gray, moist, firm

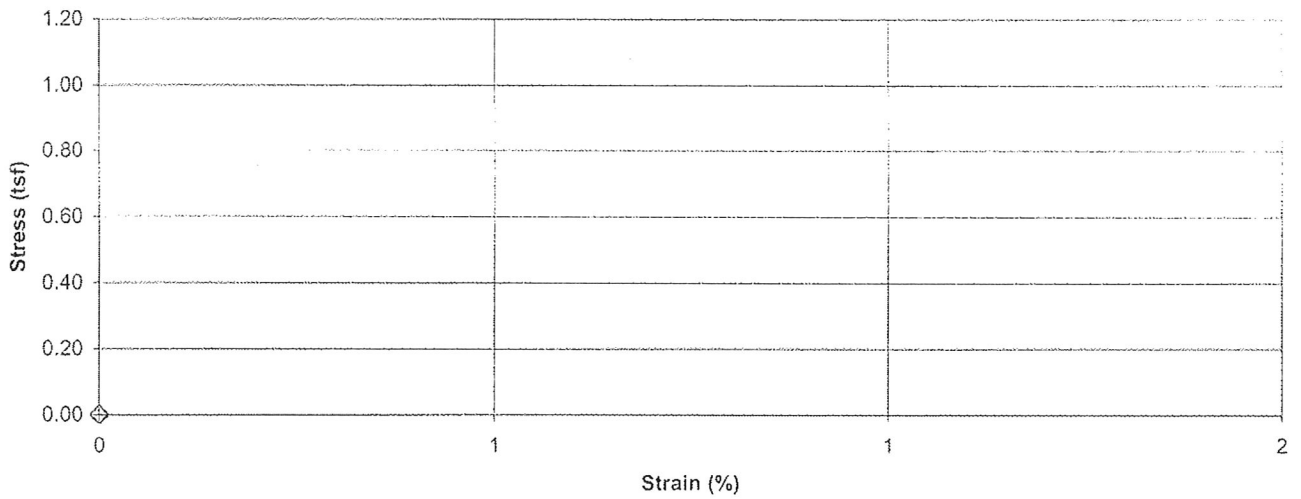
Recovered: 1.4'
Test Interval: 26.0' - 26.5'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

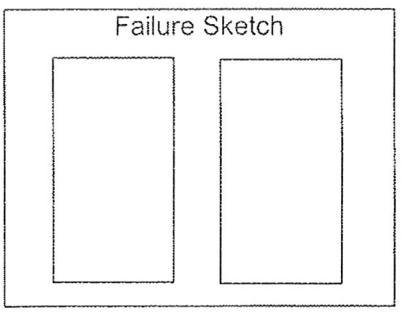
Date Extruded: 09/29/2009
Date Tested: N/A

Initial Wet Density (pcf)	116.4	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	36.6		
Initial Dry Density (pcf)	85.2		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.866	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.842	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-88, 26.0'-28.0' | Lab ID: 1091B
Visual Description: Lean Clay (CL), gray, moist, firm

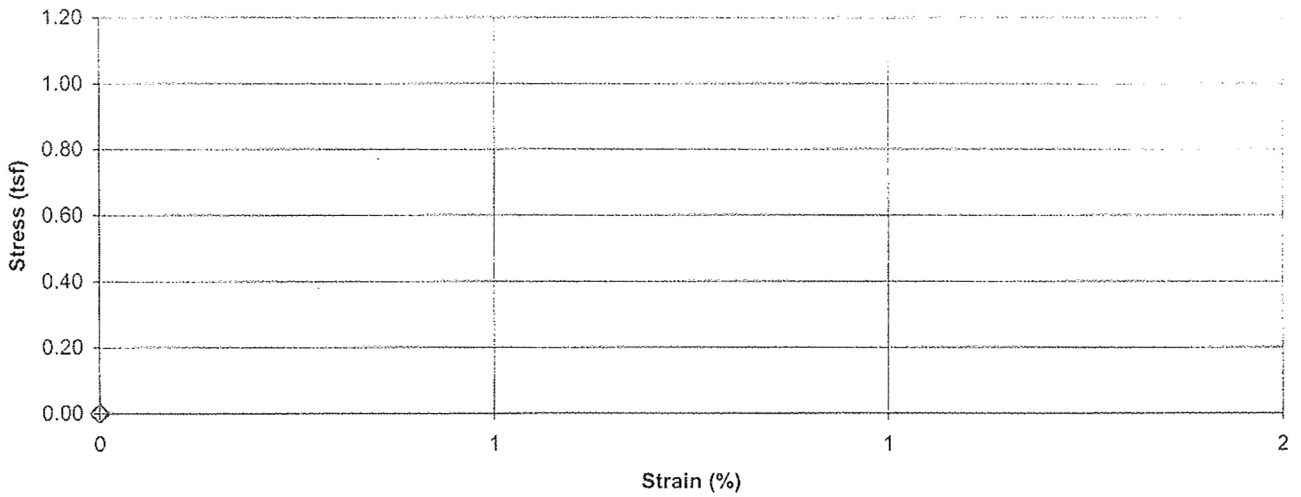
Recovered: 1.4'
Test Interval: 26.6' - 27.1'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

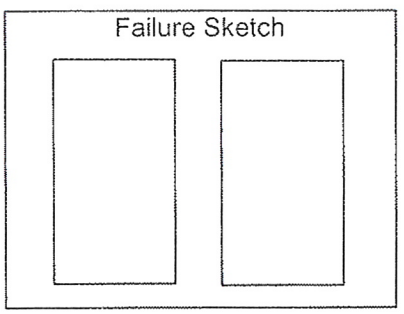
Date Extruded: 09/29/2009
Date Tested: N/A

Initial Wet Density (pcf)	118.9		
Initial Moisture Content (%)	33.3	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	89.2		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.010	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.885	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

(1072)

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-88, 28.0'-30.0' | Lab ID: 1092
Visual Description: Lean Clay (CL), gray, moist, firm

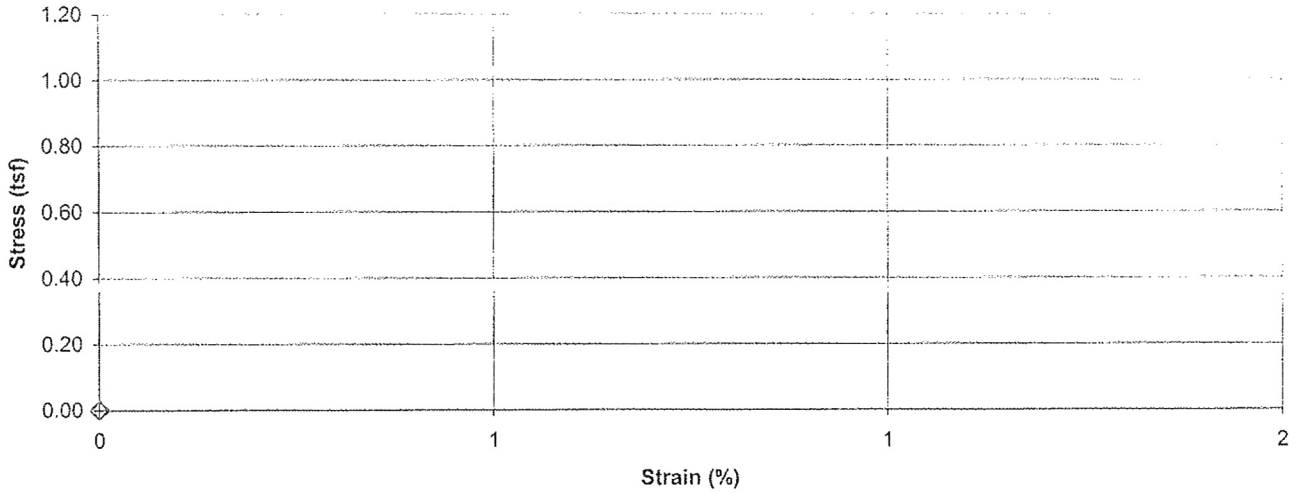
Recovered: 0.8'
Test Interval: 28.0' - 28.5'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

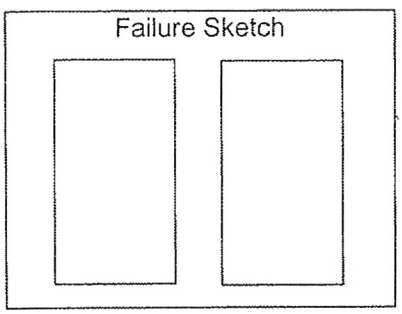
Date Extruded: 09/29/2009
Date Tested: N/A

Initial Wet Density (pcf)	120.1		
Initial Moisture Content (%)	27.7	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	94.0		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.034	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.873	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments:

Reviewed By:

1092

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-3, 4.5'-6.5' | Lab ID: 23
Visual Description: Lean Clay (CL), brown, moist, firm

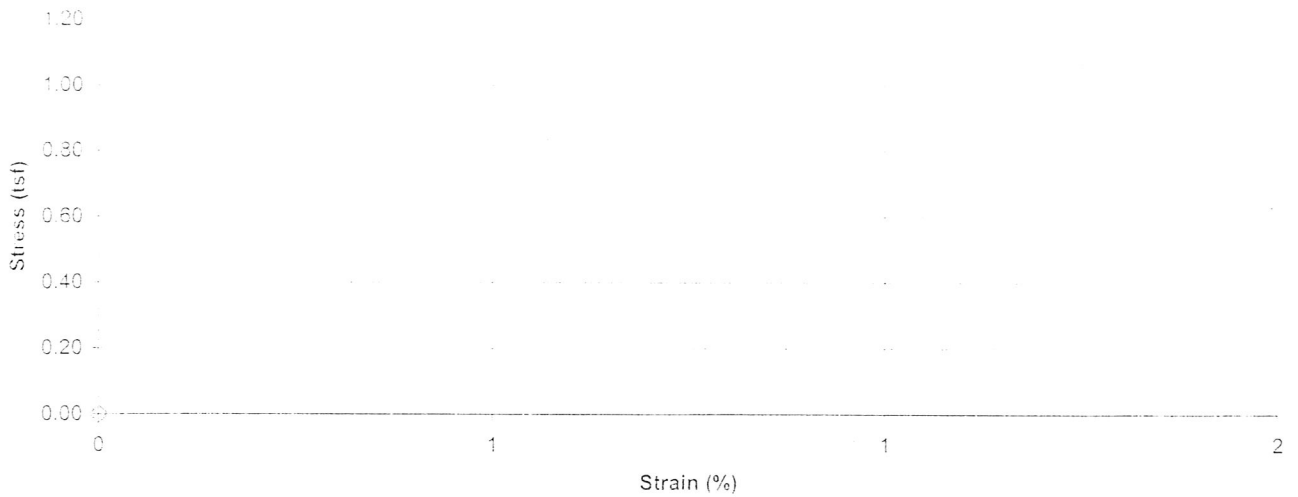
Recovered: 0.8'
Test Interval: 4.5' - 5.3'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

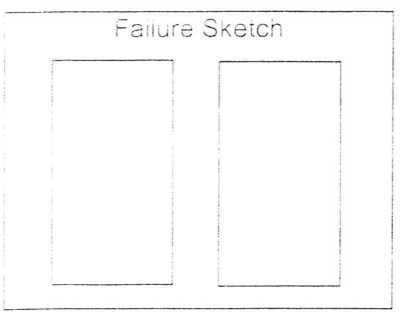
Date Extruded: 07/22/2009
Date Tested: N/A

Initial Wet Density (pcf)	N/A		
Initial Moisture Content (%)	18.8	Initial MC Taken	Before Test, From Center of Specimen
Initial Dry Density (pcf)	N/A		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	N/A	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	N/A	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	N/A	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments: No test specimen obtained due to fractures throughout. Saved in a bag.

Reviewed By

865

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015

Source: STN-3, 9.5'-11.5' | Lab ID: 24

Visual Description: Lean Clay (CL), brown, moist, firm

Recovered: 0.5'

Test Interval: 9.5' - 10.0'

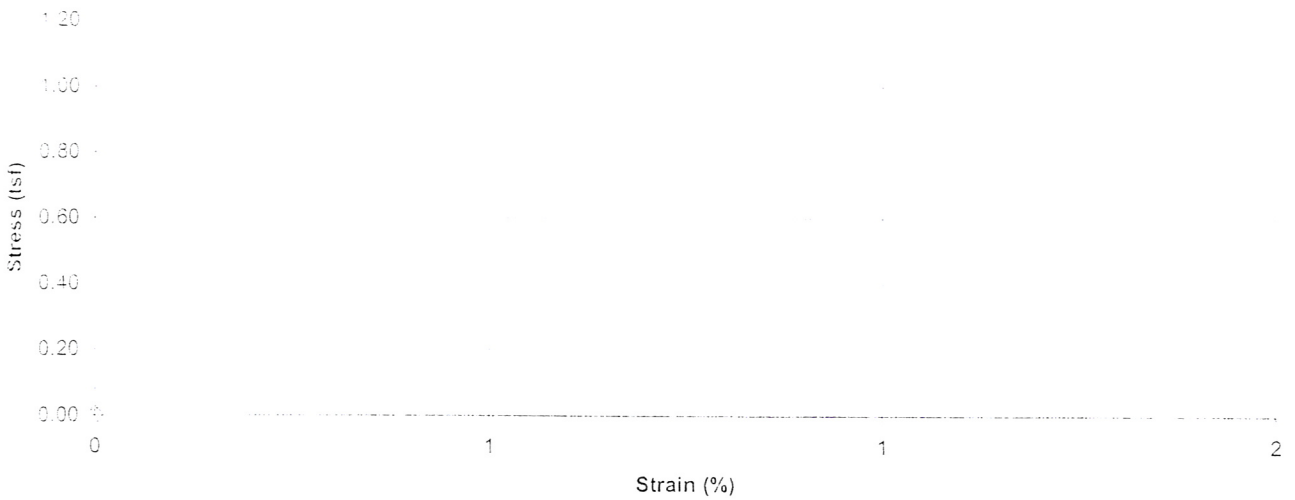
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

Date Extruded: 07/22/2009

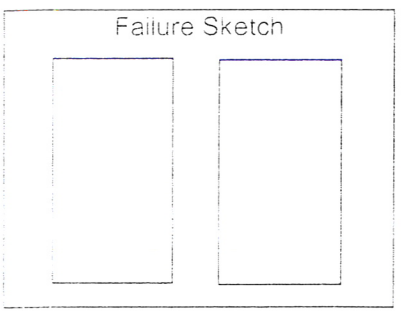
Date Tested: N/A

Initial Wet Density (pcf)	N/A		
Initial Moisture Content (%)	19.7	Initial MC Taken	Before Test, From Center of Specimen
Initial Dry Density (pcf)	N/A		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	N/A	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	N/A	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	N/A	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A

Torvane Reading (kg/cm^2): N/A

Comments: No test specimen obtained due to fractures throughout.

Reviewed By:

1869

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-3, 19.5'-21.5' | Lab ID: 26
Visual Description: Silt (ML), gray, moist, firm, fly ash

Recovered: 0.7'
Test Interval: 19.5' - 20.0'

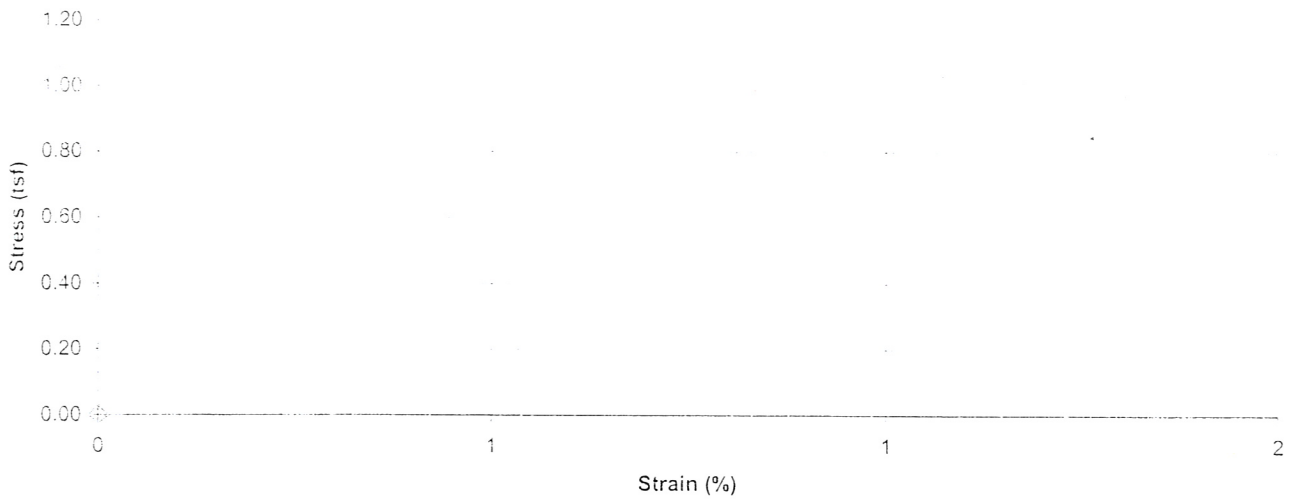
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

Date Extruded: 07/27/2009
Date Tested: N/A

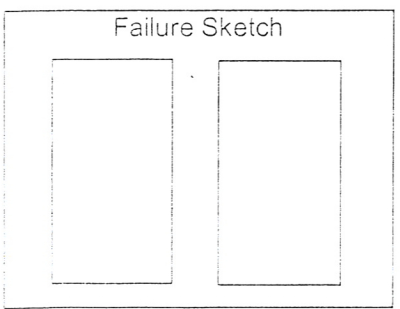
Initial Wet Density (pcf)	111.4	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	30.3		
Initial Dry Density (pcf)	85.5		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A		
Average Height (in)	5.920		
Average Diameter (in)	2.831		
Height to Diameter Ratio	2.1		

Unconfined Compressive Strength (tsf)	N/A
Undrained Shear Strength (tsf)	N/A
Strain at Maximum Stress (%)	N/A
Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments: Dry unit weight determined using 60° C mc.

Reviewed By:

1865

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015

Source: STN-10, 18.0'-18.5' | Lab ID: 1

Visual Description: Sandy Silt (ML), gray, moist, firm, fly ash

Recovered: 0.5'

Test Interval: 18.0' - 18.5'

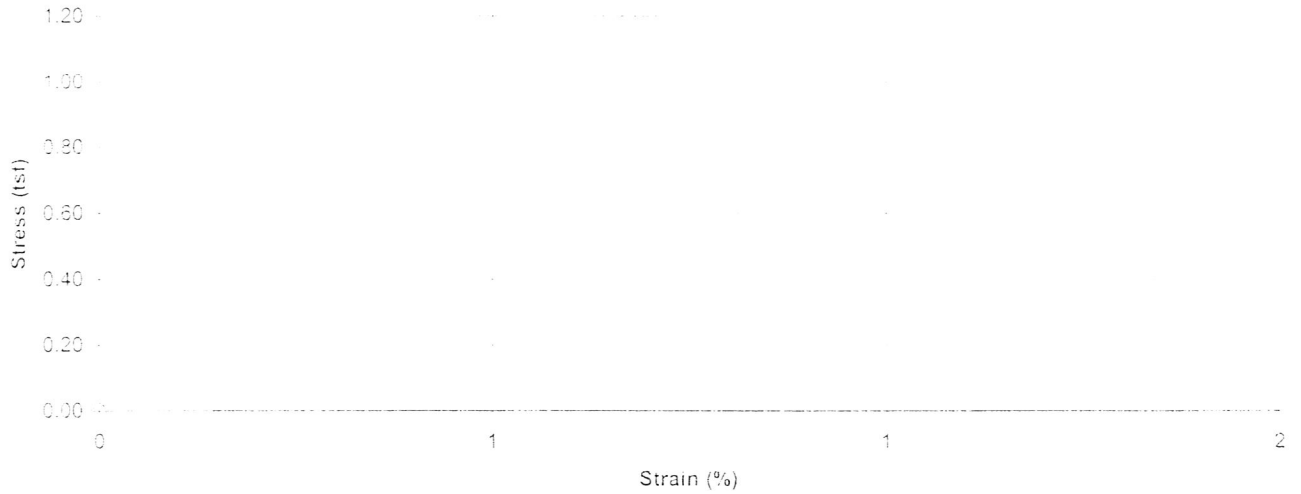
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

Date Extruded: 07/27/2009

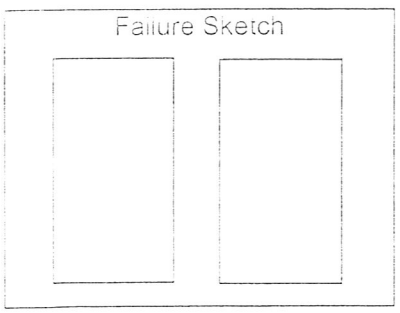
Date Tested: N/A

Initial Wet Density (pcf)	114.8		
Initial Moisture Content (%)	19.2	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	96.3		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.032	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.830	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A

Torvane Reading (kg/cm^2): N/A

Comments: Dry unit weight determined using 60° C mc.

Reviewed By:

Stantec

Unconfined Compressive Strength of Cohesive Soil

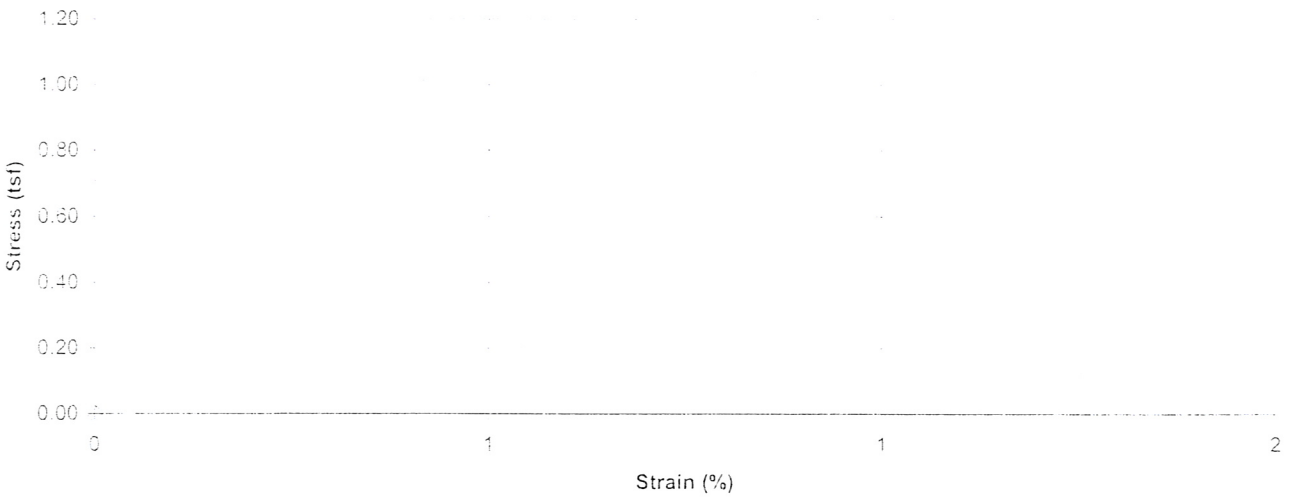
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-10, 24.5'-26.5' | Lab ID: 2
Visual Description: Poorly Graded Sand with Gravel (SP), black, moist, soft, bottom ash
Recovered: 1.4'
Test Interval: 24.6' - 25.1'

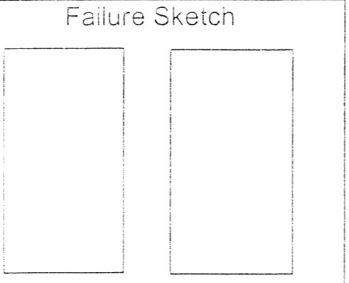
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 07/27/2009
Date Tested: N/A

Initial Wet Density (pcf)	N/A		
Initial Moisture Content (%)	43.0	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	N/A		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	N/A	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	N/A	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	N/A	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments: MC obtained using 60° C oven.
Unable to obtain 6" specimen due to sand content. Saved in bag.

Reviewed By:

865

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015

Source: STN-10, 26.5'-28.5' | Lab ID: 3A

Visual Description: Sandy Silt (ML), gray, moist, firm, fly ash

Recovered: 1.3'

Test Interval: 26.5' - 27.0'

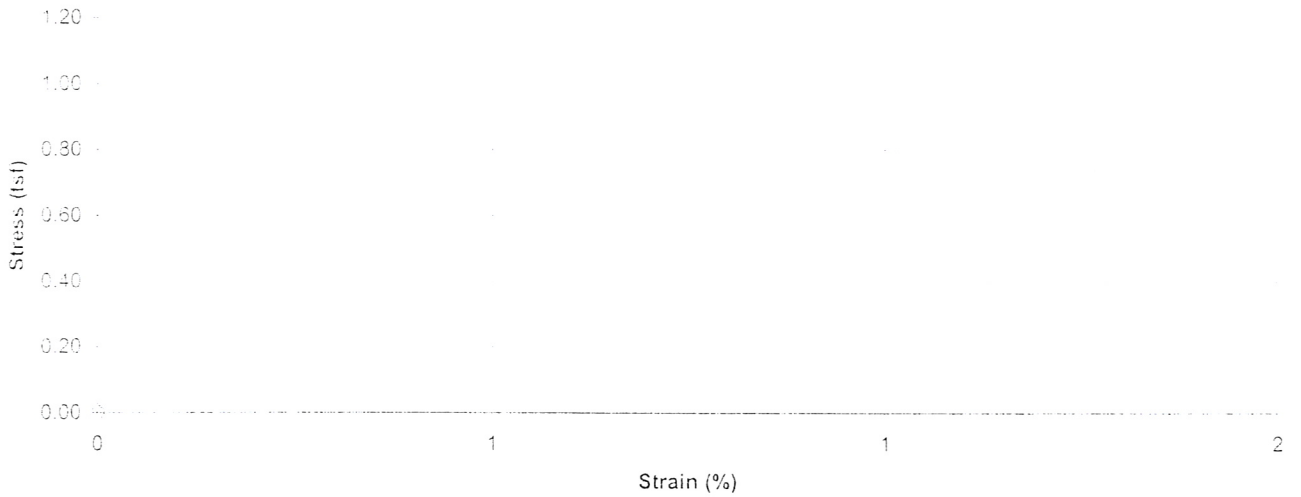
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

Date Extruded: 07/27/2009

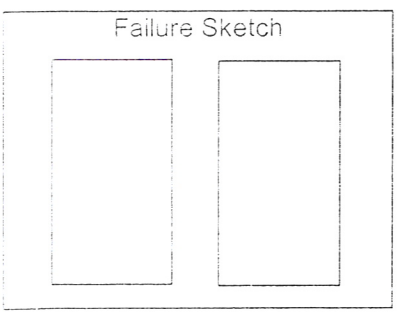
Date Tested: N/A

Initial Wet Density (pcf)	101.0		
Initial Moisture Content (%)	32.1	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	76.4		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.975	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.839	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A

Torvane Reading (kg/cm^2): N/A

Comments: Dry unit weight determined using 60° C mc.

Reviewed By:

865

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015

Source: STN-10, 26.5'-28.5' | Lab ID: 3B

Visual Description: Silt (ML), gray, moist, firm, fly ash

Recovered: 1.3'

Test Interval: 27.1' - 27.6'

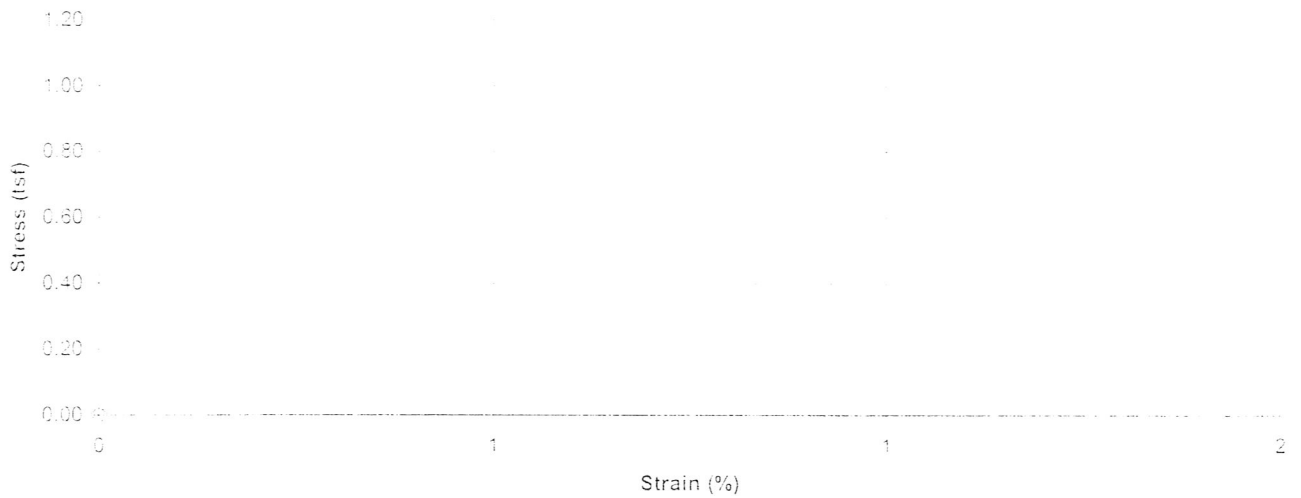
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

Date Extruded: 07/27/2009

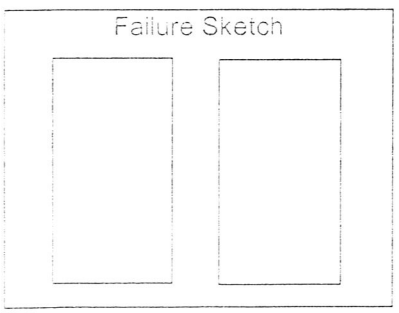
Date Tested: N/A

Initial Wet Density (pcf)	119.6	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	28.8		
Initial Dry Density (pcf)	92.9		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.971	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.869	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A

Torvane Reading (kg/cm^2): N/A

Comments: Dry unit weight determined using 60° C mc.

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

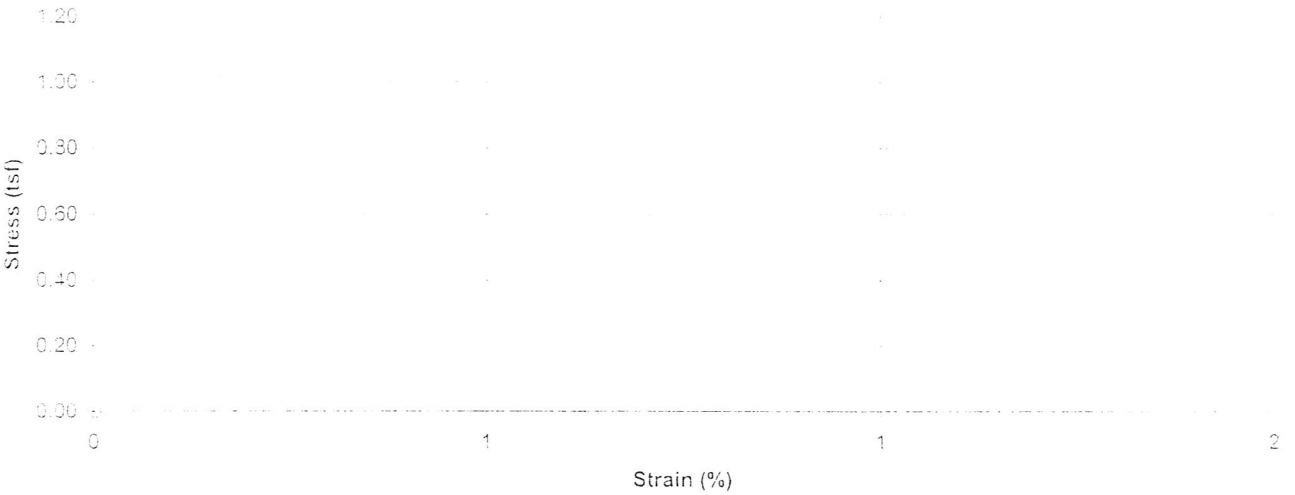
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-10, 28.5'-30.5' | Lab ID: 4A
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.4'
Test Interval: 28.5' - 30.1'

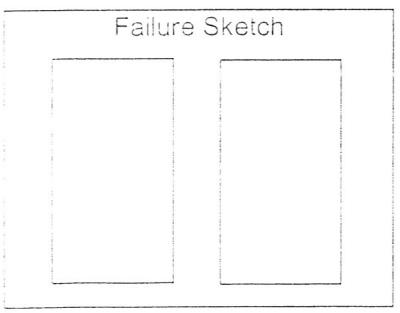
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 07/27/2009
Date Tested: N/A

Initial Wet Density (pcf)	125.4	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	22.2		
Initial Dry Density (pcf)	102.6		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.073	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.886	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

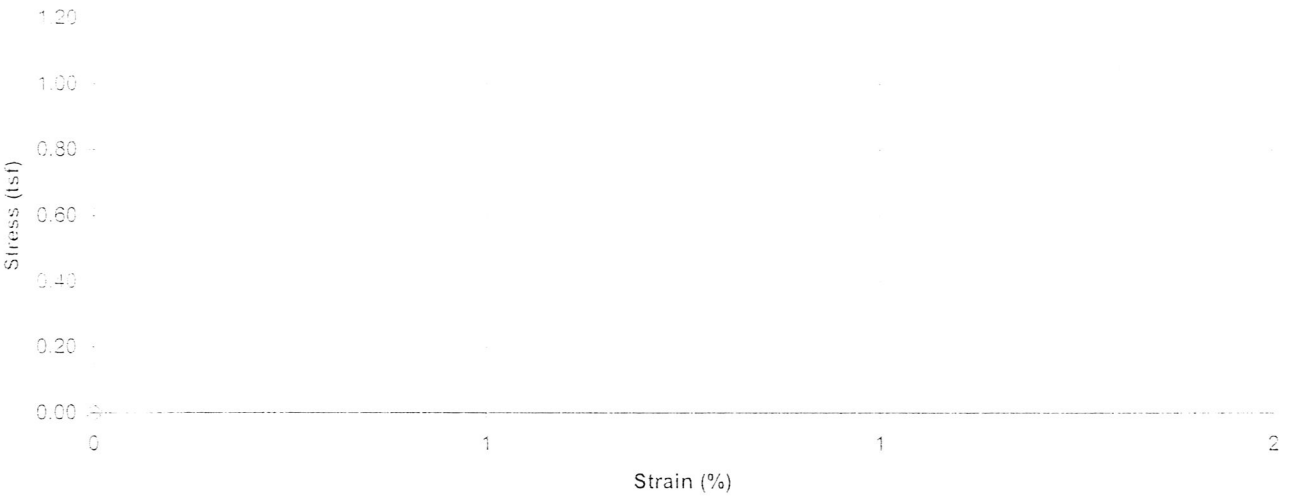
Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

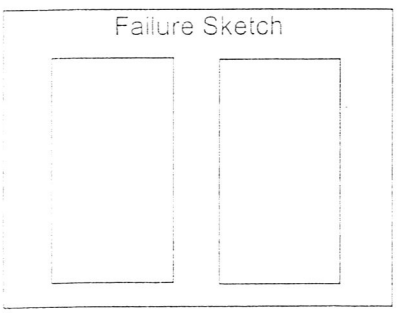
Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-10, 28.5'-30.5' | Lab ID: 4B
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.4'
Test Interval: 30.1' - 30.6'
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 07/27/2009
Date Tested: N/A

Initial Wet Density (pcf)	124.2	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	24.5		
Initial Dry Density (pcf)	99.7		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.983	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.878	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015

Source: STN-10, 30.5'-32.5' | Lab ID: 5A

Visual Description: Lean Clay (CL), brown, moist, firm

Recovered: 1.4'

Test Interval: 30.5' - 31.0'

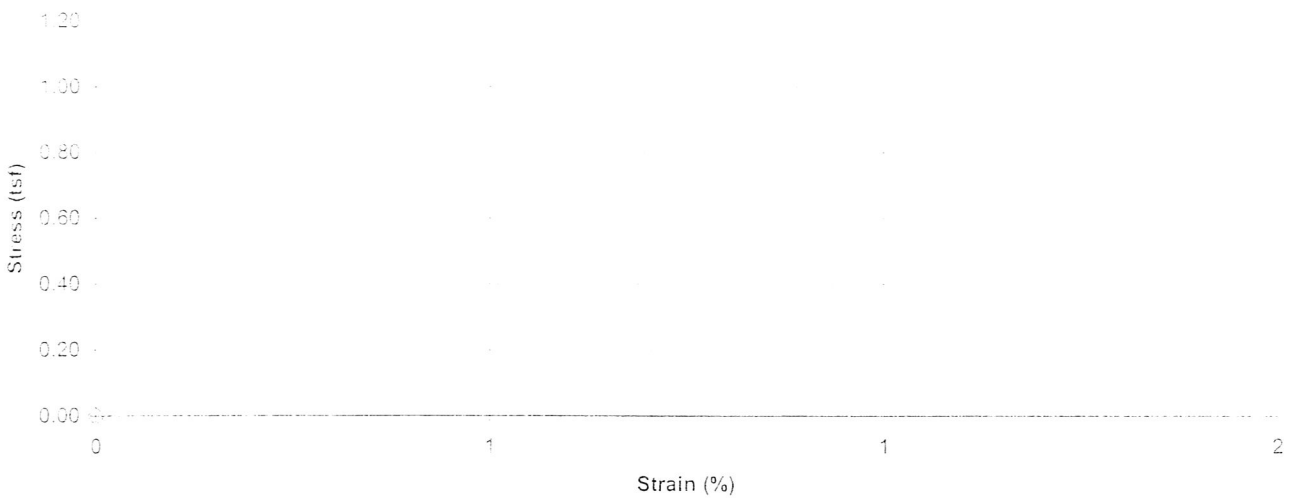
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

Date Extruded: 07/27/2009

Date Tested: N/A

Initial Wet Density (pcf)	126.9	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	21.8		
Initial Dry Density (pcf)	104.2		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.025	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.881	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch

Pocket Penetrometer Reading (tsf): N/A

Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

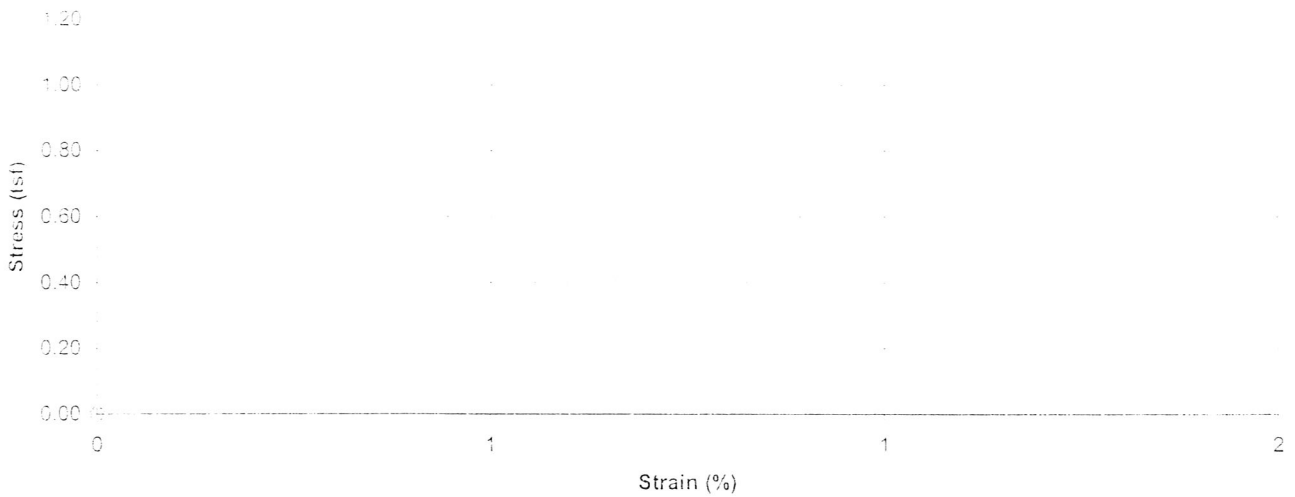
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-10, 30.5'-32.5' | Lab ID: 5B
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.4'
Test Interval: 31.0' - 31.5'

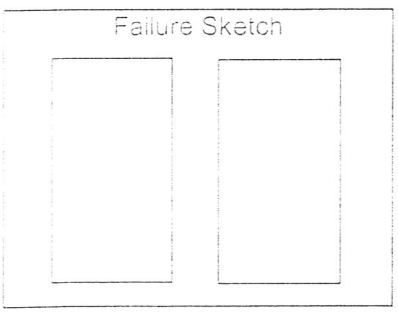
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 07/27/2009
Date Tested: N/A

Initial Wet Density (pcf)	129.6	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	20.7		
Initial Dry Density (pcf)	107.4		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.016	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.880	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015

Source: STN-10, 32.5'-34.5' | Lab ID: 6A

Visual Description: Lean Clay (CL), brown, moist, firm

Recovered: 1.9'

Test Interval: 32.6' - 33.1'

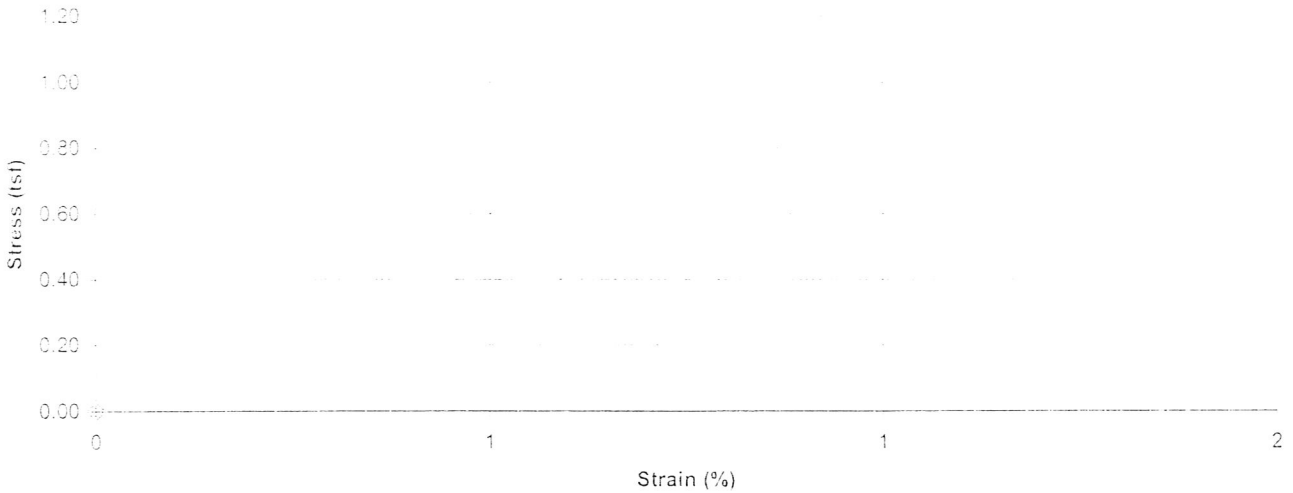
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

Date Extruded: 07/20/2009

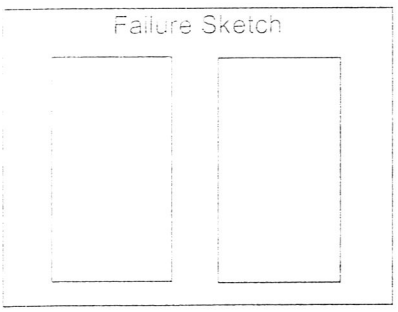
Date Tested: N/A

Initial Wet Density (pcf)	122.8	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	22.9		
Initial Dry Density (pcf)	99.9		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.949	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.884	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A

Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

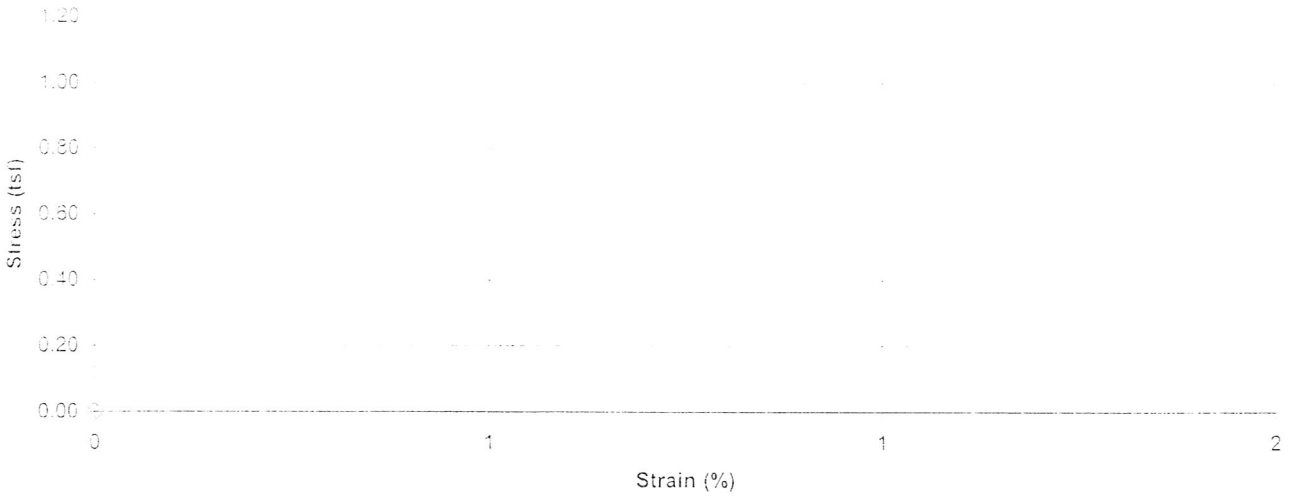
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) — Project Number: 172679015
Source: STN-10, 32.5'-34.5' — Lab ID: 6B
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.9'
Test Interval: 33.2' - 33.7'

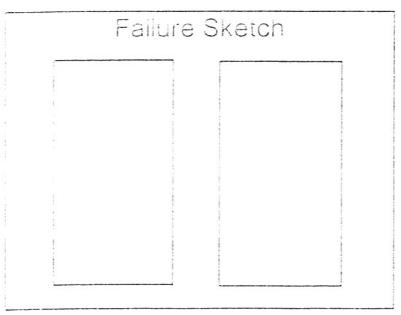
Specimen Type: Undisturbed — LL: N/A — PL: N/A — PI: N/A
Date Extruded: 07/20/2009
Date Tested: N/A

Initial Wet Density (pcf)	127.3	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	22.5		
Initial Dry Density (pcf)	103.9		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.894	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.885	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.0	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments:

Reviewed By:

Stantec

Unconfined Compressive Strength of Cohesive Soil

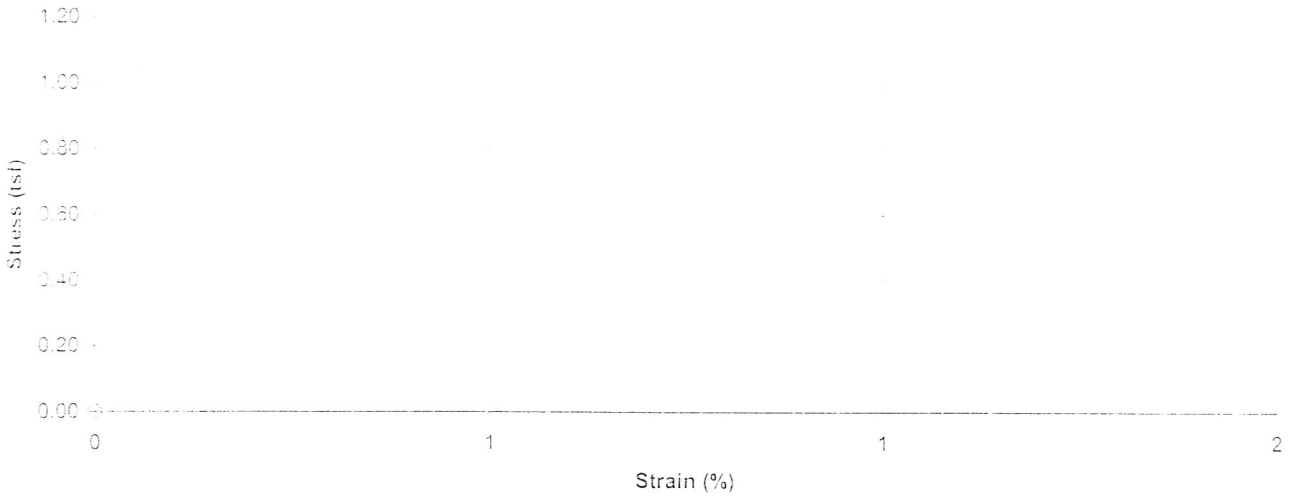
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) — Project Number: 172679015
Source: STN-10, 32.5'-34.5' — Lab ID: 6C
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.9'
Test Interval: 33.8' - 34.3'

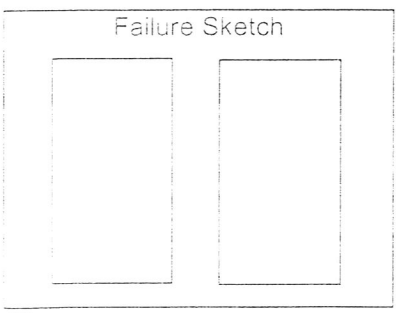
Specimen Type: Undisturbed — LL: N/A — PL: N/A — PI: N/A
Date Extruded: 07/20/2009
Date Tested: N/A

Initial Wet Density (pcf)	128.8	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	21.1		
Initial Dry Density (pcf)	106.3		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.982	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.885	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

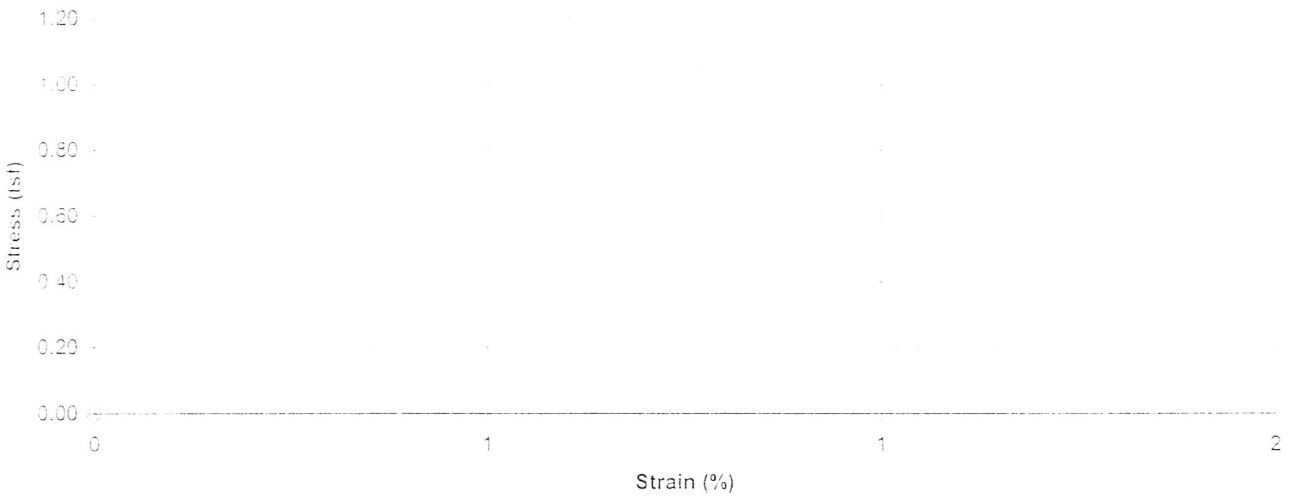
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-10, 34.5'-36.5' | Lab ID: 7A
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.6'
Test Interval: 34.6' - 35.1'

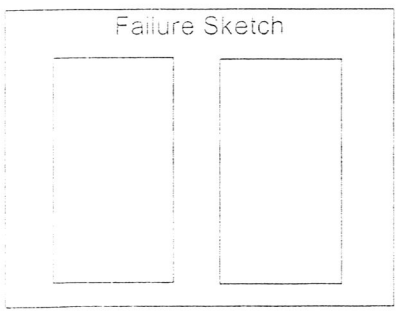
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A | Date Extruded: 07/20/2009 | Date Tested: N/A

Initial Wet Density (pcf)	126.4		
Initial Moisture Content (%)	21.8	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	103.8		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.934	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.895	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.0	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1865

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015

Source: STN-10, 34.5'-36.5' | Lab ID: 7B

Visual Description: Lean Clay (CL), brown, moist, firm

Recovered: 1.6'

Test Interval: 35.2' - 35.7'

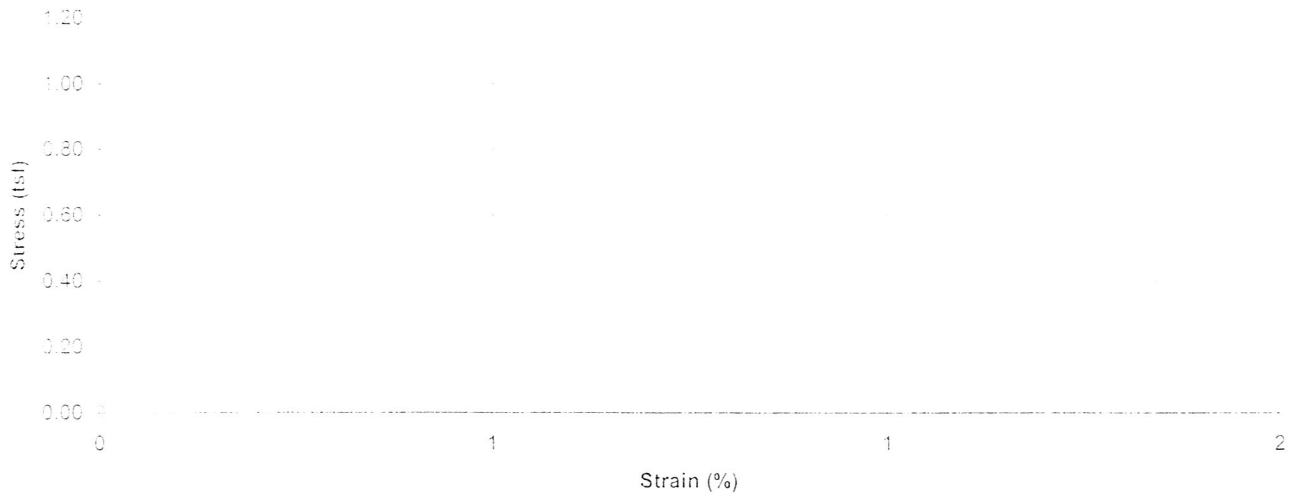
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

Date Extruded: 07/20/2009

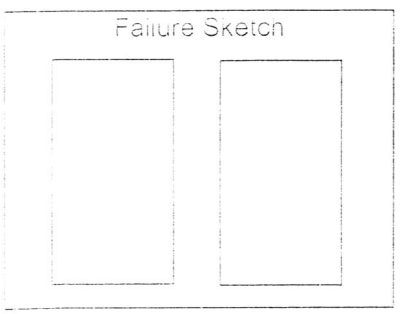
Date Tested: N/A

Initial Wet Density (pcf)	126.5	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	21.7		
Initial Dry Density (pcf)	104.0		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.007	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.886	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A

Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

7B69

Stantec

Unconfined Compressive Strength of Cohesive Soil

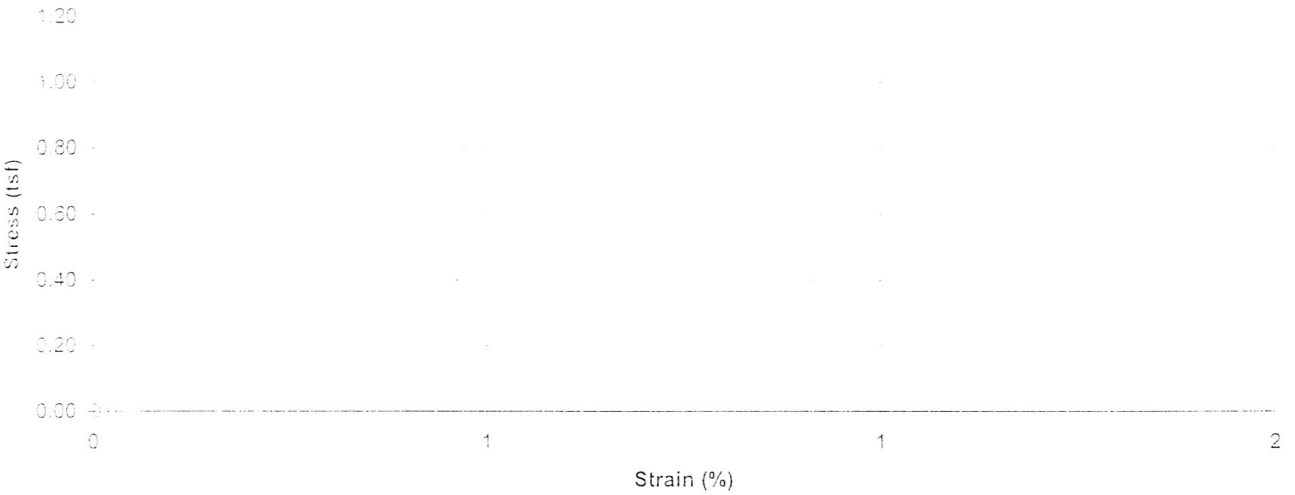
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-10, 36.5'-38.5' | Lab ID: 8A
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.4'
Test Interval: 36.5' - 37.0'

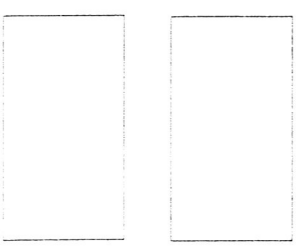
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 07/20/2009
Date Tested: N/A

Initial Wet Density (pcf)	125.4	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	24.3		
Initial Dry Density (pcf)	100.9		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.039	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.887	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

[illegible]

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015

Source: STN-10 36.5'-38.5' | Lab ID: 8B

Visual Description: Lean Clay (CL), brown, moist, firm

Recovered: 1.4'

Test Interval: 37.1' - 37.6'

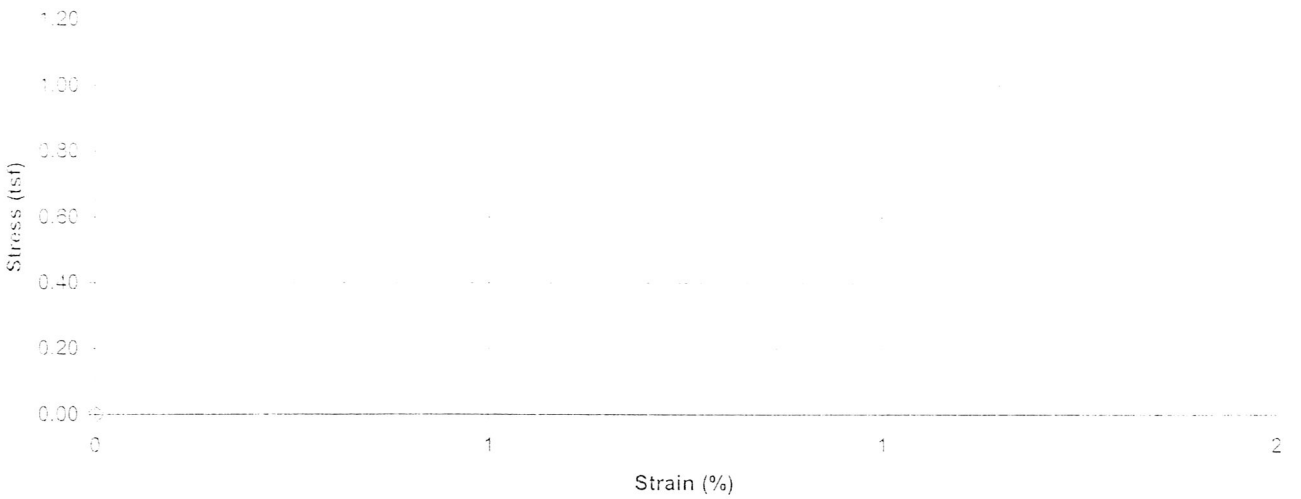
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

Date Extruded: 07/20/2009

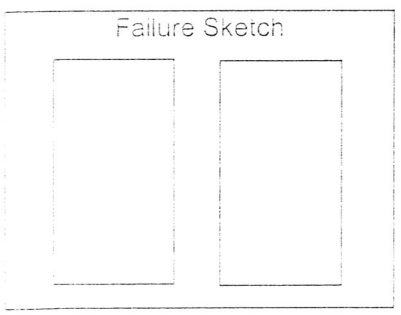
Date Tested: N/A

Initial Wet Density (pcf)	127.6	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	20.1		
Initial Dry Density (pcf)	106.3		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.016	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.888	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A

Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

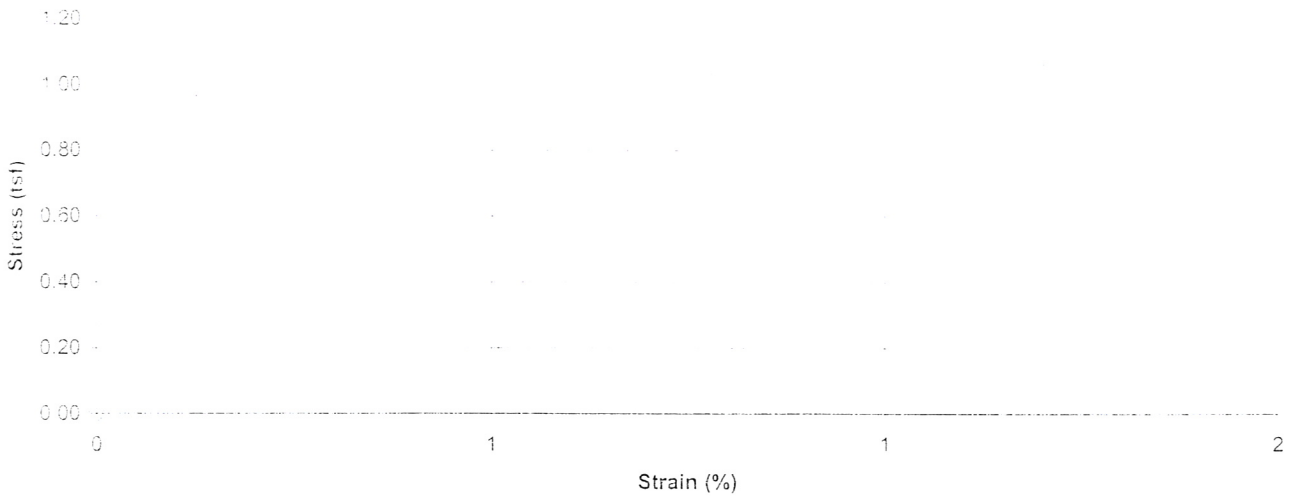
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-10, 38.5'-40.5' | Lab ID: 9A
Visual Description: Lean Clay with Sand (CL), brown, moist, firm
Recovered: 1.5'
Test Interval: 38.6' - 39.1'

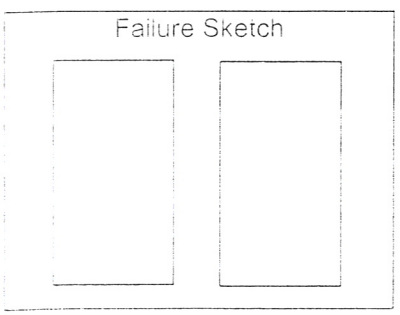
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 07/20/2009
Date Tested: N/A

Initial Wet Density (pcf)	126.9	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	24.4		
Initial Dry Density (pcf)	102.0		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.966	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.874	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1869

Stantec

Unconfined Compressive Strength of Cohesive Soil

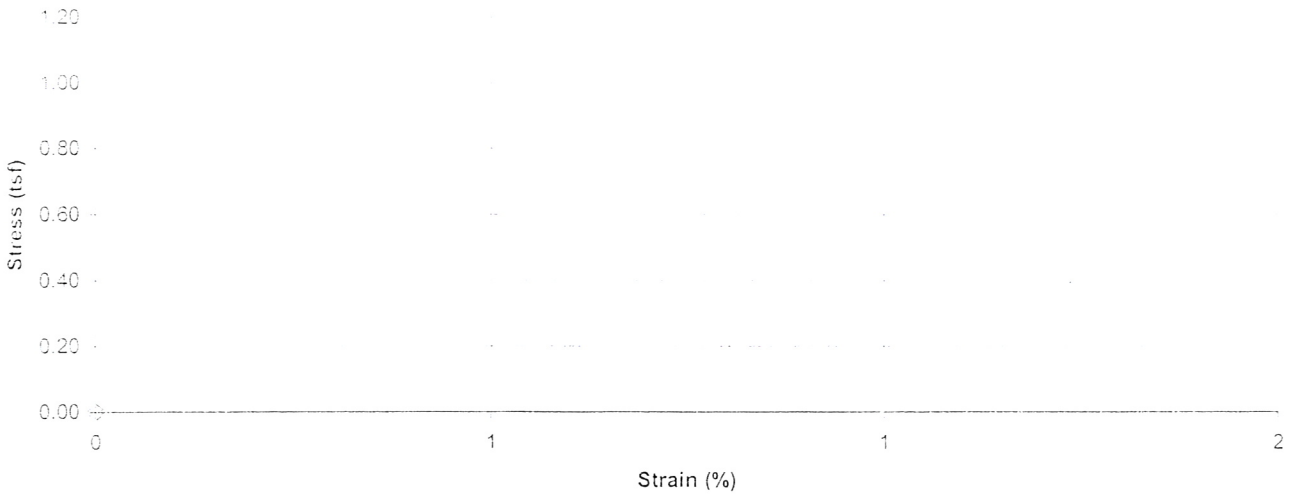
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) — Project Number: 172679015
Source: STN-10, 38.5'-40.5' — Lab ID: 9B
Visual Description: Lean Clay with Sand (CL), brown, moist, firm
Recovered: 1.5'
Test Interval: 39.2' - 39.7'

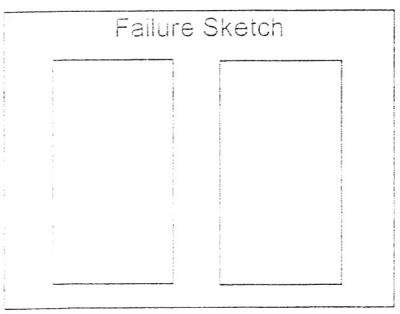
Specimen Type: Undisturbed — LL: N/A — PL: N/A — PI: N/A
Date Extruded: 07/20/2009
Date Tested: N/A

Initial Wet Density (pcf)	128.4	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	20.4		
Initial Dry Density (pcf)	106.7		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.009	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.883	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1865

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-10, 40.5'-42.5' | Lab ID: 10A
Visual Description: Lean Clay (CL), brown, wet, soft

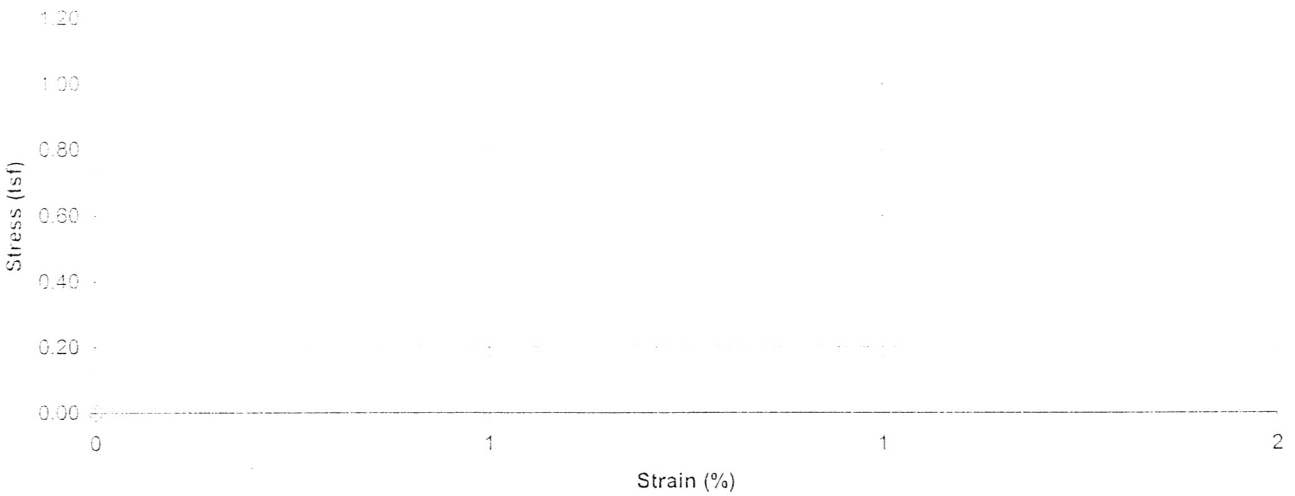
Recovered: 1.6'
Test Interval: 40.6' - 41.1'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

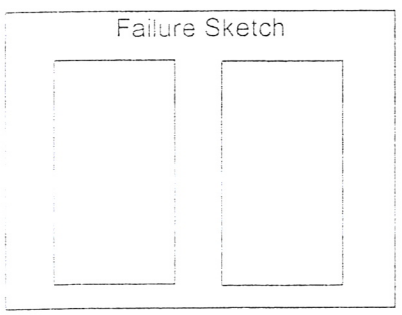
Date Extruded: 07/21/2009
Date Tested: N/A

Initial Wet Density (pcf)	122.5	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	27.3		
Initial Dry Density (pcf)	96.2		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.921	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.880	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

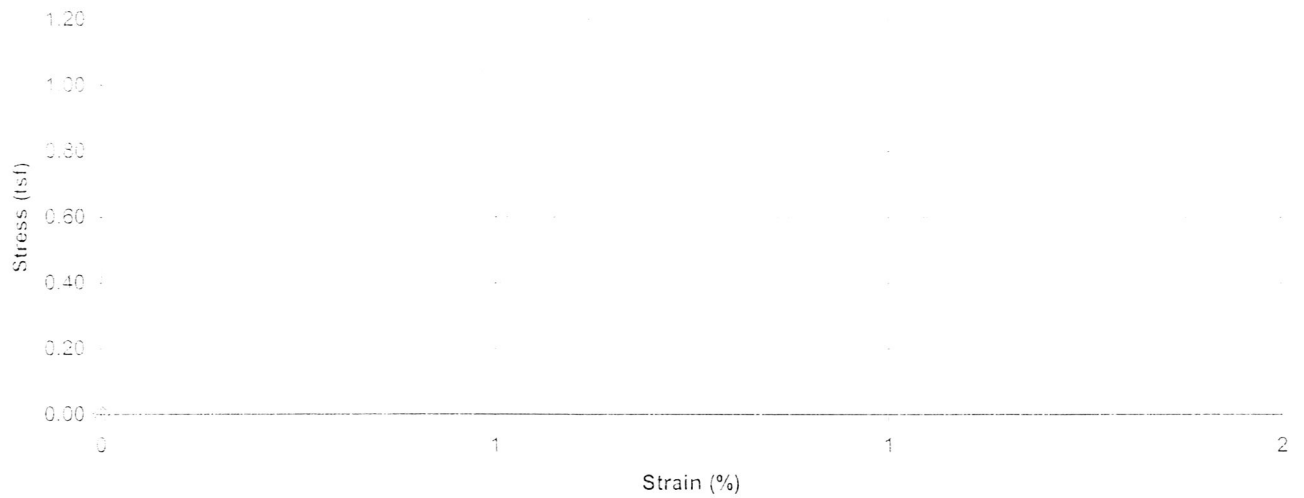
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-10, 40.5'-42.5' | Lab ID: 10B
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.6'
Test Interval: 41.2' - 41.7'

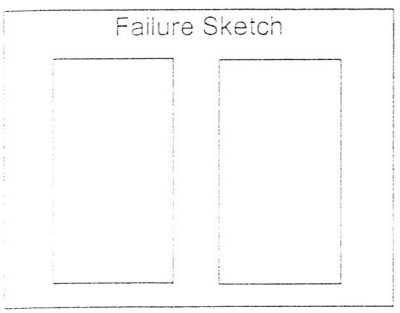
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 07/21/2009
Date Tested: N/A

Initial Wet Density (pcf)	127.8		
Initial Moisture Content (%)	20.1	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	106.4		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.943	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.910	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.0	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

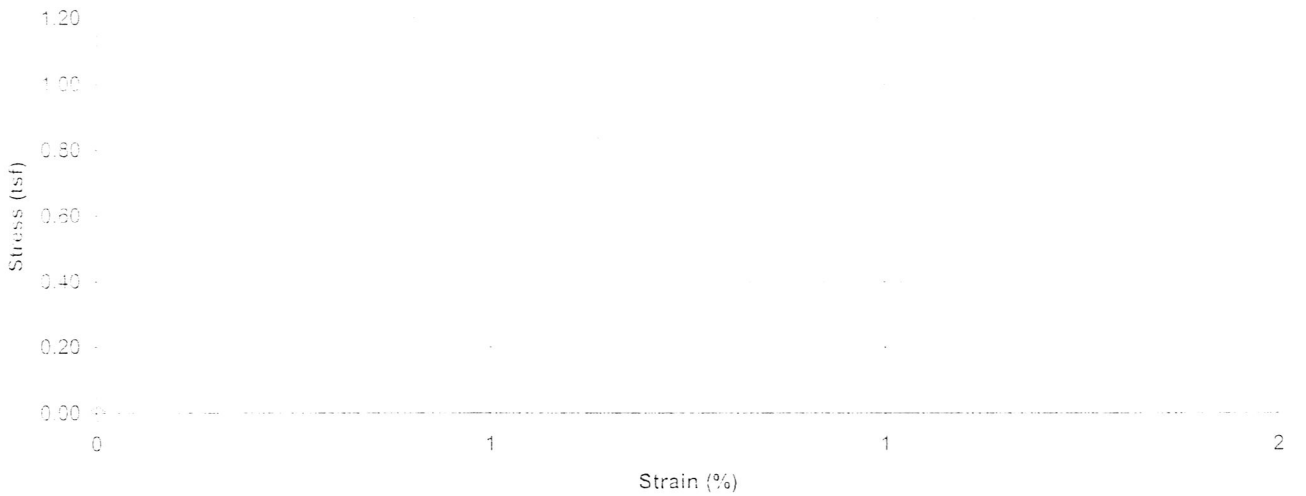
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-10, 42.5'-44.5' | Lab ID: 11A
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.4'
Test Interval: 42.6' - 43.1'

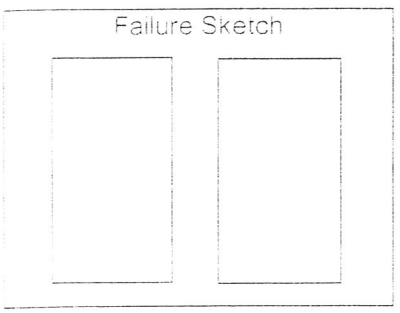
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 07/21/2009
Date Tested: N/A

Initial Wet Density (pcf)	131.6	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	19.7		
Initial Dry Density (pcf)	109.9		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.993	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.896	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-10, 42.5'-44.5' | Lab ID: 11B
Visual Description: Lean Clay (CL), brown, moist, firm

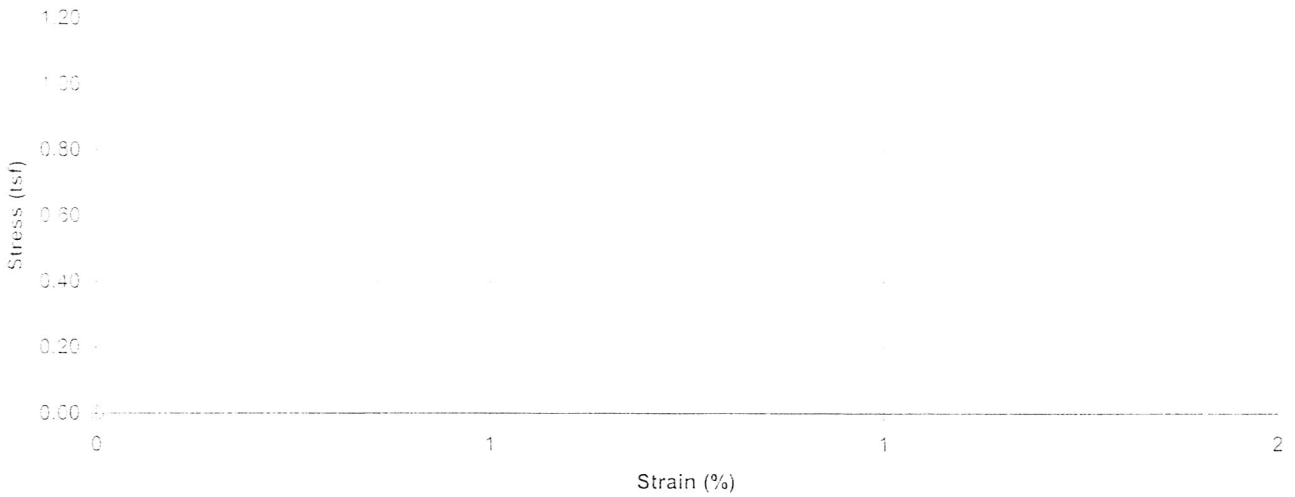
Recovered: 1.4'
Test Interval: 43.2' - 43.7'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

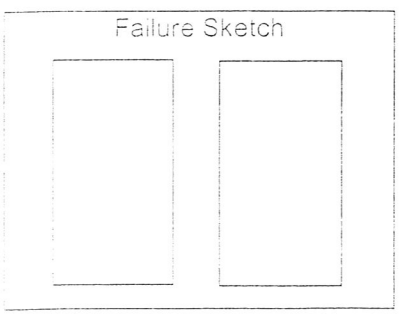
Date Extruded: 07/21/2009
Date Tested: N/A

Initial Wet Density (pcf)	129.3	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	20.4		
Initial Dry Density (pcf)	107.4		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.983	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.884	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-10, 44.5'-46.0' | Lab ID: 12A
Visual Description: Lean Clay with Sand (CL), brown, moist, soft

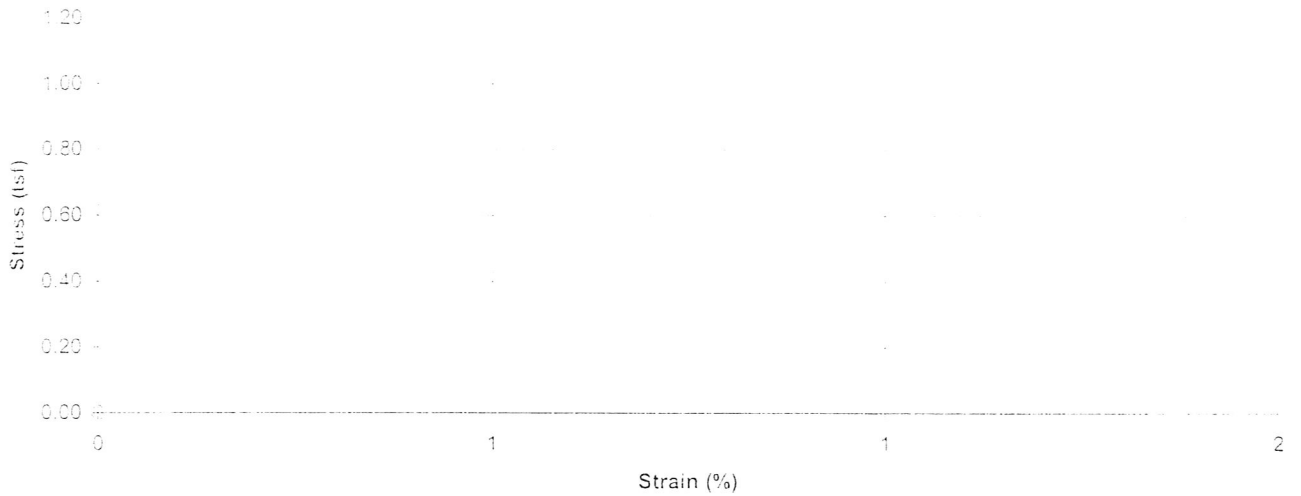
Recovered: 1.4'
Test Interval: 44.6' - 45.1'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

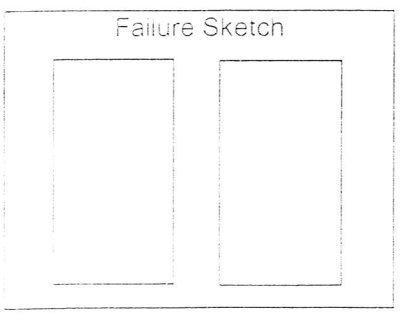
Date Extruded: 07/21/2009
Date Tested: N/A

Initial Wet Density (pcf)	127.2		
Initial Moisture Content (%)	20.8	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	105.3		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.914	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.904	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.0	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments:

Reviewed By:

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-10, 44.5'-46.0' | Lab ID: 12B
Visual Description: Clayey Sand (SC), brown, moist, firm

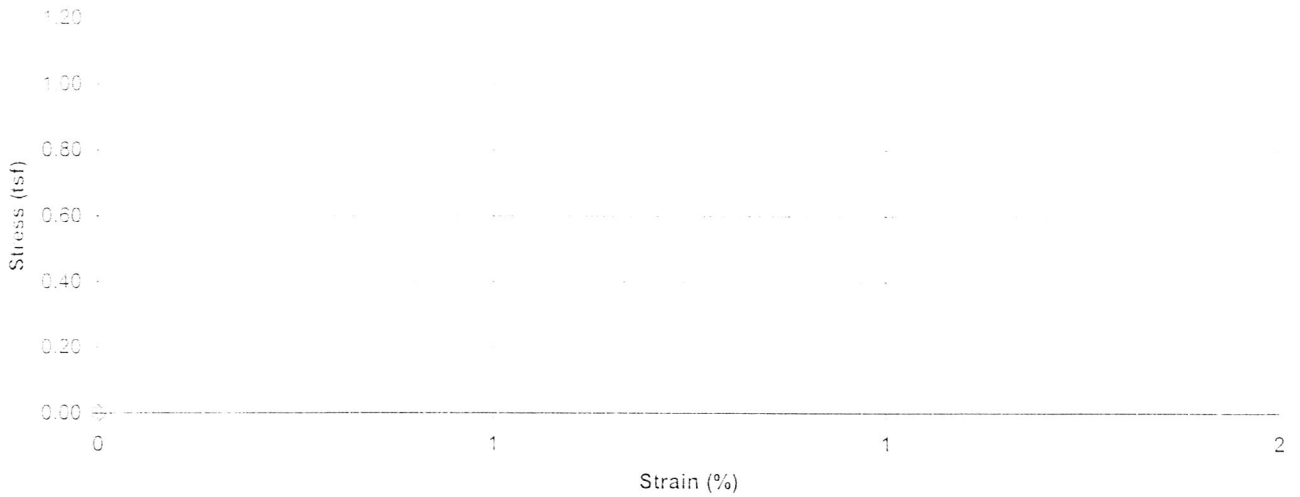
Recovered: 1.4'
Test Interval: 45.2' - 45.7'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

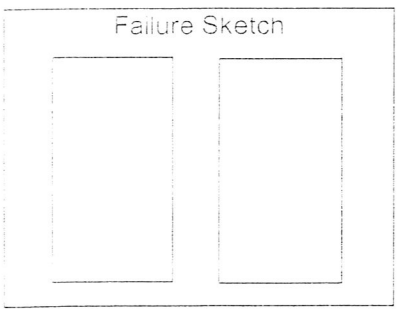
Date Extruded: 07/21/2009
Date Tested: N/A

Initial Wet Density (pcf)	125.8	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	20.7		
Initial Dry Density (pcf)	104.2		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.964	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.880	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-11, 4.5'-6.5' | Lab ID: 13
Visual Description: Lean Clay with Gravel (CL), brown, moist, firm

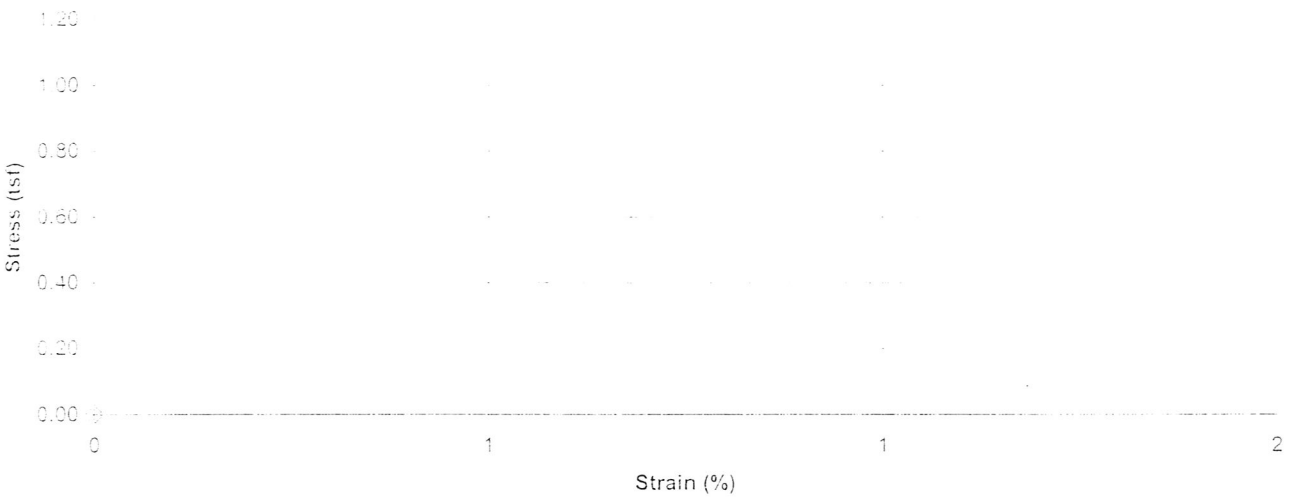
Recovered: 1'
Test Interval: 4.6' - 5.1'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

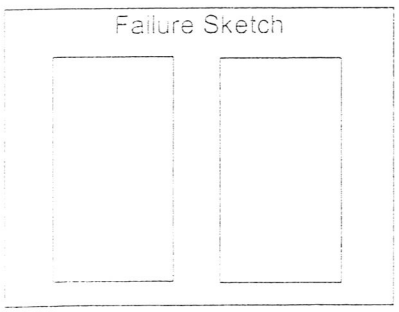
Date Extruded: 07/21/2009
Date Tested: N/A

Initial Wet Density (pcf)	127.5		
Initial Moisture Content (%)	17.9	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	108.2		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.976	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.893	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments:

Reviewed By:

Stantec

Unconfined Compressive Strength of Cohesive Soil

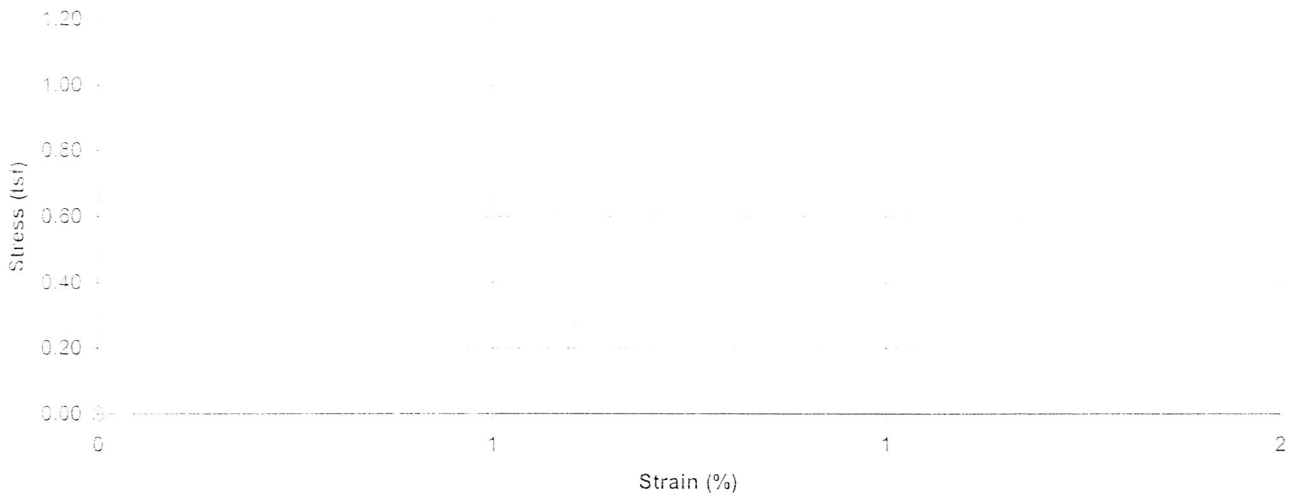
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-11, 9.5'-11.5' | Lab ID: 14
Visual Description: Poorly Graded Sand (SP), gray, moist, firm, bottom ash
Recovered: 0.7'
Test Interval: 9.5' - 10.0'

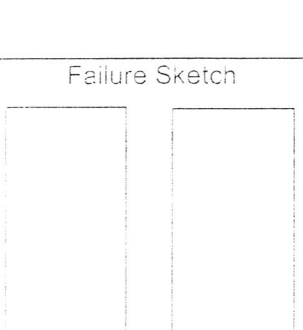
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 07/27/2009
Date Tested: N/A

Initial Wet Density (pcf)	N/A		
Initial Moisture Content (%)	35.7	Initial MC Taken	Before Test, From Center of Specimen
Initial Dry Density (pcf)	N/A		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	N/A	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	N/A	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	N/A	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

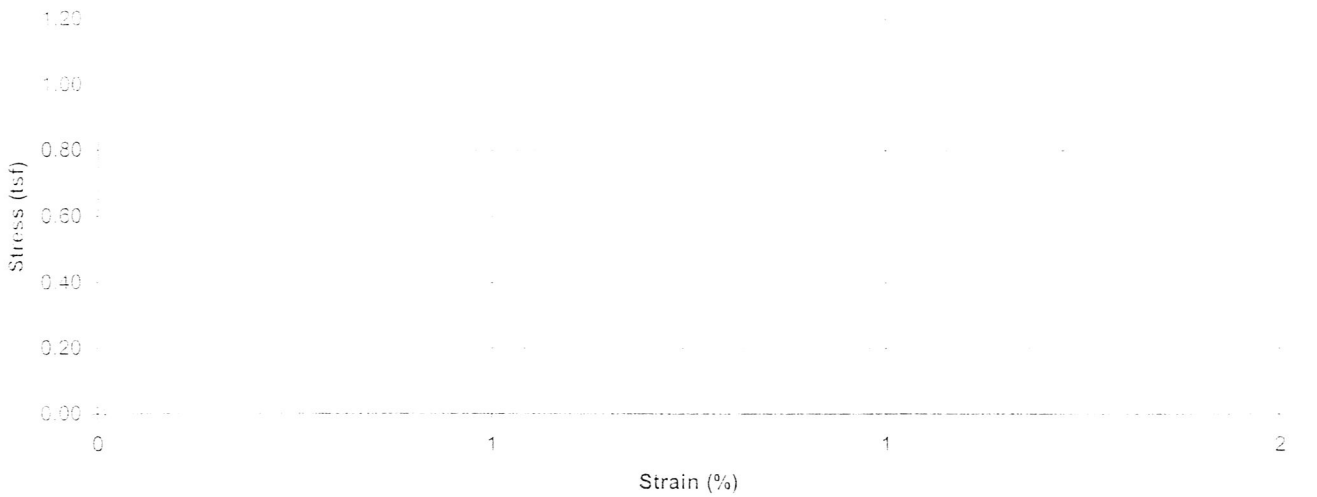
Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

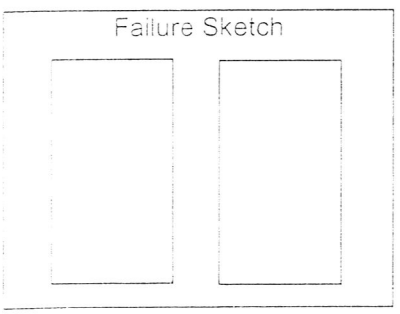
Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-11, 20.5'-22.5' | Lab ID: 15
Visual Description: Lean Clay (CL), black, moist, firm
Recovered: 0.6'
Test Interval: 20.6' - 21.1'
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 07/21/2009
Date Tested: N/A

Initial Wet Density (pcf)	122.8	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	22.9		
Initial Dry Density (pcf)	99.9		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.978	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.879	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-11, 25.5'-27.5' | Lab ID: 16
Visual Description: Lean Clay (CL), brown, moist, firm

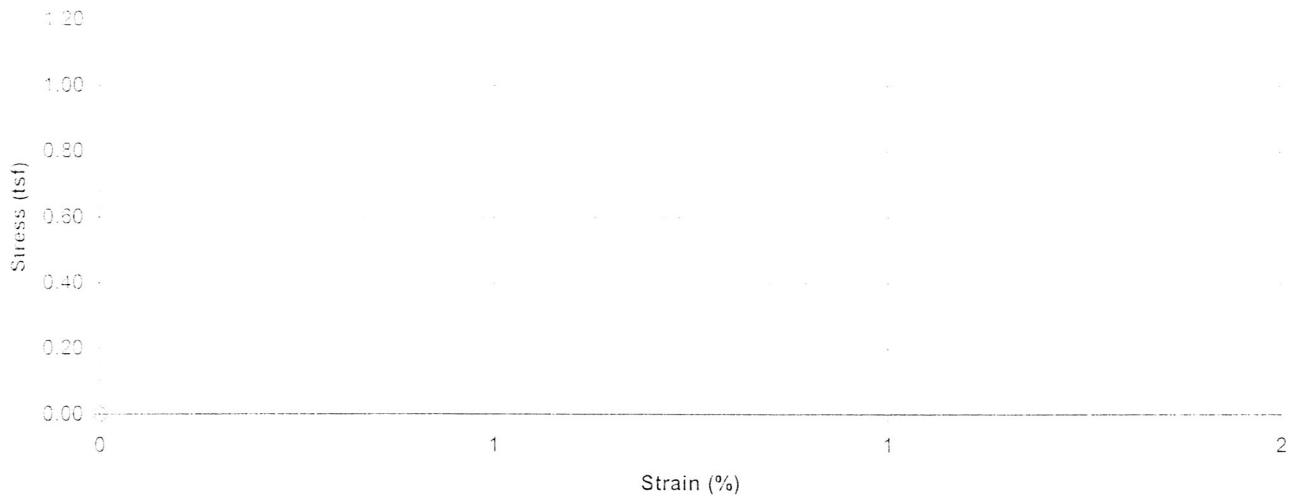
Recovered: 0.8'
Test Interval: 25.5' - 26.0'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

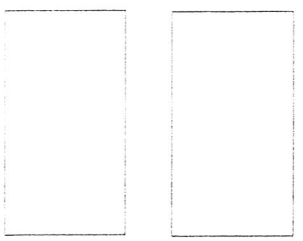
Date Extruded: 07/21/2009
Date Tested: N/A

Initial Wet Density (pcf)	126.0	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	22.7		
Initial Dry Density (pcf)	102.6		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.016	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.890	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-11, 33.5'-35.5' | Lab ID: 17
Visual Description: Lean Clay (CL), brown, moist, firm

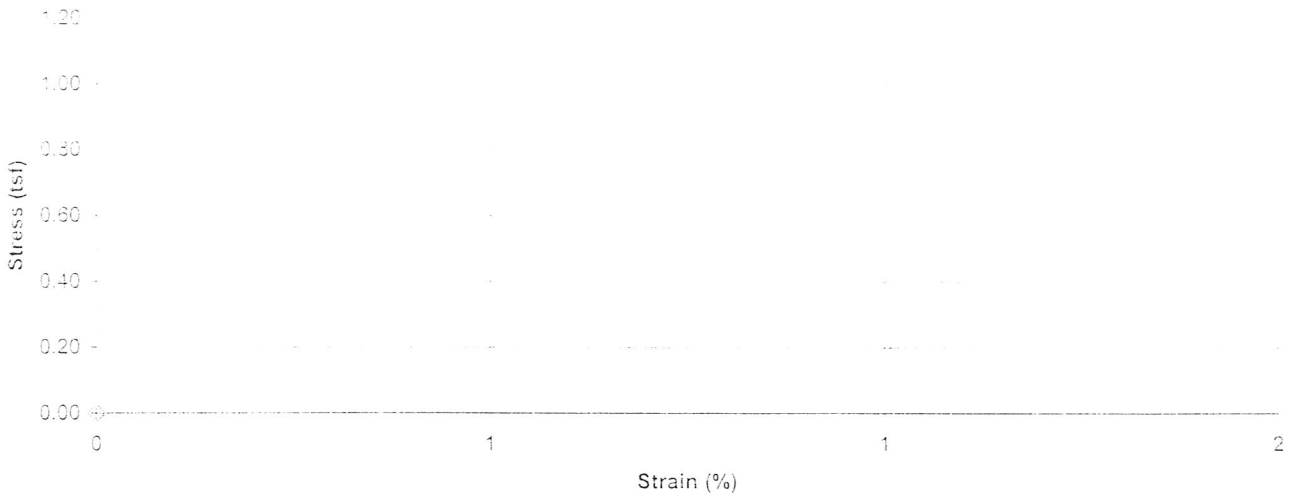
Recovered: 0.9'
Test Interval: 33.6' - 34.1'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

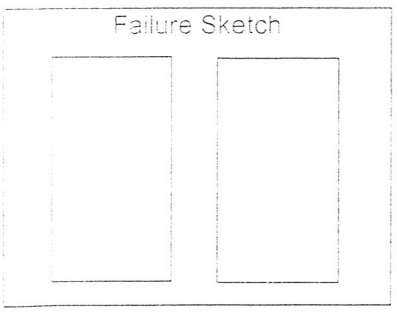
Date Extruded: 07/21/2009
Date Tested: N/A

Initial Wet Density (pcf)	125.8	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	23.2		
Initial Dry Density (pcf)	102.1		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.997	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.896	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments:

Reviewed By:

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015

Source: STN-15, 18.0'-19.0' | Lab ID: 18

Visual Description: Sandy Silt (ML), gray, moist, firm, fly ash

Recovered: 0.4'

Test Interval: 18.0' - 18.4'

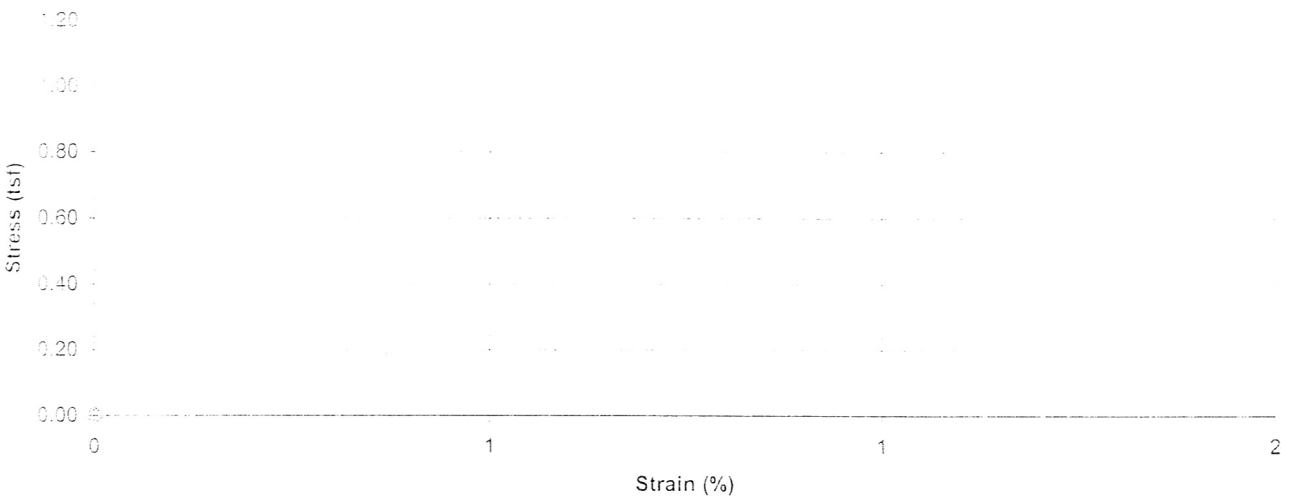
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

Date Extruded: 07/27/2009

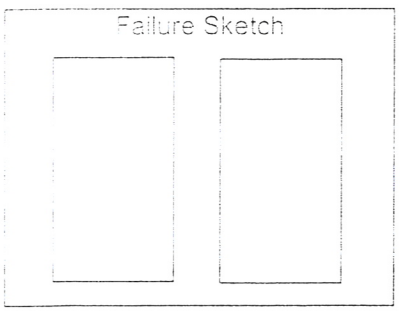
Date Tested: N/A

Initial Wet Density (pcf)	N/A		
Initial Moisture Content (%)	22.4	Initial MC Taken	Before Test, From Center of Specimen
Initial Dry Density (pcf)	N/A		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	N/A	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	N/A	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	N/A	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A

Torvane Reading (kg/cm^2): N/A

Comments: MC determined using 60° C oven.
Unable to obtain 6" specimen. Saved in bag.

Reviewed By:

865

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-20, 24.0'-26.0' | Lab ID: 19A
Visual Description: Silt (ML), gray, moist, firm, fly ash

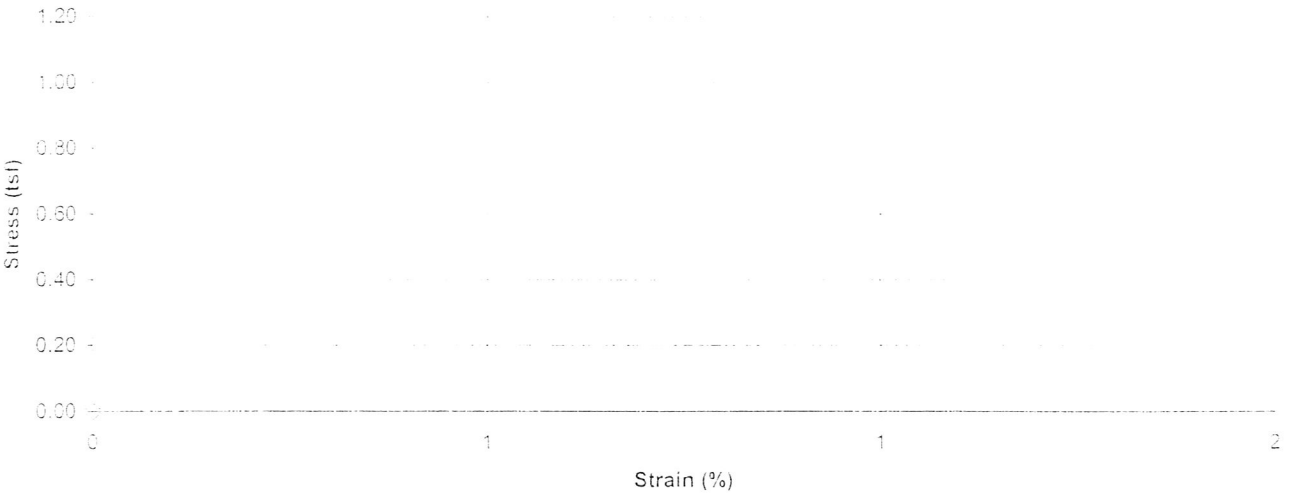
Recovered: 1.4'
Test Interval: 24.0' - 24.5'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

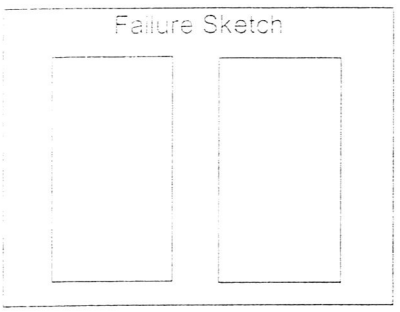
Date Extruded: 07/27/2009
Date Tested: N/A

Initial Wet Density (pcf)	105.2	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	34.7		
Initial Dry Density (pcf)	78.1		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.992	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.877	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments: Dry unit weight determined using 60° C mc.

Reviewed By: _____

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-20, 24.0'-26.0' | Lab ID: 19B
Visual Description: Silt (ML), gray, moist, firm, fly ash

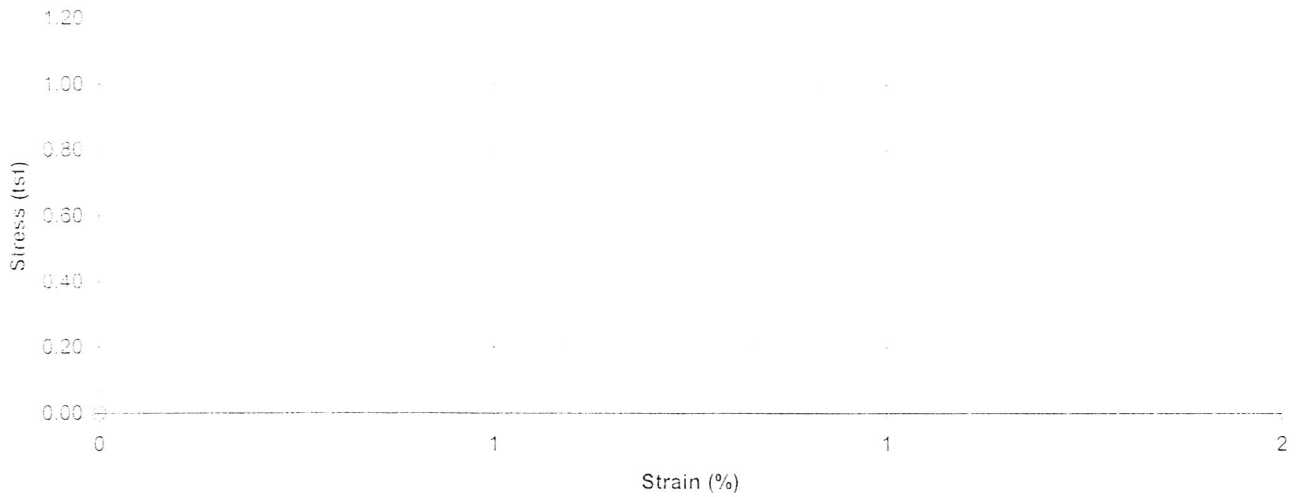
Recovered: 1.4'
Test Interval: 24.6' - 25.1'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

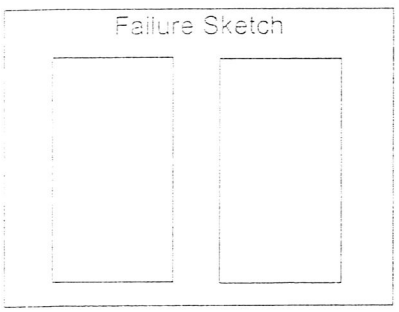
Date Extruded: 07/27/2009
Date Tested: N/A

Initial Wet Density (pcf)	N/A		
Initial Moisture Content (%)	37.5	Initial MC Taken	Before Test, From Center of Specimen
Initial Dry Density (pcf)	N/A		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	N/A	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	N/A	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	N/A	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments: MC obtained using 60° C oven.
Unable to obtain 6" specimen due to fracture. Saved in bag.

Reviewed By:

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-20, 29.0'-31.0' | Lab ID: 20
Visual Description: Silt (ML), gray, moist, firm, fly ash

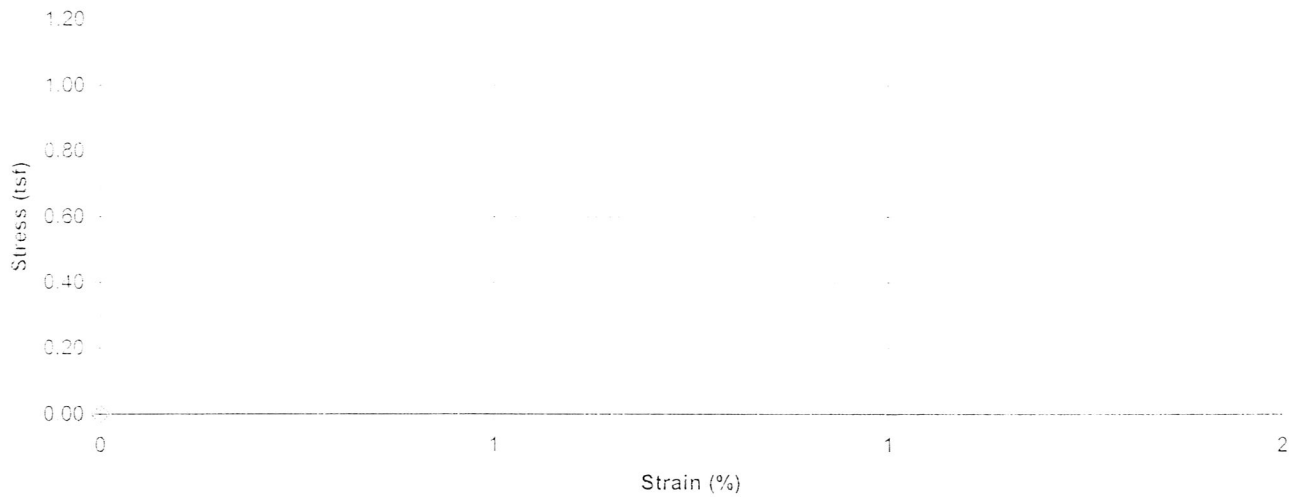
Recovered: 0.7'
Test Interval: 29.0' - 29.5'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

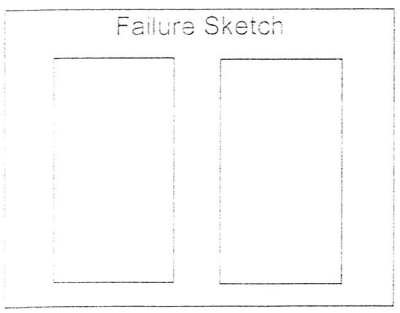
Date Extruded: 07/27/2009
Date Tested: N/A

Initial Wet Density (pcf)	106.5		
Initial Moisture Content (%)	40.6	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	75.7		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.008	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.863	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments: Dry unit weight determined using 60° C mc.

Reviewed By:

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-20, 44.5'-46.5' | Lab ID: 21A
Visual Description: Lean Clay (CL), gray, moist, firm

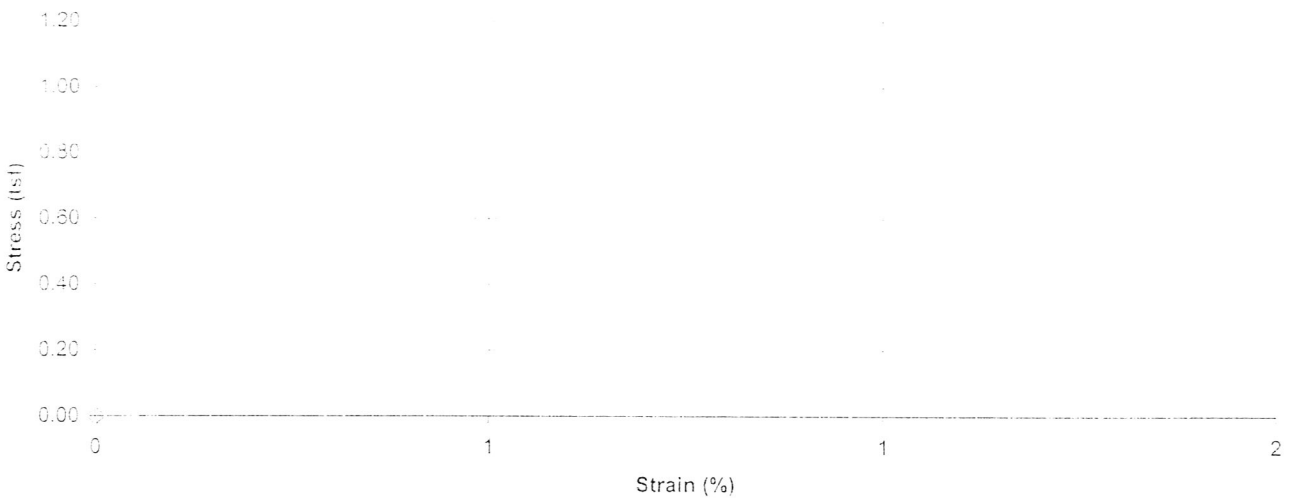
Recovered: 1.2'
Test Interval: 44.5' - 45'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

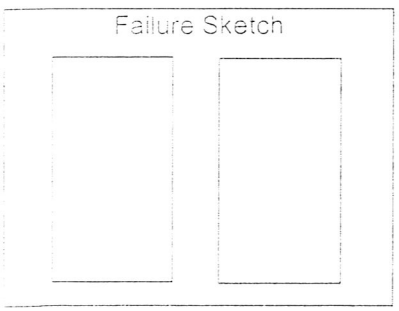
Date Extruded: 07/21/2009
Date Tested: N/A

Initial Wet Density (pcf)	115.5		
Initial Moisture Content (%)	33.5	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	86.5		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.034	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.879	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015

Source: STN-20, 44.5'-46.5' | Lab ID: 21B

Visual Description: Lean Clay (CL), gray, moist, firm

Recovered: 1.2'

Test Interval: 45.1' - 45.6'

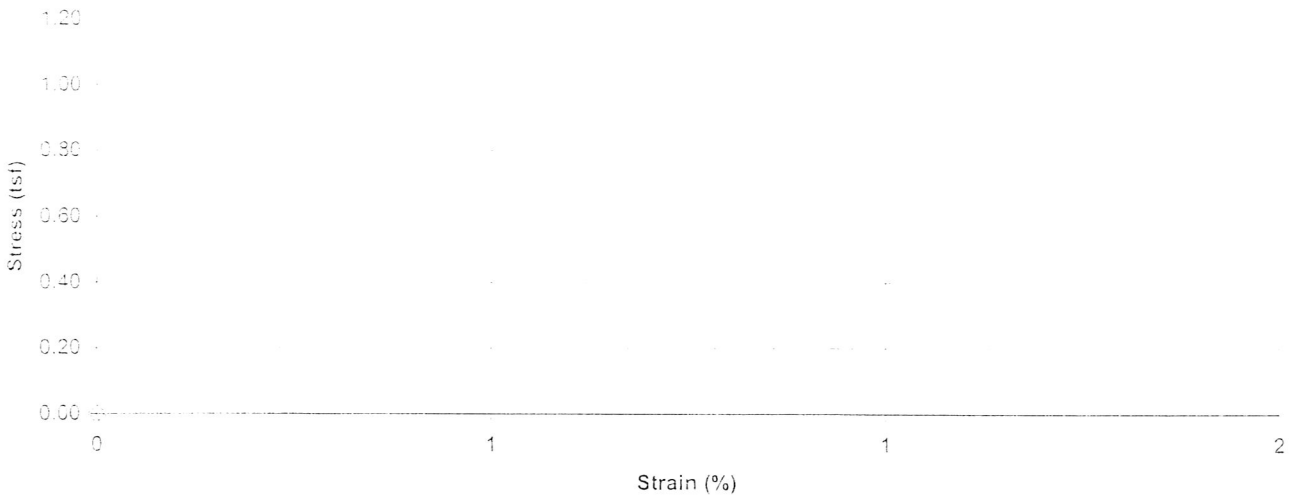
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

Date Extruded: 07/21/2009

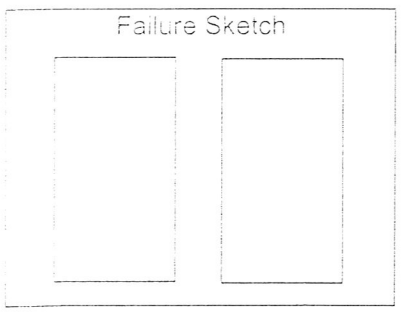
Date Tested: N/A

Initial Wet Density (pcf)	118.8		
Initial Moisture Content (%)	27.3	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	93.3		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.024	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.877	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A

Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-20, 49.5'-51.5' | Lab ID: 22A
Visual Description: Lean Clay with Gravel (CL), gray, moist, firm

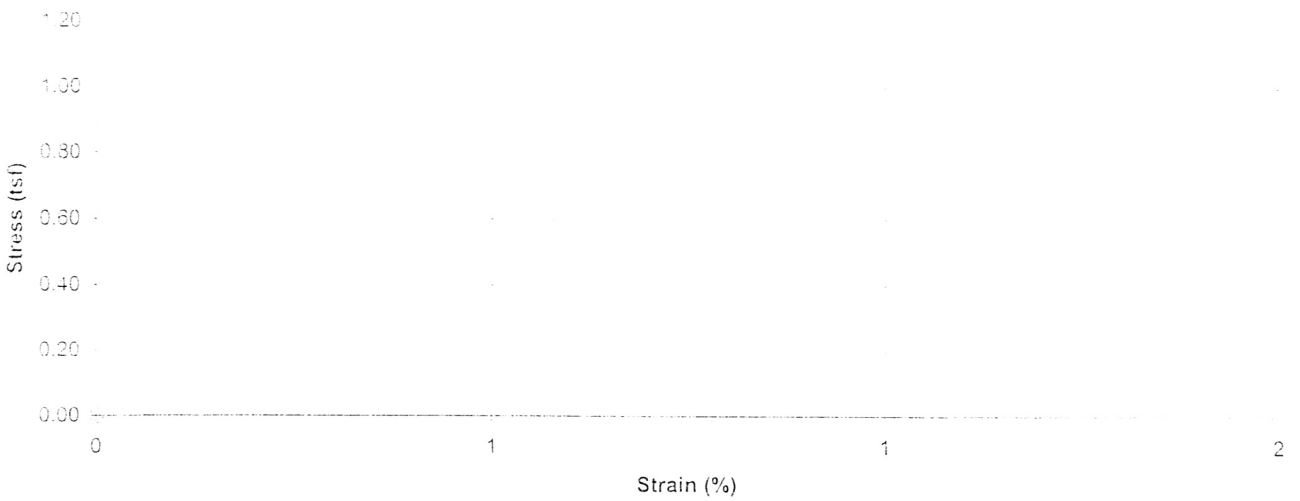
Recovered: 1.2'
Test Interval: 49.5' - 50'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

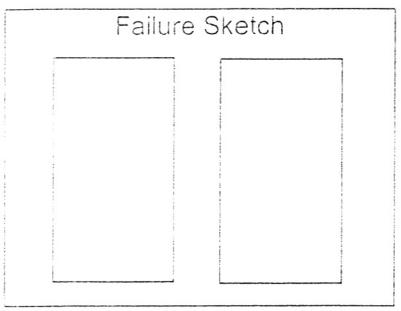
Date Extruded: 07/22/2009
Date Tested: N/A

Initial Wet Density (pcf)	124.2	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	25.0		
Initial Dry Density (pcf)	99.4		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.981	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.884	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) — Project Number: 172679015
Source: STN-32, 4.5'-6.5' — Lab ID: 27
Visual Description: Lean Clay (CL), brown, moist, firm

Recovered: 0.9'
Test Interval: 4.6' - 5.1'

Specimen Type: Undisturbed — LL: N/A — PL: N/A — PI: N/A

Date Extruded: 07/22/2009
Date Tested: N/A

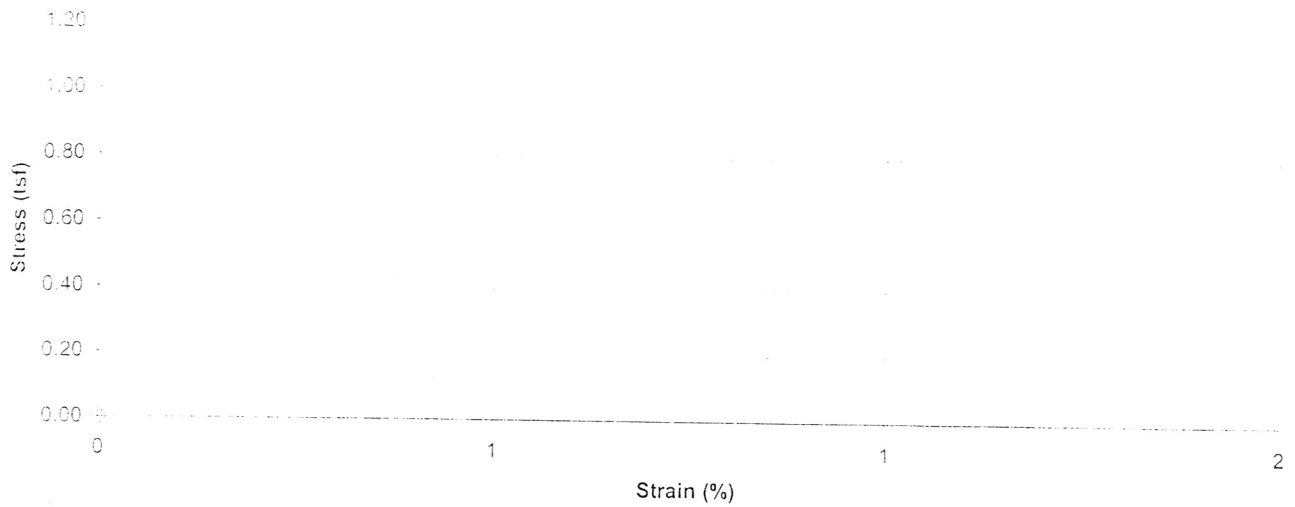
Initial Wet Density (pcf)	128.4
Initial Moisture Content (%)	16.7
Initial Dry Density (pcf)	110.0
At Test Moisture Content (%)	N/A
At Test Dry Density (pcf)	N/A
Specific Gravity	N/A
Degree of Saturation (%)	N/A
Average Height (in)	6.019
Average Diameter (in)	2.893
Height to Diameter Ratio	2.1

Initial MC Taken: Before Test, From Trimmings

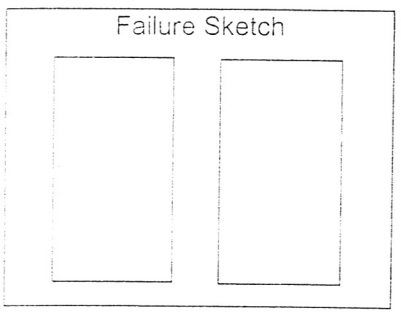
At Test MC Taken: N/A

Unconfined Compressive Strength (tsf)	N/A
Undrained Shear Strength (tsf)	N/A
Strain at Maximum Stress (%)	N/A
Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1859

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-51, 4.5'-6.5' | Lab ID: 31A
Visual Description: Lean Clay (CL), brown, moist, firm

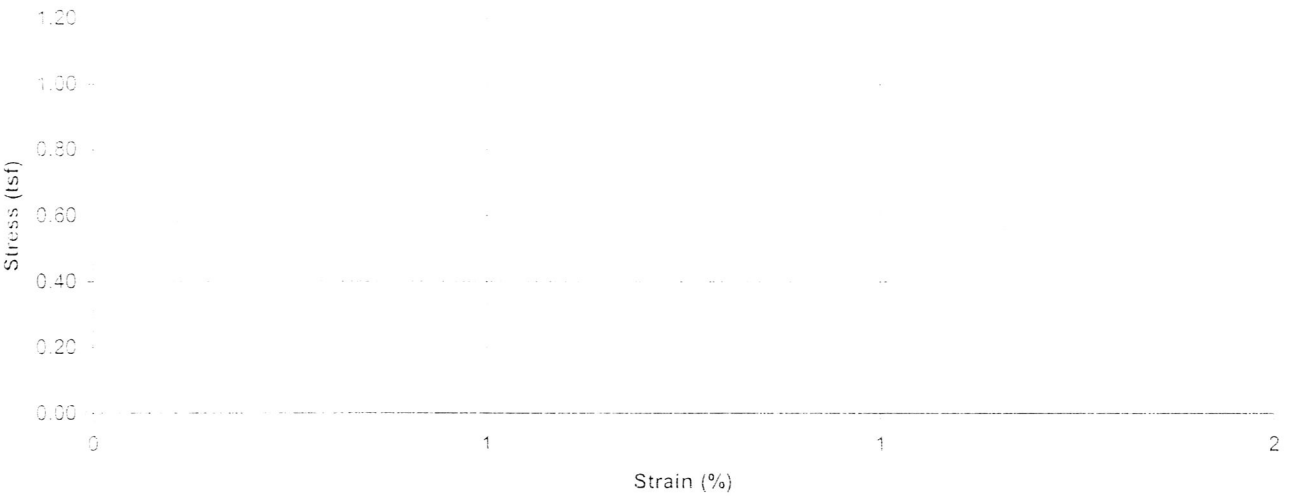
Recovered: 1.2'
Test Interval: 4.5' - 5.0'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

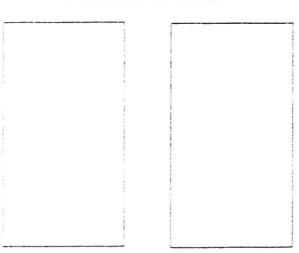
Date Extruded: 07/22/2009
Date Tested: N/A

Initial Wet Density (pcf)	126.9	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	23.1		
Initial Dry Density (pcf)	103.0		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.047	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.888	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-51, 4.5'-6.5' | Lab ID: 31B
Visual Description: Lean Clay (CL), brown, moist, firm

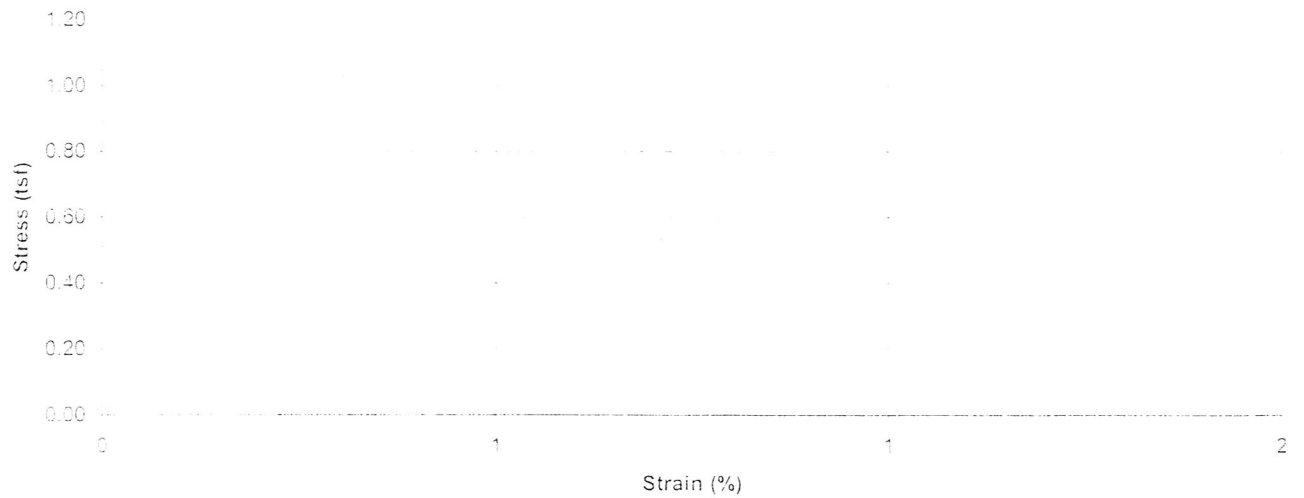
Recovered: 1.2'
Test Interval: 5.1' - 5.6'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

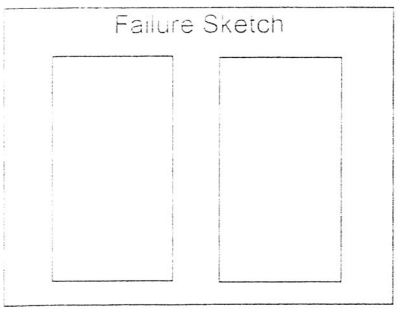
Date Extruded: 07/22/2009
Date Tested: N/A

Initial Wet Density (pcf)	123.2	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	21.8		
Initial Dry Density (pcf)	101.1		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.032	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.890	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1865

Stantec

Unconfined Compressive Strength of Cohesive Soil

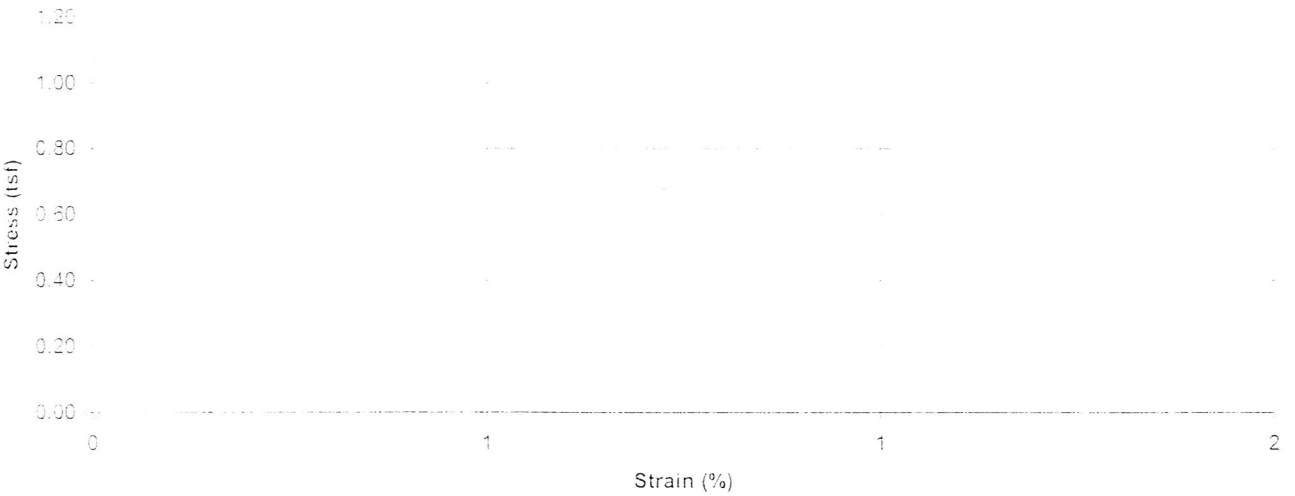
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-51, 9.5'-11.5' | Lab ID: 32A
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.3'
Test Interval: 9.5' - 10.0'

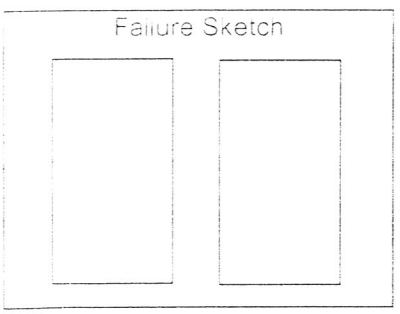
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A | Date Extruded: 07/22/2009 | Date Tested: N/A

Initial Wet Density (pcf)	122.6	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	22.8		
Initial Dry Density (pcf)	99.8		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.070	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.889	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-51, 9.5'-11.5' | Lab ID: 32B
Visual Description: Lean Clay (CL), brown, moist, firm

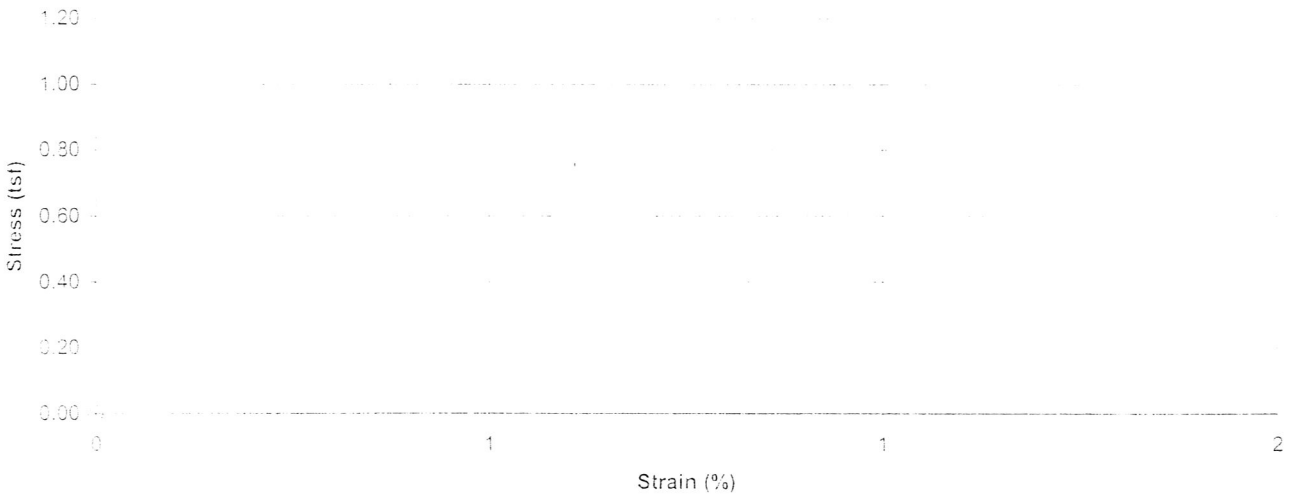
Recovered: 1.3'
Test Interval: 10.1' - 10.6'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

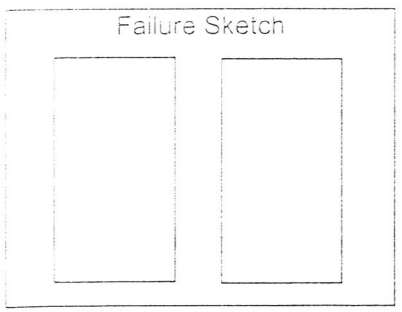
Date Extruded: 07/22/2009
Date Tested: N/A

Initial Wet Density (pcf)	125.6		
Initial Moisture Content (%)	23.3	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	101.9		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.035	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.886	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015

Source: STN-51, 19.0'-21.0' | Lab ID: 33

Visual Description: Lean Clay with Gravel (CL), brown, moist, firm

Recovered: 1.1'

Test Interval: 19.0' - 20.1'

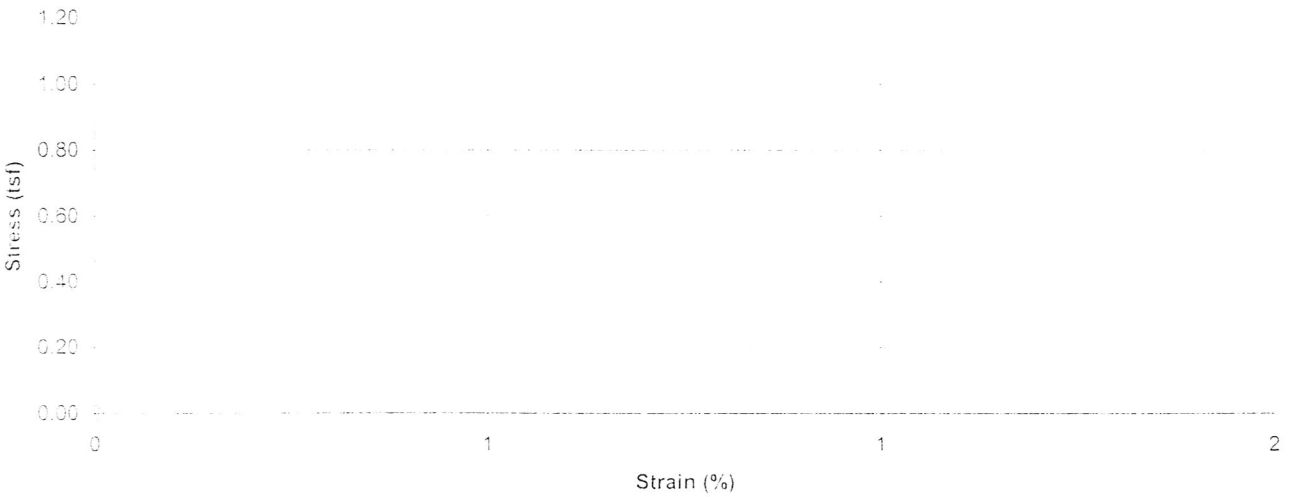
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

Date Extruded: 07/22/2009

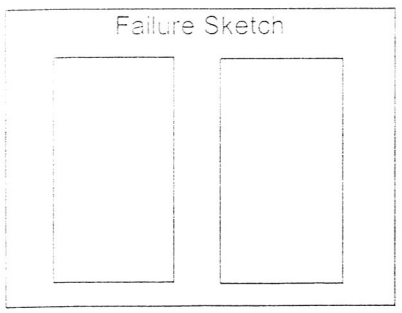
Date Tested: N/A

Initial Wet Density (pcf)	N/A		
Initial Moisture Content (%)	27.8	Initial MC Taken	Before Test, From Center of Specimen
Initial Dry Density (pcf)	N/A		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	N/A	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	N/A	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	N/A	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A

Torvane Reading (kg/cm^2): N/A

Comments: No test specimen obtained due to gravel throughout.

Reviewed By:

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015

Source: STN-51, 24.0'-26.0' | Lab ID: 34A

Visual Description: Lean Clay (CL), brown, moist, firm

Recovered: 1.3'

Test Interval: 24.1' - 24.6'

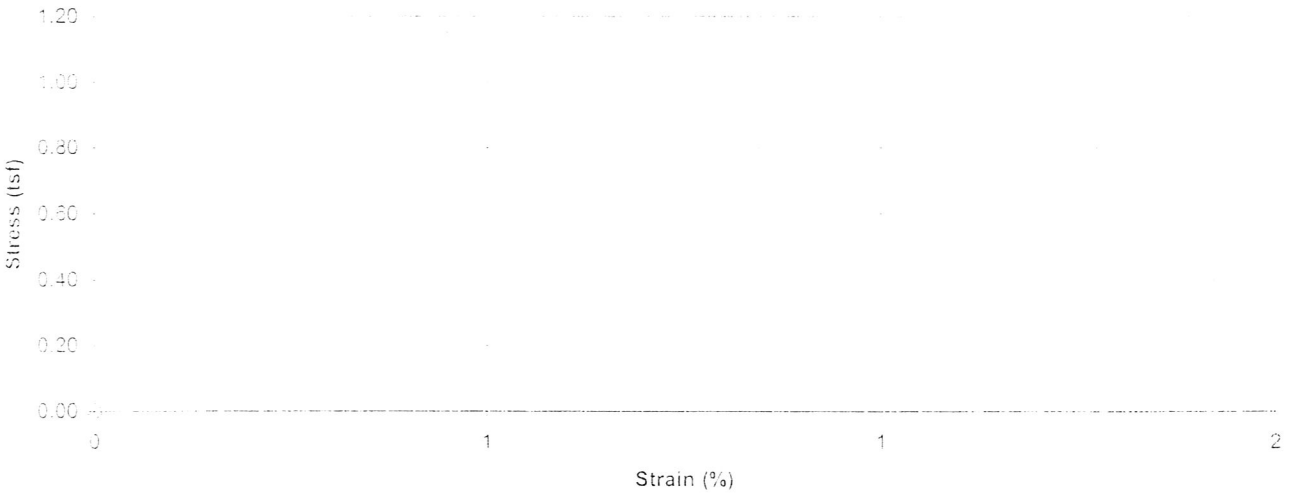
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

Date Extruded: 07/22/2009

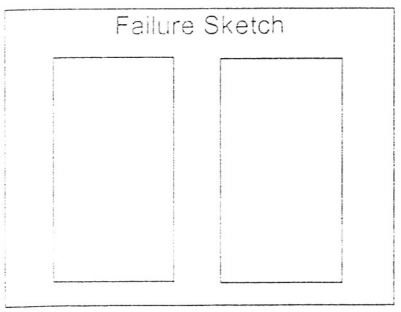
Date Tested: N/A

Initial Wet Density (pcf)	123.8		
Initial Moisture Content (%)	20.5	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	102.7		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.996	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.900	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A

Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1865

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-51, 24.0'-26.0' | Lab ID: 34B
Visual Description: Lean Clay (CL), black, moist, firm

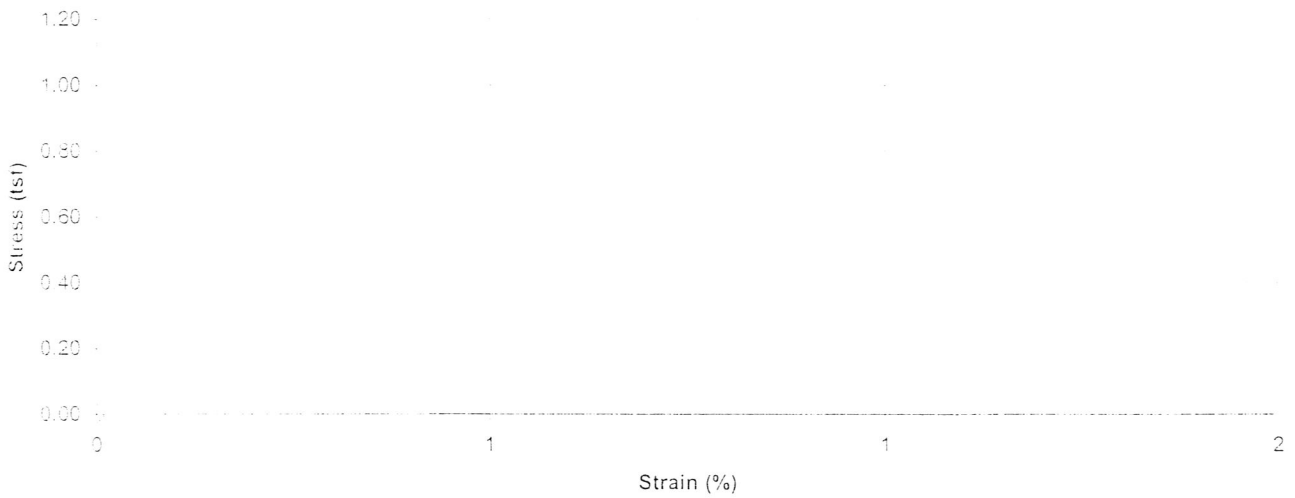
Recovered: 1.3'
Test Interval: 24.7' - 25.2'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

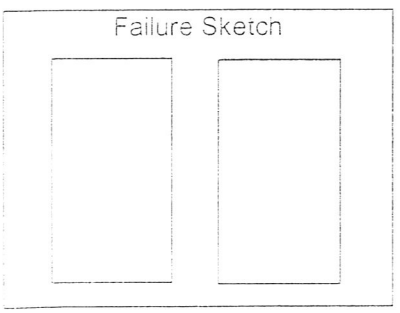
Date Extruded: 07/22/2009
Date Tested: N/A

Initial Wet Density (pcf)	126.6		
Initial Moisture Content (%)	21.3	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	104.4		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.003	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.893	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-59, 4.5'-6.5' | Lab ID: 35
Visual Description: Lean Clay (CL), brown, moist, firm

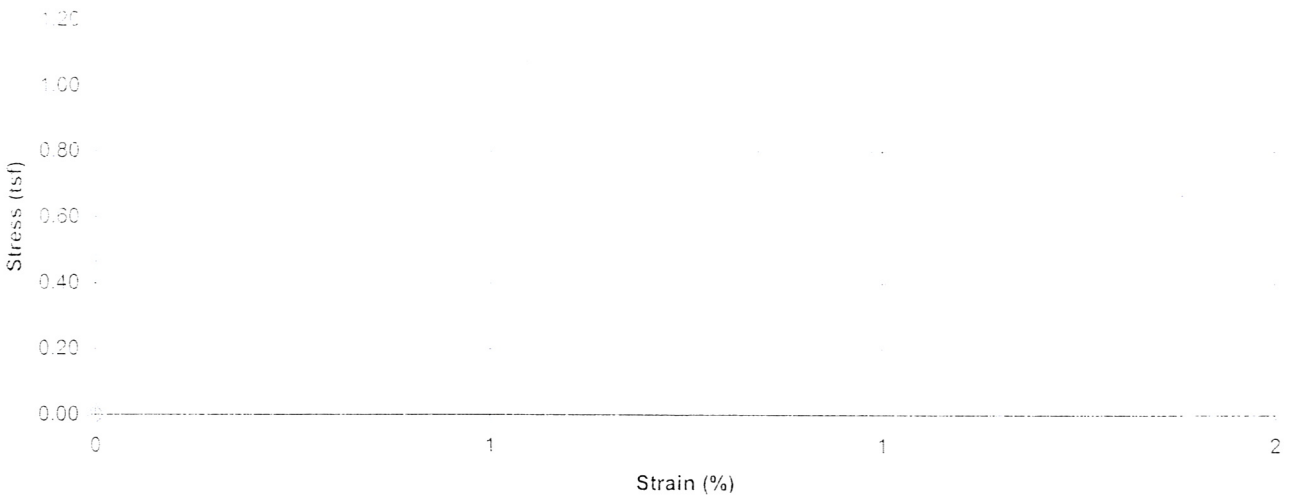
Recovered: 1'
Test Interval: 4.6' - 5.1'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

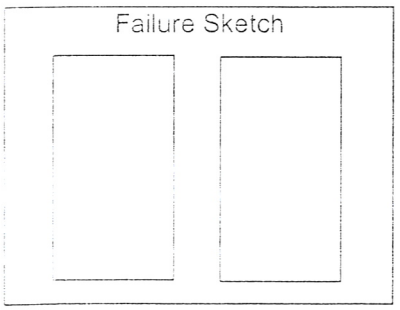
Date Extruded: 07/22/2009
Date Tested: N/A

Initial Wet Density (pcf)	124.0		
Initial Moisture Content (%)	21.5	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	102.0		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.005	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.888	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

(865)

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-59, 12.5'-14.5' | Lab ID: 36
Visual Description: Lean Clay (CL), brown, moist, firm

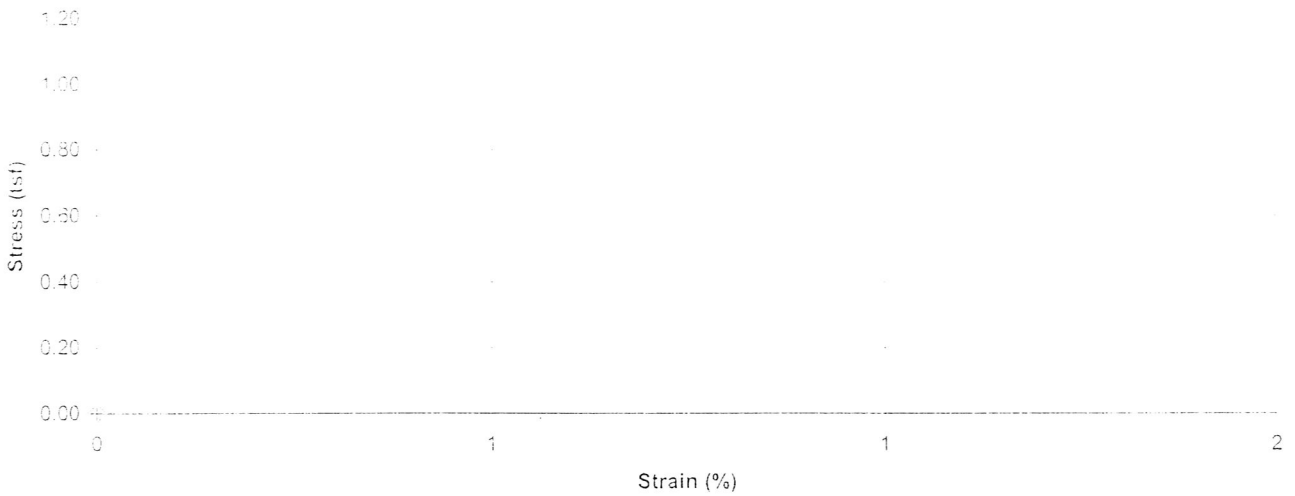
Recovered: 0.9'
Test Interval: 12.6' - 13.1'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

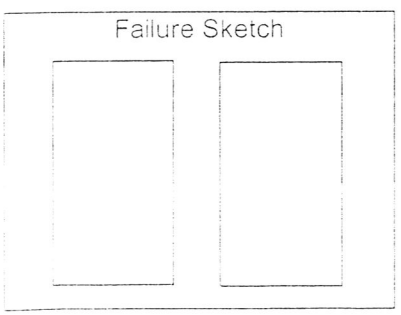
Date Extruded: 07/22/2009
Date Tested: N/A

Initial Wet Density (pcf)	120.2		
Initial Moisture Content (%)	26.8	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	94.8		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.999	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.877	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments:

Reviewed By:

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-59, 19.0'-21.0' | Lab ID: 37A
Visual Description: Lean Clay (CL), brown, moist, firm

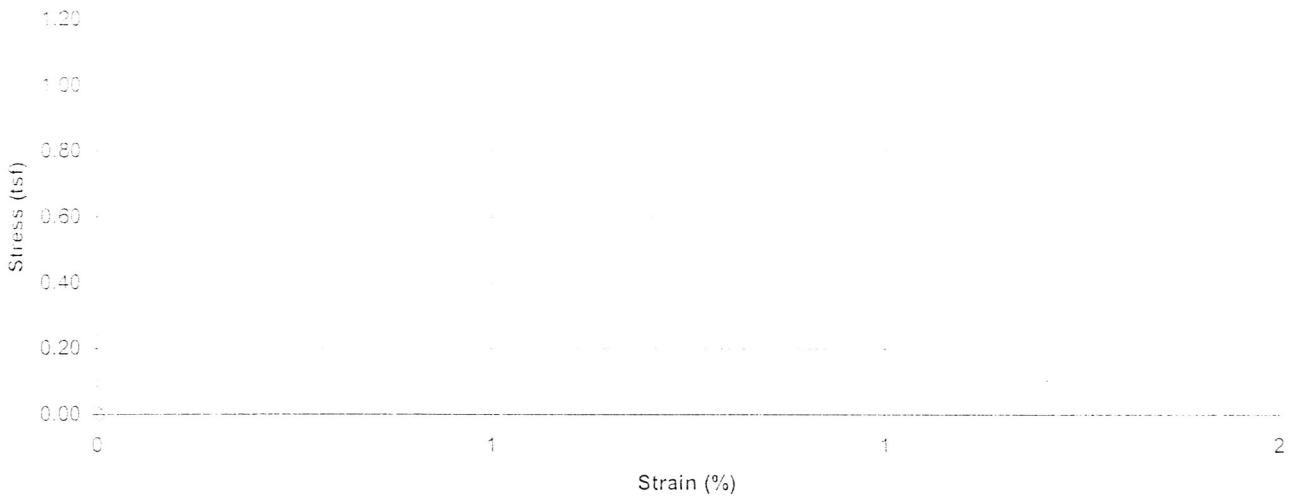
Recovered: 1.3'
Test Interval: 19.1' - 19.6'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

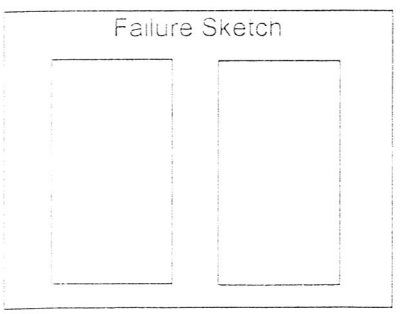
Date Extruded: 07/22/2009
Date Tested: N/A

Initial Wet Density (pcf)	118.4		
Initial Moisture Content (%)	34.2	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	88.2		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.003	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.889	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments:

Reviewed By:

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-59, 19.0'-21.0' | Lab ID: 37B
Visual Description: Lean Clay (CL), brown, moist, firm

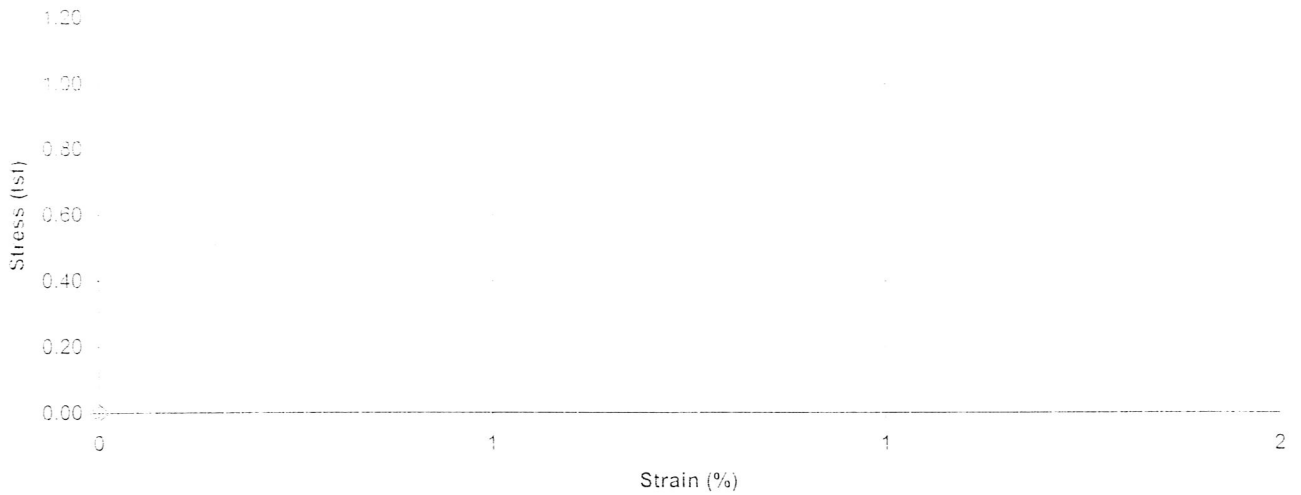
Recovered: 1.3'
Test Interval: 19.7' - 20.2'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

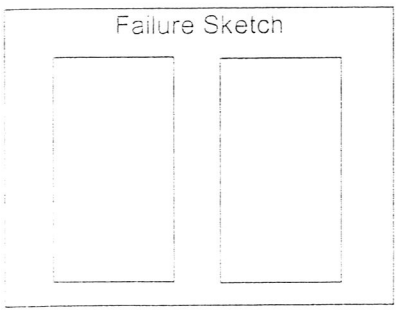
Date Extruded: 07/22/2009
Date Tested: N/A

Initial Wet Density (pcf)	120.0		
Initial Moisture Content (%)	27.3	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	94.3		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	5.986	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.888	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015

Source: STN-62, 4.5'-6.5' | Lab ID: 39

Visual Description: Lean Clay with Gravel (CL), brown, moist, firm

Recovered: 0.8'

Test Interval: 4.5' - 5.0'

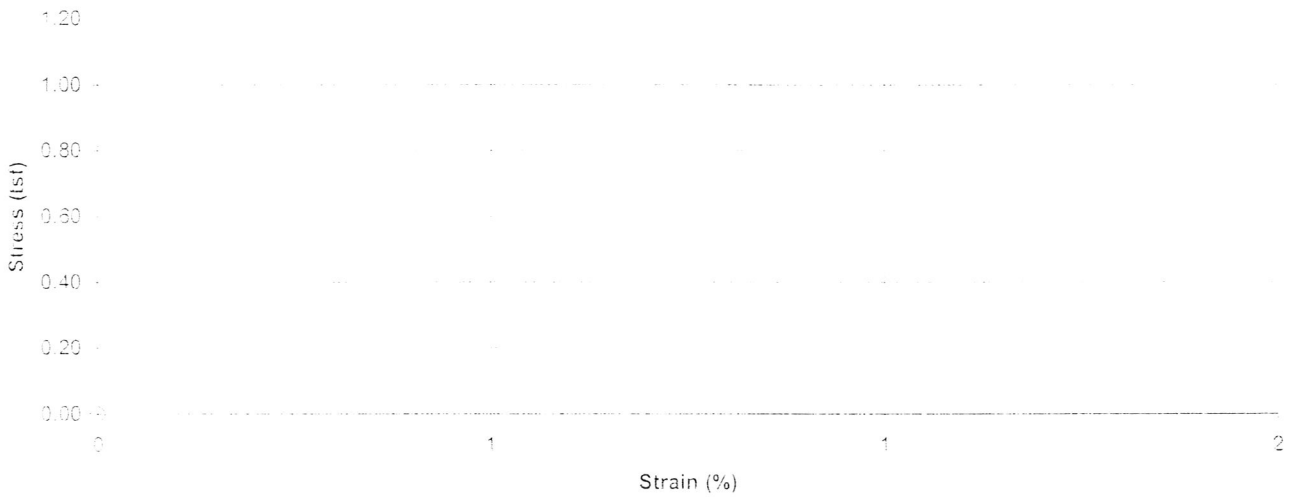
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

Date Extruded: 07/23/2009

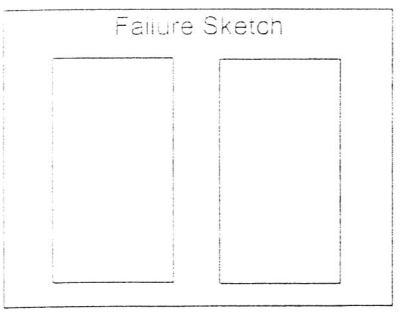
Date Tested: N/A

Initial Wet Density (pcf)	124.3		
Initial Moisture Content (%)	24.6	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	99.8		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.045	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.892	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A

Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-62, 9.5'-11.5' | Lab ID: 40
Visual Description: Fat Clay (CH), brown, moist, firm

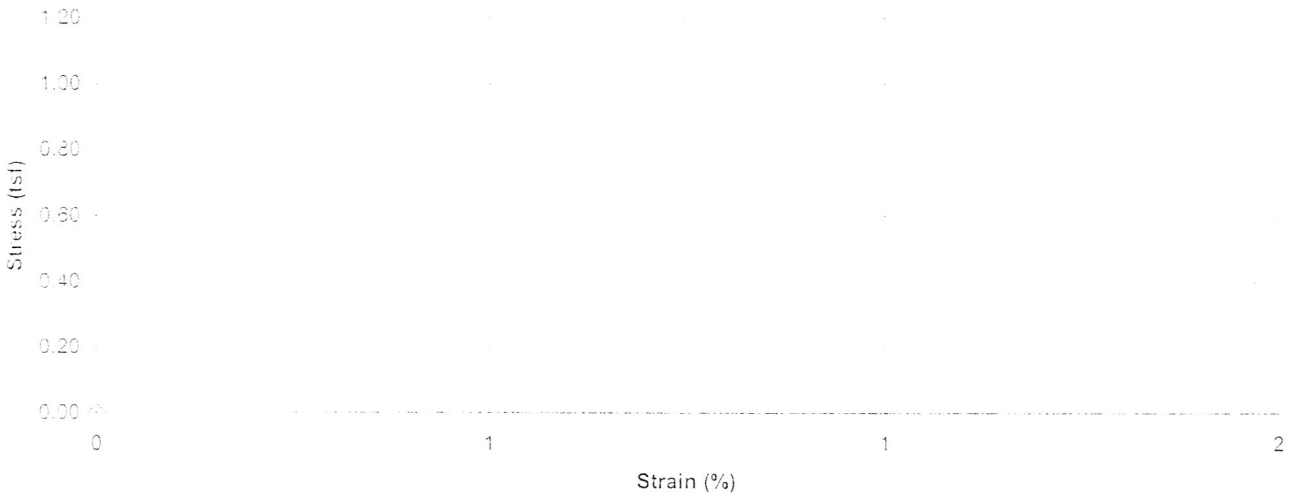
Recovered: 0.9'
Test Interval: 9.5' - 10.0'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

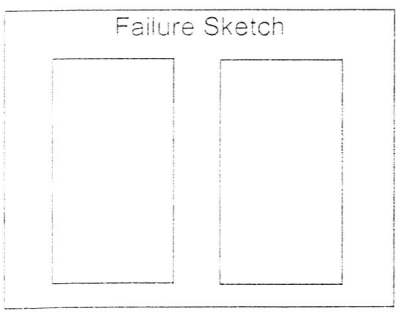
Date Extruded: 07/23/2009
Date Tested: N/A

Initial Wet Density (pcf)	126.2	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	22.5		
Initial Dry Density (pcf)	103.0		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.042	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.888	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-62, 23.5'-25.5' | Lab ID: 41
Visual Description: Gravelly Lean Clay (CL), brown, moist, firm

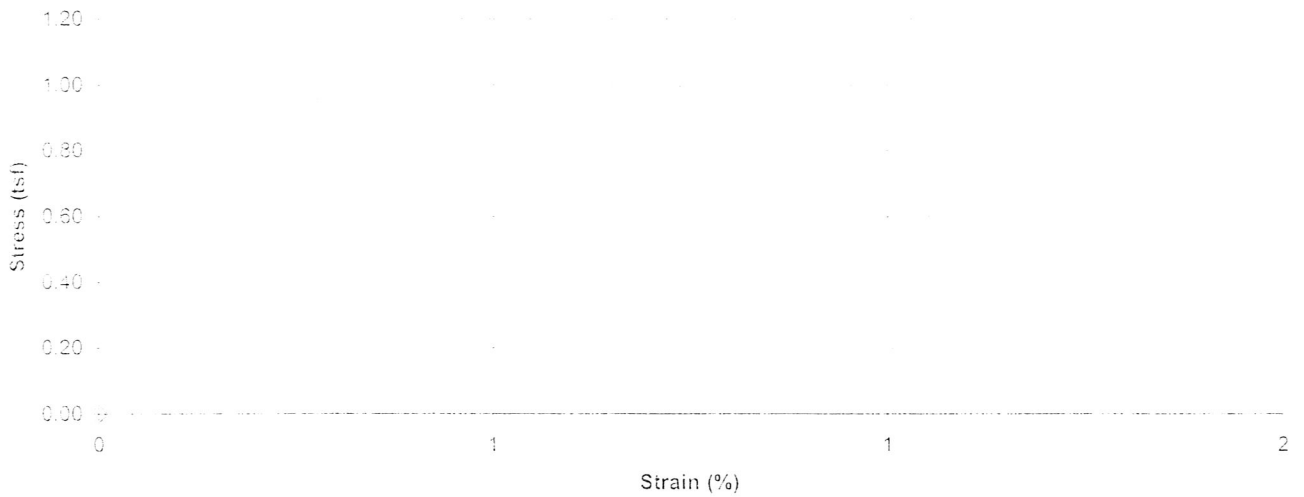
Recovered: 0.4'
Test Interval: 23.5' - 23.9'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

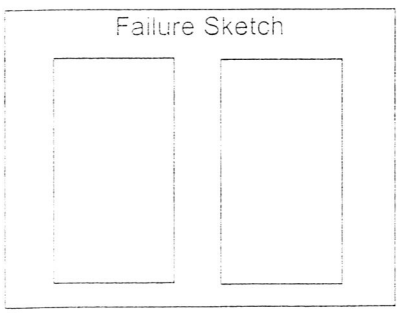
Date Extruded: 07/23/2009
Date Tested: N/A

Initial Wet Density (pcf)	N/A		
Initial Moisture Content (%)	17.5	Initial MC Taken	Before Test, From Center of Specimen
Initial Dry Density (pcf)	N/A		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	N/A	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	N/A	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	N/A	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments: Unable to obtain 6" specimen. Saved in bag.

Reviewed By:

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Source	STN-62, 39.0'-41.0'	Lab ID	42A
Visual Description	Lean Clay with Sand (CL), brown, moist, firm		
		Recovered	1.3'
		Test Interval	39.0' - 39.5'

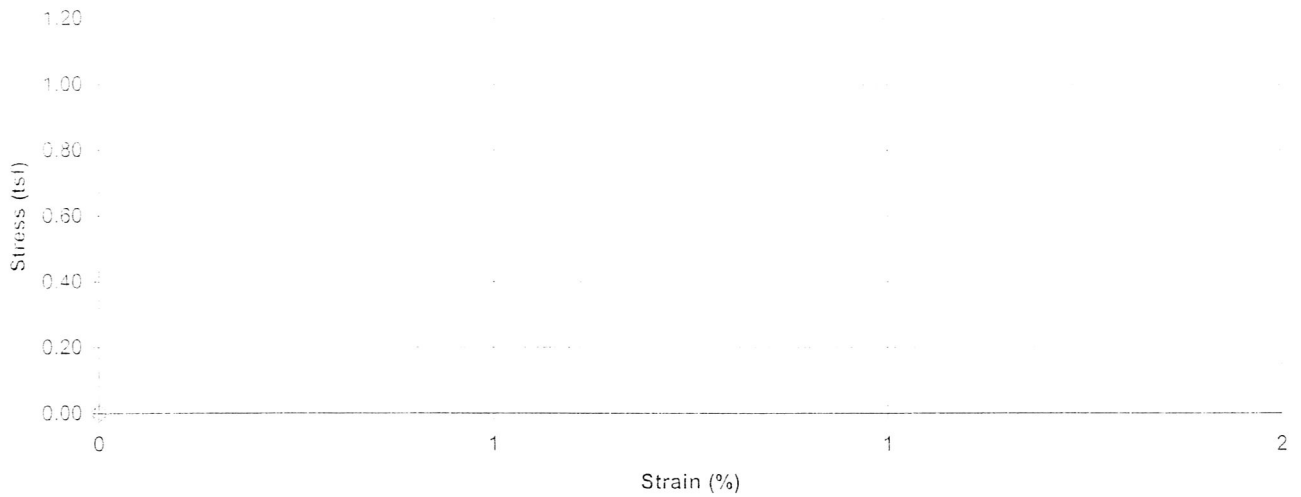
Specimen Type: Undisturbed LL N/A PL N/A PI N/A

Date Extruded 07/23/2009

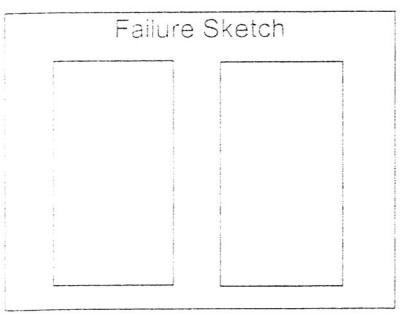
Date Tested N/A

Initial Wet Density (pcf)	124.6		
Initial Moisture Content (%)	22.9	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	101.4		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.037	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.882	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf) N/A

Torvane Reading (kg/cm^2) N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

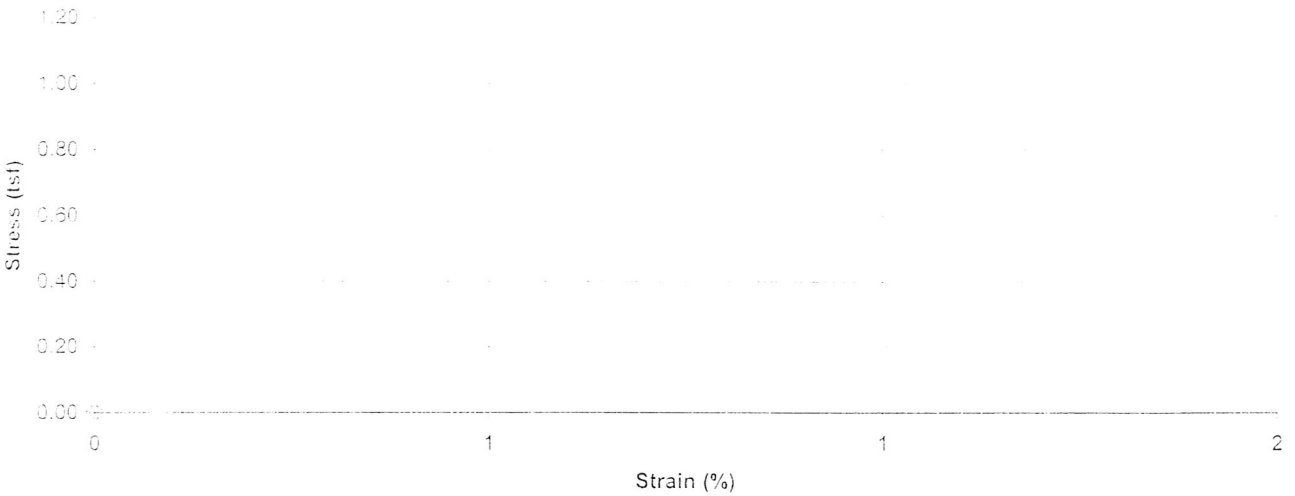
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-62, 39.0'-41.0' | Lab ID: 42B
Visual Description: Lean Clay with Sand (CL), brown, moist, firm
Recovered: 1.3'
Test Interval: 39.6' - 40.1'

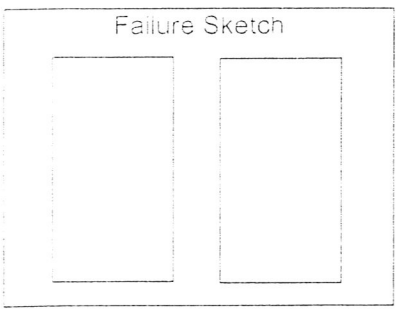
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 07/23/2009
Date Tested: N/A

Initial Wet Density (pcf)	126.2	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	23.1		
Initial Dry Density (pcf)	102.5		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.008	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.888	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-68, 9.0'-11.0' | Lab ID: 43
Visual Description: Lean Clay (CL), brown, moist, firm

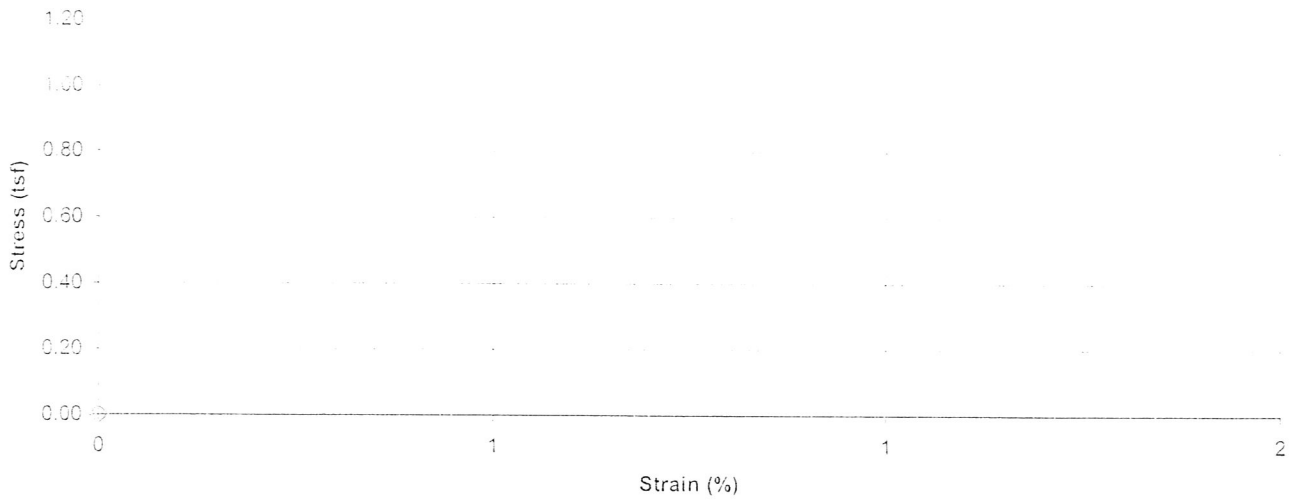
Recovered: 0.9'
Test Interval: 9.0' - 9.5'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

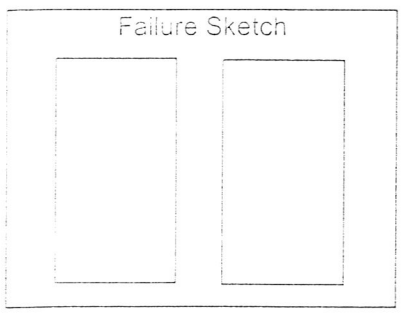
Date Extruded: 07/23/2009
Date Tested: N/A

Initial Wet Density (pcf)	126.3		
Initial Moisture Content (%)	24.1	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	101.7		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.009	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.879	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-68, 20.0'-22.0' | Lab ID: 44
Visual Description: Lean Clay (CL), brown, moist, firm

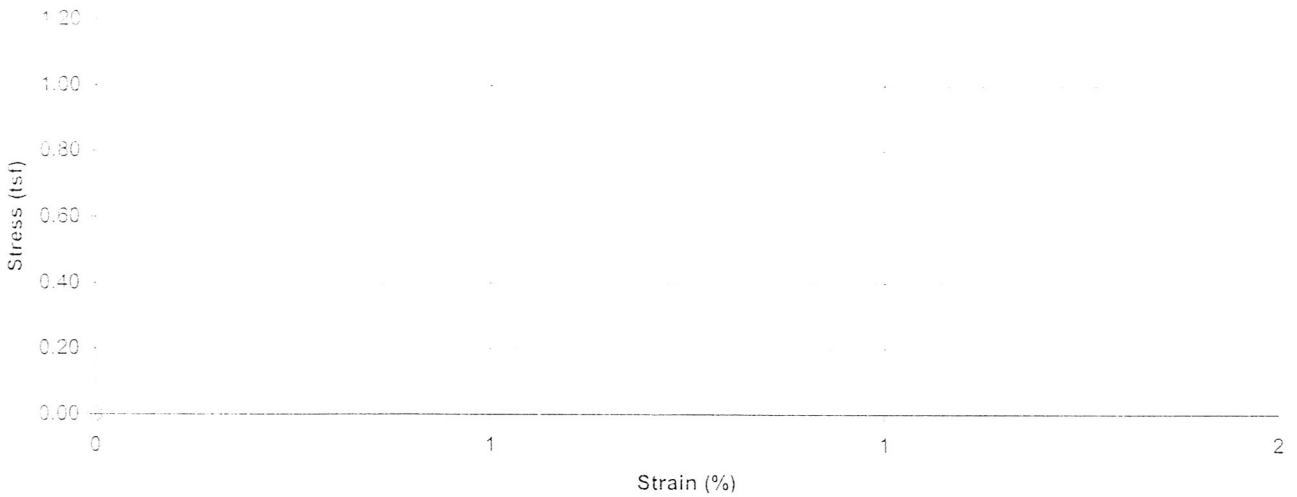
Recovered: 0.8'
Test Interval: 20.0' - 20.5'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

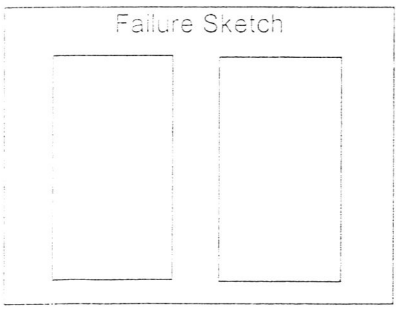
Date Extruded: 07/24/2009
Date Tested: N/A

Initial Wet Density (pcf)	125.3		
Initial Moisture Content (%)	23.4	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	101.6		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.021	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.883	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015

Source: STN-68, 25.0'-27.0' | Lab ID: 45

Visual Description: Lean Clay (CL), brown, moist, firm

Recovered: 0.7'

Test Interval: 25.0' - 25.5'

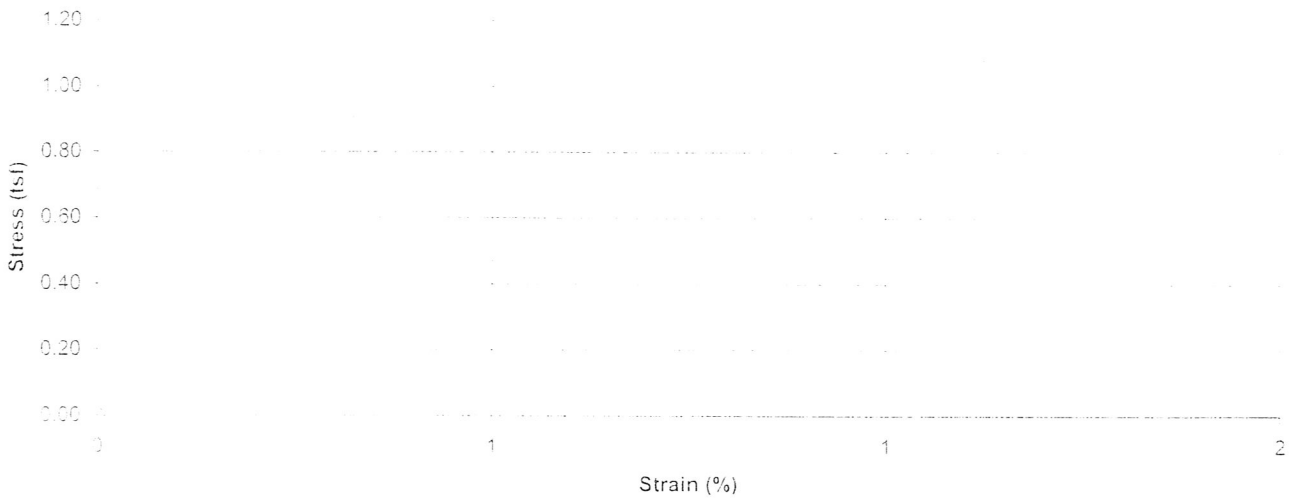
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

Date Extruded: 07/24/2009

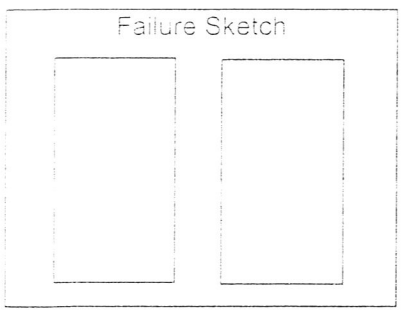
Date Tested: N/A

Initial Wet Density (pcf)	121.3	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	27.0		
Initial Dry Density (pcf)	95.5		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.042	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.879	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A

Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015

Source: STN-68, 30.0'-32.0' | Lab ID: 46

Visual Description: Lean Clay (CL), gray, moist, firm

Recovered: 0.9'

Test Interval: 30' - 30.5'

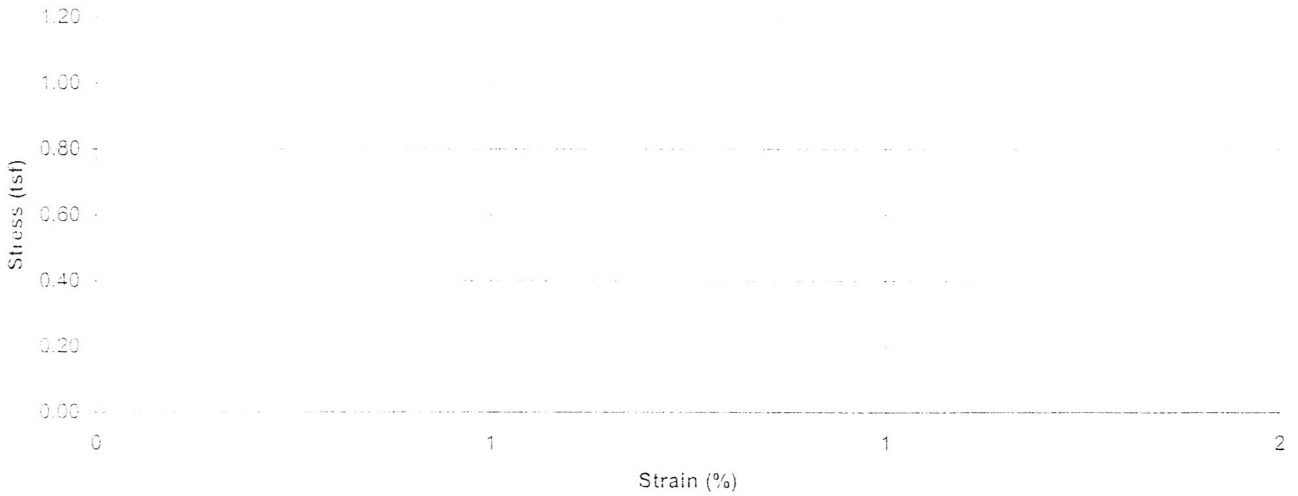
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

Date Extruded: 07/24/2009

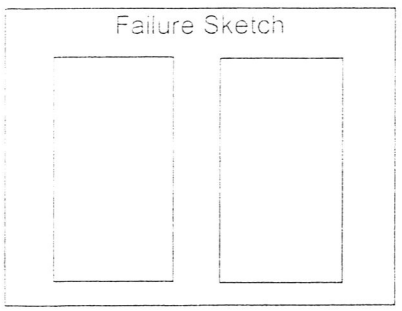
Date Tested: N/A

Initial Wet Density (pcf)	120.3	Initial MC Taken	Before Test, From Trimmings
Initial Moisture Content (%)	27.9		
Initial Dry Density (pcf)	94.0		
At Test Moisture Content (%)	N/A	At Test MC Taken	N/A
At Test Dry Density (pcf)	N/A		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	N/A
Average Height (in)	6.033	Undrained Shear Strength (tsf)	N/A
Average Diameter (in)	2.893	Strain at Maximum Stress (%)	N/A
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	N/A

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A

Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

Attachment 4
Permeability Tests

PERMEABILITY TEST
(ASTM D5084 - 90) (Method C, Increasing Tailwater Level)

Project Number	GTX-1494	Tested By	JM
Project Name	Bull Run Fossil Plant	Test Date	10/12/09
Boring No.	STN-46P	Reviewed By	MM
Sample No.	---	Review Date	10/16/09
Sample Depth	7-7.3	Lab No.	2
Sample Description	Gray ASH		

GeoTesting express

Sample Data

Length, in		Diameter, in		Pan No.	B
Location 1	3.020	Location 1	2.834	Dry Soil+Pan, grams	377.22
Location 2	3.020	Location 2	2.823	Pan Weight, grams	57.88
Location3	3.020	Location 3	2.844		
Average	3.020	Average	2.834	Moisture Content, %	57.9
		Wet Soil + Tare, grams	504.32	Wet Unit Weight, pcf	100.9
		Tare Weight, grams	0.00	Dry Unit Weight, pcf	63.9

Remarks:

Chamber Pressure, psi	65
Back Pressure, psi	60
Confining Pressure, psi	5

Date Start	Date Finish	Time Start	Time Finish	Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	k cm/sec	Temp (°C)	k cm/sec at 20 °C
				460	4.5	101.5	4.90	101.1	2.7E-07	22	2.6E-07
				872	4.5	101.5	5.20	100.8	2.5E-07	22	2.4E-07
				1240	4.5	101.5	5.40	100.6	2.3E-07	22	2.2E-07
				1800	4.5	101.5	5.70	100.3	2.1E-07	22	2.0E-07
				2000	4.5	101.5	5.80	100.2	2.0E-07	22	2.0E-07

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
5	UD	63.9	N/A	Vertical

Avg. k at 20 °C **2.2E-07** **cm/sec**

a = area of burette in cm²
L = length of sample in cm
A = area of sample in cm²
Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds
H_b = final inlet head in cm
H_2 = final outlet head in cm

a =	0.16	cm²
A =	40.69	cm²
L =	7.67	cm

HYDRAULIC CONDUCTIVITY

Project No.	***GTX-1494***	Tested By	***JM***
Project Name	***Bull Run Fossil Plant***	Test Date	***10/12/2009***
Boring No.	***STN-46P***	Reviewed By	***MM***
Sample No.	***---***	Review Date	***10/16/2009***
Sample Depth	***7-7.3***	Lab No.	***2***
Sample Description	***Gray ASH***		

ASTM D5084 - Falling Head (Method C RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*57.9*
Wet Unit Weight, pcf:	*100.9*
Dry Unit Weight, pcf:	*63.9*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***2.2E-07***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 90) (Method C, Increasing Tailwater Level)

Project Number	GTX-1494	Tested By	JM
Project Name	Bull Run Fossil Plant	Test Date	10/12/09
Boring No.	STN-48P	Reviewed By	MM
Sample No.	--	Review Date	10/17.09
Sample Depth	28-28.3 ft	Lab No.	3
Sample Description	Gray fat clay		

GeoTesting express

Sample Data

Length, in		Diameter, in		Pan No.	B-49
Location 1	3.120	Location 1	2.860	Dry Soil+Pan, grams	463.26
Location 2	3.110	Location 2	2.865	Pan Weight, grams	57.92
Location3	3.090	Location 3	2.860		
Average	3.107	Average	2.862	Moisture Content, %	38.5
		Wet Soil + Tare, grams	561.28	Wet Unit Weight, pcf	107.0
		Tare Weight, grams	0.00	Dry Unit Weight, pcf	77.3

Remarks:

Chamber Pressure, psi	65
Back Pressure, psi	60
Confining Pressure, psi	5

Date Start	Date Finish	Time Start	Time Finish	Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	k cm/sec	Temp (°C)	k cm/sec at 20 °C
				660	12.5	90.3	12.50	90.1	5.9E-08	22	5.7E-08
				2600	12.5	90.3	13.00	90	6.0E-08	22	5.8E-08
				6400	12.5	90.3	13.40	89.4	5.6E-08	22	5.3E-08
				13400	12.5	90.3	14.50	88.3	6.0E-08	22	5.7E-08
				14000	12.5	90.3	14.60	88.4	5.7E-08	22	5.5E-08

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
5	UD	77.3	N/A	Vertical

Avg. k at 20 °C **5.6E-08** **cm/sec**

a = area of burette in cm²
L = length of sample in cm
A = area of sample in cm²
Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds
H_b = final inlet head in cm
H_2 = final outlet head in cm

a =	0.16	cm²
A =	41.49	cm²
L =	7.89	cm

HYDRAULIC CONDUCTIVITY

Project No.	***GTX-1494***	Tested By	***JM***
Project Name	***Bull Run Fossil Plant***	Test Date	***10/12/2009***
Boring No.	***STN-48P***	Reviewed By	***MM***
Sample No.	***--***	Review Date	***10/17/2009***
Sample Depth	***28-28.3 ft***	Lab No.	***3***
Sample Description	***Gray fat clay***		

ASTM D5084 - Falling Head (Method C RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*38.5*
Wet Unit Weight, pcf:	*107.0*
Dry Unit Weight, pcf:	*77.3*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***5.6E-08***

Remarks: _____

PERMEABILITY TEST
(ASTM D5084 - 90) (Method C, Increasing Tailwater Level)

Project Number	GTX-1499	Tested By	JM
Project Name	Bull Run Fossil Plant	Test Date	10/13/09
Boring No.	C-16	Reviewed By	MM
Sample No.	STN-34P	Review Date	10/21/09
Sample Depth	40.2-40.6 ft	Lab No.	K1.1
Sample Description	Gray ASH		

GeoTesting express

Sample Data

Length, in		Diameter, in		Pan No.	B-3
Location 1	2.862	Location 1	2.860	Dry Soil+Pan, grams	402.91
Location 2	2.862	Location 2	2.860	Pan Weight, grams	52.45
Location3	2.862	Location 3	2.860		
Average	2.862	Average	2.860	Moisture Content, %	42.8
		Wet Soil + Tare, grams	500.55	Wet Unit Weight, pcf	103.7
		Tare Weight, grams	0.00	Dry Unit Weight, pcf	72.6

Remarks:

Chamber Pressure, psi	65
Back Pressure, psi	60
Confining Pressure, psi	5

Date Start	Date Finish	Time Start	Time Finish	Time (sec)	H_a (cm)	H_1 (cm)	H_b (cm)	H_2 (cm)	k cm/sec	Temp (°C)	k cm/sec at 20 °C
				2760	12.0	94.2	14.30	93.9	1.6E-07	22	1.6E-07
				6300	12.0	94.2	17.00	93.8	1.5E-07	22	1.4E-07
				9960	12.0	94.2	18.70	93.8	1.3E-07	22	1.2E-07
				12489	12.0	94.2	20.50	92	1.6E-07	22	1.5E-07
				16750	12.0	94.2	21.40	90.6	1.4E-07	22	1.4E-07

No. of Trials	Sample Type	Max. Density (pcf)	Compaction %	Sample Orientation
5	UD	72.6	N/A	Vertical

Avg. k at 20 °C **1.4E-07** **cm/sec**

a = area of burette in cm²
L = length of sample in cm
A = area of sample in cm²
Ha = initial inlet head in cm
H_1 = initial outlet head in cm
t = time in seconds
H_b = final inlet head in cm
H_2 = final outlet head in cm

a =	0.16	cm²
A =	41.45	cm²
L =	7.27	cm

HYDRAULIC CONDUCTIVITY

Project No.	***GTX-1499***	Tested By	***JM***
Project Name	***Bull Run Fossil Plant***	Test Date	***10/13/09***
Boring No.	***STN-34P***	Reviewed By	***MM***
Sample No.	***----***	Review Date	***10/21/09***
Sample Depth	***40.2-40.6 ft***	Lab No.	***1***
Sample Description	***Gray ASH***		

ASTM D5084 - Falling Head (Method C RisingTail)

Sample Type:	*UD*
Sample Orientation:	*Vertical*
Initial Water Content, %:	*42.8*
Wet Unit Weight, pcf:	*103.7*
Dry Unit Weight, pcf:	*72.6*
Compaction, %:	*N/A*
Hydraulic Conductivity, cm/sec. @20 °C	***1.4E-07***

Remarks: _____

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter
ASTM D 5084-03

Project Name	Bull Run Fossil Plant (TVA)	Project No.	172679015
Source	STN-10, 45.2'-45.7'	Test ID	12B
Visual Classification	Silty Sand (SM), brown, moist, firm	Prepared By	BWT
Undisturbed	XX	Specific Gravity	2.68 ASTM D854-A
		Date	9-29-09
		Maximum Dry Density (pcf)	
		Percent of Maximum	
Permeant:	De-aired tap water	LL NP PL NP PI	NP

Selection and Preparation Comments:

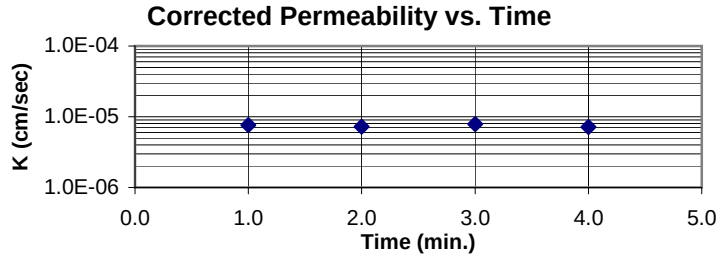
Specimens (if compacted) were compacted in a Proctor Mold as follows: The Maximum Dry Density was converted to Wet Density, this mass was divided by 4 (layers) and 3 of the 4 layers were compacted into the mold using a Proctor Hammer using 25 blows per layer. The density was varied by reducing the height of the drop by the amount listed beside "Compacted". The specimen was trimmed from the bottom two layers.

	Initial Specimen Data	After Consolidation Data	After Test Data
Height (in.)	2.4726	2.3998	2.4013
Diameter (in.)	2.7743		2.7762
Moisture Content (%)	20.7		20.2
Dry Unit Weight (pcf)	106.6		109.6
Void Ratio	0.570		0.527
Degree of Saturation (%)	97.4		103.0
Trimmings MC (%)	19.1		

Final Pressures (psi)	
Chamber	75
Influent	70
Effluent	65

Applied Head Difference (psi)	5
Back Pressure Saturated to (psi)	65
Maximum Effective Consolidation Stress (psi)	10
Minimum Effective Consolidation Stress (psi)	5

						Hydraulic Conductivity			
Date	Clock (24H:M)	Temp. ℉	Bottom Head	Top Head	Test Time (sec)	k (m/s)	k (cm/s)	k @ 20°C (m/s)	k @ 20°C (cm/s)
10-5-09	10:13	70.0	19.03	6.26	0	---	---	---	---
10-5-09	10:14	70.0	18.73	6.62	6.00E+01	7.9E-08	7.9E-06	7.6E-08	7.6E-06
10-5-09	10:15	70.0	18.42	6.93	6.00E+01	7.4E-08	7.4E-06	7.2E-08	7.2E-06
10-5-09	10:16	70.0	18.08	7.26	6.00E+01	8.0E-08	8.0E-06	7.8E-08	7.8E-06
10-5-09	10:17	70.0	17.77	7.56	6.00E+01	7.4E-08	7.4E-06	7.2E-08	7.2E-06



A gradient of approximately 55.8 was used for this test. This gradient exceeds ASTM guidelines for maximum gradient, but was used to achieve the requestors desired test duration. Examination of the sample shows no signs of material loss or clogging that may affect test results.

Average Hydraulic Conductivity @ 20°C (last 4 det erminations)	m/s	7.46E-08	cm/s	7.46E-06
Average Hydraulic Conductivity @ 20°C (last run)	m /s	7.46E-08	cm/s	7.46E-06

Reviewed by:

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter
ASTM D 5084-03

Project Name	Bull Run Fossil Plant (TVA)	Project No.	172679015
Source	STN-51, 10.1'-10.6'	Test ID	32B
Visual Classification	Sandy Lean Clay (CL), brown, moist, firm	Prepared By	BWT
Undisturbed	XX	Specific Gravity	2.71 ASTM D854-A
		Date	9-29-09
		Maximum Dry Density (pcf)	
		Percent of Maximum	
Permeant:	De-aired tap water	LL 37 PL 23	PI 14
Selection and Preparation Comments:			

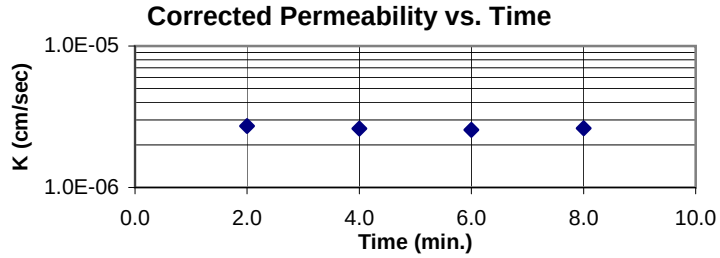
Specimens (if compacted) were compacted in a Proctor Mold as follows: The Maximum Dry Density was converted to Wet Density, this mass was divided by 4 (layers) and 3 of the 4 layers were compacted into the mold using a Proctor Hammer using 25 blows per layer. The density was varied by reducing the height of the drop by the amount listed beside "Compacted". The specimen was trimmed from the bottom two layers.

	Initial Specimen Data	After Consolidation Data	After Test Data
Height (in.)	2.4500	2.4156	2.4175
Diameter (in.)	2.7987		2.7868
Moisture Content (%)	20.0		20.9
Dry Unit Weight (pcf)	104.1		106.4
Void Ratio	0.625		0.590
Degree of Saturation (%)	86.9		96.1
Trimmings MC (%)	19.4		

Final Pressures (psi)	
Chamber	75
Influent	70
Effluent	65

Applied Head Difference (psi)	5
Back Pressure Saturated to (psi)	65
Maximum Effective Consolidation Stress (psi)	10
Minimum Effective Consolidation Stress (psi)	5

						Hydraulic Conductivity			
Date	Clock (24H:M)	Temp. ℉	Bottom Head	Top Head	Test Time (sec)	k (m/s)	k (cm/s)	k @ 20°C (m/s)	k @ 20°C (cm/s)
10-5-09	10:11	70.0	18.60	6.60	0	---	---	---	---
10-5-09	10:13	70.0	18.37	6.84	1.20E+02	2.8E-08	2.8E-06	2.7E-08	2.7E-06
10-5-09	10:15	70.0	18.15	7.07	1.20E+02	2.7E-08	2.7E-06	2.6E-08	2.6E-06
10-5-09	10:17	70.0	17.92	7.28	1.20E+02	2.6E-08	2.6E-06	2.6E-08	2.6E-06
10-5-09	10:19	70.0	17.70	7.51	1.20E+02	2.7E-08	2.7E-06	2.6E-08	2.6E-06



A gradient of approximately 56.3 was used for this test. This gradient exceeds ASTM guidelines for maximum gradient, but was used to achieve the requestors desired test duration. Examination of the sample shows no signs of material loss or clogging that may affect test results.

Average Hydraulic Conductivity @ 20°C (last 4 det erminations)	m/s	2.63E-08	cm/s	2.63E-06
Average Hydraulic Conductivity @ 20°C (last run)	m /s	2.63E-08	cm/s	2.63E-06

Reviewed by: _____

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter ASTM D 5084-03

Project Name	Bull Run Fossil Plant (TVA)	Project No.	172679015
Source	STN-59, 4.5'-6.5'	Test ID	35
Visual Classification	Lean Clay (CL), brown, moist, firm	Prepared By	BWT
Undisturbed	XX	Specific Gravity 2.69 ASTM D854-A	Date 9-29-09
		Maximum Dry Density (pcf)	Percent of Maximum

Permeant: De-aired tap water

Selection and Preparation Comments:

Specimens (if compacted) were compacted in a Proctor Mold as follows: The Maximum Dry Density was converted to Wet Density, this mass was divided by 4 (layers) and 3 of the 4 layers were compacted into the mold using a Proctor Hammer using 25 blows per layer. The density was varied by reducing the height of the drop by the amount listed beside "Compacted". The specimen was trimmed from the bottom two layers.

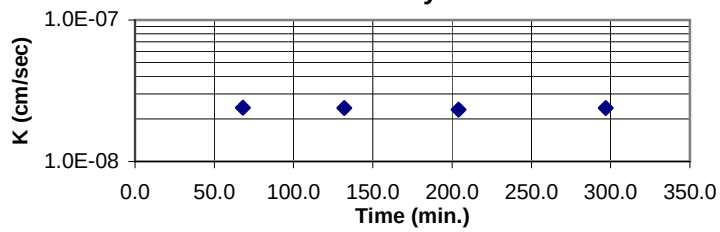
	Initial Specimen Data	After Consolidation Data	After Test Data
Height (in.)	2.4611	2.4388	2.4430
Diameter (in.)	2.7990		2.7937
Moisture Content (%)	24.5		25.7
Dry Unit Weight (pcf)	98.1		99.2
Void Ratio	0.712		0.693
Degree of Saturation (%)	92.7		99.7
Trimmings MC (%)	22.3		

Final Pressures (psi)	
Chamber	75
Influent	70
Effluent	65

Applied Head Difference (psi)	5
Back Pressure Saturated to (psi)	65
Maximum Effective Consolidation Stress (psi)	10
Minimum Effective Consolidation Stress (psi)	5

						Hydraulic Conductivity			
Date	Clock (24H:M)	Temp. ℉	Bottom Head	Top Head	Test Time (sec)	k (m/s)	k (cm/s)	k @ 20°C (m/s)	k @ 20°C (cm/s)
10-6-09	9:55	70.0	22.04	3.60	0	---	---	---	---
10-6-09	11:03	70.0	21.76	3.88	4.08E+03	2.5E-10	2.5E-08	2.4E-10	2.4E-08
10-6-09	12:07	70.0	21.50	4.14	3.84E+03	2.4E-10	2.4E-08	2.4E-10	2.4E-08
10-6-09	13:19	70.0	21.21	4.42	4.32E+03	2.4E-10	2.4E-08	2.3E-10	2.3E-08
10-6-09	14:52	70.0	20.84	4.80	5.58E+03	2.5E-10	2.5E-08	2.4E-10	2.4E-08

Corrected Permeability vs. Time



A gradient of approximately 56.1 was used for this test. This gradient exceeds ASTM guidelines for maximum gradient, but was used to achieve the requestors desired test duration. Examination of the sample shows no signs of material loss or clogging that may affect test results.

Average Hydraulic Conductivity @ 20°C (last 4 det erminations)	m/s	2.38E-10	cm/s	2.38E-08
Average Hydraulic Conductivity @ 20°C (last run)	m /s	2.38E-10	cm/s	2.38E-08

Reviewed by:

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter ASTM D 5084-03

Project Name	Bull Run Fossil Plant (TVA)	Project No.	172679015
Source	STN-10, 26.5'-28.5'	Test ID	3B
Visual Classification	Silt (ML), gray, moist, firm, fly ash	Prepared By	BWT
Undisturbed	XX	Specific Gravity	2.63 ASTM D854-A
		Date	9-29-09
		Maximum Dry Density (pcf)	
		Percent of Maximum	

Permeant: De-aired tap water

Selection and Preparation Comments:

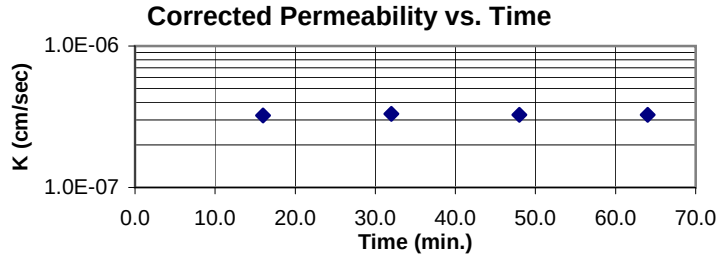
Specimens (if compacted) were compacted in a Proctor Mold as follows: The Maximum Dry Density was converted to Wet Density, this mass was divided by 4 (layers) and 3 of the 4 layers were compacted into the mold using a Proctor Hammer using 25 blows per layer. The density was varied by reducing the height of the drop by the amount listed beside "Compacted". The specimen was trimmed from the bottom two layers.

	Initial Specimen Data	After Consolidation Data	After Test Data
Height (in.)	2.4879	2.4243	2.4292
Diameter (in.)	2.7800		2.7694
Moisture Content (%)	23.6		21.7
Dry Unit Weight (pcf)	102.8		106.1
Void Ratio	0.597		0.547
Degree of Saturation (%)	103.9		104.4
Trimmings MC (%)	23.2		

Final Pressures (psi)	
Chamber	75
Influent	70
Effluent	65

Applied Head Difference (psi)	5
Back Pressure Saturated to (psi)	65
Maximum Effective Consolidation Stress (psi)	10
Minimum Effective Consolidation Stress (psi)	5

						Hydraulic Conductivity			
Date	Clock (24H:M)	Temp. ℉	Bottom Head	Top Head	Test Time (sec)	k (m/s)	k (cm/s)	k @ 20°C (m/s)	k @ 20°C (cm/s)
10-8-09	9:21	70.0	22.21	3.27	0	---	---	---	---
10-8-09	9:37	70.0	21.99	3.49	9.60E+02	3.3E-09	3.3E-07	3.2E-09	3.2E-07
10-8-09	9:53	70.0	21.76	3.71	9.60E+02	3.4E-09	3.4E-07	3.3E-09	3.3E-07
10-8-09	10:09	70.0	21.54	3.93	9.60E+02	3.3E-09	3.3E-07	3.3E-09	3.3E-07
10-8-09	10:25	70.0	21.32	4.15	9.60E+02	3.4E-09	3.4E-07	3.3E-09	3.3E-07



A gradient of approximately 55.5 was used for this test. This gradient exceeds ASTM guidelines for maximum gradient, but was used to achieve the requestors desired test duration. Examination of the sample shows no signs of material loss or clogging that may affect test results.

Average Hydraulic Conductivity @ 20°C (last 4 det erminations)	m/s	3.27E-09	cm/s	3.27E-07
Average Hydraulic Conductivity @ 20°C (last run)	m /s	3.27E-09	cm/s	3.27E-07

Reviewed by:

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter ASTM D 5084-03

Project Name	Bull Run Fossil Plant (TVA)	Project No.	172679015
Source	STN-62, 39.0'-41.0'	Test ID	42A
Visual Classification	Lean Clay with Sand (CL), brown, moist, firm	Prepared By	BWT
Undisturbed	XX	Specific Gravity	2.71 ASTM D854-A
		Date	9-29-09
		Maximum Dry Density (pcf)	
		Percent of Maximum	

Permeant: De-aired tap water

Selection and Preparation Comments:

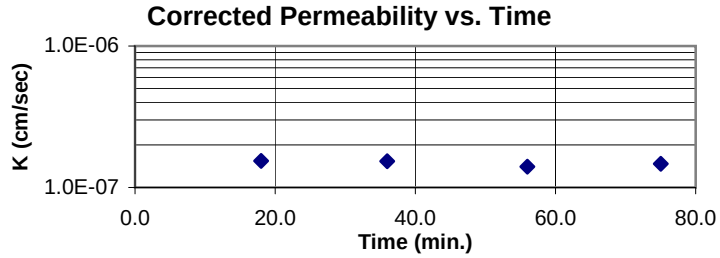
Specimens (if compacted) were compacted in a Proctor Mold as follows: The Maximum Dry Density was converted to Wet Density, this mass was divided by 4 (layers) and 3 of the 4 layers were compacted into the mold using a Proctor Hammer using 25 blows per layer. The density was varied by reducing the height of the drop by the amount listed beside "Compacted". The specimen was trimmed from the bottom two layers.

	Initial Specimen Data	After Consolidation Data	After Test Data
Height (in.)	2.4674	2.4292	2.4293
Diameter (in.)	2.7997		2.7891
Moisture Content (%)	26.0		24.9
Dry Unit Weight (pcf)	98.4		100.7
Void Ratio	0.720		0.681
Degree of Saturation (%)	97.8		99.2
Trimmings MC (%)	26.9		

Final Pressures (psi)	
Chamber	75
Influent	70
Effluent	65

Applied Head Difference (psi)	5
Back Pressure Saturated to (psi)	65
Maximum Effective Consolidation Stress (psi)	10
Minimum Effective Consolidation Stress (psi)	5

						Hydraulic Conductivity			
Date	Clock (24H:M)	Temp. ℉	Bottom Head	Top Head	Test Time (sec)	k (m/s)	k (cm/s)	k @ 20°C (m/s)	k @ 20°C (cm/s)
10-8-09	9:20	70.0	22.24	3.21	0	---	---	---	---
10-8-09	9:38	70.0	21.76	3.68	1.08E+03	1.6E-09	1.6E-07	1.5E-09	1.5E-07
10-8-09	9:56	70.0	21.30	4.16	1.08E+03	1.6E-09	1.6E-07	1.5E-09	1.5E-07
10-8-09	10:16	70.0	20.82	4.63	1.20E+03	1.4E-09	1.4E-07	1.4E-09	1.4E-07
10-8-09	10:35	70.0	20.35	5.10	1.14E+03	1.5E-09	1.5E-07	1.5E-09	1.5E-07



A gradient of approximately 55.9 was used for this test. This gradient exceeds ASTM guidelines for maximum gradient, but was used to achieve the requestors desired test duration. Examination of the sample shows no signs of material loss or clogging that may affect test results.

Average Hydraulic Conductivity @ 20°C (last 4 det erminations)	m/s	1.49E-09	cm/s	1.49E-07
Average Hydraulic Conductivity @ 20°C (last run)	m /s	1.49E-09	cm/s	1.49E-07

Reviewed by:

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter
ASTM D 5084-03

Project Name	Bull Run Fossil Plant (TVA)	Project No.	172679015
Source	STN-68, 25.0'-27.0'	Test ID	45
Visual Classification	Lean Clay (CL), brown, moist, firm	Prepared By	BWT
Undisturbed	XX	Specific Gravity 2.68 ASTM D854-A	Date 9-29-09
		Maximum Dry Density (pcf)	Percent of Maximum

Permeant: De-aired tap water

Selection and Preparation Comments:

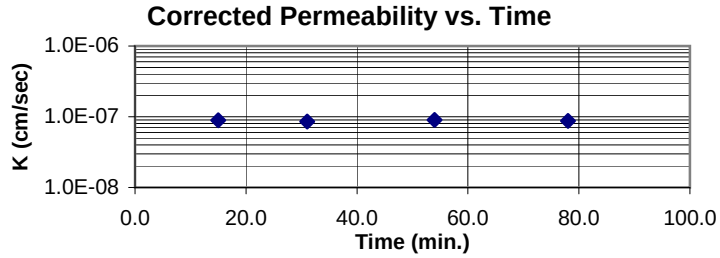
Specimens (if compacted) were compacted in a Proctor Mold as follows: The Maximum Dry Density was converted to Wet Density, this mass was divided by 4 (layers) and 3 of the 4 layers were compacted into the mold using a Proctor Hammer using 25 blows per layer. The density was varied by reducing the height of the drop by the amount listed beside "Compacted". The specimen was trimmed from the bottom two layers.

	Initial Specimen Data	After Consolidation Data	After Test Data
Height (in.)	2.4616	2.4422	2.4450
Diameter (in.)	2.8023		2.8011
Moisture Content (%)	25.1		25.3
Dry Unit Weight (pcf)	98.9		99.6
Void Ratio	0.693		0.680
Degree of Saturation (%)	97.1		99.8
Trimmings MC (%)	24.7		

Final Pressures (psi)	
Chamber	75
Influent	70
Effluent	65

Applied Head Difference (psi)	5
Back Pressure Saturated to (psi)	65
Maximum Effective Consolidation Stress (psi)	10
Minimum Effective Consolidation Stress (psi)	5

						Hydraulic Conductivity			
Date	Clock (24H:M)	Temp. ℉	Bottom Head	Top Head	Test Time (sec)	k (m/s)	k (cm/s)	k @ 20°C (m/s)	k @ 20°C (cm/s)
10-8-09	9:30	70.0	21.73	3.71	0	---	---	---	---
10-8-09	9:45	70.0	21.50	3.94	9.00E+02	9.2E-10	9.2E-08	8.9E-10	8.9E-08
10-8-09	10:01	70.0	21.27	4.18	9.60E+02	8.8E-10	8.8E-08	8.6E-10	8.6E-08
10-8-09	10:24	70.0	20.93	4.55	1.38E+03	9.3E-10	9.3E-08	9.0E-10	9.0E-08
10-8-09	10:48	70.0	20.58	4.91	1.44E+03	8.9E-10	8.9E-08	8.7E-10	8.7E-08



A gradient of approximately 56.1 was used for this test. This gradient exceeds ASTM guidelines for maximum gradient, but was used to achieve the requestors desired test duration. Examination of the sample shows no signs of material loss or clogging that may affect test results.

Average Hydraulic Conductivity @ 20°C (last 4 det erminations)	m/s	8.81E-10	cm/s	8.81E-08
Average Hydraulic Conductivity @ 20°C (last run)	m /s	8.81E-10	cm/s	8.81E-08

Reviewed by:

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter ASTM D 5084-03

Project Name	Bull Run Fossil Plant (TVA)	Project No.	172679015
Source	STN-10, 32.5'-34.5'	Test ID	6B
Visual Classification	Lean Clay (CL), brown, moist, firm	Prepared By	BWY
Undisturbed	XX	Specific Gravity 2.71 ASTM D854-A	Date 9-29-09
		Maximum Dry Density (pcf)	Percent of Maximum

Permeant: De-aired tap water

Selection and Preparation Comments:

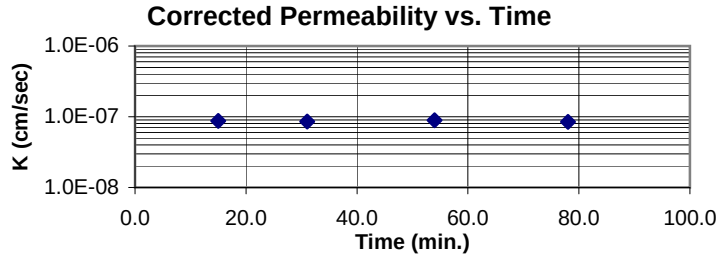
Specimens (if compacted) were compacted in a Proctor Mold as follows: The Maximum Dry Density was converted to Wet Density, this mass was divided by 4 (layers) and 3 of the 4 layers were compacted into the mold using a Proctor Hammer using 25 blows per layer. The density was varied by reducing the height of the drop by the amount listed beside "Compacted". The specimen was trimmed from the bottom two layers.

	Initial Specimen Data	After Consolidation Data	After Test Data
Height (in.)	2.4561	2.3892	2.3906
Diameter (in.)	2.7847		2.7702
Moisture Content (%)	21.5		20.1
Dry Unit Weight (pcf)	106.1		110.2
Void Ratio	0.594		0.535
Degree of Saturation (%)	98.2		101.7
Trimmings MC (%)	21.4		

Final Pressures (psi)	
Chamber	75
Influent	70
Effluent	65

Applied Head Difference (psi)	5
Back Pressure Saturated to (psi)	65
Maximum Effective Consolidation Stress (psi)	10
Minimum Effective Consolidation Stress (psi)	5

						Hydraulic Conductivity			
Date	Clock (24H:M)	Temp. ℉	Bottom Head	Top Head	Test Time (sec)	k (m/s)	k (cm/s)	k @ 20°C (m/s)	k @ 20°C (cm/s)
10-5-09	13:29	70.0	21.66	3.81	0	---	---	---	---
10-5-09	13:44	70.0	21.44	4.04	9.00E+02	9.0E-10	9.0E-08	8.7E-10	8.7E-08
10-5-09	14:00	70.0	21.21	4.28	9.60E+02	8.8E-10	8.8E-08	8.6E-10	8.6E-08
10-5-09	14:23	70.0	20.86	4.63	1.38E+03	9.2E-10	9.2E-08	8.9E-10	8.9E-08
10-5-09	14:47	70.0	20.52	4.98	1.44E+03	8.7E-10	8.7E-08	8.5E-10	8.5E-08



A gradient of approximately 56.2 was used for this test. This gradient exceeds ASTM guidelines for maximum gradient, but was used to achieve the requestors desired test duration. Examination of the sample shows no signs of material loss or clogging that may affect test results.

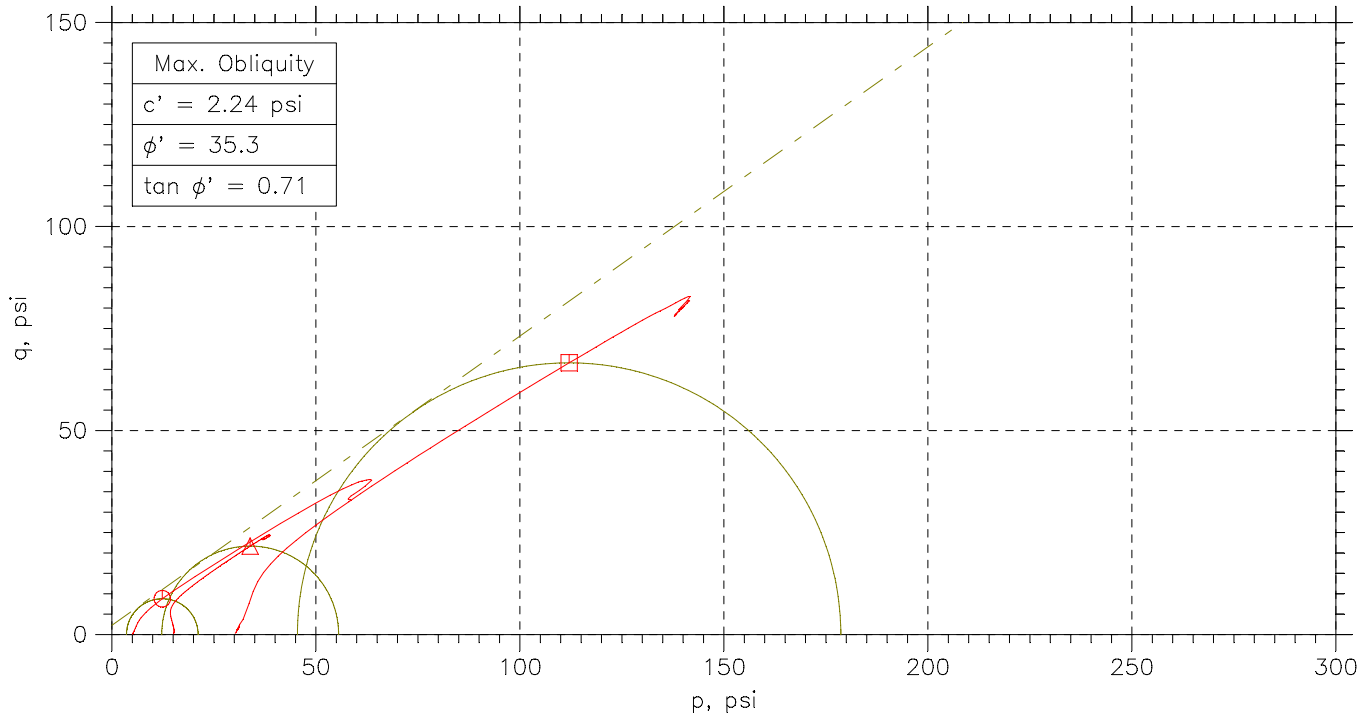
Average Hydraulic Conductivity @ 20°C (last 4 det erminations)	m/s	8.66E-10	cm/s	8.66E-08
Average Hydraulic Conductivity @ 20°C (last run)	m /s	8.66E-10	cm/s	8.66E-08

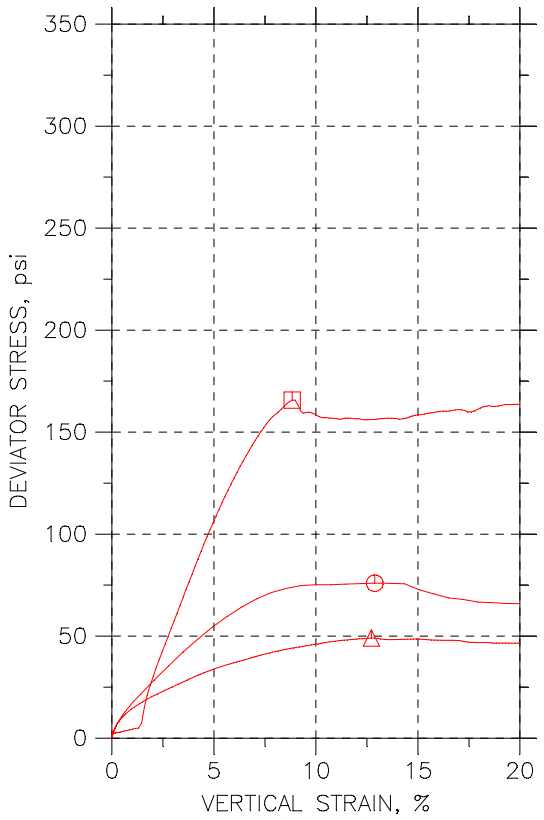
Reviewed by:

Attachment 5

Consolidated Undrained (CU) Tests

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		○	△	□	
Sample No.		---	---	---	
Test No.		13-A	13-B	CU-13 C	
Depth		30.2-30.8	31.4-32.0	40.8-41.4	
Initial	Diameter, in	2.719	2.813	2.665	
	Height, in	5.979	5.796	5.982	
	Water Content, %	56.2	61.9	35.9	
	Dry Density, pcf	65.98	57.27	80.38	
	Saturation, %	97.6	86.0	88.3	
	Void Ratio	1.55	1.94	1.1	
Before Shear	Water Content, %	56.0	61.2	33.9	
	Dry Density, pcf	67.08	63.56	87.97	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	1.51	1.65	0.916	
	Back Press., psi	83.05	68.07	44.48	
Ver. Eff. Cons. Stress, psi		4.946	14.92	29.91	
Shear Strength, psi		37.96	24.52	82.85	
Strain at Failure, %		12.9	12.7	8.84	
Strain Rate, %/min		0.07	0.07	0.07	
B-Value		0.95	0.95	0.95	
Estimated Specific Gravity		2.7	2.7	2.7	
Liquid Limit		---	---	---	
Plastic Limit		---	---	---	

GeoTesting express
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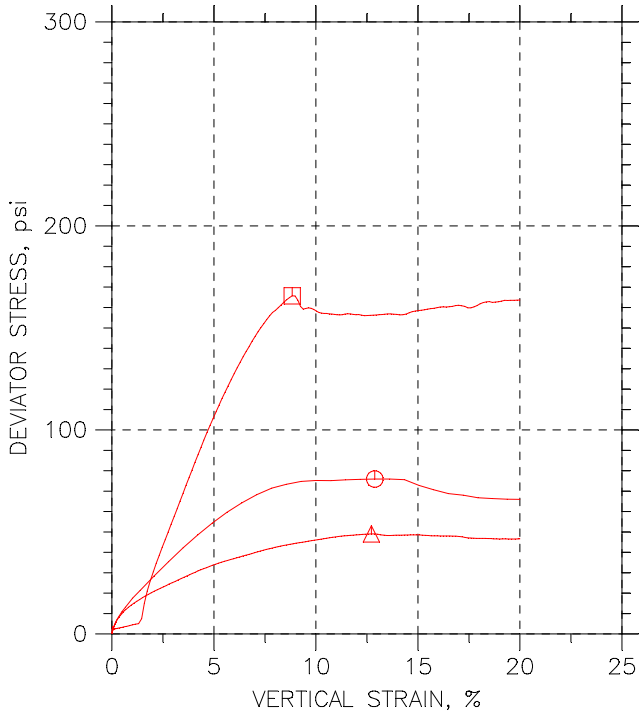
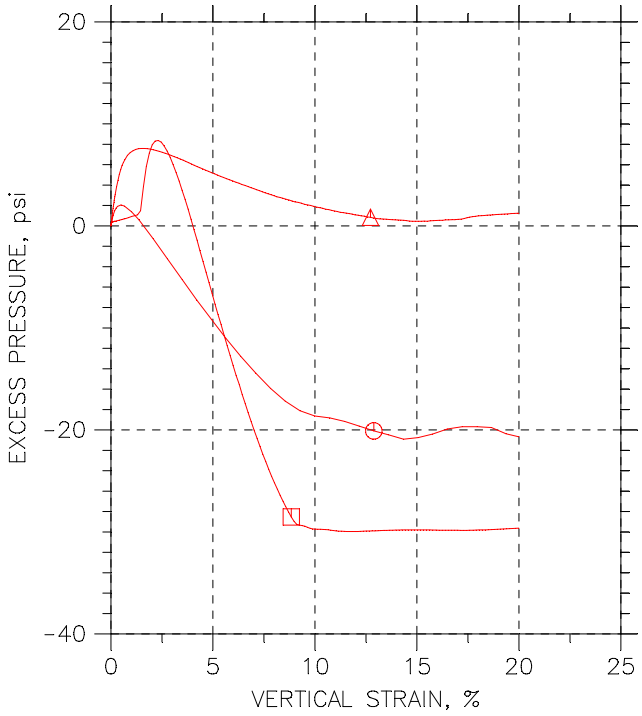
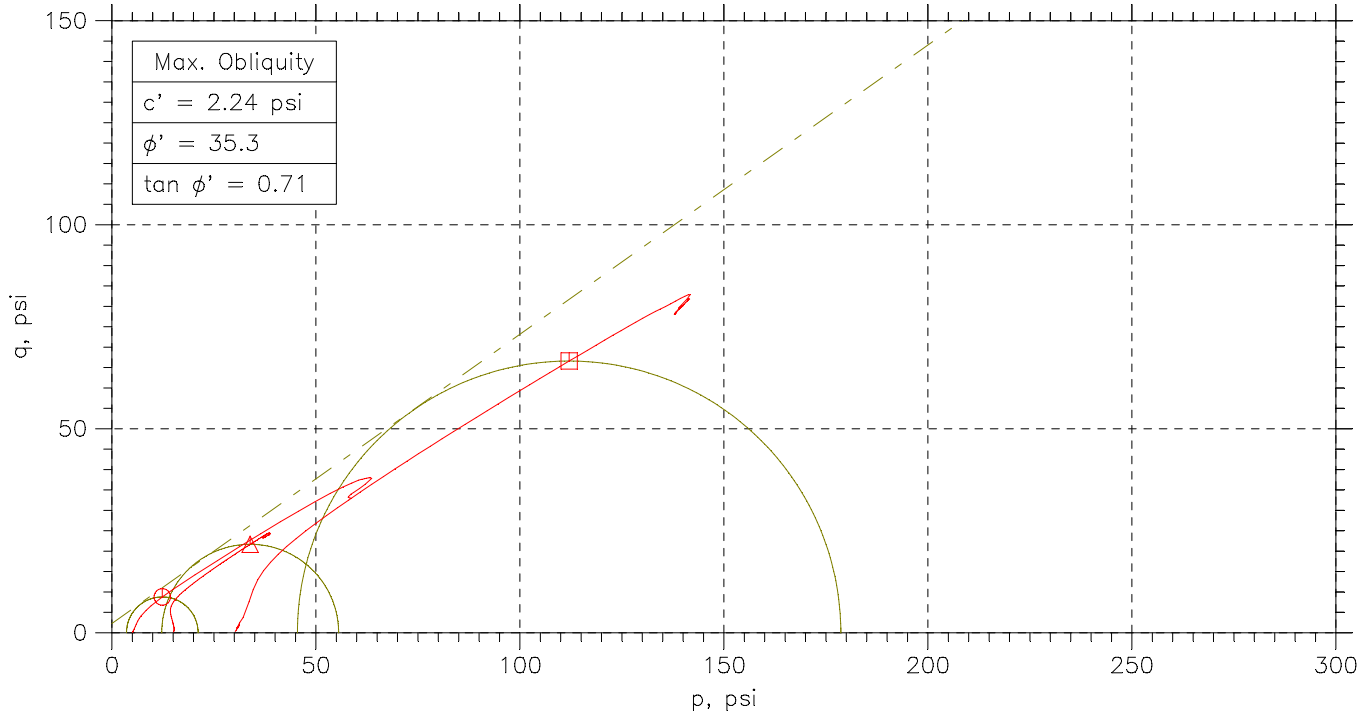
Project: Bull Run Fossil Plant
Location: ---
Project No.: GTX-1494
Boring No.: STN-34P
Sample Type: UD
Description: Gray Ash
Remarks: System 1062

Thu, 05-NOV-2009 08:06:13

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
○	---	13-A	30.2-30.8'	MM	10/29/09	GT		1494-cu-13-A.dat
△	---	13-B	31.4-32.0	MM	10/28/09	GT		1494-cu-13 B.dat
□	---	CU-13 C	40.8-41.4	MM	10/28/09	GT		1494-CU-13C.dat

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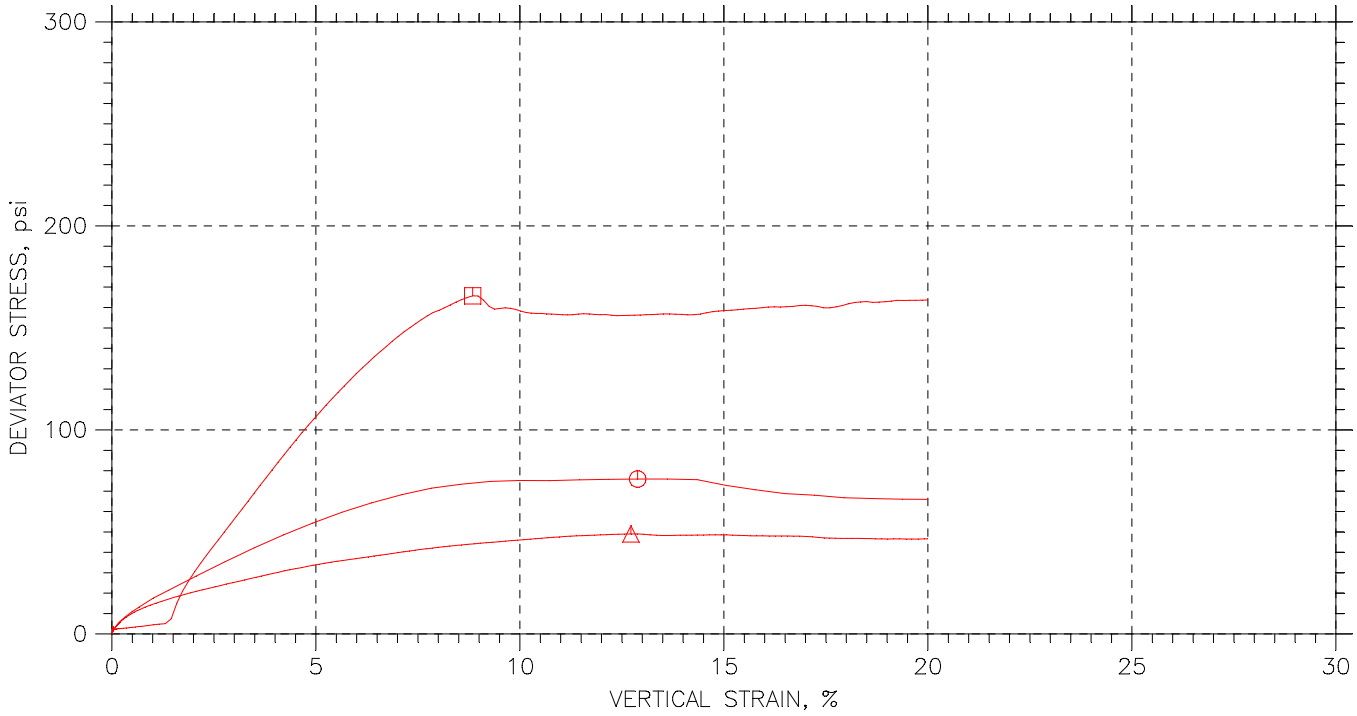
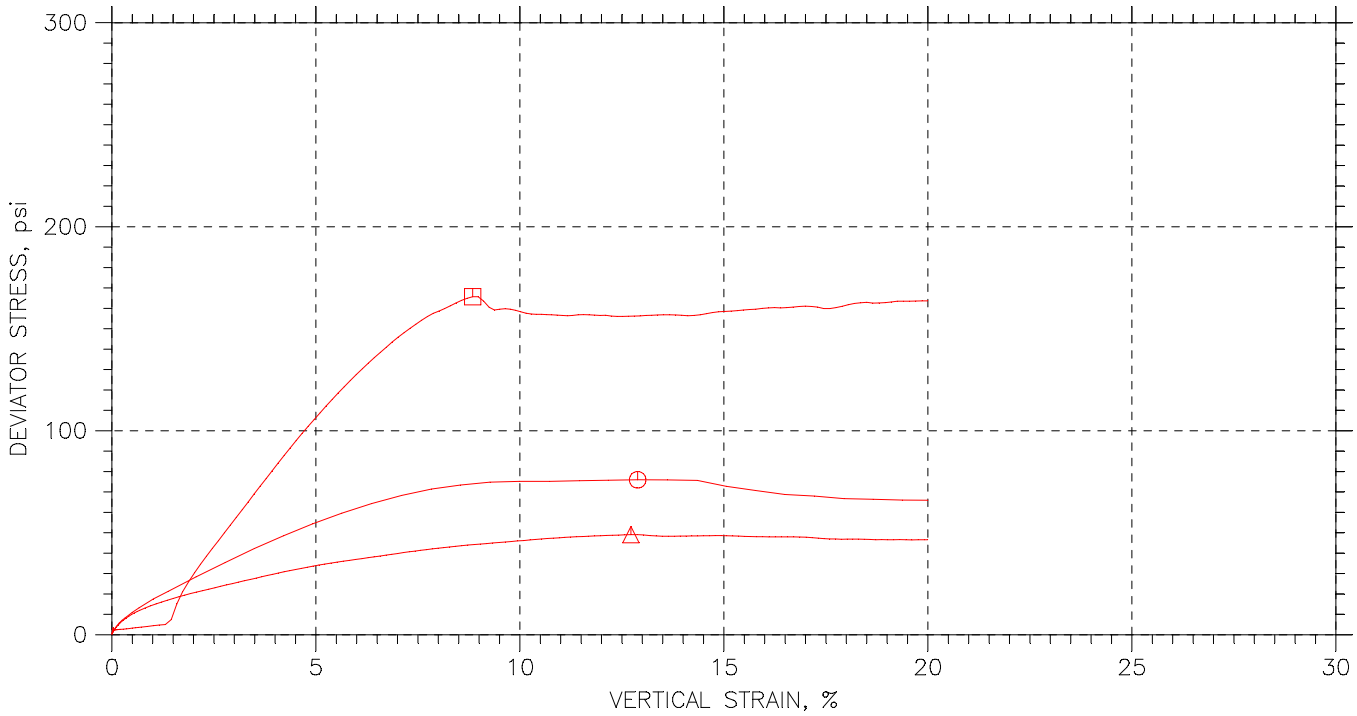
Project: Bull Run Fossil Plant	Location: ---	Project No.: GTX-1494
Boring No.: STN-34P	Sample Type: UD	
Description: Gray Ash		
Remarks: System 1062		

Thu, 05-NOV-2009 08:06:15

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⏲	---	13-A	30.2-30.8'	MM	10/29/09	GT		1494-cu-13-A.dat
△	---	13-B	31.4-32.0	MM	10/28/09	GT		1494-cu-13 B.dat
◳	---	CU-13 C	40.8-41.4	MM	10/28/09	GT		1494-CU-13C.dat

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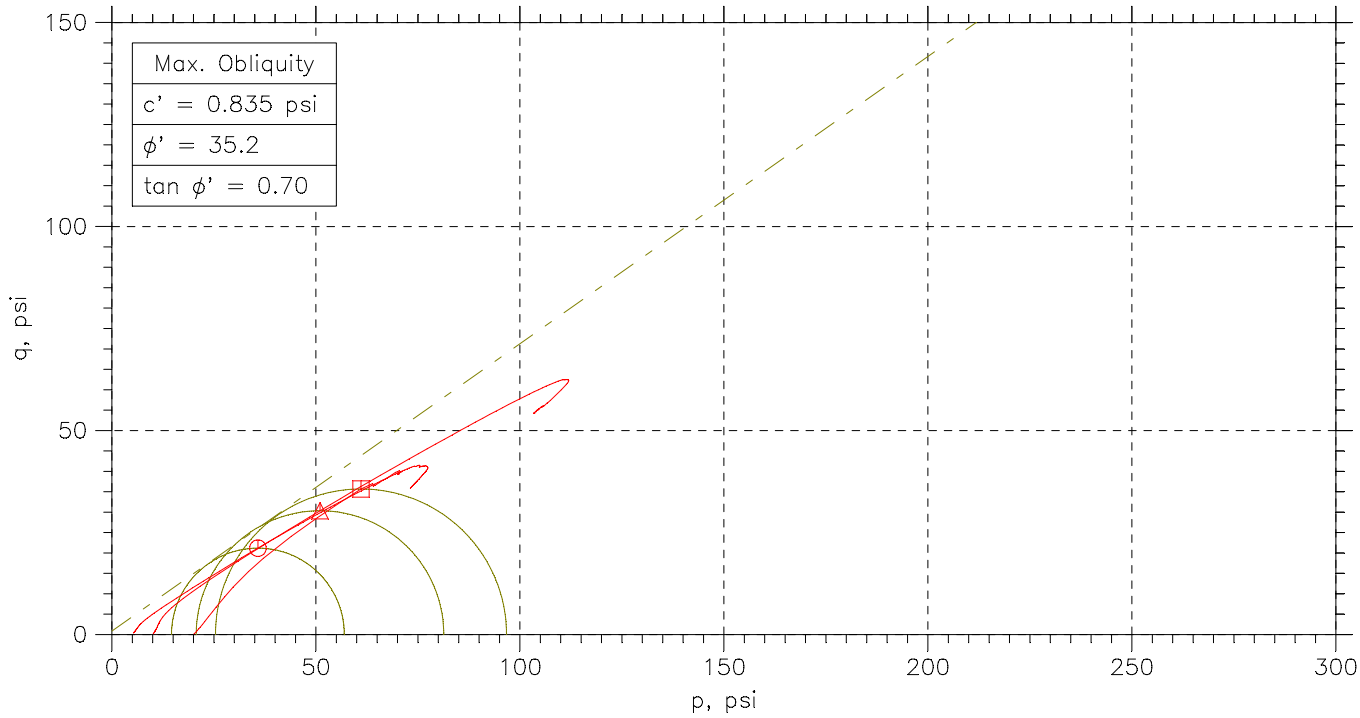
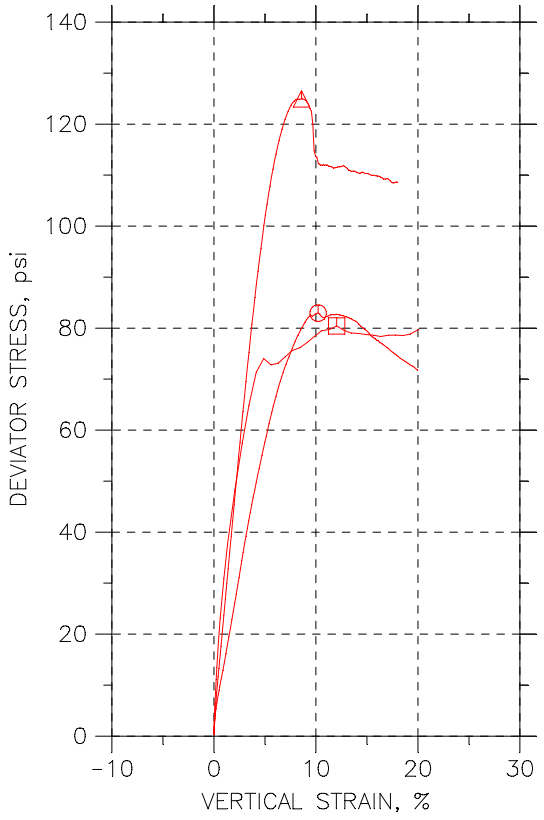
Project: Bull Run Fossil Plant	Location: ---	Project No.: GTX-1494
Boring No.: STN-34P	Sample Type: UD	
Description: Gray Ash		
Remarks: System 1062		

Thu, 05-NOV-2009 08:06:16

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		⏲	△	◫	
Sample No.		ST-13	ST-7	ST-7	
Test No.		CU-2D	CU-2B	CU-2C	
Depth		24.2-24.8	13.4-14.0'	11.5-12'	
Initial	Diameter, in	2.784	2.828	1.427	
	Height, in	6.086	5.951	3.035	
	Water Content, %	39.7	35.5	32.3	
	Dry Density, pcf	74.49	76.91	81.59	
	Saturation, %	84.9	80.5	81.9	
	Void Ratio	1.26	1.19	1.07	
Before Shear	Water Content, %	40.6	35.5	34.0	
	Dry Density, pcf	80.41	86.1	87.83	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	1.1	0.958	0.919	
	Back Press., psi	146.1	41.19	19.81	
Ver. Eff. Cons. Stress, psi		4.927	9.95	20	
Shear Strength, psi		41.47	62.47	40.21	
Strain at Failure, %		10.2	8.58	12	
Strain Rate, %/min		0.07	0.07	0.07	
B-Value		0.96	0.95	0.95	
Estimated Specific Gravity		2.7	2.7	2.7	
Liquid Limit		---	---	---	
Plastic Limit		---	---	---	

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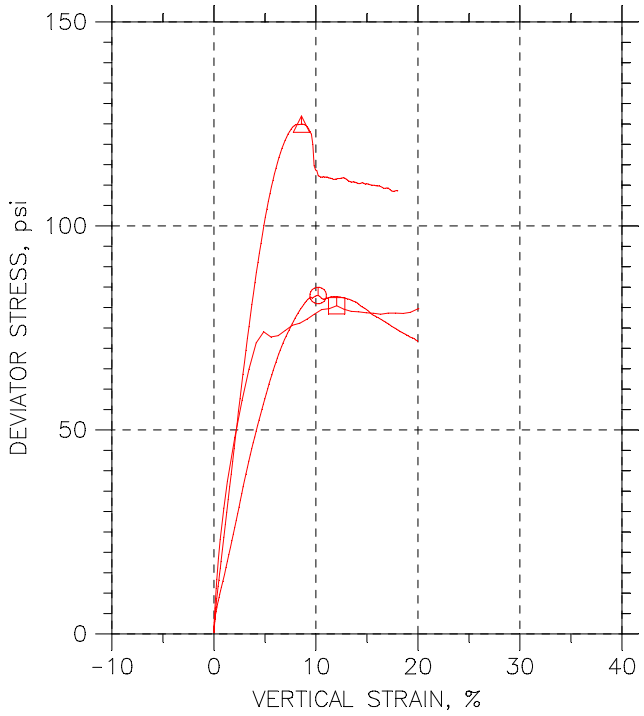
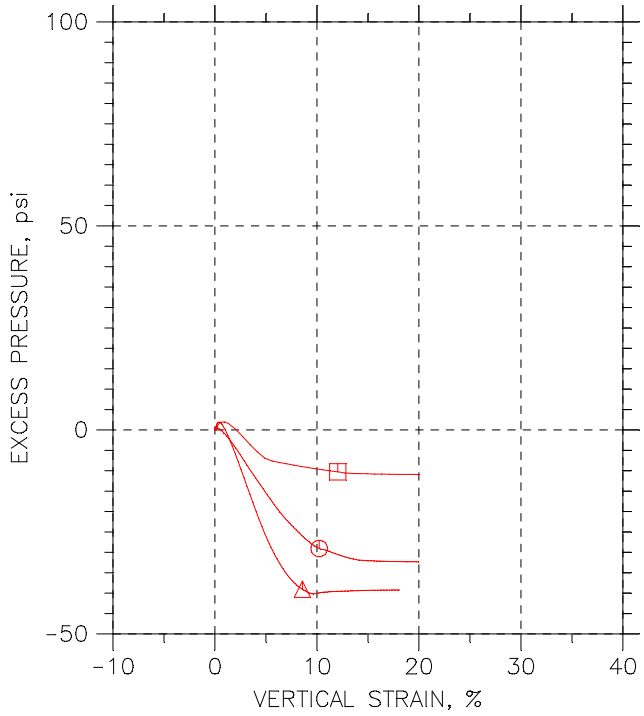
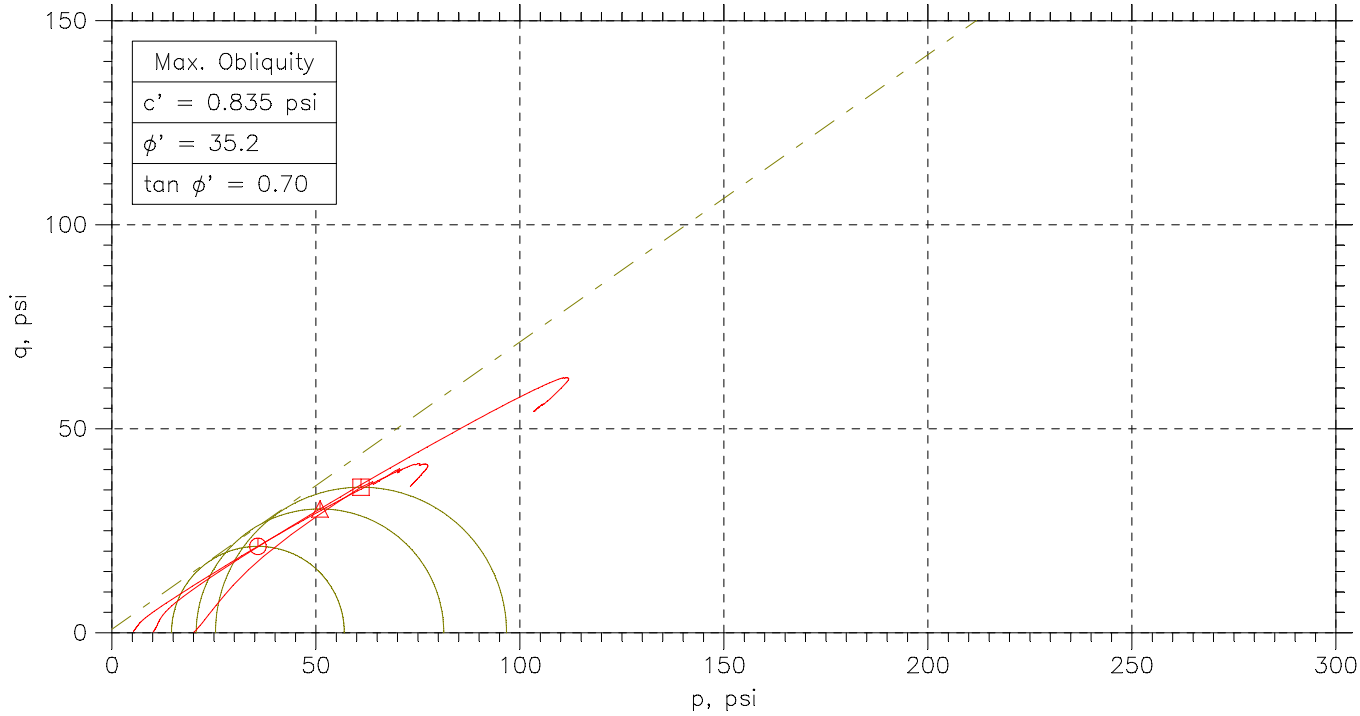
Project: Bull Run Fossil Plant
Location: ---
Project No.: GTX-1494
Boring No.: STN-49P
Sample Type: UD
Description: Gray Ash
Remarks: System 1057

Wed, 28-OCT-2009 14:41:59

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⏲	ST-13	CU-2D	24.2-24.8	MM	10/23/09	GT		1494-cu-2D.dat
△	ST-7	CU-2B	13.4-14.0'	MM	10/14/09	GT		1494-CU-2B.dat
◳	ST-7	CU-2C	11.5-12'	MM	10/13/09	GT		1494-CU-2C.dat

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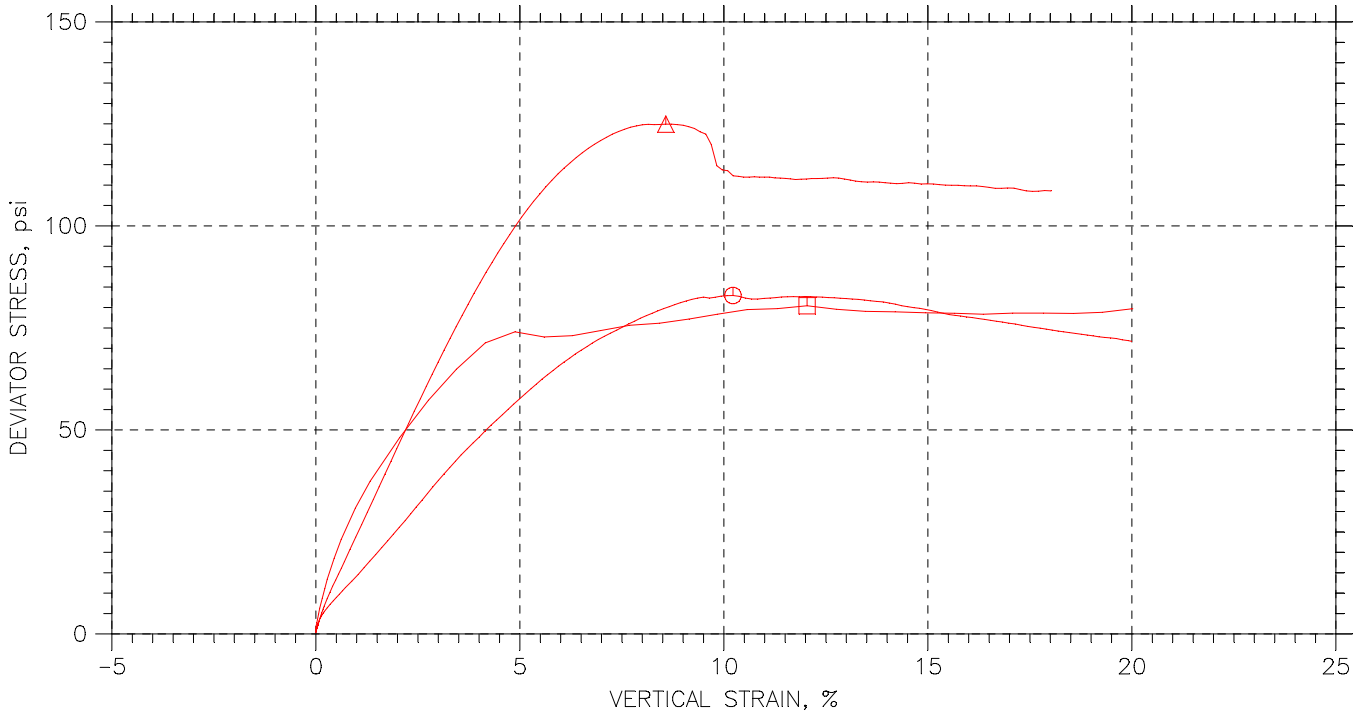
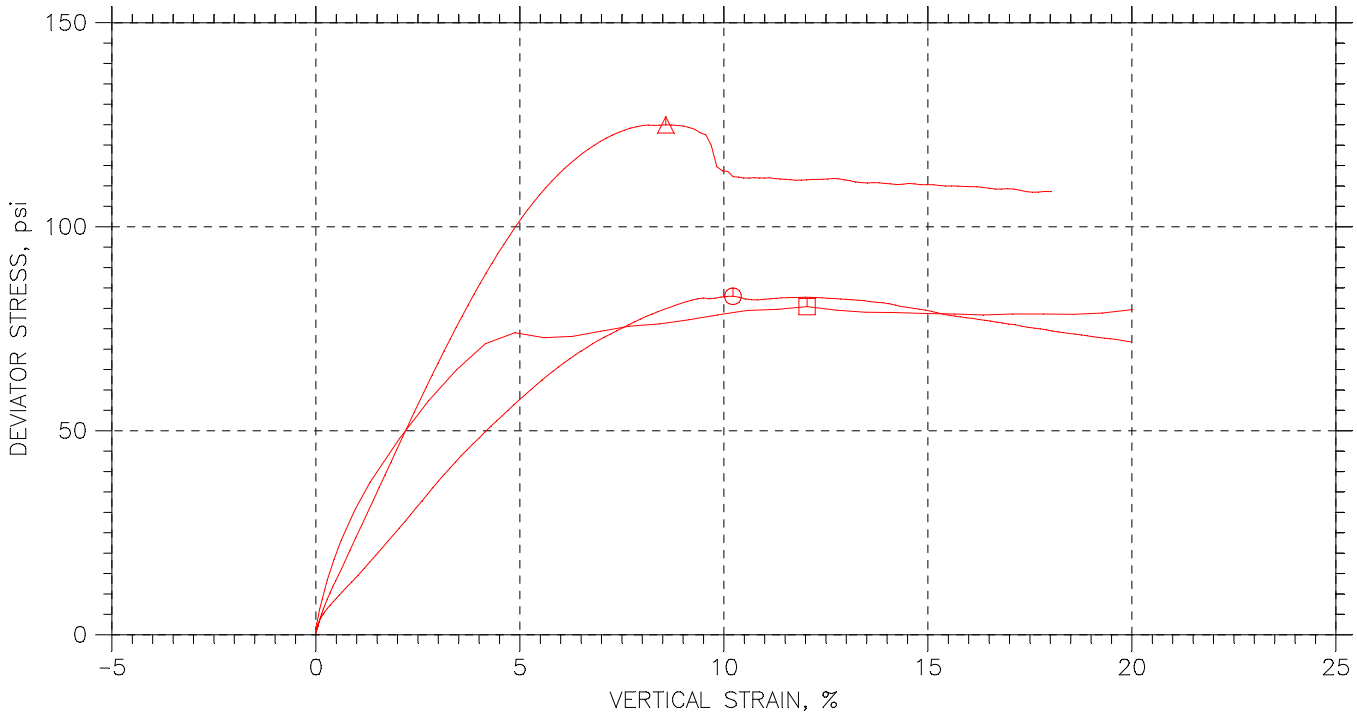
Project: Bull Run Fossil Plant	Location: ---	Project No.: GTX-1494
Boring No.: STN-49P	Sample Type: UD	
Description: Gray Ash		
Remarks: System 1057		

Wed, 28-OCT-2009 14:42:00

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⏲	ST-13	CU-2D	24.2-24.8	MM	10/23/09	GT		1494-cu-2D.dat
△	ST-7	CU-2B	13.4-14.0'	MM	10/14/09	GT		1494-CU-2B.dat
◳	ST-7	CU-2C	11.5-12'	MM	10/13/09	GT		1494-CU-2C.dat

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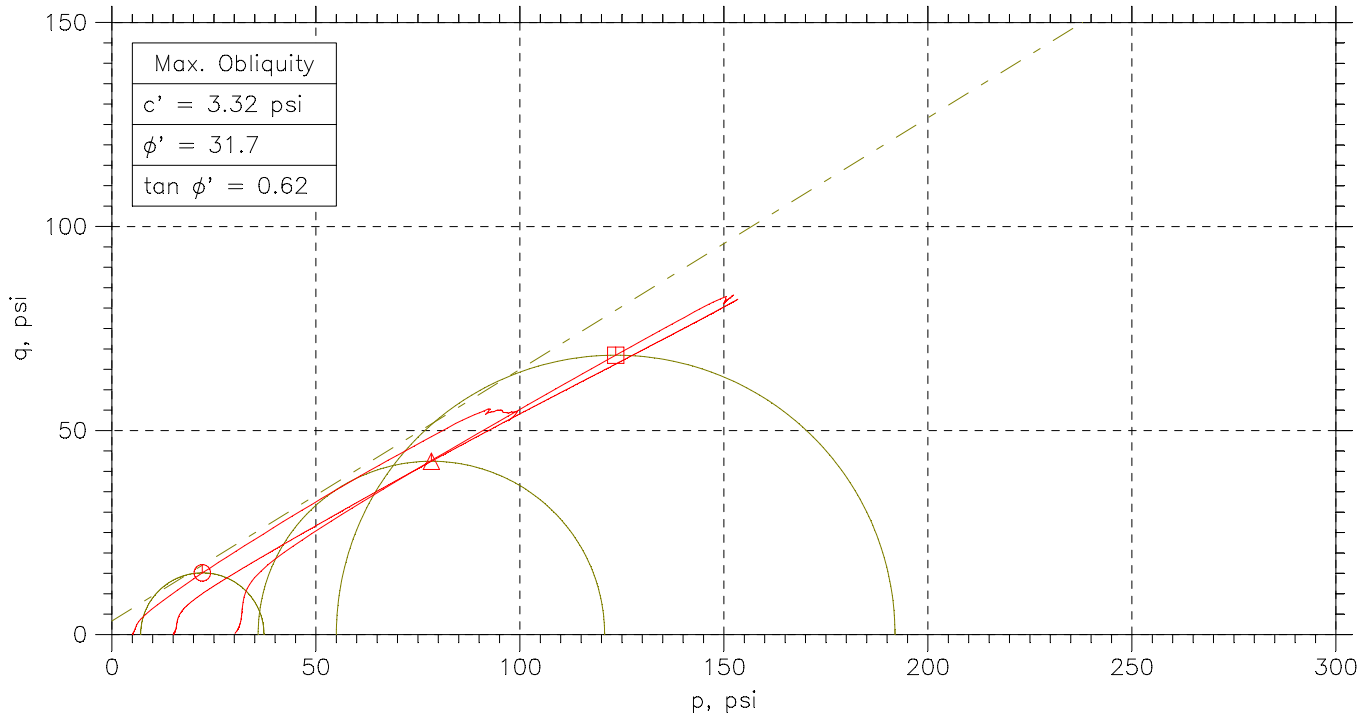
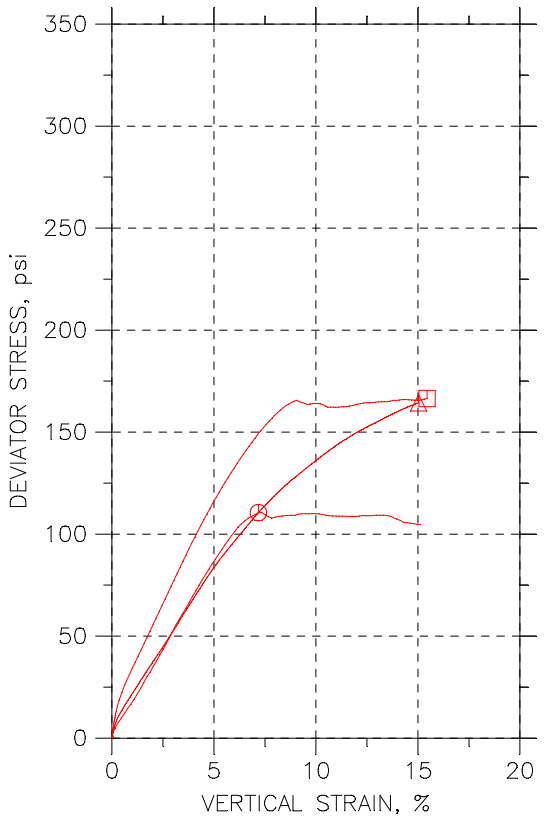
Project: Bull Run Fossil Plant	Location: ---	Project No.: GTX-1494
Boring No.: STN-49P	Sample Type: UD	
Description: Gray Ash		
Remarks: System 1057		

Wed, 28-OCT-2009 14:42:01

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		○	△	□	
Sample No.		ST-7	ST-7	ST-8	
Test No.		8A	8B	8C	
Depth		36.2-36.8	37.4-38.0	39.4-40.0	
Initial	Diameter, in	2.805	2.795	2.823	
	Height, in	6.161	5.78	5.76	
	Water Content, %	37.5	25.6	32.1	
	Dry Density, pcf	76.11	81.83	78.72	
	Saturation, %	83.3	65.3	76.0	
	Void Ratio	1.21	1.06	1.14	
Before Shear	Water Content, %	36.7	25.8	32.6	
	Dry Density, pcf	84.64	99.42	89.6	
	Saturation*, %	100.0	100.0	100.0	
	Void Ratio	0.991	0.695	0.881	
	Back Press., psi	79.85	100.9	62.36	
Ver. Eff. Cons. Stress, psi		4.983	14.98	29.91	
Shear Strength, psi		55.26	82.16	83.22	
Strain at Failure, %		7.18	15	15.5	
Strain Rate, %/min		0.07	0.07	0.07	
B-Value		0.95	0.95	0.95	
Estimated Specific Gravity		2.7	2.7	2.7	
Liquid Limit		---	---	---	
Plastic Limit		---	---	---	

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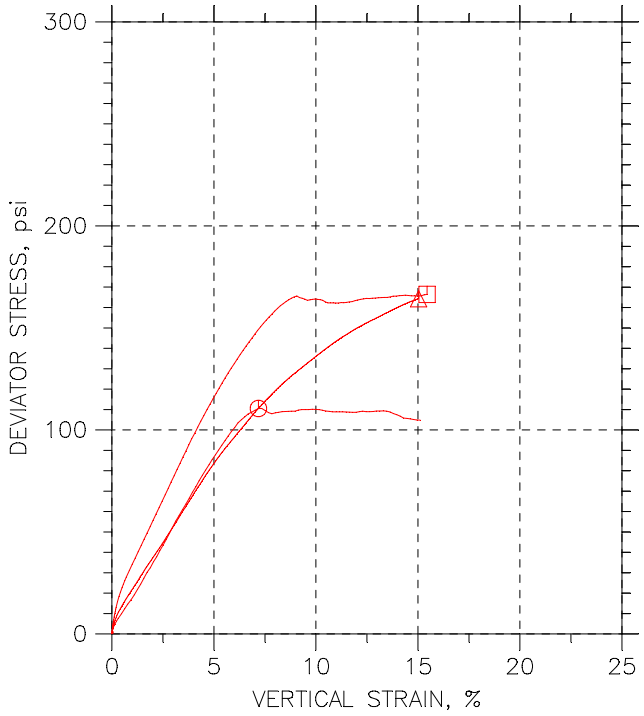
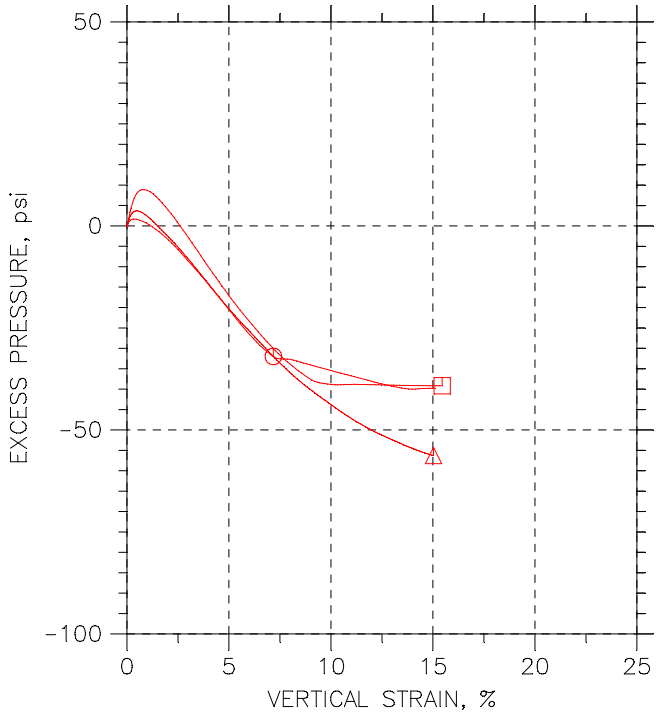
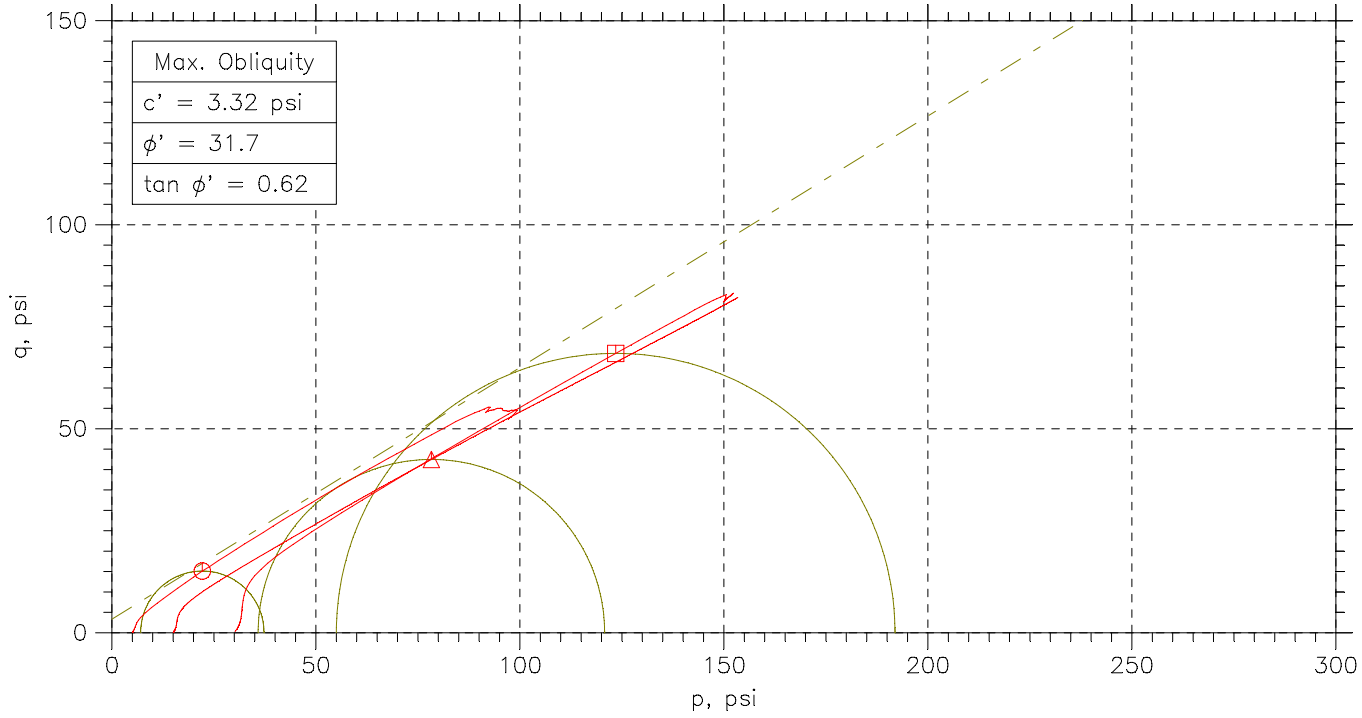
Project: Bull Run Fossil Plant
Location: ---
Project No.: GTX-1494
Boring No.: STN-34
Sample Type: UD
Description: Gray Ash
Remarks: System 1062

Wed, 28-OCT-2009 14:55:58

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
○	ST-7	8A	36.2-36.8	MM	10/20/09	CA		1494-CU-8A.dat
△	ST-7	8B	37.4-38.0	MM	10/20/09	GT		1494-CU-8B.dat
□	ST-8	8C	39.4-40.0	MM	10/20/09	GT		1494-CU-8C.dat

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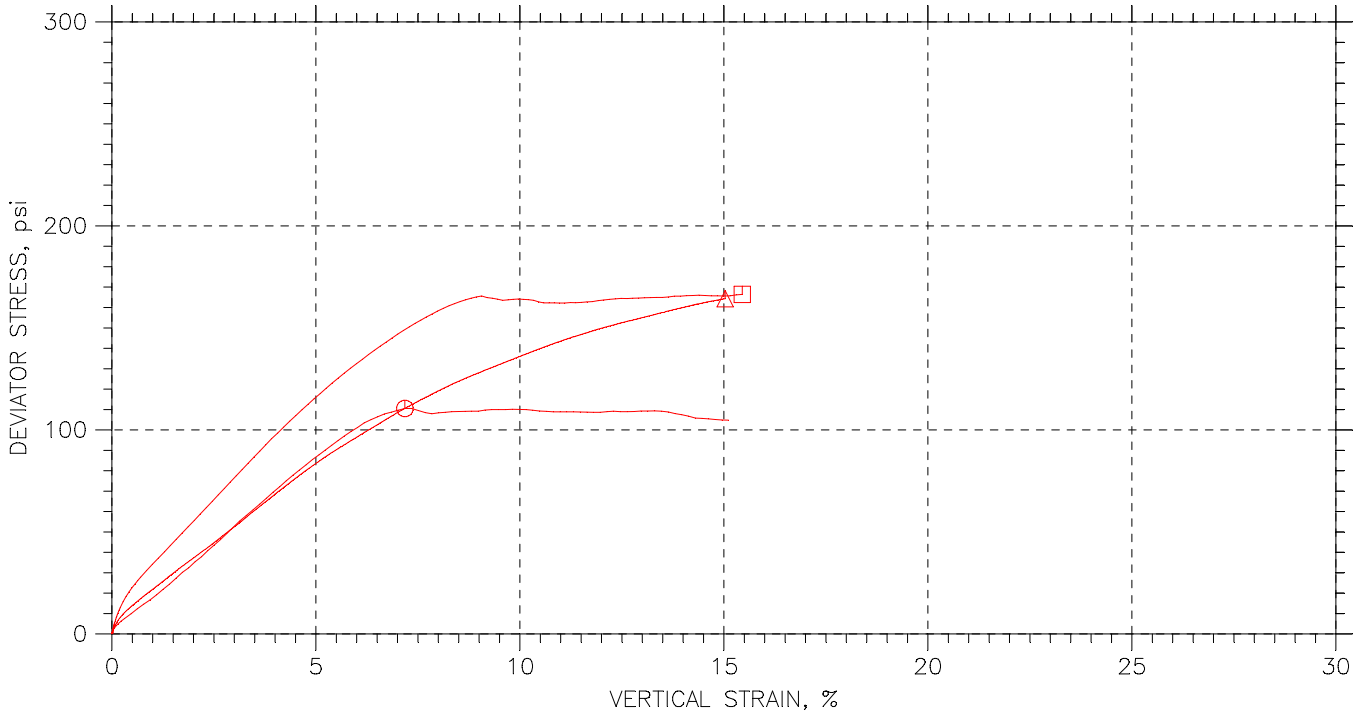
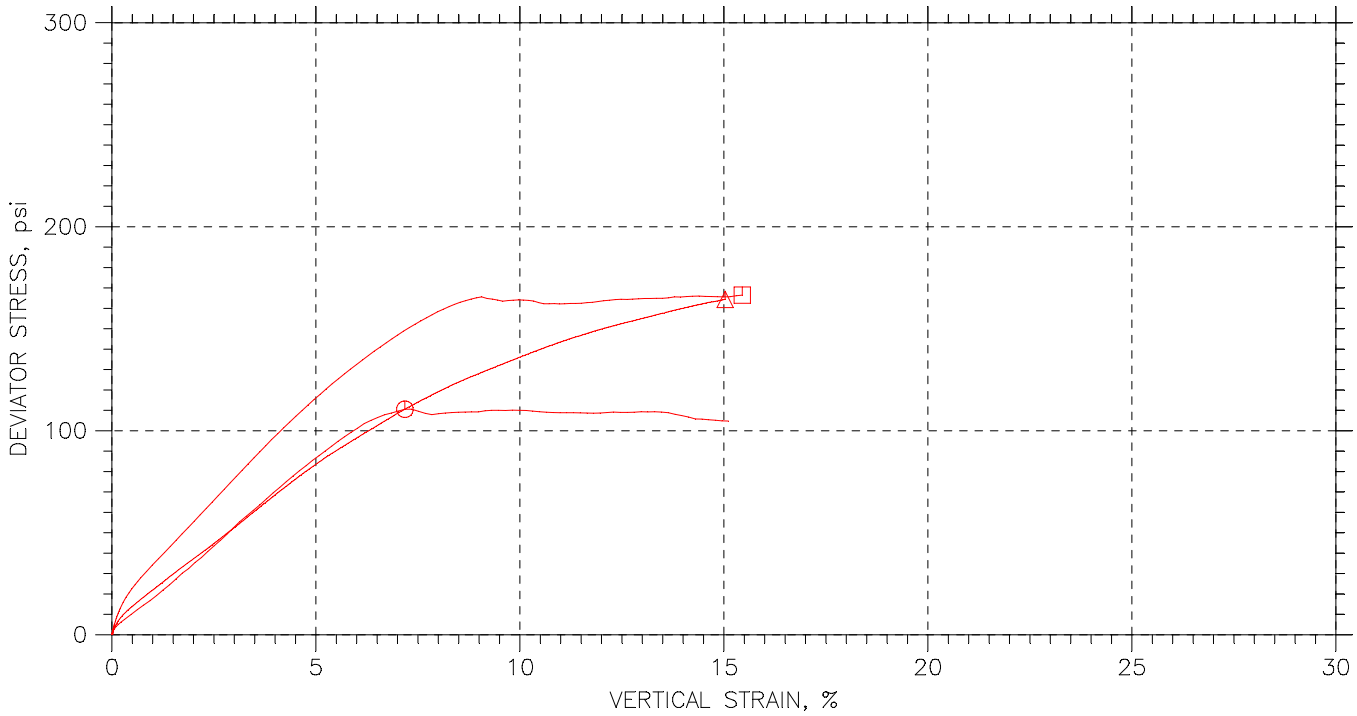
Project: Bull Run Fossil Plant	Location: ---	Project No.: GTX-1494
Boring No.: STN-34	Sample Type: UD	
Description: Gray Ash		
Remarks: System 1062		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
○	ST-7	8A	36.2-36.8	MM	10/20/09	CA		1494-CU-8A.dat
△	ST-7	8B	37.4-38.0	MM	10/20/09	GT		1494-CU-8B.dat
□	ST-8	8C	39.4-40.0	MM	10/20/09	GT		1494-CU-8C.dat

GeoTesting express
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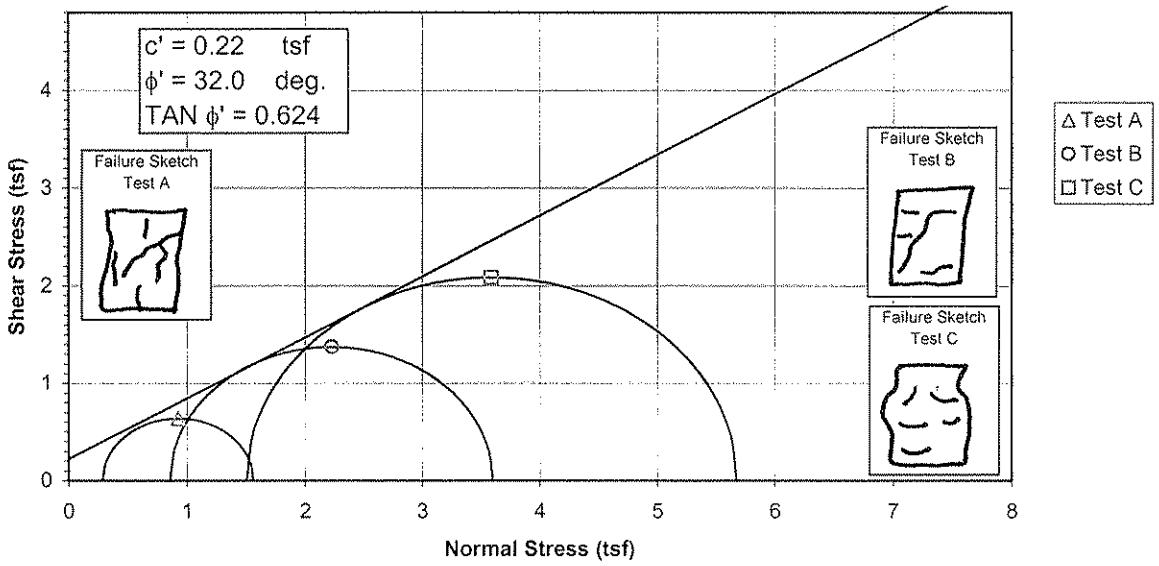
Project: Bull Run Fossil Plant	Location: ---	Project No.: GTX-1494
Boring No.: STN-34	Sample Type: UD	
Description: Gray Ash		
Remarks: System 1062		

Wed, 28-OCT-2009 14:56:01

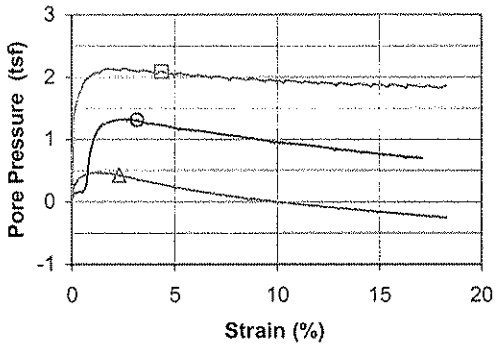
EM 1110-2-1906
Appendix X
30 Nov. 70

Failure Criterion: Maximum Effective Principal Stress Ratio

Effective Strength Envelope



Induced Pore Pressure vs. Strain



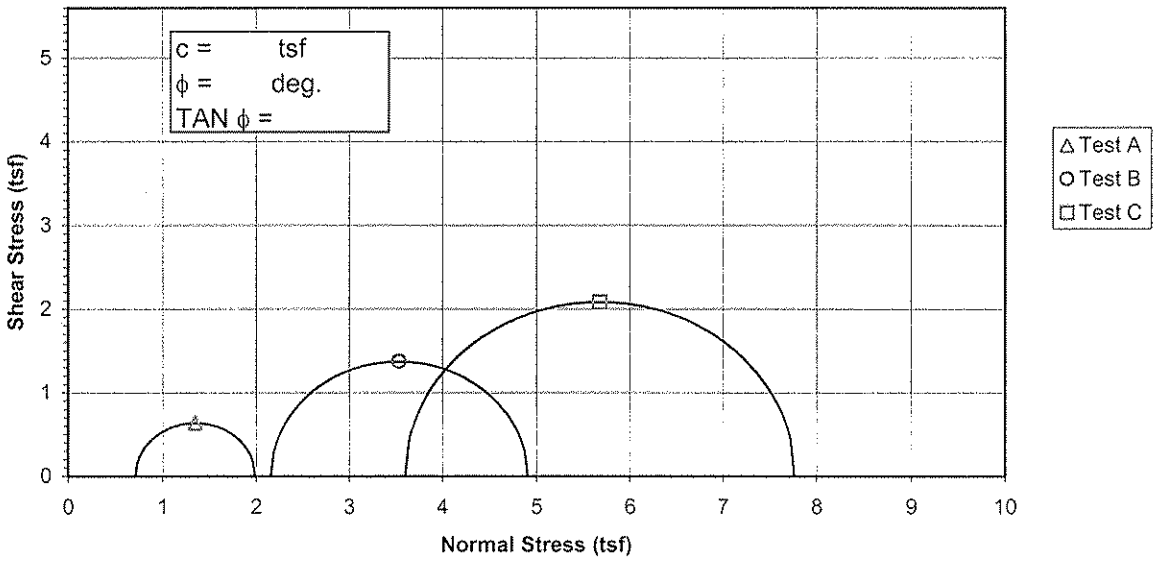
Specimen No.			A	B	C	
Initial Data	Water content %	W_o	31.1	19.9	20.3	
	Dry Density PCF	γ_{d_o}	96.8	107.6	106.1	
	Saturation %	S_o	111.5	93.2	91.6	
	Void Ratio	e_o	0.761	0.584	0.606	
After Shear	Water content %	W_f	22.7	17.9	19.3	
	Dry Density PCF	γ_{d_f}	105.2	114.4	111.7	
	Saturation %	S_f	100.0	100.0	100.0	
	Void Ratio	e_f	0.620	0.490	0.526	
	Final Back Pressure TSF	u_c	5.76	4.32	2.88	
Minor Principal Stress TSF @ failure		$\sigma_3'f$	0.29	0.86	1.50	
Maximum Deviator Stress (tsf) @ failure		$(\sigma_1'-\sigma_3')_{max}$	1.27	2.75	4.16	
Time to $(\sigma 1'-\sigma 3')$max min.		t_f	133.5	172.5	60.8	
Ultimate Deviator Stress, t/sq ft		$(\sigma 1'-\sigma 3')_{ult}$	n/a	n/a	n/a	
Initial Diameter, in.		D_o	2.882	2.884	2.887	
Initial Height, in.		H_o	6.026	5.973	6.014	

Controlled - Strain Test					
Description of Specimens	Lean Clay (CL), brown, moist, firm				
			Type of Specimen	Undisturbed	Type of test R
LL	PL	PI	Gs 2.73	Project	Bull Run Fossil Plant (TVA)
Remarks:					
			Boring No.	STN-10	Sample No. 2
			Depth Elev.	30.5'-31.0', 33.8'-34.3', 37.1'-37.6'	
			Laboratory	Stantec	Date 10-9-09
			TRIAXIAL COMPRESSION TEST REPORT		

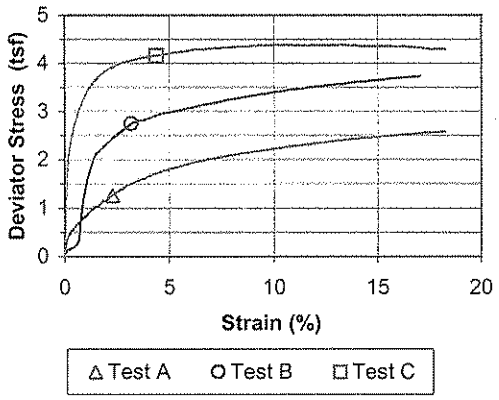
EM 1110-2-1906
Appendix X
30 Nov. 70

Failure Criterion: Maximum Effective Principal Stress Ratio

Total Strength Envelope



Deviator Stress vs. Strain



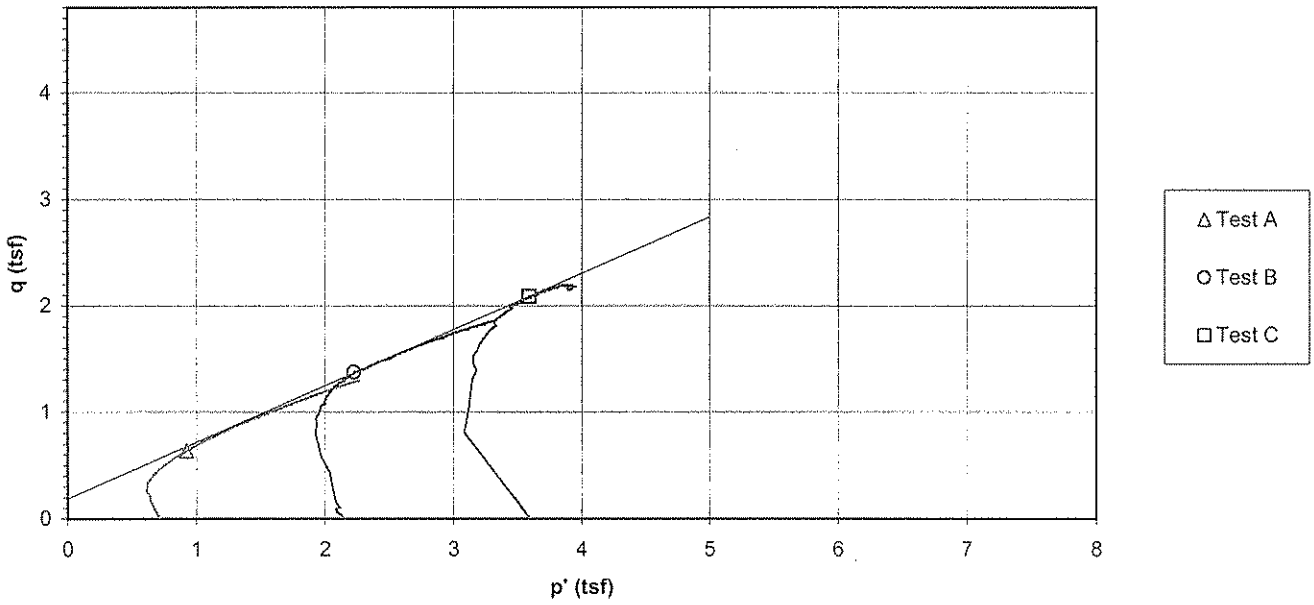
Specimen No.			A	B	C	
Initial Data	Water content %	W_o	31.1	19.9	20.3	
	Dry Density PCF	γ_{d_o}	96.8	107.6	106.1	
	Saturation %	S_o	111.5	93.2	91.6	
	Void Ratio	e_o	0.761	0.584	0.606	
After Shear	Water content %	W_f	22.7	17.9	19.3	
	Dry Density PCF	γ_{d_f}	105.2	114.4	111.7	
	Saturation %	S_f	100.0	100.0	100.0	
	Void Ratio	e_f	0.620	0.490	0.526	
	Final Back Pressure TSF	u_c	5.76	4.32	2.88	
Minor Principal Stress TSF		σ_3	0.72	2.16	3.60	
Maximum Deviator Stress (tsf) @ failure		$(\sigma_1-\sigma_3)_{max}$	1.27	2.75	4.16	
Time to $(\sigma_1-\sigma_3)_{Max.}$ min.		t_f	133.5	172.5	60.8	
Ultimate Deviator Stress, t/sq ft		$(\sigma_1-\sigma_3)_{ult}$	n/a	n/a	n/a	
Initial Diameter, in.		D_o	2.882	2.884	2.887	
Initial Height, in.		H_o	6.026	5.973	6.014	

Controlled - Strain Test					
Description of Specimens	Lean Clay (CL), brown, moist, firm				
			Type of Specimen	Undisturbed	Type of test R
LL	PL	PI	Gs 2.73	Project	Bull Run Fossil Plant (TVA)
Remarks:					
			Boring No.	STN-10	Sample No. 2
			Depth Elev.	30.5'-31.0', 33.8'-34.3', 37.1'-37.6'	
			Laboratory	Stantec	Date 10-9-09
			TRIAXIAL COMPRESSION TEST REPORT		

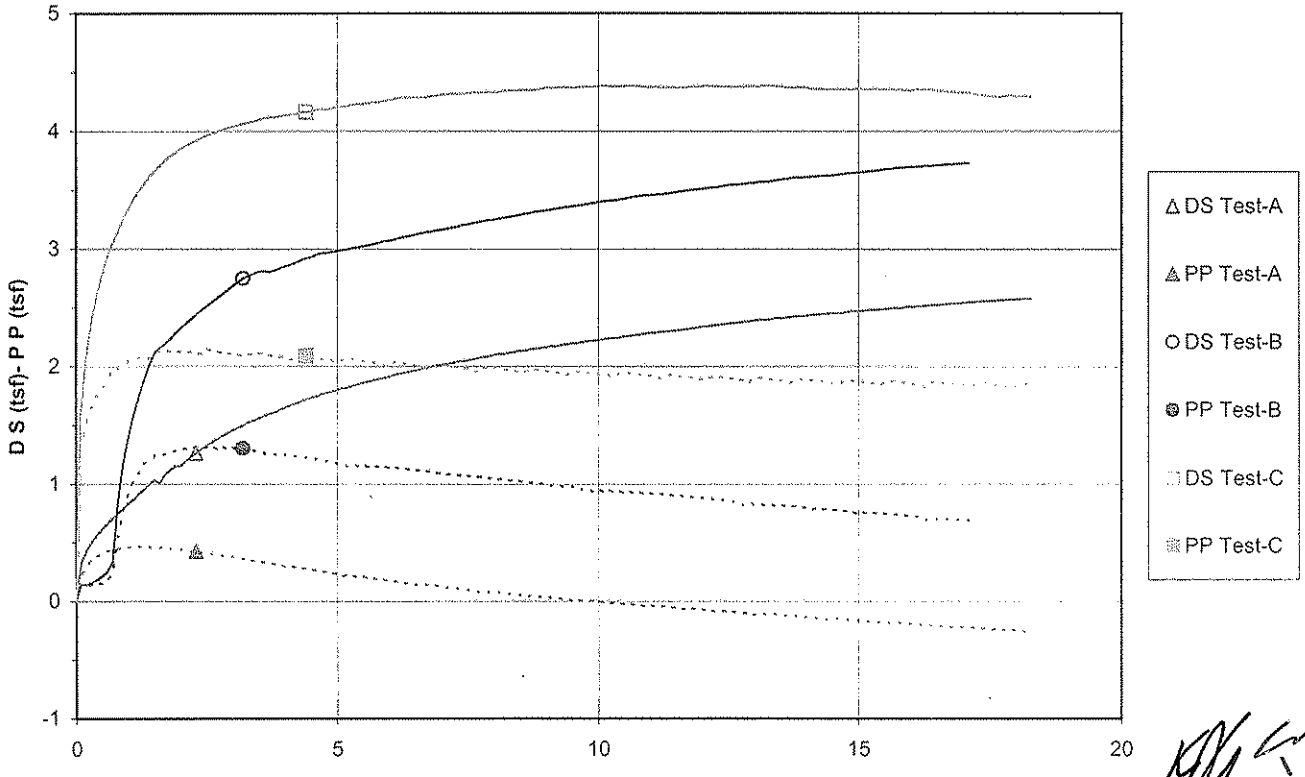
Consolidated Undrained Triaxial Test
EM 1110-2-1906 Appendix X

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Sample ID	STN-10, 30.5'-31.0' & STN-10, 33.8'-34.3' & STN-10, 37.1'-37.6'	Test Number	2
Failure Criterion:	Maximum Effective Principal Stress Ratio	ϕ' = 32.0 deg.	c' = 0.22 tsf

p' vs. q Plot



Deviator Stress and Induced Pore Pressure vs. Axial Strain



Consolidated Undrained Triaxial Test

ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN-10, 30.5'-31.0'	Test Number	CU-2A
Visual Description	Lean Clay (CL), brown, moist, firm	Prepared By	CM
Undisturbed	Source STN-10, 30.5'-32.5'	Date	7-27-2009

Specific Gravity 2.73 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in^3)		Specimen	
Top	2.880	1	6.028	Sample	39.2806 (V_o)	Wet Weight (g)	1308.70
Middle	2.883	2	6.015	Solids	22.3163 (VS_o)	Dry Weight (g)	998.42
Bottom	2.880	3	6.033	Water	18.9333 (Vw_o)	Wet Unit Weight (pcf)	126.9
Avg.	2.8810 (D_o)	4	6.028	Voids	16.9643 (Vv_o)	Dry Unit Weight (pcf)	96.8
Area (in^2)	6.5189 (A_o)	Avg. (H_o)	6.0256	Degree of Saturation (%)	111.6 (S_o)		
Moisture Content (%)	31.1	Final Trimmings		Void Ratio	0.760		

Saturation

Set Up & Saturated: Wet xx Dry Set up By KDG

Back Pressure Saturated to: 80 (psi) Final Pore Pressure Parameter B 0.96 Date 10-1-09

Panel Board Number B

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.1417	Initial	16.09 (in.)	Initial	11.44 (in.)	Specimen Height (in.)	6.0213 (H_s)
Final	0.146	Final	14.18 (in.)	Final	8.87 (in.)	Area (in^2) Method A	6.5096 (A_s)
Change	-0.0043 (ΔH_o)	Change	-1.91 (in.)	Change	-2.57 (in.)	Specimen Volume (in^3)	39.20 (Vs)

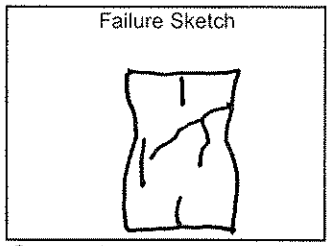
Consolidation

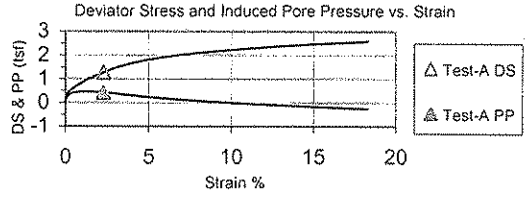
Height Readings (in.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.146	Initial	1.40 (in.)	Initial	17.73 (in.)	Chamber	90
Final	0.1543	Final	10.11 (in.)	Final	9.03 (in.)	Back	80
Change	-0.0083 (ΔH_c)	Change	-8.71 (in.)	Change	-8.70 (in.)	Lateral	10 (σ_3)
Height (in.)	6.0130 (H_c)			Volume (in^3)	36.1441 (V_c)		
Area (in^3) Method B	6.0110 (A_c)			Volume - Water (in^3)	13.8277 (VWc)	t_{50} (min.)	71
Diameter (in.)	2.7665 (D_c)			Water Content (%)	22.7		
Dry Density (pcf)	105.2			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.620

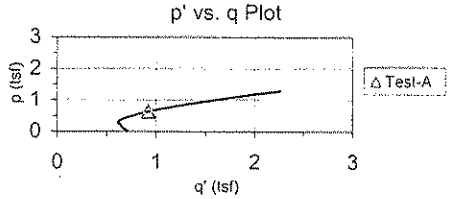
After Test

Final Measurements		Final Moisture Content		Stresses (membrane corrected) at Failure (psi)	
Maximum Diameter	3.221 (in.)	Wet Weight (g)	1225.03	Corrected Deviator	1.27 σ_d (tsf)
Wet weight (g)	1225.03 (WWf)	Dry Weight (g)	998.42	Major Principal	1.56 $\sigma_1'_f$ (tsf)
Corrected Diameter	3.197 (in.)	Tare Weight (g)	0.00	Minor Principal	0.29 $\sigma_3'_f$ (tsf)
				Rate of Strain (% / min.)	0.017
Youngs Modulus for Membrane (psi)	200			Axial Strain at Failure (%)	2.30
Membrane Thickness (in.)	0.012			Failure Criterion:	Maximum Effective Principal Stress Ratio

Failure Sketch







Comments:

Consolidated Undrained Triaxial Test

ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN-10, 33.8'-34.3'	Test Number	CU-2B
Visual Description	Lean Clay (CL), brown, moist, firm	Prepared By	CSM
Undisturbed	Source STN-10, 32.5'-34.5'	Date	7-20-2009

Specific Gravity 2.73 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in3)		Specimen	
Top	2.884	1	5.945	Sample	39.0351 (V_o)	Wet Weight (g)	1321.40
Middle	2.881	2	6.006	Solids	24.6275 (VS_o)	Dry Weight (g)	1101.82
Bottom	2.889	3	5.997	Water	13.3987 (Vw_o)	Wet Unit Weight (pcf)	129.0
Avg.	2.8847 (D_o)	4	5.945	Voids	14.4076 (Vv_o)	Dry Unit Weight (pcf)	107.5
Area (in^2)	6.5355 (A_o)	Avg. (H_o)	5.9728	Degree of Saturation (%)	93.0 (S_o)		
Moisture Content (%)	19.9	Final Trimmings		Void Ratio	0.585		

Saturation

Set Up & Saturated: Wet xx Dry Set up By KDG

Back Pressure Saturated to: 60 (psi) Final Pore Pressure Parameter B 0.96 Date 10-1-09

Panel Board Number F

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.1223	Initial	15.87 (in.)	Initial	12 (in.)	Specimen Height (in.)	5.9689 (H_s)
Final	0.1262	Final	15.63 (in.)	Final	8.78 (in.)	Area (in^2) Method A	6.5270 (A_s)
Change	-0.0039 (ΔH_o)	Change	-0.24 (in.)	Change	-3.22 (in.)	Specimen Volume (in^3)	38.96 (V_s)

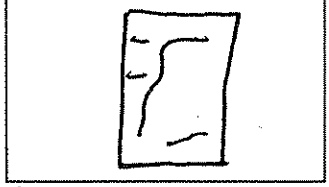
Consolidation

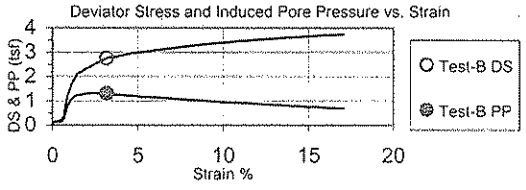
Height Readings (in.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.1262	Initial	1.33 (in.)	Initial	17.58 (in.)	Chamber	90
Final	0.1327	Final	16.69 (in.)	Final	2.86 (in.)	Back	60
Change	-0.0065 (ΔH_c)	Change	-15.36 (in.)	Change	-14.72 (in.)	Lateral	30 (σ_3)
Height (in.)	5.9624 (H_c)			Volume (in^3)	36.6923 (V_c)		
Area (in^3) Method B	6.1540 (A_c)			Volume - Water (in^3)	12.0648 (VWc)	D_{50} (min.)	41
Diameter (in.)	2.7992 (D_c)			Water Content (%)	17.9		
Dry Density (pcf)	114.4			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.490

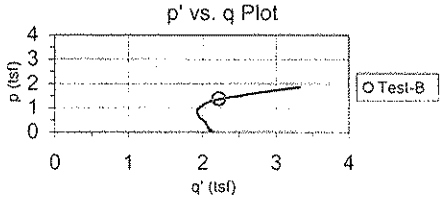
After Test

Final Measurements		Final Moisture Content		Stresses (membrane corrected) at Failure (psi)	
Maximum Diameter	3.227 (in.)	Wet Weight (g)	1299.54	Corrected Deviator	2.75 σ_d (tsf)
Wet weight (g)	1299.54 (WWf)	Dry Weight (g)	1101.82	Major Principal	3.60 $\sigma_1'_f$ (tsf)
Corrected Diameter	3.203 (in.)	Tare Weight (g)	0.00	Minor Principal	0.86 $\sigma_3'_f$ (tsf)
				Rate of Strain (% / min.)	0.020
Youngs Modulus for Membrane (psi)	200			Axial Strain at Failure (%)	3.20
Membrane Thickness (in.)	0.012			Failure Criterion:	Maximum Effective Principal Stress Ratio

Failure Sketch







Comments:

Consolidated Undrained Triaxial Test

ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN-10, 37.1'-37.6'	Test Number	CU-2C
Visual Description	Lean Clay (CL), brown, moist, firm	Prepared By	CM
Undisturbed Source	STN-10, 36.5'-38.5'	Date	7-20-2009

Specific Gravity 2.73 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in³)		Specimen	
Top	2.888	1	6.010	Sample	39.3873 (V_o)	Wet Weight (g)	1320.1
Middle	2.886	2	6.019	Solids	24.5208 (VS_o)	Dry Weight (g)	1097.05
Bottom	2.889	3	6.018	Water	13.6108 (Vw_o)	Wet Unit Weight (pcf)	127.7
Avg.	2.8877 (D_o)	4	6.010	Voids	14.8665 (Vv_o)	Dry Unit Weight (pcf)	106.1
Area (in²)	6.5491 (A_o)	Avg. (H_o)	6.0141	Degree of Saturation (%)	91.6 (S_o)		
Moisture Content (%)	20.3	Final Trimmings		Void Ratio	0.606		

Saturation

Set Up & Saturated: Wet xx Dry Set up By KDG

Back Pressure Saturated to: 40 (psi) Final Pore Pressure Parameter B 0.95 Date 10-1-09

Panel Board Number A

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.1469	Initial	16.43 (in.)	Initial	11.65 (in.)	Specimen Height (in.)	5.9852 (H_s)
Final	0.1758	Final	12.09 (in.)	Final	9.28 (in.)	Area (in²) Method A	6.4859 (A_s)
Change	-0.0289 (ΔH_o)	Change	-4.34 (in.)	Change	-2.37 (in.)	Specimen Volume (in³)	38.82 (V_s)

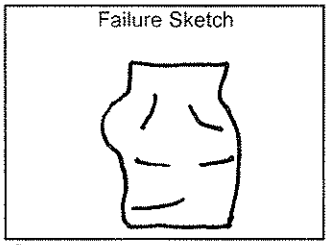
Consolidation

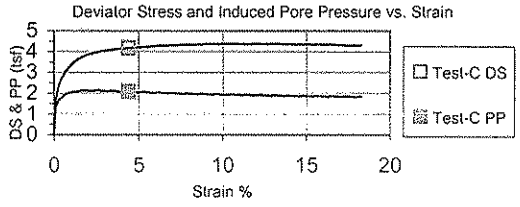
Height Readings (in.)			Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.1758		Initial	1.20 (in.)	Initial	17.12 (in.)	Chamber	90
Final	0.1999		Final	7.61 (in.)	Final	10.47 (in.)	Back	40
Change	-0.0241	(ΔH_c)	Change	-6.41 (in.)	Change	-6.65 (in.)	Lateral	50 (σ_3)
Height (in.)	5.9611	(H_c)			Volume (in³)	37.4262 (V_c)		
Area (in³) Method B	6.2784	(A_c)			Volume - Water (in³)	12.9054 (VWc)	D_{50} (min.)	5.5
Diameter (in.)	2.8273	(D_c)			Water Content (%)	19.3		
Dry Density (pcf)	111.7				Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.526

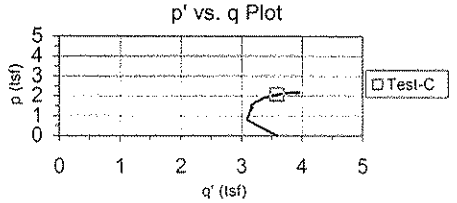
After Test

Final Measurements			Final Moisture Content		Stresses (membrane corrected) at Failure (psi)	
Maximum Diameter	3.396 (in.)		Wet Weight (g)	1308.54	Corrected Deviator	4.16 σ_d (tsf)
Wet weight (g)	1308.54 (WWf)		Dry Weight (g)	1097.05	Major Principal	5.68 $\sigma_1'_f$ (tsf)
Corrected Diameter	3.372 (in.)		Tare Weight (g)	0.00	Minor Principal	1.50 $\sigma_3'_f$ (tsf)
					Rate of Strain (% / min.)	0.076
Youngs Modulus for Membrane (psi)	200				Axial Strain at Failure (%)	4.40
Membrane Thickness (in.)	0.012				Failure Criterion:	Maximum Effective Principal Stress Ratio

Failure Sketch





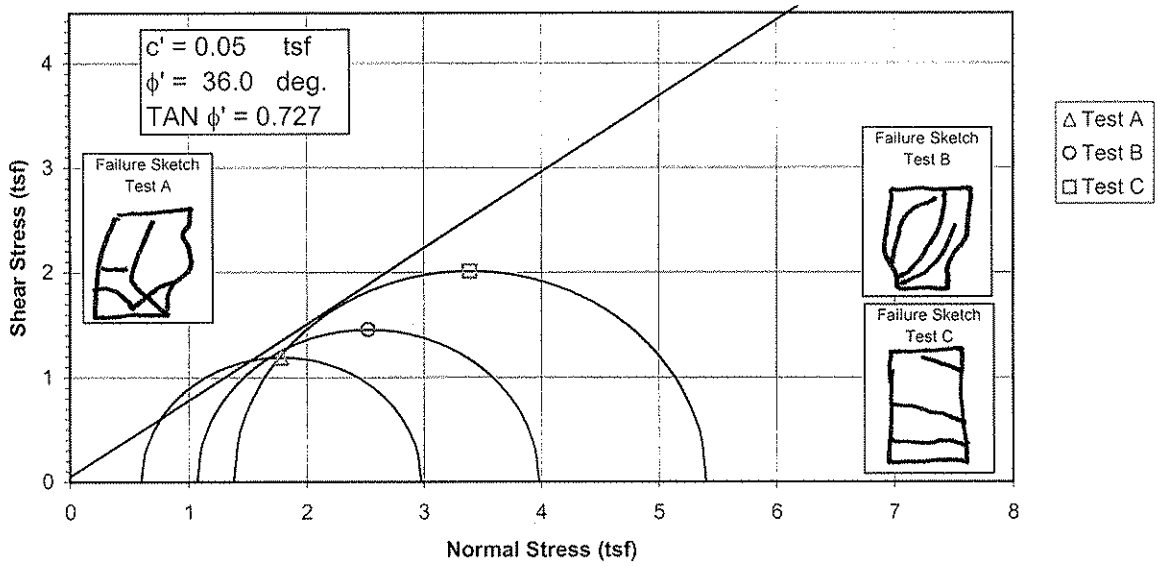


Comments:

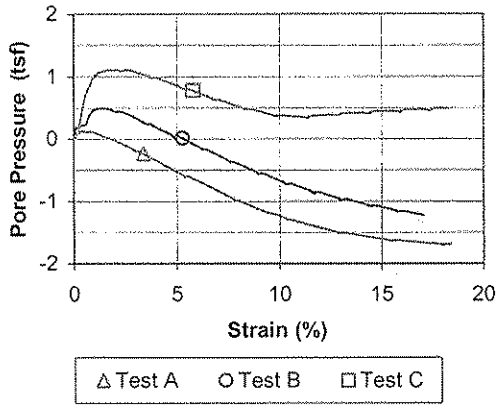
EM 1110-2-1906
Appendix X
30 Nov. 70

Failure Criterion: Maximum Effective Principal Stress Ratio

Effective Strength Envelope



Induced Pore Pressure vs. Strain



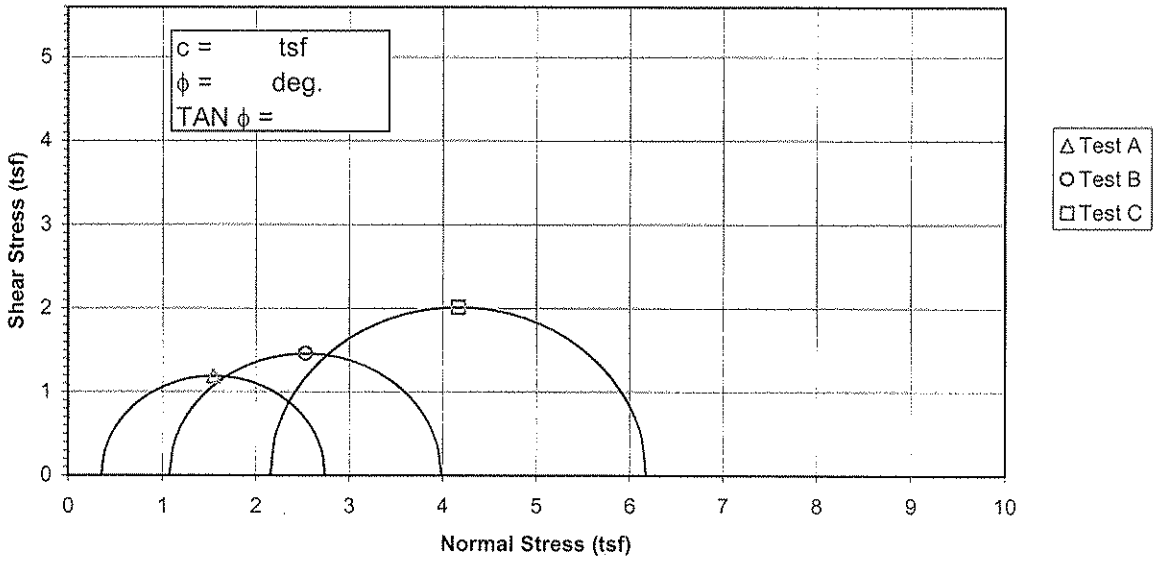
Specimen No.			A	B	C
Initial Data	Water content %	W_o	45.7	36.2	39.0
	Dry Density PCF	γ_{d_o}	69.4	76.9	76.6
	Saturation %	S_o	102.1	101.0	107.8
	Void Ratio	e_o	0.989	0.793	0.801
After Shear	Water content %	W_f	42.6	32.4	34.1
	Dry Density PCF	γ_{d_f}	71.0	80.4	78.7
	Saturation %	S_f	100.0	100.0	100.0
	Void Ratio	e_f	0.942	0.716	0.753
	Final Back Pressure TSF	u_c	6.12	5.40	4.32
Minor Principal Stress TSF @ failure		$\sigma_3'f$	0.60	1.07	1.38
Maximum Deviator Stress (tsf) @ failure		$(\sigma_1'-\sigma_3')_{max}$	2.38	2.91	4.02
Time to $(\sigma 1'-\sigma 3')$max min.		t_f	14.9	40.5	37.2
Ultimate Deviator Stress, t/sq ft		$(\sigma 1'-\sigma 3')_{ult}$	n/a	n/a	n/a
Initial Diameter, in.		D_o	2.838	2.877	2.864
Initial Height, in.		H_o	5.975	6.014	6.002

Controlled - Strain Test					
Description of Specimens	Sandy Silt (ML), gray, moist, firm, fly ash				
			Type of Specimen	Undisturbed	Type of test R
LL	PL	PI	Gs 2.21	Project	Bull Run Fossil Plant (TVA)
Remarks:	Dried in 60° oven.				
			Boring No.	STN-10, STN-20	Sample No. 1
			Depth Elev.	26.5'-27.0', 24.0'-24.5', 29.0'-29.5'	
			Laboratory	Stantec	Date 10-9-09
			TRIAXIAL COMPRESSION TEST REPORT		

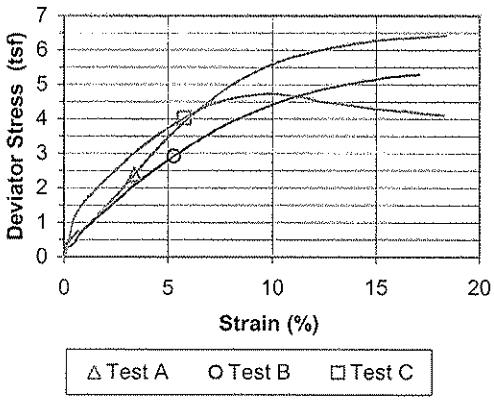
EM 1110-2-1906
Appendix X
30 Nov. 70

Failure Criterion: Maximum Effective Principal Stress Ratio

Total Strength Envelope



Deviator Stress vs. Strain



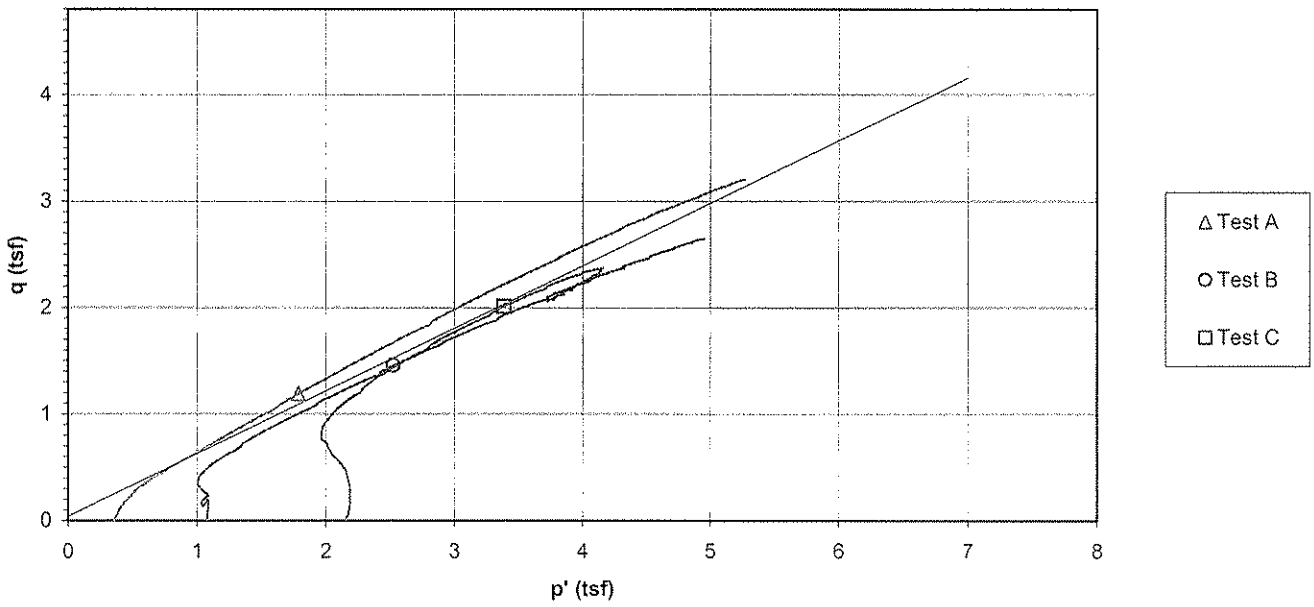
Specimen No.			A	B	C	
Initial Data	Water content %	W_o	45.7	36.2	39.0	
	Dry Density PCF	γ_{d_o}	69.4	76.9	76.6	
	Saturation %	S_o	102.1	101.0	107.8	
	Void Ratio	e_o	0.989	0.793	0.801	
After Shear	Water content %	W_f	42.6	32.4	34.1	
	Dry Density PCF	γ_{d_f}	71.0	80.4	78.7	
	Saturation %	S_f	100.0	100.0	100.0	
	Void Ratio	e_f	0.942	0.716	0.753	
	Final Back Pressure TSF	u_c	6.12	5.40	4.32	
Minor Principal Stress TSF		σ_3	0.36	1.08	2.16	
Maximum Deviator Stress (tsf) @ failure		$(\sigma_1-\sigma_3)_{max}$	2.38	2.91	4.02	
Time to $(\sigma_1-\sigma_3)_{Max.}$ min.		t_f	14.9	40.5	37.2	
Ultimate Deviator Stress, t/sq ft		$(\sigma_1-\sigma_3)_{ult}$	n/a	n/a	n/a	
Initial Diameter, in.		D_o	2.838	2.877	2.864	
Initial Height, in.		H_o	5.975	6.014	6.002	

Controlled - Strain Test					
Description of Specimens	Sandy Silt (ML), gray, moist, firm, fly ash				
			Type of Specimen	Undisturbed	Type of test R
LL	PL	PI	Gs 2.21	Project	Bull Run Fossil Plant (TVA)
Remarks:	Dried in 60° oven.				
			Boring No.	STN-10, STN-20	Sample No. 1
			Depth Elev.	26.5'-27.0', 24.0'-24.5', 29.0'-29.5'	
			Laboratory	Stantec	Date 10-9-09
			TRIAXIAL COMPRESSION TEST REPORT		

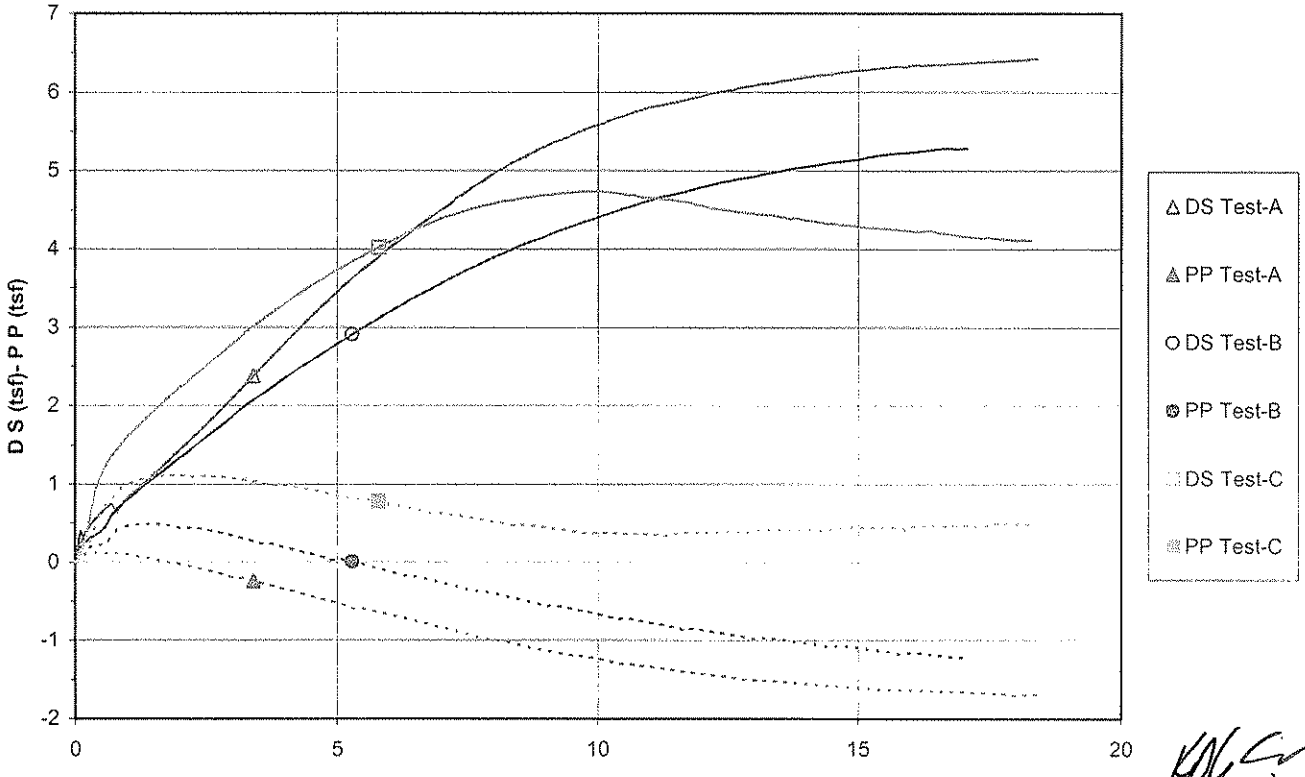
Consolidated Undrained Triaxial Test
EM 1110-2-1906 Appendix X

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Sample ID	STN-10, 26.5'-27.0' & STN-20, 24.0'-24.5' & STN-20, 29.0'-29.5'	Test Number	1
Failure Criterion:	Maximum Effective Principal Stress Ratio	ϕ' = 36.0 deg.	c' = 0.05 tsf

p' vs. q Plot



Deviator Stress and Induced Pore Pressure vs. Axial Strain



Consolidated Undrained Triaxial Test

ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN-10, 26.5'-27.0'	Test Number	CU-1A
Visual Description	Sandy Silt (ML), gray, moist, firm, fly ash	Prepared By	CM
Undisturbed	Source STN-10, 26.5'-28.5'	Date	7-27-2009

Specific Gravity 2.21 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in^3)		Specimen	
Top	2.840	1	5.976	Sample	37.8232 (V_o)	Wet Weight (g)	1002.50
Middle	2.835	2	5.981	Solids	19.0014 (VS_o)	Dry Weight (g)	688.19
Bottom	2.842	3	5.967	Water	19.1794 (Vw_o)	Wet Unit Weight (pcf)	101.0
Avg.	2.8390 (D_o)	4	5.976	Voids	18.8218 (Vv_o)	Dry Unit Weight (pcf)	69.3
Area (in^2)	6.3302 (A_o)	Avg. (H_o)	5.9750	Degree of Saturation (%)	101.9 (S_o)		
Moisture Content (%)	45.7	Final Trimmings		Void Ratio	0.991		

Saturation

Set Up & Saturated: Wet xx Dry

Back Pressure Saturated to: 85 (psi) Final Pore Pressure Parameter B 0.96

Set up By KDG

Date 9-28-09

Panel Board Number B

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.1395	Initial	17.9 (in.)	Initial	12.16 (in.)	Specimen Height (in.)	5.9710 (H_s)
Final	0.1435	Final	13.03 (in.)	Final	9.88 (in.)	Area (in^2) Method A	6.3218 (A_s)
Change	-0.0040 (ΔH_o)	Change	-4.87 (in.)	Change	-2.28 (in.)	Specimen Volume (in^3)	37.75 (Vs)

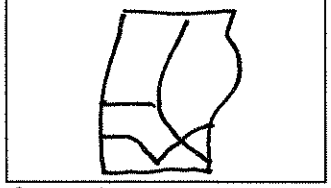
Consolidation

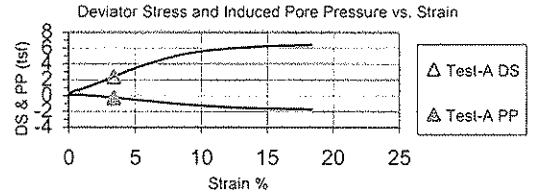
Height Readings (in.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.1435	Initial	1.18 (in.)	Initial	17.73 (in.)	Chamber	90
Final	0.144	Final	2.28 (in.)	Final	16.67 (in.)	Back	85
Change	-0.0005 (ΔH_c)	Change	-1.10 (in.)	Change	-1.06 (in.)	Lateral	5 (σ_3)
Height (in.)	5.9705 (H_c)			Volume (in^3)	36.9074 (V_c)		
Area (in^3) Method B	6.1816 (A_c)			Volume - Water (in^3)	17.9059 (VWc)	t_{50} (min.)	0.063
Diameter (in.)	2.8055 (D_c)			Water Content (%)	42.6		
Dry Density (pcf)	71.0			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.942

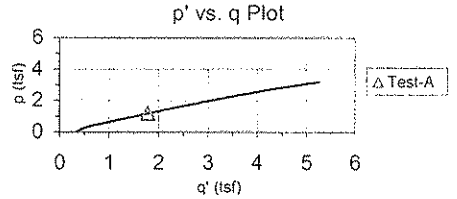
After Test

Final Measurements		Final Moisture Content		Stresses (membrane corrected) at Failure (psi)	
Maximum Diameter	3.302 (in.)	Wet Weight (g)	981.63	Corrected Deviator	2.38 σ_d (tsf)
Wet weight (g)	981.63 (WWf)	Dry Weight (g)	688.19	Major Principal	2.98 $\sigma_1'_f$ (tsf)
Corrected Diameter	3.278 (in.)	Tare Weight (g)	0.00	Minor Principal	0.60 $\sigma_3'_f$ (tsf)
				Rate of Strain (% / min.)	0.237
Youngs Modulus for Membrane (psi)	200			Axial Strain at Failure (%)	3.40
Membrane Thickness (in.)	0.012			Failure Criterion:	Maximum Effective Principal Stress Ratio

Failure Sketch







Comments:

Consolidated Undrained Triaxial Test

ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN-20, 24.0'-24.5'	Test Number	CU-1B
Visual Description	Silt (ML), gray, moist, firm, fly ash	Prepared By	CM
Undisturbed	Source STN-20, 24.0'-26.0'	Date	7-27-2009

Specific Gravity 2.21 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in3)		Specimen	
Top	2.876	1	6.040	Sample	39.0936 (V_o)	Wet Weight (g)	1075.70
Middle	2.877	2	5.989	Solids	21.8025 (VS_o)	Dry Weight (g)	789.63
Bottom	2.878	3	5.987	Water	17.4557 (Vw_o)	Wet Unit Weight (pcf)	104.8
Avg.	2.8770 (D_o)	4	6.040	Voids	17.2911 (Vv_o)	Dry Unit Weight (pcf)	76.9
Area (in^2)	6.5008 (A_o)	Avg. (H_o)	6.0136	Degree of Saturation (%)	101.0 (S_o)		
Moisture Content (%)	36.2	Final Trimmings		Void Ratio	0.793		

Saturation

Set Up & Saturated: Wet xx Dry

Back Pressure Saturated to: 75 (psi) Final Pore Pressure Parameter B 0.98 Set up By KDG Date 9-29-09 Panel Board Number F

Height Readings (in.)		Back Pressure Burette			Chamber Burette				
Initial	0.1213	Initial	16.13	(in.)	Initial	11.35	(in.)	Specimen Height (in.)	6.0011 (H_s)
Final	0.1338	Final	15.23	(in.)	Final	7.99	(in.)	Area (in^2) Method A	6.4738 (A_s)
Change	-0.0125 (ΔH_o)	Change	-0.90	(in.)	Change	-3.36	(in.)	Specimen Volume (in^3)	38.85 (V_s)

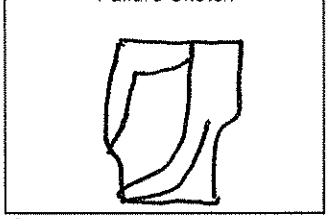
Consolidation

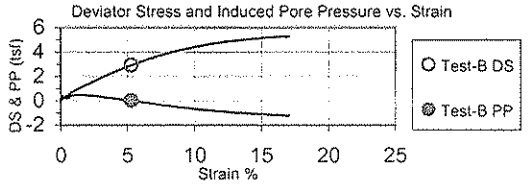
Height Readings (in.)		Back Pressure Burette Readings			Chamber Burette Readings			Pressures (psi)	
Initial	0.1338	Initial	1.72	(in.)	Initial	17.7	(in.)	Chamber	90
Final	0.1365	Final	5.67	(in.)	Final	14.08	(in.)	Back	75
Change	-0.0027 (ΔH_c)	Change	-3.95	(in.)	Change	-3.62	(in.)	Lateral	15 (σ_3)
Height (in.)	5.9984 (H_c)				Volume (in^3)	37.4160 (V_c)			
Area (in^3) Method B	6.2376 (A_c)				Volume - Water (in^3)	15.6135 (VWc)		D_{50} (min.)	0.313
Diameter (in.)	2.8182 (D_c)				Water Content (%)	32.4			
Dry Density (pcf)	80.4				Degree of Saturation (%)	100.0 (S_c)		Void Ratio	0.716

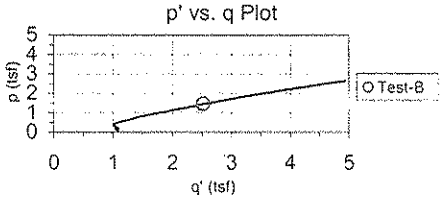
After Test

Final Measurements			Final Moisture Content		Stresses (membrane corrected) at Failure (psi)	
Maximum Diameter	3.23	(in.)	Wet Weight (g)	1045.51	Corrected Deviator	2.91 σ_d (tsf)
Wet weight (g)	1045.51	(WWf)	Dry Weight (g)	789.63	Major Principal	3.98 $\sigma_1'_f$ (tsf)
Corrected Diameter	3.206	(in.)	Tare Weight (g)	0.00	Minor Principal	1.07 $\sigma_3'_f$ (tsf)
					Rate of Strain (% / min.)	0.130
Youngs Modulus for Membrane (psi)	200				Axial Strain at Failure (%)	5.30
Membrane Thickness (in.)	0.012				Failure Criterion:	Maximum Effective Principal Stress Ratio

Failure Sketch







Comments:

Stantec

Consolidated Undrained Triaxial Test
ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN-20, 29.0'-29.5'	Test Number	CU-1C
Visual Description	Silt (ML), gray, moist, firm, fly ash	Prepared By	CM
Undisturbed	Source STN-20, 29.0'-31.0'	Date	7-27-2009

Specific Gravity 2.21 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in^3)		Specimen	
Top	2.856	1	5.985	Sample	38.6490 (V_o)	Wet Weight (g)	1081.3
Middle	2.866	2	6.024	Solids	21.4732 (VS_o)	Dry Weight (g)	777.71
Bottom	2.868	3	6.015	Water	18.5252 (Vw_o)	Wet Unit Weight (pcf)	106.6
Avg.	2.8633 (D_o)	4	5.985	Voids	17.1758 (Vv_o)	Dry Unit Weight (pcf)	76.7
Area (in^2)	6.4392 (A_o)	Avg. (H_o)	6.0021	Degree of Saturation (%)	107.9 (S_o)		
Moisture Content (%)	39.0	Final Trimmings		Void Ratio	0.800		

Saturation

Set Up & Saturated: Wet xx Dry ____ Set up By KDG

Back Pressure Saturated to: 60 (psi) Final Pore Pressure Parameter B 0.96 Date 9-30-09

Panel Board Number A

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.1208	Initial	16.65 (in.)	Initial	11.76 (in.)	Specimen Height (in.)	5.9967 (H_s)
Final	0.1262	Final	15.17 (in.)	Final	8.92 (in.)	Area (in^2) Method A	6.4276 (A_s)
Change	-0.0054 (ΔH_o)	Change	-1.48 (in.)	Change	-2.84 (in.)	Specimen Volume (in^3)	38.54 (V_s)

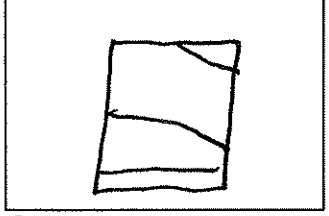
Consolidation

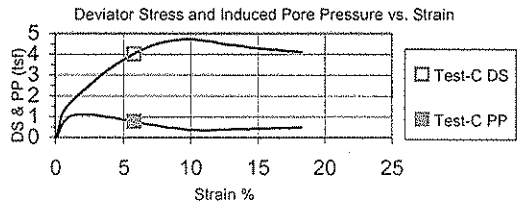
Height Readings (in.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.1262	Initial	1.27 (in.)	Initial	17.75 (in.)	Chamber	90
Final	0.159	Final	6.43 (in.)	Final	12.42 (in.)	Back	60
Change	-0.0328 (ΔH_c)	Change	-5.16 (in.)	Change	-5.33 (in.)	Lateral	30 (σ_3)
Height (in.)	5.9639 (H_c)			Volume (in^3)	37.6485 (V_c)		
Area (in^3) Method B	6.3127 (A_c)			Volume - Water (in^3)	16.1753 (VWc)	D_{50} (min.)	0.15
Diameter (in.)	2.8351 (D_c)			Water Content (%)	34.1		
Dry Density (pcf)	78.7			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.753

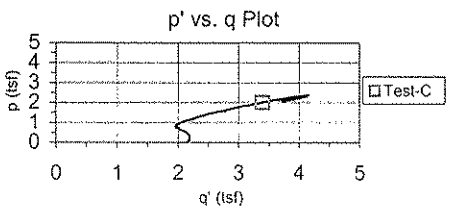
After Test

Final Measurements		Final Moisture Content		Stresses (membrane corrected) at Failure (psi)	
Maximum Diameter	3.119 (in.)	Wet Weight (g)	1042.79	Corrected Deviator	4.02 σ_d (tsf)
Wet weight (g)	1042.79 (WWf)	Dry Weight (g)	777.71	Major Principal	5.40 $\sigma_1'_f$ (tsf)
Corrected Diameter	3.095 (in.)	Tare Weight (g)	0.00	Minor Principal	1.38 $\sigma_3'_f$ (tsf)
				Rate of Strain (% / min.)	0.158
Youngs Modulus for Membrane (psi)	200			Axial Strain at Failure (%)	5.80
Membrane Thickness (in.)	0.012			Failure Criterion:	Maximum Effective Principal Stress Ratio

Failure Sketch





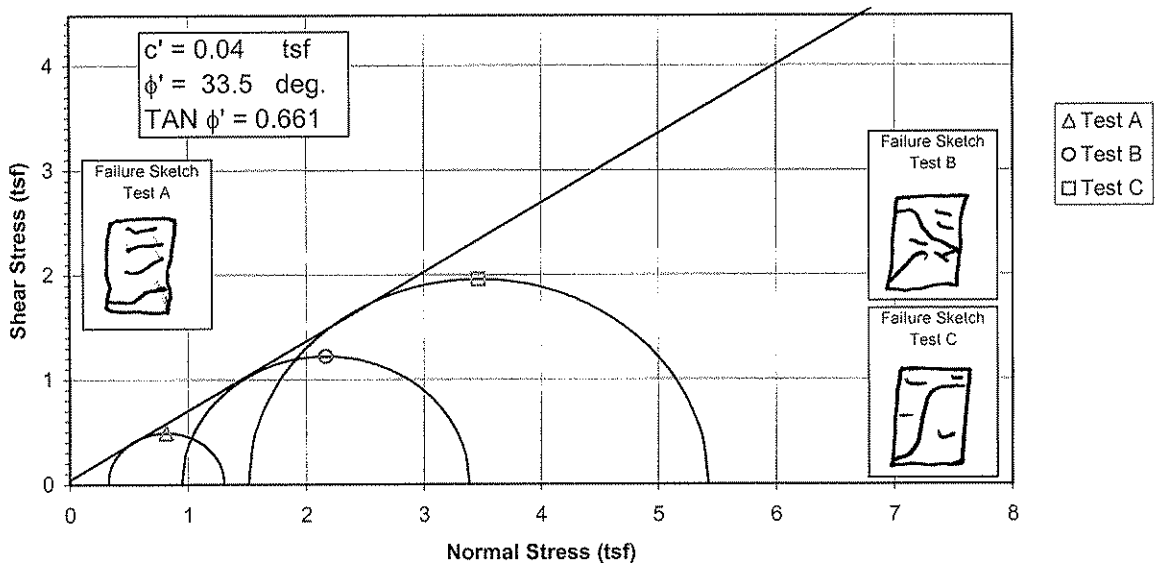


Comments: ____

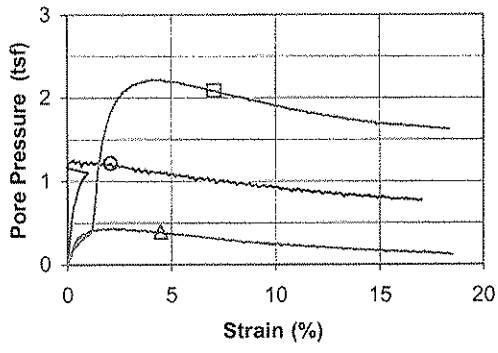
EM 1110-2-1906
Appendix X
30 Nov. 70

Failure Criterion: Maximum Effective Principal Stress Ratio

Effective Strength Envelope



Induced Pore Pressure vs. Strain

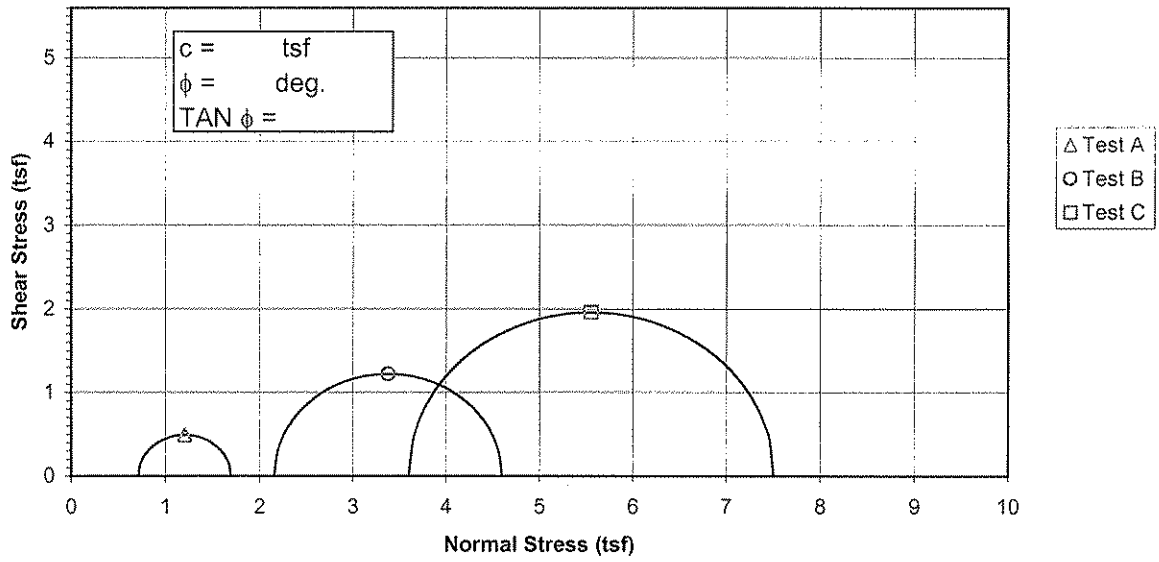


Specimen No.			A	B	C	
Initial Data	Water content %	W_o	27.8	23.3	22.7	
	Dry Density PCF	γ_{d_o}	96.0	102.2	102.4	
	Saturation %	S_o	99.0	96.3	94.5	
	Void Ratio	e_o	0.762	0.656	0.652	
After Shear	Water content %	W_f	23.8	22.3	20.8	
	Dry Density PCF	γ_{d_f}	102.9	105.5	108.1	
	Saturation %	S_f	100.0	100.0	100.0	
	Void Ratio	e_f	0.644	0.603	0.565	
	Final Back Pressure TSF	u_c	5.76	4.32	2.88	
Minor Principal Stress TSF @ failure		$\sigma_3'f$	0.33	0.95	1.51	
Maximum Deviator Stress (tsf) @ failure		$(\sigma_1'-\sigma_3')_{max}$	0.98	2.44	3.91	
Time to $(\sigma 1'-\sigma 3')max$ min.		t_f	240.5	299.4	452.6	
Ultimate Deviator Stress, t/sq ft		$(\sigma 1'-\sigma 3')_{ult}$	n/a	n/a	n/a	
Initial Diameter, in.		D_o	2.880	2.890	2.896	
Initial Height, in.		H_o	5.976	6.016	6.005	

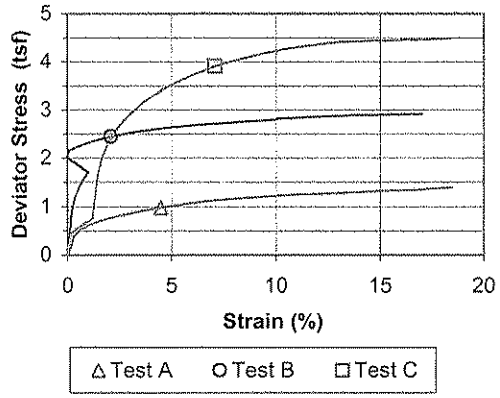
Controlled - Strain Test					
Description of Specimens	Lean Clay (CL), black, moist, firm				
			Type of Specimen	Undisturbed	Type of test $\bar{R}$
LL	PL	PI	Gs 2.71	Project	Bull Run Fossil Plant (TVA)
Remarks:					
			Boring No.	STN-11	Sample No. 6
			Depth Elev.	20.6'-21.1', 25.5'-26.0', 33.6'-34.1'	
			Laboratory	Stantec	Date 10-19-09
			TRIAXIAL COMPRESSION TEST REPORT		

Failure Criterion: Maximum Effective Principal Stress Ratio

Total Strength Envelope



Deviator Stress vs. Strain



Specimen No.			A	B	C	
Initial Data	Water content %	W_o	27.8	23.3	22.7	
	Dry Density PCF	γ_{d_o}	96.0	102.2	102.4	
	Saturation %	S_o	99.0	96.3	94.5	
	Void Ratio	e_o	0.762	0.656	0.652	
After Shear	Water content %	W_f	23.8	22.3	20.8	
	Dry Density PCF	γ_{d_f}	102.9	105.5	108.1	
	Saturation %	S_f	100.0	100.0	100.0	
	Void Ratio	e_f	0.644	0.603	0.565	
	Final Back Pressure TSF	u_c	5.76	4.32	2.88	
Minor Principal Stress TSF		σ_3	0.72	2.16	3.60	
Maximum Deviator Stress (tsf) @ failure		$(\sigma_1-\sigma_3)_{max}$	0.98	2.44	3.91	
Time to $(\sigma_1-\sigma_3)_{Max.}$ min.		t_f	240.5	299.4	452.6	
Ultimate Deviator Stress, t/sq ft		$(\sigma_1-\sigma_3)_{ult}$	n/a	n/a	n/a	
Initial Diameter, in.		D_o	2.880	2.890	2.896	
Initial Height, in.		H_o	5.976	6.016	6.005	

Controlled - Strain Test

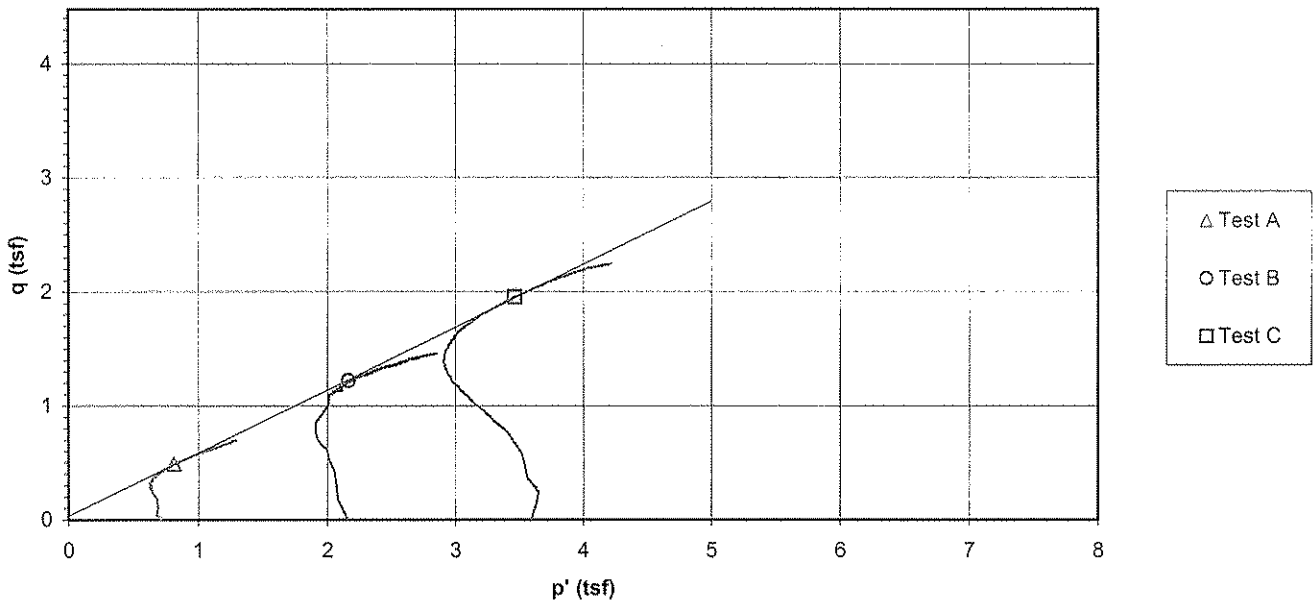
Description of Specimens: Lean Clay (CL), black, moist, firm

				Type of Specimen: Undisturbed	Type of test: R
LL	PL	PI	Gs 2.71	Project: Bull Run Fossil Plant (TVA)	
Remarks:					
				Boring No.: STN-11	Sample No.: 6
				Depth Elev.: 20.6'-21.1', 25.5'-26.0', 33.6'-34.1'	
				Laboratory: Stantec	Date: 10-19-09
				TRIAXIAL COMPRESSION TEST REPORT	

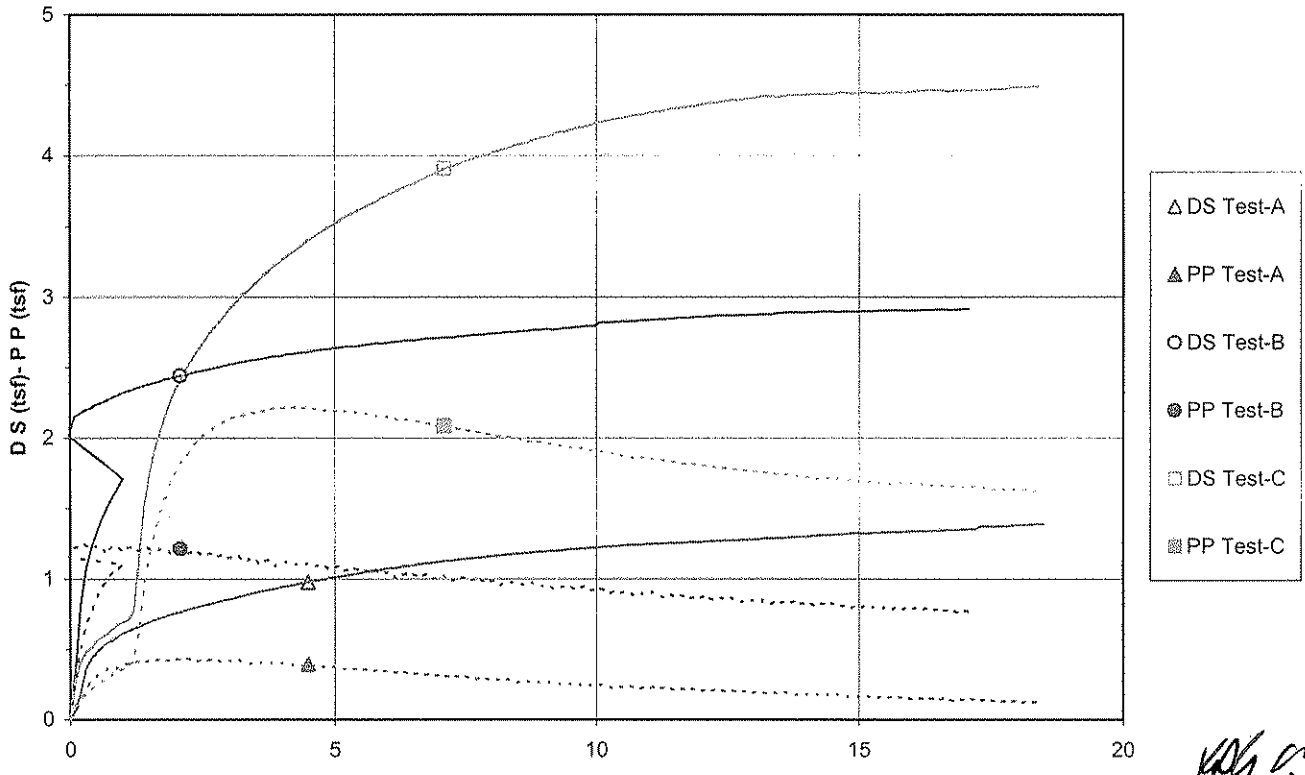
Consolidated Undrained Triaxial Test
EM 1110-2-1906 Appendix X

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Sample ID	STN-11, 20.6'-21.1' & STN-11, 25.5'-26.0' & STN-11, 33.6'-34.1'	Test Number	6
Failure Criterion:	Maximum Effective Principal Stress Ratio	ϕ' = 33.5 deg.	c' = 0.04 tsf

p' vs. q Plot



Deviator Stress and Induced Pore Pressure vs. Axial Strain



Stantec

Consolidated Undrained Triaxial Test
ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN-11, 20.6'-21.1'	Test Number	CU-6A
Visual Description	Lean Clay (CL), black, moist, firm	Prepared By	CSM
Undisturbed	Source STN-11, 20.5'-22.5'	Date	7-21-2009

Specific Gravity 2.71 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in^3)		Specimen	
Top	2.868	1	5.970	Sample	38.9104 (V_o)	Wet Weight (g)	1254.20
Middle	2.881	2	5.974	Solids	22.0929 (VS_o)	Dry Weight (g)	981.18
Bottom	2.889	3	5.990	Water	16.6595 (Vw_o)	Wet Unit Weight (pcf)	122.8
Avg.	2.8793 (D_o)	4	5.970	Voids	16.8175 (Vv_o)	Dry Unit Weight (pcf)	96.1
Area (in^2)	6.5114 (A_o)	Avg. (H_o)	5.9758	Degree of Saturation (%)	99.1 (S_o)		
Moisture Content (%)	27.8	Final Trimmings		Void Ratio	0.761		

Saturation

Set Up & Saturated: Wet xx Dry ____ Set up By RC

Back Pressure Saturated to: 80 (psi) Final Pore Pressure Parameter B 0.97 Date 10-9-09

Panel Board Number C

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.1199	Initial	17.29 (in.)	Initial	15.5 (in.)	Specimen Height (in.)	5.9757 (H_s)
Final	0.12	Final	15.31 (in.)	Final	11.1 (in.)	Area (in^2) Method A	6.5112 (A_s)
Change	-0.0001 (ΔH_o)	Change	-1.98 (in.)	Change	-4.40 (in.)	Specimen Volume (in^3)	38.91 (Vs)

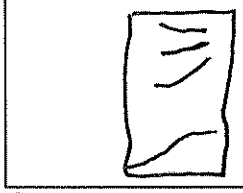
Consolidation

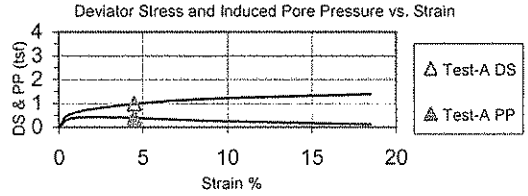
Height Readings (in.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.12	Initial	1.29 (in.)	Initial	17.5 (in.)	Chamber	90
Final	0.1321	Final	10.32 (in.)	Final	8.19 (in.)	Back	80
Change	-0.0121 (ΔH_c)	Change	-9.03 (in.)	Change	-9.31 (in.)	Lateral	10 (σ_3)
Height (in.)	5.9636 (H_c)			Volume (in^3)	36.3214 (V_c)		
Area (in^3) Method B	6.0906 (A_c)			Volume - Water (in^3)	14.2285 (VWc)	t_{50} (min.)	21
Diameter (in.)	2.7847 (D_c)			Water Content (%)	23.8		
Dry Density (pcf)	102.9			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.644

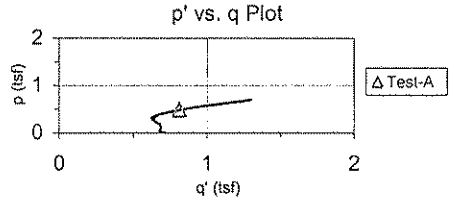
After Test

Final Measurements		Final Moisture Content		Stresses (membrane corrected) at Failure (psi)	
Maximum Diameter	3.401 (in.)	Wet Weight (g)	1214.36	Corrected Deviator	0.98 σ_d (tsf)
Wet weight (g)	1214.36 (WWf)	Dry Weight (g)	981.18	Major Principal	1.30 $\sigma_1'_f$ (tsf)
Corrected Diameter	3.377 (in.)	Tare Weight (g)	0.00	Minor Principal	0.33 $\sigma_3'_f$ (tsf)
				Rate of Strain (% / min.)	0.018
Youngs Modulus for Membrane (psi)	200			Axial Strain at Failure (%)	4.50
Membrane Thickness (in.)	0.012			Failure Criterion:	Maximum Effective Principal Stress Ratio

Failure Sketch







Comments:

Stantec

Consolidated Undrained Triaxial Test
ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN-11, 25.5'-26.0'	Test Number	CU-6B
Visual Description	Lean Clay (CL), brown, moist, firm	Prepared By	CM
Undisturbed	Source STN-11, 25.5'-27.5'	Date	7-21-2009

Specific Gravity 2.71 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in3)		Specimen	
Top	2.888	1	6.015	Sample	39.4534 (V_o)	Wet Weight (g)	1304.70
Middle	2.890	2	6.019	Solids	23.8272 (VS_o)	Dry Weight (g)	1058.21
Bottom	2.891	3	6.015	Water	15.0410 (Vw_o)	Wet Unit Weight (pcf)	126.0
Avg.	2.8897 (D_o)	4	6.015	Voids	15.6262 (Vv_o)	Dry Unit Weight (pcf)	102.2
Area (in^2)	6.5582 (A_o)	Avg. (H_o)	6.0159	Degree of Saturation (%)	96.3 (S_o)		
Moisture Content (%)	23.3	Final Trimmings		Void Ratio	0.656		

Saturation

Set Up & Saturated: Wet xx Dry ____ Set up By RC

Back Pressure Saturated to: 60 (psi) Final Pore Pressure Parameter B 0.96 Date 10-9-09

Panel Board Number F

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.1122	Initial	16.32 (in.)	Initial	16.01 (in.)	Specimen Height (in.)	6.0151 (H_s)
Final	0.113	Final	13.6 (in.)	Final	12.89 (in.)	Area (in^2) Method A	6.5565 (A_s)
Change	-0.0008 (ΔH_o)	Change	-2.72 (in.)	Change	-3.12 (in.)	Specimen Volume (in^3)	39.44 (V_s)

Consolidation

Height Readings (in.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.113	Initial	1.40 (in.)	Initial	17.49 (in.)	Chamber	90
Final	0.1553	Final	8.91 (in.)	Final	10.41 (in.)	Back	60
Change	-0.0423 (ΔH_c)	Change	-7.51 (in.)	Change	-7.08 (in.)	Lateral	30 (σ_3)
Height (in.)	5.9728 (H_c)			Volume (in^3)	38.2013 (V_c)		
Area (in^3) Method B	6.3959 (A_c)			Volume - Water (in^3)	14.3741 (VWc)	D_{50} (min.)	38
Diameter (in.)	2.8537 (D_c)			Water Content (%)	22.3		
Dry Density (pcf)	105.5			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.603

After Test

Final Measurements		Final Moisture Content	
Maximum Diameter	3.325 (in.)	Wet Weight (g)	1293.77
Wet weight (g)	1293.77 (WWf)	Dry Weight (g)	1058.21
Corrected Diameter	3.301 (in.)	Tare Weight (g)	0.00

Stresses (membrane corrected) at Failure (psi)

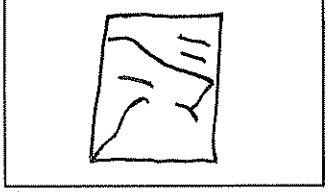
Corrected Deviator	2.44 σ_d (tsf)
Major Principal	3.39 $\sigma_1'_f$ (tsf)
Minor Principal	0.95 $\sigma_3'_f$ (tsf)
Rate of Strain (% / min.)	0.012
Axial Strain at Failure (%)	2.08

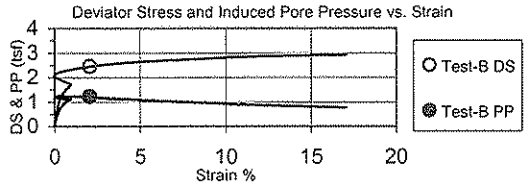
Youngs Modulus for Membrane (psi) 200

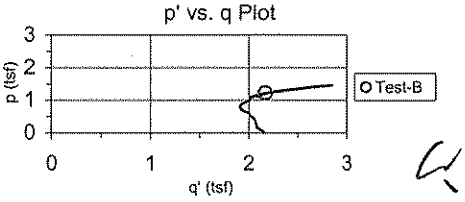
Membrane Thickness (in.) 0.012

Failure Criterion: Maximum Effective Principal Stress Ratio

Failure Sketch







Comments: ____

Consolidated Undrained Triaxial Test

ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN-11, 33.6'-34.1'	Test Number	CU-6C
Visual Description	Lean Clay (CL), brown, moist, firm	Prepared By	CSM
Undisturbed	Source STN-11, 33.5'-35.5'	Date	7-21-2009

Specific Gravity 2.71 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in^3)		Specimen	
Top	2.895	1	6.027	Sample	39.5524 (V_o)	Wet Weight (g)	1304.6
Middle	2.894	2	5.979	Solids	23.9311 (VS_o)	Dry Weight (g)	1062.82
Bottom	2.899	3	5.986	Water	14.7534 (Vw_o)	Wet Unit Weight (pcf)	125.7
Avg.	2.8960 (D_o)	4	6.027	Voids	15.6213 (Vv_o)	Dry Unit Weight (pcf)	102.4
Area (in^2)	6.5870 (A_o)	Avg. (H_o)	6.0046	Degree of Saturation (%)	94.4 (S_o)		
Moisture Content (%)	22.7	Final Trimmings		Void Ratio	0.653		

Saturation

Set Up & Saturated: Wet xx Dry

Back Pressure Saturated to: 40 (psi) Final Pore Pressure Parameter B 0.95

Set up By RC

Date 10-12-09

Panel Board Number B

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.1148	Initial	16.6 (in.)	Initial	16.42 (in.)	Specimen Height (in.)	6.0072 (H_s)
Final	0.1122	Final	12.94 (in.)	Final	16.8 (in.)	Area (in^2) Method A	6.5927 (A_s)
Change	0.0026 (ΔH_o)	Change	-3.66 (in.)	Change	0.38 (in.)	Specimen Volume (in^3)	39.60 (V_s)

Consolidation

Height Readings (in.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.1122	Initial	1.23 (in.)	Initial	16.09 (in.)	Chamber	90
Final	0.1168	Final	10.78 (in.)	Final	6.6 (in.)	Back	40
Change	-0.0046 (ΔH_c)	Change	-9.55 (in.)	Change	-9.49 (in.)	Lateral	50 (σ_3)
Height (in.)	6.0026 (H_c)			Volume (in^3)	37.4464 (V_c)		
Area (in^3) Method B	6.2383 (A_c)			Volume - Water (in^3)	13.5153 (VWc)	D_{50} (min.)	26
Diameter (in.)	2.8183 (D_c)			Water Content (%)	20.8		
Dry Density (pcf)	108.1			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.565

After Test

Final Measurements		Final Moisture Content	
Maximum Diameter	3.296 (in.)	Wet Weight (g)	1284.31
Wet weight (g)	1284.31 (WWf)	Dry Weight (g)	1062.82
Corrected Diameter	3.272 (in.)	Tare Weight (g)	0.00

Stresses (membrane corrected) at Failure (psi)

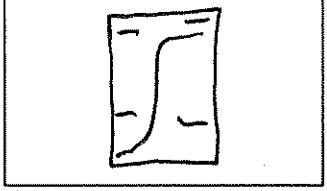
Corrected Deviator	3.91 σ_d (tsf)
Major Principal	5.42 $\sigma_1'_f$ (tsf)
Minor Principal	1.51 $\sigma_3'_f$ (tsf)
Rate of Strain (% / min.)	0.015
Axial Strain at Failure (%)	7.10

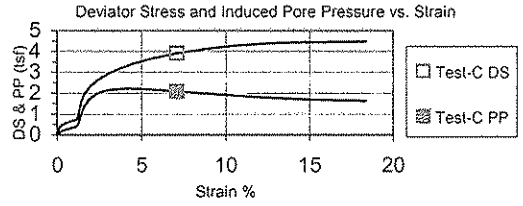
Youngs Modulus for Membrane (psi) 200

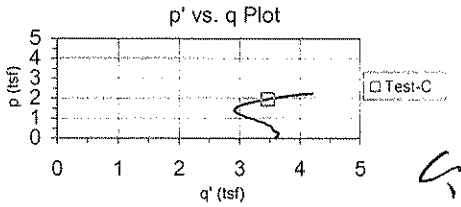
Membrane Thickness (in.) 0.012

Failure Criterion: Maximum Effective Principal Stress Ratio

Failure Sketch





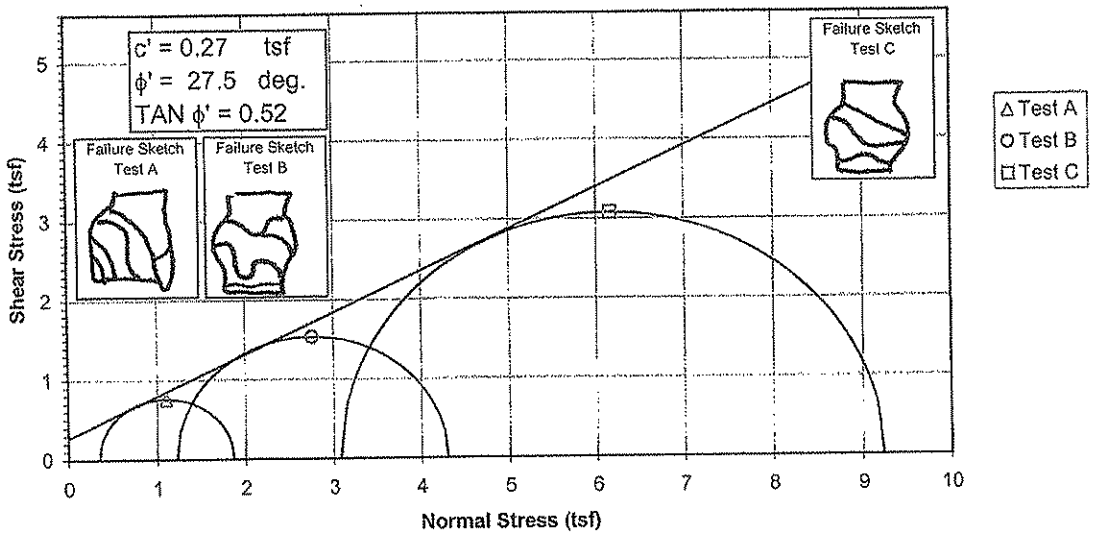


Comments:

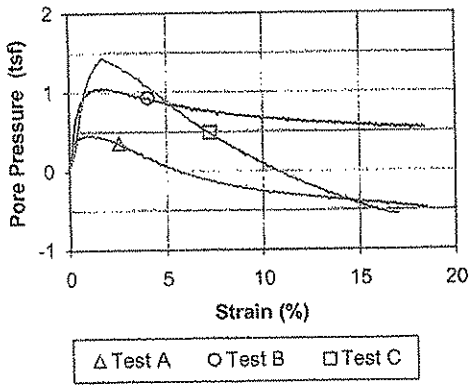
EM 1110-2-1906
Appendix X
30 Nov. 70

Failure Criterion: Maximum Effective Principal Stress Ratio

Effective Strength Envelope



Induced Pore Pressure vs. Strain



Specimen No.			A	B	C	
Initial Data	Water content %	W_o	23.1	24.1	22.9	
	Dry Density PCF	γ_{d_o}	102.9	100.6	103.4	
	Saturation %	S_o	97.6	96.2	98.1	
	Void Ratio	e_o	0.638	0.676	0.629	
After Shear	Water content %	W_f	23.1	22.8	19.6	
	Dry Density PCF	γ_{d_f}	103.8	104.4	110.2	
	Saturation %	S_f	100.0	100.0	100.0	
	Void Ratio	e_f	0.624	0.615	0.530	
	Final Back Pressure TSF	u_c	5.76	4.32	2.88	
Minor Principal Stress TSF @ failure		σ_3'f	0.35	1.23	3.09	
Maximum Deviator Stress (tsf) @ failure		$(\sigma_1'-\sigma_3')_{max}$	1.51	3.07	6.12	
Time to $(\sigma 1'-\sigma 3')$max min.		t_f	122.2	222.4	572.9	
Ultimate Deviator Stress, t/sq ft		$(\sigma 1'-\sigma 3')_{ult}$	n/a	n/a	n/a	
Initial Diameter, in.		D_o	2.880	2.880	2.865	
Initial Height, in.		H_o	6.026	6.040	6.038	

Controlled - Strain Test

Description of Specimens Lean Clay (CL), brown, moist, firm

LL | PL | PI | Gs 2.7

Remarks:

Type of Specimen Undisturbed | Type of test R

Project Bull Run Fossil Plant (TVA)

Boring No. STN-34P | Sample No. 10

Depth Elev. 50.0'-50.5', 52.6'-53.1', 54.0'-54.5'

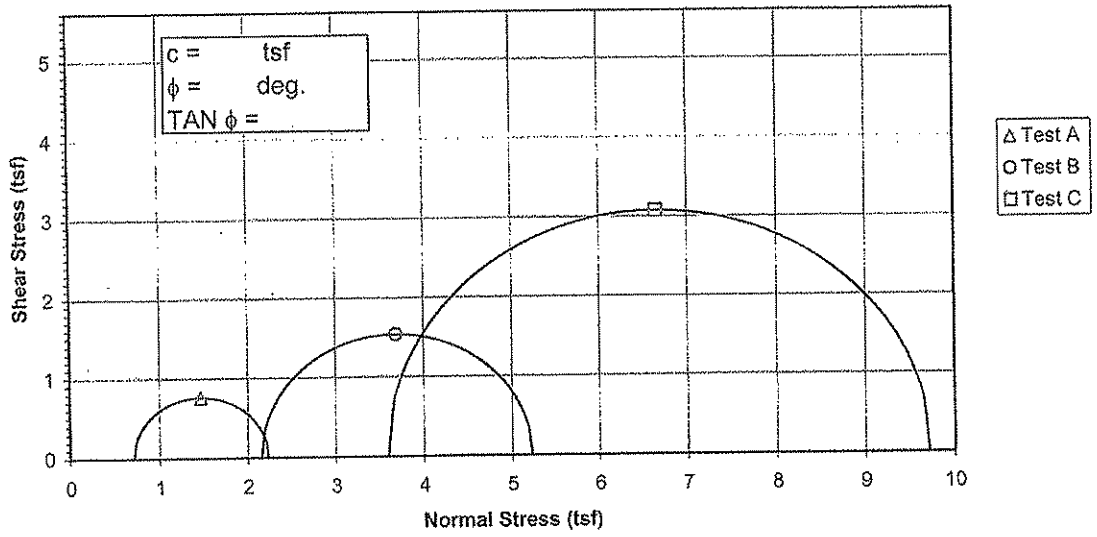
Laboratory Stantec | Date 11-11-09

TRIAXIAL COMPRESSION TEST REPORT

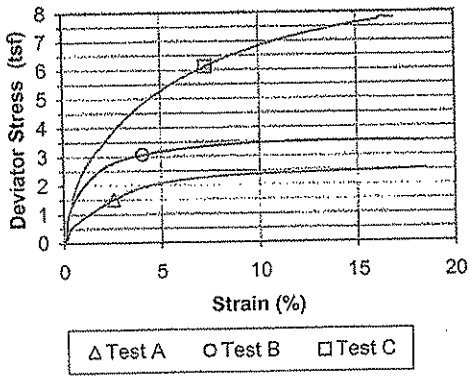
EM 1110-2-1906
Appendix X
30 Nov. 70

Failure Criterion: Maximum Effective Principal Stress Ratio

Total Strength Envelope



Deviator Stress vs. Strain



Specimen No.			A	B	C
Initial Data	Water content %	W_o	23.1	24.1	22.9
	Dry Density PCF	γ_{d_o}	102.9	100.6	103.4
	Saturation %	S_o	97.6	96.2	98.1
	Void Ratio	e_o	0.638	0.676	0.629
After Shear	Water content %	W_f	23.1	22.8	19.6
	Dry Density PCF	γ_{d_f}	103.8	104.4	110.2
	Saturation %	S_f	100.0	100.0	100.0
	Void Ratio	e_f	0.624	0.615	0.530
	Final Back Pressure TSF	u_c	5.76	4.32	2.88
Minor Principal Stress TSF		σ_3	0.72	2.16	3.60
Maximum Deviator Stress (tsf) @ failure		$(\sigma_1-\sigma_3)_{max}$	1.51	3.07	6.12
Time to $(\sigma_1-\sigma_3)_{Max.}$ min.		t_f	122.2	222.4	572.9
Ultimate Deviator Stress, t/sq ft		$(\sigma_1-\sigma_3)_{ult}$	n/a	n/a	n/a
Initial Diameter, in.		D_o	2.880	2.880	2.865
Initial Height, In.		H_o	6.026	6.040	6.038

Controlled - Strain Test

Description of Specimens: Lean Clay (CL), brown, moist, firm

LL	PL	PI	Gs 2.7

Remarks:

Type of Specimen: Undisturbed | Type of test: $\bar{R}$

Project: Bull Run Fossil Plant (TVA)

Boring No.: STN-34P | Sample No.: 10

Depth Elev.: 50.0'-50.5', 52.6'-53.1', 54.0'-54.5'

Laboratory: Stantec | Date: 11-11-09

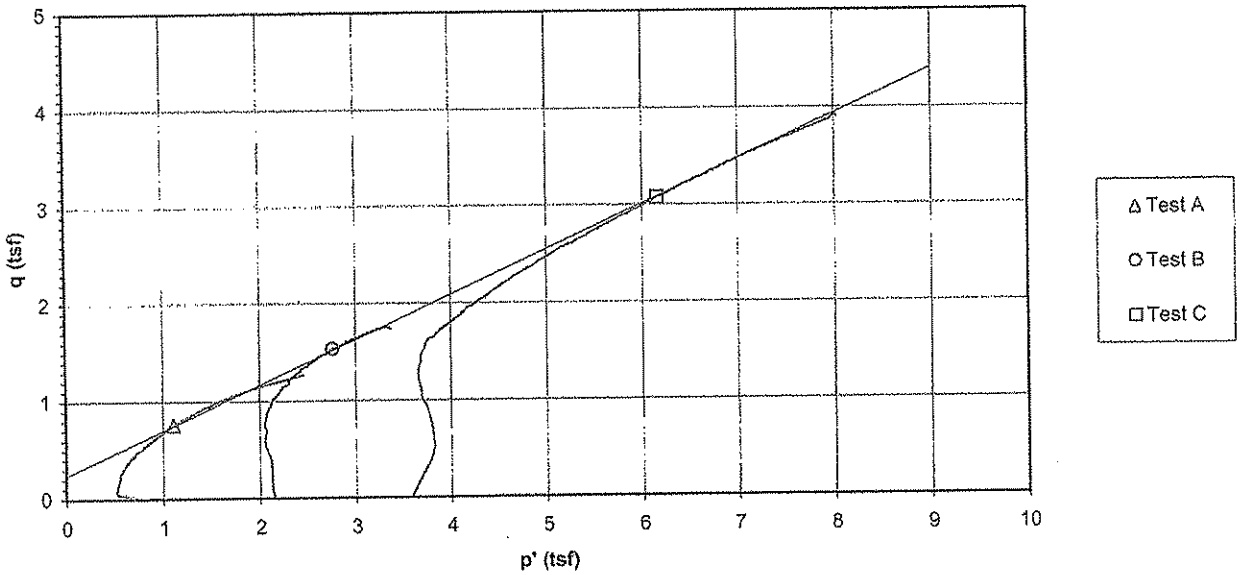
TRIAXIAL COMPRESSION TEST REPORT

Laboratory Document
Prepared By: MW
Approved BY: TLK

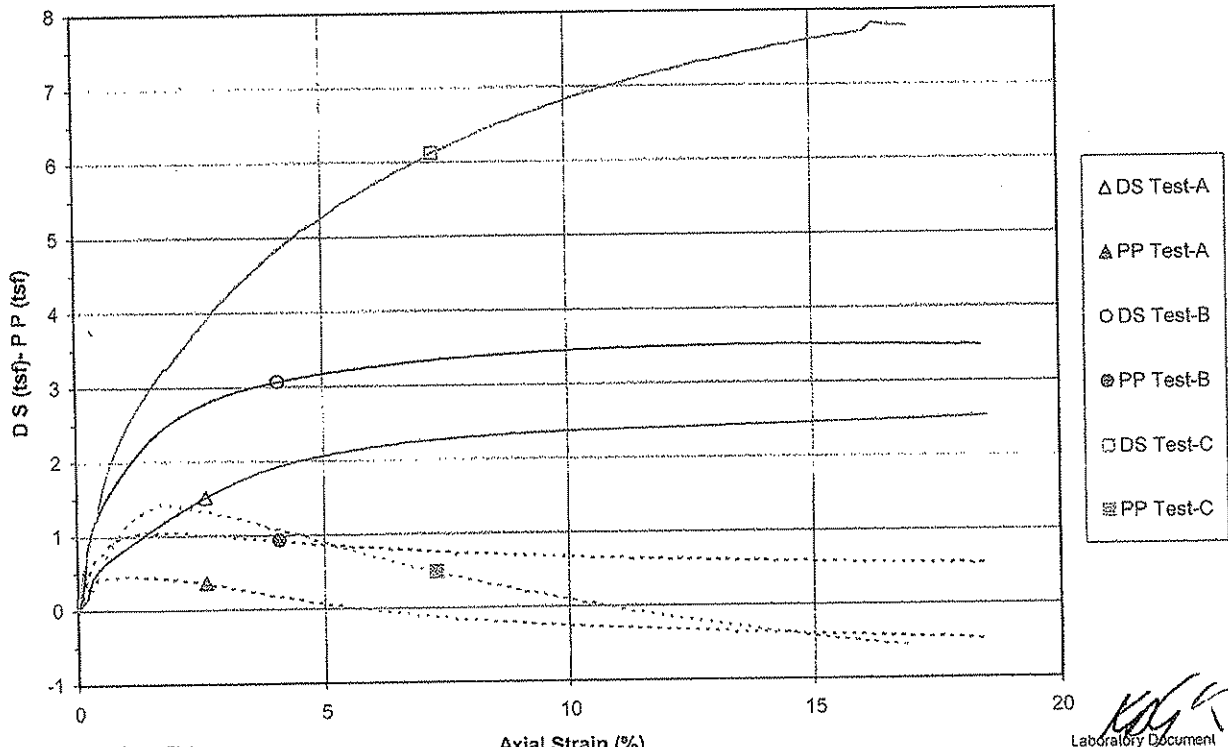
Consolidated Undrained Triaxial Test
EM 1110-2-1906 Appendix X

Project: Bull Run Fossil Plant (TVA) — Project No.: 172679015
Sample ID: STN-34P, 50.0'-50.5' & STN-34P, 52.6'-53.1' & STN-34P, 54.0'-54.5' — Test Number: 10
Failure Criterion: Maximum Effective Principal Stress Ratio — ϕ' = 27.5 deg. — c' = 0.27 tsf

p' vs. q Plot



Deviator Stress and Induced Pore Pressure vs. Axial Strain



File: 172679015_cu_10 Sheet: Plots
Preparation Date: 1998
Revision Date: 1-2008

Stantec Consulting Services Inc.

Laboratory Document
Prepared By: MW
Approved BY: TLK

Consolidated Undrained Triaxial Test

ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN-34P, 50.0'-50.5'	Test Number	CU-10A
Visual Description	Lean Clay (CL), brown, moist, firm	Prepared By	CM
Undisturbed	Source STN-34P, 50.0'-52.0'	Date	9-14-2009

Specific Gravity 2.70 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in³)		Specimen	
Top	2.882	1	6.029	Sample	39.2732 (V_o)	Wet Weight (g)	1305.10
Middle	2.879	2	6.015	Solids	23.9663 (VS_o)	Dry Weight (g)	1060.45
Bottom	2.881	3	6.032	Water	14.9283 (Vw_o)	Wet Unit Weight (pcf)	126.6
Avg.	2.8807 (D_o)	4	6.029	Voids	15.3069 (Vv_o)	Dry Unit Weight (pcf)	102.9
Area (in²)	6.5174 (A_o)	Avg. (H_o)	6.0259	Degree of Saturation (%)	97.5 (S_o)		
Moisture Content (%)	23.1 Final Trimmings			Void Ratio	0.639		

Saturation

Set Up & Saturated: Wet xx Dry Set up By KDG

Back Pressure Saturated to: 80 (psi) Final Pore Pressure Parameter B 0.99 Date 11-4-09

Panel Board Number C

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.1364	Initial	17.04 (in.)	Initial	12.51 (in.)	Specimen Height (in.)	6.0286 (H_s)
Final	0.1337	Final	14.58 (in.)	Final	10.21 (in.)	Area (in²) Method A	6.5233 (A_s)
Change	0.0027 (ΔH_o)	Change	-2.46 (in.)	Change	-2.30 (in.)	Specimen Volume (in³)	39.33 (Vs)

Consolidation

Height Readings (in.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.1337	Initial	0.91 (in.)	Initial	17.39 (in.)	Chamber	90
Final	0.145	Final	3.24 (in.)	Final	15.13 (in.)	Back	80
Change	-0.0113 (ΔH_c)	Change	-2.33 (in.)	Change	-2.26 (in.)	Lateral	10 (σ_3)
Height (in.)	6.0173 (H_c)			Volume (in³)	38.9263 (V_c)		
Area (in³) Method B	6.4691 (A_c)			Volume - Water (in³)	14.9600 (VWc)	t_{50} (min.)	8.9
Diameter (in.)	2.8700 (D_c)			Water Content (%)	23.1		
Dry Density (pcf)	103.8			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.624

After Test

Final Measurements		Final Moisture Content	
Maximum Diameter	3.312 (in.)	Wet Weight (g)	1305.62
Wet weight (g)	1305.62 (WWf)	Dry Weight (g)	1060.45
Corrected Diameter	3.288 (in.)	Tare Weight (g)	0.00

Stresses (membrane corrected) at Failure (psi)

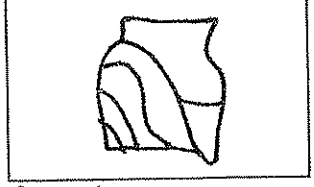
Corrected Deviator	1.51 σ_d (tsf)
Major Principal	1.87 $\sigma_1'_f$ (tsf)
Minor Principal	0.35 $\sigma_3'_f$ (tsf)
Rate of Strain (% / min.)	0.021
Axial Strain at Failure (%)	2.60

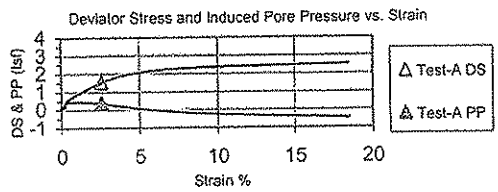
Youngs Modulus for Membrane (psi) 200

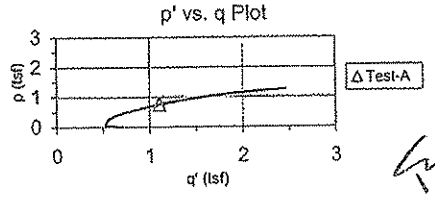
Membrane Thickness (in.) 0.012

Failure Criterion: Maximum Effective Principal Stress Ratio

Failure Sketch







Comments:

Consolidated Undrained Triaxial Test

ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN-34P, 52.6'-53.1'	Test Number	CU-10B
Visual Description	Lean Clay (CL), brown, moist, firm	Prepared By	KDG
Undisturbed	Source STN-34P, 52.0'-54.0'	Date	11-4-2009

Specific Gravity 2.70 ASTM D854 Method A | Liquid Limit N/A | Plastic Limit N/A | Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in3)		Specimen	
Top	2.880	1	6.041	Sample	39.3586 (V_o)	Wet Weight (g)	1289.10
Middle	2.879	2	6.042	Solids	23.4831 (VS_o)	Dry Weight (g)	1039.08
Bottom	2.882	3	6.039	Water	15.2564 (Vw_o)	Wet Unit Weight (pcf)	124.8
Avg.	2.8803 (D_o)	4	6.041	Voids	15.8754 (Vv_o)	Dry Unit Weight (pcf)	100.6
Area (in^2)	6.5159 (A_o)	Avg. (H_o)	6.0404	Degree of Saturation (%)	96.1 (S_o)		
Moisture Content (%)	24.1 Final Trimmings			Void Ratio	0.676		

Saturation

Set Up & Saturated: Wet xx Dry

Back Pressure Saturated to: 60 (psi) Final Pore Pressure Parameter B 0.96

Set up By KDG | Date 11-4-09 | Panel Board Number A

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.1413	Initial	15.92 (in.)	Initial	12.14 (in.)	Specimen Height (in.)	6.0421 (H_s)
Final	0.1396	Final	13.63 (in.)	Final	10.36 (in.)	Area (in^2) Method A	6.5196 (A_s)
Change	0.0017 (ΔH_o)	Change	-2.29 (in.)	Change	-1.78 (in.)	Specimen Volume (in^3)	39.39 (V_s)

Consolidation

Height Readings (in.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.1396	Initial	1.13 (in.)	Initial	16.74 (in.)	Chamber	90
Final	0.1842	Final	7.09 (in.)	Final	10.57 (in.)	Back	60
Change	-0.0446 (ΔH_c)	Change	-5.96 (in.)	Change	-6.17 (in.)	Lateral	30 (σ_3)
Height (in.)	5.9975 (H_c)			Volume (in^3)	37.9145 (V_c)		
Area (in^3) Method B	6.3217 (A_c)			Volume - Water (in^3)	14.4314 (VWc)	D_{50} (min.)	17
Diameter (in.)	2.8371 (D_c)			Water Content (%)	22.8		
Dry Density (pcf)	104.4			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.615

After Test

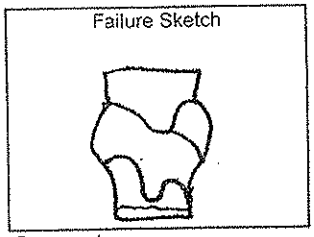
Final Measurements		Final Moisture Content		Stresses (membrane corrected) at Failure (psi)	
Maximum Diameter	3.401 (in.)	Wet Weight (g)	1275.58	Corrected Deviator	3.07 σ_d (tsf)
Wet weight (g)	1275.58 (WWf)	Dry Weight (g)	1039.08	Major Principal	4.30 $\sigma_1'_f$ (tsf)
Corrected Diameter	3.377 (in.)	Tare Weight (g)	0.00	Minor Principal	1.23 $\sigma_3'_f$ (tsf)
				Rate of Strain (% / min.)	0.018
				Axial Strain at Failure (%)	4.10

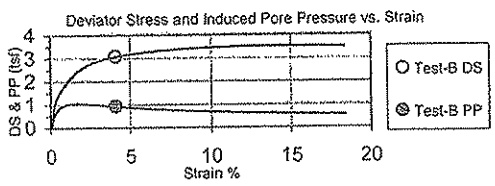
Youngs Modulus for Membrane (psi) 200

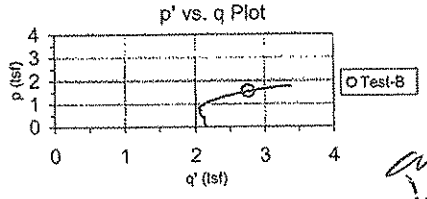
Membrane Thickness (in.) 0.012

Failure Criterion: Maximum Effective Principal Stress Ratio

Failure Sketch







Comments:

Consolidated Undrained Triaxial Test

ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN-34P, 54.0'-54.5'	Test Number	CU-10C
Visual Description	Lean Clay (CL), brown, moist, firm	Prepared By	CM
Undisturbed	Source STN-34P, 54.0'-56.0'	Date	9-14-2009

Specific Gravity 2.70 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in³)		Specimen	
Top	2.865	1	6.027	Sample	38.9616 (V_o)	Wet Weight (g)	1299
Middle	2.862	2	6.059	Solids	23.8920 (VS_o)	Dry Weight (g)	1057.17
Bottom	2.872	3	6.041	Water	14.7567 (Vw_o)	Wet Unit Weight (pcf)	127.0
Avg.	2.8663 (D_o)	4	6.027	Voids	15.0696 (Vv_o)	Dry Unit Weight (pcf)	103.4
Area (in²)	6.4527 (A_o)	Avg. (H_o)	6.0380	Degree of Saturation (%)	97.9 (S_o)		
Moisture Content (%)	22.9 Final Trimmings			Void Ratio	0.631		

Saturation

Set Up & Saturated: Wet xx Dry ____ Set up By KDG

Back Pressure Saturated to: 40 (psi) Final Pore Pressure Parameter B 0.97 Date 11-6-09

Panel Board Number D

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.1223	Initial	16.74 (in.)	Initial	10.76 (in.)	Specimen Height (in.)	6.0288 (H_s)
Final	0.1315	Final	15.42 (in.)	Final	6.25 (in.)	Area (in²) Method A	6.4330 (A_s)
Change	-0.0092 (ΔH_o)	Change	-1.32 (in.)	Change	-4.51 (in.)	Specimen Volume (in³)	38.78 (V_s)

Consolidation

Height Readings (in.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.1315	Initial	0.97 (in.)	Initial	17.35 (in.)	Chamber	90
Final	0.195	Final	11.11 (in.)	Final	5.06 (in.)	Back	40
Change	-0.0635 (ΔH_c)	Change	-10.14 (in.)	Change	-12.29 (in.)	Lateral	50 (σ_3)
Height (in.)	5.9653 (H_c)			Volume (in³)	36.5447 (V_c)		
Area (in³) Method B	6.1262 (A_c)			Volume - Water (in³)	12.6527 (VWc)	D_{50} (min.)	51
Diameter (in.)	2.7929 (D_c)			Water Content (%)	19.6		
Dry Density (pcf)	110.2			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.530

After Test

Final Measurements		Final Moisture Content	
Maximum Diameter	3.257 (in.)	Wet Weight (g)	1264.52
Wet weight (g)	1264.52 (WWf)	Dry Weight (g)	1057.17
Corrected Diameter	3.233 (in.)	Tare Weight (g)	0.00

Stresses (membrane corrected) at Failure (psi)

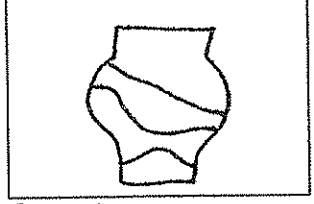
Corrected Deviator	6.12 σ_d (tsf)
Major Principal	9.23 $\sigma_1'_f$ (tsf)
Minor Principal	3.09 $\sigma_3'_f$ (tsf)
Rate of Strain (% / min.)	0.012
Axial Strain at Failure (%)	7.29

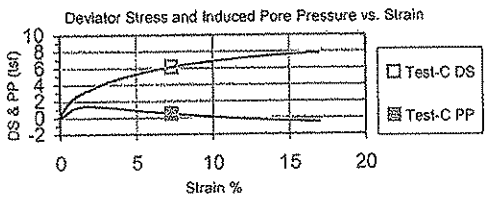
Youngs Modulus for Membrane (psi) 200

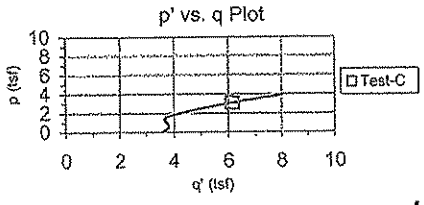
Membrane Thickness (in.) 0.012

Failure Criterion: Maximum Effective Principal Stress Ratio

Failure Sketch





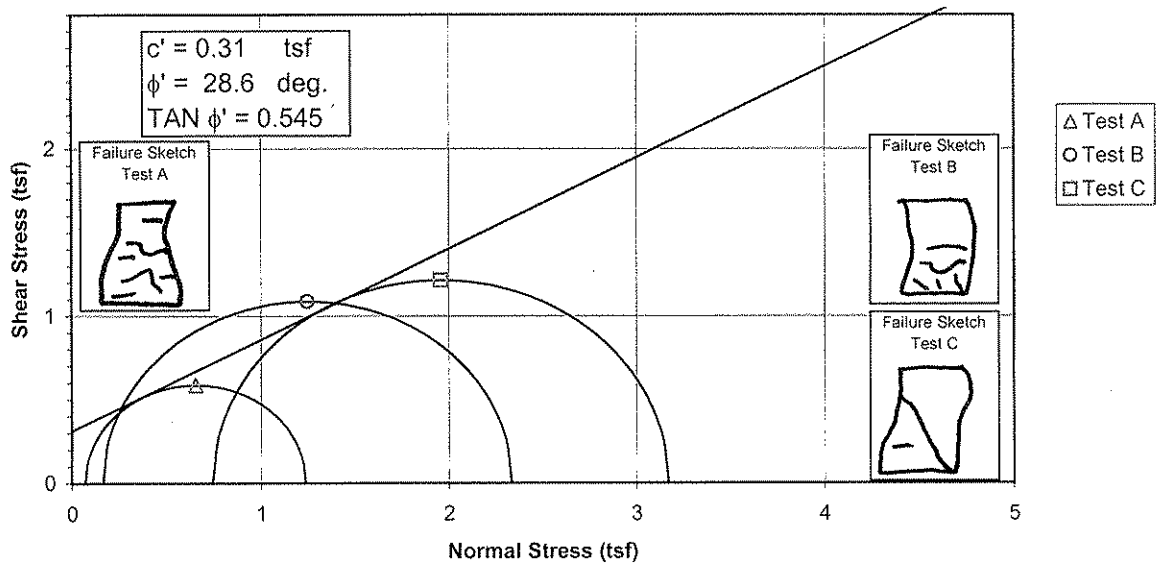


Comments: ____

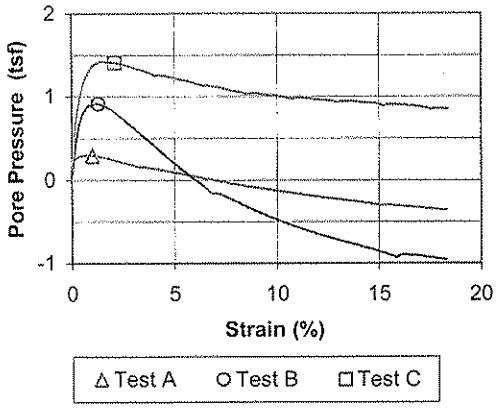
EM 1110-2-1906
Appendix X
30 Nov. 70

Failure Criterion: Maximum Effective Principal Stress Ratio

Effective Strength Envelope



Induced Pore Pressure vs. Strain



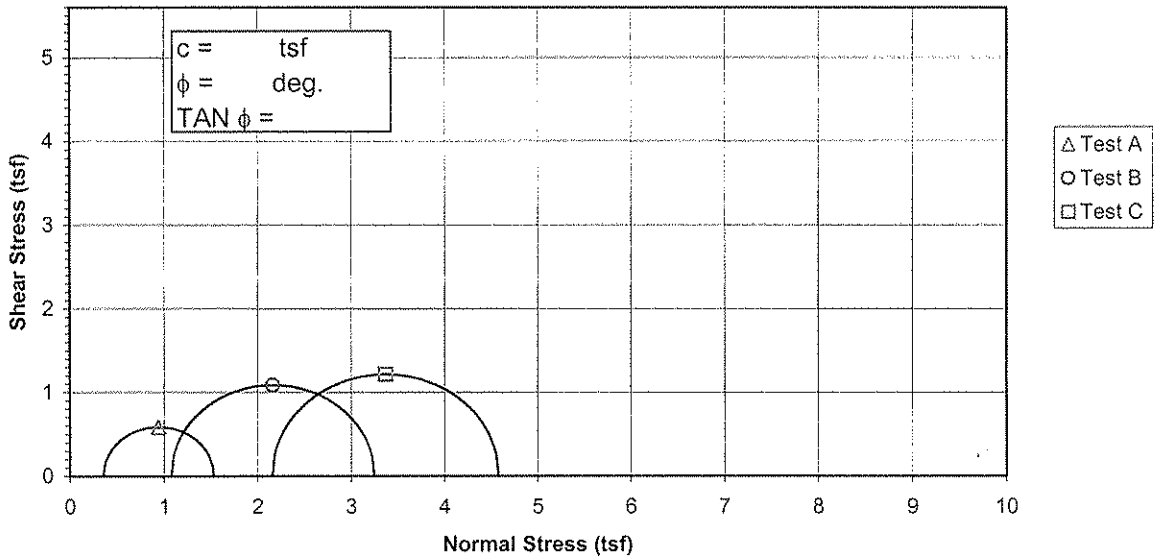
Specimen No.			A	B	C	
Initial Data	Water content %	W_o	22.5	23.7	24.8	
	Dry Density PCF	γ_{d_o}	103.7	99.5	98.2	
	Saturation %	S_o	101.1	96.1	97.1	
	Void Ratio	e_o	0.584	0.649	0.672	
After Shear	Water content %	W_f	23.5	25.3	25.2	
	Dry Density PCF	γ_{d_f}	101.5	98.5	98.7	
	Saturation %	S_f	100.0	100.0	100.0	
	Void Ratio	e_f	0.617	0.666	0.663	
	Final Back Pressure TSF	u_c	6.12	5.40	4.32	
Minor Principal Stress TSF @ failure		σ_3'f	0.07	0.16	0.74	
Maximum Deviator Stress (tsf) @ failure		$(\sigma_1'-\sigma_3')_{max}$	1.17	2.17	2.42	
Time to (σ1'-σ3')max min.		t_f	1.4	1.6	6.1	
Ultimate Deviator Stress, t/sq ft		$(\sigma 1'-\sigma 3')_{ult}$	n/a	n/a	n/a	
Initial Diameter, in.		D_o	2.887	2.890	2.890	
Initial Height, in.		H_o	6.048	6.035	6.068	

Controlled - Strain Test					
Description of Specimens	Lean Clay (CL), brown, moist, firm				
			Type of Specimen	Undisturbed	Type of test R
LL	PL	PI	Gs 2.63	Project	Bull Run Fossil Plant (TVA)
Remarks:					
			Boring No.	STN-51	Sample No. 3
			Depth Elev.	4.5'-5.0', 5.1'-5.6', 9.5'-10.0'	
			Laboratory	Stantec	Date 10-9-09
			TRIAXIAL COMPRESSION TEST REPORT		

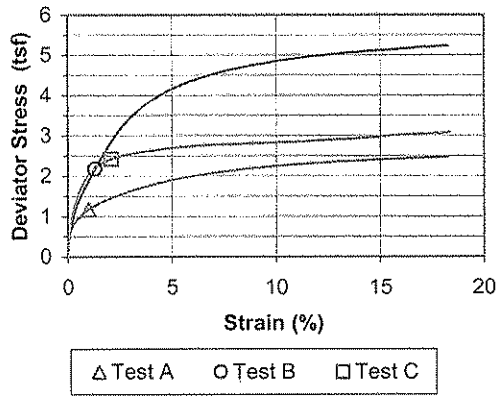
EM 1110-2-1906
Appendix X
30 Nov. 70

Failure Criterion: Maximum Effective Principal Stress Ratio

Total Strength Envelope



Deviator Stress vs. Strain



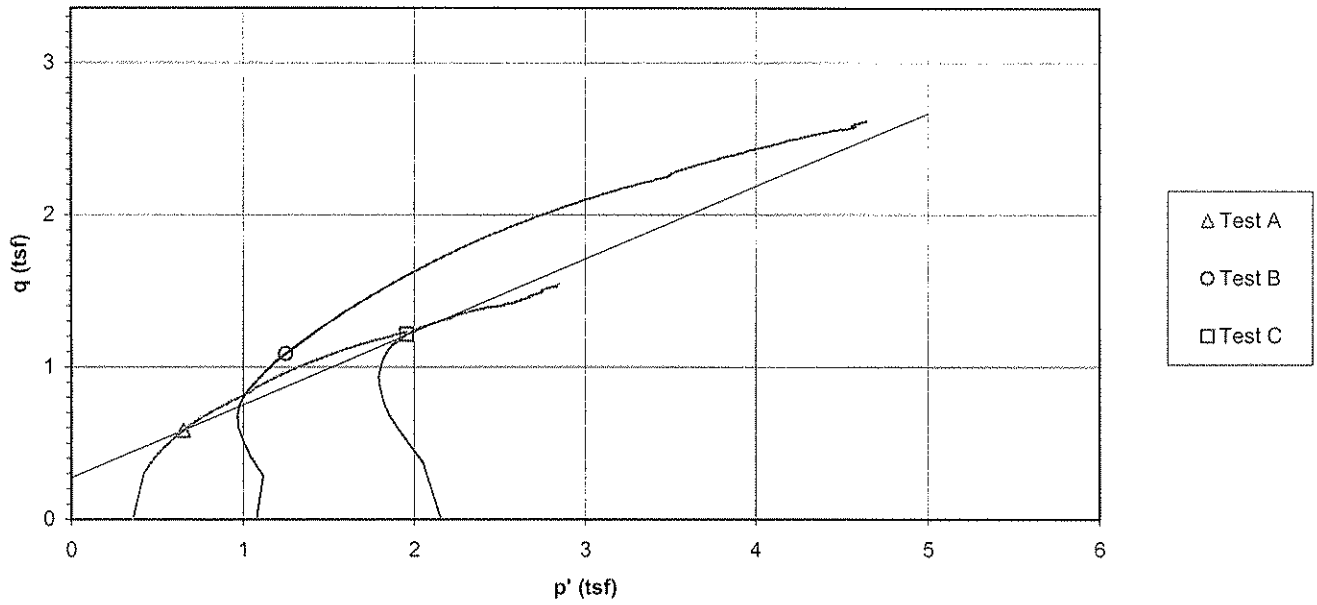
Specimen No.			A	B	C	
Initial Data	Water content %	W_o	22.5	23.7	24.8	
	Dry Density PCF	γ_{d_o}	103.7	99.5	98.2	
	Saturation %	S_o	101.1	96.1	97.1	
	Void Ratio	e_o	0.584	0.649	0.672	
After Shear	Water content %	W_f	23.5	25.3	25.2	
	Dry Density PCF	γ_{d_f}	101.5	98.5	98.7	
	Saturation %	S_f	100.0	100.0	100.0	
	Void Ratio	e_f	0.617	0.666	0.663	
	Final Back Pressure TSF	u_c	6.12	5.40	4.32	
Minor Principal Stress TSF		σ_3	0.36	1.08	2.16	
Maximum Deviator Stress (tsf) @ failure		$(\sigma_1-\sigma_3)_{max}$	1.17	2.17	2.42	
Time to $(\sigma_1-\sigma_3)_{Max.}$ min.		t_f	1.4	1.6	6.1	
Ultimate Deviator Stress, t/sq ft		$(\sigma_1-\sigma_3)_{ult}$	n/a	n/a	n/a	
Initial Diameter, in.		D_o	2.887	2.890	2.890	
Initial Height, in.		H_o	6.048	6.035	6.068	

Controlled - Strain Test				Type of Specimen Undisturbed	Type of test $\bar{R}$
Description of Specimens	Lean Clay (CL), brown, moist, firm				
LL	PL	PI	Gs 2.63	Project	Bull Run Fossil Plant (TVA)
Remarks:					
				Boring No. STN-51	Sample No. 3
				Depth Elev.	4.5'-5.0', 5.1'-5.6', 9.5'-10.0'
				Laboratory Stantec	Date 10-9-09
				TRIAXIAL COMPRESSION TEST REPORT	

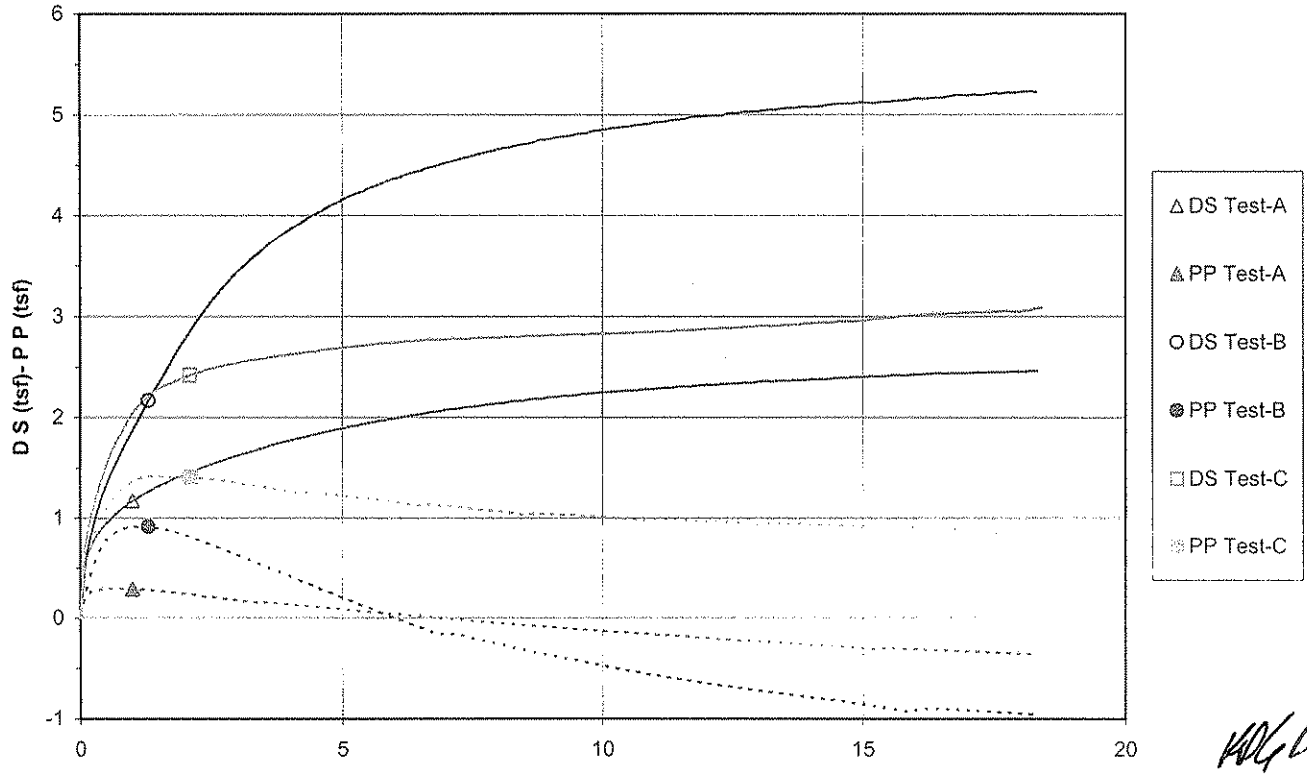
Consolidated Undrained Triaxial Test
EM 1110-2-1906 Appendix X

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Sample ID	STN - 51, 4.5'-5.0' & STN - 51, 5.1'-5.6' & STN - 51, 9.5'-10.0'	Test Number	3
Failure Criterion:	Maximum Effective Principal Stress Ratio	ϕ' = 28.6 deg.	c' = 0.31 tsf

p' vs. q Plot



Deviator Stress and Induced Pore Pressure vs. Axial Strain



Stantec

Consolidated Undrained Triaxial Test
ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN - 51, 4.5'-5.0'	Test Number	CU-3A
Visual Description	Lean Clay (CL), brown, moist, firm	Prepared By	CM
Undisturbed	Source STN-51, 4.5'-6.5'	Date	7-22-2009

Specific Gravity 2.63 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in^3)		Specimen	
Top	2.890	1	6.052	Sample	39.6183 (V_o)	Wet Weight (g)	1319.40
Middle	2.885	2	6.058	Solids	24.9996 (VS_o)	Dry Weight (g)	1077.50
Bottom	2.889	3	6.030	Water	14.7609 (Vw_o)	Wet Unit Weight (pcf)	126.9
Avg.	2.8880 (D_o)	4	6.052	Voids	14.6187 (Vv_o)	Dry Unit Weight (pcf)	103.6
Area (in^2)	6.5506 (A_o)	Avg. (H_o)	6.0480	Degree of Saturation (%)	101.0 (S_o)		
Moisture Content (%)	22.5	Final Trimmings		Void Ratio	0.585		

Saturation

Set Up & Saturated: Wet xx Dry Set up By RC

Back Pressure Saturated to: 85 (psi) Final Pore Pressure Parameter B 0.96 Date 10-5-09

Panel Board Number B

Height Readings (in.)		Back Pressure Burette			Chamber Burette				
Initial	0.1062	Initial	16.23	(in.)	Initial	15.64	(in.)	Specimen Height (in.)	6.0530 (H_s)
Final	0.1012	Final	11.84	(in.)	Final	12.24	(in.)	Area (in^2) Method A	6.5615 (A_s)
Change	0.0050 (ΔH_o)	Change	-4.39	(in.)	Change	-3.40	(in.)	Specimen Volume (in^3)	39.72 (Vs)

Consolidation

Height Readings (in.)		Back Pressure Burette Readings			Chamber Burette Readings			Pressures (psi)	
Initial	0.1012	Initial	1.07	(in.)	Initial	17.39	(in.)	Chamber	90
Final	0.101	Final	1.68	(in.)	Final	16.8	(in.)	Back	85
Change	0.0002 (ΔH_c)	Change	-0.61	(in.)	Change	-0.59	(in.)	Lateral	5 (σ_3)
Height (in.)	6.0532 (H_c)				Volume (in^3)	40.4298 (V_c)			
Area (in^3) Method B	6.6791 (A_c)				Volume - Water (in^3)	15.4302 (VWc)		t_{50} (min.)	0.342
Diameter (in.)	2.9162 (D_c)				Water Content (%)	23.5			
Dry Density (pcf)	101.5				Degree of Saturation (%)	100.0 (S_c)		Void Ratio	0.617

After Test

Final Measurements		Final Moisture Content	
Maximum Diameter	3.441 (in.)	Wet Weight (g)	1330.37
Wet weight (g)	1330.37 (WWf)	Dry Weight (g)	1077.50
Corrected Diameter	3.417 (in.)	Tare Weight (g)	0.00

Stresses (membrane corrected) at Failure (psi)

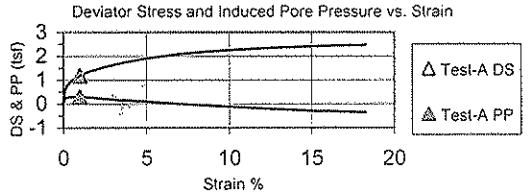
Corrected Deviator	1.17 σ_d (tsf)
Major Principal	1.24 $\sigma_1'_f$ (tsf)
Minor Principal	0.07 $\sigma_3'_f$ (tsf)
Rate of Strain (% / min.)	0.924
Axial Strain at Failure (%)	1.01

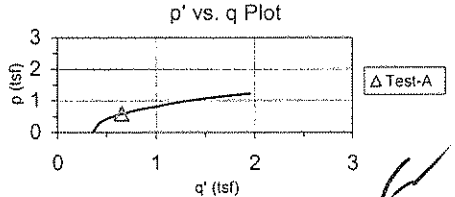
Youngs Modulus for Membrane (psi) 200

Membrane Thickness (in.) 0.012

Failure Criterion: Maximum Effective Principal Stress Ratio

Failure Sketch





Comments:

Stantec

Consolidated Undrained Triaxial Test
ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN - 51, 5.1'-5.6'	Test Number	CU-3B
Visual Description	Lean Clay (CL), brown, moist, firm	Prepared By	CM
Undisturbed	Source STN-51, 4.5'-6.5'	Date	7-22-2009

Specific Gravity 2.63 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in3)		Specimen	
Top	2.891	1	6.045	Sample	39.5904 (V_o)	Wet Weight (g)	1280.00
Middle	2.890	2	6.027	Solids	24.0034 (VS_o)	Dry Weight (g)	1034.56
Bottom	2.889	3	6.025	Water	14.9766 (Vw_o)	Wet Unit Weight (pcf)	123.2
Avg.	2.8900 (D_o)	4	6.045	Voids	15.5870 (Vv_o)	Dry Unit Weight (pcf)	99.5
Area (in^2)	6.5597 (A_o)	Avg. (H_o)	6.0354	Degree of Saturation (%)	96.1 (S_o)		
Moisture Content (%)	23.7	Final Trimmings		Void Ratio	0.649		

Saturation

Set Up & Saturated: Wet xx Dry Set up By RC

Back Pressure Saturated to: 75 (psi) Final Pore Pressure Parameter B 0.96 Date 10-6-09

Panel Board Number A

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.125	Initial	15.76 (in.)	Initial	15.79 (in.)	Specimen Height (in.)	6.0356 (H_s)
Final	0.1248	Final	10.59 (in.)	Final	10.99 (in.)	Area (in^2) Method A	6.5602 (A_s)
Change	0.0002 (ΔH_o)	Change	-5.17 (in.)	Change	-4.80 (in.)	Specimen Volume (in^3)	39.59 (V_s)

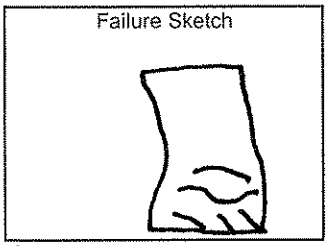
Consolidation

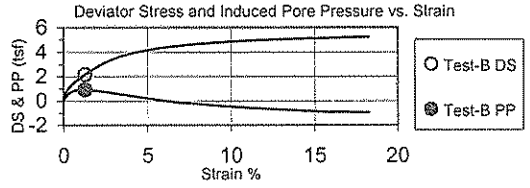
Height Readings (in.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.1248	Initial	1.16 (in.)	Initial	17.19 (in.)	Chamber	90
Final	0.1281	Final	2.35 (in.)	Final	15.75 (in.)	Back	75
Change	-0.0033 (ΔH_c)	Change	-1.19 (in.)	Change	-1.44 (in.)	Lateral	15 (σ_3)
Height (in.)	6.0323 (H_c)			Volume (in^3)	40.0009 (V_c)		
Area (in^3) Method B	6.6311 (A_c)			Volume - Water (in^3)	15.9974 (VWc)	D_{50} (min.)	0.258
Diameter (in.)	2.9057 (D_c)			Water Content (%)	25.3		
Dry Density (pcf)	98.5			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.666

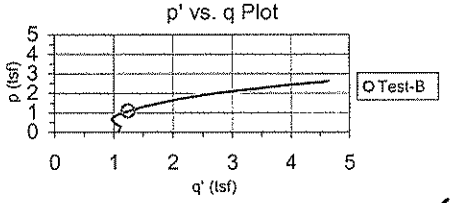
After Test

Final Measurements		Final Moisture Content		Stresses (membrane corrected) at Failure (psi)	
Maximum Diameter	3.353 (in.)	Wet Weight (g)	1296.73	Corrected Deviator	2.17 σ_d (tsf)
Wet weight (g)	1296.73 (WWf)	Dry Weight (g)	1034.56	Major Principal	2.34 $\sigma_1'_f$ (tsf)
Corrected Diameter	3.329 (in.)	Tare Weight (g)	0.00	Minor Principal	0.16 $\sigma_3'_f$ (tsf)
				Rate of Strain (% / min.)	0.907
Youngs Modulus for Membrane (psi)	200			Axial Strain at Failure (%)	1.30
Membrane Thickness (in.)	0.012			Failure Criterion:	Maximum Effective Principal Stress Ratio

Failure Sketch







Comments:

Consolidated Undrained Triaxial Test

ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN - 51, 9.5'-10.0'	Test Number	CU-3C
Visual Description	Lean Clay (CL), brown, moist, firm	Prepared By	CM
Undisturbed	Source STN-51, 9.5'-11.5'	Date	7-22-2009

Specific Gravity 2.63 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in^3)		Specimen	
Top	2.885	1	6.065	Sample	39.7877 (V_o)	Wet Weight (g)	1280.4
Middle	2.890	2	6.060	Solids	23.8040 (VS_o)	Dry Weight (g)	1025.97
Bottom	2.893	3	6.085	Water	15.5255 (Vw_o)	Wet Unit Weight (pcf)	122.6
Avg.	2.8893 (D_o)	4	6.065	Voids	15.9837 (Vv_o)	Dry Unit Weight (pcf)	98.2
Area (in^2)	6.5567 (A_o)	Avg. (H_o)	6.0683	Degree of Saturation (%)	97.1 (S_o)		
Moisture Content (%)	24.8	Final Trimmings		Void Ratio	0.671		

Saturation

Set Up & Saturated: Wet xx Dry Set up By RC

Back Pressure Saturated to: 60 (psi) Final Pore Pressure Parameter B 0.97 Date 10-6-09

Panel Board Number B

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.1291	Initial	15.5 (in.)	Initial	16 (in.)	Specimen Height (in.)	6.0766 (H_s)
Final	0.1208	Final	10.9 (in.)	Final	14.03 (in.)	Area (in^2) Method A	6.5746 (A_s)
Change	0.0083 (ΔH_o)	Change	-4.60 (in.)	Change	-1.97 (in.)	Specimen Volume (in^3)	39.95 (V_s)

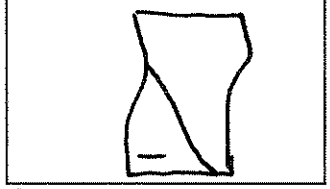
Consolidation

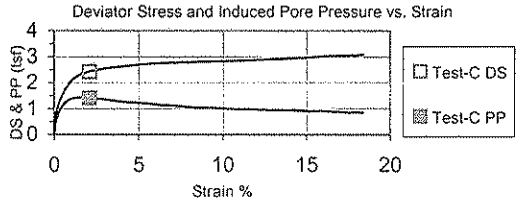
Height Readings (in.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.1208	Initial	1.32 (in.)	Initial	17.46 (in.)	Chamber	90
Final	0.1335	Final	5.20 (in.)	Final	13.56 (in.)	Back	60
Change	-0.0127 (ΔH_c)	Change	-3.88 (in.)	Change	-3.90 (in.)	Lateral	30 (σ_3)
Height (in.)	6.0639 (H_c)			Volume (in^3)	39.5931 (V_c)		
Area (in^3) Method B	6.5294 (A_c)			Volume - Water (in^3)	15.7891 (VWc)	D_{50} (min.)	0.813
Diameter (in.)	2.8833 (D_c)			Water Content (%)	25.2		
Dry Density (pcf)	98.7			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.663

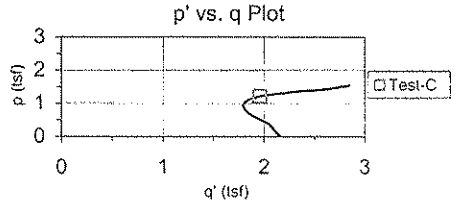
After Test

Final Measurements		Final Moisture Content		Stresses (membrane corrected) at Failure (psi)	
Maximum Diameter	3.424 (in.)	Wet Weight (g)	1284.72	Corrected Deviator	2.42 σ_d (tsf)
Wet weight (g)	1284.72 (WWf)	Dry Weight (g)	1025.97	Major Principal	3.17 $\sigma_1'_f$ (tsf)
Corrected Diameter	3.400 (in.)	Tare Weight (g)	0.00	Minor Principal	0.74 $\sigma_3'_f$ (tsf)
				Rate of Strain (% / min.)	0.254
Youngs Modulus for Membrane (psi)	200			Axial Strain at Failure (%)	2.10
Membrane Thickness (in.)	0.012			Failure Criterion:	Maximum Effective Principal Stress Ratio

Failure Sketch







Comments:

EM 1110-2-1906
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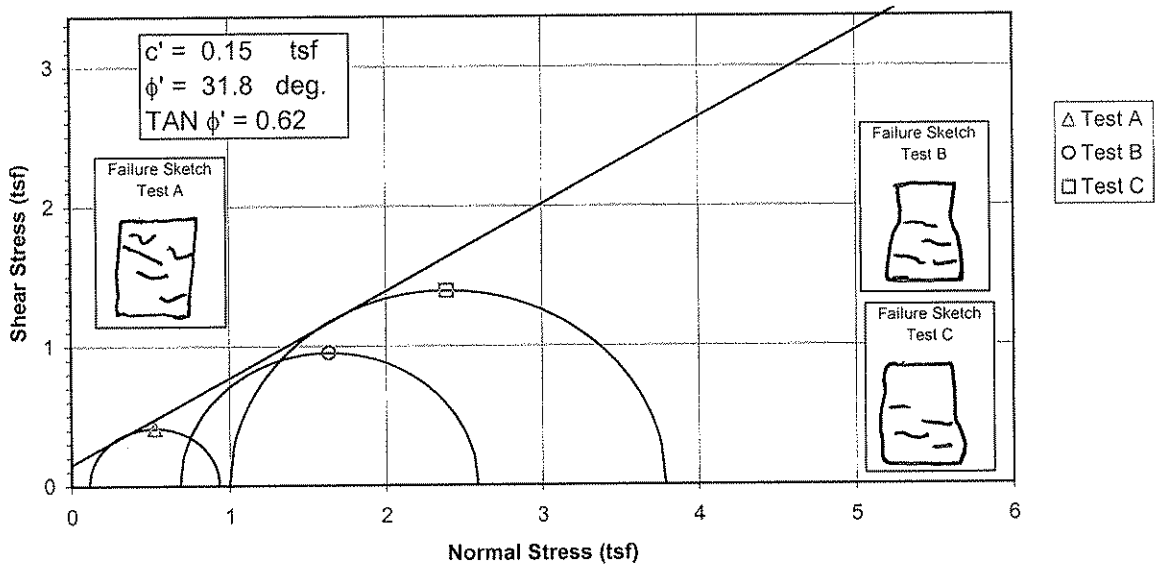
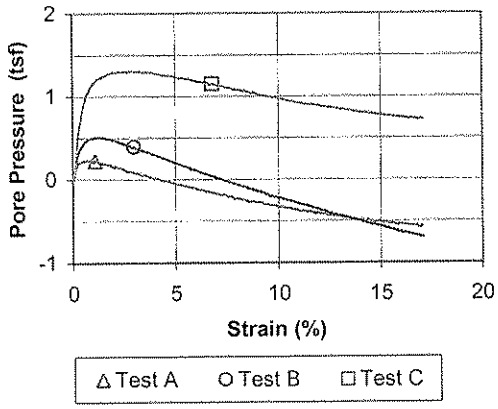
Failure Criterion: Maximum Effective Principal Stress Ratio

Effective Strength Envelope



Induced Pore Pressure vs. Strain



Specimen No.			A	B	C	
Initial Data	Water content %	W_o	21.7	21.6	23.0	
	Dry Density PCF	γ_{d_o}	104.1	103.2	102.6	
	Saturation %	S_o	96.9	94.3	98.9	
	Void Ratio	e_o	0.595	0.610	0.619	
After Shear	Water content %	W_f	22.3	19.5	19.8	
	Dry Density PCF	γ_{d_f}	104.2	109.3	108.8	
	Saturation %	S_f	100.0	100.0	100.0	
	Void Ratio	e_f	0.593	0.519	0.526	
	Final Back Pressure TSF	u_c	6.12	5.40	4.32	
Minor Principal Stress TSF @ failure		$\sigma_3'f$	0.12	0.69	1.00	
Maximum Deviator Stress (tsf) @ failure		$(\sigma_1'-\sigma_3')_{max}$	0.80	1.90	2.78	
Time to $(\sigma 1'-\sigma 3')$max min.		t_f	48.4	135.8	338.8	
Ultimate Deviator Stress, t/sq ft		$(\sigma 1'-\sigma 3')_{ult}$	n/a	n/a	n/a	
Initial Diameter, in.		D_o	2.891	2.882	2.889	
Initial Height, in.		H_o	6.005	6.018	6.004	

Controlled - Strain Test

Description of Specimens Lean Clay (CL), black, moist, firm

LL	PL	PI	Gs 2.66

Remarks:

Type of Specimen Undisturbed | Type of test R

Project Bull Run Fossil Plant (TVA)

Boring No. STN-51, 68, 62 | Sample No. 5

Depth Elev. 24.7'-25.2', 20.0'-20.5', 39.6'-40.1'

Laboratory Stantec | Date 11-19-09

TRIAXIAL COMPRESSION TEST REPORT

EM 1110-2-1906
Appendix X
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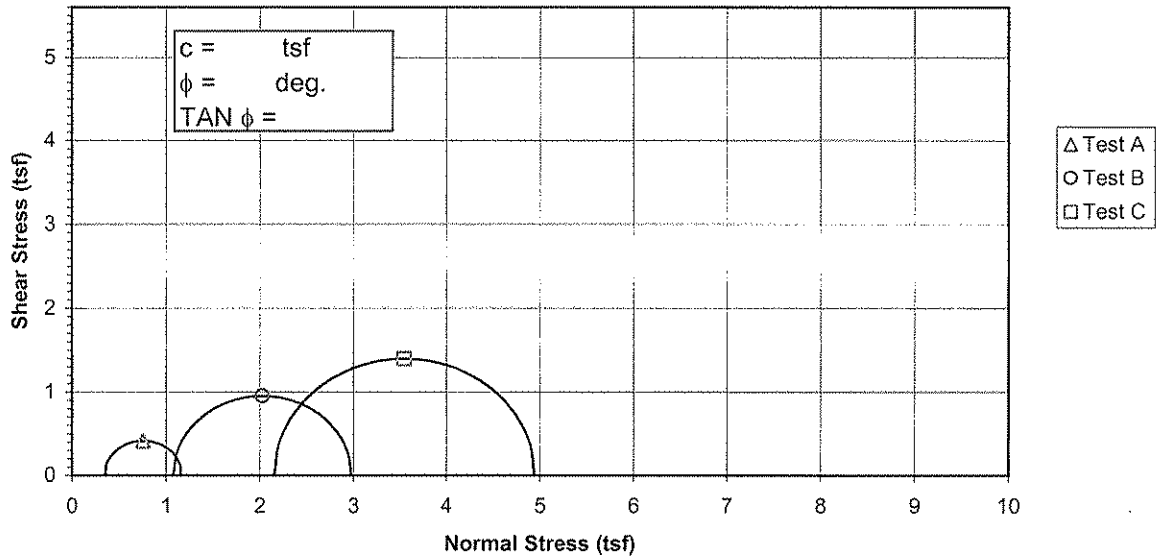
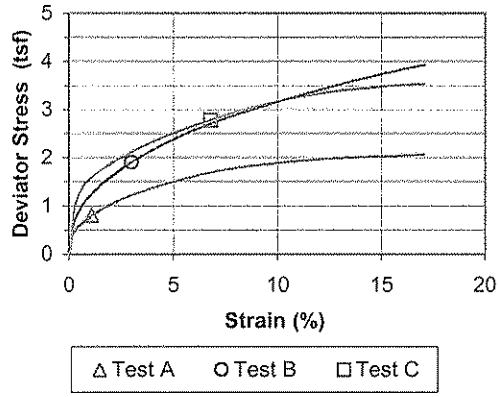
Failure Criterion: Maximum Effective Principal Stress Ratio

Total Strength Envelope



Deviator Stress vs. Strain



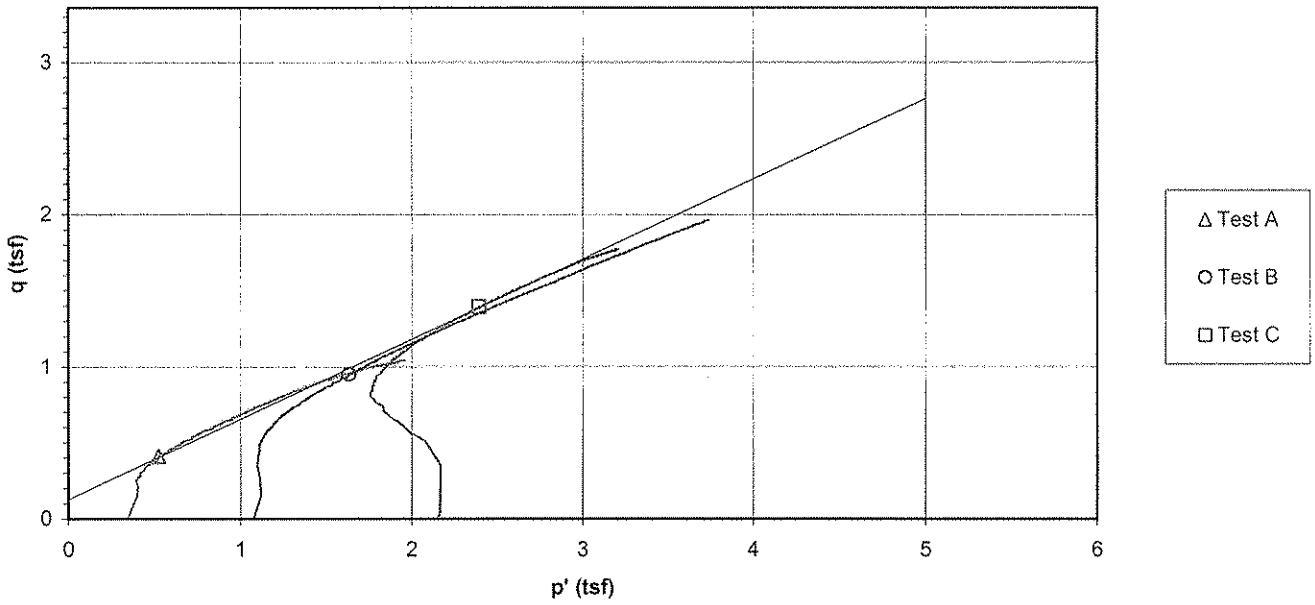
Specimen No.			A	B	C	
Initial Data	Water content %	W_o	21.7	21.6	23.0	
	Dry Density PCF	γ_{d_o}	104.1	103.2	102.6	
	Saturation %	S_o	96.9	94.3	98.9	
	Void Ratio	e_o	0.595	0.610	0.619	
After Shear	Water content %	W_f	22.3	19.5	19.8	
	Dry Density PCF	γ_{d_f}	104.2	109.3	108.8	
	Saturation %	S_f	100.0	100.0	100.0	
	Void Ratio	e_f	0.593	0.519	0.526	
	Final Back Pressure TSF	u_c	6.12	5.40	4.32	
Minor Principal Stress TSF		σ_3	0.36	1.08	2.16	
Maximum Deviator Stress (tsf) @ failure		$(\sigma_1-\sigma_3)_{max}$	0.80	1.90	2.78	
Time to $(\sigma_1-\sigma_3)_{Max.}$ min.		t_f	48.4	135.8	338.8	
Ultimate Deviator Stress, t/sq ft		$(\sigma_1-\sigma_3)_{ult}$	n/a	n/a	n/a	
Initial Diameter, in.		D_o	2.891	2.882	2.889	
Initial Height, in.		H_o	6.005	6.018	6.004	

Controlled - Strain Test					
Description of Specimens	Lean Clay (CL), black, moist, firm				
			Type of Specimen	Undisturbed	Type of test $\bar{R}$
LL	PL	PI	Gs 2.66	Project	Bull Run Fossil Plant (TVA)
Remarks:					
			Boring No.	STN-51, 68, 62	Sample No. 5
			Depth Elev.	24.7'-25.2', 20.0'-20.5', 39.6'-40.1'	
			Laboratory	FMSM Engineers	Date 11-19-09
			TRIAXIAL COMPRESSION TEST REPORT		

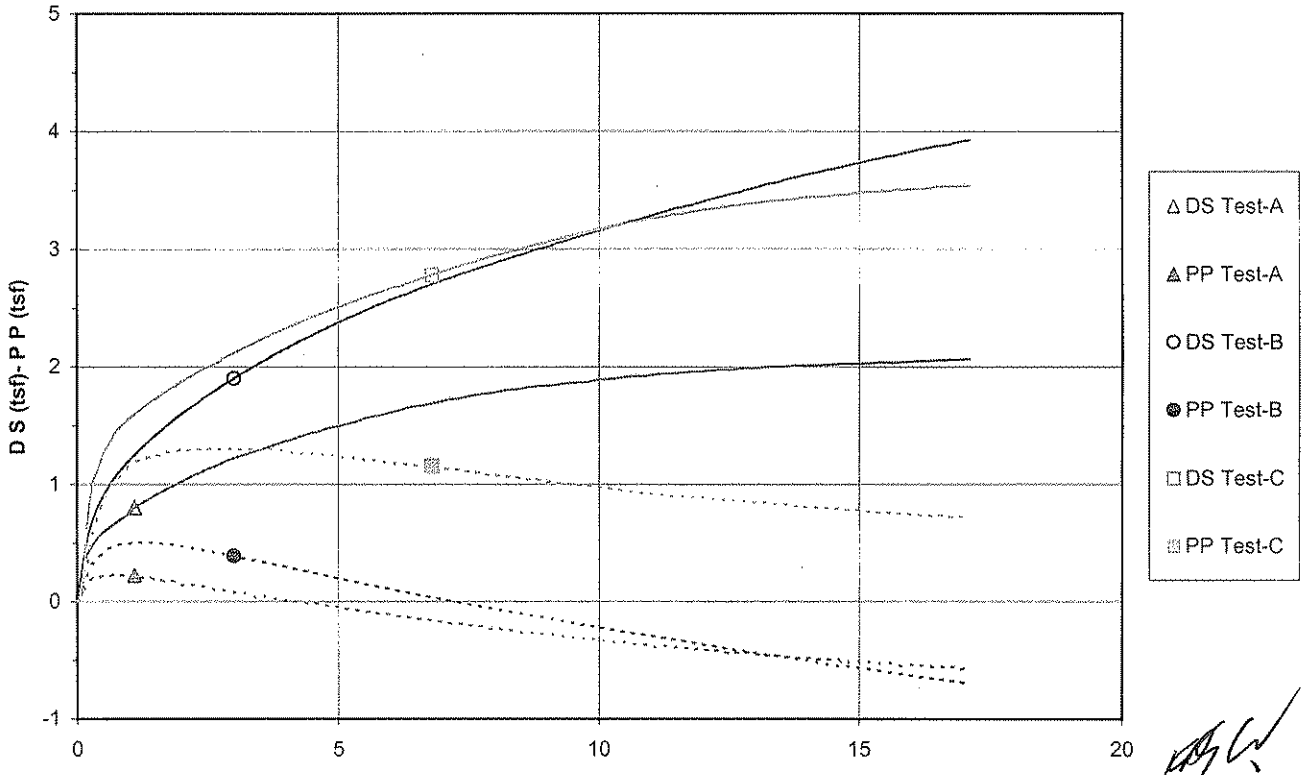
Consolidated Undrained Triaxial Test
EM 1110-2-1906 Appendix X

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Sample ID	STN - 51, 24.7'-25.2' & STN - 68, 20.0'-20.5' & STN - 62, 39.6'-40.1'	Test Number	5
Failure Criterion:	Maximum Effective Principal Stress Ratio	ϕ' = 31.8 deg.	c' = 0.15 tsf

p' vs. q Plot



Deviator Stress and Induced Pore Pressure vs. Axial Strain



Consolidated Undrained Triaxial Test

ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN - 51, 24.7'-25.2'	Test Number	CU-5A
Visual Description	Lean Clay (CL), black, moist, firm	Prepared By	CSM
Undisturbed	Source STN-51, 24.0'-26.0'	Date	7-22-2009

Specific Gravity: 2.66 ASTM D854 Method A | Liquid Limit: N/A | Plastic Limit: N/A | Plasticity Index: N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in^3)		Specimen	
Top	2.901	1	6.011	Sample	39.4647 (V_o)	Wet Weight (g)	1311.00
Middle	2.886	2	6.017	Solids	24.7175 (VS_o)	Dry Weight (g)	1077.49
Bottom	2.891	3	5.982	Water	14.2488 (Vw_o)	Wet Unit Weight (pcf)	126.5
Avg.	2.8927 (D_o)	4	6.011	Voids	14.7472 (Vv_o)	Dry Unit Weight (pcf)	104.0
Area (in^2)	6.5718 (A_o)	Avg. (H_o)	6.0051	Degree of Saturation (%)	96.6 (S_o)		
Moisture Content (%)	21.7	Final Trimmings		Void Ratio	0.597		

Saturation

Set Up & Saturated: Wet xx Dry ____ | Set up By: RC

Back Pressure Saturated to: 85 (psi) | Final Pore Pressure Parameter B: 0.96 | Date: 10-6-09

Panel Board Number: E

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.1349	Initial	15.76 (in.)	Initial	15.96 (in.)	Specimen Height (in.)	6.0052 (H_s)
Final	0.1348	Final	9.72 (in.)	Final	13.8 (in.)	Area (in^2) Method A	6.5721 (A_s)
Change	0.0001 (ΔH_o)	Change	-6.04 (in.)	Change	-2.16 (in.)	Specimen Volume (in^3)	39.47 (Vs)

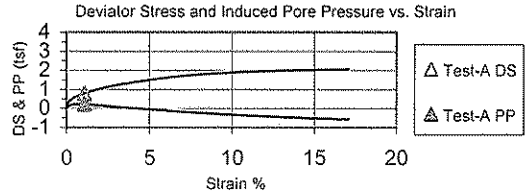
Consolidation

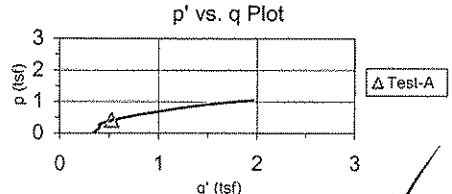
Height Readings (in.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.1348	Initial	1.19 (in.)	Initial	17.5 (in.)	Chamber	90
Final	0.1409	Final	2.35 (in.)	Final	16.18 (in.)	Back	85
Change	-0.0061 (ΔH_c)	Change	-1.16 (in.)	Change	-1.32 (in.)	Lateral	5 (σ_3)
Height (in.)	5.9991 (H_c)			Volume (in^3)	39.3745 (V_c)		
Area (in^3) Method B	6.5634 (A_c)			Volume - Water (in^3)	14.6570 (VWc)	t_{50} (min.)	14
Diameter (in.)	2.8908 (D_c)			Water Content (%)	22.3		
Dry Density (pcf)	104.2			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.593

After Test

Final Measurements			Final Moisture Content		Stresses (membrane corrected) at Failure (psi)	
Maximum Diameter	3.304 (in.)		Wet Weight (g)	1317.69	Corrected Deviator	0.80 σ_d (tsf)
Wet weight (g)	1317.69 (WWf)		Dry Weight (g)	1077.49	Major Principal	0.94 $\sigma_1'_f$ (tsf)
Corrected Diameter	3.280 (in.)		Tare Weight (g)	0.00	Minor Principal	0.12 $\sigma_3'_f$ (tsf)
					Rate of Strain (% / min.)	0.037
Youngs Modulus for Membrane (psi)	200				Axial Strain at Failure (%)	1.10
Membrane Thickness (in.)	0.012				Failure Criterion: Maximum Effective Principal Stress Ratio	

Failure Sketch





Comments:

Stantec

Consolidated Undrained Triaxial Test
ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN - 68, 20.0'-20.5'	Test Number	CU-5B
Visual Description	Lean Clay (CL), brown, moist, firm	Prepared By	CM
Undisturbed	Source STN-68, 20.0'-22.0'	Date	7-24-2009

Specific Gravity: 2.66 ASTM D854 Method A | Liquid Limit: N/A | Plastic Limit: N/A | Plasticity Index: N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in3)		Specimen	
Top	2.884	1	6.010	Sample	39.2755 (V_o)	Wet Weight (g)	1292.90
Middle	2.880	2	6.023	Solids	24.3846 (VS_o)	Dry Weight (g)	1062.98
Bottom	2.884	3	6.029	Water	14.0297 (Vw_o)	Wet Unit Weight (pcf)	125.4
Avg.	2.8827 (D_o)	4	6.010	Voids	14.8909 (Vv_o)	Dry Unit Weight (pcf)	103.1
Area (in^2)	6.5265 (A_o)	Avg. (H_o)	6.0179	Degree of Saturation (%)	94.2 (S_o)		
Moisture Content (%)	21.6	Final Trimmings		Void Ratio	0.611		

Saturation

Set Up & Saturated: Wet xx Dry ____ | Set up By: RC

Back Pressure Saturated to: 75 (psi) | Final Pore Pressure Parameter B: 0.98 | Date: 10-8-09

Panel Board Number: D

Height Readings (in.)		Back Pressure Burette			Chamber Burette				
Initial	0.1188	Initial	15.98	(in.)	Initial	15.82	(in.)	Specimen Height (in.)	6.0201 (H_s)
Final	0.1166	Final	13.19	(in.)	Final	12.44	(in.)	Area (in^2) Method A	6.5312 (A_s)
Change	0.0022 (ΔH_o)	Change	-2.79	(in.)	Change	-3.38	(in.)	Specimen Volume (in^3)	39.32 (V_s)

Consolidation

Height Readings (in.)		Back Pressure Burette Readings			Chamber Burette Readings			Pressures (psi)	
Initial	0.1166	Initial	0.88	(in.)	Initial	17.63	(in.)	Chamber	90
Final	0.1384	Final	3.84	(in.)	Final	14.69	(in.)	Back	75
Change	-0.0218 (ΔH_c)	Change	-2.96	(in.)	Change	-2.94	(in.)	Lateral	15 (σ_3)
Height (in.)	5.9983 (H_c)				Volume (in^3)	37.0463 (V_c)			
Area (in^3) Method B	6.1762 (A_c)				Volume - Water (in^3)	12.6617 (VWc)		D_{50} (min.)	13
Diameter (in.)	2.8042 (D_c)				Water Content (%)	19.5			
Dry Density (pcf)	109.3				Degree of Saturation (%)	100.0 (S_c)		Void Ratio	0.519

After Test

Final Measurements			Final Moisture Content	
Maximum Diameter	3.277 (in.)		Wet Weight (g)	1270.48
Wet weight (g)	1270.48 (WWf)		Dry Weight (g)	1062.98
Corrected Diameter	3.253 (in.)		Tare Weight (g)	0.00

Stresses (membrane corrected) at Failure (psi)

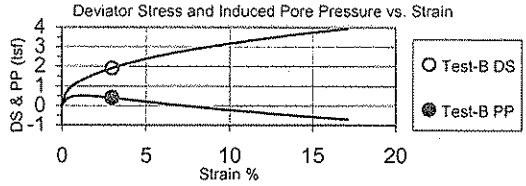
Corrected Deviator	1.90	σ_d (tsf)
Major Principal	2.59	$\sigma_1'_f$ (tsf)
Minor Principal	0.69	$\sigma_3'_f$ (tsf)
Rate of Strain (% / min.)	0.021	
Axial Strain at Failure (%)	3.00	

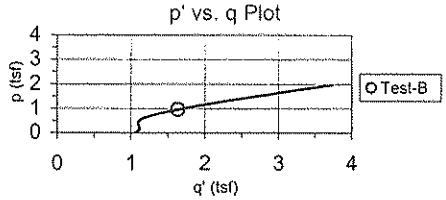
Youngs Modulus for Membrane (psi): 200

Membrane Thickness (in.): 0.012

Failure Criterion: Maximum Effective Principal Stress Ratio

Failure Sketch





Comments: ____

Stantec

Consolidated Undrained Triaxial Test
ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN - 62, 39.6'-40.1'	Test Number	CU-5C
Visual Description	Lean Clay with Sand (CL), brown, moist, firm	Prepared By	CM
Undisturbed	Source STN-62, 39.0'-41.0'	Date	7-23-2009

Specific Gravity 2.66 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in^3)		Specimen	
Top	2.890	1	5.995	Sample	39.3325 (V_o)	Wet Weight (g)	1303.5
Middle	2.892	2	6.025	Solids	24.3060 (VS_o)	Dry Weight (g)	1059.55
Bottom	2.882	3	6.004	Water	14.8857 (Vw_o)	Wet Unit Weight (pcf)	126.2
Avg.	2.8880 (D_o)	4	5.995	Voids	15.0266 (Vv_o)	Dry Unit Weight (pcf)	102.6
Area (in^2)	6.5506 (A_o)	Avg. (H_o)	6.0044	Degree of Saturation (%)	99.1 (S_o)		
Moisture Content (%)	23.0	Final Trimmings		Void Ratio	0.618		

Saturation

Set Up & Saturated: Wet xx Dry Set up By RC

Back Pressure Saturated to: 60 (psi) Final Pore Pressure Parameter B 0.98 Date 10-8-09

Panel Board Number E

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.1388	Initial	16.19 (in.)	Initial	16.03 (in.)	Specimen Height (in.)	6.0056 (H_s)
Final	0.1376	Final	14.1 (in.)	Final	13.28 (in.)	Area (in^2) Method A	6.5533 (A_s)
Change	0.0012 (ΔH_o)	Change	-2.09 (in.)	Change	-2.75 (in.)	Specimen Volume (in^3)	39.36 (V_s)

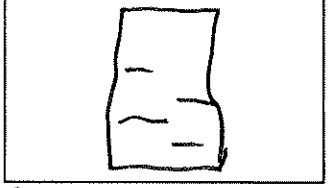
Consolidation

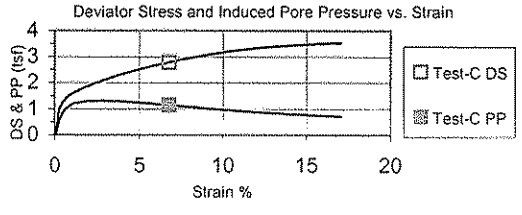
Height Readings (in.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.1376	Initial	1.37 (in.)	Initial	17.57 (in.)	Chamber	90
Final	0.1704	Final	9.49 (in.)	Final	9.11 (in.)	Back	60
Change	-0.0328 (ΔH_c)	Change	-8.12 (in.)	Change	-8.46 (in.)	Lateral	30 (σ_3)
Height (in.)	5.9728 (H_c)			Volume (in^3)	37.0938 (V_c)		
Area (in^3) Method B	6.2105 (A_c)			Volume - Water (in^3)	12.7878 (VWc)	D_{50} (min.)	16
Diameter (in.)	2.8120 (D_c)			Water Content (%)	19.8		
Dry Density (pcf)	108.8			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.526

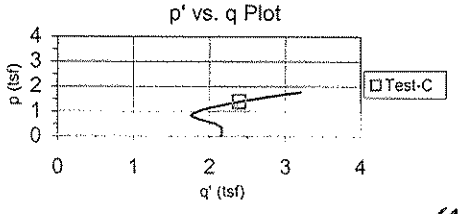
After Test

Final Measurements		Final Moisture Content		Stresses (membrane corrected) at Failure (psi)	
Maximum Diameter	3.275 (in.)	Wet Weight (g)	1269.12	Corrected Deviator	2.78 σ_d (tsf)
Wet weight (g)	1269.12 (WWf)	Dry Weight (g)	1059.55	Major Principal	3.79 $\sigma_1'_f$ (tsf)
Corrected Diameter	3.251 (in.)	Tare Weight (g)	0.00	Minor Principal	1.00 $\sigma_3'_f$ (tsf)
				Rate of Strain (% / min.)	0.021
Youngs Modulus for Membrane (psi)	200			Axial Strain at Failure (%)	6.80
Membrane Thickness (in.)	0.012			Failure Criterion:	Maximum Effective Principal Stress Ratio

Failure Sketch







Comments:

EM 1110-2-1906
Appendix X
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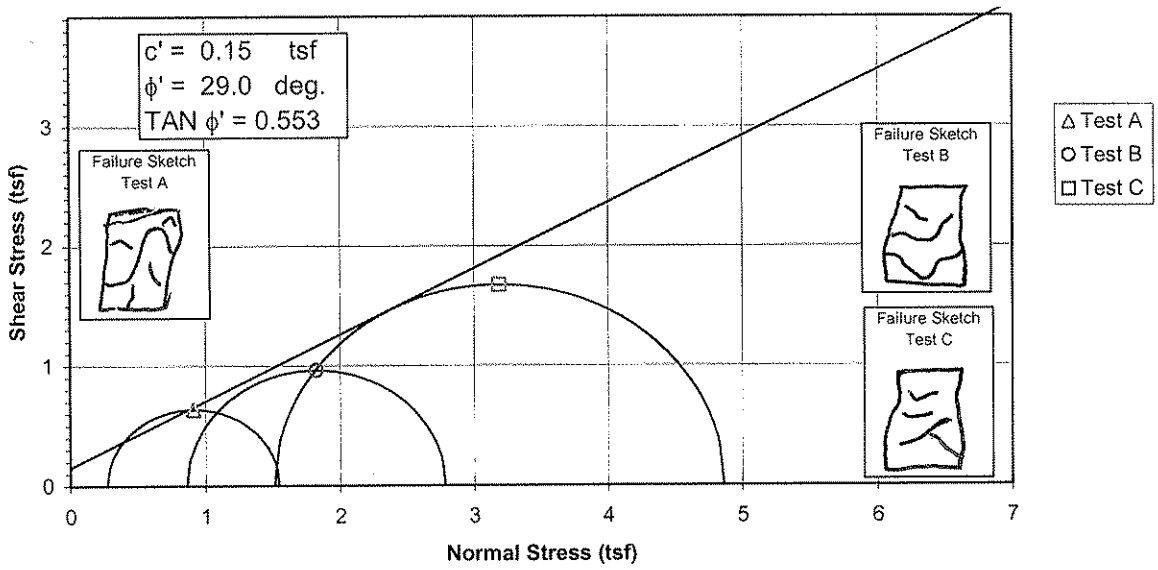
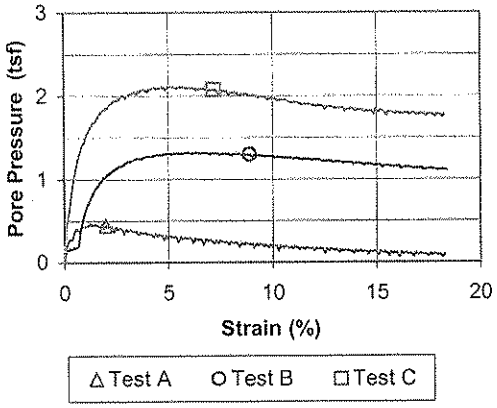
Failure Criterion: Maximum Effective Principal Stress Ratio

Effective Strength Envelope



Induced Pore Pressure vs. Strain



Specimen No.			A	B	C	
Initial Data	Water content %	W_o	28.2	30.0	26.8	
	Dry Density PCF	γ_{d_o}	93.7	91.0	94.5	
	Saturation %	S_o	95.4	95.2	92.5	
	Void Ratio	e_o	0.799	0.851	0.783	
After Shear	Water content %	W_f	28.0	26.2	23.5	
	Dry Density PCF	γ_{d_f}	95.9	98.7	103.1	
	Saturation %	S_f	100.0	100.0	100.0	
	Void Ratio	e_f	0.757	0.709	0.636	
	Final Back Pressure TSF	u_c	5.76	4.32	2.88	
Minor Principal Stress TSF @ failure		σ_3'f	0.28	0.87	1.52	
Maximum Deviator Stress (tsf) @ failure		$(\sigma_1'-\sigma_3')_{max}$	1.27	1.92	3.34	
Time to $(\sigma 1'-\sigma 3')$max min.		t_f	66.4	629.9	547.2	
Ultimate Deviator Stress, t/sq ft		$(\sigma 1'-\sigma 3')_{ult}$	n/a	n/a	n/a	
Initial Diameter, in.		D_o	2.878	2.890	2.887	
Initial Height, in.		H_o	6.000	6.003	5.994	

Controlled - Strain Test					
Description of Specimens	Lean Clay (CL), brown, moist, firm				
			Type of Specimen	Undisturbed	Type of test $\bar{R}$
LL	PL	PI	Gs 2.7	Project	Bull Run Fossil Plant (TVA)
Remarks:					
			Boring No.	STN-59	Sample No. 4
			Depth Elev.	12.6'-13.1', 19.1'-19.6', 19.7'-20.2'	
			Laboratory	Stantec	Date 10-19-09
			TRIAXIAL COMPRESSION TEST REPORT		

EM 1110-2-1906
Appendix X
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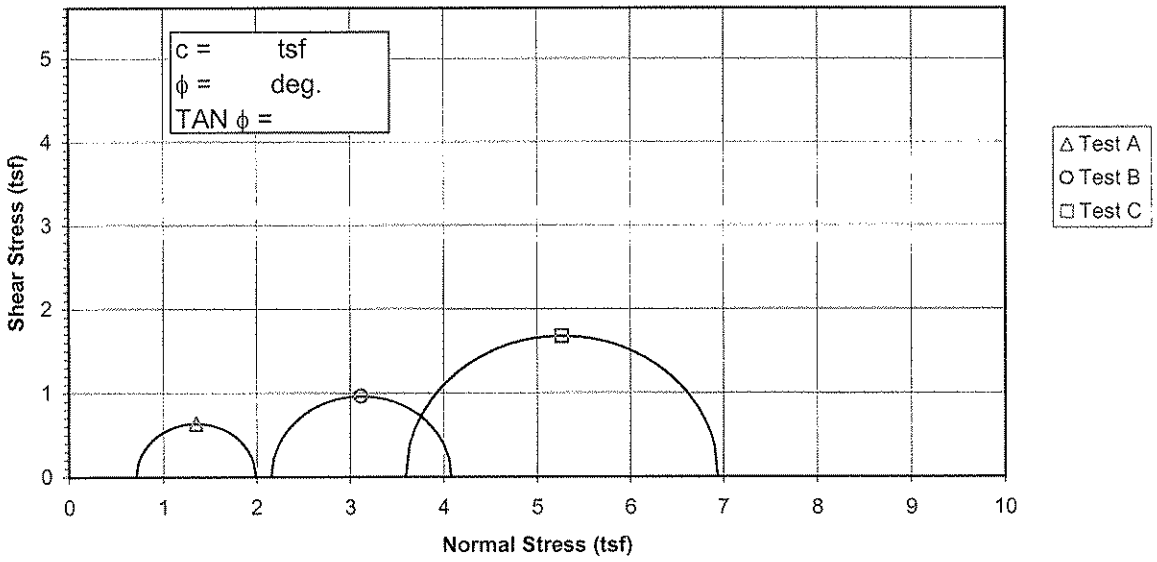
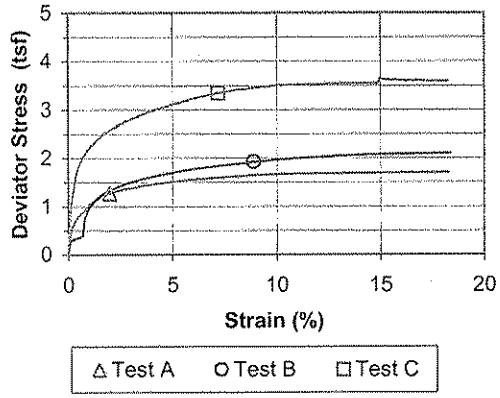
Failure Criterion: Maximum Effective Principal Stress Ratio

Total Strength Envelope



Deviator Stress vs. Strain



Specimen No.			A	B	C	
Initial Data	Water content %	W_o	28.2	30.0	26.8	
	Dry Density PCF	γ_{d_o}	93.7	91.0	94.5	
	Saturation %	S_o	95.4	95.2	92.5	
	Void Ratio	e_o	0.799	0.851	0.783	
After Shear	Water content %	W_f	28.0	26.2	23.5	
	Dry Density PCF	γ_{d_f}	95.9	98.7	103.1	
	Saturation %	S_f	100.0	100.0	100.0	
	Void Ratio	e_f	0.757	0.709	0.636	
	Final Back Pressure TSF	u_c	5.76	4.32	2.88	
Minor Principal Stress TSF		σ_3	0.72	2.16	3.60	
Maximum Deviator Stress (tsf) @ failure		$(\sigma_1-\sigma_3)_{max}$	1.27	1.92	3.34	
Time to $(\sigma_1-\sigma_3)_{Max.}$ min.		t_f	66.4	629.9	547.2	
Ultimate Deviator Stress, t/sq ft		$(\sigma_1-\sigma_3)_{ult}$	n/a	n/a	n/a	
Initial Diameter, in.		D_o	2.878	2.890	2.887	
Initial Height, in.		H_o	6.000	6.003	5.994	

Controlled - Strain Test

Description of Specimens Lean Clay (CL), brown, moist, firm

LL	PL	PI	Gs 2.7

Remarks:

Type of Specimen Undisturbed | Type of test $\bar{R}$

Project Bull Run Fossil Plant (TVA)

Boring No. STN-59 | Sample No. 4

Depth Elev. 12.6'-13.1', 19.1'-19.6', 19.7'-20.2'

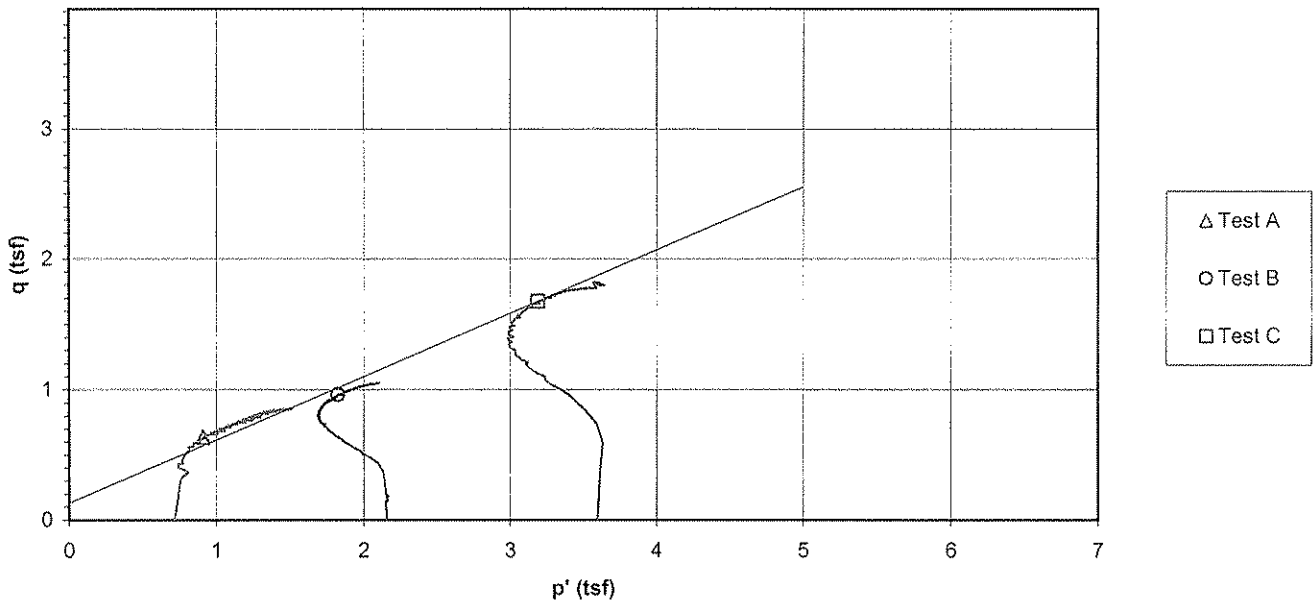
Laboratory Stantec | Date 10-19-09

TRIAXIAL COMPRESSION TEST REPORT

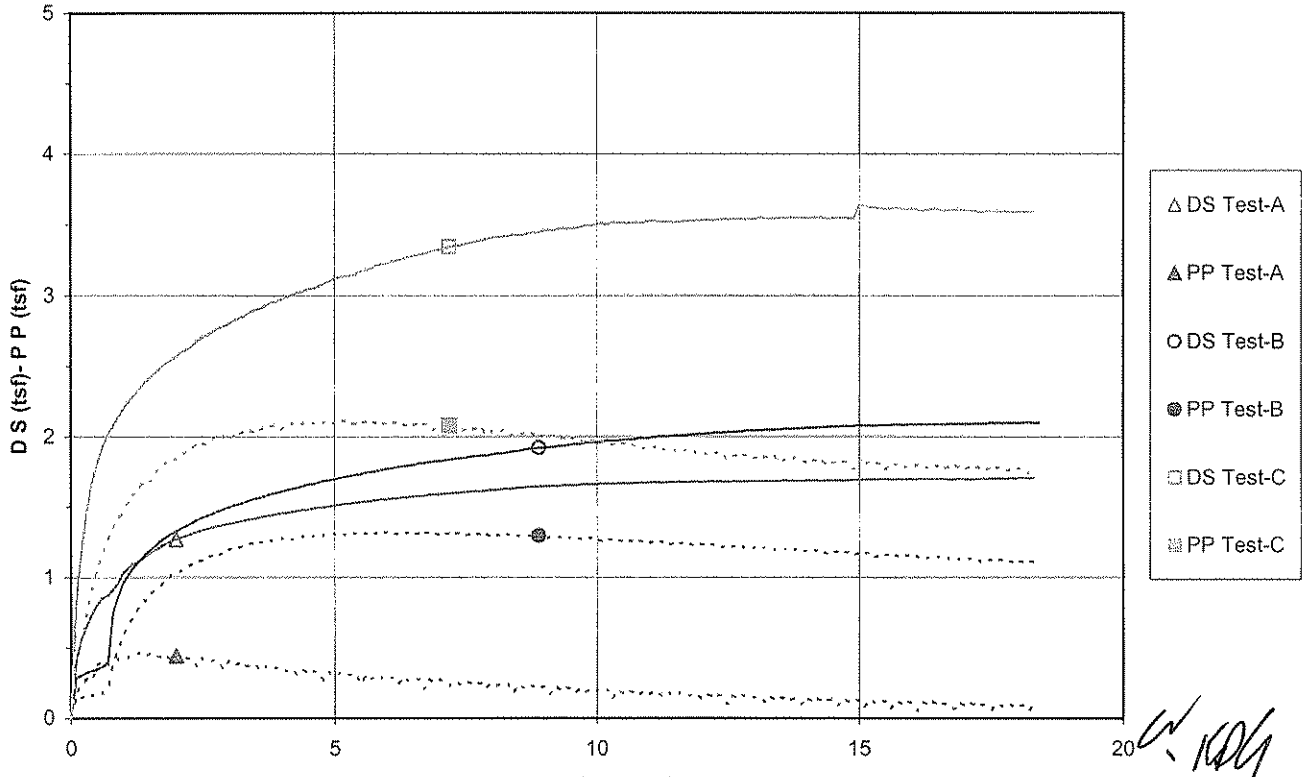
Consolidated Undrained Triaxial Test
EM 1110-2-1906 Appendix X

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Sample ID	STN - 59, 12.6'-13.1' & STN - 59, 19.1'-19.6' & STN - 59, 19.7'-20.2'	Test Number	4
Failure Criterion:	Maximum Effective Principal Stress Ratio	ϕ' = 29.0 deg.	c' = 0.15 tsf

p' vs. q Plot



Deviator Stress and Induced Pore Pressure vs. Axial Strain



Consolidated Undrained Triaxial Test

ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN - 59, 12.6'-13.1'	Test Number	CU-4A
Visual Description	Lean Clay (CL), brown, moist, firm	Prepared By	CSM
Undisturbed	Source STN-59, 12.5'-14.5'	Date	7-22-2009

Specific Gravity 2.70 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in^3)		Specimen	
Top	2.875	1	6.001	Sample	39.0125 (V_o)	Wet Weight (g)	1231.30
Middle	2.881	2	5.998	Solids	21.7030 (VS_o)	Dry Weight (g)	960.31
Bottom	2.876	3	5.999	Water	16.5358 (Vw_o)	Wet Unit Weight (pcf)	120.2
Avg.	2.8773 (D_o)	4	6.001	Voids	17.3095 (Vv_o)	Dry Unit Weight (pcf)	93.8
Area (in^2)	6.5023 (A_o)	Avg. (H_o)	5.9998	Degree of Saturation (%)	95.5 (S_o)		
Moisture Content (%)	28.2	Final Trimmings		Void Ratio	0.798		

Saturation

Set Up & Saturated: Wet xx Dry ____ Set up By RC

Back Pressure Saturated to: 80 (psi) Final Pore Pressure Parameter B 0.98 Date 10-6-09

Panel Board Number A

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.1207	Initial	15.73 (in.)	Initial	15.62 (in.)	Specimen Height (in.)	6.0003 (H_s)
Final	0.1202	Final	12.75 (in.)	Final	9.81 (in.)	Area (in^2) Method A	6.5034 (A_s)
Change	0.0005 (ΔH_o)	Change	-2.98 (in.)	Change	-5.81 (in.)	Specimen Volume (in^3)	39.02 (Vs)

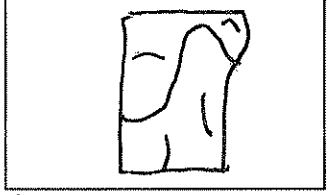
Consolidation

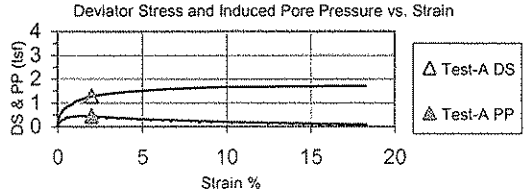
Height Readings (in.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.1202	Initial	1.27 (in.)	Initial	17.14 (in.)	Chamber	90
Final	0.1262	Final	3.19 (in.)	Final	14.82 (in.)	Back	80
Change	-0.0060 (ΔH_c)	Change	-1.92 (in.)	Change	-2.32 (in.)	Lateral	10 (σ_3)
Height (in.)	5.9943 (H_c)			Volume (in^3)	38.1259 (V_c)		
Area (in^3) Method B	6.3604 (A_c)			Volume - Water (in^3)	16.4230 (VWc)	t_{50} (min.)	17
Diameter (in.)	2.8458 (D_c)			Water Content (%)	28.0		
Dry Density (pcf)	96.0			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.757

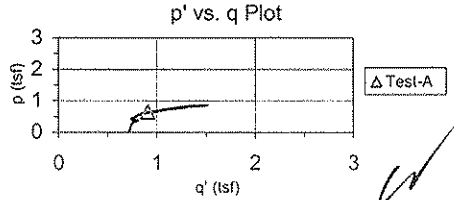
After Test

Final Measurements		Final Moisture Content		Stresses (membrane corrected) at Failure (psi)	
Maximum Diameter	3.324 (in.)	Wet Weight (g)	1229.45	Corrected Deviator	1.27 σ_d (tsf)
Wet weight (g)	1229.45 (WWf)	Dry Weight (g)	960.31	Major Principal	1.55 $\sigma_1'_f$ (tsf)
Corrected Diameter	3.300 (in.)	Tare Weight (g)	0.00	Minor Principal	0.28 $\sigma_3'_f$ (tsf)
				Rate of Strain (% / min.)	0.026
Youngs Modulus for Membrane (psi)	200			Axial Strain at Failure (%)	2.00
Membrane Thickness (in.)	0.012			Failure Criterion:	Maximum Effective Principal Stress Ratio

Failure Sketch







Comments:

Consolidated Undrained Triaxial Test

ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)			Project Number	172679015
Sample Identification	STN - 59, 19.1'-19.6'			Test Number	CU-4B
Visual Description	Lean Clay (CL), brown, moist, firm			Prepared By	CSM
Undisturbed	Source STN-59, 19.0'-21.0'			Date	7-22-2009
Specific Gravity	2.70 ASTM D854 Method A	Liquid Limit	N/A	Plastic Limit N/A	Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in3)		Specimen	
Top	2.888	1	6.002	Sample	39.3483 (V_o)	Wet Weight (g)	1223.30
Middle	2.892	2	6.007	Solids	21.2653 (VS_o)	Dry Weight (g)	940.94
Bottom	2.887	3	6.001	Water	17.2294 (Vw_o)	Wet Unit Weight (pcf)	118.4
Avg.	2.8890 (D_o)	4	6.002	Voids	18.0830 (Vv_o)	Dry Unit Weight (pcf)	91.1
Area (in^2)	6.5552 (A_o)	Avg. (H_o)	6.0026	Degree of Saturation (%)	95.3 (S_o)		
Moisture Content (%)	30.0	Final Trimmings		Void Ratio	0.850		

Saturation

Set Up & Saturated: Wet xx Dry ____ Set up By RC

Back Pressure Saturated to: 60 (psi) Final Pore Pressure Parameter B 0.97 Date 10-7-09

Panel Board Number B

Height Readings (in.)		Back Pressure Burette			Chamber Burette				
Initial	0.1135	Initial	15.93	(in.)	Initial	15.69	(in.)	Specimen Height (in.)	6.0062 (H_s)
Final	0.1099	Final	14.43	(in.)	Final	13.52	(in.)	Area (in^2) Method A	6.5630 (A_s)
Change	0.0036 (ΔH_o)	Change	-1.50	(in.)	Change	-2.17	(in.)	Specimen Volume (in^3)	39.42 (V_s)

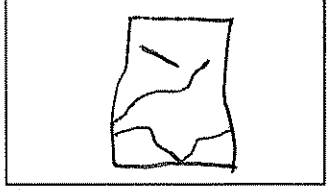
Consolidation

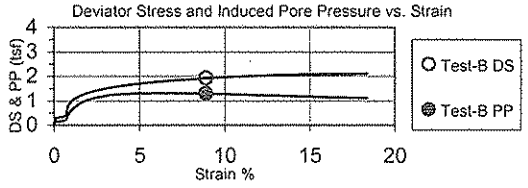
Height Readings (in.)		Back Pressure Burette Readings			Chamber Burette Readings			Pressures (psi)	
Initial	0.1099	Initial	1.30	(in.)	Initial	17.4	(in.)	Chamber	90
Final	0.1908	Final	12.94	(in.)	Final	5.86	(in.)	Back	60
Change	-0.0809 (ΔH_c)	Change	-11.64	(in.)	Change	-11.54	(in.)	Lateral	30 (σ_3)
Height (in.)	5.9253 (H_c)				Volume (in^3)	36.3328 (V_c)			
Area (in^3) Method B	6.1318 (A_c)				Volume - Water (in^3)	15.0675 (VWc)		D_{50} (min.)	100
Diameter (in.)	2.7941 (D_c)				Water Content (%)	26.2			
Dry Density (pcf)	98.7				Degree of Saturation (%)	100.0 (S_c)		Void Ratio	0.709

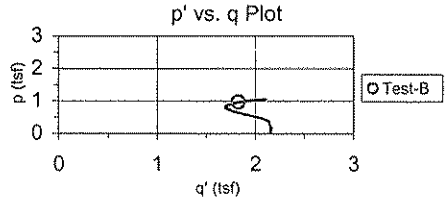
After Test

Final Measurements			Final Moisture Content		Stresses (membrane corrected) at Failure (psi)	
Maximum Diameter	3.273 (in.)		Wet Weight (g)	1187.87	Corrected Deviator	1.92 σ_d (tsf)
Wet weight (g)	1187.87 (WWf)		Dry Weight (g)	940.94	Major Principal	2.79 $\sigma_1'_f$ (tsf)
Corrected Diameter	3.249 (in.)		Tare Weight (g)	0.00	Minor Principal	0.87 $\sigma_3'_f$ (tsf)
					Rate of Strain (% / min.)	0.014
Youngs Modulus for Membrane (psi)	200				Axial Strain at Failure (%)	8.90
Membrane Thickness (in.)	0.012				Failure Criterion:	Maximum Effective Principal Stress Ratio

Failure Sketch







Comments: ____

Stantec

Consolidated Undrained Triaxial Test
ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN - 59, 19.7'-20.2'	Test Number	CU-4C
Visual Description	Lean Clay (CL), brown, moist, firm	Prepared By	CSM
Undisturbed	Source STN-59, 19.0'-21.0'	Date	7-22-2009

Specific Gravity 2.70 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in^3)		Specimen	
Top	2.890	1	6.019	Sample	39.2638 (V_o)	Wet Weight (g)	1234.8
Middle	2.884	2	5.967	Solids	22.0063 (VS_o)	Dry Weight (g)	973.73
Bottom	2.890	3	5.972	Water	15.9306 (Vw_o)	Wet Unit Weight (pcf)	119.8
Avg.	2.8880 (D_o)	4	6.019	Voids	17.2575 (Vv_o)	Dry Unit Weight (pcf)	94.5
Area (in^2)	6.5506 (A_o)	Avg. (H_o)	5.9939	Degree of Saturation (%)	92.3 (S_o)		
Moisture Content (%)	26.8	Final Trimmings		Void Ratio	0.784		

Saturation

Set Up & Saturated: Wet xx Dry Set up By RC

Back Pressure Saturated to: 40 (psi) Final Pore Pressure Parameter B 0.95 Date 10-8-09

Panel Board Number A

Height Readings (in.)		Back Pressure Burette			Chamber Burette				
Initial	0.1285	Initial	16.34	(in.)	Initial	15.64	(in.)	Specimen Height (in.)	5.9930 (H_s)
Final	0.1294	Final	14.35	(in.)	Final	12.28	(in.)	Area (in^2) Method A	6.5487 (A_s)
Change	-0.0009 (ΔH_o)	Change	-1.99	(in.)	Change	-3.36	(in.)	Specimen Volume (in^3)	39.25 (V_s)

Consolidation

Height Readings (in.)		Back Pressure Burette Readings			Chamber Burette Readings			Pressures (psi)	
Initial	0.1294	Initial	1.21	(in.)	Initial	17.54	(in.)	Chamber	90
Final	0.2303	Final	14.73	(in.)	Final	1.89	(in.)	Back	40
Change	-0.1009 (ΔH_c)	Change	-13.52	(in.)	Change	-15.65	(in.)	Lateral	50 (σ_3)
Height (in.)	5.8921 (H_c)				Volume (in^3)	35.9927 (V_c)			
Area (in^3) Method B	6.1087 (A_c)				Volume - Water (in^3)	13.9865 (VWc)		D_{50} (min.)	130
Diameter (in.)	2.7889 (D_c)				Water Content (%)	23.5			
Dry Density (pcf)	103.1				Degree of Saturation (%)	100.0 (S_c)		Void Ratio	0.636

After Test

Final Measurements			Final Moisture Content	
Maximum Diameter	3.27	(in.)	Wet Weight (g)	1202.94
Wet weight (g)	1202.94	(WWf)	Dry Weight (g)	973.73
Corrected Diameter	3.246	(in.)	Tare Weight (g)	0.00

Stresses (membrane corrected) at Failure (psi)

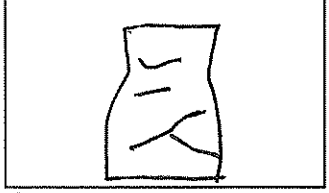
Corrected Deviator	3.34	σ_d (tsf)
Major Principal	4.86	$\sigma_1'_f$ (tsf)
Minor Principal	1.52	$\sigma_3'_f$ (tsf)
Rate of Strain (% / min.)	0.015	
Axial Strain at Failure (%)	7.20	

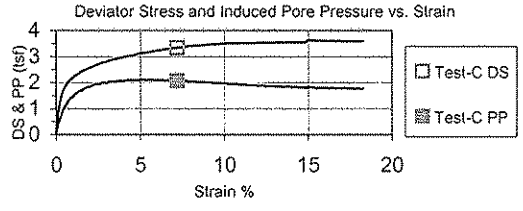
Youngs Modulus for Membrane (psi) 200

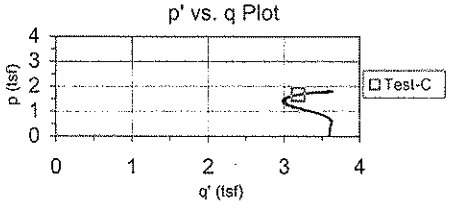
Membrane Thickness (in.) 0.012

Failure Criterion: Maximum Effective Principal Stress Ratio

Failure Sketch







Comments:

EM 1110-2-1906
Appendix X
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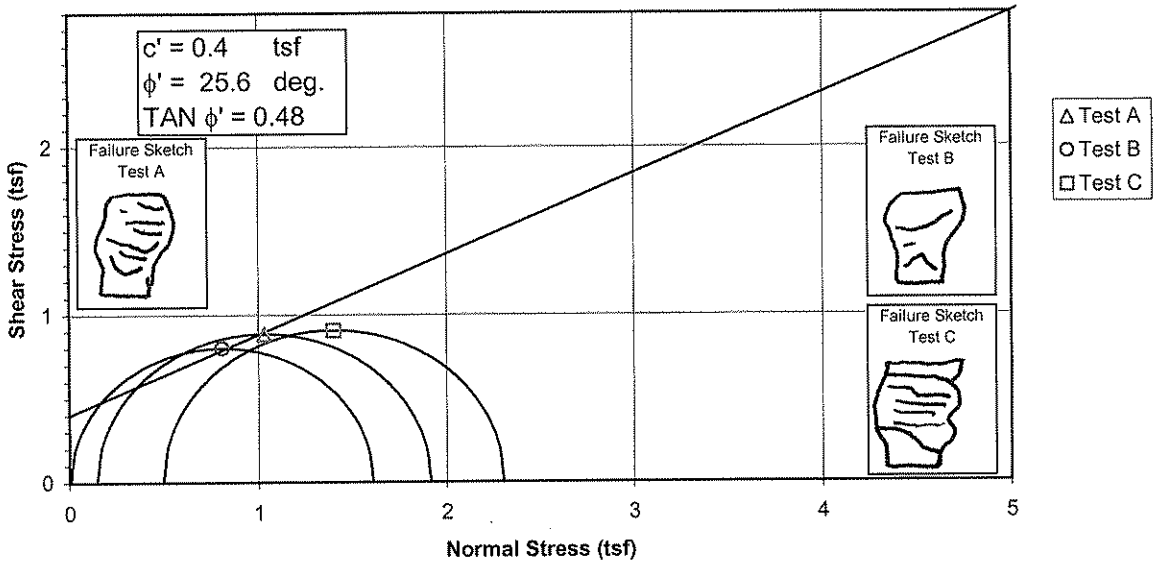
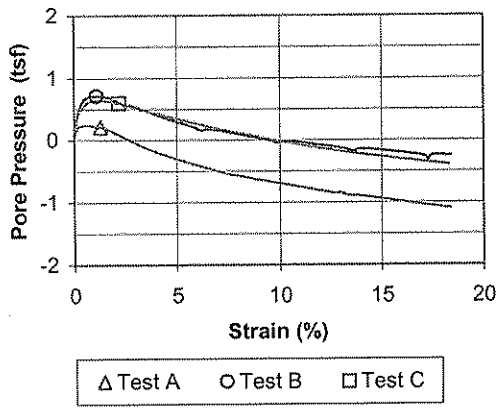
Failure Criterion: Maximum Effective Principal Stress Ratio

Effective Strength Envelope



Induced Pore Pressure vs. Strain



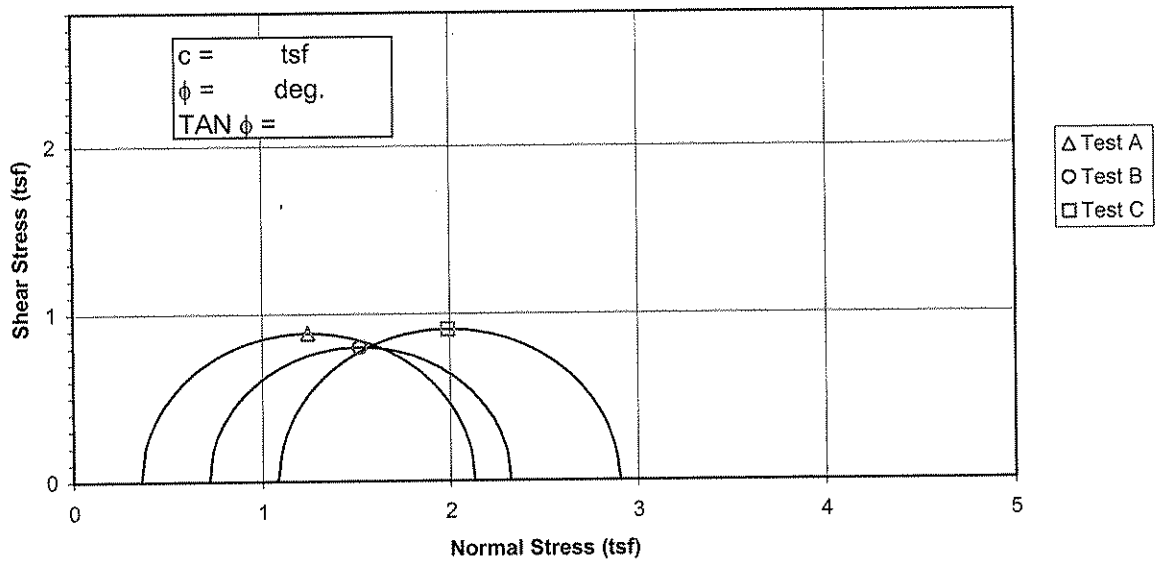
Specimen No.			A	B	C	
Initial Data	Water content %	W_o	21.3	23.9	22.1	
	Dry Density PCF	γ_{d_o}	102.5	101.7	103.4	
	Saturation %	S_o	89.2	98.1	94.8	
	Void Ratio	e_o	0.644	0.658	0.630	
After Shear	Water content %	W_f	23.1	24.5	21.8	
	Dry Density PCF	γ_{d_f}	103.8	101.4	106.1	
	Saturation %	S_f	100.0	100.0	100.0	
	Void Ratio	e_f	0.624	0.662	0.589	
	Final Back Pressure TSF	u_c	6.12	5.76	5.40	
Minor Principal Stress TSF @ failure		$\sigma_3'f$	0.15	0.01	0.49	
Maximum Deviator Stress (tsf) @ failure		$(\sigma_1'-\sigma_3')_{max}$	1.77	1.60	1.82	
Time to (σ1'-σ3')max min.		t_f	2.3	2.9	89.4	
Ultimate Deviator Stress, t/sq ft		$(\sigma 1'-\sigma 3')_{ult}$	n/a	n/a	n/a	
Initial Diameter, in.		D_o	2.892	2.889	2.880	
Initial Height, in.		H_o	6.046	6.049	6.010	

Controlled - Strain Test					
Description of Specimens	Lean Clay with Gravel (CL), brown, moist, firm				
				Type of Specimen Undisturbed	Type of test $\bar{R}$
LL	PL	PI	Gs 2.7	Project	Bull Run Fossil Plant (TVA)
Remarks:					
				Boring No. STN-62, STN-68	Sample No. 9
				Depth Elev.	4.5'-5.0', 9.5'-10.0', 9.0'-9.5'
				Laboratory Stantec	Date 10-27-09
				TRIAXIAL COMPRESSION TEST REPORT	

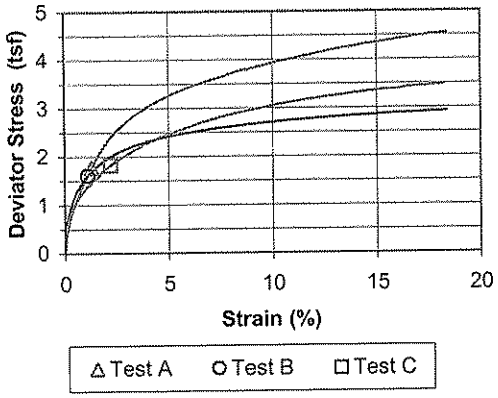
EM 1110-2-1906
Appendix X
30 Nov. 70

Failure Criterion: Maximum Effective Principal Stress Ratio

Total Strength Envelope



Deviator Stress vs. Strain



Specimen No.			A	B	C	
Initial Data	Water content %	W_o	21.3	23.9	22.1	
	Dry Density PCF	γ_{d_o}	102.5	101.7	103.4	
	Saturation %	S_o	89.2	98.1	94.8	
	Void Ratio	e_o	0.644	0.658	0.630	
After Shear	Water content %	W_f	23.1	24.5	21.8	
	Dry Density PCF	γ_{d_f}	103.8	101.4	106.1	
	Saturation %	S_f	100.0	100.0	100.0	
	Void Ratio	e_f	0.624	0.662	0.589	
	Final Back Pressure TSF	u_c	6.12	5.76	5.40	
Minor Principal Stress TSF		σ_3	0.36	0.72	1.08	
Maximum Deviator Stress (tsf) @ failure		$(\sigma_1-\sigma_3)_{max}$	1.77	1.60	1.82	
Time to $(\sigma_1-\sigma_3)_{Max.}$ min.		t_f	2.3	2.9	89.4	
Ultimate Deviator Stress, t/sq ft		$(\sigma_1-\sigma_3)_{ult}$	n/a	n/a	n/a	
Initial Diameter, in.		D_o	2.892	2.889	2.880	
Initial Height, in.		H_o	6.046	6.049	6.010	

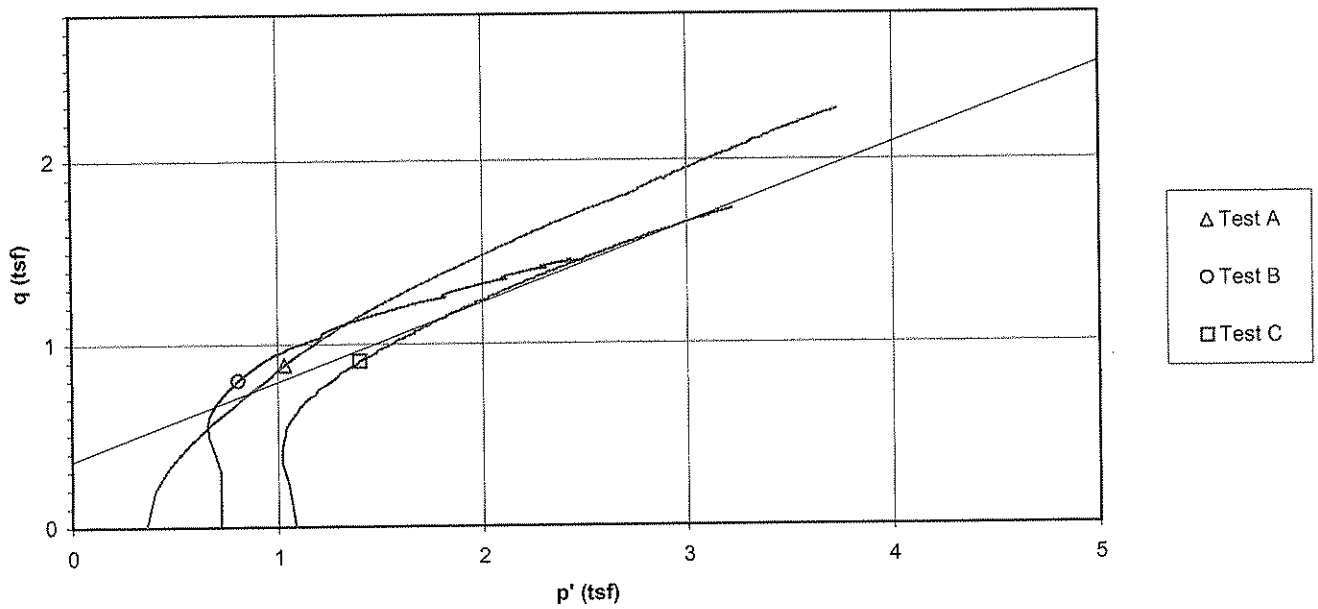
Controlled - Strain Test					
Description of Specimens	Lean Clay with Gravel (CL), brown, moist, firm				
			Type of Specimen	Undisturbed	Type of test $\bar{R}$
LL	PL	PI	Gs 2.7	Project	Bull Run Fossil Plant (TVA)
Remarks:					
			Boring No.	STN-62, STN-68	Sample No. 9
			Depth Elev.	4.5'-5.0', 9.5'-10.0', 9.0'-9.5'	
			Laboratory	Stantec	Date 10-27-09
			TRIAXIAL COMPRESSION TEST REPORT		

KDG

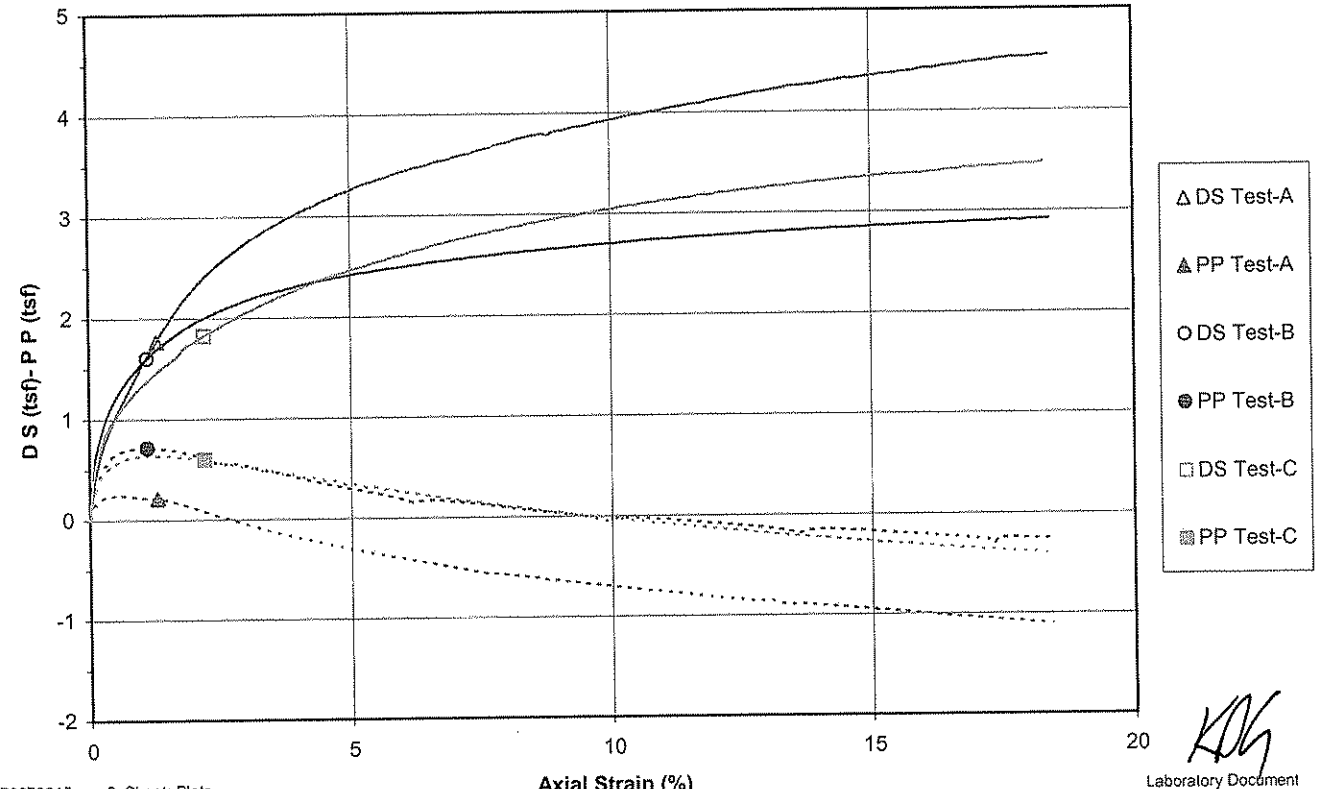
Consolidated Undrained Triaxial Test
EM 1110-2-1906 Appendix X

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Sample ID	STN-62, 4.5'-5.0' & STN-62, 9.5'-10.0' & STN-68, 9.0'-9.5'	Test Number	9
Failure Criterion:	Maximum Effective Principal Stress Ratio	ϕ' = 25.6 deg.	c' = 0.40 tsf

p' vs. q Plot



Deviator Stress and Induced Pore Pressure vs. Axial Strain



File: 172679015_cu_9 Sheet: Plots
Preparation Date: 1998
Revision Date: 1-2008

Stantec Consulting Services Inc.

Laboratory Document
Prepared By: MW
Approved BY: TLK

Stantec

Consolidated Undrained Triaxial Test
ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN-62, 4.5'-5.0'	Test Number	CU-9A
Visual Description	Lean Clay with Gravel (CL), brown, moist, firm	Prepared By	CM
Undisturbed	Source STN-62, 4.5'-6.5'	Date	7-23-2009

Specific Gravity 2.70 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in^3)		Specimen	
Top	2.899	1	6.051	Sample	39.7158 (V_o)	Wet Weight (g)	1296.00
Middle	2.890	2	6.053	Solids	24.1509 (VS_o)	Dry Weight (g)	1068.63
Bottom	2.887	3	6.030	Water	13.8744 (Vw_o)	Wet Unit Weight (pcf)	124.3
Avg.	2.8920 (D_o)	4	6.051	Voids	15.5649 (Vv_o)	Dry Unit Weight (pcf)	102.5
Area (in^2)	6.5688 (A_o)	Avg. (H_o)	6.0461	Degree of Saturation (%)	89.1 (S_o)		
Moisture Content (%)	21.3 Final Trimmings			Void Ratio	0.644		

Saturation

Set Up & Saturated: Wet xx Dry ____ Set up By RC

Back Pressure Saturated to: 85 (psi) Final Pore Pressure Parameter B 0.97 Date 10-22-09

Panel Board Number B

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.1244	Initial	16.6 (in.)	Initial	15.8 (in.)	Specimen Height (in.)	6.0543 (H_s)
Final	0.1162	Final	10.32 (in.)	Final	13.23 (in.)	Area (in^2) Method A	6.5866 (A_s)
Change	0.0082 (ΔH_o)	Change	-6.28 (in.)	Change	-2.57 (in.)	Specimen Volume (in^3)	39.88 (Vs)

Consolidation

Height Readings (in.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.1162	Initial	1.59 (in.)	Initial	17.45 (in.)	Chamber	90
Final	0.1197	Final	2.30 (in.)	Final	16.74 (in.)	Back	85
Change	-0.0035 (ΔH_c)	Change	-0.71 (in.)	Change	-0.71 (in.)	Lateral	5 (σ_3)
Height (in.)	6.0508 (H_c)			Volume (in^3)	39.2176 (V_c)		
Area (in^3) Method B	6.4814 (A_c)			Volume - Water (in^3)	15.0667 (VWc)	t_{50} (min.)	0.336
Diameter (in.)	2.8727 (D_c)			Water Content (%)	23.1		
Dry Density (pcf)	103.8			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.624

After Test

Final Measurements		Final Moisture Content	
Maximum Diameter	3.352 (in.)	Wet Weight (g)	1315.54
Wet weight (g)	1315.54 (WWf)	Dry Weight (g)	1068.63
Corrected Diameter	3.328 (in.)	Tare Weight (g)	0.00

Stresses (membrane corrected) at Failure (psi)

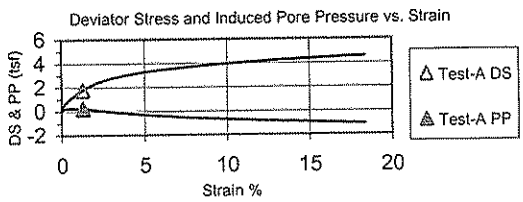
Corrected Deviator	1.77 σ_d (tsf)
Major Principal	1.92 $\sigma_1'_f$ (tsf)
Minor Principal	0.15 $\sigma_3'_f$ (tsf)
Rate of Strain (% / min.)	0.597
Axial Strain at Failure (%)	1.30

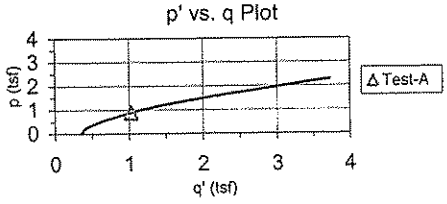
Youngs Modulus for Membrane (psi) 200

Membrane Thickness (in.) 0.012

Failure Criterion: Maximum Effective Principal Stress Ratio

Failure Sketch





Comments:

Stantec

Consolidated Undrained Triaxial Test
ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN-62, 9.5'-10.0'	Test Number	CU-9B
Visual Description	Fat Clay (CH), brown, moist, firm	Prepared By	CM
Undisturbed	Source STN-62, 9.5'-11.5'	Date	7-23-2009

Specific Gravity 2.70 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in3)		Specimen	
Top	2.882	1	6.070	Sample	39.6316 (V_o)	Wet Weight (g)	1311.10
Middle	2.890	2	6.035	Solids	23.9158 (VS_o)	Dry Weight (g)	1058.22
Bottom	2.893	3	6.021	Water	15.4306 (Vw_o)	Wet Unit Weight (pcf)	126.0
Avg.	2.8883 (D_o)	4	6.070	Voids	15.7157 (Vv_o)	Dry Unit Weight (pcf)	101.7
Area (in^2)	6.5522 (A_o)	Avg. (H_o)	6.0486	Degree of Saturation (%)	98.2 (S_o)		
Moisture Content (%)	23.9 Final Trimmings			Void Ratio	0.657		

Saturation

Set Up & Saturated: Wet xx Dry ____ Set up By RC

Back Pressure Saturated to: 80 (psi) Final Pore Pressure Parameter B 0.96 Date 10-22-09

Panel Board Number A

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.109	Initial	16.7 (in.)	Initial	15.71 (in.)	Specimen Height (in.)	6.0498 (H_s)
Final	0.1078	Final	13.86 (in.)	Final	10.21 (in.)	Area (in^2) Method A	6.5548 (A_s)
Change	0.0012 (ΔH_o)	Change	-2.84 (in.)	Change	-5.50 (in.)	Specimen Volume (in^3)	39.66 (V_s)

Consolidation

Height Readings (in.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.1078	Initial	1.22 (in.)	Initial	17.4 (in.)	Chamber	90
Final	0.1126	Final	1.90 (in.)	Final	16.5 (in.)	Back	80
Change	-0.0048 (ΔH_c)	Change	-0.68 (in.)	Change	-0.90 (in.)	Lateral	10 (σ_3)
Height (in.)	6.0450 (H_c)			Volume (in^3)	39.7595 (V_c)		
Area (in^3) Method B	6.5772 (A_c)			Volume - Water (in^3)	15.8437 (VWc)	D_{50} (min.)	0.773
Diameter (in.)	2.8939 (D_c)			Water Content (%)	24.5		
Dry Density (pcf)	101.4			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.662

After Test

Final Measurements		Final Moisture Content	
Maximum Diameter	3.521 (in.)	Wet Weight (g)	1317.87
Wet weight (g)	1317.87 (WWf)	Dry Weight (g)	1058.22
Corrected Diameter	3.497 (in.)	Tare Weight (g)	0.00

Stresses (membrane corrected) at Failure (psi)

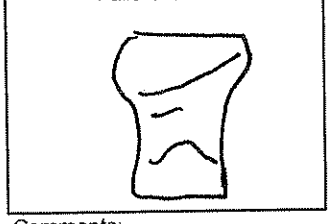
Corrected Deviator	1.60 σ_d (tsf)
Major Principal	1.61 $\sigma_1'_f$ (tsf)
Minor Principal	0.01 $\sigma_3'_f$ (tsf)
Rate of Strain (% / min.)	0.365
Axial Strain at Failure (%)	1.11

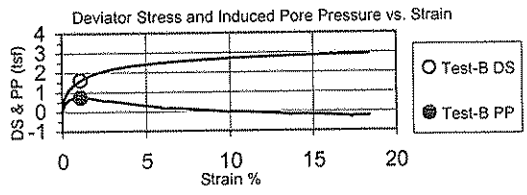
Youngs Modulus for Membrane (psi) 200

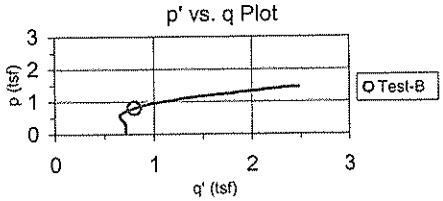
Membrane Thickness (in.) 0.012

Failure Criterion: Maximum Effective Principal Stress Ratio

Failure Sketch







Comments:

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Consolidated Undrained Triaxial Test
ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN-68, 9.0'-9.5'	Test Number	CU-9C
Visual Description	Lean Clay (CL), brown, moist, firm	Prepared By	CM
Undisturbed	Source STN-68, 9.0'-11.0'	Date	7-23-2009

Specific Gravity 2.70 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in^3)		Specimen	
Top	2.879	1	6.011	Sample	39.1302 (V_o)	Wet Weight (g)	1297.4
Middle	2.880	2	6.014	Solids	24.0102 (VS_o)	Dry Weight (g)	1062.40
Bottom	2.879	3	6.004	Water	14.3399 (Vw_o)	Wet Unit Weight (pcf)	126.3
Avg.	2.8793 (D_o)	4	6.011	Voids	15.1200 (Vv_o)	Dry Unit Weight (pcf)	103.4
Area (in^2)	6.5114 (A_o)	Avg. (H_o)	6.0095	Degree of Saturation (%)	94.8 (S_o)		
Moisture Content (%)	22.1	Final Trimmings		Void Ratio	0.630		

Saturation

Set Up & Saturated: Wet xx Dry ____ Set up By RC

Back Pressure Saturated to: 75 (psi) Final Pore Pressure Parameter B 0.98 Date 10-22-09

Panel Board Number B

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.1133	Initial	16.66 (in.)	Initial	16.44 (in.)	Specimen Height (in.)	6.0163 (H_s)
Final	0.1065	Final	13.34 (in.)	Final	15.03 (in.)	Area (in^2) Method A	6.5261 (A_s)
Change	0.0068 (ΔH_o)	Change	-3.32 (in.)	Change	-1.41 (in.)	Specimen Volume (in^3)	39.26 (V_s)

Consolidation

Height Readings (in.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.1065	Initial	1.03 (in.)	Initial	17.56 (in.)	Chamber	90
Final	0.1116	Final	4.05 (in.)	Final	14.18 (in.)	Back	75
Change	-0.0051 (ΔH_c)	Change	-3.02 (in.)	Change	-3.38 (in.)	Lateral	15 (σ_3)
Height (in.)	6.0112 (H_c)			Volume (in^3)	38.1524 (V_c)		
Area (in^3) Method B	6.3469 (A_c)			Volume - Water (in^3)	14.1422 (VWc)	D_{50} (min.)	17
Diameter (in.)	2.8427 (D_c)			Water Content (%)	21.8		
Dry Density (pcf)	106.1			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.589

After Test

Final Measurements		Final Moisture Content	
Maximum Diameter	3.362 (in.)	Wet Weight (g)	1294.16
Wet weight (g)	1294.16 (WWf)	Dry Weight (g)	1062.40
Corrected Diameter	3.338 (in.)	Tare Weight (g)	0.00

Stresses (membrane corrected) at Failure (psi)

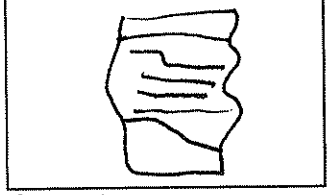
Corrected Deviator	1.82 σ_d (tsf)
Major Principal	2.31 $\sigma_1'_f$ (tsf)
Minor Principal	0.49 $\sigma_3'_f$ (tsf)
Rate of Strain (% / min.)	0.025
Axial Strain at Failure (%)	2.20

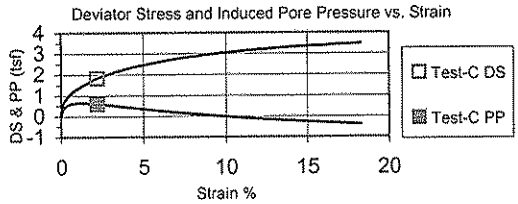
Youngs Modulus for Membrane (psi) 200

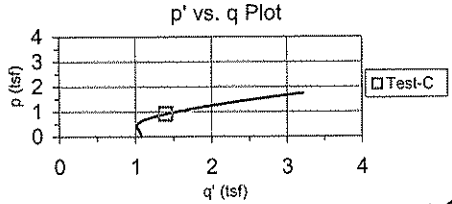
Membrane Thickness (in.) 0.012

Failure Criterion: Maximum Effective Principal Stress Ratio

Failure Sketch







Comments:

Consolidated Undrained Triaxial Test
EM 1110-2-1906 Appendix X

Consolidation Values			Final Values					
Height	6.051 (in.)	15.369 (cm)	Height	4.937 (in.)	Tested By	RC	Project Number	172679015
Diameter	2.873 (in)	7.297 (cm)	Dia. avg.	3.219 (in)	Date	10-22-09	Test Number	CU-9A
Area	6.482 (in^2)	41.818 (cm^2)	Area avg.	8.140 (in^2)	Press No.	1	Data File ID	9A
					Panel No.	B	Lateral Pressure (psi)	5.0
							Chamber Pressure - σ_3 (psi)	90

Clock Time (min.)	Load (lbf)	Deflection Dial Reading (in.)	Pore Pressure Reading (psi)	Corrected Hieght (in.)	Strain (%)	Corrected Area (cm^2)	Corrected Load (lbf)	Deviator Stress (tsf)	Corrected Deviator Stress* (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p' $(\sigma_1'+\sigma_3')/2$ (tsf)	q $(\sigma_1-\sigma_3)/2$ (tsf)	Effective Principal Stress Ratio σ_1' / σ_3'
0:00:00	-0.1	-0.023	85.0	6.051	0.00	41.8178	0.0	0.000	0.000	0.360	0.360	0.360	0.360	0.000	0.999
0:00:21	35.5	-0.016	87.1	6.045	0.10	41.8604	35.6	0.396	0.396	0.756	0.603	0.208	0.405	0.198	2.905
0:00:33	56.8	-0.010	87.9	6.038	0.21	41.9066	57.0	0.632	0.632	0.992	0.783	0.152	0.468	0.316	5.157
0:00:41	69.2	-0.004	88.1	6.032	0.30	41.9449	69.3	0.768	0.768	1.128	0.901	0.133	0.517	0.384	6.759
0:00:51	81.5	0.002	88.3	6.026	0.41	41.9892	81.6	0.904	0.903	1.263	1.025	0.123	0.574	0.451	8.350
0:01:01	92.6	0.008	88.4	6.020	0.51	42.0329	92.7	1.026	1.024	1.384	1.141	0.117	0.629	0.512	9.721
0:01:11	102.3	0.015	88.4	6.014	0.61	42.0761	102.4	1.132	1.131	1.491	1.247	0.116	0.681	0.565	10.736
0:01:21	111.5	0.021	88.4	6.008	0.71	42.1188	111.6	1.232	1.230	1.590	1.349	0.119	0.734	0.615	11.379
0:01:31	120.4	0.027	88.2	6.002	0.81	42.1605	120.6	1.330	1.328	1.688	1.455	0.128	0.791	0.664	11.411
0:01:40	128.4	0.032	88.2	5.996	0.90	42.1996	128.5	1.416	1.414	1.774	1.543	0.129	0.836	0.707	11.957
0:01:50	137.8	0.038	88.1	5.990	1.01	42.2425	137.9	1.518	1.516	1.876	1.653	0.137	0.895	0.758	12.037
0:02:00	146.2	0.045	87.9	5.984	1.11	42.2870	146.3	1.609	1.607	1.967	1.754	0.148	0.951	0.803	11.881
0:02:09	154.4	0.051	88.0	5.978	1.21	42.3295	154.5	1.697	1.694	2.054	1.839	0.145	0.992	0.847	12.717
0:02:18	161.4	0.056	88.0	5.972	1.30	42.3697	161.6	1.773	1.770	2.130	1.917	0.147	1.032	0.885	13.038
0:02:29	170.7	0.063	87.8	5.965	1.41	42.4166	170.8	1.873	1.870	2.230	2.027	0.158	1.092	0.935	12.862
0:02:38	177.0	0.068	87.6	5.960	1.50	42.4547	177.1	1.940	1.936	2.296	2.105	0.169	1.137	0.968	12.422
0:02:48	184.5	0.074	87.5	5.954	1.60	42.4990	184.7	2.020	2.017	2.377	2.199	0.183	1.191	1.008	12.033
0:02:58	191.5	0.080	87.3	5.948	1.70	42.5420	191.6	2.095	2.091	2.451	2.287	0.197	1.242	1.045	11.628
0:03:08	198.4	0.087	87.1	5.942	1.80	42.5857	198.5	2.168	2.163	2.523	2.375	0.212	1.293	1.082	11.218
0:03:17	204.3	0.093	86.8	5.935	1.91	42.6314	204.5	2.230	2.226	2.586	2.454	0.229	1.341	1.113	10.729
0:03:27	210.5	0.099	86.6	5.929	2.01	42.6774	210.6	2.295	2.290	2.650	2.536	0.247	1.391	1.145	10.280
0:03:36	215.9	0.105	86.4	5.923	2.10	42.7167	216.0	2.352	2.347	2.707	2.608	0.262	1.435	1.173	9.968
0:03:46	221.0	0.111	86.1	5.917	2.21	42.7612	221.1	2.404	2.399	2.759	2.679	0.280	1.479	1.199	9.573
0:03:56	225.7	0.117	85.9	5.911	2.30	42.8037	225.8	2.453	2.448	2.808	2.746	0.299	1.522	1.224	9.197
0:04:06	230.4	0.123	85.6	5.905	2.41	42.8495	230.6	2.502	2.496	2.856	2.812	0.316	1.564	1.248	8.910
0:04:14	234.4	0.129	85.4	5.899	2.50	42.8910	234.5	2.543	2.537	2.897	2.866	0.329	1.597	1.268	8.704
0:04:26	239.4	0.136	85.2	5.893	2.61	42.9394	239.5	2.594	2.587	2.947	2.934	0.347	1.640	1.294	8.466
0:04:34	242.6	0.141	85.0	5.887	2.70	42.9787	242.7	2.626	2.619	2.979	2.981	0.362	1.671	1.310	8.239
0:04:44	246.6	0.147	84.7	5.881	2.80	43.0237	246.8	2.667	2.660	3.020	3.040	0.380	1.710	1.330	7.999
0:04:55	250.5	0.154	84.5	5.875	2.91	43.0717	250.6	2.706	2.699	3.059	3.094	0.395	1.744	1.349	7.829
0:05:04	254.5	0.160	84.3	5.869	3.01	43.1156	254.6	2.746	2.738	3.098	3.148	0.410	1.779	1.369	7.675
0:05:14	257.8	0.166	84.1	5.863	3.11	43.1599	257.9	2.778	2.771	3.131	3.198	0.427	1.812	1.385	7.488
0:05:24	260.9	0.172	83.8	5.857	3.21	43.2050	261.1	2.810	2.802	3.162	3.246	0.445	1.845	1.401	7.303
0:05:34	264.4	0.178	83.6	5.851	3.31	43.2486	264.5	2.844	2.836	3.196	3.296	0.460	1.878	1.418	7.162
0:05:43	267.2	0.183	83.4	5.845	3.40	43.2903	267.4	2.872	2.864	3.224	3.335	0.472	1.903	1.432	7.070
0:05:53	270.4	0.189	83.3	5.839	3.50	43.3358	270.5	2.903	2.895	3.255	3.380	0.486	1.933	1.447	6.955
0:06:03	273.3	0.196	83.1	5.832	3.61	43.3839	273.5	2.931	2.922	3.282	3.423	0.500	1.961	1.461	6.842
0:06:13	276.7	0.202	82.9	5.826	3.71	43.4293	276.8	2.964	2.955	3.315	3.467	0.512	1.990	1.477	6.766
0:06:22	279.3	0.208	82.7	5.820	3.81	43.4742	279.5	2.989	2.980	3.340	3.506	0.526	2.016	1.490	6.664
0:06:31	281.5	0.214	82.5	5.815	3.90	43.5160	281.7	3.010	3.000	3.360	3.541	0.540	2.041	1.500	6.551
0:06:41	285.0	0.220	82.4	5.809	4.00	43.5621	285.1	3.043	3.034	3.394	3.584	0.550	2.067	1.517	6.514
0:06:51	287.7	0.226	82.2	5.802	4.11	43.6109	287.8	3.069	3.059	3.419	3.622	0.564	2.093	1.529	6.425
0:06:59	289.8	0.232	82.0	5.797	4.20	43.6514	290.0	3.089	3.079	3.439	3.653	0.575	2.114	1.539	6.358
0:07:09	292.2	0.238	81.8	5.790	4.31	43.7009	292.3	3.110	3.100	3.460	3.689	0.589	2.139	1.550	6.263
0:07:18	294.9	0.244	81.7	5.785	4.40	43.7427	295.0	3.136	3.125	3.485	3.723	0.598	2.160	1.563	6.228
0:07:28	297.9	0.250	81.5	5.778	4.51	43.7906	298.0	3.165	3.154	3.514	3.763	0.609	2.186	1.577	6.178
0:07:38	300.1	0.256	81.3	5.772	4.61	43.8387	300.2	3.184	3.173	3.533	3.796	0.623	2.209	1.586	6.093
0:07:46	302.3	0.262	81.2	5.766	4.70	43.8811	302.5	3.205	3.194	3.554	3.826	0.632	2.229	1.597	6.050
0:07:56	305.0	0.268	81.1	5.760	4.81	43.9291	305.1	3.230	3.218	3.578	3.860	0.642	2.251	1.609	6.011
0:08:06	306.8	0.274	80.9	5.754	4.91	43.9766	307.0	3.246	3.234	3.594	3.889	0.655	2.272	1.617	5.937
0:08:15	308.7	0.280	80.7	5.748	5.00	44.0191	308.9	3.263	3.251	3.611	3.918	0.668	2.293	1.625	5.869
0:08:25	311.6	0.286	80.6	5.742	5.10	44.0673	311.8	3.290	3.277	3.637	3.953	0.676	2.315	1.639	5.848
0:08:34	314.0	0.293	80.5	5.736	5.21	44.1163	314.1	3.311	3.299	3.659	3.986	0.687	2.337	1.649	5.798
0:08:44	316.4	0.299	80.3	5.729	5.31	44.1646	316.5	3.333	3.320	3.680	4.016	0.697	2.357	1.660	5.763
0:08:53	317.5	0.304	80.1	5.724	5.40	44.2069	317.7	3.341	3.328	3.688	4.038	0.709	2.373	1.664	5.692
0:09:03	319.7	0.311	80.0	5.718	5.51	44.2550	319.9	3.361	3.348	3.708	4.066	0.718	2.392	1.674	5.659
0:09:13	321.9	0.317	79.9	5.711	5.61	44.3024	322.0	3.380	3.366	3.726	4.093	0.728	2.410	1.683	5.627
0:09:23	323.5	0.323	79.7	5.705	5.71	44.3506	323.7	3.393	3.380	3.740	4.119	0.739	2.429	1.690	5.570
0:09:31	325.5	0.329	79.6	5.700	5.80	44.3942	325.6	3.410	3.397	3.757	4.145	0.749	2.447	1.698	5.534
0:09:41	327.9	0.335	79.5	5.693	5.91	44.4438	328.0	3.432	3.418	3.778	4.176	0.758	2.467	1.709	5.509

Consolidated Undrained Triaxial Test
EM 1110-2-1906 Appendix X

Consolidation Values		
Height	6.051 (in.)	15.369 (cm)
Diameter	2.873 (in)	7.297 (cm)
Area	6.482 (in^2)	41.818 (cm^2)

Final Values	
Height	4.937 (in.)
Dia. avg.	3.219 (in)
Area avg.	8.140 (in^2)

Tested By	RC
Date	10-22-09
Press No.	1
Panel No.	B

Project Number	172679015
Test Number	CU-9A
Data File ID	9A
Lateral Pressure (psi)	5.0
Chamber Pressure - σ_3 (psi)	90

Clock Time (min.)	Load (lbf)	Deflection Dial Reading (in.)	Pore Pressure Reading (psi)	Corrected Hieght (in.)	Strain (%)	Corrected Area (cm^2)	Corrected Load (lbf)	Deviator Stress (tsf)	Corrected Deviator Stress* (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p' $(\sigma_1'+\sigma_3')/2$ (tsf)	q $(\sigma_1-\sigma_3)/2$ (tsf)	Effective Principal Stress Ratio σ_1'/σ_3'
0:09:51	329.7	0.341	79.4	5.687	6.01	44.4931	329.8	3.447	3.433	3.793	4.199	0.767	2.483	1.716	5.477
0:10:00	331.2	0.347	79.2	5.682	6.10	44.5359	331.3	3.460	3.445	3.805	4.221	0.777	2.499	1.722	5.435
0:10:10	333.4	0.353	79.1	5.675	6.21	44.5860	333.6	3.479	3.464	3.824	4.247	0.784	2.516	1.732	5.420
0:10:20	334.8	0.359	79.0	5.669	6.31	44.6349	335.0	3.490	3.474	3.834	4.270	0.795	2.532	1.737	5.368
0:10:29	336.2	0.365	78.8	5.663	6.41	44.6802	336.4	3.501	3.485	3.845	4.289	0.804	2.547	1.743	5.334
0:10:39	337.7	0.371	78.7	5.657	6.50	44.7262	337.8	3.512	3.496	3.856	4.311	0.815	2.563	1.748	5.288
0:10:50	340.2	0.378	78.5	5.651	6.61	44.7785	340.3	3.534	3.518	3.878	4.343	0.824	2.583	1.759	5.267
0:11:00	341.7	0.383	78.4	5.645	6.71	44.8235	341.8	3.546	3.530	3.890	4.362	0.832	2.597	1.765	5.244
0:11:12	343.3	0.390	78.3	5.639	6.81	44.8747	343.4	3.559	3.542	3.902	4.384	0.842	2.613	1.771	5.204
0:11:21	344.4	0.395	78.1	5.633	6.91	44.9204	344.5	3.567	3.550	3.910	4.405	0.855	2.630	1.775	5.150
0:11:31	346.6	0.401	78.0	5.627	7.00	44.9665	346.7	3.585	3.569	3.929	4.430	0.862	2.646	1.784	5.139
0:11:42	348.7	0.407	77.9	5.621	7.11	45.0170	348.8	3.603	3.586	3.946	4.457	0.871	2.664	1.793	5.117
0:11:52	350.2	0.413	77.8	5.615	7.20	45.0632	350.3	3.615	3.598	3.958	4.480	0.882	2.681	1.799	5.079
0:12:03	351.4	0.420	77.5	5.609	7.31	45.1156	351.6	3.623	3.606	3.966	4.502	0.897	2.699	1.803	5.021
0:12:13	353.6	0.426	77.5	5.603	7.41	45.1627	353.7	3.642	3.624	3.984	4.527	0.903	2.715	1.812	5.012
0:12:23	355.4	0.431	77.4	5.597	7.50	45.2098	355.5	3.657	3.638	3.998	4.549	0.910	2.729	1.819	4.996
0:12:34	357.3	0.438	77.2	5.590	7.61	45.2629	357.4	3.672	3.653	4.013	4.576	0.923	2.749	1.827	4.960
0:12:44	358.7	0.444	77.1	5.585	7.71	45.3097	358.9	3.683	3.665	4.025	4.594	0.929	2.762	1.832	4.943
0:12:54	360.9	0.450	77.2	5.579	7.80	45.3564	361.1	3.702	3.683	4.043	4.608	0.925	2.766	1.841	4.983
0:13:05	362.9	0.456	77.1	5.573	7.90	45.4062	363.0	3.718	3.699	4.059	4.629	0.931	2.780	1.849	4.974
0:13:16	364.3	0.462	77.0	5.566	8.01	45.4601	364.4	3.728	3.709	4.069	4.645	0.936	2.790	1.854	4.960
0:13:25	366.0	0.468	76.9	5.561	8.10	45.5044	366.1	3.741	3.722	4.082	4.666	0.945	2.806	1.861	4.938
0:13:35	368.2	0.474	76.8	5.555	8.20	45.5534	368.4	3.760	3.741	4.101	4.688	0.948	2.818	1.870	4.946
0:13:46	370.1	0.480	76.7	5.548	8.31	45.6088	370.2	3.774	3.754	4.114	4.709	0.955	2.832	1.877	4.933
0:13:56	371.5	0.487	76.6	5.542	8.41	45.6591	371.7	3.785	3.765	4.125	4.727	0.962	2.845	1.882	4.912
0:14:05	373.1	0.492	76.6	5.536	8.50	45.7031	373.2	3.797	3.777	4.137	4.744	0.967	2.855	1.888	4.905
0:14:14	374.5	0.498	76.5	5.530	8.60	45.7529	374.6	3.807	3.787	4.147	4.758	0.972	2.865	1.893	4.897
0:14:26	376.0	0.505	76.4	5.524	8.71	45.8078	376.1	3.818	3.797	4.157	4.774	0.978	2.876	1.898	4.884
0:14:35	374.9	0.511	76.1	5.518	8.81	45.8594	375.1	3.803	3.782	4.142	4.784	1.003	2.893	1.891	4.772
0:14:45	377.9	0.517	76.2	5.512	8.91	45.9076	378.0	3.829	3.807	4.167	4.804	0.997	2.900	1.904	4.819
0:14:55	379.9	0.522	76.1	5.506	9.01	45.9563	380.0	3.845	3.824	4.184	4.823	1.000	2.912	1.912	4.823
0:15:05	380.7	0.528	76.0	5.500	9.10	46.0066	380.9	3.849	3.827	4.187	4.836	1.008	2.922	1.914	4.795
0:15:15	382.8	0.534	75.9	5.494	9.20	46.0561	382.9	3.866	3.844	4.204	4.856	1.012	2.934	1.922	4.798
0:15:26	384.9	0.541	75.9	5.487	9.31	46.1118	385.0	3.883	3.860	4.220	4.876	1.016	2.946	1.930	4.800
0:15:36	385.9	0.547	75.8	5.481	9.41	46.1614	386.0	3.889	3.866	4.226	4.891	1.025	2.958	1.933	4.771
0:15:46	386.8	0.553	75.7	5.476	9.50	46.2097	386.9	3.893	3.870	4.230	4.903	1.033	2.968	1.935	4.747
0:15:56	388.3	0.558	75.6	5.470	9.60	46.2590	388.5	3.905	3.882	4.242	4.918	1.037	2.978	1.941	4.744
0:16:06	390.4	0.565	75.5	5.464	9.70	46.3112	390.5	3.921	3.898	4.258	4.939	1.041	2.990	1.949	4.743
0:16:18	391.6	0.571	75.4	5.457	9.81	46.3674	391.8	3.929	3.905	4.265	4.953	1.048	3.001	1.953	4.726
0:16:27	392.8	0.577	75.4	5.452	9.90	46.4140	392.9	3.936	3.913	4.273	4.967	1.054	3.010	1.956	4.711
0:16:37	394.6	0.583	75.3	5.445	10.00	46.4667	394.7	3.950	3.926	4.286	4.987	1.061	3.024	1.963	4.701
0:16:47	395.9	0.589	75.2	5.440	10.10	46.5162	396.1	3.959	3.935	4.295	5.001	1.066	3.034	1.967	4.690
0:16:58	397.6	0.595	75.1	5.433	10.21	46.5729	397.7	3.971	3.946	4.306	5.019	1.073	3.046	1.973	4.676
0:17:08	399.5	0.601	75.0	5.427	10.31	46.6235	399.6	3.986	3.961	4.321	5.039	1.078	3.059	1.980	4.673
0:17:18	401.1	0.607	75.0	5.421	10.41	46.6750	401.3	3.998	3.973	4.333	5.054	1.081	3.067	1.986	4.674
0:17:28	402.2	0.613	74.9	5.415	10.50	46.7242	402.3	4.004	3.979	4.339	5.066	1.087	3.077	1.989	4.659
0:17:39	403.2	0.619	74.8	5.409	10.61	46.7813	403.4	4.009	3.984	4.344	5.079	1.096	3.087	1.992	4.636
0:17:49	404.8	0.625	74.7	5.403	10.71	46.8319	404.9	4.021	3.995	4.355	5.098	1.103	3.100	1.997	4.622
0:17:59	406.2	0.631	74.6	5.397	10.80	46.8826	406.4	4.030	4.004	4.364	5.109	1.105	3.107	2.002	4.623
0:18:10	407.8	0.638	74.6	5.391	10.91	46.9395	407.9	4.041	4.015	4.375	5.126	1.111	3.119	2.007	4.612
0:18:20	408.6	0.643	74.4	5.385	11.01	46.9889	408.7	4.044	4.018	4.378	5.138	1.121	3.130	2.009	4.585
0:18:30	410.5	0.649	74.4	5.379	11.10	47.0404	410.6	4.059	4.033	4.393	5.156	1.123	3.139	2.016	4.590
0:18:41	412.3	0.656	74.3	5.373	11.21	47.0975	412.5	4.072	4.045	4.405	5.173	1.128	3.150	2.023	4.586
0:18:51	413.7	0.661	74.3	5.367	11.30	47.1473	413.8	4.081	4.054	4.414	5.187	1.133	3.160	2.027	4.578
0:19:00	414.6	0.667	74.1	5.361	11.40	47.1989	414.7	4.086	4.059	4.419	5.201	1.143	3.172	2.029	4.551
0:19:12	416.4	0.674	74.1	5.354	11.51	47.2568	416.5	4.098	4.071	4.431	5.216	1.146	3.181	2.035	4.552
0:19:22	417.8	0.680	74.0	5.349	11.60	47.3078	417.9	4.108	4.080	4.440	5.232	1.152	3.192	2.040	4.540
0:19:31	418.3	0.685	73.9	5.343	11.70	47.3591	418.5	4.109	4.081	4.441	5.241	1.160	3.200	2.040	4.518
0:19:43	419.8	0.692	73.8	5.336	11.81	47.4176	419.9	4.118	4.090	4.450	5.258	1.169	3.213	2.045	4.499
0:19:53	422.0	0.698	73.7	5.330	11.91	47.4721	422.2	4.135	4.107	4.467	5.277	1.171	3.224	2.053	4.507

Consolidated Undrained Triaxial Test
EM 1110-2-1906 Appendix X

Consolidation Values		
Height	6.051 (in.)	15.369 (cm)
Diameter	2.873 (in)	7.297 (cm)
Area	6.482 (in^2)	41.818 (cm^2)

Final Values	
Height	4.937 (in.)
Dia. avg.	3.219 (in)
Area avg.	8.140 (in^2)

Tested By	RC
Date	10-22-09
Press No.	1
Panel No.	B

Project Number	172679015
Test Number	CU-9A
Data File ID	9A
Lateral Pressure (psi)	5.0
Chamber Pressure - σ_3 (psi)	90

Clock Time (min.)	Load (lbf)	Deflection Dial Reading (in.)	Pore Pressure Reading (psi)	Corrected Hieght (in.)	Strain (%)	Corrected Area (cm^2)	Corrected Load (lbf)	Deviator Stress (tsf)	Corrected Deviator Stress* (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p' $(\sigma_1'+\sigma_3')/2$ (tsf)	q $(\sigma_1-\sigma_3)/2$ (tsf)	Effective Principal Stress Ratio σ_1'/σ_3'
0:20:03	423.5	0.704	73.7	5.324	12.01	47.5239	423.6	4.145	4.116	4.476	5.291	1.176	3.234	2.058	4.501
0:20:13	424.5	0.710	73.6	5.319	12.10	47.5756	424.6	4.150	4.121	4.481	5.304	1.183	3.244	2.060	4.482
0:20:23	426.2	0.716	73.5	5.312	12.20	47.6297	426.4	4.163	4.133	4.493	5.321	1.188	3.254	2.067	4.480
0:20:34	427.7	0.722	73.4	5.306	12.31	47.6881	427.8	4.171	4.142	4.502	5.334	1.193	3.264	2.071	4.472
0:20:44	429.2	0.728	73.4	5.300	12.41	47.7422	429.3	4.181	4.151	4.511	5.349	1.198	3.273	2.076	4.466
0:20:54	430.2	0.734	73.3	5.294	12.51	47.7969	430.4	4.187	4.157	4.517	5.361	1.204	3.283	2.078	4.451
0:21:04	432.1	0.740	73.1	5.288	12.61	47.8520	432.2	4.200	4.169	4.529	5.386	1.217	3.302	2.085	4.426
0:21:13	433.6	0.747	73.1	5.282	12.71	47.9083	433.7	4.210	4.179	4.539	5.395	1.216	3.306	2.090	4.436
0:21:23	435.2	0.753	73.0	5.276	12.81	47.9616	435.4	4.221	4.190	4.550	5.411	1.221	3.316	2.095	4.431
0:21:33	436.3	0.759	73.1	5.270	12.91	48.0171	436.5	4.227	4.196	4.556	5.412	1.216	3.314	2.098	4.450
0:21:43	437.6	0.765	73.2	5.264	13.01	48.0717	437.7	4.234	4.202	4.562	5.411	1.208	3.309	2.101	4.478
0:21:53	439.1	0.771	73.0	5.258	13.11	48.1263	439.3	4.244	4.213	4.573	5.433	1.221	3.327	2.106	4.450
0:22:03	440.4	0.777	72.8	5.252	13.21	48.1821	440.5	4.251	4.220	4.580	5.456	1.237	3.347	2.110	4.411
0:22:13	441.8	0.783	72.7	5.246	13.31	48.2377	441.9	4.260	4.228	4.588	5.475	1.248	3.361	2.114	4.389
0:22:23	443.6	0.789	72.6	5.240	13.41	48.2914	443.8	4.273	4.241	4.601	5.496	1.256	3.376	2.120	4.377
0:22:33	445.1	0.794	72.6	5.234	13.50	48.3453	445.2	4.282	4.250	4.610	5.502	1.253	3.377	2.125	4.392
0:22:43	445.8	0.801	72.6	5.228	13.60	48.4021	446.0	4.284	4.252	4.612	5.504	1.253	3.378	2.126	4.394
0:22:54	446.8	0.807	72.6	5.221	13.71	48.4618	447.0	4.289	4.256	4.616	5.508	1.252	3.380	2.128	4.398
0:23:04	448.3	0.813	72.6	5.215	13.81	48.5158	448.5	4.298	4.265	4.625	5.518	1.253	3.385	2.132	4.404
0:23:13	448.9	0.819	72.5	5.210	13.90	48.5705	449.0	4.299	4.265	4.625	5.527	1.262	3.394	2.133	4.381
0:23:23	450.2	0.825	72.4	5.204	14.00	48.6263	450.3	4.306	4.273	4.633	5.538	1.266	3.402	2.136	4.376
0:23:35	452.0	0.831	72.4	5.197	14.11	48.6873	452.1	4.318	4.284	4.644	5.553	1.269	3.411	2.142	4.375
0:23:44	453.5	0.837	72.3	5.191	14.21	48.7429	453.7	4.328	4.294	4.654	5.565	1.271	3.418	2.147	4.377
0:23:54	454.7	0.843	72.2	5.185	14.30	48.7980	454.9	4.335	4.300	4.660	5.579	1.279	3.429	2.150	4.363
0:24:04	456.2	0.849	72.2	5.179	14.40	48.8544	456.4	4.344	4.309	4.669	5.591	1.282	3.437	2.154	4.360
0:24:15	457.9	0.856	72.2	5.173	14.51	48.9166	458.0	4.354	4.319	4.679	5.604	1.285	3.444	2.159	4.361
0:24:25	458.9	0.861	72.1	5.167	14.61	48.9714	459.0	4.359	4.324	4.684	5.613	1.290	3.451	2.162	4.352
0:24:35	459.3	0.867	72.0	5.161	14.71	49.0277	459.4	4.357	4.322	4.682	5.619	1.298	3.459	2.161	4.329
0:24:45	460.7	0.873	71.9	5.155	14.80	49.0847	460.8	4.365	4.330	4.690	5.629	1.300	3.465	2.165	4.331
0:24:56	462.3	0.880	71.9	5.149	14.91	49.1466	462.4	4.375	4.339	4.699	5.642	1.303	3.473	2.169	4.330
0:25:06	463.4	0.886	71.9	5.143	15.01	49.2019	463.5	4.381	4.345	4.705	5.651	1.307	3.479	2.172	4.325
0:25:16	464.3	0.891	71.7	5.137	15.11	49.2583	464.4	4.384	4.348	4.708	5.665	1.317	3.491	2.174	4.300
0:25:26	466.1	0.897	71.7	5.131	15.20	49.3145	466.2	4.396	4.360	4.720	5.678	1.319	3.498	2.180	4.306
0:25:37	467.2	0.904	71.6	5.124	15.31	49.3772	467.3	4.401	4.364	4.724	5.686	1.322	3.504	2.182	4.301
0:25:47	468.2	0.910	71.6	5.119	15.41	49.4334	468.3	4.405	4.368	4.728	5.694	1.326	3.510	2.184	4.294
0:25:57	469.3	0.916	71.5	5.113	15.51	49.4924	469.4	4.411	4.373	4.733	5.706	1.333	3.519	2.187	4.281
0:26:07	470.9	0.922	71.4	5.107	15.60	49.5496	471.0	4.420	4.383	4.743	5.718	1.336	3.527	2.191	4.280
0:26:16	471.8	0.928	71.4	5.101	15.70	49.6072	472.0	4.424	4.386	4.746	5.727	1.341	3.534	2.193	4.271
0:26:28	472.9	0.934	71.3	5.094	15.81	49.6719	473.0	4.428	4.390	4.750	5.739	1.348	3.543	2.195	4.256
0:26:37	474.9	0.940	71.2	5.088	15.91	49.7298	475.0	4.441	4.403	4.763	5.755	1.353	3.554	2.201	4.255
0:26:47	476.6	0.946	71.2	5.082	16.01	49.7872	476.8	4.453	4.414	4.774	5.768	1.354	3.561	2.207	4.261
0:26:57	477.8	0.952	71.2	5.077	16.10	49.8431	477.9	4.458	4.420	4.780	5.776	1.357	3.567	2.210	4.257
0:27:08	478.4	0.958	71.0	5.070	16.21	49.9080	478.5	4.459	4.420	4.780	5.787	1.368	3.578	2.210	4.230
0:27:17	479.9	0.964	71.0	5.064	16.30	49.9622	480.1	4.468	4.429	4.789	5.799	1.370	3.584	2.214	4.232
0:27:29	481.6	0.970	70.9	5.058	16.41	50.0273	481.8	4.478	4.439	4.799	5.812	1.374	3.593	2.219	4.231
0:27:38	482.7	0.976	70.8	5.052	16.51	50.0863	482.9	4.483	4.443	4.803	5.823	1.380	3.601	2.221	4.220
0:27:48	483.7	0.982	70.7	5.046	16.61	50.1463	483.8	4.486	4.446	4.806	5.835	1.388	3.612	2.223	4.202
0:27:58	485.2	0.988	70.7	5.040	16.71	50.2052	485.3	4.495	4.455	4.815	5.844	1.390	3.617	2.227	4.205
0:28:08	487.1	0.994	70.7	5.034	16.81	50.2650	487.2	4.507	4.467	4.827	5.858	1.392	3.625	2.233	4.209
0:28:18	488.0	1.000	70.6	5.028	16.91	50.3262	488.2	4.510	4.470	4.830	5.868	1.398	3.633	2.235	4.196
0:28:28	489.4	1.007	70.5	5.022	17.01	50.3870	489.6	4.518	4.477	4.837	5.880	1.404	3.642	2.238	4.189
0:28:38	491.0	1.012	70.5	5.016	17.10	50.4464	491.2	4.528	4.486	4.846	5.892	1.406	3.649	2.243	4.192
0:28:48	491.8	1.018	70.4	5.010	17.20	50.5075	492.0	4.529	4.488	4.848	5.897	1.409	3.653	2.244	4.185
0:28:58	492.6	1.024	70.3	5.004	17.30	50.5681	492.7	4.531	4.489	4.849	5.905	1.417	3.661	2.244	4.169
0:29:07	494.5	1.030	70.3	4.998	17.40	50.6277	494.7	4.543	4.502	4.862	5.920	1.419	3.669	2.251	4.173
0:29:17	495.9	1.036	70.2	4.992	17.50	50.6886	496.0	4.551	4.508	4.868	5.931	1.423	3.677	2.254	4.168
0:29:28	497.0	1.043	70.1	4.985	17.61	50.7562	497.1	4.554	4.512	4.872	5.941	1.430	3.685	2.256	4.156
0:29:38	498.4	1.049	70.1	4.979	17.71	50.8177	498.6	4.562	4.520	4.880	5.951	1.431	3.691	2.260	4.158
0:29:48	498.9	1.055	70.0	4.973	17.81	50.8783	499.1	4.561	4.518	4.878	5.955	1.437	3.696	2.259	4.145
0:29:58	499.6	1.061	70.0	4.967	17.91	50.9386	499.8	4.562	4.519	4.879	5.957	1.438	3.698	2.259	4.142

Consolidated Undrained Triaxial Test
EM 1110-2-1906 Appendix X

Consolidation Values			Final Values		Tested By	RC	Project Number	172679015
Height	6.051 (in.)	15.369 (cm)	Height	4.937 (in.)	Date	10-22-09	Test Number	CU-9A
Diameter	2.873 (in)	7.297 (cm)	Dia. avg.	3.219 (in)	Press No.	1	Data File ID	9A
Area	6.482 (in^2)	41.818 (cm^2)	Area avg.	8.140 (in^2)	Panel No.	B	Lateral Pressure (psi)	5.0
							Chamber Pressure - σ_3 (psi)	90

Clock Time (min.)	Load (lbf)	Deflection Dial Reading (in.)	Pore Pressure Reading (psi)	Corrected Hieght (in.)	Strain (%)	Corrected Area (cm^2)	Corrected Load (lbf)	Deviator Stress (tsf)	Corrected Deviator Stress* (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p' $(\sigma_1'+\sigma_3')/2$ (tsf)	q $(\sigma_1-\sigma_3)/2$ (tsf)	Effective Principal Stress Ratio σ_1'/σ_3'
0:30:08	499.9	1.067	69.9	4.962	18.00	50.9986	500.1	4.560	4.516	4.876	5.965	1.449	3.707	2.258	4.118
0:30:18	501.6	1.073	69.9	4.956	18.10	51.0604	501.8	4.569	4.526	4.886	5.974	1.448	3.711	2.263	4.125
0:30:29	503.1	1.079	69.8	4.949	18.21	51.1278	503.2	4.577	4.533	4.893	5.984	1.452	3.718	2.266	4.122
0:30:39	504.2	1.085	69.8	4.943	18.31	51.1892	504.3	4.581	4.537	4.897	5.993	1.456	3.725	2.268	4.115
0:30:49	505.3	1.091	69.7	4.937	18.40	51.2502	505.4	4.586	4.541	4.901	6.005	1.464	3.735	2.271	4.102

Consolidated Undrained Triaxial Test
EM 1110-2-1906 Appendix X

Consolidation Values			Final Values		
Height	6.045 (in.)	15.354 (cm)	Height	4.933 (in.)	
Diameter	2.894 (in)	7.351 (cm)	Dia. avg.	3.238 (in)	
Area	6.578 (in^2)	42.436 (cm^2)	Area avg.	8.233 (in^2)	

Tested By	RC
Date	10-22-09
Press No.	1
Panel No.	A

Project Number	172679015
Test Number	CU-9B
Data File ID	9B
Lateral Pressure (psi)	10.0
Chamber Pressure - σ_3 (psi)	90

Clock Time (min.)	Load (lbf)	Deflection Dial Reading (in.)	Pore Pressure Reading (psi)	Corrected Hieght (in.)	Strain (%)	Corrected Area (cm^2)	Corrected Load (lbf)	Deviator Stress (tsf)	Corrected Deviator Stress* (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p' $(\sigma_1'+\sigma_3')/2$ (tsf)	q $(\sigma_1-\sigma_3)/2$ (tsf)	Effective Principal Stress Ratio σ_1'/σ_3'
0:00:00	-0.2	-0.020	80.0	6.045	0.00	42.4363	0.0	0.000	0.000	0.720	0.720	0.720	0.720	0.000	1.000
0:00:26	56.1	-0.013	84.3	6.038	0.11	42.4830	56.3	0.616	0.616	1.336	1.026	0.410	0.718	0.308	2.503
0:00:38	74.0	-0.007	86.0	6.033	0.21	42.5243	74.2	0.811	0.811	1.531	1.096	0.285	0.690	0.405	3.847
0:00:52	89.4	-0.001	87.5	6.027	0.30	42.5659	89.5	0.978	0.977	1.697	1.154	0.176	0.665	0.489	6.542
0:01:05	101.2	0.005	88.5	6.020	0.41	42.6111	101.4	1.106	1.105	1.825	1.211	0.105	0.658	0.553	11.544
0:01:19	109.7	0.011	89.1	6.015	0.50	42.6510	109.8	1.197	1.196	1.916	1.263	0.067	0.665	0.598	18.861
0:01:35	118.0	0.017	89.4	6.008	0.61	42.6954	118.1	1.287	1.285	2.005	1.328	0.042	0.685	0.643	31.438
0:01:50	124.8	0.023	89.6	6.002	0.71	42.7382	125.0	1.360	1.358	2.078	1.385	0.027	0.706	0.679	51.228
0:02:05	131.2	0.029	89.8	5.996	0.81	42.7811	131.3	1.427	1.425	2.145	1.444	0.018	0.731	0.713	80.552
0:02:20	136.5	0.035	89.8	5.990	0.91	42.8241	136.7	1.484	1.482	2.202	1.494	0.011	0.753	0.741	131.168
0:02:36	142.3	0.041	89.9	5.984	1.01	42.8678	142.5	1.546	1.543	2.263	1.552	0.009	0.781	0.772	174.796
0:02:52	147.8	0.048	89.9	5.978	1.11	42.9142	148.0	1.603	1.600	2.320	1.609	0.008	0.808	0.800	204.809
0:03:07	152.4	0.054	89.9	5.972	1.21	42.9565	152.5	1.651	1.648	2.368	1.658	0.009	0.834	0.824	179.815
0:03:20	156.4	0.059	89.8	5.966	1.30	42.9971	156.6	1.693	1.690	2.410	1.702	0.011	0.857	0.845	149.328
0:03:36	160.3	0.065	89.8	5.960	1.41	43.0411	160.5	1.734	1.730	2.450	1.746	0.015	0.880	0.865	116.465
0:03:54	164.5	0.072	89.7	5.954	1.51	43.0863	164.7	1.777	1.774	2.494	1.794	0.020	0.907	0.887	90.091
0:04:10	168.0	0.077	89.6	5.948	1.60	43.1277	168.2	1.814	1.810	2.530	1.837	0.027	0.932	0.905	69.080
0:04:26	171.5	0.083	89.5	5.942	1.71	43.1726	171.6	1.849	1.845	2.565	1.882	0.037	0.959	0.922	51.357
0:04:43	175.1	0.089	89.4	5.936	1.80	43.2146	175.3	1.886	1.882	2.602	1.928	0.045	0.986	0.941	42.669
0:05:00	178.4	0.095	89.0	5.930	1.90	43.2589	178.5	1.919	1.914	2.634	1.986	0.072	1.029	0.957	27.709
0:05:18	181.4	0.101	89.0	5.924	2.00	43.3032	181.5	1.949	1.945	2.665	2.021	0.075	1.048	0.973	26.769
0:05:35	184.5	0.108	88.7	5.918	2.11	43.3491	184.7	1.981	1.976	2.696	2.070	0.094	1.082	0.988	22.047
0:05:51	187.0	0.114	88.4	5.912	2.21	43.3939	187.1	2.005	2.000	2.720	2.117	0.116	1.117	1.000	18.190
0:06:08	189.3	0.119	88.1	5.906	2.30	43.4363	189.4	2.028	2.022	2.742	2.156	0.133	1.145	1.011	16.173
0:06:24	191.8	0.125	87.9	5.900	2.40	43.4801	192.0	2.053	2.047	2.767	2.202	0.154	1.178	1.024	14.304
0:06:41	194.1	0.132	87.5	5.894	2.50	43.5255	194.3	2.075	2.069	2.789	2.248	0.178	1.213	1.035	12.643
0:06:57	196.5	0.138	87.7	5.888	2.60	43.5708	196.7	2.099	2.093	2.813	2.262	0.169	1.216	1.047	13.379
0:07:14	198.7	0.144	87.8	5.881	2.71	43.6178	198.8	2.120	2.113	2.833	2.275	0.161	1.218	1.057	14.128
0:07:29	200.3	0.150	87.6	5.875	2.80	43.6607	200.5	2.135	2.129	2.849	2.301	0.172	1.236	1.065	13.414
0:07:47	202.9	0.156	87.5	5.869	2.91	43.7076	203.0	2.160	2.153	2.873	2.333	0.180	1.256	1.077	12.986
0:08:03	204.7	0.162	87.4	5.863	3.01	43.7518	204.9	2.178	2.171	2.891	2.361	0.190	1.275	1.085	12.445
0:08:18	206.5	0.168	87.2	5.858	3.10	43.7943	206.6	2.194	2.187	2.907	2.389	0.202	1.295	1.093	11.825
0:08:35	208.1	0.174	87.0	5.851	3.20	43.8402	208.3	2.209	2.202	2.922	2.416	0.213	1.315	1.101	11.319
0:08:51	210.1	0.180	86.9	5.845	3.30	43.8858	210.3	2.228	2.220	2.940	2.445	0.224	1.334	1.110	10.916
0:09:07	211.6	0.186	86.7	5.839	3.40	43.9318	211.8	2.242	2.233	2.953	2.470	0.236	1.353	1.117	10.473
0:09:22	212.9	0.192	86.5	5.833	3.50	43.9771	213.0	2.252	2.244	2.964	2.493	0.249	1.371	1.122	10.014
0:09:38	214.5	0.198	86.4	5.827	3.61	44.0240	214.7	2.268	2.259	2.979	2.520	0.260	1.390	1.130	9.679
0:09:55	215.8	0.204	86.2	5.821	3.71	44.0694	215.9	2.278	2.269	2.989	2.544	0.274	1.409	1.135	9.290
0:10:11	217.4	0.210	86.0	5.815	3.81	44.1157	217.5	2.293	2.284	3.004	2.569	0.284	1.427	1.142	9.030
0:10:27	218.8	0.216	85.8	5.809	3.91	44.1613	218.9	2.305	2.296	3.016	2.597	0.301	1.449	1.148	8.628
0:10:44	220.5	0.222	85.7	5.803	4.00	44.2058	220.7	2.321	2.312	3.032	2.624	0.313	1.468	1.156	8.398
0:11:00	222.0	0.228	85.5	5.797	4.10	44.2519	222.1	2.334	2.325	3.045	2.649	0.324	1.487	1.162	8.168
0:11:16	222.9	0.235	85.3	5.791	4.21	44.2993	223.1	2.342	2.332	3.052	2.670	0.338	1.504	1.166	7.910
0:11:32	224.4	0.240	85.1	5.785	4.30	44.3438	224.5	2.355	2.344	3.064	2.696	0.352	1.524	1.172	7.665
0:11:50	225.8	0.247	85.0	5.779	4.41	44.3919	226.0	2.367	2.357	3.077	2.717	0.360	1.539	1.178	7.540
0:12:06	227.1	0.253	84.8	5.773	4.50	44.4376	227.3	2.378	2.367	3.087	2.740	0.373	1.556	1.184	7.354
0:12:23	228.0	0.259	84.6	5.767	4.60	44.4840	228.1	2.385	2.374	3.094	2.760	0.386	1.573	1.187	7.155
0:12:39	229.5	0.264	84.5	5.761	4.70	44.5297	229.7	2.398	2.387	3.107	2.782	0.394	1.588	1.194	7.059
0:12:57	230.5	0.271	84.4	5.755	4.81	44.5787	230.7	2.406	2.395	3.115	2.801	0.406	1.603	1.198	6.902
0:13:13	231.5	0.277	84.2	5.749	4.90	44.6251	231.6	2.413	2.402	3.122	2.819	0.416	1.618	1.201	6.768
0:13:29	232.6	0.283	84.1	5.743	5.00	44.6715	232.8	2.423	2.411	3.131	2.837	0.426	1.631	1.206	6.667
0:13:46	233.9	0.289	84.0	5.737	5.10	44.7171	234.1	2.434	2.422	3.142	2.857	0.435	1.646	1.211	6.575
0:14:02	235.0	0.295	83.8	5.731	5.20	44.7642	235.1	2.442	2.430	3.150	2.875	0.444	1.660	1.215	6.469
0:14:18	235.6	0.301	83.6	5.724	5.30	44.8125	235.8	2.447	2.434	3.154	2.892	0.457	1.675	1.217	6.323
0:14:36	236.8	0.307	83.5	5.718	5.41	44.8618	237.0	2.457	2.444	3.164	2.911	0.467	1.689	1.222	6.232
0:14:52	238.3	0.313	83.4	5.712	5.51	44.9093	238.5	2.469	2.456	3.176	2.930	0.474	1.702	1.228	6.187
0:15:08	238.9	0.319	83.2	5.706	5.60	44.9551	239.1	2.473	2.460	3.180	2.947	0.487	1.717	1.230	6.053
0:15:26	240.2	0.325	83.1	5.700	5.71	45.0049	240.3	2.483	2.469	3.189	2.968	0.498	1.733	1.235	5.959
0:15:42	241.2	0.331	82.9	5.694	5.81	45.0526	241.4	2.491	2.478	3.198	2.987	0.510	1.748	1.239	5.863
0:15:58	241.7	0.337	82.7	5.688	5.90	45.0988	241.8	2.493	2.479	3.199	3.004	0.524	1.764	1.240	5.729

Consolidated Undrained Triaxial Test
EM 1110-2-1906 Appendix X

Consolidation Values			Final Values		
Height	6.045 (in.)	15.354 (cm)	Height	4.933 (in.)	
Diameter	2.894 (in)	7.351 (cm)	Dia. avg.	3.238 (in)	
Area	6.578 (in^2)	42.436 (cm^2)	Area avg.	8.233 (in^2)	

Tested By	RC
Date	10-22-09
Press No.	1
Panel No.	A

Project Number	172679015
Test Number	CU-9B
Data File ID	9B
Lateral Pressure (psi)	10.0
Chamber Pressure - σ_3 (psi)	90

Clock Time (min.)	Load (lbf)	Deflection Dial Reading (in.)	Pore Pressure Reading (psi)	Corrected Hieght (in.)	Strain (%)	Corrected Area (cm^2)	Corrected Load (lbf)	Deviator Stress (tsf)	Corrected Deviator Stress* (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p' $(\sigma_1'+\sigma_3')/2$ (tsf)	q $(\sigma_1-\sigma_3)/2$ (tsf)	Effective Principal Stress Ratio σ_1'/σ_3'
0:16:16	242.8	0.343	82.5	5.682	6.00	45.1473	243.0	2.503	2.488	3.208	3.026	0.537	1.781	1.244	5.636
0:16:32	243.7	0.349	82.3	5.676	6.10	45.1949	243.8	2.509	2.494	3.214	3.048	0.554	1.801	1.247	5.507
0:16:49	245.0	0.356	82.1	5.670	6.21	45.2457	245.2	2.520	2.505	3.225	3.074	0.569	1.821	1.253	5.404
0:17:06	245.7	0.361	82.2	5.664	6.30	45.2913	245.9	2.524	2.509	3.229	3.068	0.558	1.813	1.255	5.495
0:17:22	246.7	0.367	82.4	5.658	6.40	45.3380	246.8	2.532	2.516	3.236	3.061	0.544	1.803	1.258	5.623
0:17:39	247.9	0.374	82.4	5.652	6.51	45.3892	248.0	2.541	2.525	3.245	3.071	0.545	1.808	1.263	5.636
0:17:56	248.9	0.379	82.4	5.646	6.60	45.4363	249.0	2.549	2.533	3.253	3.078	0.545	1.811	1.267	5.650
0:18:12	249.9	0.385	82.4	5.640	6.70	45.4849	250.1	2.557	2.541	3.261	3.088	0.547	1.818	1.270	5.642
0:18:28	250.5	0.392	82.3	5.634	6.80	45.5340	250.6	2.559	2.543	3.263	3.096	0.553	1.825	1.272	5.600
0:18:45	251.4	0.398	82.2	5.628	6.90	45.5837	251.5	2.566	2.550	3.270	3.110	0.560	1.835	1.275	5.552
0:19:01	252.5	0.404	82.2	5.622	7.00	45.6308	252.7	2.575	2.558	3.278	3.121	0.562	1.841	1.279	5.552
0:19:17	253.5	0.410	82.1	5.616	7.10	45.6799	253.7	2.582	2.565	3.285	3.132	0.567	1.849	1.283	5.528
0:19:34	253.9	0.416	82.0	5.610	7.20	45.7308	254.1	2.583	2.566	3.286	3.144	0.578	1.861	1.283	5.444
0:19:50	255.3	0.422	82.0	5.603	7.31	45.7806	255.5	2.595	2.578	3.298	3.156	0.578	1.867	1.289	5.463
0:20:07	255.9	0.428	81.9	5.597	7.41	45.8306	256.1	2.598	2.581	3.301	3.165	0.584	1.874	1.290	5.419
0:20:22	256.5	0.434	81.8	5.592	7.50	45.8772	256.6	2.601	2.583	3.303	3.175	0.591	1.883	1.292	5.370
0:20:39	257.2	0.440	81.6	5.585	7.61	45.9301	257.4	2.606	2.588	3.308	3.191	0.603	1.897	1.294	5.295
0:20:54	258.4	0.446	81.6	5.580	7.70	45.9766	258.6	2.615	2.597	3.317	3.201	0.604	1.903	1.298	5.298
0:21:10	259.1	0.452	81.5	5.573	7.80	46.0266	259.2	2.619	2.600	3.320	3.214	0.613	1.914	1.300	5.240
0:21:27	259.8	0.458	81.4	5.567	7.90	46.0767	260.0	2.624	2.605	3.325	3.225	0.620	1.922	1.303	5.203
0:21:43	260.9	0.464	81.3	5.561	8.00	46.1269	261.1	2.632	2.613	3.333	3.239	0.625	1.932	1.307	5.179
0:22:00	261.7	0.470	81.2	5.555	8.11	46.1799	261.9	2.637	2.618	3.338	3.251	0.633	1.942	1.309	5.136
0:22:17	262.3	0.476	81.1	5.549	8.21	46.2299	262.4	2.640	2.620	3.340	3.262	0.642	1.952	1.310	5.082
0:22:33	263.1	0.482	81.0	5.543	8.31	46.2809	263.3	2.645	2.625	3.345	3.274	0.648	1.961	1.313	5.053
0:22:49	264.3	0.488	81.0	5.537	8.41	46.3309	264.5	2.654	2.634	3.354	3.286	0.651	1.969	1.317	5.045
0:23:05	264.8	0.494	80.8	5.531	8.50	46.3800	264.9	2.656	2.636	3.356	3.297	0.661	1.979	1.318	4.990
0:23:23	265.8	0.501	80.8	5.525	8.61	46.4331	265.9	2.663	2.642	3.362	3.307	0.664	1.986	1.321	4.977
0:23:39	266.4	0.506	80.7	5.519	8.70	46.4823	266.6	2.667	2.646	3.366	3.319	0.672	1.995	1.323	4.936
0:23:55	267.3	0.512	80.6	5.513	8.80	46.5310	267.5	2.673	2.652	3.372	3.330	0.678	2.004	1.326	4.914
0:24:14	268.2	0.519	80.5	5.506	8.91	46.5869	268.4	2.679	2.657	3.377	3.341	0.683	2.012	1.329	4.891
0:24:29	268.5	0.524	80.4	5.501	9.00	46.6334	268.7	2.679	2.658	3.378	3.350	0.692	2.021	1.329	4.844
0:24:47	269.6	0.531	80.3	5.495	9.11	46.6876	269.8	2.687	2.665	3.385	3.360	0.695	2.028	1.333	4.835
0:25:03	270.2	0.537	80.2	5.489	9.20	46.7369	270.3	2.690	2.668	3.388	3.372	0.704	2.038	1.334	4.792
0:25:19	270.9	0.543	80.1	5.483	9.30	46.7883	271.1	2.694	2.672	3.392	3.383	0.711	2.047	1.336	4.759
0:25:35	271.7	0.549	80.0	5.477	9.40	46.8404	271.9	2.699	2.677	3.397	3.394	0.717	2.056	1.339	4.733
0:25:53	272.6	0.555	79.9	5.470	9.51	46.8950	272.8	2.705	2.682	3.402	3.409	0.727	2.068	1.341	4.692
0:26:09	273.7	0.561	79.8	5.464	9.60	46.9454	273.9	2.713	2.690	3.410	3.423	0.733	2.078	1.345	4.671
0:26:25	273.8	0.567	79.6	5.459	9.70	46.9953	274.0	2.711	2.688	3.408	3.435	0.747	2.091	1.344	4.597
0:26:43	274.8	0.573	79.5	5.452	9.81	47.0499	274.9	2.717	2.694	3.414	3.453	0.758	2.106	1.347	4.552
0:26:59	275.7	0.579	79.3	5.446	9.90	47.1008	275.8	2.723	2.700	3.420	3.470	0.770	2.120	1.350	4.505
0:27:16	276.3	0.585	79.4	5.440	10.00	47.1516	276.4	2.726	2.702	3.422	3.465	0.762	2.113	1.351	4.546
0:27:33	276.6	0.591	79.7	5.434	10.10	47.2057	276.8	2.727	2.703	3.423	3.445	0.742	2.094	1.351	4.642
0:27:51	277.9	0.597	79.7	5.428	10.21	47.2597	278.1	2.736	2.712	3.432	3.456	0.744	2.100	1.356	4.644
0:28:07	278.9	0.603	79.8	5.422	10.31	47.3122	279.1	2.743	2.718	3.438	3.456	0.738	2.097	1.359	4.684
0:28:24	279.2	0.609	79.7	5.416	10.40	47.3633	279.3	2.742	2.718	3.438	3.459	0.741	2.100	1.359	4.667
0:28:40	280.2	0.615	79.7	5.410	10.50	47.4151	280.3	2.749	2.724	3.444	3.466	0.742	2.104	1.362	4.672
0:28:56	281.1	0.621	79.7	5.404	10.60	47.4680	281.3	2.755	2.730	3.450	3.474	0.744	2.109	1.365	4.672
0:29:14	281.9	0.627	79.6	5.398	10.70	47.5226	282.1	2.760	2.735	3.455	3.482	0.747	2.115	1.367	4.661
0:29:30	282.6	0.633	79.6	5.392	10.80	47.5748	282.8	2.764	2.738	3.458	3.489	0.750	2.120	1.369	4.649
0:29:46	283.3	0.639	79.5	5.386	10.90	47.6285	283.5	2.768	2.742	3.462	3.497	0.755	2.126	1.371	4.632
0:30:02	283.9	0.645	79.5	5.380	11.00	47.6816	284.1	2.770	2.744	3.464	3.500	0.756	2.128	1.372	4.631
0:30:20	284.4	0.652	79.5	5.374	11.11	47.7384	284.6	2.772	2.745	3.465	3.505	0.759	2.132	1.373	4.615
0:30:36	284.9	0.658	79.4	5.368	11.20	47.7905	285.1	2.774	2.747	3.467	3.514	0.766	2.140	1.374	4.585
0:30:53	285.9	0.664	79.3	5.362	11.31	47.8461	286.0	2.780	2.753	3.473	3.526	0.773	2.149	1.377	4.564
0:31:09	286.4	0.670	79.2	5.356	11.41	47.8994	286.5	2.782	2.754	3.474	3.532	0.777	2.154	1.377	4.546
0:31:25	287.1	0.676	79.1	5.350	11.50	47.9530	287.3	2.786	2.758	3.478	3.540	0.782	2.161	1.379	4.529
0:31:41	287.9	0.682	79.1	5.343	11.61	48.0090	288.1	2.790	2.762	3.482	3.548	0.785	2.166	1.381	4.519
0:31:56	288.6	0.688	79.0	5.338	11.70	48.0595	288.8	2.794	2.766	3.486	3.555	0.789	2.172	1.383	4.506
0:32:13	289.1	0.694	79.0	5.332	11.80	48.1152	289.2	2.795	2.767	3.487	3.562	0.795	2.179	1.384	4.482
0:32:30	289.6	0.700	78.9	5.326	11.90	48.1697	289.7	2.797	2.769	3.489	3.569	0.800	2.184	1.384	4.462

Consolidated Undrained Triaxial Test
EM 1110-2-1906 Appendix X

Consolidation Values			Final Values		Tested By	RC	Project Number	172679015
Height	6.045 (in.)	15.354 (cm)	Height	4.933 (in.)	Date	10-22-09	Test Number	CU-9B
Diameter	2.894 (in)	7.351 (cm)	Dia. avg.	3.238 (in)	Press No.	1	Data File ID	9B
Area	6.578 (in^2)	42.436 (cm^2)	Area avg.	8.233 (in^2)	Panel No.	A	Lateral Pressure (psi)	10.0
							Chamber Pressure - σ_3 (psi)	90

Clock Time (min.)	Load (lbf)	Deflection Dial Reading (in.)	Pore Pressure Reading (psi)	Corrected Hieght (in.)	Strain (%)	Corrected Area (cm^2)	Corrected Load (lbf)	Deviator Stress (tsf)	Corrected Deviator Stress* (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p' $(\sigma_1'+\sigma_3')/2$ (tsf)	q $(\sigma_1-\sigma_3)/2$ (tsf)	Effective Principal Stress Ratio σ_1'/σ_3'
0:32:46	290.2	0.706	78.8	5.319	12.00	48.2251	290.4	2.800	2.772	3.492	3.575	0.803	2.189	1.386	4.451
0:33:02	291.2	0.712	78.8	5.314	12.10	48.2783	291.4	2.806	2.777	3.497	3.582	0.805	2.194	1.389	4.451
0:33:19	291.7	0.718	78.7	5.307	12.20	48.3355	291.9	2.808	2.779	3.499	3.592	0.812	2.202	1.390	4.421
0:33:35	292.5	0.724	78.7	5.301	12.31	48.3913	292.6	2.812	2.783	3.503	3.599	0.816	2.208	1.392	4.410
0:33:51	293.1	0.730	78.6	5.295	12.40	48.4454	293.2	2.815	2.785	3.505	3.605	0.820	2.213	1.393	4.397
0:34:07	293.8	0.736	78.5	5.289	12.50	48.4998	294.0	2.818	2.788	3.508	3.614	0.825	2.219	1.394	4.381
0:34:24	294.3	0.742	78.5	5.283	12.60	48.5568	294.5	2.820	2.790	3.510	3.619	0.829	2.224	1.395	4.366
0:34:40	294.9	0.748	78.4	5.277	12.70	48.6114	295.1	2.822	2.792	3.512	3.628	0.836	2.232	1.396	4.340
0:34:58	296.0	0.754	78.3	5.271	12.81	48.6684	296.2	2.830	2.799	3.519	3.639	0.839	2.239	1.400	4.335
0:35:14	296.7	0.760	78.3	5.265	12.90	48.7223	296.8	2.833	2.802	3.522	3.646	0.843	2.244	1.401	4.324
0:35:31	296.8	0.766	78.1	5.259	13.00	48.7777	296.9	2.831	2.800	3.520	3.654	0.854	2.254	1.400	4.280
0:35:48	297.9	0.772	78.1	5.253	13.10	48.8352	298.1	2.839	2.807	3.527	3.663	0.856	2.260	1.404	4.280
0:36:05	298.7	0.779	78.0	5.247	13.21	48.8934	298.9	2.843	2.811	3.531	3.676	0.864	2.270	1.406	4.254
0:36:21	299.3	0.785	77.9	5.241	13.31	48.9489	299.4	2.844	2.813	3.533	3.686	0.873	2.279	1.406	4.223
0:36:37	299.7	0.790	77.7	5.235	13.40	49.0038	299.9	2.846	2.814	3.534	3.696	0.882	2.289	1.407	4.190
0:36:53	300.7	0.797	77.6	5.229	13.50	49.0604	300.9	2.852	2.820	3.540	3.711	0.891	2.301	1.410	4.165
0:37:10	301.4	0.803	77.5	5.223	13.61	49.1192	301.5	2.855	2.822	3.542	3.725	0.903	2.314	1.411	4.126
0:37:26	301.5	0.809	77.5	5.217	13.70	49.1744	301.7	2.853	2.820	3.540	3.719	0.899	2.309	1.410	4.138
0:37:42	302.4	0.815	77.8	5.211	13.80	49.2305	302.6	2.858	2.825	3.545	3.704	0.879	2.291	1.413	4.214
0:38:00	303.4	0.821	77.9	5.205	13.90	49.2888	303.6	2.864	2.831	3.551	3.702	0.871	2.287	1.415	4.250
0:38:17	303.9	0.827	77.9	5.199	14.00	49.3457	304.1	2.865	2.832	3.552	3.701	0.869	2.285	1.416	4.258
0:38:34	304.4	0.833	77.9	5.192	14.11	49.4054	304.5	2.866	2.833	3.553	3.702	0.869	2.285	1.416	4.260
0:38:50	304.9	0.839	77.9	5.187	14.20	49.4597	305.0	2.868	2.834	3.554	3.705	0.871	2.288	1.417	4.255
0:39:08	306.0	0.845	78.0	5.180	14.30	49.5183	306.1	2.875	2.841	3.561	3.708	0.867	2.288	1.420	4.275
0:39:25	306.4	0.851	77.9	5.174	14.40	49.5778	306.6	2.875	2.841	3.561	3.713	0.871	2.292	1.421	4.261
0:39:42	306.8	0.857	77.9	5.168	14.51	49.6371	306.9	2.875	2.841	3.561	3.716	0.875	2.295	1.420	4.248
0:39:58	307.3	0.863	77.8	5.162	14.60	49.6940	307.4	2.877	2.842	3.562	3.720	0.878	2.299	1.421	4.237
0:40:14	308.3	0.869	77.8	5.156	14.70	49.7496	308.5	2.883	2.848	3.568	3.726	0.877	2.302	1.424	4.246
0:40:31	308.8	0.875	77.8	5.150	14.80	49.8086	309.0	2.884	2.849	3.569	3.730	0.880	2.305	1.425	4.237
0:40:49	309.1	0.881	77.7	5.144	14.91	49.8698	309.3	2.884	2.848	3.568	3.737	0.889	2.313	1.424	4.206
0:41:05	310.2	0.887	77.6	5.138	15.00	49.9265	310.3	2.890	2.855	3.575	3.747	0.892	2.319	1.427	4.201
0:41:22	310.8	0.893	77.5	5.132	15.10	49.9867	310.9	2.892	2.856	3.576	3.753	0.896	2.325	1.428	4.187
0:41:38	311.5	0.899	77.5	5.126	15.20	50.0444	311.7	2.896	2.860	3.580	3.759	0.899	2.329	1.430	4.180
0:41:54	311.8	0.905	77.4	5.120	15.30	50.1022	312.0	2.895	2.859	3.579	3.763	0.904	2.333	1.430	4.163
0:42:11	312.5	0.912	77.4	5.114	15.41	50.1657	312.7	2.898	2.861	3.581	3.769	0.907	2.338	1.431	4.155
0:42:27	313.7	0.918	77.4	5.108	15.51	50.2248	313.8	2.905	2.868	3.588	3.776	0.908	2.342	1.434	4.160
0:42:43	313.8	0.924	77.3	5.102	15.60	50.2827	314.0	2.904	2.867	3.587	3.781	0.914	2.348	1.433	4.136
0:42:59	314.4	0.930	77.2	5.096	15.71	50.3436	314.5	2.905	2.868	3.588	3.787	0.919	2.353	1.434	4.121
0:43:15	315.5	0.936	77.2	5.089	15.81	50.4037	315.6	2.912	2.874	3.594	3.795	0.920	2.358	1.437	4.123
0:43:32	316.1	0.942	77.2	5.083	15.91	50.4637	316.2	2.914	2.876	3.596	3.799	0.923	2.361	1.438	4.117
0:43:48	316.5	0.948	77.1	5.077	16.01	50.5244	316.6	2.914	2.876	3.596	3.803	0.927	2.365	1.438	4.103
0:44:02	317.4	0.954	77.1	5.072	16.10	50.5798	317.5	2.919	2.881	3.601	3.810	0.929	2.369	1.441	4.102
0:44:20	317.4	0.960	77.0	5.066	16.20	50.6422	317.6	2.916	2.878	3.598	3.814	0.936	2.375	1.439	4.075
0:44:36	318.2	0.966	77.0	5.059	16.30	50.7031	318.3	2.919	2.880	3.600	3.820	0.939	2.379	1.440	4.068
0:44:52	318.5	0.972	76.9	5.053	16.40	50.7634	318.7	2.919	2.880	3.600	3.825	0.944	2.384	1.440	4.051
0:45:08	319.6	0.978	76.9	5.047	16.50	50.8236	319.7	2.925	2.886	3.606	3.832	0.946	2.389	1.443	4.051
0:45:25	320.2	0.984	76.8	5.041	16.61	50.8869	320.4	2.928	2.888	3.608	3.838	0.950	2.394	1.444	4.042
0:45:41	320.4	0.990	76.7	5.035	16.71	50.9481	320.6	2.926	2.886	3.606	3.842	0.956	2.399	1.443	4.019
0:45:57	320.9	0.996	76.6	5.029	16.80	51.0079	321.0	2.927	2.886	3.606	3.849	0.962	2.406	1.443	4.000
0:46:14	322.1	1.002	76.6	5.023	16.91	51.0707	322.2	2.934	2.894	3.614	3.860	0.966	2.413	1.447	3.996
0:46:30	322.5	1.008	76.5	5.017	17.00	51.1300	322.7	2.935	2.894	3.614	3.868	0.973	2.421	1.447	3.974
0:46:46	322.9	1.014	76.4	5.011	17.10	51.1899	323.1	2.935	2.894	3.614	3.876	0.982	2.429	1.447	3.948
0:47:04	323.4	1.020	76.2	5.005	17.20	51.2533	323.6	2.936	2.895	3.615	3.887	0.992	2.439	1.448	3.919
0:47:21	324.0	1.026	75.5	4.999	17.30	51.3159	324.2	2.938	2.896	3.616	3.939	1.042	2.491	1.448	3.779
0:47:37	324.8	1.032	76.4	4.993	17.40	51.3766	325.0	2.941	2.900	3.620	3.879	0.979	2.429	1.450	3.961
0:47:53	325.6	1.038	76.5	4.987	17.50	51.4387	325.7	2.945	2.903	3.623	3.872	0.969	2.420	1.452	3.997
0:48:10	326.4	1.045	76.6	4.981	17.60	51.5032	326.5	2.948	2.906	3.626	3.872	0.965	2.418	1.453	4.011
0:48:26	327.1	1.050	76.6	4.975	17.70	51.5639	327.3	2.951	2.909	3.629	3.871	0.962	2.417	1.455	4.024
0:48:42	327.2	1.056	76.6	4.969	17.80	51.6269	327.3	2.948	2.906	3.626	3.872	0.966	2.419	1.453	4.009
0:49:00	327.6	1.062	76.5	4.963	17.90	51.6894	327.8	2.949	2.906	3.626	3.875	0.969	2.422	1.453	4.001

Consolidated Undrained Triaxial Test
EM 1110-2-1906 Appendix X

Consolidation Values				Final Values			
Height	6.045 (in.)	15.354 (cm)		Height	4.933 (in.)		
Diameter	2.894 (in)	7.351 (cm)		Dia. avg.	3.238 (in)		
Area	6.578 (in^2)	42.436 (cm^2)		Area avg.	8.233 (in^2)		

Tested By	RC	Project Number	172679015
Date	10-22-09	Test Number	CU-9B
Press No.	1	Data File ID	9B
Panel No.	A	Lateral Pressure (psi)	10.0
		Chamber Pressure - σ_3 (psi)	90

Clock Time (min.)	Load (lbf)	Deflection Dial Reading (in.)	Pore Pressure Reading (psi)	Corrected Hieght (in.)	Strain (%)	Corrected Area (cm^2)	Corrected Load (lbf)	Deviator Stress (tsf)	Corrected Deviator Stress* (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p' $(\sigma_1'+\sigma_3')/2$ (tsf)	q $(\sigma_1-\sigma_3)/2$ (tsf)	Effective Principal Stress Ratio σ_1' / σ_3'
0:49:17	328.7	1.069	76.6	4.957	18.00	51.7542	328.9	2.955	2.912	3.632	3.879	0.967	2.423	1.456	4.013
0:49:33	329.3	1.075	76.5	4.951	18.10	51.8172	329.4	2.956	2.913	3.633	3.883	0.970	2.427	1.457	4.004
0:49:51	329.8	1.081	76.5	4.945	18.21	51.8814	330.0	2.957	2.914	3.634	3.887	0.973	2.430	1.457	3.996
0:50:07	330.5	1.087	76.5	4.939	18.30	51.9426	330.6	2.960	2.916	3.636	3.889	0.972	2.431	1.458	3.999
0:50:24	331.2	1.093	76.5	4.933	18.40	52.0076	331.4	2.963	2.919	3.639	3.892	0.973	2.433	1.460	4.001

Consolidated Undrained Triaxial Test
EM 1110-2-1906 Appendix X

	Consolidation Values		Final Values	
Height	6.011 (in.)	15.268 (cm)	Height	4.911 (in.)
Diameter	2.843 (in)	7.221 (cm)	Dia. avg.	3.243 (in)
Area	6.347 (in^2)	40.950 (cm^2)	Area avg.	8.260 (in^2)

Tested By	KDG
Date	10-26-09
Press No.	1
Panel No.	B

Project Number	172679015
Test Number	CU-9C
Data File ID	9C
Lateral Pressure (psi)	15.0
Chamber Pressure - σ_3 (psi)	90

Clock Time (min.)	Load (lbf)	Deflection Dial Reading (in.)	Pore Pressure Reading (psi)	Corrected Hieght (in.)	Strain (%)	Corrected Area (cm^2)	Corrected Load (lbf)	Deviator Stress (tsf)	Corrected Deviator Stress* (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p' $(\sigma_1'+\sigma_3')/2$ (tsf)	q $(\sigma_1-\sigma_3)/2$ (tsf)	Effective Principal Stress Ratio σ_1'/σ_3'
0:00:00	-0.2	-0.018	74.8	6.011	0.00	40.9501	0.0	0.000	0.000	1.080	1.080	1.092	1.086	-0.006	0.989
0:06:37	42.9	-0.012	78.7	6.005	0.10	40.9921	43.1	0.488	0.488	1.568	1.288	0.811	1.049	0.238	1.588
0:10:34	61.7	-0.006	80.6	5.999	0.20	41.0321	61.8	0.701	0.700	1.780	1.365	0.676	1.021	0.344	2.019
0:14:27	73.3	0.000	81.5	5.993	0.30	41.0737	73.4	0.831	0.830	1.910	1.429	0.610	1.019	0.409	2.343
0:18:25	82.3	0.007	82.1	5.987	0.40	41.1157	82.5	0.933	0.932	2.012	1.486	0.566	1.026	0.460	2.627
0:22:17	89.3	0.013	82.5	5.981	0.50	41.1572	89.4	1.010	1.009	2.089	1.534	0.537	1.036	0.499	2.859
0:25:52	95.8	0.018	83.0	5.975	0.60	41.1973	95.9	1.083	1.081	2.161	1.573	0.503	1.038	0.535	3.128
0:30:02	102.0	0.024	83.2	5.969	0.70	41.2389	102.1	1.151	1.150	2.230	1.624	0.486	1.055	0.569	3.342
0:33:51	107.3	0.031	83.4	5.963	0.80	41.2811	107.4	1.210	1.208	2.288	1.672	0.476	1.074	0.598	3.516
0:37:46	112.5	0.036	83.5	5.957	0.90	41.3224	112.7	1.268	1.265	2.345	1.722	0.468	1.095	0.627	3.678
0:41:31	117.5	0.042	83.7	5.951	1.00	41.3636	117.6	1.323	1.320	2.400	1.762	0.453	1.107	0.654	3.888
0:45:46	121.9	0.048	83.7	5.945	1.10	41.4056	122.0	1.370	1.368	2.448	1.807	0.451	1.129	0.678	4.007
0:49:46	126.4	0.054	83.7	5.939	1.20	41.4478	126.6	1.420	1.417	2.497	1.859	0.453	1.156	0.703	4.105
0:53:40	130.1	0.061	83.6	5.933	1.30	41.4904	130.3	1.460	1.457	2.537	1.905	0.460	1.183	0.723	4.142
0:57:43	134.6	0.066	83.8	5.927	1.40	41.5317	134.8	1.509	1.505	2.585	1.943	0.449	1.196	0.747	4.326
1:01:42	138.1	0.072	83.7	5.921	1.50	41.5735	138.3	1.547	1.543	2.623	1.988	0.457	1.223	0.766	4.352
1:05:52	141.8	0.079	83.6	5.915	1.60	41.6167	142.0	1.586	1.582	2.662	2.034	0.463	1.248	0.785	4.394
1:09:39	145.3	0.085	83.5	5.909	1.70	41.6583	145.5	1.624	1.620	2.700	2.079	0.471	1.275	0.804	4.412
1:13:45	151.7	0.091	83.5	5.903	1.80	41.7009	151.9	1.694	1.689	2.769	2.145	0.468	1.307	0.839	4.588
1:17:46	155.4	0.097	83.4	5.897	1.90	41.7432	155.5	1.732	1.728	2.808	2.194	0.477	1.335	0.858	4.596
1:21:45	158.1	0.103	83.2	5.891	2.00	41.7867	158.3	1.761	1.756	2.836	2.233	0.488	1.361	0.872	4.572
1:25:29	161.6	0.109	83.1	5.885	2.10	41.8284	161.8	1.798	1.793	2.873	2.281	0.500	1.391	0.891	4.564
1:29:26	164.7	0.115	83.1	5.879	2.20	41.8715	164.8	1.830	1.825	2.905	2.307	0.494	1.400	0.907	4.674
1:33:21	167.3	0.121	83.0	5.873	2.30	41.9142	167.5	1.858	1.852	2.932	2.347	0.506	1.426	0.920	4.638
1:37:24	169.8	0.127	82.8	5.867	2.40	41.9578	170.0	1.884	1.878	2.958	2.388	0.521	1.455	0.933	4.580
1:41:14	173.0	0.133	82.6	5.861	2.50	41.9999	173.2	1.917	1.911	2.991	2.432	0.532	1.482	0.950	4.571
1:45:18	175.7	0.139	82.7	5.855	2.60	42.0431	175.9	1.945	1.939	3.019	2.454	0.526	1.490	0.964	4.663
1:49:20	178.2	0.145	82.5	5.849	2.70	42.0865	178.4	1.971	1.964	3.044	2.494	0.541	1.518	0.976	4.607
1:53:16	180.7	0.151	82.3	5.843	2.80	42.1296	180.8	1.996	1.989	3.069	2.532	0.555	1.544	0.989	4.563
1:57:21	184.0	0.157	82.1	5.837	2.90	42.1732	184.1	2.030	2.023	3.103	2.580	0.568	1.574	1.006	4.541
2:01:28	186.5	0.163	82.2	5.831	3.00	42.2163	186.6	2.055	2.048	3.128	2.600	0.563	1.581	1.018	4.617
2:05:32	188.5	0.169	82.0	5.825	3.10	42.2600	188.6	2.075	2.068	3.148	2.635	0.579	1.607	1.028	4.552
2:09:31	191.0	0.175	81.8	5.819	3.20	42.3035	191.2	2.101	2.093	3.173	2.675	0.593	1.634	1.041	4.512
2:13:29	193.8	0.181	81.5	5.813	3.30	42.3476	194.0	2.130	2.122	3.202	2.725	0.614	1.669	1.055	4.436
2:17:27	196.1	0.187	81.7	5.807	3.40	42.3912	196.3	2.153	2.145	3.225	2.734	0.601	1.667	1.067	4.552
2:21:23	198.0	0.193	81.4	5.801	3.50	42.4351	198.2	2.172	2.163	3.243	2.769	0.618	1.694	1.076	4.483
2:25:14	201.0	0.199	81.3	5.795	3.60	42.4792	201.2	2.202	2.194	3.274	2.807	0.625	1.716	1.091	4.491
2:29:06	203.0	0.205	81.0	5.789	3.70	42.5234	203.2	2.222	2.213	3.293	2.847	0.646	1.746	1.101	4.408
2:33:07	205.1	0.211	81.2	5.783	3.80	42.5673	205.3	2.243	2.233	3.313	2.859	0.637	1.748	1.111	4.488
2:37:01	207.2	0.217	81.0	5.777	3.90	42.6118	207.3	2.263	2.253	3.333	2.892	0.651	1.771	1.121	4.446
2:40:51	209.7	0.223	80.8	5.771	4.00	42.6560	209.8	2.287	2.278	3.358	2.927	0.660	1.793	1.133	4.432
2:44:47	211.6	0.229	80.5	5.765	4.10	42.7007	211.7	2.306	2.296	3.376	2.966	0.682	1.824	1.142	4.349
2:48:39	213.6	0.235	80.7	5.759	4.20	42.7456	213.8	2.326	2.316	3.396	2.976	0.672	1.824	1.152	4.427
2:52:23	215.8	0.241	80.5	5.753	4.30	42.7898	215.9	2.347	2.336	3.416	3.009	0.684	1.847	1.162	4.397
2:56:15	217.9	0.247	80.3	5.747	4.40	42.8344	218.1	2.368	2.357	3.437	3.040	0.695	1.868	1.173	4.375
3:00:14	219.8	0.253	80.1	5.741	4.50	42.8794	219.9	2.385	2.374	3.454	3.077	0.715	1.896	1.181	4.305
3:04:03	221.7	0.259	80.2	5.735	4.60	42.9242	221.9	2.404	2.392	3.472	3.087	0.706	1.897	1.190	4.372
3:08:01	223.7	0.265	80.0	5.729	4.70	42.9695	223.8	2.422	2.411	3.491	3.118	0.719	1.918	1.200	4.338
3:12:07	225.1	0.271	79.8	5.723	4.80	43.0146	225.3	2.436	2.424	3.504	3.145	0.733	1.939	1.206	4.291
3:16:06	226.8	0.277	79.6	5.717	4.90	43.0597	226.9	2.451	2.439	3.519	3.179	0.752	1.965	1.214	4.229
3:20:02	228.9	0.283	79.7	5.711	5.00	43.1051	229.1	2.471	2.459	3.539	3.190	0.743	1.967	1.224	4.295
3:24:05	230.5	0.289	79.5	5.705	5.10	43.1505	230.7	2.486	2.474	3.554	3.217	0.755	1.986	1.231	4.261
3:28:07	232.2	0.295	79.3	5.699	5.20	43.1958	232.4	2.501	2.489	3.569	3.244	0.767	2.006	1.239	4.230
3:32:06	233.7	0.301	79.1	5.693	5.30	43.2414	233.8	2.514	2.502	3.582	3.278	0.788	2.033	1.245	4.159
3:36:17	235.6	0.307	79.2	5.687	5.40	43.2872	235.8	2.533	2.519	3.599	3.285	0.777	2.031	1.254	4.227
3:40:24	237.5	0.313	79.1	5.681	5.50	43.3330	237.7	2.551	2.537	3.617	3.313	0.787	2.050	1.263	4.209
3:44:34	238.8	0.319	78.9	5.675	5.60	43.3792	239.0	2.562	2.548	3.628	3.339	0.802	2.071	1.268	4.161
3:48:38	240.3	0.325	78.8	5.669	5.70	43.4248	240.4	2.575	2.561	3.641	3.359	0.810	2.085	1.275	4.148
3:52:45	242.4	0.331	78.7	5.663	5.80	43.4715	242.6	2.595	2.581	3.661	3.382	0.812	2.097	1.285	4.163
3:56:47	244.1	0.337	78.6	5.657	5.90	43.5175	244.3	2.610	2.596	3.676	3.408	0.824	2.116	1.292	4.137

Consolidated Undrained Triaxial Test
EM 1110-2-1906 Appendix X

Consolidation Values			Final Values		Tested By	KDG	Project Number	172679015
Height	6.011 (in.)	15.268 (cm)	Height	4.911 (in.)	Date	10-26-09	Test Number	CU-9C
Diameter	2.843 (in)	7.221 (cm)	Dia. avg.	3.243 (in)	Press No.	1	Data File ID	9C
Area	6.347 (in^2)	40.950 (cm^2)	Area avg.	8.260 (in^2)	Panel No.	B	Lateral Pressure (psi)	15.0
							Chamber Pressure - σ_3 (psi)	90

Clock Time (min.)	Load (lbf)	Deflection Dial Reading (in.)	Pore Pressure Reading (psi)	Corrected Hieght (in.)	Strain (%)	Corrected Area (cm^2)	Corrected Load (lbf)	Deviator Stress (tsf)	Corrected Deviator Stress* (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p' $(\sigma_1'+\sigma_3')/2$ (tsf)	q $(\sigma_1-\sigma_3)/2$ (tsf)	Effective Principal Stress Ratio σ_1'/σ_3'
4:00:50	245.5	0.343	78.4	5.651	6.00	43.5637	245.6	2.622	2.607	3.687	3.433	0.837	2.135	1.298	4.101
4:04:54	247.2	0.349	78.3	5.645	6.10	43.6099	247.3	2.637	2.622	3.702	3.451	0.840	2.146	1.305	4.107
4:09:00	249.3	0.355	78.3	5.639	6.20	43.6563	249.4	2.657	2.642	3.722	3.476	0.846	2.161	1.315	4.110
4:13:09	250.8	0.361	78.1	5.633	6.30	43.7028	250.9	2.670	2.655	3.735	3.500	0.857	2.179	1.322	4.085
4:17:14	252.0	0.367	77.9	5.627	6.40	43.7498	252.2	2.680	2.665	3.745	3.524	0.871	2.198	1.327	4.047
4:21:22	253.9	0.373	77.9	5.620	6.50	43.7966	254.1	2.698	2.682	3.762	3.540	0.869	2.204	1.336	4.071
4:25:22	255.7	0.379	77.8	5.615	6.60	43.8434	255.9	2.714	2.698	3.778	3.565	0.878	2.222	1.343	4.059
4:29:32	257.1	0.385	77.7	5.609	6.70	43.8903	257.3	2.726	2.710	3.790	3.587	0.889	2.238	1.349	4.035
4:33:37	258.1	0.391	77.4	5.602	6.80	43.9375	258.2	2.733	2.716	3.796	3.610	0.905	2.258	1.352	3.988
4:37:40	260.2	0.397	77.5	5.596	6.90	43.9850	260.4	2.753	2.736	3.816	3.623	0.898	2.260	1.362	4.032
4:41:48	261.5	0.403	77.4	5.590	7.00	44.0321	261.7	2.764	2.747	3.827	3.645	0.910	2.278	1.368	4.006
4:45:51	263.0	0.409	77.2	5.584	7.10	44.0791	263.1	2.776	2.758	3.838	3.667	0.920	2.293	1.373	3.987
4:49:58	264.2	0.415	77.0	5.578	7.20	44.1265	264.4	2.786	2.769	3.849	3.693	0.936	2.314	1.379	3.946
4:53:54	265.9	0.421	77.1	5.572	7.30	44.1742	266.0	2.800	2.783	3.863	3.697	0.926	2.312	1.386	3.992
4:57:59	267.3	0.427	77.0	5.566	7.40	44.2222	267.5	2.813	2.795	3.875	3.721	0.938	2.330	1.392	3.967
5:02:02	268.6	0.433	76.8	5.560	7.50	44.2699	268.8	2.823	2.805	3.885	3.743	0.950	2.347	1.397	3.941
5:06:02	269.7	0.439	76.6	5.554	7.60	44.3176	269.9	2.832	2.813	3.893	3.767	0.965	2.366	1.401	3.903
5:10:00	271.3	0.445	76.7	5.548	7.70	44.3655	271.4	2.845	2.826	3.906	3.771	0.956	2.363	1.407	3.944
5:14:03	272.9	0.451	76.6	5.542	7.80	44.4141	273.1	2.859	2.840	3.920	3.795	0.967	2.381	1.414	3.926
5:18:01	273.8	0.457	76.4	5.536	7.90	44.4619	273.9	2.865	2.845	3.925	3.814	0.980	2.397	1.417	3.891
5:21:55	275.3	0.463	76.2	5.530	8.00	44.5105	275.4	2.877	2.858	3.938	3.840	0.993	2.416	1.423	3.866
5:25:54	276.9	0.469	76.3	5.524	8.10	44.5590	277.1	2.891	2.872	3.952	3.844	0.984	2.414	1.430	3.908
5:29:48	278.0	0.475	76.2	5.518	8.20	44.6071	278.2	2.900	2.880	3.960	3.863	0.995	2.429	1.434	3.883
5:33:40	278.9	0.481	76.0	5.512	8.30	44.6560	279.1	2.906	2.886	3.966	3.883	1.009	2.446	1.437	3.850
5:37:39	280.8	0.487	75.8	5.506	8.40	44.7047	281.0	2.923	2.902	3.982	3.911	1.020	2.465	1.445	3.835
5:41:32	282.2	0.493	76.0	5.500	8.50	44.7534	282.3	2.934	2.913	3.993	3.911	1.010	2.460	1.451	3.874
5:45:25	282.8	0.499	75.8	5.494	8.60	44.8023	282.9	2.936	2.915	3.995	3.930	1.026	2.478	1.452	3.831
5:49:17	284.3	0.505	75.6	5.488	8.70	44.8514	284.5	2.949	2.928	4.008	3.952	1.035	2.493	1.458	3.818
5:53:18	285.6	0.511	75.5	5.482	8.80	44.9007	285.7	2.959	2.938	4.018	3.973	1.047	2.510	1.463	3.795
5:57:23	286.8	0.517	75.6	5.476	8.90	44.9504	286.9	2.968	2.947	4.027	3.972	1.037	2.505	1.468	3.831
6:01:19	287.7	0.523	75.4	5.470	9.00	44.9993	287.9	2.975	2.953	4.033	3.992	1.050	2.521	1.471	3.800
6:05:16	289.5	0.529	75.3	5.464	9.10	45.0488	289.7	2.990	2.968	4.048	4.015	1.059	2.537	1.478	3.793
6:09:18	290.4	0.535	75.1	5.458	9.20	45.0985	290.5	2.995	2.973	4.053	4.035	1.073	2.554	1.481	3.760
6:13:26	291.2	0.541	75.2	5.452	9.30	45.1483	291.3	3.000	2.978	4.058	4.030	1.063	2.547	1.483	3.790
6:17:28	292.4	0.547	75.0	5.446	9.40	45.1983	292.5	3.009	2.987	4.067	4.053	1.078	2.565	1.488	3.761
6:21:36	294.1	0.553	75.0	5.440	9.50	45.2482	294.3	3.024	3.001	4.081	4.072	1.083	2.577	1.495	3.761
6:25:48	295.3	0.559	74.7	5.434	9.60	45.2981	295.4	3.032	3.009	4.089	4.098	1.100	2.599	1.499	3.725
6:29:51	296.2	0.565	74.9	5.428	9.70	45.3482	296.3	3.039	3.015	4.095	4.094	1.091	2.592	1.502	3.754
6:33:51	297.6	0.571	74.7	5.422	9.80	45.3983	297.8	3.050	3.026	4.106	4.116	1.101	2.608	1.507	3.738
6:38:00	298.7	0.577	74.6	5.416	9.90	45.4487	298.9	3.058	3.034	4.114	4.131	1.109	2.620	1.511	3.726
6:42:11	299.7	0.583	74.3	5.410	10.00	45.4996	299.8	3.064	3.040	4.120	4.157	1.129	2.643	1.514	3.683
6:46:15	300.8	0.589	74.5	5.404	10.10	45.5497	301.0	3.072	3.048	4.128	4.153	1.116	2.635	1.518	3.720
6:50:21	302.7	0.595	74.4	5.398	10.20	45.6007	302.8	3.088	3.063	4.143	4.175	1.124	2.650	1.526	3.716
6:54:28	303.7	0.601	74.3	5.392	10.30	45.6517	303.8	3.095	3.070	4.150	4.190	1.132	2.661	1.529	3.702
6:58:35	304.7	0.607	74.2	5.386	10.40	45.7023	304.9	3.102	3.077	4.157	4.204	1.139	2.671	1.533	3.692
7:02:34	305.5	0.613	74.2	5.380	10.50	45.7537	305.7	3.107	3.081	4.161	4.211	1.141	2.676	1.535	3.691
7:06:39	306.9	0.619	74.1	5.374	10.60	45.8048	307.1	3.117	3.091	4.171	4.228	1.148	2.688	1.540	3.684
7:10:46	308.2	0.625	74.0	5.368	10.70	45.8560	308.3	3.127	3.100	4.180	4.244	1.155	2.700	1.544	3.674
7:14:51	308.9	0.631	73.8	5.362	10.80	45.9071	309.1	3.131	3.105	4.185	4.256	1.163	2.710	1.547	3.658
7:18:56	309.9	0.637	73.8	5.356	10.90	45.9589	310.0	3.137	3.110	4.190	4.264	1.166	2.715	1.549	3.658
7:23:00	311.6	0.643	73.7	5.350	11.00	46.0102	311.8	3.151	3.124	4.204	4.285	1.172	2.729	1.556	3.656
7:27:05	312.3	0.649	73.6	5.344	11.10	46.0622	312.5	3.155	3.128	4.208	4.297	1.181	2.739	1.558	3.639
7:31:10	313.0	0.655	73.6	5.338	11.20	46.1141	313.1	3.158	3.130	4.210	4.303	1.184	2.743	1.559	3.635
7:35:11	313.9	0.662	73.5	5.332	11.30	46.1663	314.1	3.163	3.136	4.216	4.311	1.187	2.749	1.562	3.633
7:39:16	315.7	0.667	73.4	5.326	11.40	46.2181	315.8	3.177	3.150	4.230	4.330	1.192	2.761	1.569	3.633
7:43:18	316.1	0.674	73.3	5.320	11.50	46.2707	316.3	3.178	3.150	4.230	4.345	1.206	2.775	1.569	3.603
7:47:21	317.0	0.679	73.3	5.314	11.60	46.3225	317.2	3.184	3.156	4.236	4.349	1.204	2.776	1.572	3.611
7:51:24	319.1	0.686	73.3	5.308	11.70	46.3755	319.3	3.202	3.173	4.253	4.367	1.206	2.787	1.581	3.622
7:55:28	320.1	0.692	73.1	5.302	11.80	46.4277	320.2	3.207	3.179	4.259	4.381	1.214	2.798	1.584	3.608
7:59:32	320.4	0.698	73.0	5.296	11.90	46.4806	320.6	3.207	3.178	4.258	4.391	1.224	2.808	1.583	3.587

Consolidated Undrained Triaxial Test
EM 1110-2-1906 Appendix X

Consolidation Values			Final Values		
Height	6.011 (in.)	15.268 (cm)	Height	4.911 (in.)	
Diameter	2.843 (in)	7.221 (cm)	Dia. avg.	3.243 (in)	
Area	6.347 (in^2)	40.950 (cm^2)	Area avg.	8.260 (in^2)	

Tested By	KDG
Date	10-26-09
Press No.	1
Panel No.	B

Project Number	172679015
Test Number	CU-9C
Data File ID	9C
Lateral Pressure (psi)	15.0
Chamber Pressure - σ_3 (psi)	90

Clock Time (min.)	Load (lbf)	Deflection Dial Reading (in.)	Pore Pressure Reading (psi)	Corrected Hieght (in.)	Strain (%)	Corrected Area (cm^2)	Corrected Load (lbf)	Deviator Stress (tsf)	Corrected Deviator Stress* (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p' $(\sigma_1'+\sigma_3')/2$ (tsf)	q $(\sigma_1-\sigma_3)/2$ (tsf)	Effective Principal Stress Ratio σ_1' / σ_3'
8:03:30	321.2	0.704	73.0	5.290	12.00	46.5333	321.4	3.211	3.182	4.262	4.394	1.224	2.809	1.585	3.591
8:07:30	323.1	0.710	73.0	5.284	12.10	46.5860	323.3	3.227	3.198	4.278	4.410	1.224	2.817	1.593	3.603
8:11:32	323.9	0.716	72.9	5.278	12.20	46.6390	324.0	3.230	3.201	4.281	4.423	1.234	2.829	1.595	3.584
8:15:28	324.6	0.722	72.7	5.272	12.30	46.6923	324.7	3.234	3.204	4.284	4.437	1.245	2.841	1.596	3.565
8:19:18	326.0	0.728	72.7	5.266	12.40	46.7467	326.1	3.244	3.214	4.294	4.445	1.243	2.844	1.601	3.577
8:23:12	326.8	0.734	72.7	5.260	12.50	46.7987	327.0	3.249	3.218	4.298	4.450	1.243	2.846	1.603	3.580
8:27:15	327.9	0.740	72.6	5.254	12.60	46.8530	328.1	3.256	3.225	4.305	4.466	1.252	2.859	1.607	3.567
8:31:05	328.7	0.746	72.4	5.248	12.70	46.9067	328.8	3.260	3.229	4.309	4.481	1.264	2.873	1.609	3.546
8:34:57	329.7	0.752	72.4	5.242	12.80	46.9602	329.8	3.266	3.235	4.315	4.490	1.266	2.878	1.612	3.545
8:38:57	330.5	0.758	72.4	5.236	12.90	47.0137	330.7	3.271	3.240	4.320	4.493	1.265	2.879	1.614	3.551
8:42:56	331.5	0.764	72.3	5.230	13.00	47.0679	331.7	3.277	3.245	4.325	4.510	1.277	2.893	1.617	3.533
8:46:58	333.0	0.770	72.2	5.224	13.10	47.1222	333.1	3.287	3.255	4.335	4.525	1.281	2.903	1.622	3.532
8:51:04	333.8	0.776	72.1	5.218	13.20	47.1763	333.9	3.291	3.259	4.339	4.533	1.286	2.910	1.624	3.526
8:55:08	334.7	0.782	72.1	5.212	13.30	47.2308	334.8	3.296	3.264	4.344	4.538	1.285	2.912	1.626	3.531
8:59:09	335.2	0.788	72.0	5.206	13.40	47.2850	335.3	3.298	3.265	4.345	4.551	1.298	2.924	1.627	3.507
9:03:17	336.4	0.794	71.9	5.200	13.50	47.3396	336.6	3.306	3.273	4.353	4.565	1.303	2.934	1.631	3.503
9:07:27	337.7	0.800	71.9	5.194	13.60	47.3947	337.8	3.315	3.282	4.362	4.575	1.305	2.940	1.635	3.505
9:11:38	338.1	0.806	71.9	5.188	13.70	47.4494	338.3	3.315	3.282	4.362	4.576	1.306	2.941	1.635	3.503
9:15:41	339.4	0.812	71.7	5.182	13.80	47.5050	339.5	3.324	3.290	4.370	4.593	1.314	2.953	1.639	3.495
9:19:51	340.6	0.818	71.7	5.176	13.90	47.5604	340.7	3.331	3.298	4.378	4.606	1.320	2.963	1.643	3.489
9:24:01	341.8	0.824	71.7	5.170	14.00	47.6157	341.9	3.339	3.305	4.385	4.615	1.321	2.968	1.647	3.494
9:28:06	342.0	0.830	71.6	5.164	14.10	47.6703	342.2	3.338	3.303	4.383	4.617	1.325	2.971	1.646	3.484
9:32:12	343.0	0.836	71.5	5.158	14.20	47.7259	343.2	3.344	3.309	4.389	4.629	1.331	2.980	1.649	3.477
9:36:20	344.1	0.842	71.4	5.152	14.30	47.7818	344.3	3.351	3.316	4.396	4.641	1.337	2.989	1.652	3.472
9:40:31	345.0	0.848	71.4	5.146	14.40	47.8381	345.2	3.355	3.320	4.400	4.646	1.338	2.992	1.654	3.474
9:44:35	345.8	0.854	71.4	5.140	14.50	47.8937	346.0	3.359	3.324	4.404	4.655	1.343	2.999	1.656	3.467
9:48:37	347.4	0.860	71.3	5.134	14.60	47.9501	347.6	3.371	3.335	4.415	4.668	1.345	3.006	1.662	3.472
9:52:40	347.9	0.866	71.2	5.128	14.70	48.0056	348.0	3.371	3.336	4.416	4.678	1.354	3.016	1.662	3.454
9:56:53	348.1	0.872	71.2	5.122	14.80	48.0622	348.3	3.370	3.334	4.414	4.678	1.356	3.017	1.661	3.451
10:00:53	349.8	0.878	71.2	5.116	14.90	48.1185	350.0	3.382	3.346	4.426	4.691	1.357	3.024	1.667	3.458
10:05:05	350.8	0.884	71.1	5.110	15.00	48.1752	351.0	3.388	3.351	4.431	4.703	1.363	3.033	1.670	3.450
10:09:14	351.3	0.890	70.9	5.104	15.10	48.2316	351.5	3.389	3.352	4.432	4.713	1.372	3.042	1.670	3.434
10:13:21	352.3	0.896	71.0	5.098	15.20	48.2889	352.5	3.394	3.357	4.437	4.716	1.371	3.043	1.673	3.441
10:17:22	353.6	0.902	70.9	5.092	15.30	48.3455	353.7	3.402	3.365	4.445	4.727	1.374	3.051	1.677	3.441
10:21:25	354.6	0.908	70.8	5.086	15.40	48.4026	354.7	3.408	3.371	4.451	4.739	1.380	3.060	1.680	3.434
10:25:33	355.0	0.914	70.7	5.080	15.50	48.4602	355.1	3.408	3.370	4.450	4.747	1.388	3.068	1.679	3.419
10:29:34	355.0	0.920	70.7	5.074	15.60	48.5176	355.2	3.404	3.366	4.446	4.744	1.389	3.066	1.677	3.416
10:33:34	356.2	0.926	70.7	5.068	15.70	48.5757	356.3	3.411	3.373	4.453	4.751	1.390	3.071	1.681	3.418
10:37:42	357.2	0.932	70.6	5.062	15.80	48.6326	357.3	3.417	3.378	4.458	4.762	1.395	3.079	1.683	3.413
10:41:51	357.5	0.938	70.5	5.056	15.90	48.6904	357.7	3.416	3.377	4.457	4.771	1.405	3.088	1.683	3.395
10:45:55	358.1	0.944	70.5	5.050	16.00	48.7488	358.2	3.417	3.378	4.458	4.772	1.405	3.088	1.683	3.396
10:50:02	359.6	0.950	70.5	5.044	16.10	48.8068	359.8	3.428	3.388	4.468	4.782	1.405	3.094	1.688	3.403
10:54:06	360.6	0.956	70.4	5.038	16.20	48.8647	360.8	3.433	3.394	4.474	4.794	1.412	3.103	1.691	3.396
10:58:11	361.3	0.962	70.2	5.032	16.30	48.9229	361.5	3.436	3.396	4.476	4.808	1.423	3.115	1.692	3.379
11:02:12	362.5	0.968	70.3	5.026	16.40	48.9820	362.6	3.443	3.403	4.483	4.807	1.416	3.112	1.696	3.395
11:06:17	364.2	0.974	70.3	5.019	16.50	49.0406	364.3	3.455	3.414	4.494	4.821	1.418	3.120	1.701	3.400
11:10:23	364.7	0.980	70.2	5.013	16.60	49.0996	364.8	3.455	3.415	4.495	4.831	1.428	3.130	1.702	3.383
11:14:24	365.5	0.986	70.0	5.008	16.70	49.1578	365.6	3.459	3.418	4.498	4.845	1.438	3.142	1.703	3.368
11:18:25	367.4	0.992	70.1	5.001	16.80	49.2175	367.6	3.473	3.432	4.512	4.850	1.429	3.139	1.710	3.393
11:22:26	367.5	0.998	70.0	4.995	16.90	49.2766	367.6	3.469	3.428	4.508	4.853	1.437	3.145	1.708	3.378
11:26:27	367.9	1.004	69.9	4.989	17.00	49.3357	368.1	3.469	3.428	4.508	4.861	1.444	3.152	1.708	3.366
11:30:26	369.2	1.010	69.9	4.983	17.10	49.3951	369.3	3.477	3.435	4.515	4.874	1.451	3.162	1.712	3.360
11:34:30	370.3	1.016	69.9	4.977	17.20	49.4547	370.5	3.484	3.442	4.522	4.877	1.447	3.162	1.715	3.371
11:38:40	370.5	1.022	69.8	4.971	17.30	49.5146	370.7	3.481	3.439	4.519	4.878	1.451	3.165	1.714	3.362
11:42:45	371.0	1.028	69.7	4.965	17.40	49.5743	371.2	3.482	3.439	4.519	4.886	1.460	3.174	1.714	3.347
11:46:47	372.8	1.034	69.7	4.959	17.50	49.6351	373.0	3.494	3.452	4.532	4.901	1.461	3.181	1.720	3.355
11:50:52	373.3	1.040	69.7	4.953	17.60	49.6952	373.5	3.494	3.452	4.532	4.902	1.462	3.182	1.720	3.354
11:55:00	373.8	1.046	69.6	4.947	17.70	49.7553	373.9	3.495	3.452	4.532	4.907	1.467	3.187	1.720	3.345
11:59:08	374.9	1.052	69.5	4.941	17.80	49.8155	375.1	3.501	3.458	4.538	4.920	1.474	3.197	1.723	3.338
12:03:19	376.1	1.058	69.5	4.935	17.90	49.8763	376.2	3.508	3.464	4.544	4.930	1.477	3.203	1.726	3.338

Consolidated Undrained Triaxial Test
EM 1110-2-1906 Appendix X

Consolidation Values			Final Values	
Height	6.011 (in.)	15.268 (cm)	Height	4.911 (in.)
Diameter	2.843 (in)	7.221 (cm)	Dia. avg.	3.243 (in)
Area	6.347 (in^2)	40.950 (cm^2)	Area avg.	8.260 (in^2)

Tested By	KDG
Date	10-26-09
Press No.	1
Panel No.	B

Project Number	172679015
Test Number	CU-9C
Data File ID	9C
Lateral Pressure (psi)	15.0
Chamber Pressure - σ_3 (psi)	90

Clock Time (min.)	Load (lbf)	Deflection Dial Reading (in.)	Pore Pressure Reading (psi)	Corrected Hieght (in.)	Strain (%)	Corrected Area (cm^2)	Corrected Load (lbf)	Deviator Stress (tsf)	Corrected Deviator Stress* (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p' $(\sigma_1'+\sigma_3')/2$ (tsf)	q $(\sigma_1-\sigma_3)/2$ (tsf)	Effective Principal Stress Ratio σ_1' / σ_3'
12:07:39	376.3	1.064	69.5	4.929	18.00	49.9372	376.5	3.506	3.462	4.542	4.928	1.477	3.203	1.725	3.336
12:12:00	376.9	1.070	69.4	4.923	18.10	49.9986	377.1	3.507	3.463	4.543	4.934	1.483	3.208	1.726	3.328
12:16:05	378.3	1.076	69.3	4.917	18.20	50.0590	378.5	3.516	3.472	4.552	4.949	1.489	3.219	1.730	3.324
12:20:18	379.3	1.082	69.3	4.911	18.30	50.1204	379.4	3.520	3.476	4.556	4.958	1.494	3.226	1.732	3.319

EM 1110-2-1906
Appendix X
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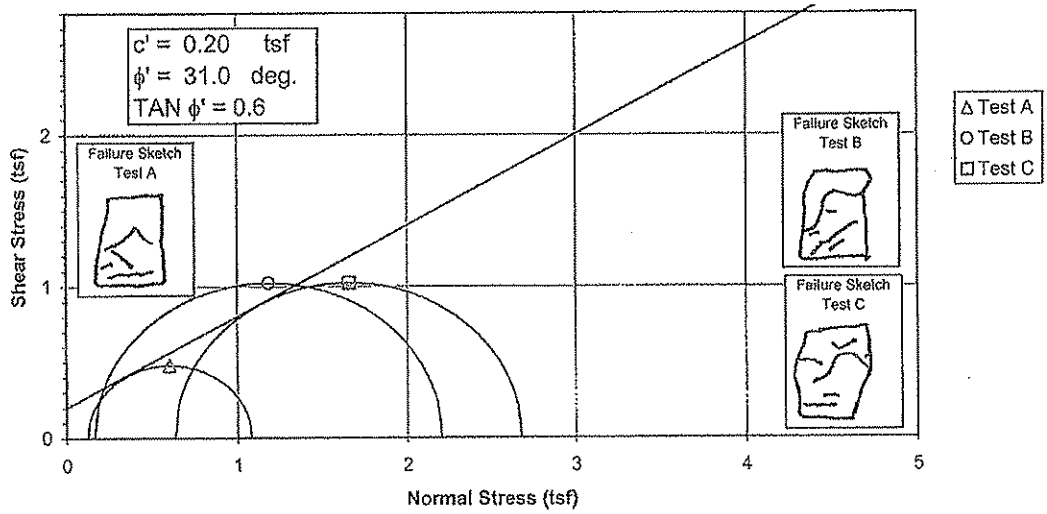
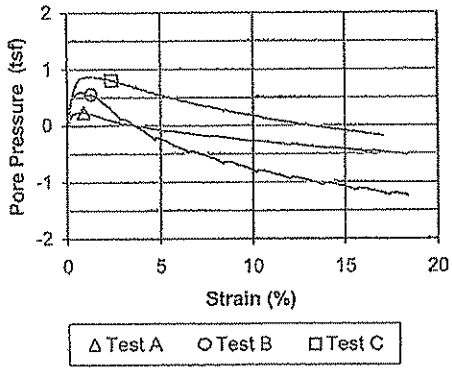
Failure Criterion: Maximum Effective Principal Stress Ratio

Effective Strength Envelope



Induced Pore Pressure vs. Strain



Specimen No.			A	B	C
Initial Data	Water content %	W_o	25.4	22.9	27.5
	Dry Density PCF	γ_{d_o}	98.5	102.6	94.0
	Saturation %	S_o	95.1	94.4	92.5
	Void Ratio	e_o	0.730	0.662	0.813
After Shear	Water content %	W_f	26.5	24.2	27.7
	Dry Density PCF	γ_{d_f}	98.9	102.7	97.0
	Saturation %	S_f	100.0	100.0	100.0
	Void Ratio	e_f	0.723	0.660	0.757
	Final Back Pressure TSF	u_c	6.12	5.76	5.04
Minor Principal Stress TSF @ failure		$\sigma_3'f$	0.13	0.17	0.64
Maximum Deviator Stress (tsf) @ failure		$(\sigma_1'-\sigma_3')_{max}$	0.96	2.04	2.04
Time to (σ1'-σ3')max min.		t_f	4.5	9.3	69.3
Ultimate Deviator Stress, t/sq ft		$(\sigma1'-\sigma3')_{ult}$	n/a	n/a	n/a
Initial Diameter, in.		D_o	2.884	2.889	2.887
Initial Height, in.		H_o	6.029	6.024	6.030

Controlled - Strain Test

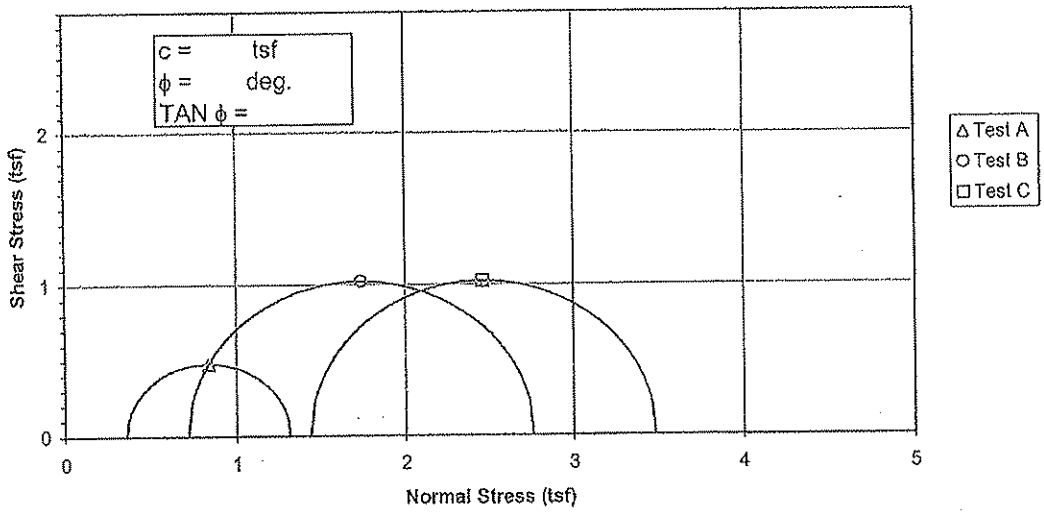
Description of Specimens Lean Clay (CL), brown, moist, firm

				Type of Specimen Undisturbed	Type of test $\bar{R}$
LL	PL	PI	Gs 2.73	Project Bull Run Fossil Plant (TVA)	
Remarks:					
				Boring No. STN-67	Sample No. 8
				Depth Elev. 4.5'-5.0', 5.1'-5.6', 9.5'-10.0'	
				Laboratory Stantec	Date 10-27-09
				TRIAXIAL COMPRESSION TEST REPORT	

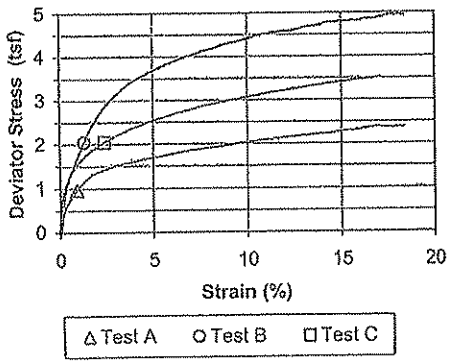
EM 1110-2-1906
Appendix X
30 Nov. 70

Failure Criterion: Maximum Effective Principal Stress Ratio

Total Strength Envelope



Deviator Stress vs. Strain



Specimen No.			A	B	C
Initial Data	Water content %	W_o	25.4	22.9	27.5
	Dry Density PCF	γ_{d_o}	98.5	102.6	94.0
	Saturation %	S_o	95.1	94.4	92.5
	Void Ratio	e_o	0.730	0.662	0.813
After Shear	Water content %	W_f	26.5	24.2	27.7
	Dry Density PCF	γ_{d_f}	98.9	102.7	97.0
	Saturation %	S_f	100.0	100.0	100.0
	Void Ratio	e_f	0.723	0.660	0.757
	Final Back Pressure TSF	u_c	6.12	5.76	5.04
Minor Principal Stress TSF		σ_3	0.36	0.72	1.44
Maximum Deviator Stress (tsf) @ failure		$(\sigma_1-\sigma_3)_{max}$	0.96	2.04	2.04
Time to $(\sigma_1-\sigma_3)_{Max.}$ min.		t_f	4.5	9.3	69.3
Ultimate Deviator Stress, t/sq ft		$(\sigma_1-\sigma_3)_{ult}$	n/a	n/a	n/a
Initial Diameter, in.		D_o	2.884	2.889	2.887
Initial Height, in.		H_o	6.029	6.024	6.030

Controlled - Strain Test

Description of Specimens: Lean Clay (CL), brown, moist, firm

LL | PL | PI | Gs 2.73

Remarks:

Type of Specimen: Undisturbed | Type of test: R

Project: Bull Run Fossil Plant (TVA)

Boring No.: STN-67 | Sample No.: 8

Depth Elev.: 4.5'-5.0', 5.1'-5.6', 9.5'-10.0'

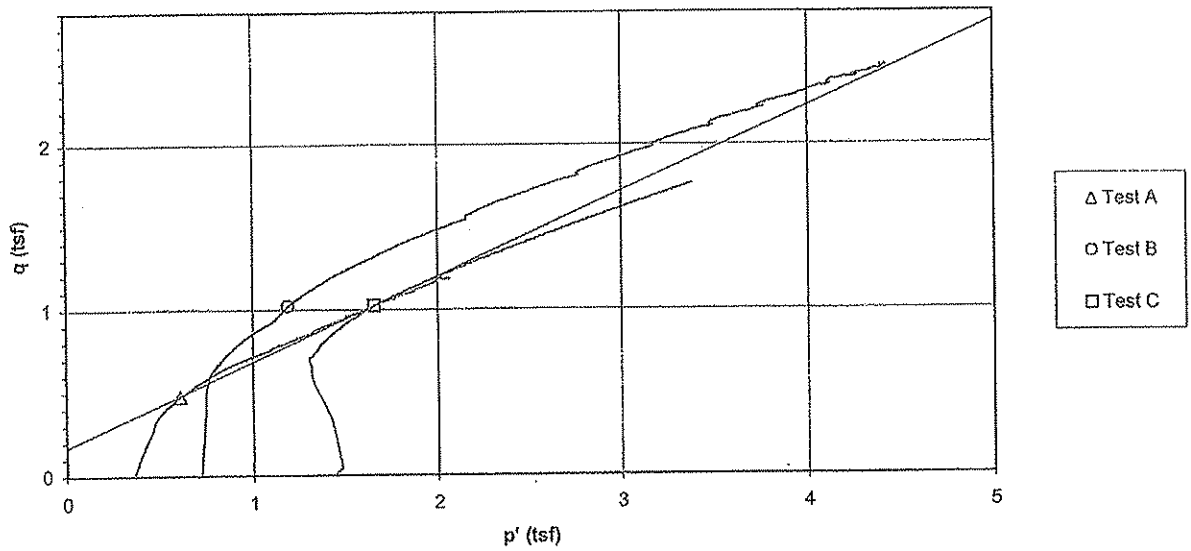
Laboratory: Stantec | Date: 10-27-09

TRIAXIAL COMPRESSION TEST REPORT

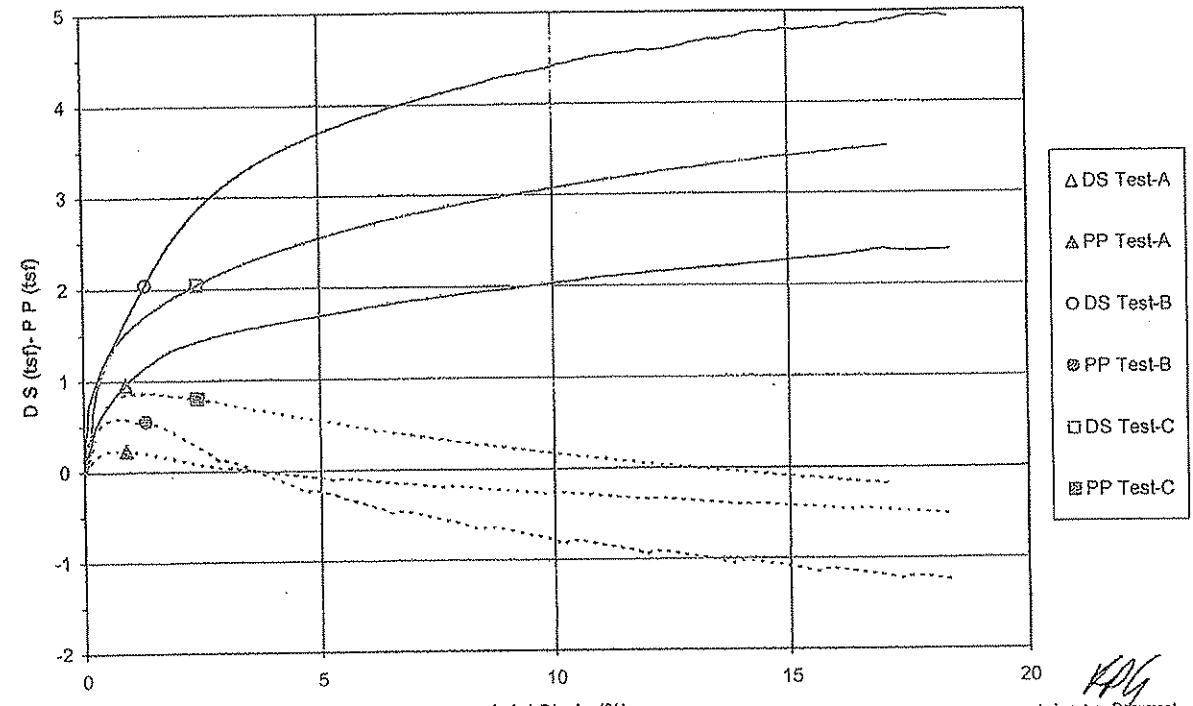
Consolidated Undrained Triaxial Test
EM 1110-2-1906 Appendix X

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Sample ID	STN-67, 4.5'-5.0' & STN-67, 5.1'-5.6' & STN-67, 9.5'-10.0'	Test Number	8
Failure Criterion:	Maximum Effective Principal Stress Ratio	ϕ' = 31.0 deg.	c' = 0.20 tsf

p' vs. q Plot



Deviator Stress and Induced Pore Pressure vs. Axial Strain



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Preparation Date: 1998
Revision Date: 1-2008

Stantec Consulting Services Inc.

Laboratory Document
Prepared By: MW
Approved BY: TLK

Consolidated Undrained Triaxial Test

ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN-67, 4.5'-5.0'	Test Number	CU-8A
Visual Description	Lean Clay (CL), brown, moist, firm	Prepared By	CM
Undisturbed	Source STN-67, 4.5'-6.5'	Date	9-28-2009

Specific Gravity 2.73 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in^3)		Specimen	
Top	2.880	1	6.035	Sample	39.3671 (V_o)	Wet Weight (g)	1277.80
Middle	2.887	2	6.027	Solids	22.7681 (VS_o)	Dry Weight (g)	1018.63
Bottom	2.883	3	6.021	Water	15.8146 (Vw_o)	Wet Unit Weight (pcf)	123.7
Avg.	2.8833 (D_o)	4	6.035	Voids	16.5991 (Vv_o)	Dry Unit Weight (pcf)	98.6
Area (in^2)	6.5295 (A_o)	Avg. (H_o)	6.0291	Degree of Saturation (%)	95.3 (S_o)		
Moisture Content (%)	25.4 Final Trimmings			Void Ratio	0.729		

Saturation

Set Up & Saturated: Wet xx Dry ____ Set up By RC

Back Pressure Saturated to: 85 (psi) Final Pore Pressure Parameter B 0.97 Date 10-15-09

Panel Board Number C

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.1199	Initial	17 (in.)	Initial	15.88 (in.)	Specimen Height (in.)	6.0292 (H_s)
Final	0.1198	Final	14.41 (in.)	Final	11.34 (in.)	Area (in^2) Method A	6.5297 (A_s)
Change	0.0001 (ΔH_o)	Change	-2.59 (in.)	Change	-4.54 (in.)	Specimen Volume (in^3)	39.37 (Vs)

Consolidation

Height Readings (in.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.1198	Initial	1.45 (in.)	Initial	17.79 (in.)	Chamber	90
Final	0.1209	Final	3.69 (in.)	Final	15.71 (in.)	Back	85
Change	-0.0011 (ΔH_c)	Change	-2.24 (in.)	Change	-2.08 (in.)	Lateral	5 (σ_3)
Height (in.)	6.0281 (H_c)			Volume (in^3)	39.2337 (V_c)		
Area (in^3) Method B	6.5084 (A_c)			Volume - Water (in^3)	16.4657 (VWc)	t_{50} (min.)	1.3
Diameter (in.)	2.8787 (D_c)			Water Content (%)	26.5		
Dry Density (pcf)	98.9			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.723

After Test

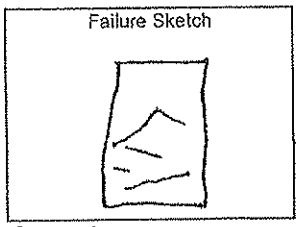
Final Measurements		Final Moisture Content		Stresses (membrane corrected) at Failure (psi)	
Maximum Diameter	3.412 (in.)	Wet Weight (g)	1288.47	Corrected Deviator	0.96 σ_d (tsf)
Wet weight (g)	1288.47 (WWf)	Dry Weight (g)	1018.63	Major Principal	1.08 $\sigma_1'_f$ (tsf)
Corrected Diameter	3.388 (in.)	Tare Weight (g)	0.00	Minor Principal	0.13 $\sigma_3'_f$ (tsf)
				Rate of Strain (% / min.)	0.172
				Axial Strain at Failure (%)	0.90

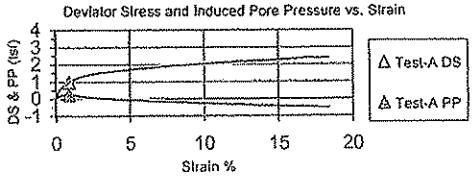
Youngs Modulus for Membrane (psi) 200

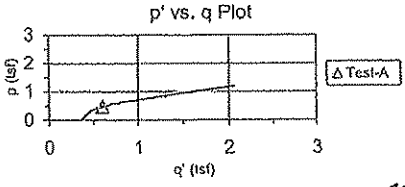
Membrane Thickness (in.) 0.012

Failure Criterion: Maximum Effective Principal Stress Ratio

Failure Sketch







Comments:

Stantec

Consolidated Undrained Triaxial Test
ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN-67, 5.1'-5.6'	Test Number	CU-8B
Visual Description	Lean Clay (CL), brown, moist, firm	Prepared By	CM
Undisturbed	Source STN-67, 4.5'-6.5'	Date	9-28-2009

Specific Gravity 2.73 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in3)		Specimen	
Top	2.885	1	6.019	Sample	39.4984 (V_o)	Wet Weight (g)	1305.80
Middle	2.886	2	6.032	Solids	23.7532 (VS_o)	Dry Weight (g)	1062.70
Bottom	2.897	3	6.027	Water	14.8338 (Vw_o)	Wet Unit Weight (pcf)	125.9
Avg.	2.8893 (D_o)	4	6.019	Voids	15.7452 (Vv_o)	Dry Unit Weight (pcf)	102.5
Area (in^2)	6.5567 (A_o)	Avg. (H_o)	6.0241	Degree of Saturation (%)	94.2 (S_o)		
Moisture Content (%)	22.9 Final Trimmings			Void Ratio	0.663		

Saturation

Set Up & Saturated: Wet xx Dry ____ Set up By RC

Back Pressure Saturated to: 80 (psi) Final Pore Pressure Parameter B 0.97 Date 10-21-09

Panel Board Number A

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.1168	Initial	16.6 (in.)	Initial	15.45 (in.)	Specimen Height (in.)	6.0261 (H_s)
Final	0.1168	Final	12.51 (in.)	Final	9.75 (in.)	Area (in^2) Method A	6.5611 (A_s)
Change	0.0020 (ΔH_o)	Change	-4.09 (in.)	Change	-5.70 (in.)	Specimen Volume (in^3)	39.54 (V_s)

Consolidation

Height Readings (in.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.1168	Initial	1.50 (in.)	Initial	17.3 (in.)	Chamber	90
Final	0.1212	Final	2.50 (in.)	Final	15.7 (in.)	Back	80
Change	-0.0044 (ΔH_c)	Change	-1.00 (in.)	Change	-1.60 (in.)	Lateral	10 (σ_3)
Height (in.)	6.0217 (H_c)			Volume (in^3)	39.4308 (V_c)		
Area (in^3) Method B	6.5481 (A_c)			Volume - Water (in^3)	15.6777 (VWc)	D_{50} (min.)	1.1
Diameter (in.)	2.8874 (D_c)			Water Content (%)	24.2		
Dry Density (pcf)	102.7			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.660

After Test

Final Measurements		Final Moisture Content	
Maximum Diameter	3.446 (in.)	Wet Weight (g)	1319.63
Wet weight (g)	1319.63 (WWf)	Dry Weight (g)	1062.70
Corrected Diameter	3.422 (In.)	Tare Weight (g)	0.00

Stresses (membrane corrected) at Failure (psi)

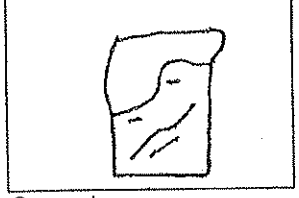
Corrected Deviator	2.04 σ_d (tsf)
Major Principal	2.21 $\sigma_1'_f$ (tsf)
Minor Principal	0.17 $\sigma_3'_f$ (tsf)
Rate of Strain (% / min.)	0.167
Axial Strain at Failure (%)	1.31

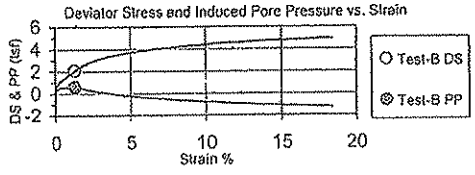
Youngs Modulus for Membrane (psi) 200

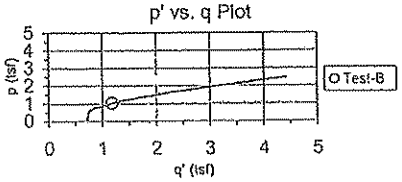
Membrane Thickness (in.) 0.012

Failure Criterion: Maximum Effective Principal Stress Ratio

Failure Sketch







Comments:

Stantec

Consolidated Undrained Triaxial Test

ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN-67, 9.5'-10.0'	Test Number	CU-8C
Visual Description	Lean Clay (CL), brown, moist, firm	Prepared By	CM
Undisturbed	Source STN-67, 9.5'-11.5'	Date	9-29-2009

Specific Gravity 2.73 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in³)		Specimen	
Top	2.891	1	6.033	Sample	39.4706 (V_o)	Wet Weight (g)	1242.4
Middle	2.888	2	6.032	Solids	21.7738 (VS_o)	Dry Weight (g)	974.15
Bottom	2.882	3	6.022	Water	16.3688 (Vw_o)	Wet Unit Weight (pcf)	119.9
Avg.	2.8870 (D_o)	4	6.033	Voids	17.6968 (Vv_o)	Dry Unit Weight (pcf)	94.0
Area (in²)	6.5461 (A_o)	Avg. (H_o)	6.0296	Degree of Saturation (%)	92.5 (S_o)		
Moisture Content (%)	27.5 Final Trimmings			Void Ratio	0.813		

Saturation

Set Up & Saturated: Wet xx Dry Set up By RC

Back Pressure Saturated to: 70 (psi) Final Pore Pressure Parameter B 0.96 Date 10-21-09

Panel Board Number D

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.1132	Initial	16.7 (in.)	Initial	15.32 (in.)	Specimen Height (in.)	6.0417 (H_s)
Final	0.1011	Final	11.13 (in.)	Final	10.81 (in.)	Area (in²) Method A	6.5723 (A_s)
Change	0.0121 (ΔH_o)	Change	-5.57 (in.)	Change	-4.51 (in.)	Specimen Volume (in³)	39.71 (V_s)

Consolidation

Height Readings (in.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.1011	Initial	1.30 (in.)	Initial	17.22 (in.)	Chamber	90
Final	0.1385	Final	4.01 (in.)	Final	14.53 (in.)	Back	70
Change	-0.0374 (ΔH_c)	Change	-2.71 (in.)	Change	-2.69 (in.)	Lateral	20 (σ_3)
Height (in.)	6.0043 (H_c)			Volume (in³)	38.2597 (V_c)		
Area (in³) Method B	6.3720 (A_c)			Volume - Water (in³)	16.4860 (VWc)	D_{50} (min.)	8.9
Diameter (in.)	2.8484 (D_c)			Water Content (%)	27.7		
Dry Density (pcf)	97.0			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.757

After Test

Final Measurements		Final Moisture Content	
Maximum Diameter	3.328 (in.)	Wet Weight (g)	1244.32
Wet weight (g)	1244.32 (WWf)	Dry Weight (g)	974.15
Corrected Diameter	3.280 (in.)	Tare Weight (g)	0.00

Stresses (membrane corrected) at Failure (psi)

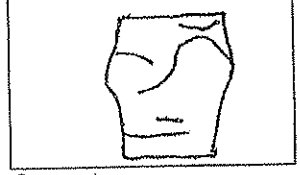
Corrected Deviator	2.04 σ_d (tsf)
Major Principal	2.68 $\sigma_1'_f$ (tsf)
Minor Principal	0.64 $\sigma_3'_f$ (tsf)
Rate of Strain (% / min.)	0.030
Axial Strain at Failure (%)	2.40

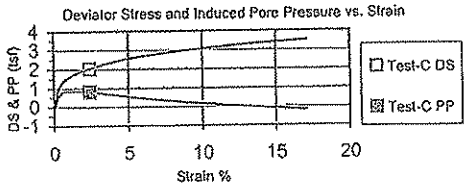
Youngs Modulus for Membrane (psi) 200

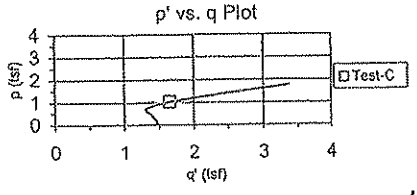
Membrane Thickness (in.) 0.024

Failure Criterion: Maximum Effective Principal Stress Ratio

Failure Sketch







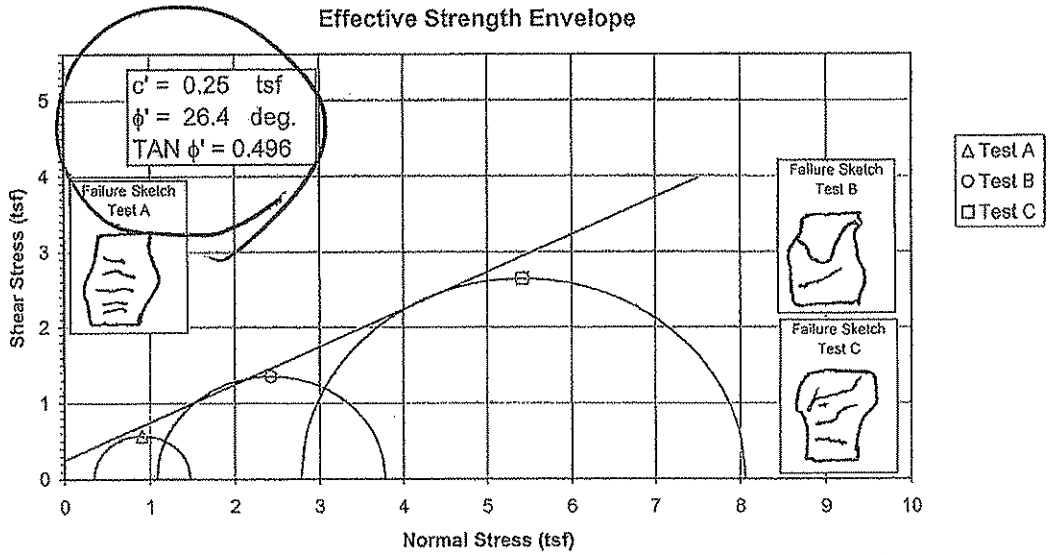
Comments:

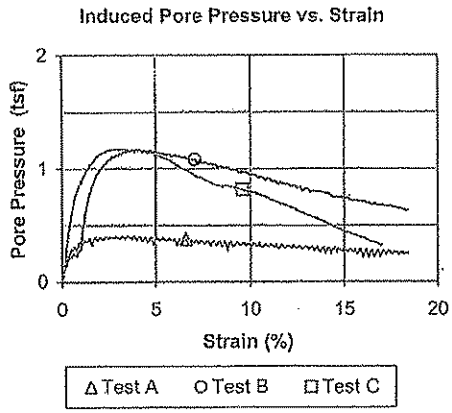
(GYPSUM STACK)

ALLUVIUM & LEAN CLAY

EM 1110-2-1906
Appendix X
30 Nov. 70

Failure Criterion: Maximum Effective Principal Stress Ratio





Specimen No.			A	B	C
Initial Data	Water content %	W_{c_o}	31.8	28.8	28.6
	Dry Density PCF	γ_{d_o}	88.7	92.3	93.3
	Saturation %	S_o	96.4	95.4	97.1
	Void Ratio	e_o	0.880	0.806	0.786
After Shear	Water content %	W_f	28.2	26.8	24.7
	Dry Density PCF	γ_{d_f}	95.0	97.1	100.4
	Saturation %	S_f	100.0	100.0	100.0
	Void Ratio	e_f	0.754	0.717	0.660
	Final Back Pressure TSF	u_c	5.76	4.32	2.88
Minor Principal Stress TSF @ failure		$\sigma_3'f$	0.34	1.08	2.78
Maximum Deviator Stress (tsf) @ failure		$(\sigma_1'-\sigma_3')_{max}$	1.13	2.70	5.28
Time to $(\sigma 1'-\sigma 3')$max min.		t_f	385.9	950.9	1180.4
Ultimate Deviator Stress, t/sq ft		$(\sigma 1'-\sigma 3')_{ult}$	n/a	n/a	n/a
Initial Diameter, in.		D_o	2.855	2.885	2.874
Initial Height, in.		H_o	6.043	6.011	6.034

Controlled - Strain Test

Description of Specimens Lean Clay (CL), gray, moist, firm

LL | PL | PI | Gs 2.67

Remarks:

Type of Specimen Undisturbed | Type of test R

Project Bull Run Fossil Plant (TVA)

Boring No. STN-88 | Sample No. 7

Depth Elev. 24.6'-25.1', 26.6'-27.1', 28.0'-28.5'

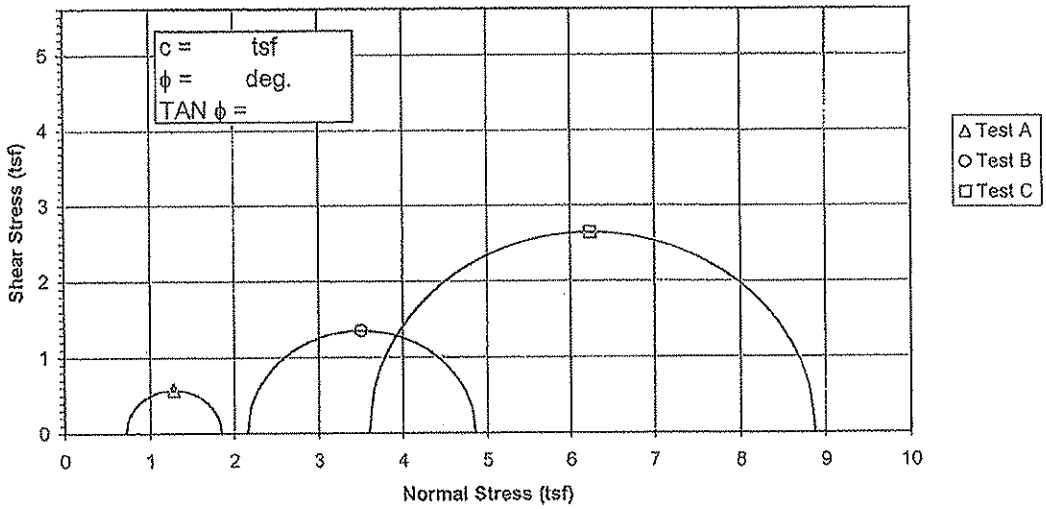
Laboratory Stantec | Date 10-27-09

TRIAXIAL COMPRESSION TEST REPORT

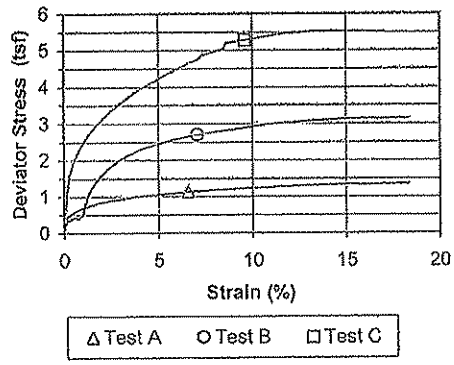
EM 1110-2-1906
Appendix X
30 Nov. 70

Failure Criterion: Maximum Effective Principal Stress Ratio

Total Strength Envelope



Deviator Stress vs. Strain



Specimen No.			A	B	C	
Initial Data	Water content %	W_o	31.8	28.8	28.6	
	Dry Density PCF	γ_{d_o}	88.7	92.3	93.3	
	Saturation %	S_o	96.4	95.4	97.1	
	Void Ratio	e_o	0.880	0.806	0.786	
After Shear	Water content %	W_f	28.2	26.8	24.7	
	Dry Density PCF	γ_{d_f}	95.0	97.1	100.4	
	Saturation %	S_f	100.0	100.0	100.0	
	Void Ratio	e_f	0.754	0.717	0.660	
	Final Back Pressure TSF	u_c	5.76	4.32	2.88	
Minor Principal Stress TSF		σ_3	0.72	2.16	3.60	
Maximum Deviator Stress (tsf) @ failure		$(\sigma_1-\sigma_3)_{max}$	1.13	2.70	5.28	
Time to $(\sigma_1-\sigma_3)_{Max.}$ min.		t_f	385.9	950.9	1180.4	
Ultimate Deviator Stress, t/sq ft		$(\sigma_1-\sigma_3)_{ult}$	n/a	n/a	n/a	
Initial Diameter, in.		D_o	2.855	2.885	2.874	
Initial Height, in.		H_o	6.043	6.011	6.034	

Controlled - Strain Test

Description of Specimens: Lean Clay (CL), gray, moist, firm

LL | PL | PI | Gs 2.67

Remarks:

Type of Specimen: Undisturbed | Type of test: R

Project: Bull Run Fossil Plant (TVA)

Boring No.: STN-88 | Sample No.: 7

Depth Elev.: 24.6'-25.1', 26.6'-27.1', 28.0'-28.5'

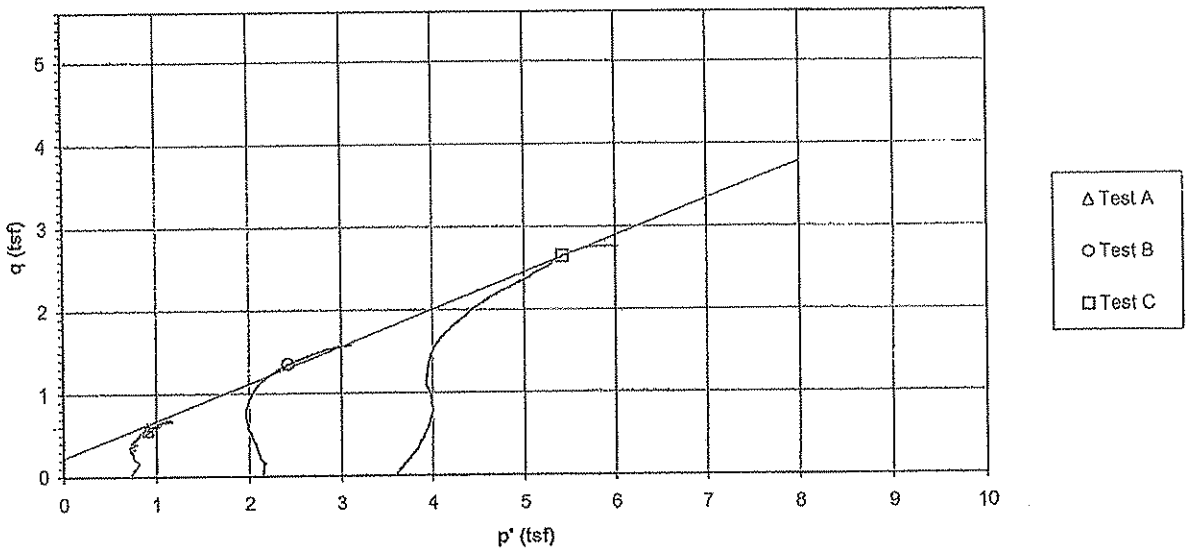
Laboratory: Stantec | Date: 10-27-09

TRIAXIAL COMPRESSION TEST REPORT

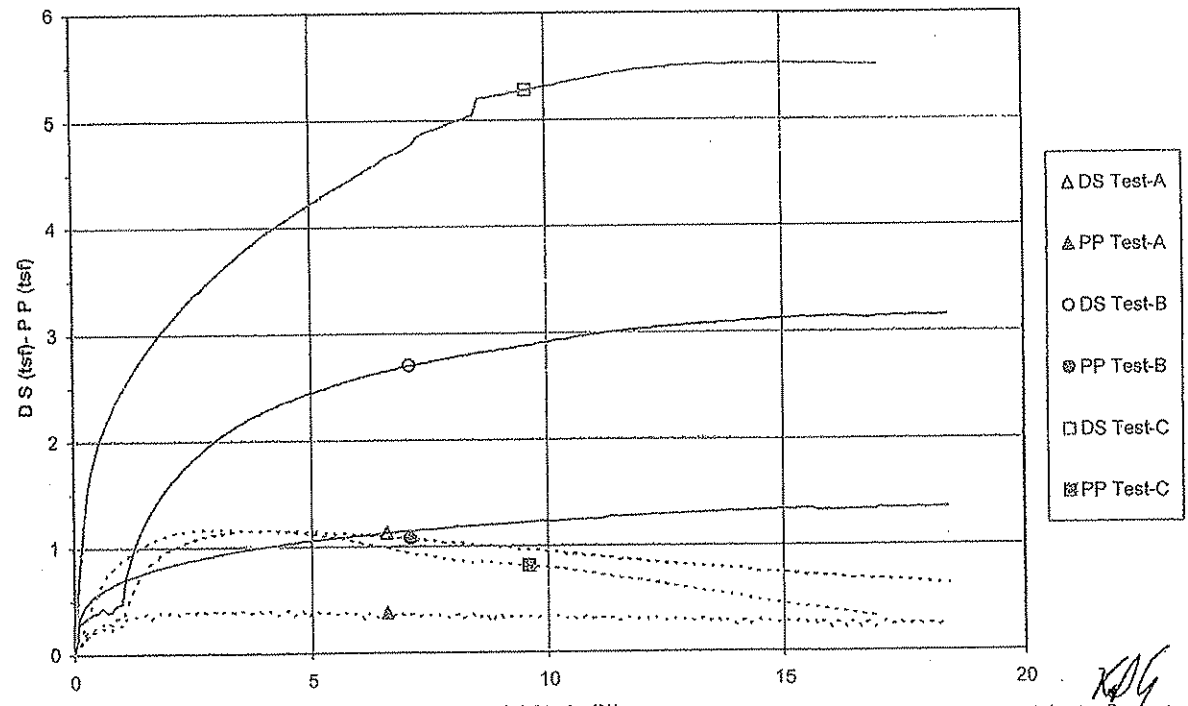
Consolidated Undrained Triaxial Test
EM 1110-2-1906 Appendix X

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Sample ID	STN-88, 24.6'-25.1' & STN-88, 26.6'-27.1' & STN-88, 28.0'-28.5'	Test Number	7
Failure Criterion:	Maximum Effective Principal Stress Ratio	ϕ' =	26.4 deg.
		c' =	0.25 tsf

p' vs. q Plot



Deviator Stress and Induced Pore Pressure vs. Axial Strain



Consolidated Undrained Triaxial Test

ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN-86, 24.6'-25.1'	Test Number	CU-7A
Visual Description	Lean Clay (CL), gray, moist, firm	Prepared By	CM
Undisturbed	Source STN-88, 24.0'-26.0'	Date	9-29-2009

Specific Gravity 2.67 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in^3)		Specimen	
Top	2.856	1	6.053	Sample	38.6967 (V_o)	Wet Weight (g)	1186.50
Middle	2.854	2	6.045	Solids	20.5774 (VS_o)	Dry Weight (g)	900.39
Bottom	2.856	3	6.024	Water	17.4585 (Vw_o)	Wet Unit Weight (pcf)	116.8
Avg.	2.8553 (D_o)	4	6.053	Voids	18.1193 (Vv_o)	Dry Unit Weight (pcf)	88.6
Area (in^2)	6.4033 (A_o)	Avg. (H_o)	6.0433	Degree of Saturation (%)	96.4 (S_o)		
Moisture Content (%)	31.8 Final Trimmings			Void Ratio	0.881		

Saturation

Set Up & Saturated: Wet xx Dry

Back Pressure Saturated to: 80 (psi) Final Pore Pressure Parameter B 0.96

Set up By RC

Date 10-15-09

Panel Board Number A

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.1193	Initial	16.58 (in.)	Initial	15.19 (in.)	Specimen Height (in.)	6.0434 (H_s)
Final	0.1192	Final	14.91 (in.)	Final	8.5 (in.)	Area (in^2) Method A	6.4035 (A_s)
Change	0.0001 (ΔH_o)	Change	-1.67 (in.)	Change	-6.69 (in.)	Specimen Volume (in^3)	38.70 (Vs)

Consolidation

Height Readings (in.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.1192	Initial	1.31 (in.)	Initial	17.41 (in.)	Chamber	90
Final	0.127	Final	7.80 (in.)	Final	9.64 (in.)	Back	80
Change	-0.0078 (ΔH_c)	Change	-6.49 (in.)	Change	-7.77 (in.)	Lateral	10 (σ_3)
Height (in.)	6.0356 (H_c)			Volume (in^3)	36.0894 (V_c)		
Area (in^3) Method B	5.9795 (A_c)			Volume - Water (in^3)	15.5120 (VWc)	t_{50} (min.)	20
Diameter (in.)	2.7592 (D_c)			Water Content (%)	28.2		
Dry Density (pcf)	95.0			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.754

After Test

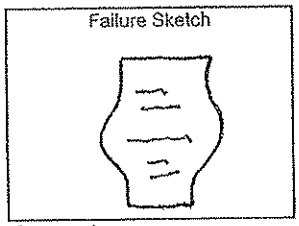
Final Measurements		Final Moisture Content		Stresses (membrane corrected) at Failure (psi)	
Maximum Diameter	3.252 (in.)	Wet Weight (g)	1154.60	Corrected Deviator	1.13 σ_d (tsf)
Wet weight (g)	1154.6 (WWf)	Dry Weight (g)	900.39	Major Principal	1.47 $\sigma_1'_f$ (tsf)
Corrected Diameter	3.228 (In.)	Tare Weight (g)	0.00	Minor Principal	0.34 $\sigma_3'_f$ (tsf)
				Rate of Strain (% / min.)	0.017
				Axial Strain at Failure (%)	6.60

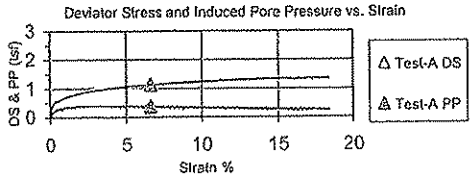
Youngs Modulus for Membrane (psi) 200

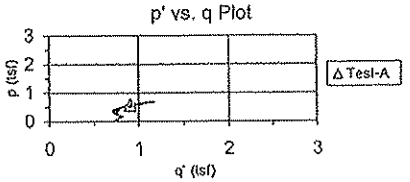
Membrane Thickness (in.) 0.012

Failure Criterion: Maximum Effective Principal Stress Ratio

Failure Sketch







Comments:

Stantec

Consolidated Undrained Triaxial Test
ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN-88, 26.6'-27.1'	Test Number	CU-7B
Visual Description	Lean Clay (CL), gray, moist, firm	Prepared By	CM
Undisturbed	Source STN-88, 26.0'-28.0'	Date	9-29-2009

Specific Gravity 2.67 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in3)		Specimen	
Top	2.889	1	6.012	Sample	39.2925 (V_o)	Wet Weight (g)	1226.30
Middle	2.885	2	6.016	Solids	21.7596 (VS_o)	Dry Weight (g)	952.12
Bottom	2.881	3	6.004	Water	16.7306 (Vw_o)	Wet Unit Weight (pcf)	118.9
Avg.	2.8850 (D_o)	4	6.012	Voids	17.5329 (Vv_o)	Dry Unit Weight (pcf)	92.3
Area (in^2)	6.5370 (A_o)	Avg. (H_o)	6.0108	Degree of Saturation (%)	95.4 (S_o)		
Moisture Content (%)	28.8 Final Trimmings			Void Ratio	0.806		

Saturation

Set Up & Saturated: Wet xx Dry ____ Set up By RC

Back Pressure Saturated to: 60 (psi) Final Pore Pressure Parameter B 0.95 Date 10-15-09

Panel Board Number B

Height Readings (in.)		Back Pressure Burette		Chamber Burette		
Initial	0.1212	Initial	16.68 (In.)	Initial	15.59 (in.)	Specimen Height (in.) 6.0170 (H_s)
Final	0.115	Final	14.01 (in.)	Final	13.48 (in.)	Area (in^2) Method A 6.5505 (A_s)
Change	0.0062 (ΔH_o)	Change	-2.67 (In.)	Change	-2.11 (in.)	Specimen Volume (in^3) 39.41 (V_s)

Consolidation

Height Readings (In.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.115	Initial	1.21 (in.)	Initial	17.41 (in.)	Chamber	90
Final	0.1183	Final	9.05 (In.)	Final	8.84 (in.)	Back	60
Change	-0.0033 (ΔH_c)	Change	-7.84 (in.)	Change	-8.57 (in.)	Lateral	30 (σ_3)
Height (in.)	6.0137 (H_c)			Volume (in^3)	37.3516 (V_c)		
Area (in^3) Method B	6.2111 (A_c)			Volume - Water (in^3)	15.5919 (VWc)	D_{50} (min.)	50
Diameter (in.)	2.8122 (D_c)			Water Content (%)	26.8		
Dry Density (pcf)	97.1			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.717

After Test

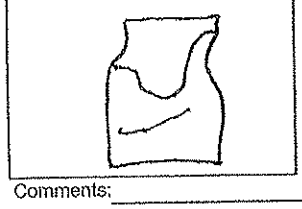
Final Measurements		Final Moisture Content		Stresses (membrane corrected) at Failure (psi)	
Maximum Diameter	3.281 (In.)	Wet Weight (g)	1207.64	Corrected Deviator	2.70 σ_d (tsf)
Wet weight (g)	1207.64 (WWf)	Dry Weight (g)	952.12	Major Principal	3.78 $\sigma_1'_f$ (tsf)
Corrected Diameter	3.257 (In.)	Tare Weight (g)	0.00	Minor Principal	1.08 $\sigma_3'_f$ (tsf)
				Rate of Strain (% / min.)	0.013
				Axial Strain at Failure (%)	7.10

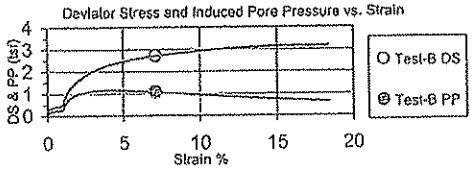
Youngs Modulus for Membrane (psi) 200

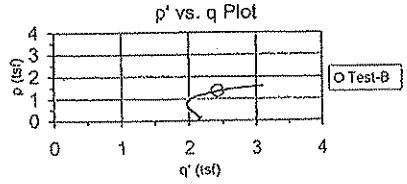
Membrane Thickness (In.) 0.012

Failure Criterion: Maximum Effective Principal Stress Ratio

Failure Sketch







Comments:

Consolidated Undrained Triaxial Test

ASTM D4767-04

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN-88, 28.0'-28.5'	Test Number	CU-7C
Visual Description	Lean Clay (CL), gray, moist, firm	Prepared By	CM
Undisturbed	Source STM-88, 28.0'-30.0'	Date	9-29-2009

Specific Gravity 2.67 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in^3)		Specimen	
Top	2.868	1	6.036	Sample	39.1088 (V_o)	Wet Weight (g)	1232.9
Middle	2.877	2	6.047	Solids	21.9162 (VS_o)	Dry Weight (g)	958.97
Bottom	2.873	3	6.018	Water	16.7153 (Vw_o)	Wet Unit Weight (pcf)	120.1
Avg.	2.8727 (D_o)	4	6.036	Voids	17.1926 (Vv_o)	Dry Unit Weight (pcf)	93.4
Area (in^2)	6.4813 (A_o)	Avg. (H_o)	6.0341	Degree of Saturation (%)	97.2 (S_o)		
Moisture Content (%)	28.6 Final Trimmings			Void Ratio	0.784		

Saturation

Set Up & Saturated: Wet xx Dry

Back Pressure Saturated to: 40 (psi) Final Pore Pressure Parameter B 0.99

Set up By RC

Date 10-15-09

Panel Board Number D

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial	0.1179	Initial	16.51 (in.)	Initial	16.13 (in.)	Specimen Height (in.)	6.0354 (H_s)
Final	0.1166	Final	15.01 (in.)	Final	14.72 (in.)	Area (in^2) Method A	6.4841 (A_s)
Change	0.0013 (ΔH_o)	Change	-1.50 (in.)	Change	-1.41 (in.)	Specimen Volume (in^3)	39.13 (V_s)

Consolidation

Height Readings (in.)		Back Pressure Burette Readings		Chamber Burette Readings		Pressures (psi)	
Initial	0.1165	Initial	1.37 (in.)	Initial	15.01 (in.)	Chamber	90
Final	0.1412	Final	8.25 (in.)	Final	8.57 (in.)	Back	40
Change	-0.0247 (ΔH_c)	Change	-6.88 (in.)	Change	-6.44 (in.)	Lateral	50 (σ_3)
Height (in.)	6.0107 (H_c)			Volume (in^3)	36.3744 (V_c)		
Area (in^3) Method B	6.0516 (A_c)			Volume - Water (in^3)	14.4582 (VWc)	D_{50} (min.)	115
Diameter (in.)	2.7758 (D_c)			Water Content (%)	24.7		
Dry Density (pcf)	100.4			Degree of Saturation (%)	100.0 (S_c)	Void Ratio	0.660

After Test

Final Measurements		Final Moisture Content	
Maximum Diameter	3.276 (in.)	Wet Weight (g)	1195.91
Wet weight (g)	1195.91 (WWf)	Dry Weight (g)	958.97
Corrected Diameter	3.228 (in.)	Tare Weight (g)	0.00

Stresses (membrane corrected) at Failure (psi)

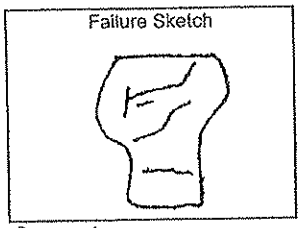
Corrected Deviator	5.28 σ_d (tsf)
Major Principal	8.06 $\sigma_1'_f$ (tsf)
Minor Principal	2.78 $\sigma_3'_f$ (tsf)
Rate of Strain (% / min.)	0.012
Axial Strain at Failure (%)	9.60

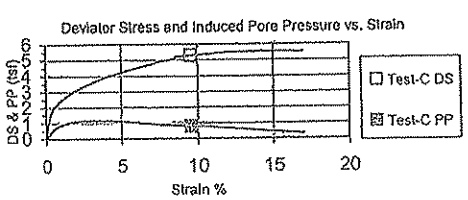
Youngs Modulus for Membrane (psi) 200

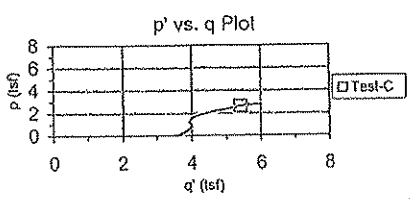
Membrane Thickness (in.) 0.024

Failure Criterion: Maximum Effective Principal Stress Ratio

Failure Sketch







Comments:

Attachment 6

Unconsolidated
Undrained (UU) Tests

Stantec

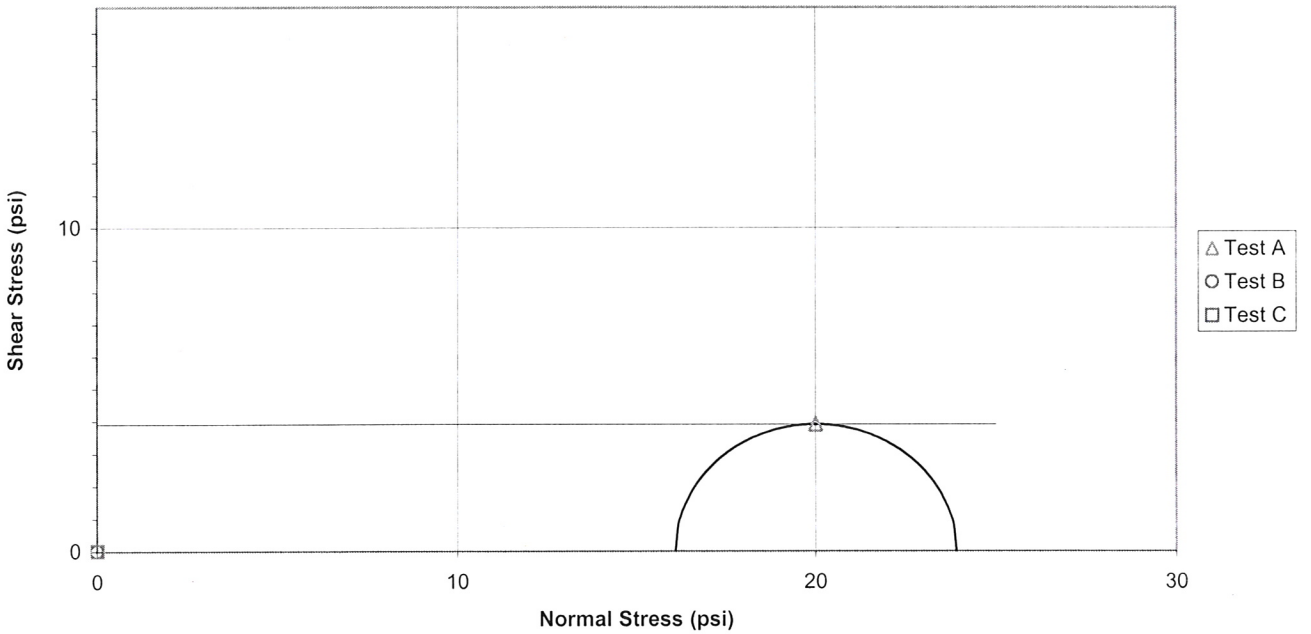
Unconsolidated Undrained Triaxial Test
ASTM D 2850-03a

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Sample ID	STN-56P, 20.6'-21.1'	Test Number	1069B

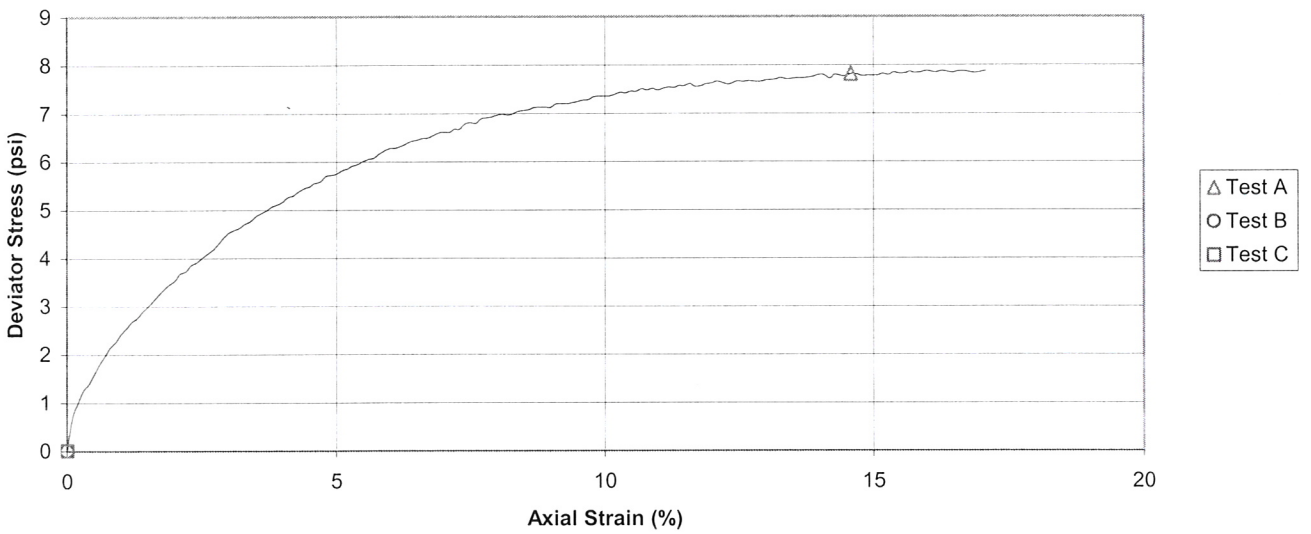
ϕ = 0.0 deg. c = 3.9 psi

Failure Criterion: Maximum Deviator Stress

Mohr Failure Envelope



Deviator Stress vs. Axial Strain



Unconsolidated Undrained Triaxial Test
ASTM D2850-03a

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN-56P, 20.6'-21.1'	Test Number	UU-1069B
Visual Description	Sandy Lean Clay (CL), brown, moist, soft	Prepared By	CM
Undisturbed	Source STN-56P, 20.0'-22.0'	Date	9-16-09

Specific Gravity 2.70 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in^3)		Specimen	
Top	2.854	1	6.031	Sample	38.5000 (V_o)	Wet Weight (g)	1275.10
Middle	2.857	2	6.015	Solids	23.2349 (VS_o)	Dry Weight (g)	1028.09
Bottom	2.856	3	5.969	Water	15.0725 (Vw_o)	Wet Unit Weight (pcf)	126.2
Avg.	2.8557 (D_o)	4	6.031	Voids	15.2651 (Vv_o)	Dry Unit Weight (pcf)	101.7
Area (in^2)	6.4048 (A_o)	Avg. (H_o)	6.0111	Degree of Saturation (%)	98.7 (S_o)		
Moisture Content (%)	24.0	Final Trimmings		Void Ratio	0.657		

Saturation

Set Up & Saturated: Wet xx Dry

Back Pressure Saturated to: 0 (psi) Final Pore Pressure Parameter B

Set up By KDG

Date 11-4-09

Panel Board Number D

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial		Initial	(in.)	Initial	(in.)	Specimen Height (in.)	6.0111 (H_s)
Final		Final	(in.)	Final	(in.)	Area (in^2) Method A	6.4048 (A_s)
Change	0.0000 (ΔH_o)	Change	(in.)	Change	(in.)	Specimen Volume (in^3)	38.5 (Vs)

Consolidation

Height Readings (in.)		Back Pressure Burette Readings		Chamber Burete Readings		Pressures (psi)	
Initial		Initial	(in.)	Initial	(in.)	Chamber	16
Final		Final	(in.)	Final	(in.)	Back	0
Change	0.0000 (ΔH_c)	Change	(in.)	Change	(in.)	Lateral	16 (σ_3)
Height (in.)	6.0111 (H_c)			Volume (in^3)	38.5000 (V_c)		
Area (in^3) Method A	6.4048 (A_c)			Volume - Water (in^3)	14.6307 (VWc)	t_{50} (min.)	
Diameter (in.)	2.8557 (D_c)			Water Content (%)	23.3		
Dry Density (pcf)	101.7			Degree of Saturation (%)	95.8 (S_c)	Void Ratio	0.657

After Test

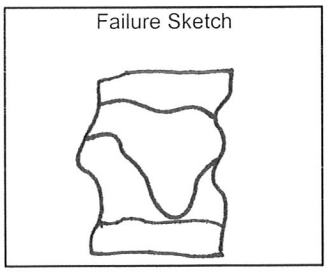
Final Measurements		Final Moisture Content		Stresses (membrane corrected) at Failure (psi)	
Maximum Diameter	3.255 (in.)	Wet Weight (g)	1267.86	Corrected Deviator	7.82 σ_d (psi)
Wet weight (g)	1267.86 (WWf)	Dry Weight (g)	1028.09	Major Principal	23.91 σ_{1f} (psi)
Average Diameter	3.164 (in.)	Tare Weight (g)	0.00	Minor Principal	16.09 σ_{3f} (psi)
				Rate of Strain (% / min.)	0.253
				Axial Strain at Failure (%)	14.59

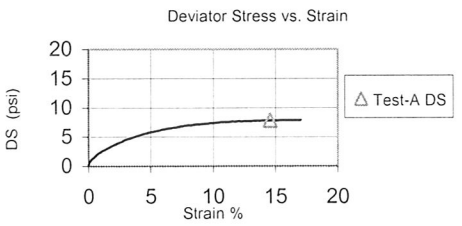
Youngs Modulus for Membrane (psi) 200

Membrane Thickness (in.) 0.012

Failure Criterion: Maximum Deviator Stress

Failure Sketch





Comments: 1006

Unconsolidated Undrained Triaxial Test
ASTM D2850-03a

Consolidation Values		Final Values					
Height	6.011 (in.)	Height	4.9843 (in.)	Tested By	KDG	Project Number	172679015
Diameter	2.856 (in)	Dia. avg.	3.164 (in)	Date	11-4-09	Test Number	UU-1069B
Area	6.405 (in^2)	Area avg.	7.8609 (in^2)	Press No.	2	Data File ID	UU-1069B
				Panel No.	D	Back Pressure (psi)	0
						Lateral Pressure (psi)	16

Clock Time (min.)	Load (lbf)	Deflection Dial Reading (in.)	Chamber Pressure Reading (psi)	Corrected Hieght (in.)	Strain (%)	Corrected Area (in^2)	Corrected Load (lbf)	Deviator Stress (psi)	Corrected Deviator Stress* (tsf)	σ_1 (psi)	σ_3 (psi)	p $(\sigma_1+\sigma_3)/2$ (psi)	q $(\sigma_1-\sigma_3)/2$ (psi)	Principal Stress Ratio σ_1 / σ_3	Test Time (min.)
0:00:00	0.6	-0.001	16.1	6.011	0.00	6.4048	0.0	0.000	0.000	16.071	16.071	16.07	0.00	1.000	0.0
0:00:15	5.2	0.006	16.0	6.005	0.11	6.4116	4.6	0.717	0.713	16.749	16.036	16.39	0.36	1.044	0.3
0:00:27	7.3	0.013	16.1	5.998	0.22	6.4190	6.7	1.044	1.036	17.089	16.053	16.57	0.52	1.065	0.5
0:00:37	8.8	0.018	16.0	5.992	0.31	6.4248	8.2	1.277	1.266	17.309	16.043	16.68	0.63	1.079	0.6
0:00:46	9.5	0.024	16.0	5.987	0.40	6.4308	8.9	1.391	1.377	17.418	16.041	16.73	0.69	1.086	0.8
0:00:56	10.9	0.030	16.0	5.981	0.50	6.4370	10.3	1.597	1.580	17.620	16.040	16.83	0.79	1.099	0.9
0:01:08	12.5	0.036	16.0	5.974	0.62	6.4445	11.9	1.841	1.821	17.844	16.023	16.93	0.91	1.114	1.1
0:01:18	13.5	0.042	16.0	5.969	0.71	6.4504	12.9	1.997	1.973	18.017	16.043	17.03	0.99	1.123	1.3
0:01:28	14.6	0.048	16.1	5.963	0.80	6.4565	14.0	2.168	2.141	18.214	16.073	17.14	1.07	1.133	1.5
0:01:40	15.4	0.055	16.1	5.956	0.92	6.4641	14.9	2.300	2.269	18.350	16.081	17.22	1.13	1.141	1.7
0:01:50	16.5	0.060	16.1	5.951	1.01	6.4699	15.9	2.455	2.421	18.506	16.085	17.30	1.21	1.151	1.8
0:02:02	17.4	0.067	16.1	5.944	1.12	6.4774	16.8	2.599	2.562	18.655	16.094	17.37	1.28	1.159	2.0
0:02:12	18.2	0.072	16.1	5.938	1.21	6.4833	17.6	2.720	2.680	18.772	16.093	17.43	1.34	1.167	2.2
0:02:22	18.7	0.078	16.1	5.933	1.30	6.4894	18.1	2.788	2.744	18.847	16.103	17.48	1.37	1.170	2.4
0:02:34	19.7	0.085	16.1	5.926	1.42	6.4970	19.1	2.944	2.896	18.999	16.103	17.55	1.45	1.180	2.6
0:02:44	20.4	0.090	16.1	5.921	1.51	6.5028	19.8	3.043	2.992	19.095	16.103	17.60	1.50	1.186	2.7
0:02:54	21.1	0.096	16.1	5.915	1.60	6.5092	20.6	3.159	3.105	19.209	16.104	17.66	1.55	1.193	2.9
0:03:06	22.1	0.103	16.1	5.908	1.71	6.5165	21.5	3.295	3.238	19.345	16.107	17.73	1.62	1.201	3.1
0:03:16	22.8	0.108	16.1	5.903	1.80	6.5225	22.3	3.411	3.351	19.458	16.107	17.78	1.68	1.208	3.3
0:03:25	23.5	0.114	16.1	5.897	1.90	6.5287	22.9	3.506	3.442	19.553	16.110	17.83	1.72	1.214	3.4
0:03:38	24.1	0.121	16.1	5.890	2.01	6.5365	23.5	3.600	3.532	19.640	16.108	17.87	1.77	1.219	3.6
0:03:47	25.1	0.126	16.1	5.885	2.10	6.5425	24.5	3.743	3.673	19.780	16.107	17.94	1.84	1.228	3.8
0:04:00	25.5	0.133	16.1	5.878	2.22	6.5500	24.9	3.802	3.728	19.838	16.110	17.97	1.86	1.231	4.0
0:04:09	26.4	0.138	16.1	5.872	2.31	6.5562	25.8	3.938	3.861	19.966	16.105	18.04	1.93	1.240	4.2
0:04:19	26.8	0.144	16.1	5.867	2.40	6.5623	26.2	3.988	3.907	20.012	16.105	18.06	1.95	1.243	4.3
0:04:31	27.5	0.151	16.1	5.860	2.51	6.5700	26.9	4.091	4.006	20.111	16.105	18.11	2.00	1.249	4.5
0:04:41	28.0	0.156	16.1	5.854	2.61	6.5762	27.4	4.172	4.084	20.193	16.109	18.15	2.04	1.254	4.7
0:04:51	28.6	0.162	16.1	5.849	2.70	6.5824	28.0	4.251	4.160	20.267	16.106	18.19	2.08	1.258	4.9
0:05:03	29.5	0.169	16.1	5.842	2.81	6.5901	28.9	4.387	4.292	20.403	16.110	18.26	2.15	1.266	5.1
0:05:13	30.4	0.174	16.1	5.837	2.90	6.5963	29.8	4.520	4.423	20.532	16.110	18.32	2.21	1.275	5.2
0:05:25	31.2	0.181	16.1	5.830	3.02	6.6040	30.6	4.638	4.537	20.636	16.099	18.37	2.27	1.282	5.4
0:05:35	31.6	0.186	16.1	5.824	3.11	6.6101	31.0	4.689	4.585	20.690	16.105	18.40	2.29	1.285	5.6
0:05:45	31.9	0.192	16.1	5.819	3.20	6.6162	31.3	4.729	4.622	20.719	16.097	18.41	2.31	1.287	5.8
0:05:57	32.5	0.199	16.1	5.812	3.31	6.6242	32.0	4.825	4.714	20.814	16.100	18.46	2.36	1.293	6.0
0:06:07	32.9	0.204	16.1	5.807	3.40	6.6303	32.3	4.877	4.763	20.866	16.103	18.48	2.38	1.296	6.1
0:06:19	33.7	0.211	16.1	5.800	3.52	6.6382	33.1	4.991	4.873	20.977	16.104	18.54	2.44	1.303	6.3
0:06:29	34.2	0.216	16.1	5.794	3.61	6.6444	33.6	5.052	4.931	21.030	16.099	18.56	2.47	1.306	6.5
0:06:38	34.5	0.222	16.1	5.789	3.70	6.6507	34.0	5.107	4.982	21.083	16.101	18.59	2.49	1.309	6.6
0:06:51	35.2	0.229	16.1	5.782	3.81	6.6587	34.7	5.204	5.076	21.172	16.096	18.63	2.54	1.315	6.9
0:07:00	35.6	0.234	16.1	5.776	3.91	6.6651	35.0	5.247	5.115	21.214	16.098	18.66	2.56	1.318	7.0
0:07:10	36.0	0.240	16.1	5.771	4.00	6.6715	35.4	5.303	5.169	21.267	16.098	18.68	2.58	1.321	7.2
0:07:22	36.7	0.247	16.1	5.764	4.11	6.6794	36.1	5.407	5.269	21.367	16.098	18.73	2.63	1.327	7.4
0:07:32	37.0	0.252	16.1	5.758	4.21	6.6860	36.4	5.443	5.302	21.397	16.095	18.75	2.65	1.329	7.5
0:07:42	37.5	0.258	16.1	5.753	4.30	6.6923	37.0	5.523	5.378	21.470	16.092	18.78	2.69	1.334	7.7
0:07:54	38.1	0.265	16.1	5.746	4.41	6.7005	37.5	5.600	5.451	21.537	16.085	18.81	2.73	1.339	7.9
0:08:04	38.4	0.270	16.1	5.740	4.50	6.7069	37.8	5.638	5.486	21.577	16.091	18.83	2.74	1.341	8.1
0:08:14	38.9	0.276	16.1	5.735	4.60	6.7134	38.3	5.712	5.557	21.649	16.092	18.87	2.78	1.345	8.2
0:08:26	39.2	0.283	16.1	5.728	4.71	6.7216	38.7	5.750	5.592	21.674	16.082	18.88	2.80	1.348	8.4
0:08:36	40.0	0.288	16.1	5.722	4.81	6.7282	39.5	5.865	5.703	21.784	16.081	18.93	2.85	1.355	8.6
0:08:45	40.2	0.294	16.1	5.717	4.90	6.7347	39.6	5.886	5.721	21.799	16.078	18.94	2.86	1.356	8.8
0:08:56	40.5	0.300	16.1	5.711	5.00	6.7417	39.9	5.921	5.753	21.832	16.079	18.96	2.88	1.358	8.9
0:09:08	41.1	0.307	16.1	5.704	5.11	6.7499	40.5	5.995	5.823	21.903	16.079	18.99	2.91	1.362	9.1
0:09:18	41.3	0.313	16.1	5.698	5.21	6.7569	40.7	6.030	5.855	21.921	16.067	18.99	2.93	1.364	9.3
0:09:28	41.8	0.318	16.1	5.692	5.30	6.7634	41.2	6.095	5.916	21.987	16.070	19.03	2.96	1.368	9.5
0:09:38	42.1	0.324	16.1	5.687	5.40	6.7701	41.5	6.129	5.947	22.005	16.058	19.03	2.97	1.370	9.6
0:09:50	42.6	0.331	16.1	5.680	5.51	6.7784	42.0	6.198	6.013	22.065	16.052	19.06	3.01	1.375	9.8

* Corrected Deviator Stress
for Membrane Only (ASTM Method)
$= (4(EM)(Thickness)(Strain))/D_c$
Where: EM = 200 psi and Thickness =.012"

Unconsolidated Undrained Triaxial Test
ASTM D2850-03a

Consolidation Values		Final Values					
Height	6.011 (in.)	Height	4.9843 (in.)	Tested By	KDG	Project Number	172679015
Diameter	2.856 (in)	Dia. avg.	3.164 (in)	Date	11-4-09	Test Number	UU-1069B
Area	6.405 (in^2)	Area avg.	7.8609 (in^2)	Press No.	2	Data File ID	UU-1069B
				Panel No.	D	Back Pressure (psi)	0
						Lateral Pressure (psi)	16

Clock Time (min.)	Load (lbf)	Deflection Dial Reading (in.)	Chamber Pressure Reading (psi)	Corrected Hieght (in.)	Strain (%)	Corrected Area (in^2)	Corrected Load (lbf)	Deviator Stress (psi)	Corrected Deviator Stress* (tsf)	σ_1 (psi)	σ_3 (psi)	p $(\sigma_1+\sigma_3)/2$ (psi)	q $(\sigma_1-\sigma_3)/2$ (psi)	Principal Stress Ratio σ_1 / σ_3	Test Time (min.)
0:10:00	43.0	0.336	16.0	5.674	5.60	6.7850	42.4	6.246	6.057	22.105	16.048	19.08	3.03	1.377	10.0
0:10:10	43.2	0.342	16.0	5.669	5.70	6.7917	42.6	6.268	6.076	22.102	16.026	19.06	3.04	1.379	10.2
0:10:22	43.8	0.349	16.1	5.662	5.81	6.8000	43.3	6.361	6.166	22.232	16.066	19.15	3.08	1.384	10.4
0:10:32	44.3	0.354	16.1	5.656	5.90	6.8065	43.8	6.428	6.230	22.314	16.084	19.20	3.11	1.387	10.5
0:10:42	44.7	0.360	16.1	5.651	5.99	6.8130	44.1	6.475	6.273	22.360	16.087	19.22	3.14	1.390	10.7
0:10:54	44.9	0.367	16.1	5.644	6.11	6.8213	44.3	6.493	6.288	22.384	16.096	19.24	3.14	1.391	10.9
0:11:03	45.2	0.372	16.1	5.639	6.20	6.8279	44.6	6.530	6.322	22.415	16.094	19.25	3.16	1.393	11.1
0:11:14	45.5	0.378	16.1	5.633	6.29	6.8349	44.9	6.575	6.364	22.467	16.104	19.29	3.18	1.395	11.2
0:11:26	46.0	0.385	16.1	5.626	6.41	6.8432	45.4	6.639	6.423	22.531	16.108	19.32	3.21	1.399	11.4
0:11:36	46.2	0.390	16.1	5.621	6.50	6.8499	45.7	6.666	6.448	22.559	16.111	19.33	3.22	1.400	11.6
0:11:48	46.6	0.397	16.1	5.614	6.61	6.8582	46.0	6.708	6.485	22.594	16.108	19.35	3.24	1.403	11.8
0:11:58	46.7	0.402	16.1	5.608	6.70	6.8648	46.1	6.721	6.496	22.613	16.117	19.37	3.25	1.403	12.0
0:12:08	47.1	0.408	16.1	5.603	6.79	6.8715	46.5	6.767	6.538	22.654	16.116	19.39	3.27	1.406	12.1
0:12:20	47.6	0.415	16.1	5.596	6.91	6.8801	47.0	6.833	6.601	22.720	16.118	19.42	3.30	1.410	12.3
0:12:30	47.7	0.420	16.1	5.591	7.00	6.8865	47.1	6.845	6.610	22.727	16.117	19.42	3.30	1.410	12.5
0:12:42	47.8	0.427	16.1	5.584	7.11	6.8949	47.2	6.851	6.613	22.734	16.122	19.43	3.31	1.410	12.7
0:12:52	48.4	0.432	16.1	5.578	7.20	6.9016	47.8	6.923	6.681	22.799	16.118	19.46	3.34	1.415	12.9
0:13:02	48.4	0.438	16.1	5.573	7.29	6.9082	47.8	6.919	6.674	22.788	16.115	19.45	3.34	1.414	13.0
0:13:14	49.2	0.444	16.1	5.566	7.40	6.9166	48.7	7.036	6.787	22.907	16.120	19.51	3.39	1.421	13.2
0:13:24	49.5	0.450	16.1	5.561	7.49	6.9233	48.9	7.064	6.812	22.928	16.116	19.52	3.41	1.423	13.4
0:13:36	49.5	0.456	16.1	5.554	7.60	6.9316	48.9	7.052	6.797	22.916	16.120	19.52	3.40	1.422	13.6
0:13:46	50.1	0.462	16.1	5.549	7.69	6.9384	49.6	7.143	6.884	23.009	16.125	19.57	3.44	1.427	13.8
0:13:58	50.4	0.469	16.1	5.542	7.80	6.9469	49.9	7.176	6.914	23.033	16.120	19.58	3.46	1.429	14.0
0:14:08	50.6	0.474	16.1	5.537	7.89	6.9536	50.0	7.190	6.925	23.037	16.113	19.57	3.46	1.430	14.1
0:14:20	51.0	0.481	16.1	5.530	8.00	6.9620	50.4	7.239	6.970	23.086	16.116	19.60	3.49	1.433	14.3
0:14:30	51.2	0.486	16.1	5.525	8.09	6.9688	50.6	7.257	6.985	23.103	16.118	19.61	3.49	1.433	14.5
0:14:42	51.1	0.493	16.1	5.518	8.21	6.9773	50.5	7.244	6.968	23.077	16.109	19.59	3.48	1.433	14.7
0:14:52	51.4	0.498	16.1	5.512	8.30	6.9842	50.8	7.279	7.000	23.106	16.105	19.61	3.50	1.435	14.9
0:15:02	51.8	0.504	16.1	5.507	8.39	6.9911	51.2	7.322	7.040	23.146	16.106	19.63	3.52	1.437	15.0
0:15:14	52.0	0.510	16.1	5.500	8.50	6.9997	51.4	7.349	7.063	23.174	16.111	19.64	3.53	1.438	15.2
0:15:24	52.2	0.516	16.1	5.495	8.59	7.0068	51.6	7.365	7.076	23.187	16.111	19.65	3.54	1.439	15.4
0:15:34	52.6	0.522	16.1	5.489	8.69	7.0142	52.0	7.414	7.122	23.238	16.116	19.68	3.56	1.442	15.6
0:15:46	52.8	0.529	16.1	5.482	8.80	7.0229	52.2	7.428	7.132	23.241	16.109	19.68	3.57	1.443	15.8
0:15:56	52.8	0.534	16.1	5.477	8.89	7.0299	52.2	7.430	7.131	23.234	16.103	19.67	3.57	1.443	15.9
0:16:06	52.8	0.540	16.1	5.471	8.98	7.0370	52.3	7.425	7.123	23.232	16.109	19.67	3.56	1.442	16.1
0:16:18	53.5	0.546	16.1	5.464	9.10	7.0459	52.9	7.505	7.199	23.303	16.104	19.70	3.60	1.447	16.3
0:16:28	53.6	0.552	16.1	5.459	9.19	7.0529	53.0	7.514	7.205	23.311	16.106	19.71	3.60	1.447	16.5
0:16:40	53.7	0.559	16.1	5.452	9.30	7.0618	53.1	7.515	7.202	23.302	16.101	19.70	3.60	1.447	16.7
0:16:50	53.9	0.564	16.1	5.446	9.40	7.0689	53.3	7.537	7.221	23.318	16.097	19.71	3.61	1.449	16.8
0:16:59	54.1	0.570	16.1	5.441	9.49	7.0761	53.5	7.562	7.243	23.344	16.101	19.72	3.62	1.450	17.0
0:17:12	54.4	0.577	16.1	5.434	9.60	7.0849	53.8	7.597	7.274	23.370	16.095	19.73	3.64	1.452	17.2
0:17:22	54.5	0.582	16.1	5.428	9.69	7.0923	54.0	7.609	7.283	23.378	16.095	19.74	3.64	1.453	17.4
0:17:31	55.1	0.588	16.1	5.423	9.78	7.0994	54.5	7.673	7.344	23.442	16.098	19.77	3.67	1.456	17.5
0:17:44	55.2	0.595	16.1	5.416	9.90	7.1085	54.6	7.685	7.352	23.450	16.098	19.77	3.68	1.457	17.7
0:17:54	55.3	0.600	16.1	5.411	9.99	7.1157	54.7	7.688	7.352	23.448	16.096	19.77	3.68	1.457	17.9
0:18:03	55.4	0.606	16.1	5.405	10.08	7.1230	54.8	7.692	7.353	23.446	16.093	19.77	3.68	1.457	18.1
0:18:16	55.7	0.612	16.1	5.398	10.20	7.1319	55.2	7.735	7.392	23.484	16.092	19.79	3.70	1.459	18.3
0:18:26	56.1	0.618	16.1	5.392	10.29	7.1396	55.6	7.782	7.436	23.520	16.084	19.80	3.72	1.462	18.4
0:18:36	56.1	0.623	16.1	5.387	10.38	7.1467	55.5	7.770	7.421	23.505	16.083	19.79	3.71	1.461	18.6
0:18:48	56.5	0.630	16.1	5.380	10.49	7.1556	55.9	7.815	7.462	23.531	16.069	19.80	3.73	1.464	18.8
0:18:58	56.5	0.636	16.1	5.375	10.58	7.1629	56.0	7.813	7.457	23.516	16.059	19.79	3.73	1.464	19.0
0:19:10	57.0	0.642	16.0	5.368	10.70	7.1719	56.4	7.865	7.505	23.555	16.050	19.80	3.75	1.468	19.2
0:19:20	56.9	0.648	16.0	5.363	10.79	7.1791	56.3	7.841	7.478	23.522	16.044	19.78	3.74	1.466	19.3
0:19:32	57.2	0.654	16.1	5.356	10.90	7.1881	56.7	7.882	7.516	23.572	16.056	19.81	3.76	1.468	19.5
0:19:42	57.1	0.660	16.1	5.351	10.99	7.1953	56.5	7.849	7.480	23.569	16.089	19.83	3.74	1.465	19.7
0:19:54	57.4	0.667	16.1	5.344	11.10	7.2044	56.9	7.892	7.519	23.613	16.094	19.85	3.76	1.467	19.9

* Corrected Deviator Stress
for Membrane Only (ASTM Method)
$= (4(EM)(Thickness)(Strain))/D_c$
Where: EM = 200 psi and Thickness =.012"

Unconsolidated Undrained Triaxial Test
ASTM D2850-03a

Consolidation Values			Final Values							
Height	6.011 (in.)		Height	4.9843 (in.)		Tested By	KDG		Project Number	172679015
Diameter	2.856 (in)		Dia. avg.	3.164 (in)		Date	11-4-09		Test Number	UU-1069B
Area	6.405 (in^2)		Area avg.	7.8609 (in^2)		Press No.	2		Data File ID	UU-1069B
						Panel No.	D		Back Pressure (psi)	0
									Lateral Pressure (psi)	16

Clock Time (min.)	Load (lbf)	Deflection Dial Reading (in.)	Chamber Pressure Reading (psi)	Corrected Hieght (in.)	Strain (%)	Corrected Area (in^2)	Corrected Load (lbf)	Deviator Stress (psi)	Corrected Deviator Stress* (tsf)	σ_1 (psi)	σ_3 (psi)	p $(\sigma_1+\sigma_3)/2$ (psi)	q $(\sigma_1-\sigma_3)/2$ (psi)	Principal Stress Ratio σ_1 / σ_3	Test Time (min.)
0:30:02	65.3	1.009	16.1	5.002	16.79	7.6969	64.7	8.410	7.845	23.987	16.142	20.06	3.92	1.486	30.0
0:30:12	65.3	1.014	16.1	4.997	16.88	7.7053	64.7	8.400	7.833	23.972	16.139	20.06	3.92	1.485	30.2
0:30:22	65.5	1.020	16.1	4.991	16.97	7.7138	64.9	8.416	7.845	23.979	16.134	20.06	3.92	1.486	30.4
0:30:34	65.8	1.026	16.1	4.984	17.08	7.7243	65.2	8.447	7.873	24.011	16.138	20.07	3.94	1.488	30.6

* Corrected Deviator Stress
for Membrane Only (ASTM Method)
$= (4(EM)(Thickness)(Strain))/D_c$
Where: EM = 200 psi and Thickness =.012"

Stantec

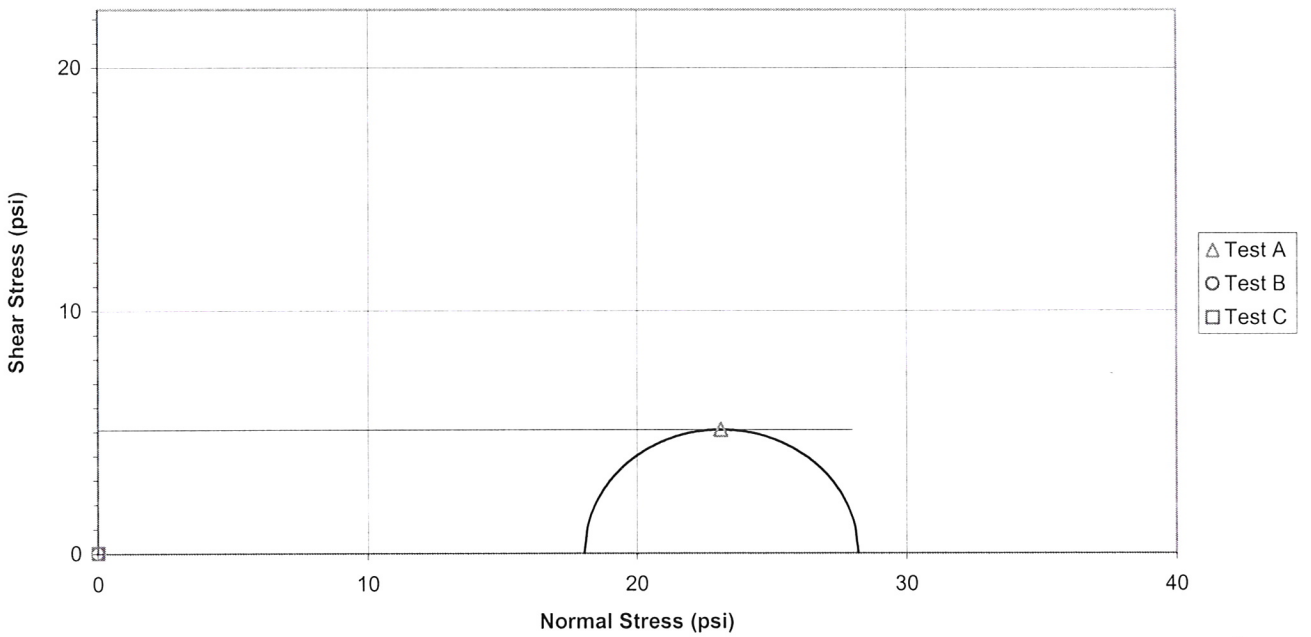
Unconsolidated Undrained Triaxial Test
ASTM D 2850-03a

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Sample ID	STN-56P, 22.6'-23.1'	Test Number	1070B

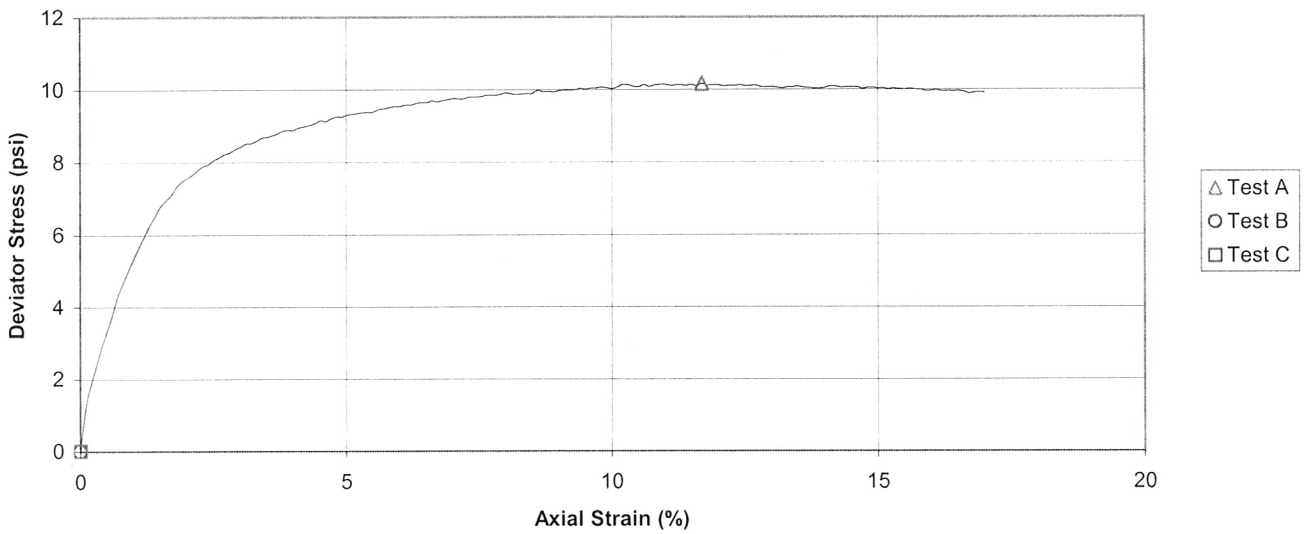
ϕ = 0.0 deg. c = 5.1 psi

Failure Criterion: Maximum Deviator Stress

Mohr Failure Envelope



Deviator Stress vs. Axial Strain



1211

1006

Unconsolidated Undrained Triaxial Test
ASTM D2850-03a

Project Name	Bull Run Fossil Plant (TVA)	Project Number	172679015
Sample Identification	STN-56P, 22.6'-23.1'	Test Number	UU-1070B
Visual Description	Sandy Lean Clay (CL), brown, moist, firm	Prepared By	CM
Undisturbed	Source STN-56P, 22.0'-24.0'	Date	9-16-09

Specific Gravity 2.70 ASTM D854 Method A Liquid Limit N/A Plastic Limit N/A Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in^3)		Specimen	
Top	2.862	1	6.014	Sample	38.5702 (V_o)	Wet Weight (g)	1274.40
Middle	2.863	2	5.970	Solids	23.3895 (VS_o)	Dry Weight (g)	1034.93
Bottom	2.859	3	5.995	Water	14.6122 (Vw_o)	Wet Unit Weight (pcf)	125.9
Avg.	2.8613 (D_o)	4	6.014	Voids	15.1806 (Vv_o)	Dry Unit Weight (pcf)	102.2
Area (in^2)	6.4302 (A_o)	Avg. (H_o)	5.9983	Degree of Saturation (%)	96.3 (S_o)		
Moisture Content (%)	23.1	Final Trimmings		Void Ratio	0.649		

Saturation

Set Up & Saturated: Wet xx Dry ____ Set up By KDG

Back Pressure Saturated to: 0 (psi) Final Pore Pressure Parameter B ____ Date 11-4-09

Panel Board Number D

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial		Initial	(in.)	Initial	(in.)	Specimen Height (in.)	5.9983 (H_s)
Final		Final	(in.)	Final	(in.)	Area (in^2) Method A	6.4302 (A_s)
Change	0.0000 (ΔH_o)	Change	(in.)	Change	(in.)	Specimen Volume (in^3)	38.5702 (Vs)

Consolidation

Height Readings (in.)		Back Pressure Burette Readings		Chamber Burete Readings		Pressures (psi)	
Initial		Initial	(in.)	Initial	(in.)	Chamber	18
Final		Final	(in.)	Final	(in.)	Back	0
Change	0.0000 (ΔH_c)	Change	(in.)	Change	(in.)	Lateral	18 (σ_3)
Height (in.)	5.9983 (H_c)			Volume (in^3)	38.5702 (V_c)		
Area (in^3) Method A	6.4302 (A_c)			Volume - Water (in^3)	14.2272 (VWc)	t_{50} (min.)	
Diameter (in.)	2.8613 (D_c)			Water Content (%)	22.5		
Dry Density (pcf)	102.2			Degree of Saturation (%)	93.7 (S_c)	Void Ratio	0.649

After Test

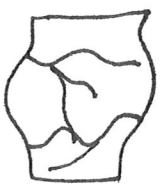
Final Measurements			Final Moisture Content		Stresses (membrane corrected) at Failure (psi)	
Maximum Diameter	3.285 (in.)	Wet Weight (g)	1268.09		Corrected Deviator	10.16 σ_d (psi)
Wet weight (g)	1268.09 (WWf)	Dry Weight (g)	1034.93		Major Principal	28.21 σ_{1f} (psi)
Average Diameter	3.153 (in.)	Tare Weight (g)	0.00		Minor Principal	18.05 σ_{3f} (psi)
					Rate of Strain (% / min.)	0.254
					Axial Strain at Failure (%)	11.71

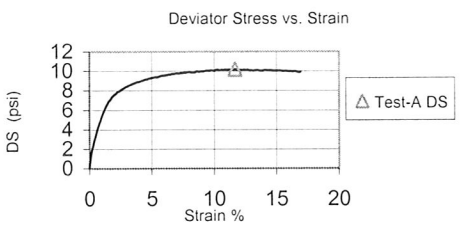
Youngs Modulus for Membrane (psi) 200

Membrane Thickness (in.) 0.012

Failure Criterion: Maximum Deviator Stress

Failure Sketch





Comments: KDG

Unconsolidated Undrained Triaxial Test
ASTM D2850-03a

Consolidation Values			Final Values					
Height	5.998 (in.)		Height	4.9780 (in.)	Tested By	KDG	Project Number	172679015
Diameter	2.861 (in)		Dia. avg.	3.153 (in)	Date	11-4-09	Test Number	UU-1070B
Area	6.430 (in^2)		Area avg.	7.8080 (in^2)	Press No.	2	Data File ID	UU-1070B
					Panel No.	D	Back Pressure (psi)	0
							Lateral Pressure (psi)	18

Clock Time (min.)	Load (lbf)	Deflection Dial Reading (in.)	Chamber Pressure Reading (psi)	Corrected Hieght (in.)	Strain (%)	Corrected Area (in^2)	Corrected Load (lbf)	Deviator Stress (psi)	Corrected Deviator Stress* (tsf)	σ_1 (psi)	σ_3 (psi)	p $(\sigma_1+\sigma_3)/2$ (psi)	q $(\sigma_1-\sigma_3)/2$ (psi)	Principal Stress Ratio σ_1 / σ_3	Test Time (min.)
0:00:00	1.0	0.000	18.0	5.998	0.00	6.4302	0.0	0.000	0.000	18.003	18.003	18.00	0.00	1.000	0.0
0:00:15	9.6	0.007	18.0	5.991	0.12	6.4379	8.6	1.335	1.331	19.346	18.015	18.68	0.67	1.074	0.3
0:00:25	13.1	0.012	18.0	5.986	0.21	6.4436	12.1	1.878	1.871	19.883	18.011	18.95	0.94	1.104	0.4
0:00:34	16.2	0.018	18.0	5.980	0.30	6.4496	15.1	2.346	2.336	20.353	18.017	19.19	1.17	1.130	0.6
0:00:47	19.9	0.025	18.0	5.974	0.41	6.4566	18.9	2.923	2.909	20.924	18.015	19.47	1.45	1.161	0.8
0:00:56	22.7	0.030	18.0	5.968	0.50	6.4627	21.7	3.352	3.335	21.350	18.015	19.68	1.67	1.185	0.9
0:01:09	26.0	0.037	18.0	5.961	0.62	6.4701	25.0	3.864	3.844	21.856	18.012	19.93	1.92	1.213	1.2
0:01:18	28.8	0.042	18.0	5.956	0.70	6.4759	27.8	4.293	4.269	22.290	18.021	20.16	2.13	1.237	1.3
0:01:31	31.6	0.049	18.0	5.949	0.82	6.4834	30.6	4.717	4.689	22.697	18.008	20.35	2.34	1.260	1.5
0:01:40	33.8	0.055	18.0	5.943	0.91	6.4896	32.7	5.043	5.012	23.027	18.015	20.52	2.51	1.278	1.7
0:01:50	35.8	0.060	18.0	5.938	1.00	6.4953	34.8	5.350	5.317	23.335	18.018	20.68	2.66	1.295	1.8
0:02:02	38.1	0.067	18.0	5.931	1.11	6.5026	37.1	5.702	5.665	23.684	18.019	20.85	2.83	1.314	2.0
0:02:12	40.0	0.072	18.0	5.926	1.20	6.5087	39.0	5.995	5.954	23.975	18.021	21.00	2.98	1.330	2.2
0:02:24	42.2	0.079	18.0	5.919	1.31	6.5159	41.1	6.315	6.271	24.289	18.018	21.15	3.14	1.348	2.4
0:02:35	43.8	0.085	18.0	5.914	1.41	6.5222	42.8	6.559	6.511	24.527	18.016	21.27	3.26	1.361	2.6
0:02:45	45.5	0.090	18.0	5.908	1.50	6.5282	44.5	6.818	6.768	24.789	18.021	21.41	3.38	1.376	2.8
0:02:57	46.8	0.097	18.0	5.901	1.62	6.5359	45.8	7.009	6.954	24.970	18.016	21.49	3.48	1.386	3.0
0:03:07	47.8	0.102	18.0	5.896	1.71	6.5420	46.7	7.142	7.085	25.107	18.022	21.56	3.54	1.393	3.1
0:03:19	49.4	0.109	18.0	5.889	1.82	6.5492	48.3	7.381	7.320	25.342	18.021	21.68	3.66	1.406	3.3
0:03:29	50.4	0.114	18.0	5.884	1.91	6.5554	49.3	7.525	7.461	25.478	18.017	21.75	3.73	1.414	3.5
0:03:39	51.0	0.120	18.0	5.878	2.00	6.5615	50.0	7.621	7.554	25.571	18.017	21.79	3.78	1.419	3.7
0:03:51	51.8	0.127	18.0	5.871	2.11	6.5691	50.8	7.734	7.663	25.676	18.013	21.84	3.83	1.425	3.9
0:04:02	52.8	0.133	18.0	5.866	2.21	6.5757	51.7	7.866	7.792	25.808	18.016	21.91	3.90	1.433	4.0
0:04:11	53.4	0.138	18.0	5.860	2.30	6.5818	52.4	7.962	7.885	25.895	18.010	21.95	3.94	1.438	4.2
0:04:24	53.9	0.145	18.0	5.853	2.41	6.5893	52.9	8.028	7.947	25.956	18.009	21.98	3.97	1.441	4.4
0:04:33	54.7	0.150	18.0	5.848	2.51	6.5955	53.7	8.139	8.055	26.068	18.013	22.04	4.03	1.447	4.6
0:04:46	55.4	0.157	18.0	5.841	2.62	6.6033	54.3	8.229	8.141	26.143	18.002	22.07	4.07	1.452	4.8
0:04:55	56.0	0.163	18.0	5.835	2.71	6.6096	54.9	8.311	8.220	26.234	18.013	22.12	4.11	1.456	4.9
0:05:05	56.3	0.168	18.0	5.830	2.80	6.6156	55.3	8.352	8.258	26.263	18.005	22.13	4.13	1.459	5.1
0:05:17	57.0	0.175	18.0	5.823	2.91	6.6232	56.0	8.454	8.356	26.360	18.004	22.18	4.18	1.464	5.3
0:05:27	57.5	0.180	18.0	5.818	3.00	6.6294	56.5	8.516	8.415	26.420	18.005	22.21	4.21	1.467	5.5
0:05:39	58.2	0.187	18.0	5.811	3.12	6.6372	57.2	8.618	8.513	26.509	17.996	22.25	4.26	1.473	5.7
0:05:49	58.4	0.192	18.0	5.806	3.21	6.6432	57.3	8.630	8.522	26.528	18.005	22.27	4.26	1.473	5.8
0:06:01	59.0	0.199	18.0	5.799	3.32	6.6512	57.9	8.709	8.598	26.604	18.006	22.31	4.30	1.477	6.0
0:06:11	59.6	0.205	18.0	5.794	3.41	6.6574	58.5	8.792	8.677	26.677	17.999	22.34	4.34	1.482	6.2
0:06:23	59.8	0.211	18.0	5.787	3.52	6.6649	58.8	8.816	8.698	26.695	17.997	22.35	4.35	1.483	6.4
0:06:33	60.2	0.217	18.0	5.782	3.61	6.6712	59.2	8.868	8.747	26.739	17.992	22.37	4.37	1.486	6.6
0:06:43	60.6	0.222	18.0	5.776	3.70	6.6776	59.5	8.914	8.790	26.782	17.993	22.39	4.39	1.489	6.7
0:06:55	61.2	0.229	18.0	5.769	3.81	6.6853	60.1	8.993	8.865	26.850	17.985	22.42	4.43	1.493	6.9
0:07:06	61.4	0.235	18.0	5.764	3.91	6.6920	60.4	9.021	8.890	26.876	17.986	22.43	4.45	1.494	7.1
0:07:15	61.5	0.240	18.0	5.758	4.00	6.6984	60.4	9.024	8.890	26.873	17.983	22.43	4.44	1.494	7.3
0:07:28	62.0	0.247	18.0	5.751	4.12	6.7062	61.0	9.096	8.958	26.939	17.981	22.46	4.48	1.498	7.5
0:07:37	62.3	0.252	18.0	5.746	4.20	6.7125	61.3	9.127	8.986	26.960	17.974	22.47	4.49	1.500	7.6
0:07:50	62.6	0.259	18.0	5.739	4.31	6.7202	61.6	9.163	9.018	26.984	17.966	22.47	4.51	1.502	7.8
0:07:59	63.1	0.264	18.0	5.734	4.41	6.7267	62.0	9.224	9.076	27.037	17.961	22.50	4.54	1.505	8.0
0:08:12	63.7	0.271	17.9	5.727	4.52	6.7347	62.6	9.301	9.150	27.098	17.948	22.52	4.57	1.510	8.2
0:08:21	63.6	0.277	18.0	5.722	4.61	6.7411	62.5	9.276	9.122	27.085	17.963	22.52	4.56	1.508	8.4
0:08:31	64.2	0.282	18.0	5.716	4.70	6.7476	63.1	9.355	9.197	27.183	17.987	22.58	4.60	1.511	8.5
0:08:43	64.6	0.289	18.0	5.709	4.82	6.7557	63.6	9.417	9.255	27.254	17.999	22.63	4.63	1.514	8.7
0:08:53	64.7	0.294	18.0	5.704	4.91	6.7622	63.7	9.417	9.253	27.257	18.004	22.63	4.63	1.514	8.9
0:09:05	65.2	0.301	18.0	5.697	5.02	6.7704	64.2	9.482	9.313	27.323	18.010	22.67	4.66	1.517	9.1
0:09:15	65.4	0.307	18.0	5.691	5.11	6.7768	64.4	9.504	9.333	27.348	18.015	22.68	4.67	1.518	9.3
0:09:25	65.6	0.312	18.0	5.686	5.21	6.7834	64.6	9.523	9.348	27.362	18.014	22.69	4.67	1.519	9.4
0:09:37	65.9	0.319	18.0	5.679	5.32	6.7917	64.9	9.551	9.373	27.392	18.019	22.71	4.69	1.520	9.6
0:09:47	66.1	0.325	18.0	5.673	5.41	6.7983	65.0	9.568	9.386	27.412	18.026	22.72	4.69	1.521	9.8
0:09:57	66.2	0.330	18.0	5.668	5.51	6.8048	65.2	9.575	9.390	27.414	18.023	22.72	4.70	1.521	10.0

* Corrected Deviator Stress
for Membrane Only (ASTM Method)
$= (4(EM)(Thickness)(Strain))/D_c$
Where: EM = 200 psi and Thickness =.012"

Unconsolidated Undrained Triaxial Test
ASTM D2850-03a

Consolidation Values			Final Values						
Height	5.998 (in.)		Height	4.9780 (in.)		Tested By	KDG	Project Number	172679015
Diameter	2.861 (in)		Dia. avg.	3.153 (in)		Date	11-4-09	Test Number	UU-1070B
Area	6.430 (in^2)		Area avg.	7.8080 (in^2)		Press No.	2	Data File ID	UU-1070B
						Panel No.	D	Back Pressure (psi)	0
								Lateral Pressure (psi)	18

Clock Time (min.)	Load (lbf)	Deflection Dial Reading (in.)	Chamber Pressure Reading (psi)	Corrected Hieght (in.)	Strain (%)	Corrected Area (in^2)	Corrected Load (lbf)	Deviator Stress (psi)	Corrected Deviator Stress* (tsf)	σ_1 (psi)	σ_3 (psi)	p $(\sigma_1+\sigma_3)/2$ (psi)	q $(\sigma_1-\sigma_3)/2$ (psi)	Principal Stress Ratio σ_1 / σ_3	Test Time (min.)
0:10:09	66.8	0.337	18.0	5.661	5.62	6.8131	65.7	9.648	9.460	27.487	18.027	22.76	4.73	1.525	10.2
0:10:19	67.0	0.343	18.0	5.656	5.71	6.8198	65.9	9.670	9.478	27.501	18.022	22.76	4.74	1.526	10.3
0:10:28	67.3	0.348	18.0	5.650	5.81	6.8266	66.3	9.711	9.516	27.546	18.029	22.79	4.76	1.528	10.5
0:10:41	67.6	0.355	18.0	5.643	5.92	6.8349	66.5	9.736	9.538	27.568	18.031	22.80	4.77	1.529	10.7
0:10:50	67.7	0.361	18.0	5.637	6.01	6.8418	66.7	9.746	9.544	27.573	18.029	22.80	4.77	1.529	10.8
0:11:00	68.1	0.366	18.0	5.632	6.11	6.8485	67.0	9.787	9.582	27.602	18.020	22.81	4.79	1.532	11.0
0:11:12	68.2	0.373	18.0	5.625	6.22	6.8570	67.2	9.798	9.589	27.616	18.026	22.82	4.79	1.532	11.2
0:11:22	68.6	0.379	18.0	5.619	6.31	6.8636	67.6	9.843	9.631	27.659	18.028	22.84	4.82	1.534	11.4
0:11:32	68.8	0.384	18.0	5.614	6.41	6.8704	67.8	9.867	9.652	27.684	18.032	22.86	4.83	1.535	11.5
0:11:44	68.9	0.391	18.0	5.607	6.52	6.8789	67.9	9.864	9.645	27.680	18.035	22.86	4.82	1.535	11.7
0:11:54	69.3	0.397	18.0	5.602	6.61	6.8856	68.3	9.921	9.699	27.734	18.035	22.88	4.85	1.538	11.9
0:12:04	69.2	0.402	18.0	5.596	6.70	6.8923	68.1	9.887	9.662	27.697	18.034	22.87	4.83	1.536	12.1
0:12:16	69.5	0.409	18.0	5.589	6.82	6.9007	68.5	9.927	9.699	27.729	18.031	22.88	4.85	1.538	12.3
0:12:26	69.8	0.414	18.0	5.584	6.91	6.9073	68.8	9.962	9.730	27.758	18.027	22.89	4.87	1.540	12.4
0:12:38	70.2	0.421	18.0	5.577	7.02	6.9158	69.1	9.997	9.762	27.789	18.027	22.91	4.88	1.542	12.6
0:12:47	70.2	0.427	18.0	5.572	7.11	6.9226	69.1	9.987	9.749	27.778	18.029	22.90	4.87	1.541	12.8
0:12:57	70.3	0.432	18.0	5.566	7.20	6.9293	69.2	9.990	9.748	27.777	18.029	22.90	4.87	1.541	13.0
0:13:09	70.7	0.439	18.0	5.559	7.32	6.9378	69.7	10.046	9.800	27.823	18.023	22.92	4.90	1.544	13.2
0:13:19	70.8	0.444	18.0	5.554	7.41	6.9446	69.7	10.042	9.794	27.818	18.024	22.92	4.90	1.543	13.3
0:13:31	71.0	0.451	18.0	5.547	7.52	6.9531	69.9	10.058	9.806	27.828	18.022	22.93	4.90	1.544	13.5
0:13:41	71.3	0.456	18.0	5.542	7.61	6.9598	70.2	10.090	9.835	27.864	18.029	22.95	4.92	1.545	13.7
0:13:53	71.5	0.463	18.0	5.535	7.72	6.9682	70.5	10.111	9.852	27.876	18.024	22.95	4.93	1.547	13.9
0:14:03	71.5	0.468	18.0	5.530	7.81	6.9750	70.5	10.109	9.847	27.869	18.023	22.95	4.92	1.546	14.1
0:14:15	71.9	0.475	18.0	5.523	7.92	6.9835	70.8	10.142	9.876	27.895	18.019	22.96	4.94	1.548	14.3
0:14:25	72.2	0.481	18.0	5.518	8.01	6.9904	71.2	10.182	9.913	27.929	18.016	22.97	4.96	1.550	14.4
0:14:37	72.1	0.487	18.0	5.511	8.13	6.9989	71.0	10.150	9.878	27.897	18.019	22.96	4.94	1.548	14.6
0:14:47	72.1	0.493	18.0	5.506	8.21	7.0057	71.1	10.147	9.871	27.883	18.012	22.95	4.94	1.548	14.8
0:14:57	72.3	0.498	18.0	5.500	8.30	7.0126	71.2	10.156	9.878	27.898	18.020	22.96	4.94	1.548	15.0
0:15:09	72.5	0.505	18.0	5.494	8.41	7.0210	71.4	10.173	9.890	27.905	18.015	22.96	4.95	1.549	15.2
0:15:19	72.5	0.510	18.0	5.488	8.50	7.0279	71.5	10.170	9.885	27.898	18.013	22.96	4.94	1.549	15.3
0:15:31	73.3	0.517	18.0	5.482	8.61	7.0364	72.3	10.271	9.982	27.998	18.016	23.01	4.99	1.554	15.5
0:15:41	73.1	0.522	18.0	5.476	8.70	7.0433	72.1	10.230	9.938	27.949	18.011	22.98	4.97	1.552	15.7
0:15:54	73.3	0.529	18.0	5.469	8.82	7.0524	72.3	10.245	9.949	27.957	18.008	22.98	4.97	1.553	15.9
0:16:04	73.2	0.535	18.0	5.464	8.91	7.0595	72.2	10.229	9.930	27.935	18.005	22.97	4.97	1.552	16.1
0:16:13	73.6	0.540	18.0	5.458	9.00	7.0665	72.6	10.272	9.970	27.970	18.001	22.99	4.98	1.554	16.2
0:16:26	73.8	0.547	18.0	5.451	9.12	7.0753	72.8	10.286	9.980	27.976	17.996	22.99	4.99	1.555	16.4
0:16:35	73.9	0.552	18.0	5.446	9.21	7.0824	72.9	10.289	9.980	27.968	17.989	22.98	4.99	1.555	16.6
0:16:48	74.1	0.559	18.0	5.439	9.32	7.0913	73.1	10.304	9.992	27.979	17.987	22.98	5.00	1.555	16.8
0:16:57	74.4	0.565	18.0	5.434	9.41	7.0985	73.4	10.342	10.026	28.004	17.978	22.99	5.01	1.558	17.0
0:17:07	74.4	0.570	18.0	5.428	9.50	7.1056	73.4	10.325	10.006	27.976	17.970	22.97	5.00	1.557	17.1
0:17:19	74.8	0.577	18.0	5.421	9.62	7.1145	73.7	10.362	10.040	28.002	17.962	22.98	5.02	1.559	17.3
0:17:29	74.8	0.582	18.0	5.416	9.71	7.1218	73.8	10.365	10.039	28.004	17.965	22.98	5.02	1.559	17.5
0:17:41	75.1	0.589	18.0	5.409	9.82	7.1308	74.1	10.393	10.063	28.065	18.002	23.03	5.03	1.559	17.7
0:17:51	75.1	0.595	18.0	5.404	9.91	7.1380	74.1	10.376	10.044	28.056	18.012	23.03	5.02	1.558	17.9
0:18:01	75.0	0.600	18.0	5.398	10.01	7.1455	74.0	10.355	10.019	28.040	18.021	23.03	5.01	1.556	18.0
0:18:13	75.5	0.607	18.0	5.391	10.12	7.1545	74.5	10.408	10.068	28.091	18.023	23.06	5.03	1.559	18.2
0:18:23	76.1	0.613	18.0	5.386	10.21	7.1617	75.1	10.481	10.138	28.168	18.030	23.10	5.07	1.562	18.4
0:18:35	76.1	0.619	18.0	5.379	10.33	7.1706	75.1	10.470	10.123	28.152	18.029	23.09	5.06	1.561	18.6
0:18:45	75.9	0.625	18.0	5.373	10.42	7.1779	74.8	10.428	10.078	28.117	18.039	23.08	5.04	1.559	18.8
0:18:55	76.0	0.630	18.0	5.368	10.51	7.1853	74.9	10.428	10.076	28.120	18.044	23.08	5.04	1.558	18.9
0:19:07	76.5	0.637	18.0	5.361	10.62	7.1944	75.5	10.494	10.138	28.178	18.040	23.11	5.07	1.562	19.1
0:19:17	76.2	0.642	18.0	5.356	10.71	7.2016	75.2	10.439	10.080	28.119	18.039	23.08	5.04	1.559	19.3
0:19:29	76.7	0.649	18.0	5.349	10.82	7.2107	75.6	10.491	10.128	28.173	18.045	23.11	5.06	1.561	19.5
0:19:39	76.9	0.655	18.0	5.344	10.91	7.2181	75.8	10.506	10.140	28.186	18.046	23.12	5.07	1.562	19.7
0:19:48	77.0	0.660	18.0	5.338	11.01	7.2254	75.9	10.508	10.139	28.182	18.043	23.11	5.07	1.562	19.8
0:20:01	76.9	0.667	18.0	5.331	11.12	7.2350	75.8	10.480	10.107	28.147	18.040	23.09	5.05	1.560	20.0

* Corrected Deviator Stress
for Membrane Only (ASTM Method)
$= (4(EM)(Thickness)(Strain))/D_c$
Where: EM = 200 psi and Thickness = .012"

Unconsolidated Undrained Triaxial Test
ASTM D2850-03a

Consolidation Values			Final Values					
Height	5.998	(in.)	Height	4.9780	(in.)	Tested By	KDG	
Diameter	2.861	(in)	Dia. avg.	3.153	(in)	Date	11-4-09	
Area	6.430	(in^2)	Area avg.	7.8080	(in^2)	Press No.	2	
						Panel No.	D	

Project Number	172679015
Test Number	UU-1070B
Data File ID	UU-1070B
Back Pressure (psi)	0
Lateral Pressure (psi)	18

Clock Time (min.)	Load (lbf)	Deflection Dial Reading (in.)	Chamber Pressure Reading (psi)	Corrected Hieght (in.)	Strain (%)	Corrected Area (in^2)	Corrected Load (lbf)	Deviator Stress (psi)	Corrected Deviator Stress* (tsf)	σ_1 (psi)	σ_3 (psi)	p $(\sigma_1+\sigma_3)/2$ (psi)	q $(\sigma_1-\sigma_3)/2$ (psi)	Principal Stress Ratio σ_1 / σ_3	Test Time (min.)
0:20:11	77.1	0.673	18.0	5.326	11.21	7.2424	76.0	10.500	10.123	28.168	18.045	23.11	5.06	1.561	20.2
0:20:23	77.2	0.679	18.1	5.319	11.33	7.2516	76.2	10.502	10.122	28.172	18.050	23.11	5.06	1.561	20.4
0:20:33	77.2	0.685	18.1	5.314	11.42	7.2589	76.2	10.494	10.111	28.166	18.055	23.11	5.06	1.560	20.6
0:20:43	77.5	0.690	18.1	5.308	11.51	7.2663	76.5	10.522	10.135	28.187	18.052	23.12	5.07	1.561	20.7
0:20:55	77.3	0.697	18.0	5.301	11.62	7.2755	76.3	10.490	10.100	28.147	18.048	23.10	5.05	1.560	20.9
0:21:05	77.9	0.702	18.1	5.296	11.71	7.2829	76.9	10.554	10.162	28.214	18.053	23.13	5.08	1.563	21.1
0:21:17	77.7	0.709	18.1	5.289	11.82	7.2922	76.6	10.509	10.112	28.164	18.052	23.11	5.06	1.560	21.3
0:21:27	77.8	0.714	18.0	5.284	11.91	7.2996	76.8	10.523	10.123	28.171	18.047	23.11	5.06	1.561	21.5
0:21:39	78.0	0.721	18.1	5.277	12.02	7.3089	76.9	10.525	10.121	28.172	18.050	23.11	5.06	1.561	21.7
0:21:49	77.9	0.726	18.1	5.272	12.11	7.3162	76.9	10.505	10.099	28.152	18.054	23.10	5.05	1.559	21.8
0:21:59	78.0	0.732	18.0	5.266	12.21	7.3242	77.0	10.513	10.104	28.153	18.049	23.10	5.05	1.560	22.0
0:22:11	78.2	0.739	18.1	5.259	12.32	7.3337	77.1	10.519	10.105	28.158	18.052	23.10	5.05	1.560	22.2
0:22:21	78.4	0.744	18.0	5.254	12.41	7.3412	77.4	10.541	10.124	28.173	18.048	23.11	5.06	1.561	22.4
0:22:33	78.4	0.751	18.0	5.247	12.52	7.3506	77.3	10.520	10.100	28.145	18.045	23.09	5.05	1.560	22.6
0:22:43	78.5	0.757	18.0	5.242	12.61	7.3583	77.5	10.532	10.109	28.149	18.041	23.10	5.05	1.560	22.7
0:22:55	78.7	0.763	18.0	5.235	12.72	7.3677	77.7	10.547	10.120	28.162	18.042	23.10	5.06	1.561	22.9
0:23:05	78.5	0.769	18.0	5.230	12.82	7.3755	77.5	10.505	10.075	28.121	18.046	23.08	5.04	1.558	23.1
0:23:15	78.5	0.774	18.0	5.224	12.91	7.3832	77.5	10.498	10.065	28.106	18.041	23.07	5.03	1.558	23.3
0:23:27	78.7	0.781	18.0	5.217	13.02	7.3930	77.7	10.507	10.070	28.112	18.042	23.08	5.04	1.558	23.5
0:23:37	78.7	0.787	18.0	5.212	13.11	7.4008	77.6	10.492	10.052	28.094	18.043	23.07	5.03	1.557	23.6
0:23:46	78.7	0.792	18.0	5.206	13.21	7.4086	77.7	10.484	10.041	28.075	18.035	23.06	5.02	1.557	23.8
0:23:58	79.0	0.799	18.0	5.199	13.32	7.4184	78.0	10.510	10.063	28.105	18.041	23.07	5.03	1.558	24.0
0:24:08	79.1	0.805	18.0	5.194	13.41	7.4263	78.1	10.517	10.067	28.107	18.040	23.07	5.03	1.558	24.1
0:24:18	79.4	0.810	18.0	5.188	13.51	7.4344	78.4	10.545	10.092	28.131	18.039	23.09	5.05	1.559	24.3
0:24:30	79.3	0.817	18.0	5.181	13.62	7.4444	78.2	10.511	10.054	28.089	18.035	23.06	5.03	1.557	24.5
0:24:40	79.3	0.823	18.0	5.176	13.72	7.4524	78.3	10.509	10.049	28.078	18.029	23.05	5.02	1.557	24.7
0:24:50	79.3	0.828	18.0	5.170	13.81	7.4603	78.2	10.488	10.024	28.055	18.031	23.04	5.01	1.556	24.8
0:25:02	79.5	0.835	18.0	5.163	13.92	7.4703	78.4	10.498	10.031	28.055	18.024	23.04	5.02	1.557	25.0
0:25:12	79.7	0.841	18.0	5.158	14.01	7.4783	78.6	10.515	10.045	28.073	18.028	23.05	5.02	1.557	25.2
0:25:22	80.1	0.846	18.0	5.152	14.11	7.4864	79.1	10.564	10.091	28.114	18.023	23.07	5.05	1.560	25.4
0:25:34	80.2	0.853	18.0	5.145	14.22	7.4965	79.1	10.555	10.077	28.103	18.025	23.06	5.04	1.559	25.6
0:25:44	80.1	0.859	18.0	5.139	14.32	7.5048	79.1	10.538	10.058	28.079	18.022	23.05	5.03	1.558	25.7
0:25:53	80.3	0.864	18.0	5.134	14.41	7.5129	79.3	10.549	10.065	28.074	18.009	23.04	5.03	1.559	25.9
0:26:03	80.4	0.870	18.0	5.128	14.51	7.5212	79.3	10.548	10.061	28.067	18.006	23.04	5.03	1.559	26.1
0:26:15	80.5	0.877	18.0	5.121	14.62	7.5314	79.5	10.551	10.060	28.053	17.993	23.02	5.03	1.559	26.3
0:26:25	80.3	0.883	18.0	5.116	14.71	7.5395	79.3	10.515	10.022	28.002	17.980	22.99	5.01	1.557	26.4
0:26:35	80.6	0.888	18.0	5.110	14.80	7.5476	79.6	10.545	10.048	28.026	17.978	23.00	5.02	1.559	26.6
0:26:47	80.7	0.895	18.0	5.103	14.92	7.5580	79.7	10.543	10.043	28.058	18.015	23.04	5.02	1.557	26.8
0:26:57	80.7	0.901	18.0	5.098	15.01	7.5662	79.7	10.534	10.031	28.065	18.034	23.05	5.02	1.556	27.0
0:27:07	80.9	0.906	18.0	5.092	15.10	7.5743	79.8	10.539	10.033	28.067	18.035	23.05	5.02	1.556	27.1
0:27:19	80.8	0.913	18.0	5.085	15.22	7.5845	79.8	10.518	10.008	28.048	18.040	23.04	5.00	1.555	27.3
0:27:29	81.1	0.918	18.0	5.080	15.31	7.5926	80.0	10.541	10.027	28.070	18.043	23.06	5.01	1.556	27.5
0:27:41	81.1	0.925	18.0	5.073	15.42	7.6029	80.1	10.531	10.014	28.056	18.042	23.05	5.01	1.555	27.7
0:27:51	81.1	0.931	18.0	5.067	15.52	7.6115	80.1	10.524	10.004	28.052	18.048	23.05	5.00	1.554	27.9
0:28:01	81.3	0.936	18.1	5.062	15.61	7.6196	80.3	10.540	10.016	28.070	18.054	23.06	5.01	1.555	28.0
0:28:13	81.3	0.943	18.1	5.055	15.72	7.6301	80.2	10.517	9.990	28.053	18.063	23.06	4.99	1.553	28.2
0:28:23	81.4	0.949	18.1	5.050	15.82	7.6384	80.4	10.525	9.995	28.054	18.060	23.06	5.00	1.553	28.4
0:28:33	81.3	0.954	18.1	5.044	15.91	7.6465	80.2	10.493	9.959	28.023	18.063	23.04	4.98	1.551	28.6
0:28:45	81.5	0.961	18.1	5.037	16.02	7.6568	80.4	10.506	9.969	28.028	18.059	23.04	4.98	1.552	28.8
0:28:55	81.7	0.966	18.1	5.032	16.11	7.6650	80.7	10.523	9.983	28.045	18.062	23.05	4.99	1.553	28.9
0:29:07	81.6	0.973	18.1	5.025	16.22	7.6754	80.5	10.495	9.950	28.011	18.061	23.04	4.98	1.551	29.1
0:29:16	81.8	0.978	18.1	5.020	16.31	7.6836	80.7	10.506	9.959	28.022	18.063	23.04	4.98	1.551	29.3
0:29:29	81.8	0.985	18.1	5.013	16.43	7.6940	80.8	10.501	9.950	28.011	18.061	23.04	4.97	1.551	29.5
0:29:38	82.0	0.991	18.1	5.008	16.52	7.7023	81.0	10.512	9.958	28.018	18.060	23.04	4.98	1.551	29.6
0:29:51	82.0	0.997	18.1	5.001	16.63	7.7126	80.9	10.493	9.935	27.995	18.060	23.03	4.97	1.550	29.9
0:30:00	81.7	1.003	18.1	4.996	16.72	7.7209	80.7	10.451	9.890	27.949	18.059	23.00	4.95	1.548	30.0

* Corrected Deviator Stress
for Membrane Only (ASTM Method)
$= (4(EM)(Thickness)(Strain))/D_c$
Where: EM = 200 psi and Thickness =.012"

Unconsolidated Undrained Triaxial Test
ASTM D2850-03a

Consolidation Values			Final Values							
Height	5.998	(in.)	Height	4.9780	(in.)	Tested By	KDG	Project Number	172679015
Diameter	2.861	(in)	Dia. avg.	3.153	(in)	Date	11-4-09	Test Number	UU-1070B
Area	6.430	(in^2)	Area avg.	7.8080	(in^2)	Press No.	2	Data File ID	UU-1070B
						Panel No.	D	Back Pressure (psi)	0
								Lateral Pressure (psi)	18

Clock Time (min.)	Load (lbf)	Deflection Dial Reading (in.)	Chamber Pressure Reading (psi)	Corrected Hieght (in.)	Strain (%)	Corrected Area (in^2)	Corrected Load (lbf)	Deviator Stress (psi)	Corrected Deviator Stress* (tsf)	σ_1 (psi)	σ_3 (psi)	p $(\sigma_1+\sigma_3)/2$ (psi)	q $(\sigma_1-\sigma_3)/2$ (psi)	Principal Stress Ratio σ_1 / σ_3	Test Time (min.)
0:30:10	82.0	1.008	18.1	4.990	16.81	7.7294	81.0	10.475	9.911	27.971	18.060	23.02	4.96	1.549	30.2
0:30:22	82.2	1.015	18.1	4.983	16.92	7.7398	81.2	10.488	9.920	27.980	18.060	23.02	4.96	1.549	30.4
0:30:32	82.3	1.020	18.1	4.978	17.01	7.7481	81.3	10.488	9.917	27.977	18.060	23.02	4.96	1.549	30.5

* Corrected Deviator Stress
for Membrane Only (ASTM Method)
$= (4(EM)(Thickness)(Strain))/D_c$
Where: EM = 200 psi and Thickness =.012"

Stantec

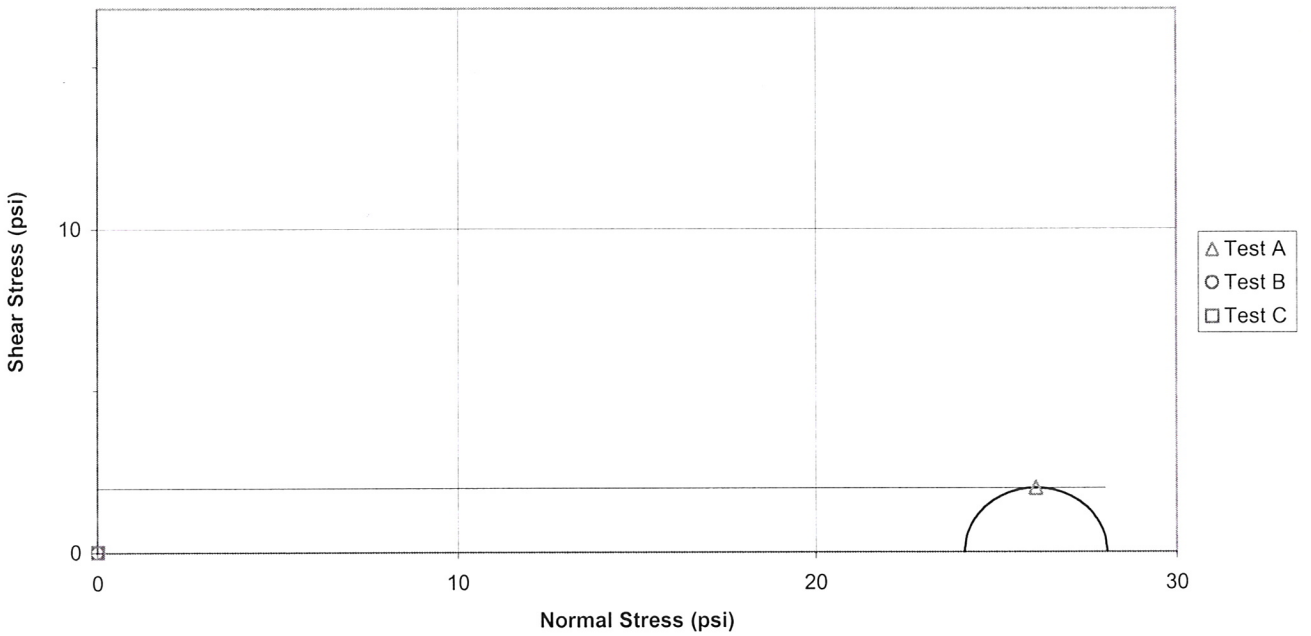
Unconsolidated Undrained Triaxial Test
ASTM D 2850-03a

Project	Bull Run Fossil Plant (TVA)	Project No.	172679015
Sample ID	STN-56P, 28.6'-29.1'	Test Number	1073B

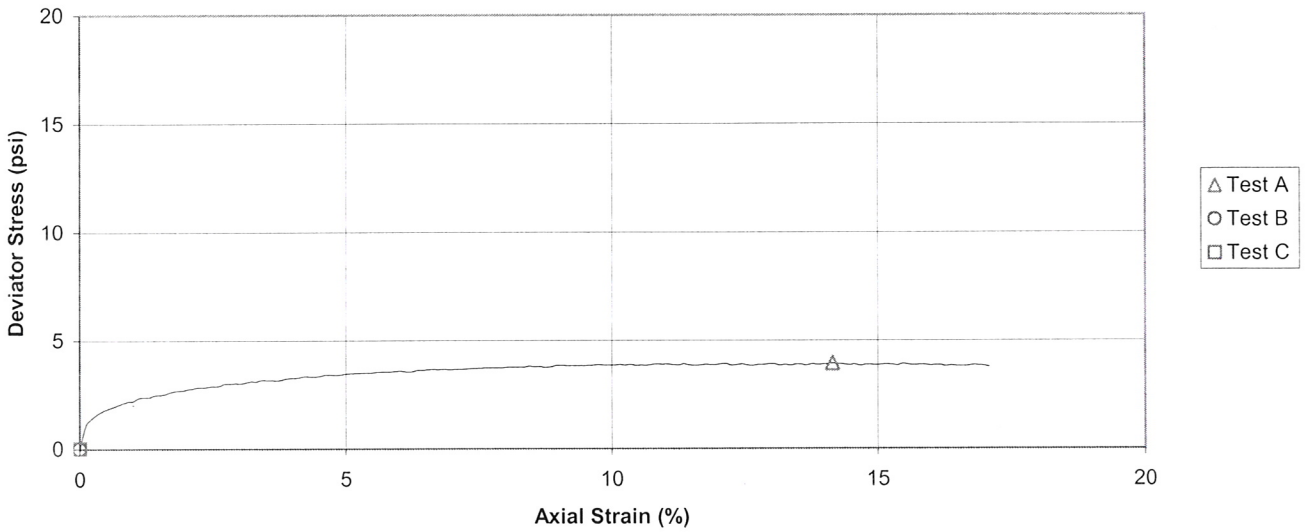
ϕ = 0.0 deg. c = 2.0 psi

Failure Criterion: Maximum Deviator Stress

Mohr Failure Envelope



Deviator Stress vs. Axial Strain



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KCK

Unconsolidated Undrained Triaxial Test
ASTM D2850-03a

Project Name	Bull Run Fossil Plant (TVA)			Project Number	172679015
Sample Identification	STN-56P, 28.6'-29.1'			Test Number	UU-1073B
Visual Description	Sandy Lean Clay (CL), brown, wet, soft			Prepared By	CM
Undisturbed	Source STN-56P, 28.0'-30.0'			Date	9-28-09
Specific Gravity	2.69	ASTM D854 Method A	Liquid Limit N/A	Plastic Limit N/A	Plasticity Index N/A

Initial Specimen Data

Specimen Diameter (in.)		Specimen Height (in.)		Volumes (in^3)		Specimen	
Top	2.880	1	6.093	Sample	39.0723 (V_o)	Wet Weight (g)	1251.16
Middle	2.869	2	5.990	Solids	22.3567 (VS_o)	Dry Weight (g)	985.57
Bottom	2.844	3	6.080	Water	16.2062 (Vw_o)	Wet Unit Weight (pcf)	122.0
Avg.	2.8643 (D_o)	4	6.093	Voids	16.7156 (Vv_o)	Dry Unit Weight (pcf)	96.1
Area (in^2)	6.4437 (A_o)	Avg. (H_o)	6.0636	Degree of Saturation (%)	97.0 (S_o)		
Moisture Content (%)	26.9	Final Trimmings		Void Ratio	0.748		

Saturation

Set Up & Saturated: Wet xx Dry ____ Set up By KDG

Back Pressure Saturated to: 0 (psi) Final Pore Pressure Parameter B ____ Date 11-4-09

Panel Board Number D

Height Readings (in.)		Back Pressure Burette		Chamber Burette			
Initial		Initial	(in.)	Initial	(in.)	Specimen Height (in.)	6.0636 (H_s)
Final		Final	(in.)	Final	(in.)	Area (in^2) Method A	6.4437 (A_s)
Change	0.0000 (ΔH_o)	Change	(in.)	Change	(in.)	Specimen Volume (in^3)	39.0723 (Vs)

Consolidation

Height Readings (in.)		Back Pressure Burette Readings		Chamber Burete Readings		Pressures (psi)	
Initial		Initial	(in.)	Initial	(in.)	Chamber	24
Final		Final	(in.)	Final	(in.)	Back	0
Change	0.0000 (ΔH_c)	Change	(in.)	Change	(in.)	Lateral	24 (σ_3)
Height (in.)	6.0636 (H_c)			Volume (in^3)	39.0723 (V_c)		
Area (in^3) Method A	6.4437 (A_c)			Volume - Water (in^3)	15.4179 (VWc)	t_{50} (min.)	
Diameter (in.)	2.8643 (D_c)			Water Content (%)	25.6		
Dry Density (pcf)	96.1			Degree of Saturation (%)	92.2 (S_c)	Void Ratio	0.748

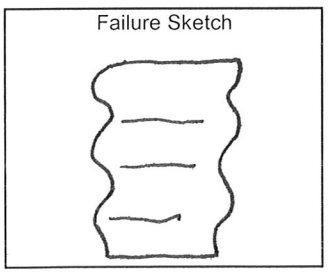
After Test

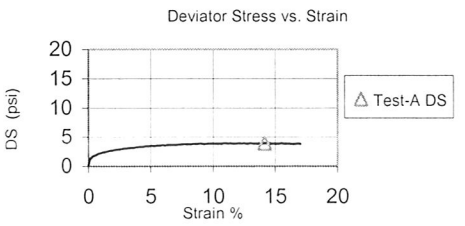
Final Measurements			Final Moisture Content		Stresses (membrane corrected) at Failure (psi)	
Maximum Diameter	3.304 (in.)	Wet Weight (g)	1238.24	Corrected Deviator	3.94 σ_d (psi)	
Wet weight (g)	1238.24 (WWf)	Dry Weight (g)	985.57	Major Principal	28.05 σ_{1f} (psi)	
Average Diameter	3.217 (in.)	Tare Weight (g)	0.00	Minor Principal	24.11 σ_{3f} (psi)	
				Rate of Strain (% / min.)	0.252	

Youngs Modulus for Membrane (psi) 200 Axial Strain at Failure (%) 14.16

Membrane Thickness (in.) 0.012 Failure Criterion: Maximum Deviator Stress

Failure Sketch





Comments: KDG

Unconsolidated Undrained Triaxial Test
ASTM D2850-03a

Consolidation Values			Final Values					
Height	6.064	(in.)	Height	5.0277	(in.)	Tested By	KDG	
Diameter	2.864	(in)	Dia. avg.	3.217	(in)	Date	11-4-09	
Area	6.444	(in^2)	Area avg.	8.1282	(in^2)	Press No.	2	
						Panel No.	D	

Project Number	172679015
Test Number	UU-1073B
Data File ID	UU-1073B
Back Pressure (psi)	0
Lateral Pressure (psi)	24

Clock Time (min.)	Load (lbf)	Deflection Dial Reading (in.)	Chamber Pressure Reading (psi)	Corrected Hieght (in.)	Strain (%)	Corrected Area (in^2)	Corrected Load (lbf)	Deviator Stress (psi)	Corrected Deviator Stress* (tsf)	σ_1 (psi)	σ_3 (psi)	p $(\sigma_1+\sigma_3)/2$ (psi)	q $(\sigma_1-\sigma_3)/2$ (psi)	Principal Stress Ratio σ_1 / σ_3	Test Time (min.)
0:00:00	0.3	0.000	24.1	6.064	0.00	6.4437	0.0	0.000	0.000	24.062	24.062	24.06	0.00	1.000	0.0
0:00:15	7.6	0.007	24.1	6.056	0.12	6.4516	7.3	1.124	1.120	25.179	24.058	24.62	0.56	1.047	0.3
0:00:24	9.2	0.013	24.0	6.051	0.21	6.4572	8.9	1.373	1.366	25.414	24.048	24.73	0.68	1.057	0.4
0:00:35	10.5	0.018	24.1	6.045	0.31	6.4635	10.2	1.571	1.561	25.622	24.061	24.84	0.78	1.065	0.6
0:00:47	11.6	0.025	24.1	6.038	0.42	6.4706	11.2	1.736	1.722	25.806	24.084	24.95	0.86	1.071	0.8
0:00:57	12.2	0.030	24.1	6.033	0.50	6.4764	11.9	1.838	1.821	25.906	24.085	25.00	0.91	1.076	1.0
0:01:09	13.0	0.037	24.1	6.026	0.62	6.4838	12.6	1.945	1.924	26.021	24.097	25.06	0.96	1.080	1.2
0:01:19	13.6	0.043	24.1	6.020	0.71	6.4899	13.3	2.046	2.023	26.133	24.111	25.12	1.01	1.084	1.3
0:01:29	14.2	0.049	24.1	6.015	0.80	6.4959	13.8	2.132	2.105	26.216	24.111	25.16	1.05	1.087	1.5
0:01:41	14.8	0.055	24.1	6.008	0.92	6.5033	14.5	2.230	2.199	26.307	24.108	25.21	1.10	1.091	1.7
0:01:51	15.0	0.061	24.1	6.003	1.00	6.5091	14.6	2.244	2.210	26.322	24.112	25.22	1.11	1.092	1.9
0:02:03	15.9	0.068	24.1	5.996	1.12	6.5167	15.6	2.393	2.355	26.473	24.118	25.30	1.18	1.098	2.1
0:02:13	16.2	0.073	24.1	5.990	1.21	6.5225	15.8	2.426	2.386	26.497	24.112	25.30	1.19	1.099	2.2
0:02:25	16.3	0.080	24.1	5.984	1.32	6.5297	15.9	2.437	2.393	26.512	24.119	25.32	1.20	1.099	2.4
0:02:35	16.8	0.085	24.1	5.978	1.41	6.5359	16.5	2.523	2.476	26.596	24.120	25.36	1.24	1.103	2.6
0:02:47	17.0	0.092	24.1	5.972	1.51	6.5428	16.7	2.546	2.495	26.609	24.114	25.36	1.25	1.103	2.8
0:02:57	17.3	0.097	24.1	5.966	1.61	6.5491	17.0	2.595	2.541	26.660	24.119	25.39	1.27	1.105	3.0
0:03:09	17.9	0.104	24.1	5.959	1.72	6.5565	17.6	2.678	2.621	26.738	24.117	25.43	1.31	1.109	3.2
0:03:19	18.2	0.110	24.1	5.954	1.81	6.5626	17.9	2.722	2.661	26.787	24.126	25.46	1.33	1.110	3.3
0:03:31	18.5	0.116	24.1	5.947	1.92	6.5700	18.1	2.761	2.696	26.816	24.120	25.47	1.35	1.112	3.5
0:03:41	18.8	0.122	24.1	5.942	2.01	6.5760	18.5	2.813	2.746	26.864	24.118	25.49	1.37	1.114	3.7
0:03:53	19.1	0.129	24.1	5.935	2.13	6.5838	18.8	2.854	2.783	26.896	24.113	25.50	1.39	1.115	3.9
0:04:03	19.5	0.134	24.1	5.929	2.21	6.5896	19.1	2.899	2.825	26.942	24.117	25.53	1.41	1.117	4.1
0:04:15	19.6	0.141	24.1	5.923	2.32	6.5971	19.2	2.913	2.835	26.951	24.117	25.53	1.42	1.118	4.3
0:04:25	19.9	0.147	24.1	5.917	2.42	6.6036	19.5	2.957	2.876	26.991	24.115	25.55	1.44	1.119	4.4
0:04:37	20.0	0.153	24.1	5.910	2.53	6.6108	19.7	2.975	2.891	27.006	24.116	25.56	1.45	1.120	4.6
0:04:47	20.2	0.159	24.1	5.905	2.62	6.6170	19.8	2.997	2.909	27.021	24.112	25.57	1.45	1.121	4.8
0:04:59	20.9	0.166	24.1	5.898	2.73	6.6247	20.6	3.103	3.012	27.118	24.107	25.61	1.51	1.125	5.0
0:05:09	20.9	0.171	24.1	5.893	2.82	6.6308	20.6	3.102	3.008	27.119	24.111	25.61	1.50	1.125	5.2
0:05:21	21.1	0.178	24.1	5.886	2.93	6.6383	20.8	3.132	3.034	27.143	24.109	25.63	1.52	1.126	5.4
0:05:31	21.1	0.183	24.1	5.880	3.03	6.6448	20.7	3.119	3.018	27.131	24.113	25.62	1.51	1.125	5.5
0:05:41	21.5	0.189	24.1	5.875	3.12	6.6509	21.1	3.177	3.073	27.183	24.110	25.65	1.54	1.127	5.7
0:05:53	21.8	0.196	24.1	5.868	3.23	6.6587	21.5	3.227	3.118	27.227	24.109	25.67	1.56	1.129	5.9
0:06:03	21.8	0.201	24.1	5.862	3.32	6.6650	21.4	3.217	3.106	27.213	24.107	25.66	1.55	1.129	6.1
0:06:15	22.3	0.208	24.1	5.856	3.43	6.6726	22.0	3.295	3.181	27.283	24.103	25.69	1.59	1.132	6.3
0:06:25	22.3	0.213	24.1	5.850	3.52	6.6790	22.0	3.287	3.169	27.269	24.100	25.68	1.58	1.131	6.4
0:06:37	22.4	0.220	24.1	5.843	3.64	6.6868	22.1	3.298	3.176	27.277	24.101	25.69	1.59	1.132	6.6
0:06:47	22.2	0.226	24.1	5.838	3.73	6.6931	21.9	3.272	3.147	27.248	24.101	25.67	1.57	1.131	6.8
0:06:57	22.8	0.231	24.1	5.832	3.82	6.6995	22.4	3.348	3.220	27.325	24.105	25.71	1.61	1.134	7.0
0:07:09	23.1	0.238	24.1	5.825	3.93	6.7074	22.8	3.395	3.264	27.357	24.093	25.73	1.63	1.135	7.2
0:07:19	23.3	0.244	24.1	5.820	4.02	6.7139	22.9	3.414	3.279	27.373	24.094	25.73	1.64	1.136	7.3
0:07:31	23.4	0.251	24.1	5.812	4.14	6.7222	23.1	3.437	3.298	27.391	24.094	25.74	1.65	1.137	7.5
0:07:41	23.8	0.256	24.1	5.807	4.23	6.7284	23.4	3.480	3.338	27.435	24.097	25.77	1.67	1.139	7.7
0:07:50	23.8	0.262	24.1	5.802	4.32	6.7348	23.4	3.475	3.330	27.429	24.098	25.76	1.67	1.138	7.8
0:08:03	23.8	0.269	24.1	5.795	4.44	6.7428	23.4	3.472	3.324	27.418	24.094	25.76	1.66	1.138	8.1
0:08:12	24.1	0.274	24.1	5.789	4.53	6.7493	23.7	3.515	3.363	27.459	24.096	25.78	1.68	1.140	8.2
0:08:22	24.5	0.280	24.1	5.783	4.62	6.7560	24.1	3.570	3.415	27.507	24.092	25.80	1.71	1.142	8.4
0:08:35	24.5	0.287	24.1	5.777	4.74	6.7640	24.2	3.571	3.412	27.492	24.080	25.79	1.71	1.142	8.6
0:08:44	24.5	0.293	24.1	5.771	4.83	6.7705	24.1	3.565	3.404	27.481	24.078	25.78	1.70	1.141	8.7
0:08:57	24.8	0.299	24.1	5.764	4.94	6.7784	24.4	3.606	3.441	27.513	24.072	25.79	1.72	1.143	9.0
0:09:06	25.0	0.305	24.1	5.759	5.03	6.7849	24.6	3.633	3.464	27.529	24.065	25.80	1.73	1.144	9.1
0:09:19	25.1	0.312	24.1	5.752	5.14	6.7932	24.8	3.646	3.474	27.530	24.057	25.79	1.74	1.144	9.3
0:09:28	25.3	0.317	24.1	5.746	5.23	6.7996	25.0	3.674	3.499	27.552	24.053	25.80	1.75	1.145	9.5
0:09:40	25.5	0.324	24.1	5.740	5.35	6.8076	25.1	3.691	3.512	27.570	24.058	25.81	1.76	1.146	9.7
0:09:50	25.5	0.329	24.1	5.734	5.44	6.8141	25.1	3.688	3.506	27.589	24.083	25.84	1.75	1.146	9.8
0:10:00	25.6	0.335	24.1	5.729	5.53	6.8206	25.3	3.702	3.517	27.617	24.100	25.86	1.76	1.146	10.0

* Corrected Deviator Stress
for Membrane Only (ASTM Method)
$= (4(EM)(Thickness)(Strain))/D_c$
Where: EM = 200 psi and Thickness =.012"

Unconsolidated Undrained Triaxial Test
ASTM D2850-03a

Consolidation Values			Final Values							
Height	6.064	(in.)	Height	5.0277	(in.)	Tested By	KDG	Project Number	172679015
Diameter	2.864	(in)	Dia. avg.	3.217	(in)	Date	11-4-09	Test Number	UU-1073B
Area	6.444	(in^2)	Area avg.	8.1282	(in^2)	Press No.	2	Data File ID	UU-1073B
						Panel No.	D	Back Pressure (psi)	0
								Lateral Pressure (psi)	24

Clock Time (min.)	Load (lbf)	Deflection Dial Reading (in.)	Chamber Pressure Reading (psi)	Corrected Hieght (in.)	Strain (%)	Corrected Area (in^2)	Corrected Load (lbf)	Deviator Stress (psi)	Corrected Deviator Stress* (tsf)	σ_1 (psi)	σ_3 (psi)	p $(\sigma_1+\sigma_3)/2$ (psi)	q $(\sigma_1-\sigma_3)/2$ (psi)	Principal Stress Ratio σ_1 / σ_3	Test Time (min.)
0:10:12	25.8	0.342	24.1	5.722	5.64	6.8287	25.5	3.731	3.542	27.650	24.108	25.88	1.77	1.147	10.2
0:10:22	25.9	0.347	24.1	5.716	5.73	6.8353	25.6	3.743	3.552	27.654	24.102	25.88	1.78	1.147	10.4
0:10:34	26.0	0.354	24.1	5.709	5.84	6.8434	25.7	3.752	3.556	27.665	24.108	25.89	1.78	1.148	10.6
0:10:44	26.3	0.360	24.1	5.704	5.93	6.8501	25.9	3.786	3.587	27.704	24.117	25.91	1.79	1.149	10.7
0:10:56	26.4	0.366	24.1	5.697	6.04	6.8582	26.0	3.795	3.592	27.707	24.115	25.91	1.80	1.149	10.9
0:11:06	26.2	0.372	24.1	5.692	6.13	6.8648	25.8	3.762	3.556	27.675	24.119	25.90	1.78	1.147	11.1
0:11:18	26.3	0.379	24.1	5.685	6.25	6.8731	26.0	3.778	3.569	27.691	24.122	25.91	1.78	1.148	11.3
0:11:28	26.8	0.384	24.1	5.679	6.34	6.8798	26.4	3.841	3.628	27.747	24.119	25.93	1.81	1.150	11.5
0:11:38	26.8	0.390	24.1	5.674	6.43	6.8864	26.4	3.837	3.622	27.741	24.119	25.93	1.81	1.150	11.6
0:11:50	27.0	0.396	24.1	5.667	6.54	6.8946	26.7	3.873	3.654	27.778	24.125	25.95	1.83	1.151	11.8
0:12:00	27.2	0.402	24.1	5.662	6.63	6.9012	26.9	3.898	3.675	27.795	24.120	25.96	1.84	1.152	12.0
0:12:12	27.1	0.409	24.1	5.655	6.74	6.9096	26.8	3.874	3.648	27.772	24.124	25.95	1.82	1.151	12.2
0:12:22	27.3	0.414	24.1	5.649	6.83	6.9163	27.0	3.897	3.668	27.791	24.124	25.96	1.83	1.152	12.4
0:12:34	27.2	0.421	24.1	5.642	6.95	6.9247	26.9	3.882	3.649	27.780	24.130	25.95	1.82	1.151	12.6
0:12:44	27.4	0.427	24.1	5.637	7.04	6.9315	27.1	3.909	3.673	27.800	24.127	25.96	1.84	1.152	12.7
0:12:56	27.5	0.433	24.1	5.630	7.15	6.9400	27.1	3.908	3.669	27.789	24.121	25.95	1.83	1.152	12.9
0:13:06	27.6	0.439	24.1	5.625	7.24	6.9468	27.3	3.929	3.686	27.807	24.121	25.96	1.84	1.153	13.1
0:13:15	27.8	0.445	24.1	5.619	7.33	6.9536	27.5	3.952	3.707	27.830	24.123	25.98	1.85	1.154	13.3
0:13:28	28.0	0.451	24.1	5.612	7.45	6.9621	27.6	3.970	3.720	27.837	24.116	25.98	1.86	1.154	13.5
0:13:37	28.1	0.457	24.1	5.607	7.54	6.9688	27.8	3.988	3.736	27.852	24.117	25.98	1.87	1.155	13.6
0:13:50	28.2	0.464	24.1	5.600	7.65	6.9773	27.9	3.993	3.737	27.863	24.126	25.99	1.87	1.155	13.8
0:13:59	28.3	0.469	24.1	5.594	7.74	6.9842	28.0	4.007	3.747	27.866	24.119	25.99	1.87	1.155	14.0
0:14:12	28.3	0.476	24.1	5.587	7.85	6.9928	28.0	4.004	3.741	27.859	24.118	25.99	1.87	1.155	14.2
0:14:21	28.4	0.482	24.1	5.582	7.94	6.9998	28.0	4.003	3.737	27.859	24.122	25.99	1.87	1.155	14.4
0:14:34	28.7	0.488	24.1	5.575	8.06	7.0084	28.3	4.044	3.774	27.895	24.121	26.01	1.89	1.156	14.6
0:14:44	28.7	0.494	24.1	5.569	8.15	7.0156	28.4	4.044	3.771	27.893	24.122	26.01	1.89	1.156	14.7
0:14:54	28.8	0.500	24.1	5.564	8.24	7.0225	28.5	4.052	3.776	27.892	24.116	26.00	1.89	1.157	14.9
0:15:06	28.8	0.506	24.1	5.557	8.36	7.0312	28.5	4.050	3.770	27.882	24.111	26.00	1.89	1.156	15.1
0:15:16	29.2	0.512	24.1	5.552	8.45	7.0381	28.8	4.093	3.810	27.919	24.109	26.01	1.91	1.158	15.3
0:15:28	29.1	0.519	24.1	5.545	8.56	7.0468	28.7	4.075	3.788	27.898	24.110	26.00	1.89	1.157	15.5
0:15:38	29.3	0.525	24.1	5.539	8.66	7.0543	28.9	4.098	3.808	27.917	24.109	26.01	1.90	1.158	15.6
0:15:48	29.0	0.530	24.1	5.533	8.75	7.0612	28.7	4.058	3.765	27.878	24.113	26.00	1.88	1.156	15.8
0:16:00	29.2	0.537	24.1	5.526	8.86	7.0700	28.9	4.086	3.789	27.899	24.110	26.00	1.89	1.157	16.0
0:16:10	29.7	0.543	24.1	5.521	8.95	7.0772	29.4	4.153	3.853	27.961	24.107	26.03	1.93	1.160	16.2
0:16:22	29.8	0.549	24.1	5.514	9.06	7.0859	29.4	4.151	3.847	27.953	24.106	26.03	1.92	1.160	16.4
0:16:32	29.7	0.555	24.1	5.509	9.15	7.0927	29.4	4.141	3.835	27.941	24.107	26.02	1.92	1.159	16.5
0:16:44	29.7	0.562	24.1	5.502	9.26	7.1015	29.4	4.137	3.827	27.929	24.102	26.02	1.91	1.159	16.7
0:16:54	29.8	0.567	24.1	5.497	9.35	7.1084	29.4	4.143	3.830	27.933	24.104	26.02	1.91	1.159	16.9
0:17:06	29.9	0.574	24.1	5.490	9.46	7.1172	29.5	4.146	3.829	27.925	24.097	26.01	1.91	1.159	17.1
0:17:16	30.0	0.579	24.1	5.484	9.55	7.1242	29.7	4.168	3.848	27.944	24.096	26.02	1.92	1.160	17.3
0:17:28	30.2	0.586	24.1	5.478	9.66	7.1330	29.9	4.188	3.864	27.957	24.094	26.03	1.93	1.160	17.5
0:17:38	30.4	0.591	24.1	5.472	9.75	7.1400	30.1	4.216	3.889	27.978	24.089	26.03	1.94	1.161	17.6
0:17:48	30.3	0.597	24.1	5.467	9.84	7.1473	29.9	4.187	3.857	27.940	24.083	26.01	1.93	1.160	17.8
0:18:00	30.3	0.604	24.1	5.460	9.96	7.1562	30.0	4.191	3.857	27.938	24.081	26.01	1.93	1.160	18.0
0:18:10	30.4	0.609	24.1	5.454	10.05	7.1634	30.1	4.199	3.863	27.942	24.079	26.01	1.93	1.160	18.2
0:18:22	30.6	0.616	24.1	5.448	10.16	7.1722	30.3	4.225	3.885	27.947	24.063	26.00	1.94	1.161	18.4
0:18:32	30.5	0.621	24.1	5.442	10.25	7.1793	30.2	4.205	3.862	27.920	24.058	25.99	1.93	1.161	18.5
0:18:44	30.8	0.628	24.1	5.436	10.36	7.1883	30.4	4.235	3.888	27.954	24.066	26.01	1.94	1.162	18.7
0:18:54	30.6	0.633	24.1	5.430	10.45	7.1956	30.2	4.202	3.852	27.937	24.085	26.01	1.93	1.160	18.9
0:19:06	30.7	0.640	24.1	5.423	10.56	7.2045	30.4	4.218	3.864	27.970	24.106	26.04	1.93	1.160	19.1
0:19:16	30.7	0.645	24.1	5.418	10.65	7.2116	30.3	4.208	3.851	27.964	24.113	26.04	1.93	1.160	19.3
0:19:28	31.1	0.652	24.1	5.411	10.76	7.2205	30.7	4.257	3.896	28.012	24.116	26.06	1.95	1.162	19.5
0:19:40	31.2	0.659	24.1	5.405	10.87	7.2294	30.8	4.266	3.902	28.022	24.121	26.07	1.95	1.162	19.7
0:19:50	31.1	0.664	24.1	5.399	10.96	7.2366	30.8	4.251	3.884	28.007	24.123	26.07	1.94	1.161	19.8
0:20:02	31.3	0.671	24.1	5.393	11.07	7.2456	31.0	4.273	3.902	28.025	24.123	26.07	1.95	1.162	20.0
0:20:12	31.1	0.676	24.1	5.387	11.16	7.2529	30.8	4.244	3.870	28.001	24.131	26.07	1.94	1.160	20.2

* Corrected Deviator Stress
for Membrane Only (ASTM Method)
$= (4(EM)(Thickness)(Strain))/D_c$
Where: EM = 200 psi and Thickness =.012"

Unconsolidated Undrained Triaxial Test
ASTM D2850-03a

Consolidation Values			Final Values					
Height	6.064	(in.)	Height	5.0277	(in.)	Tested By	KDG	
Diameter	2.864	(in)	Dia. avg.	3.217	(in)	Date	11-4-09	
Area	6.444	(in^2)	Area avg.	8.1282	(in^2)	Press No.	2	
						Panel No.	D	

Project Number	172679015
Test Number	UU-1073B
Data File ID	UU-1073B
Back Pressure (psi)	0
Lateral Pressure (psi)	24

Clock Time (min.)	Load (lbf)	Deflection Dial Reading (in.)	Chamber Pressure Reading (psi)	Corrected Hieght (in.)	Strain (%)	Corrected Area (in^2)	Corrected Load (lbf)	Deviator Stress (psi)	Corrected Deviator Stress* (tsf)	σ_1 (psi)	σ_3 (psi)	p $(\sigma_1+\sigma_3)/2$ (psi)	q $(\sigma_1-\sigma_3)/2$ (psi)	Principal Stress Ratio σ_1 / σ_3	Test Time (min.)
0:30:28	34.5	1.023	24.1	5.040	16.88	7.7522	34.2	4.412	3.846	27.988	24.142	26.06	1.92	1.159	30.5
0:30:40	34.5	1.030	24.1	5.033	16.99	7.7628	34.2	4.406	3.836	27.975	24.139	26.06	1.92	1.159	30.7
0:30:50	34.1	1.036	24.1	5.028	17.08	7.7715	33.8	4.346	3.774	27.915	24.141	26.03	1.89	1.156	30.8

* Corrected Deviator Stress
for Membrane Only (ASTM Method)
$= (4(EM)(Thickness)(Strain))/D_c$
Where: EM = 200 psi and Thickness =.012"

Attachment 7

Unconfined Compressive (UC) Tests

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-34P, 50.0'-52.0' | Lab ID: 1027B
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.3'
Test Interval: 50.6' - 51.1'

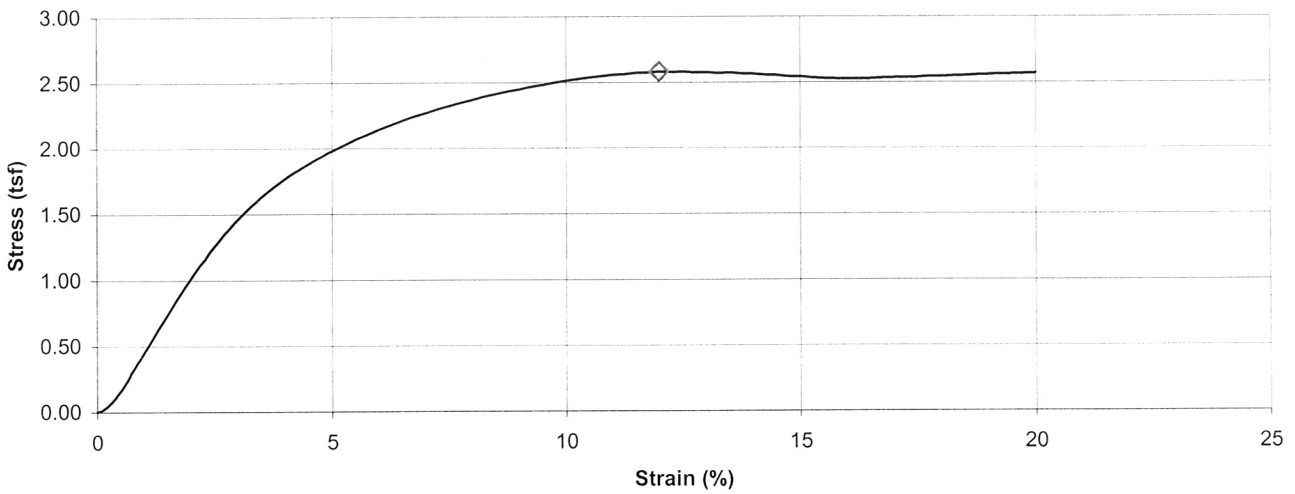
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/14/2009
Date Tested: 10/30/2009

Initial Wet Density (pcf)	126.4
Initial Moisture Content (%)	23.4
Initial Dry Density (pcf)	102.4
At Test Moisture Content (%)	23.0
At Test Dry Density (pcf)	102.7
Specific Gravity	N/A
Degree of Saturation (%)	N/A
Average Height (in)	6.027
Average Diameter (in)	2.878
Height to Diameter Ratio	2.1

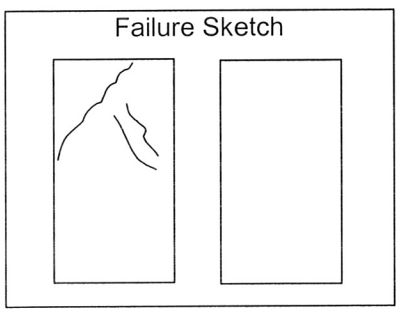
Initial MC Taken: Before Test, From Trimmings
At Test MC Taken: After Test, From Center of Specimen

Unconfined Compressive Strength (tsf)	2.58
Undrained Shear Strength (tsf)	1.29
Strain at Maximum Stress (%)	12.0
Strain rate to failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

12/11

Stantec

Unconfined Compressive Strength of Cohesive Soil

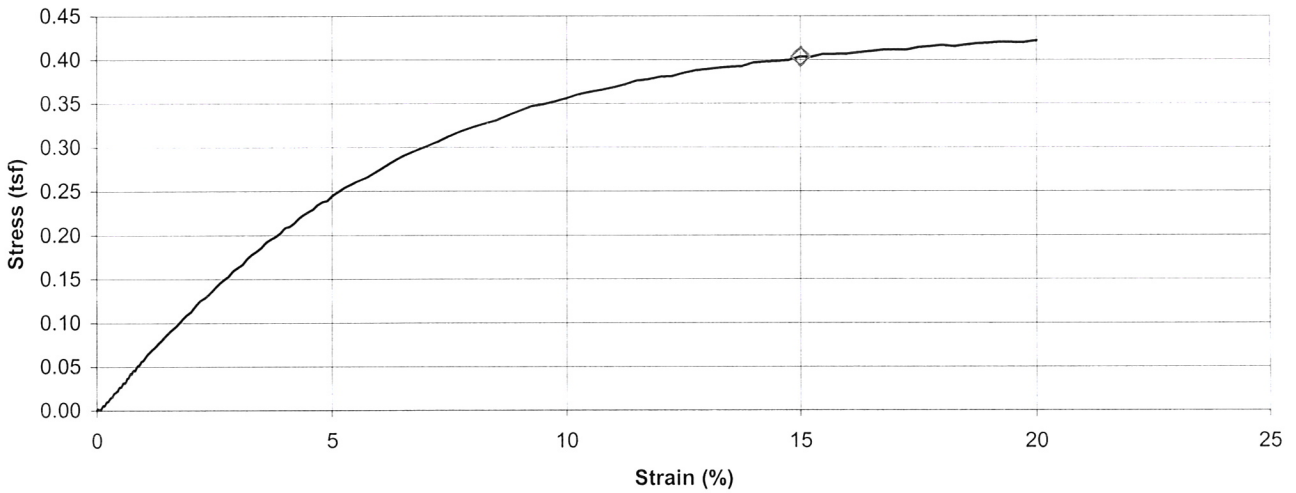
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-34P, 56.0'-58.0' | Lab ID: 1030A
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.9'
Test Interval: 56.0' - 56.5'

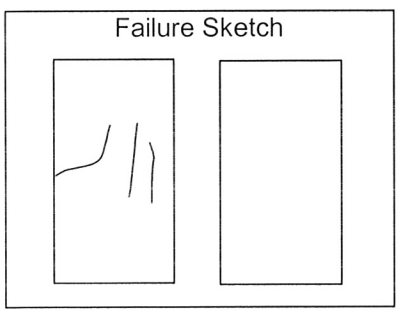
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/30/2009
Date Tested: 09/30/2009

Initial Wet Density (pcf)	122.8		
Initial Moisture Content (%)	21.0	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	101.5		
At Test Moisture Content (%)	27.9	At Test MC Taken	After Test, From Center of Specimen
At Test Dry Density (pcf)	96.0		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	0.40
Average Height (in)	6.006	Undrained Shear Strength (tsf)	0.20
Average Diameter (in)	2.878	Strain at Maximum Stress (%)	15.0
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1211

Stantec

Unconfined Compressive Strength of Cohesive Soil

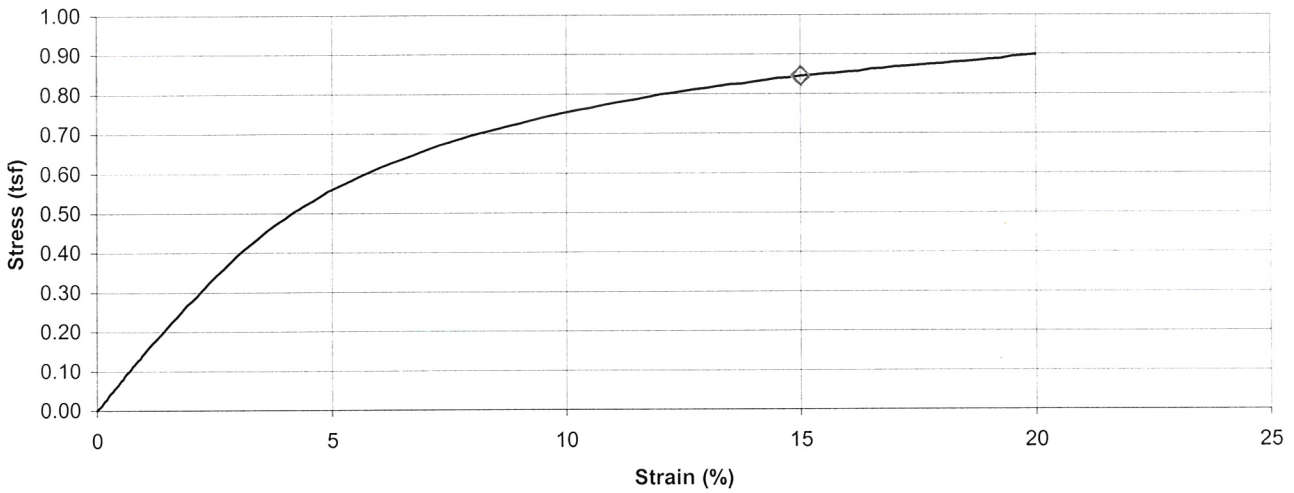
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-51P, 32.0'-34.0' | Lab ID: 1066A
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.2'
Test Interval: 32.0' - 32.5'

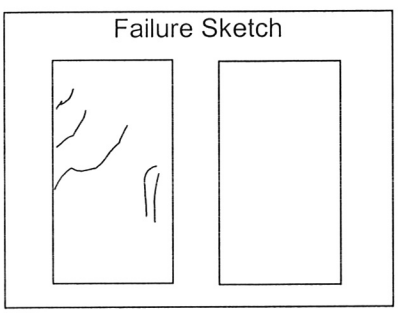
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/16/2009
Date Tested: 11/02/2009

Initial Wet Density (pcf)	126.0		
Initial Moisture Content (%)	26.0	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	100.0		
At Test Moisture Content (%)	22.0	At Test MC Taken	After Test, From Center of Specimen
At Test Dry Density (pcf)	103.3		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	0.84
Average Height (in)	6.038	Undrained Shear Strength (tsf)	0.42
Average Diameter (in)	2.860	Strain at Maximum Stress (%)	15.0
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

121

Stantec

Unconfined Compressive Strength of Cohesive Soil

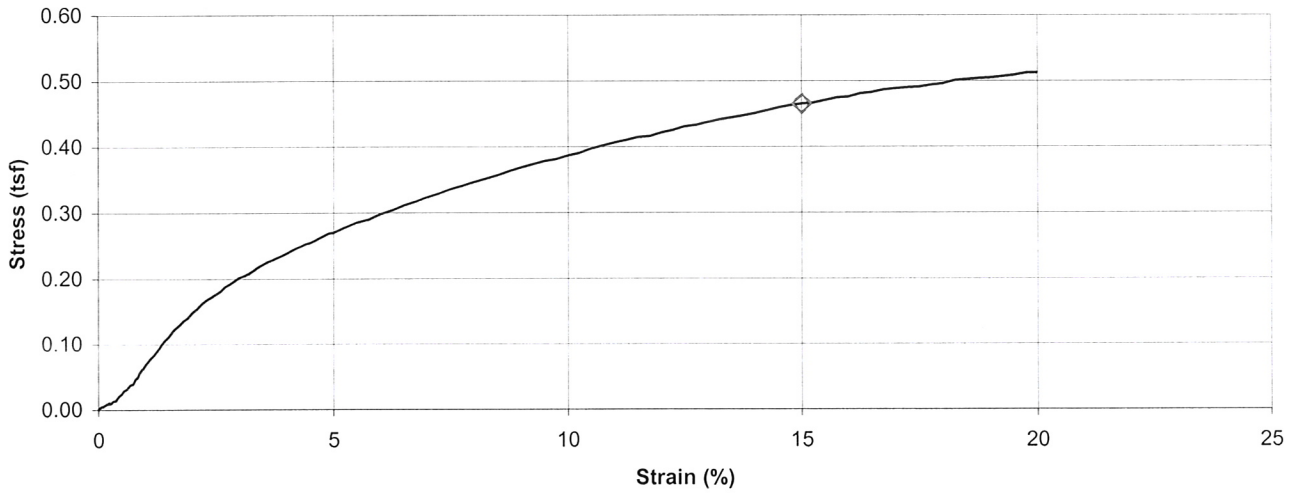
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-51P, 36.0'-38.0' | Lab ID: 1068A
Visual Description: Lean Clay (CL), brown, moist, firm
Recovered: 1.7'
Test Interval: 36.0' - 36.5'

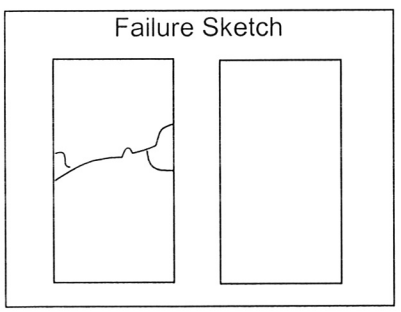
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/16/2009
Date Tested: 11/02/2009

Initial Wet Density (pcf)	125.9		
Initial Moisture Content (%)	23.1	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	102.3		
At Test Moisture Content (%)	22.9	At Test MC Taken	After Test, From Center of Specimen
At Test Dry Density (pcf)	102.5		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	0.46
Average Height (in)	6.037	Undrained Shear Strength (tsf)	0.23
Average Diameter (in)	2.888	Strain at Maximum Stress (%)	15.0
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1211

Stantec

Unconfined Compressive Strength of Cohesive Soil

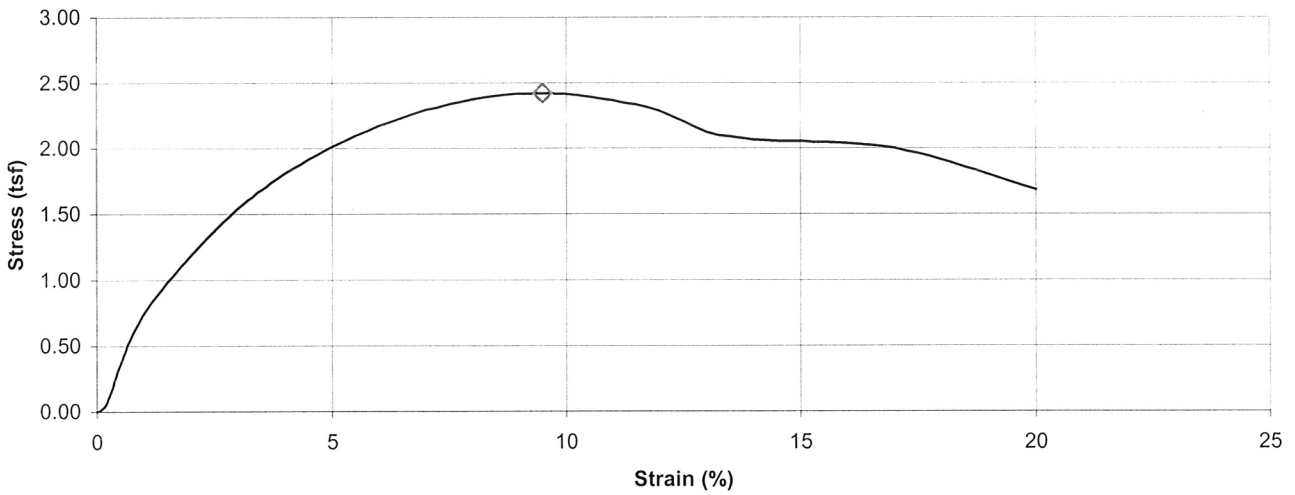
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-67, 19.0'-21.0' | Lab ID: 1076
Visual Description: Lean Clay (CL), gray, moist, firm
Recovered: 0.8'
Test Interval: 19.0' - 19.5'

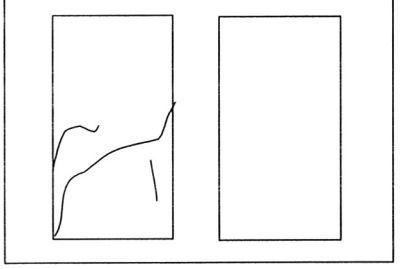
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/29/2009
Date Tested: 11/02/2009

Initial Wet Density (pcf)	123.3		
Initial Moisture Content (%)	25.8	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	98.0		
At Test Moisture Content (%)	20.6	At Test MC Taken	After Test, From Center of Specimen
At Test Dry Density (pcf)	102.2		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	2.42
Average Height (in)	6.030	Undrained Shear Strength (tsf)	1.21
Average Diameter (in)	2.871	Strain at Maximum Stress (%)	9.5
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

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Stantec

Unconfined Compressive Strength of Cohesive Soil

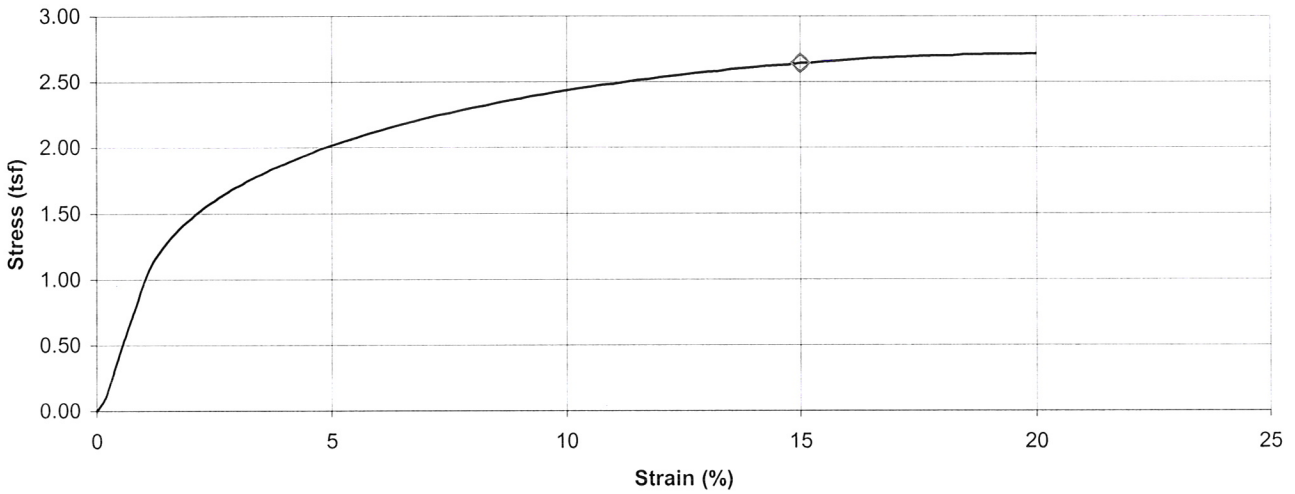
ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-67, 24.0'-26.0' | Lab ID: 1077B
Visual Description: Lean Clay (CL), gray, moist, firm
Recovered: 1.4'
Test Interval: 24.6' - 25.1'

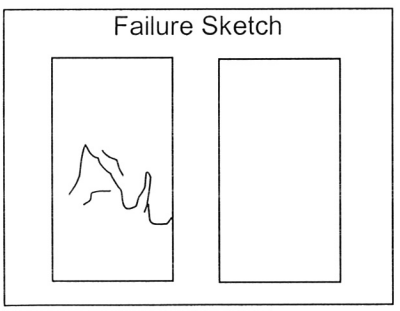
Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A
Date Extruded: 09/29/2009
Date Tested: 11/02/2009

Initial Wet Density (pcf)	122.4		
Initial Moisture Content (%)	24.7	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	98.2		
At Test Moisture Content (%)	25.3	At Test MC Taken	After Test, From Center of Specimen
At Test Dry Density (pcf)	97.7		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	2.64
Average Height (in)	6.030	Undrained Shear Strength (tsf)	1.32
Average Diameter (in)	2.878	Strain at Maximum Stress (%)	15.0
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

1211

Stantec

Unconfined Compressive Strength of Cohesive Soil

ASTM D 2166

Project Name: Bull Run Fossil Plant (TVA) | Project Number: 172679015
Source: STN-88, 26.0'-28.0' | Lab ID: 1091A
Visual Description: Lean Clay (CL), gray, moist, firm

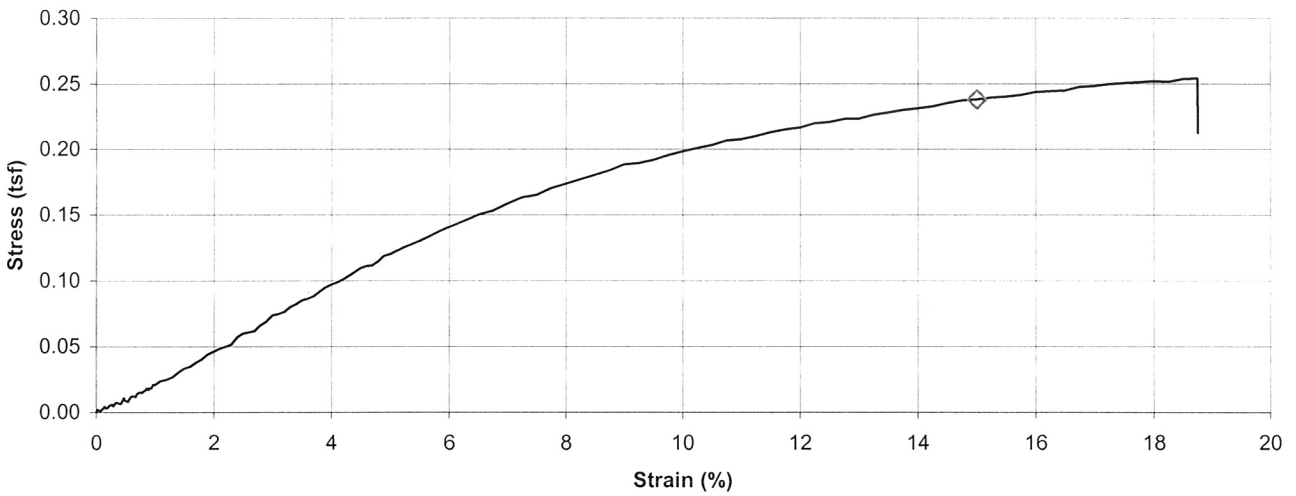
Recovered: 1.4'
Test Interval: 26.0' - 26.5'

Specimen Type: Undisturbed | LL: N/A | PL: N/A | PI: N/A

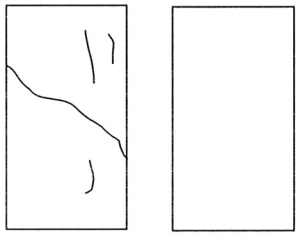
Date Extruded: 09/29/2009
Date Tested: 11/02/2009

Initial Wet Density (pcf)	116.4		
Initial Moisture Content (%)	36.6	Initial MC Taken	Before Test, From Trimmings
Initial Dry Density (pcf)	85.2		
At Test Moisture Content (%)	33.7	At Test MC Taken	After Test, From Center of Specimen
At Test Dry Density (pcf)	87.1		
Specific Gravity	N/A		
Degree of Saturation (%)	N/A	Unconfined Compressive Strength (tsf)	0.24
Average Height (in)	5.866	Undrained Shear Strength (tsf)	0.12
Average Diameter (in)	2.842	Strain at Maximum Stress (%)	15.0
Height to Diameter Ratio	2.1	Strain rate to failure (% / min.)	1.00

Stress vs. Strain



Failure Sketch



Pocket Penetrometer Reading (tsf): N/A
Torvane Reading (kg/cm^2): N/A

Comments

Reviewed By

12/11

Attachment 8

Direct Simple Shear (DSS) Tests

GeoTesting express
a subsidiary of Geocomp Corporation

Consolidated Undrained Direct Simple Shear Test of Cohesive Soil by ASTM D 6528

Client:	Stantec	GTX#:	9421
Project Name:	Bull Run Fossil Plant	Test Date:	11/02/09
Project Location:	---		

Boring ID:	STN-49P
Sample ID:	DSS-1 (ST-3)
Depth, ft:	4.3-5.0 ft

Visual Description: Moist, gray silt

Test Equipment: Top and bottom box (circular) = 2.62 in diameter. Load cells and LVDT's connected to data acquisition system for shear force, normal load, horizontal and vertical displacement; surface area = 5.39 in^2, soil height = 1 inch

Test Condition: inundated

Sample Preparation: Extruded from tube, cut, trimmed and placed into apparatus at as-received density and moisture content.

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5
Test No.	DSS-1A				
Initial Moisture Content, %	31.7				
Initial Dry Density, pcf	81.9				
Nominal Rate of Shear Strain, %/min	0.0008				
Vertical Consolidation Stress, psi	2				
Final Moisture Content, %	31.6				
Measured Peak Shear Stress, psi	1.89				
Shear Strain at Peak Shear Stress, %	20.0				
Membrane Correction, psi	0.30				
Corrected Peak Shear Stress, psi	1.59				
S / σ'_{vc}	0.80				

Comments: Tested By: md Checked By: jdt

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

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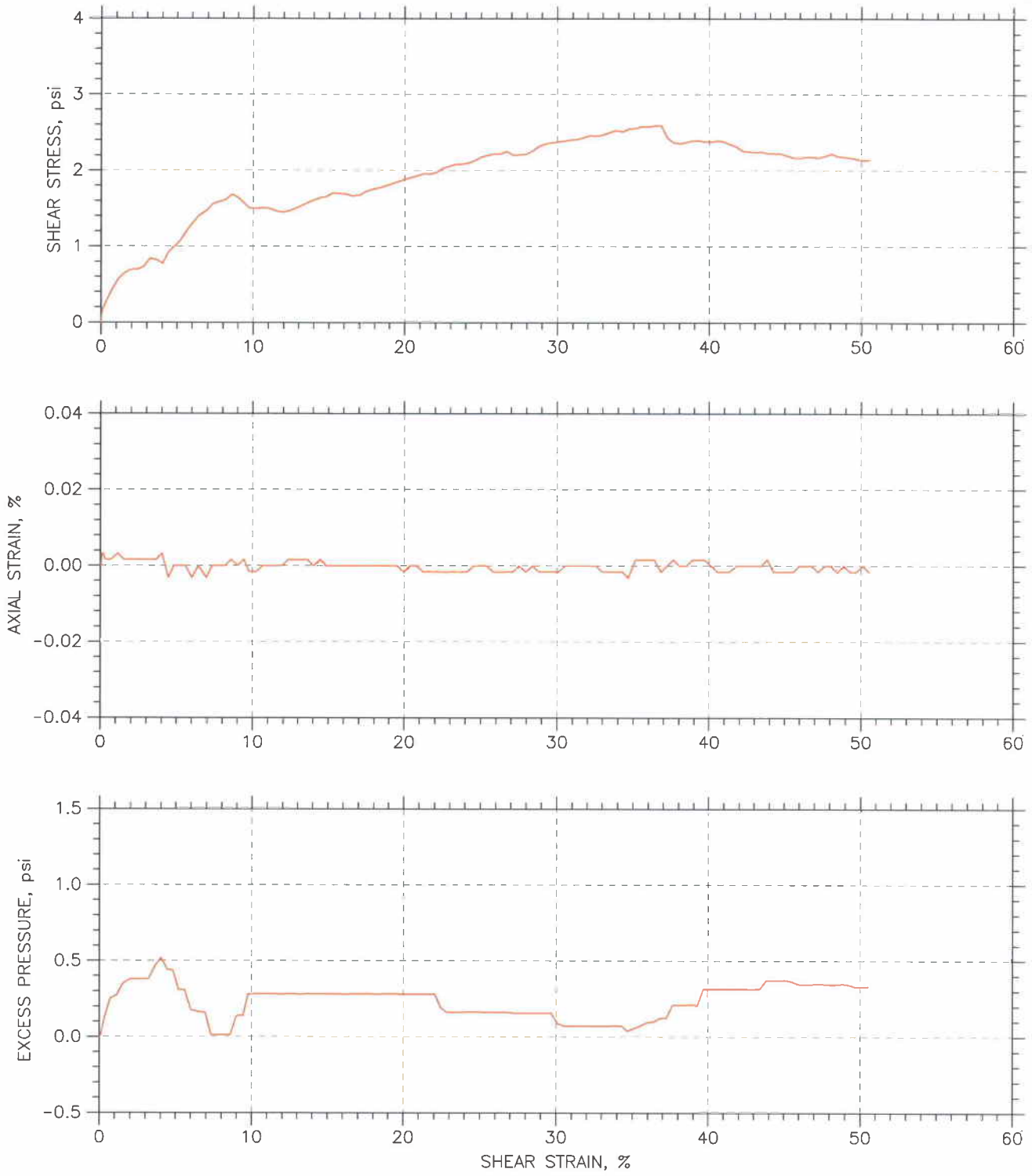
DIRECT SIMPLE SHEAR TEST



Project: Bull Run Fossil Plant	Location: ---	Project No.: GTX-9421
Boring No.: DSS-1	Tested By: md	Checked By: jdt
Sample No.: STN-49P	Test Date: 11/02/09	Depth: 4.3-5.0
Test No.: DSS-1A	Sample Type: core	Elevation: ST-3
Description: Moist, gray silt		
Remarks: System L - 1.0 membrane		
File: \\Geocompdb1\projects\GTX9421\9421-DSS-1An.dat		

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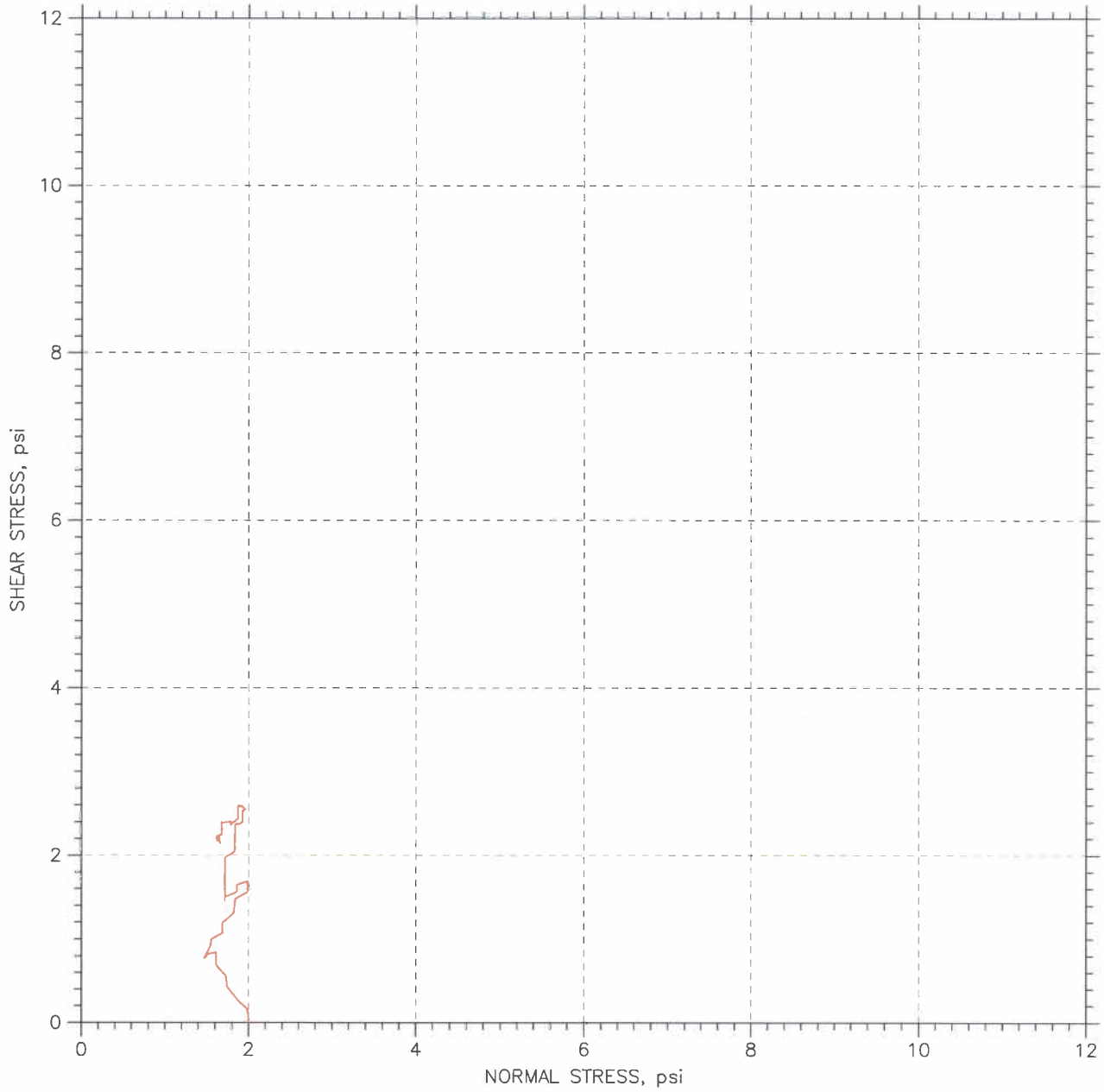
DIRECT SIMPLE SHEAR TEST



Project: Bull Run Fossil Plant	Location: ---	Project No.: GTX-9421
Boring No.: DSS-1	Tested By: md	Checked By: jdt
Sample No.: STN-49P	Test Date: 11/02/09	Depth: 4.3-5.0
Test No.: DSS-1A	Sample Type: core	Elevation: ST-3
Description: Moist, gray silt		
Remarks: System L - 1.0 membrane		
File: \\Geocompdb1\projects\GTX9421\9421-DSS-1An.dat		

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Consolidated Undrained Direct Simple Shear Test of Cohesive Soil by ASTM D 6528

Client:	Stantec	GTX#:	9421
Project Name:	Bull Run Fossil Plant	Test Date:	10/23/09
Project Location:	---		

Boring ID:	STN-46
Sample ID:	DSS-2 (ST-6)
Depth, ft:	11.0-11.5 ft

Visual Description: Moist, gray silt

Test Equipment: Top and bottom box (circular) = 2.62 in diameter. Load cells and LVDT's connected to data acquisition system for shear force, normal load, horizontal and vertical displacement; surface area = 5.39 in^2, soil height = 1 inch

Test Condition: inundated

Sample Preparation: Extruded from tube, cut, trimmed and placed into apparatus at as-received density and moisture content.

Test Comments: Shearing occurred primarily in the top of the specimen.

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5
Test No.	DSS-2A				
Initial Moisture Content, %	28.6				
Initial Dry Density, pcf	86.1				
Nominal Rate of Shear Strain, %/min	0.0008				
Vertical Consolidation Stress, psi	4				
Final Moisture Content, %	29.1				
Measured Peak Shear Stress, psi	2.22				
Shear Strain at Peak Shear Stress, %	8.77				
Membrane Correction, psi	0.22				
Corrected Peak Shear Stress, psi	2.00				
S / σ'_{vc}	0.50				

Tested By: md Checked By: jdt

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

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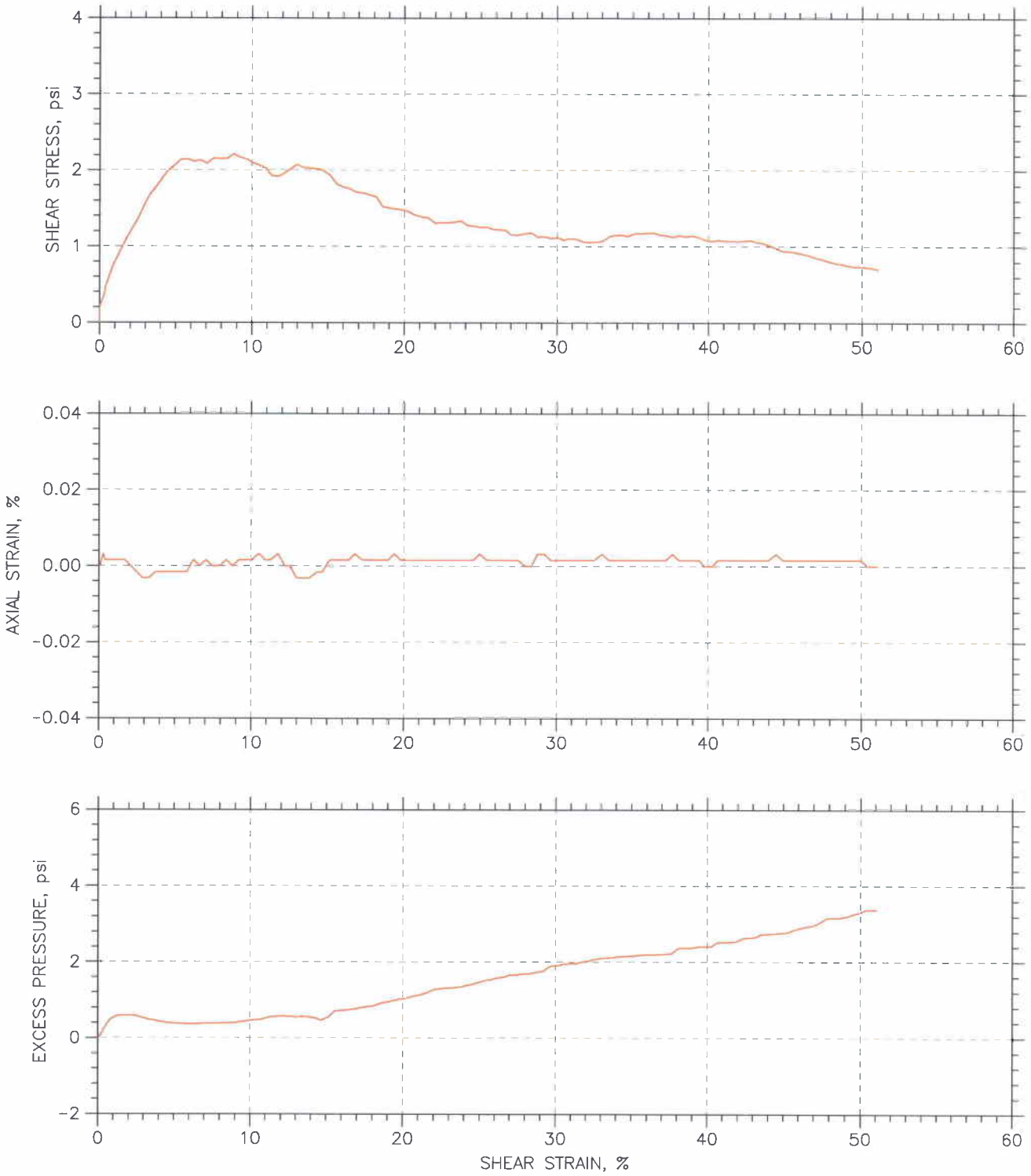
DIRECT SIMPLE SHEAR TEST



Project: Bull Run Fossil Plant	Location: ---	Project No.: GTX-9421
Boring No.: DSS-2	Tested By: md	Checked By: jdt
Sample No.: STN-46	Test Date: 10/30/09	Depth: 11-11.5
Test No.: DSS-2A	Sample Type: core	Elevation: ST-6
Description: Moist, gray silt		
Remarks: System L - 1.0 membrane		
File: \\Geocompdb1\projects\GTX9421\9421-DSS-2An.dat		

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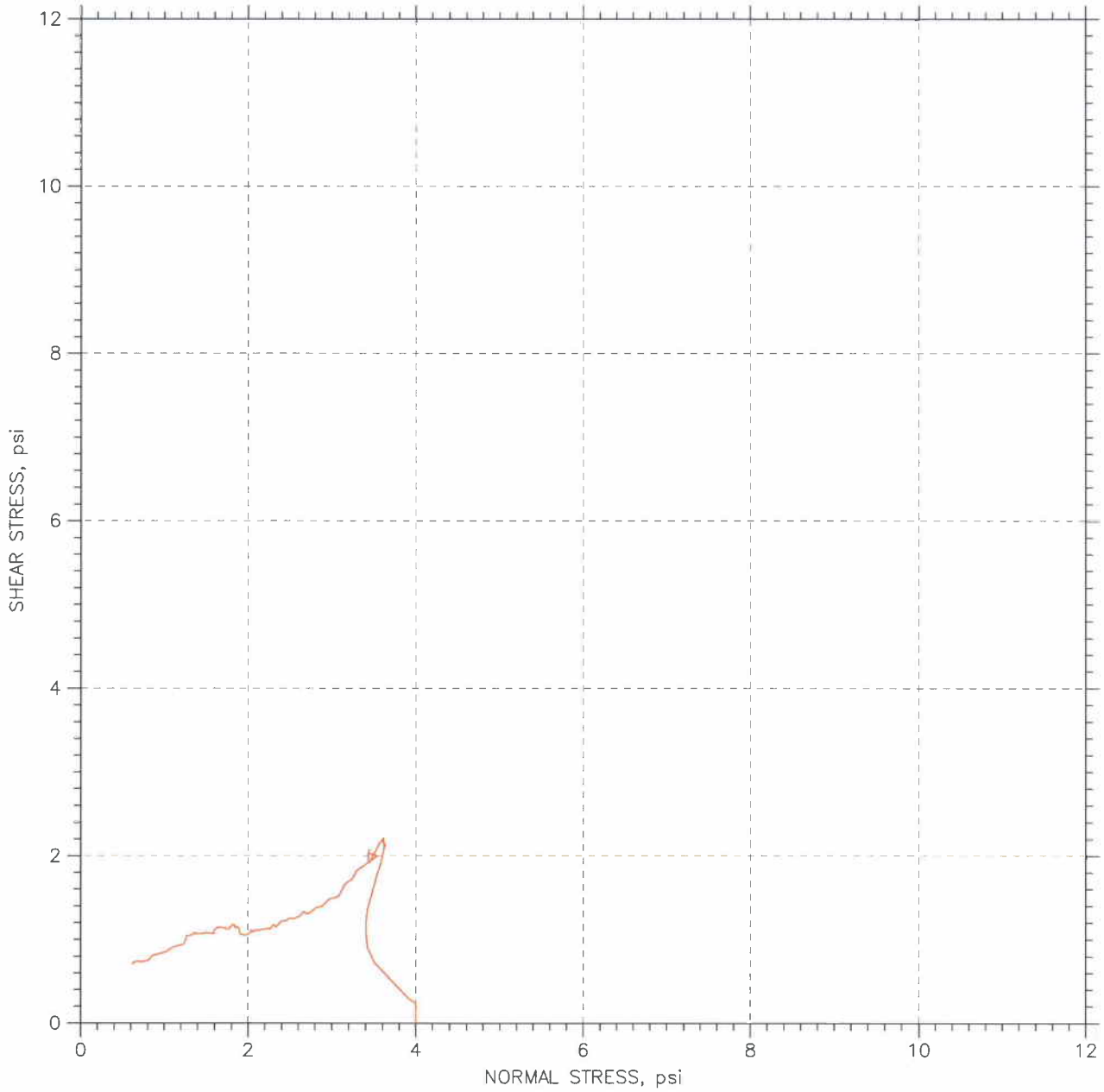
DIRECT SIMPLE SHEAR TEST



Project: Bull Run Fossil Plant	Location: ---	Project No.: GTX-9421
Boring No.: DSS-2	Tested By: md	Checked By: jdt
Sample No.: STN-46	Test Date: 10/30/09	Depth: 11-11.5
Test No.: DSS-2A	Sample Type: core	Elevation: ST-6
Description: Moist, gray silt		
Remarks: System L - 1.0 membrane		
File: \\Geocompdb1\projects\GTX9421\9421-DSS-2An.dat		

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Consolidated Undrained Direct Simple Shear Test of Cohesive Soil by ASTM D 6528

Client:	Stantec	GTX#:	9421
Project Name:	Bull Run Fossil Plant	Test Date:	10/25/09
Project Location:	---		

Boring ID:	STN-49P
Sample ID:	DSS-3 (ST-13)
Depth, ft:	25.4-26.0 ft

Visual Description: Moist, gray silt with sand

Test Equipment: Top and bottom box (circular) = 2.62 in diameter. Load cells and LVDT's connected to data acquisition system for shear force, normal load, horizontal and vertical displacement; surface area = 5.39 in^2, soil height = 1 inch

Test Condition: inundated

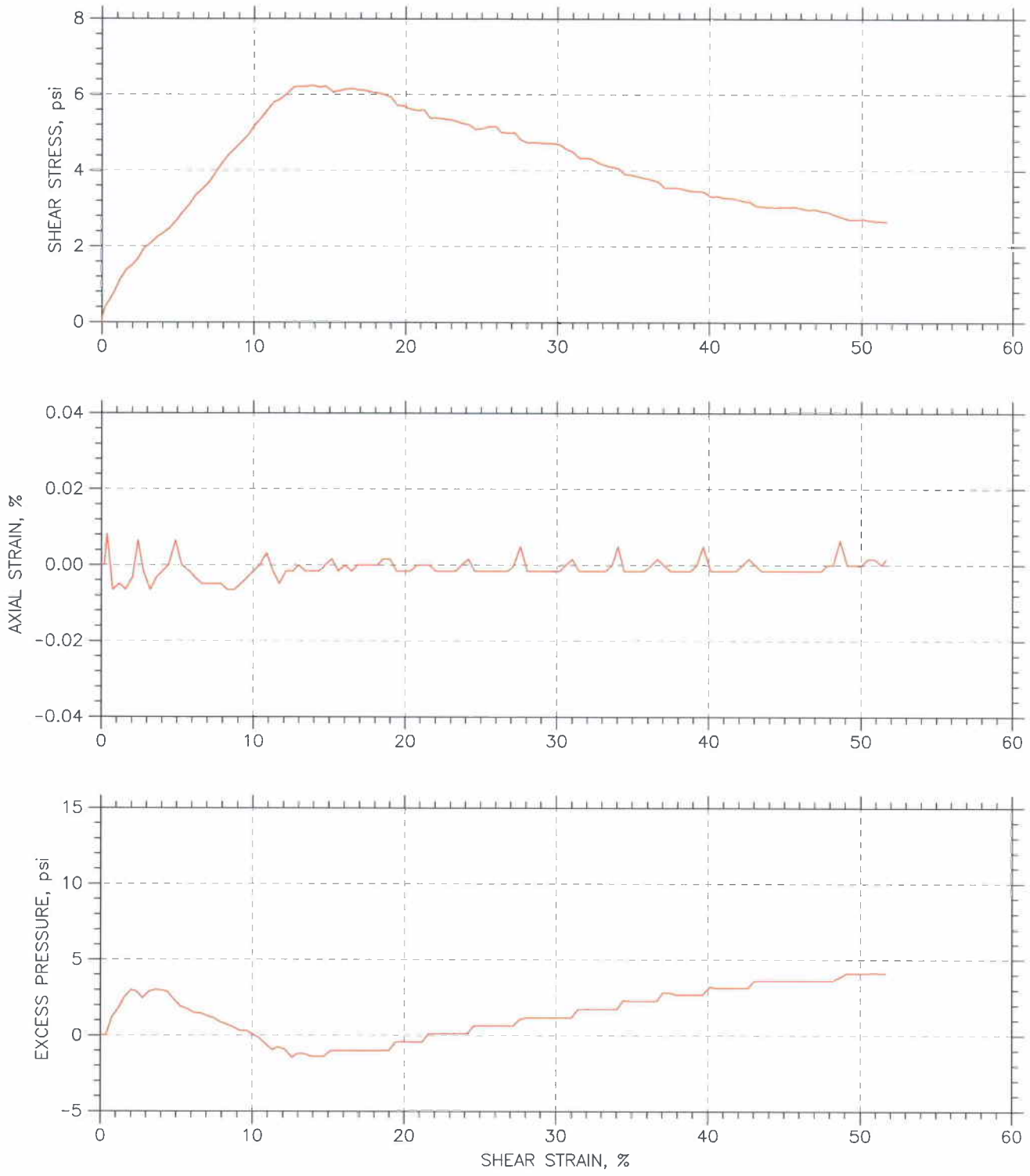
Sample Preparation: Extruded from tube, cut, trimmed and placed into apparatus at as-received density and moisture content.

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5
Test No.	DSS-3				
Initial Moisture Content, %	37.4				
Initial Dry Density, pcf	73.8				
Nominal Rate of Shear Strain, %/min	0.0008				
Vertical Consolidation Stress, psi	7				
Final Moisture Content, %	38.2				
Measured Peak Shear Stress, psi	6.25				
Shear Strain at Peak Shear Stress, %	13.8				
Membrane Correction, psi	0.27				
Corrected Peak Shear Stress, psi	5.98				
S / σ'_{vc}	0.85				

Comments: Tested By: md Checked By: jdt

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

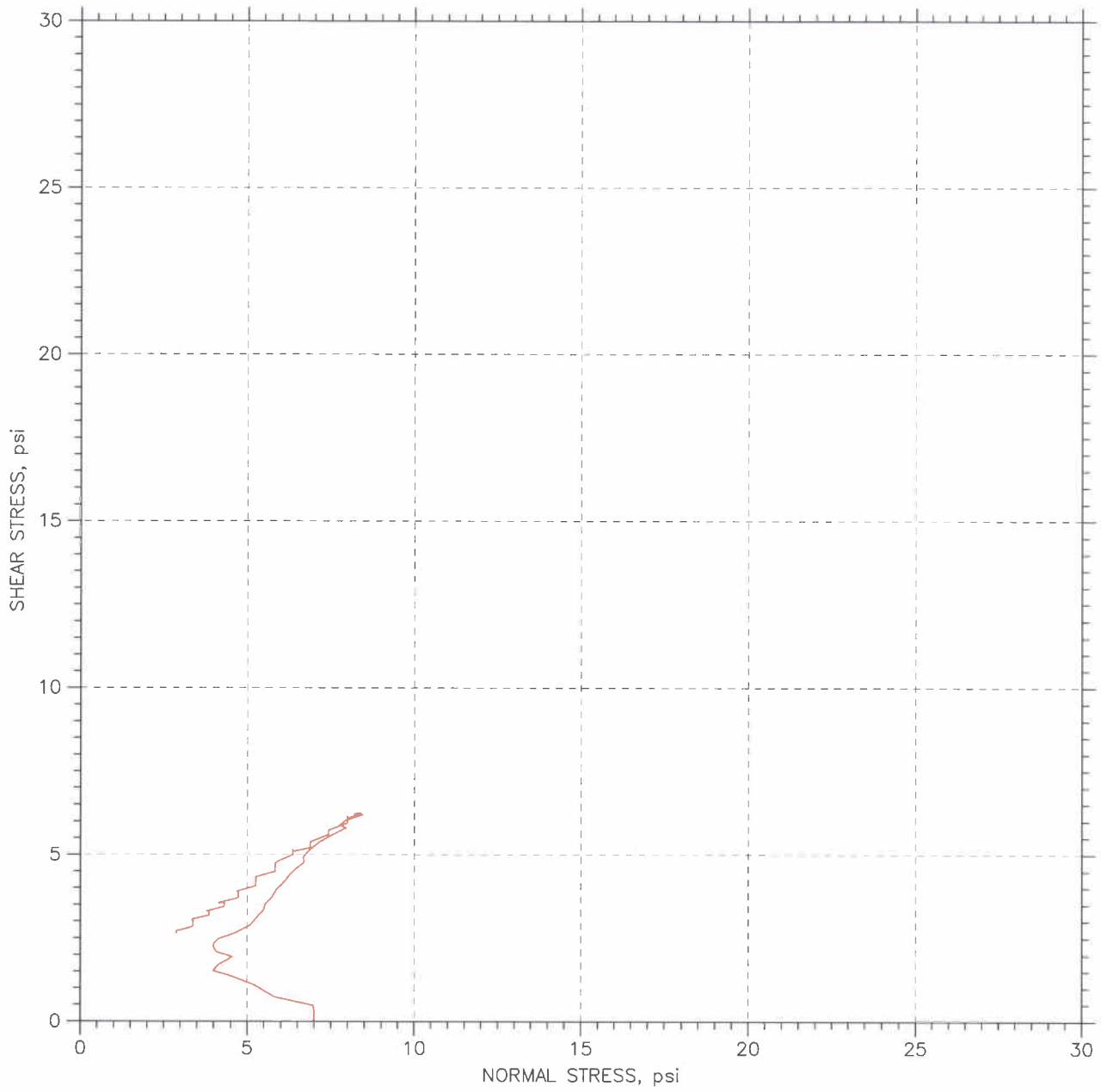
DIRECT SIMPLE SHEAR TEST



Project: Bull Run Fossil Plant	Location: ---	Project No.: GTX-9421
Boring No.: DSS-3	Tested By: md	Checked By: jdt
Sample No.: STN-49P	Test Date: 10/25/09	Depth: 25.4-26.0
Test No.: DSS-3	Sample Type: core	Elevation: ST-13
Description: Moist, gray silt with sand		
Remarks: System L - 1.0 membrane		
File: \\Geocompdb1\projects\GTX9421\9421-DSS-3n.dat		

Thu, 29-OCT-2009 15:16:59

DIRECT SIMPLE SHEAR TEST



Project: Bull Run Fossil Plant	Location: ---	Project No.: GTX-9421
Boring No.: DSS-3	Tested By: md	Checked By: jdt
Sample No.: STN-49P	Test Date: 10/25/09	Depth: 25.4-26.0
Test No.: DSS-3	Sample Type: core	Elevation: ST-13
Description: Moist, gray silt with sand		
Remarks: System L - 1.0 membrane		
File: \\Geocompdb1\projects\GTX9421\9421-DSS-3n.dat		

Thu, 29-OCT-2009 15:16:59

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Consolidated Undrained Direct Simple Shear Test of Cohesive Soil by ASTM D 6528

Client:	Stantec	GTX#:	9421
Project Name:	Bull Run Fossil Plant	Test Date:	10/26/09
Project Location:	---		

Boring ID:	STN-48P
Sample ID:	DSS-4 (ST-2)
Depth, ft:	27.0-27.8 ft

Visual Description: Moist, gray silt

Test Equipment: Top and bottom box (circular) = 2.62 in diameter. Load cells and LVDT's connected to data acquisition system for shear force, normal load, horizontal and vertical displacement; surface area = 5.39 in^2, soil height = 1 inch

Test Condition: inundated

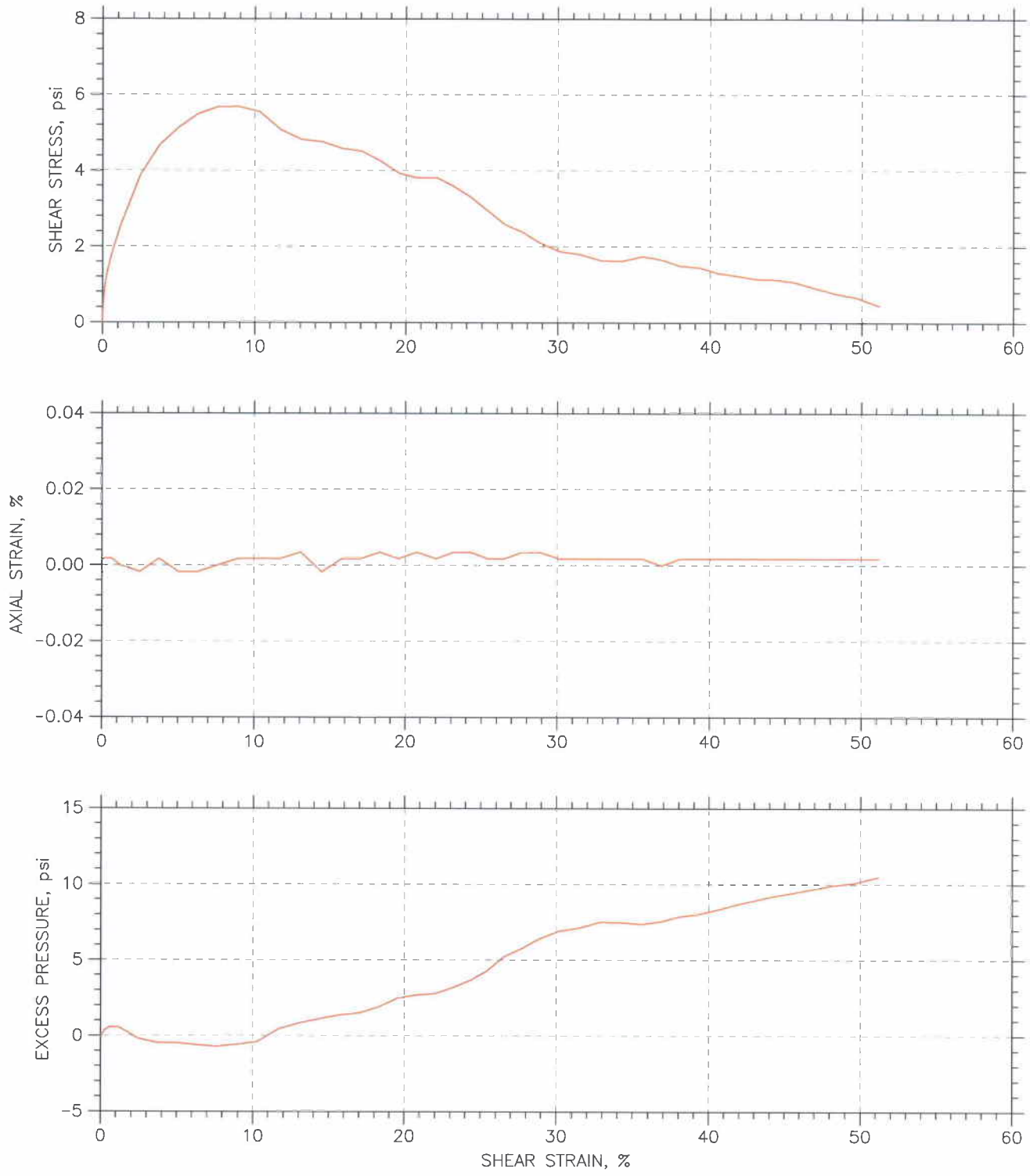
Sample Preparation: Extruded from tube, cut, trimmed and placed into apparatus at as-received density and moisture content.

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5
Test No.	DSS-4				
Initial Moisture Content, %	25.2				
Initial Dry Density, pcf	89.3				
Nominal Rate of Shear Strain, %/min	0.0008				
Vertical Consolidation Stress, psi	13				
Final Moisture Content, %	30.0				
Measured Peak Shear Stress, psi	5.68				
Shear Strain at Peak Shear Stress, %	8.9				
Membrane Correction, psi	0.22				
Corrected Peak Shear Stress, psi	5.46				
S / σ'_{vc}	0.42				

Comments: Tested By: md Checked By: jdt

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

DIRECT SIMPLE SHEAR TEST



Project: Bull Run Fossil Plant	Location: ---	Project No.: GTX-9421
Boring No.: DSS-4	Tested By: md	Checked By: jdt
Sample No.: STN-48P	Test Date: 10/26/09	Depth: 27.0-27.8
Test No.: DSS-4	Sample Type: core	Elevation: ST-2
Description: Moist, gray silt		
Remarks: System J - 1.0 membrane		
File: \\Geocompdb1\projects\GTX9421\9421-DSS-4n.dat		

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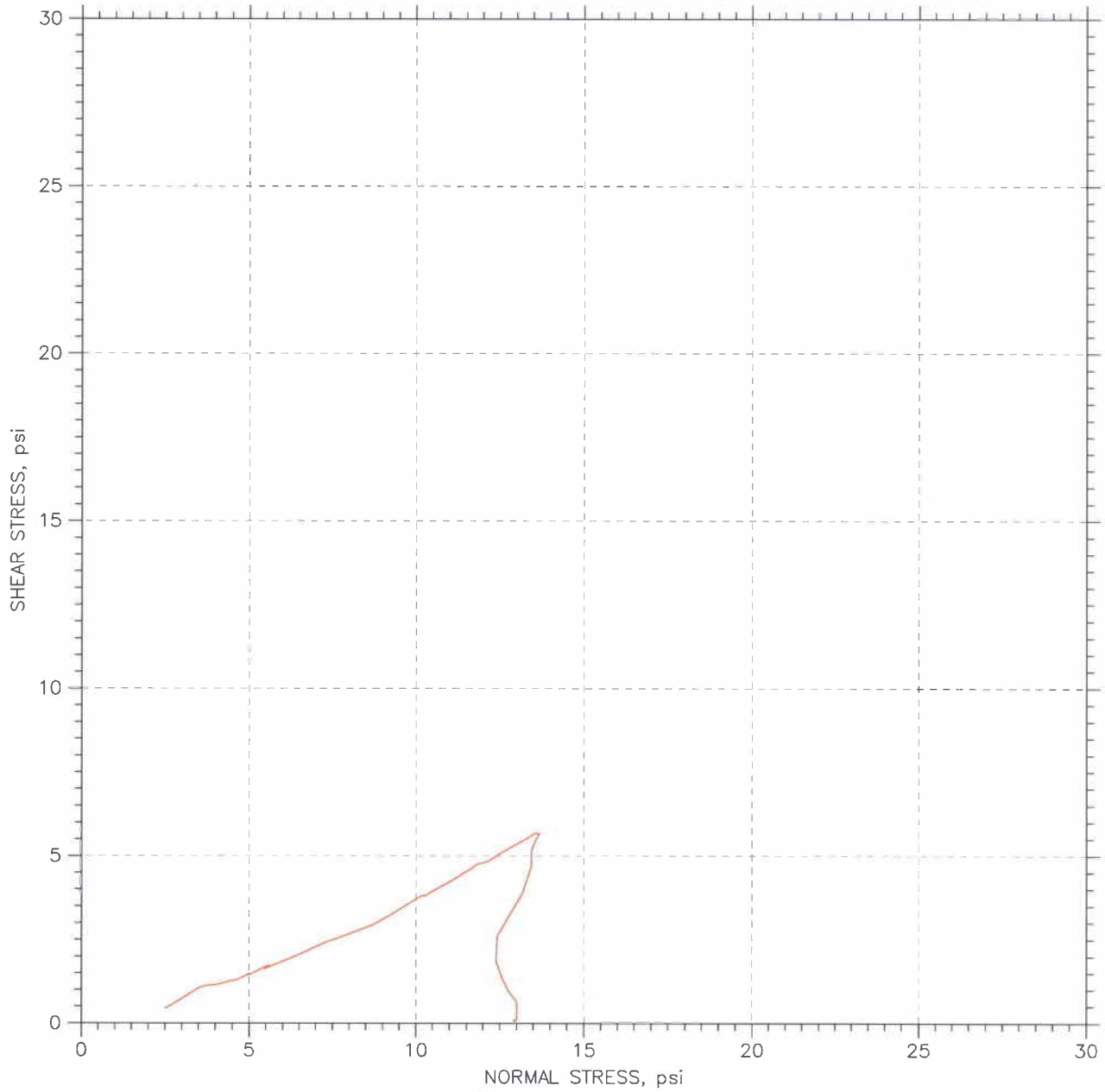
DIRECT SIMPLE SHEAR TEST



Project: Bull Run Fossil Plant	Location: ---	Project No.: GTX-9421
Boring No.: DSS-4	Tested By: md	Checked By: jdt
Sample No.: STN-48P	Test Date: 10/26/09	Depth: 27.0-27.8
Test No.: DSS-4	Sample Type: core	Elevation: ST-2
Description: Moist, gray silt		
Remarks: System J - 1.0 membrane		
File: \\Geocompdb1\projects\GTX9421\9421-DSS-4n.dat		

Thu, 29-OCT-2009 13:52:29

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Consolidated Undrained Direct Simple Shear Test of Cohesive Soil by ASTM D 6528

Client:	Stantec	GTX#:	9421
Project Name:	Bull Run Fossil Plant	Test Date:	10/27/09
Project Location:	---		

Boring ID:	STN-48P
Sample ID:	DSS-5 (ST-5)
Depth, ft:	34.3-35.0 ft

Visual Description: Dry, light and dark gray sand

Test Equipment: Top and bottom box (circular) = 2.62 in diameter. Load cells and LVDT's connected to data acquisition system for shear force, normal load, horizontal and vertical displacement; surface area = 5.39 in^2, soil height = 1 inch

Test Condition: inundated

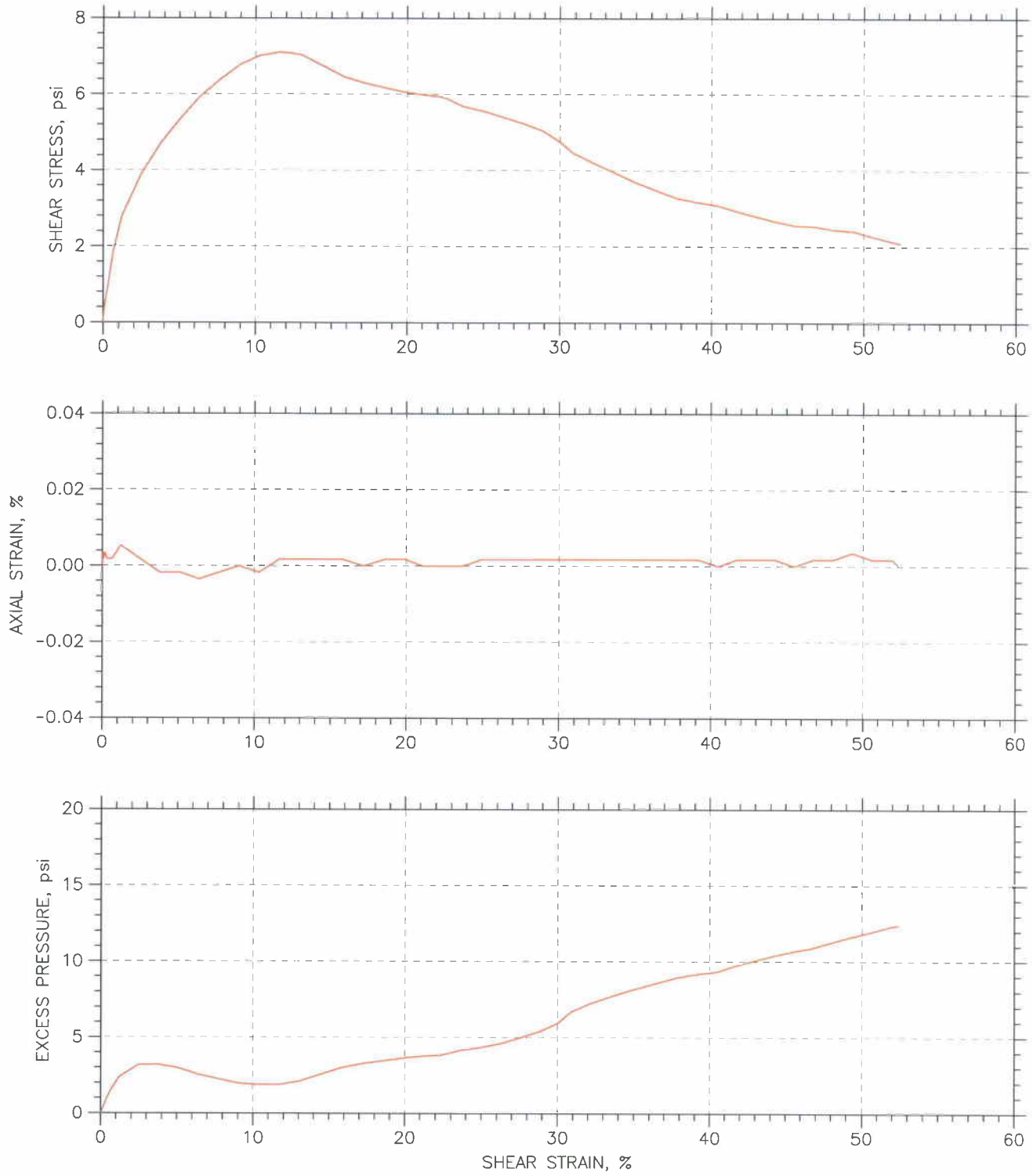
Sample Preparation: Extruded from tube, cut, trimmed and placed into apparatus at as-received density and moisture content.

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5
Test No.	DSS-5				
Initial Moisture Content, %	65.8				
Initial Dry Density, pcf	52.2				
Nominal Rate of Shear Strain, %/min	0.0008				
Vertical Consolidation Stress, psi	15				
Final Moisture Content, %	73.3				
Measured Peak Shear Stress, psi	7.11				
Shear Strain at Peak Shear Stress, %	11.63				
Membrane Correction, psi	0.26				
Corrected Peak Shear Stress, psi	6.85				
S / σ'_{vc}	0.46				

Comments: Tested By: md Checked By: jdt

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

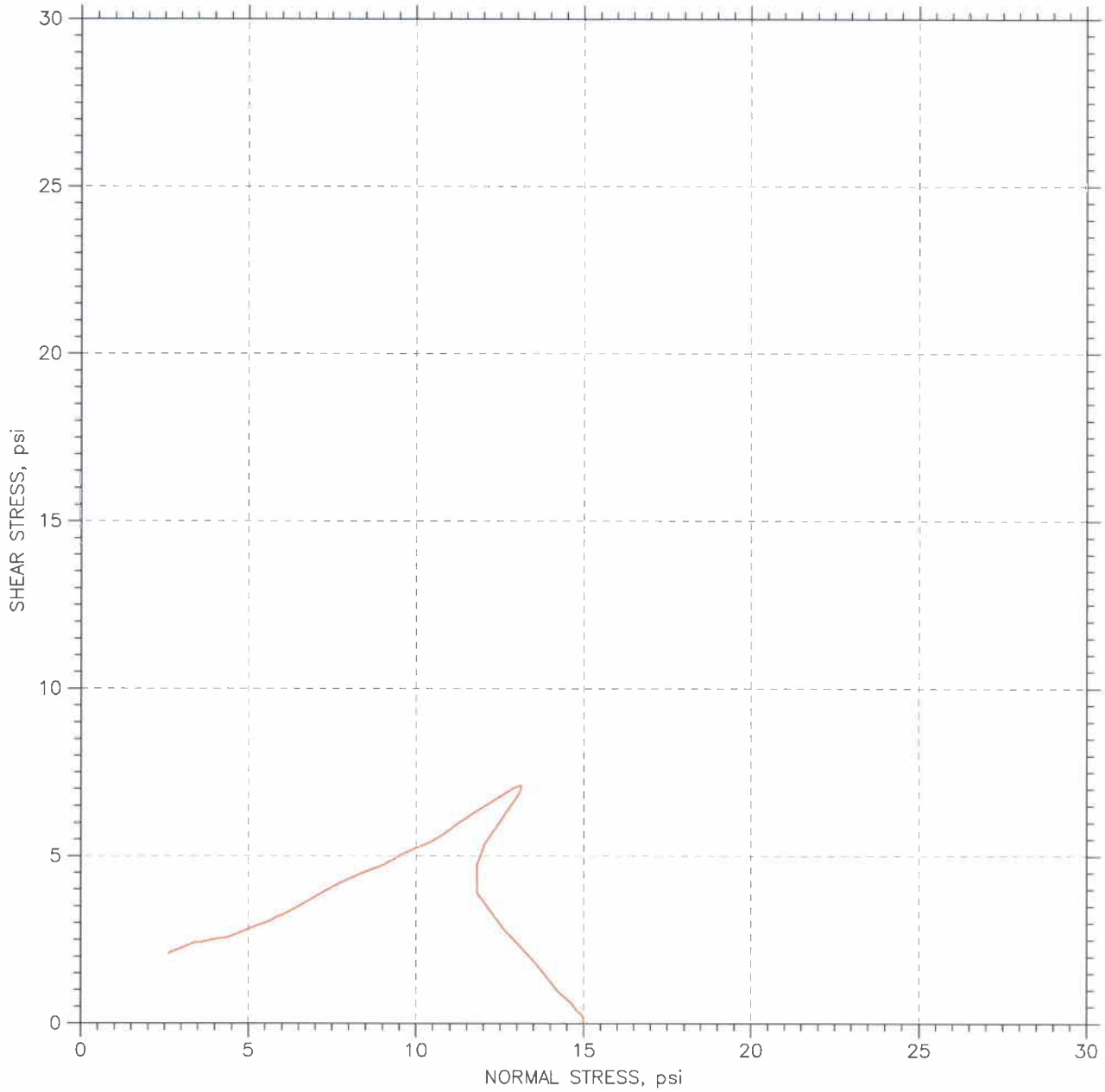
DIRECT SIMPLE SHEAR TEST



Project: Bull Run Fossil Plant	Location: ---	Project No.: GTX-9421
Boring No.: DSS-5	Tested By: md	Checked By: jdt
Sample No.: STN-48P	Test Date: 10/27/09	Depth: 34.3-35.0
Test No.: DSS-5	Sample Type: core	Elevation: ST-5
Description: Dry, light and dark gray sand		
Remarks: System J - 1.0 membrane		
File: \\Geocompdb1\projects\GTX9421\9421-DSS-5n.dat		

Thu, 29-OCT-2009 14:54:11

DIRECT SIMPLE SHEAR TEST



Project: Bull Run Fossil Plant	Location: ---	Project No.: GTX-9421
Boring No.: DSS-5	Tested By: md	Checked By: jdt
Sample No.: STN-48P	Test Date: 10/27/09	Depth: 34.3-35.0
Test No.: DSS-5	Sample Type: core	Elevation: ST-5
Description: Dry, light and dark gray sand		
Remarks: System J - 1.0 membrane		
File: \\Geocompdb1\projects\GTX9421\9421-DSS-5n.dat		

Thu, 29-OCT-2009 14:54:12

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Consolidated Undrained Direct Simple Shear Test of Cohesive Soil by ASTM D 6528

Client:	Stantec	GTX#:	9421
Project Name:	Bull Run Fossil Plant	Test Date:	10/27/09
Project Location:	---		

Boring ID:	STN-48P
Sample ID:	DSS-6 (ST-8)
Depth, ft:	40.4-41.0 ft

Visual Description: Moist, brown and gray clay and silt

Test Equipment: Top and bottom box (circular) = 2.62 in diameter. Load cells and LVDT's connected to data acquisition system for shear force, normal load, horizontal and vertical displacement; surface area = 5.39 in^2, soil height = 1 inch

Test Condition: inundated

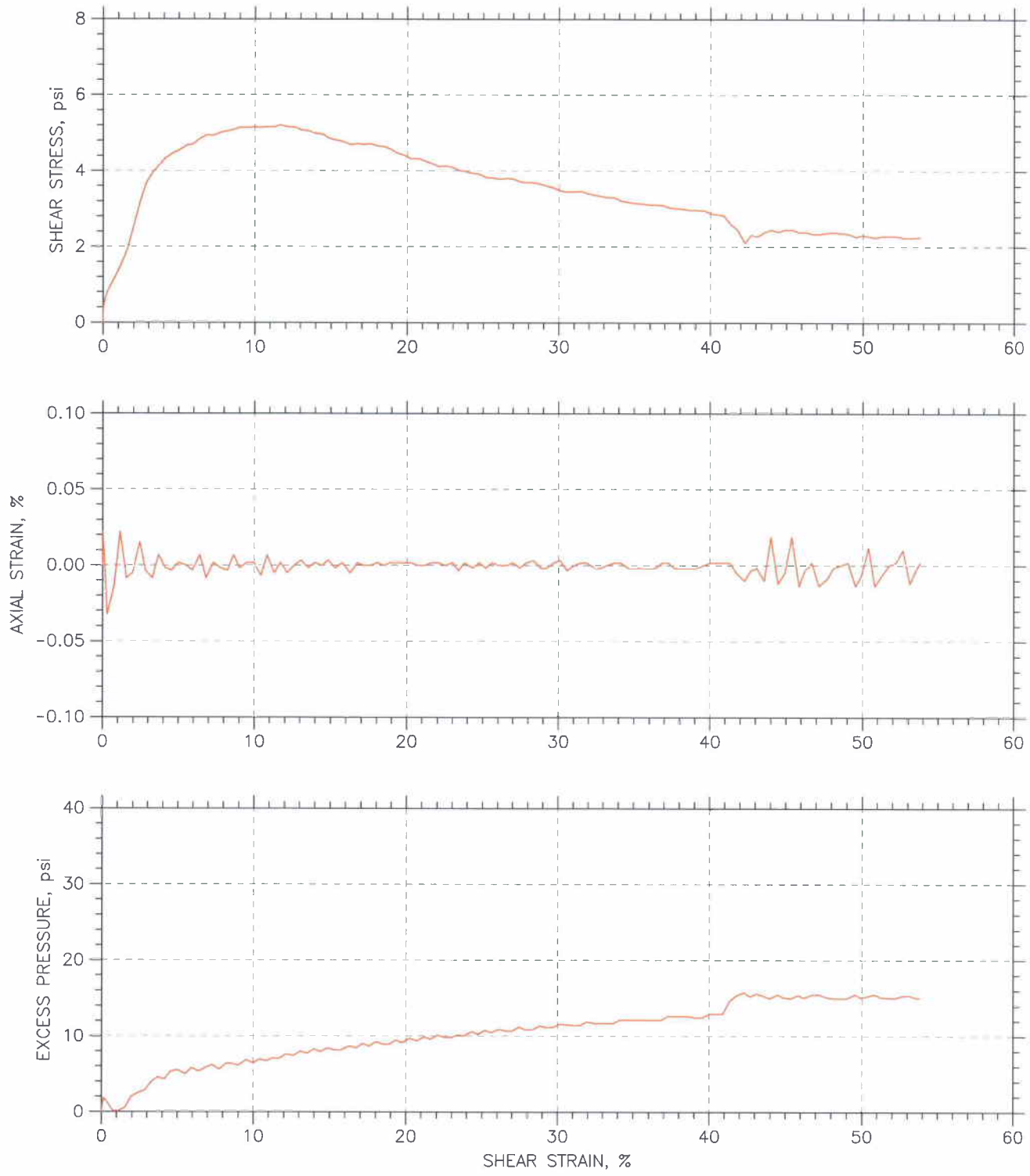
Sample Preparation: Extruded from tube, cut, trimmed and placed into apparatus at as-received density and moisture content.

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5
Test No.	DSS-6				
Initial Moisture Content, %	28.1				
Initial Dry Density, pcf	92.6				
Nominal Rate of Shear Strain, %/min	0.0008				
Vertical Consolidation Stress, psi	17				
Final Moisture Content, %	29.8				
Measured Peak Shear Stress, psi	5.2				
Shear Strain at Peak Shear Stress, %	11.73				
Membrane Correction, psi	0.26				
Corrected Peak Shear Stress, psi	4.94				
S / σ'_{vc}	0.29				

Comments: Tested By: md Checked By: jdt

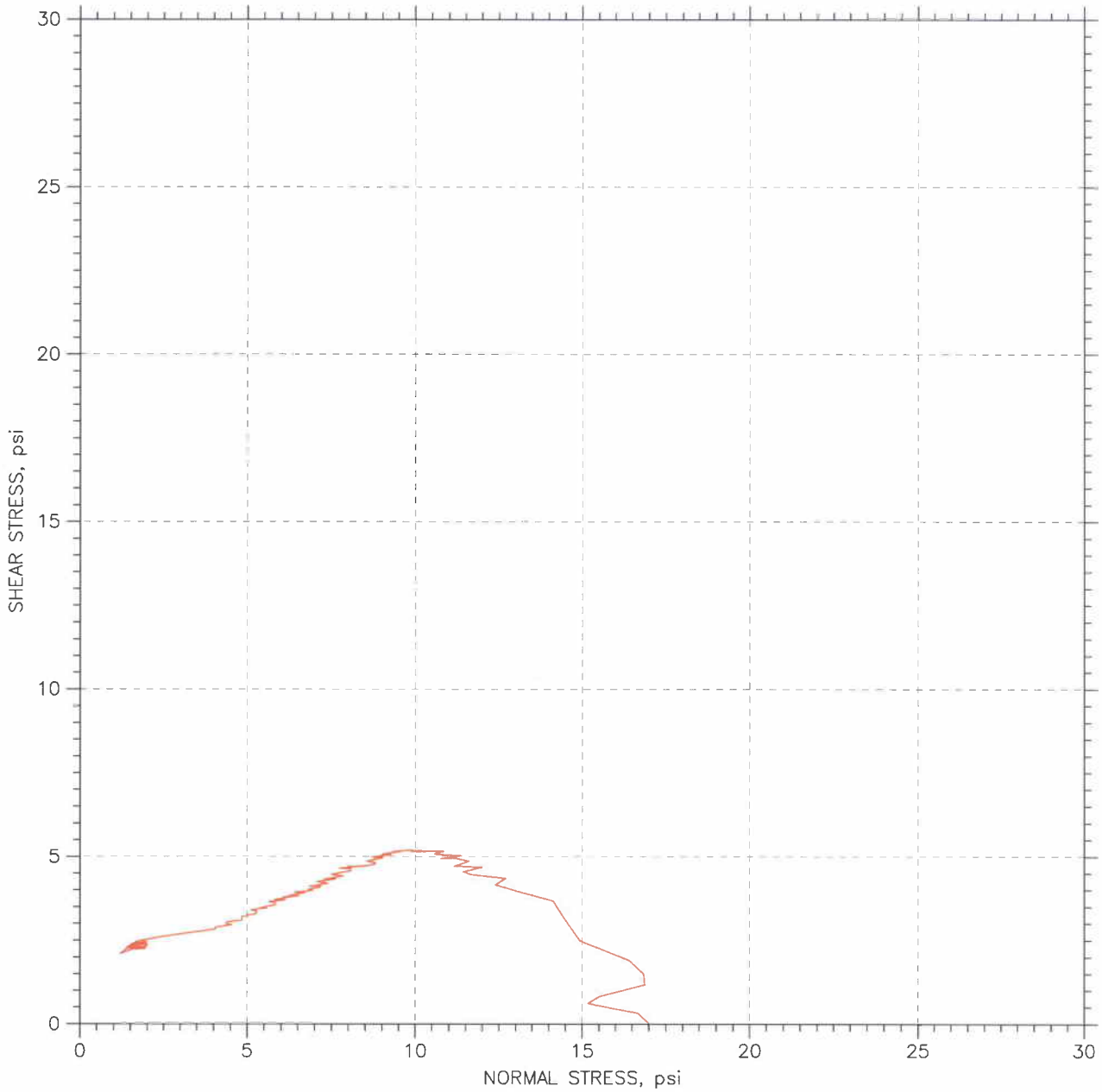
Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

DIRECT SIMPLE SHEAR TEST



Project: Bull Run Fossil Plant	Location: ---	Project No.: GTX-9421
Boring No.: DSS-6	Tested By: md	Checked By: jdt
Sample No.: STN-48P	Test Date: 10/27/09	Depth: 40.4-41
Test No.: DSS-6	Sample Type: core	Elevation: ST-8
Description: Moist, brown and gray clay and silt		
Remarks: System L - 1.0 membrane		
File: \\Geocompdb1\projects\GTX9421\9421-DSS-6n.dat		

DIRECT SIMPLE SHEAR TEST



Project: Bull Run Fossil Plant	Location: ---	Project No.: GTX-9421
Boring No.: DSS-6	Tested By: md	Checked By: jdt
Sample No.: STN-48P	Test Date: 10/27/09	Depth: 40.4-41
Test No.: DSS-6	Sample Type: core	Elevation: ST-8
Description: Moist, brown and gray clay and silt		
Remarks: System L - 1.0 membrane		
File: \\Geocompdb1\projects\GTX9421\9421-DSS-6n.dat		

Thu, 29-OCT-2009 15:22:55

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Consolidated Undrained Direct Simple Shear Test of Cohesive Soil by ASTM D 6528

Client:	Stantec	GTX#:	9421
Project Name:	Bull Run Fossil Plant	Test Date:	10/25/09
Project Location:	---		

Boring ID:	STN-46
Sample ID:	DSS-7 (ST-5)
Depth, ft:	8.1-8.9 ft

Visual Description: Moist, gray sandy silt

Test Equipment: Top and bottom box (circular) = 2.62 in diameter. Load cells and LVDT's connected to data acquisition system for shear force, normal load, horizontal and vertical displacement; surface area = 5.39 in^2, soil height = 1 inch

Test Condition: inundated

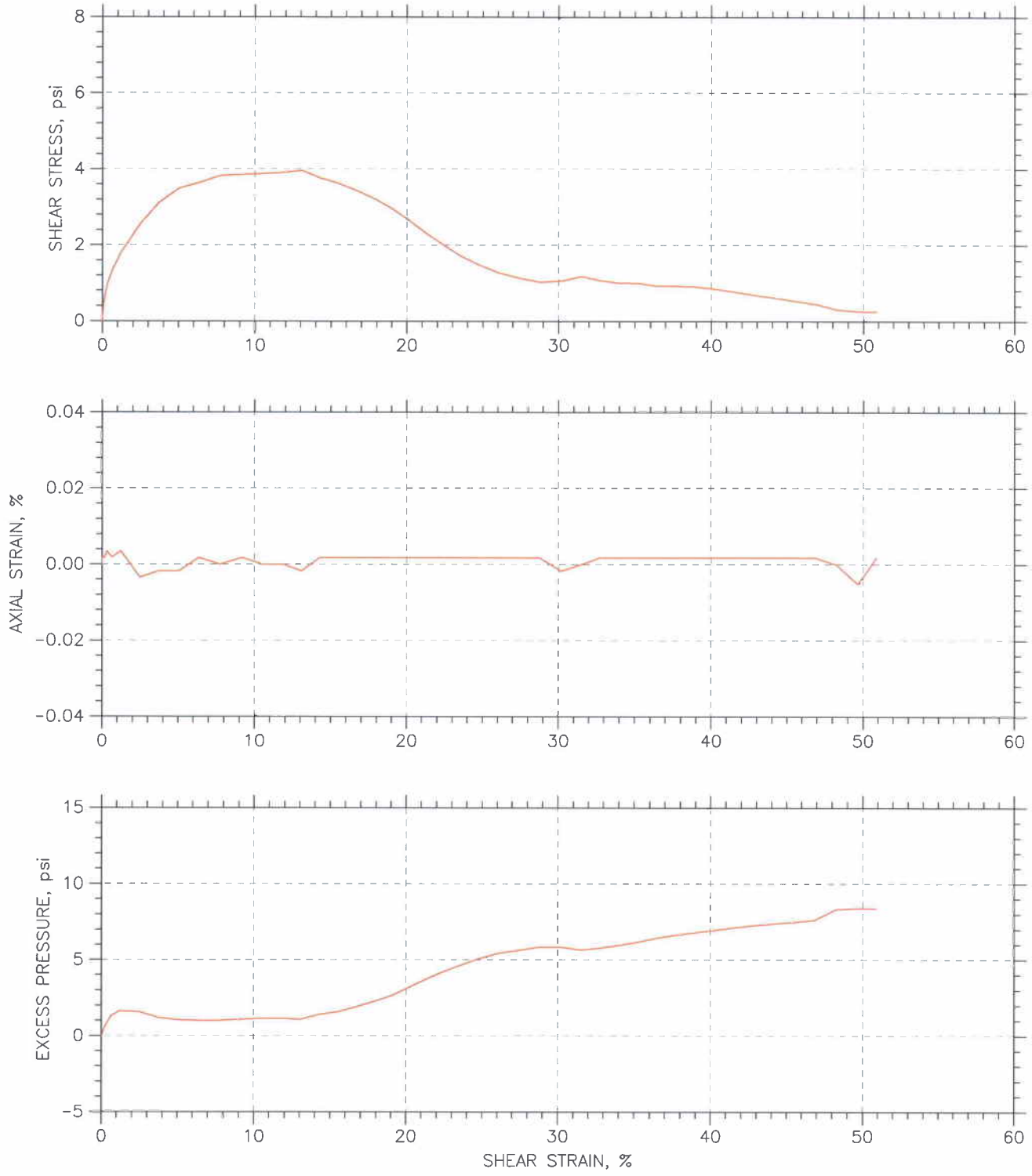
Sample Preparation: Extruded from tube, cut, trimmed and placed into apparatus at as-received density and moisture content.

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5
Test No.	DSS-7				
Initial Moisture Content, %	30.4				
Initial Dry Density, pcf	81.9				
Nominal Rate of Shear Strain, %/min	0.0008				
Vertical Consolidation Stress, psi	9				
Final Moisture Content, %	33.5				
Measured Peak Shear Stress, psi	3.96				
Shear Strain at Peak Shear Stress, %	13.08				
Membrane Correction, psi	0.27				
Corrected Peak Shear Stress, psi	3.69				
S / σ'_{vc}	0.41				

Comments: Tested By: md Checked By: jdt

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

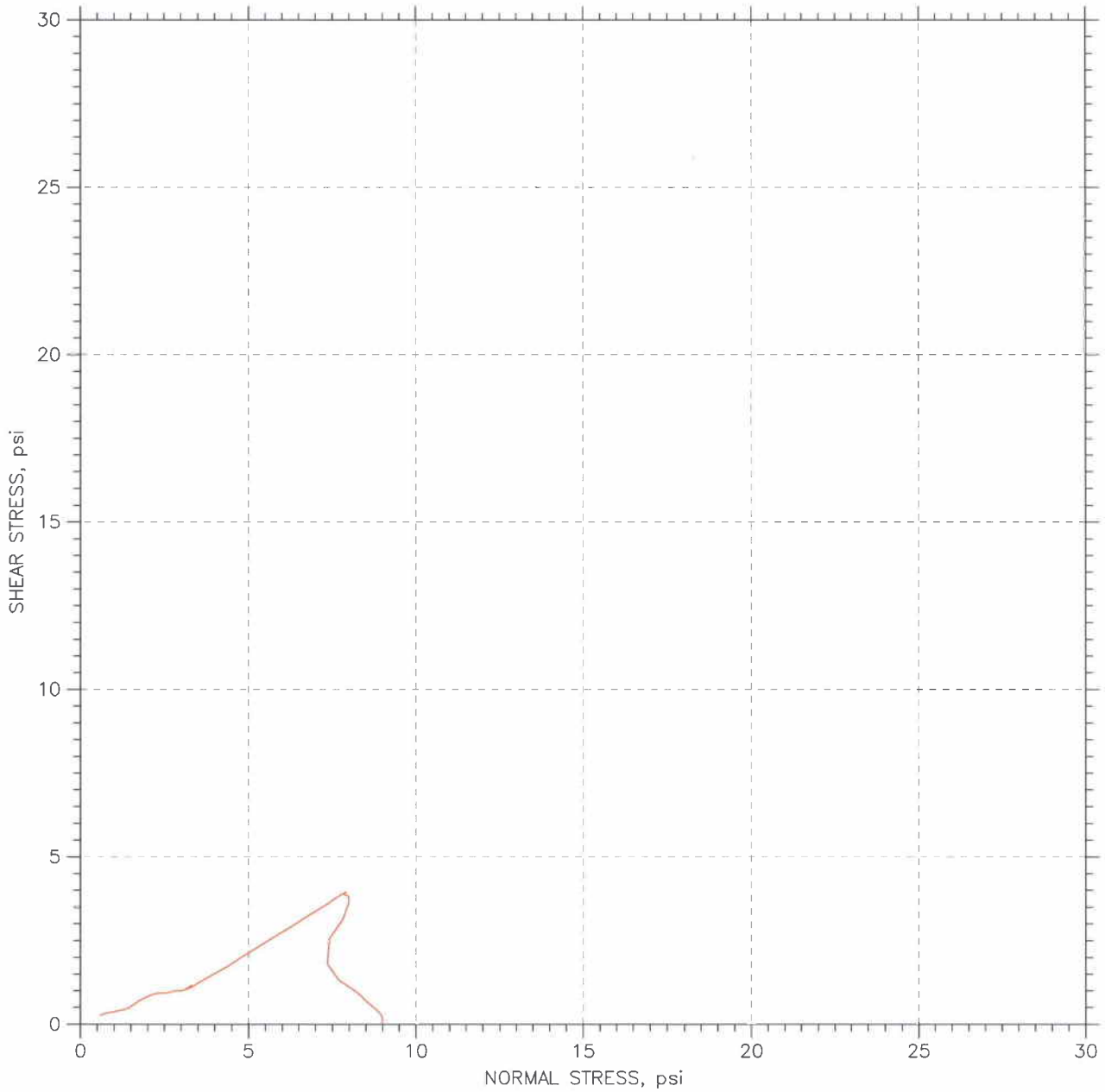
DIRECT SIMPLE SHEAR TEST



Project: Bull Run Fossil Plant	Location: ---	Project No.: GTX-9421
Boring No.: DSS-7	Tested By: md	Checked By: jdt
Sample No.: STN-46	Test Date: 10/25/09	Depth: 8.1-8.9
Test No.: DSS-7	Sample Type: core	Elevation: ST-5
Description: Moist, gray sandy silt		
Remarks: System J - 1.0 membrane		
File: \\Geocompdb1\projects\GTX9421\9421-DSS-7n.dat		

Thu, 29-OCT-2009 16:20:46

DIRECT SIMPLE SHEAR TEST



Project: Bull Run Fossil Plant	Location: ---	Project No.: GTX-9421
Boring No.: DSS-7	Tested By: md	Checked By: jdt
Sample No.: STN-46	Test Date: 10/25/09	Depth: 8.1-8.9
Test No.: DSS-7	Sample Type: core	Elevation: ST-5
Description: Moist, gray sandy silt		
Remarks: System J - 1.0 membrane		
File: \\Geocompdb1\projects\GTX9421\9421-DSS-7n.dat		

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Consolidated Undrained Direct Simple Shear Test of Cohesive Soil by ASTM D 6528

Client:	Stantec	GTX#:	9421
Project Name:	Bull Run Fossil Plant	Test Date:	11/10/09
Project Location:	---		

Boring ID:	STN-11
Sample ID:	DSS-8
Depth, ft:	4.6-5.1 ft

Visual Description: Moist, yellowish brown clay with sand and gravel

Test Equipment: Top and bottom box (circular) = 2.62 in diameter. Load cells and LVDT's connected to data acquisition system for shear force, normal load, horizontal and vertical displacement; surface area = 5.39 in^2, soil height = 1 inch

Test Condition: inundated

Sample Preparation: Extruded from tube, cut, trimmed and placed into apparatus at as-received density and moisture content.

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5
Test No.	DSS-8				
Initial Moisture Content, %	22.1				
Initial Dry Density, pcf	99.9				
Nominal Rate of Shear Strain, %/min	0.0008				
Vertical Consolidation Stress, psi	4				
Final Moisture Content, %	26.2				
Measured Peak Shear Stress, psi	1.77				
Shear Strain at Peak Shear Stress, %	8.81				
Membrane Correction, psi	0.22				
Corrected Peak Shear Stress, psi	1.55				
S / σ'_{vc}	0.39				

Comments: Tested By: md Checked By: jdt

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

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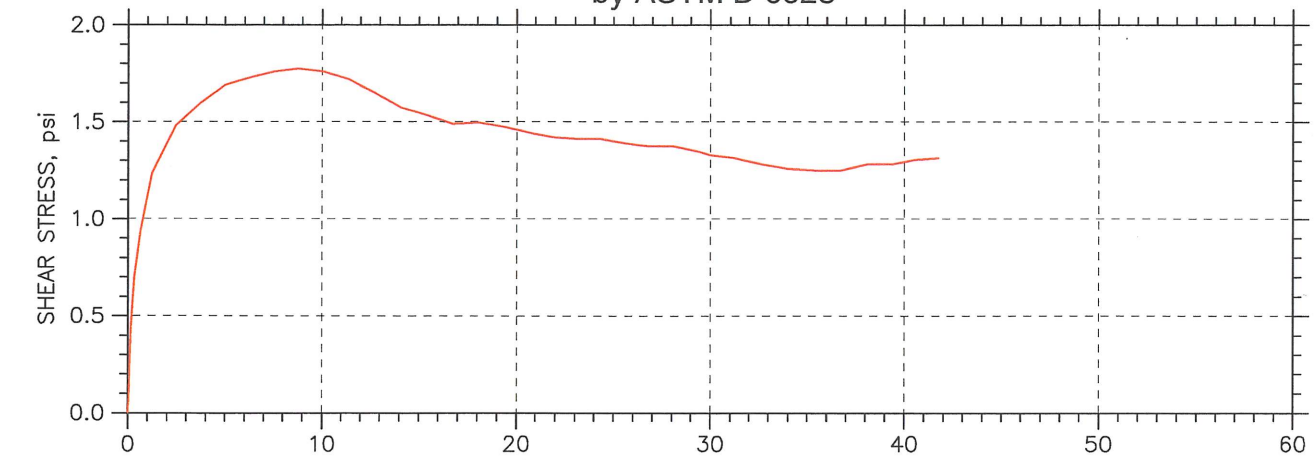
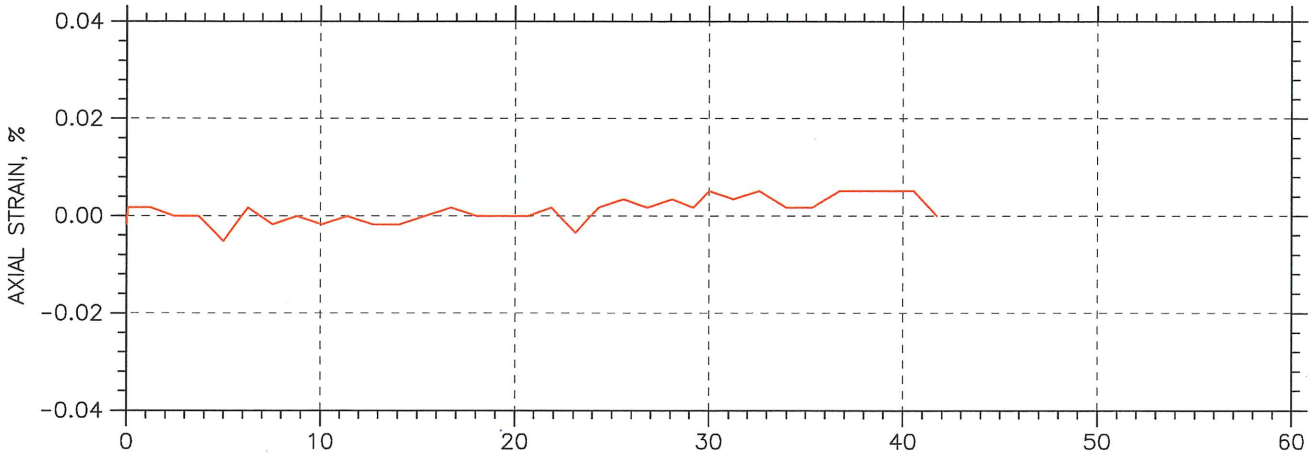
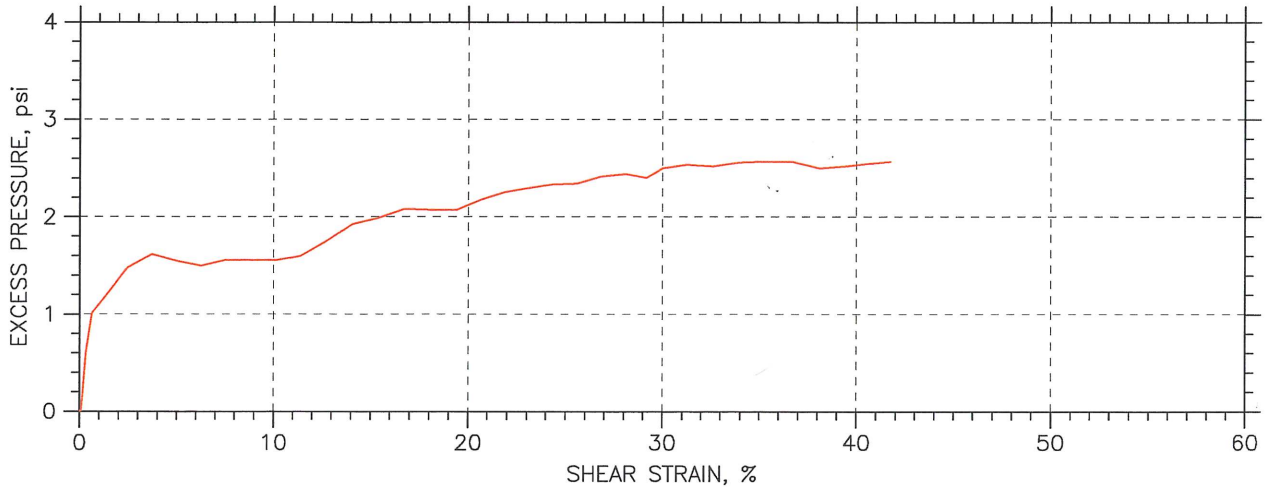
DIRECT SIMPLE SHEAR TEST
by ASTM D 6528







Project: Bull Run Fossil Plant	Location: ---	Project No.: GTX-9421
Boring No.: DSS-8	Tested By: md	Checked By: jdt
Sample No.: STN-11	Test Date: 11/10/09	Depth: 4.6-5.1
Test No.: DSS-8	Sample Type: core	Elevation: ---
Description: Moist, yellowish brown clay with sand and gravel		
Remarks: System J - 1.0 membrane		
File: \\Geocompdb1\projects\GTX9421\9421-DSS-8n.dat		

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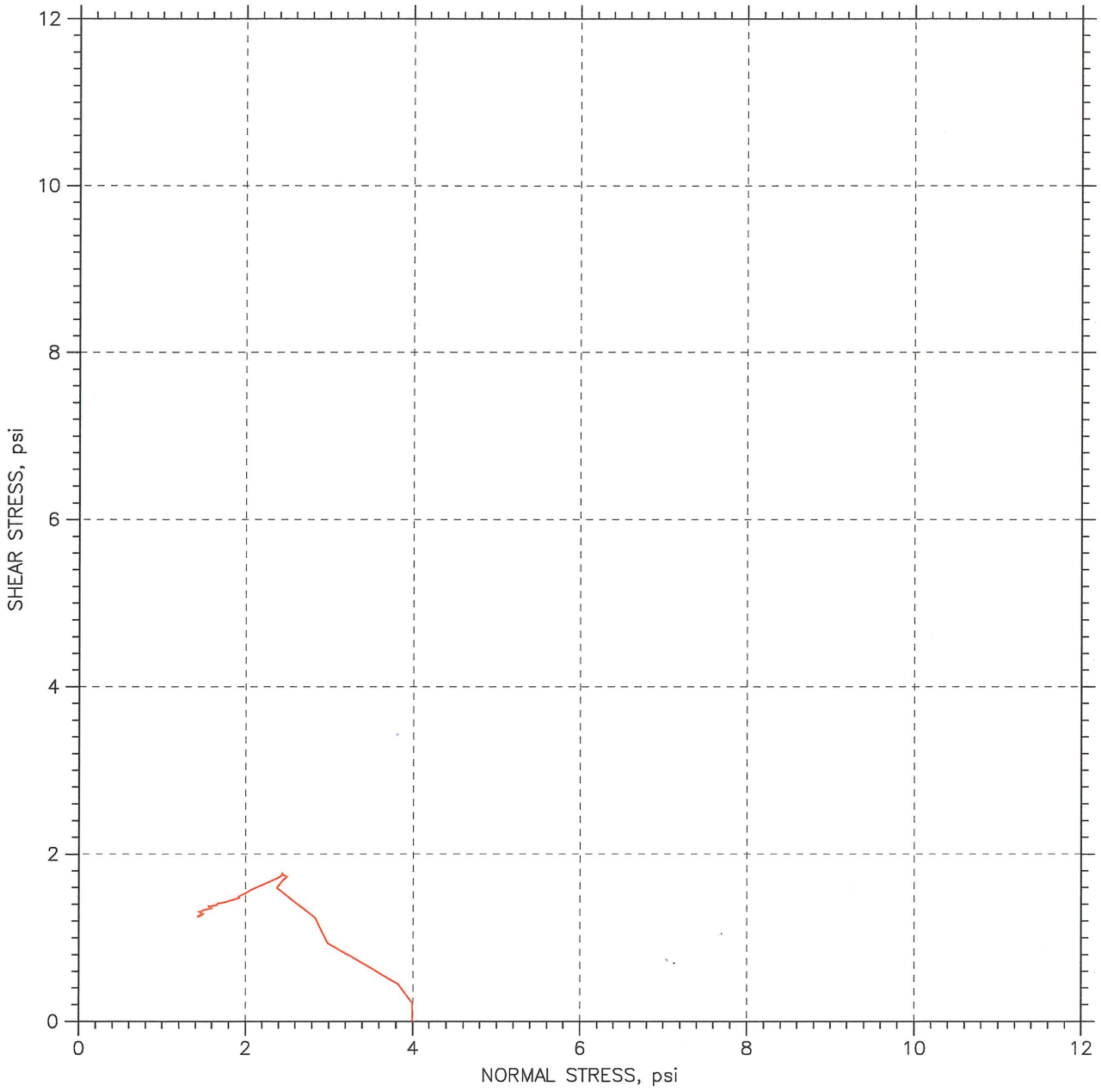
DIRECT SIMPLE SHEAR TEST
by ASTM D 6528



Project: Bull Run Fossil Plant	Location: ---	Project No.: GTX-9421
Boring No.: DSS-8	Tested By: md	Checked By: jdt
Sample No.: STN-11	Test Date: 11/10/09	Depth: 4.6-5.1
Test No.: DSS-8	Sample Type: core	Elevation: ---
Description: Moist, yellowish brown clay with sand and gravel		
Remarks: System J - 1.0 membrane		
File: \\Geocompdb1\projects\GTX9421\9421-DSS-8n.dat		

Fri, 13-NOV-2009 09:21:15

Appendix G

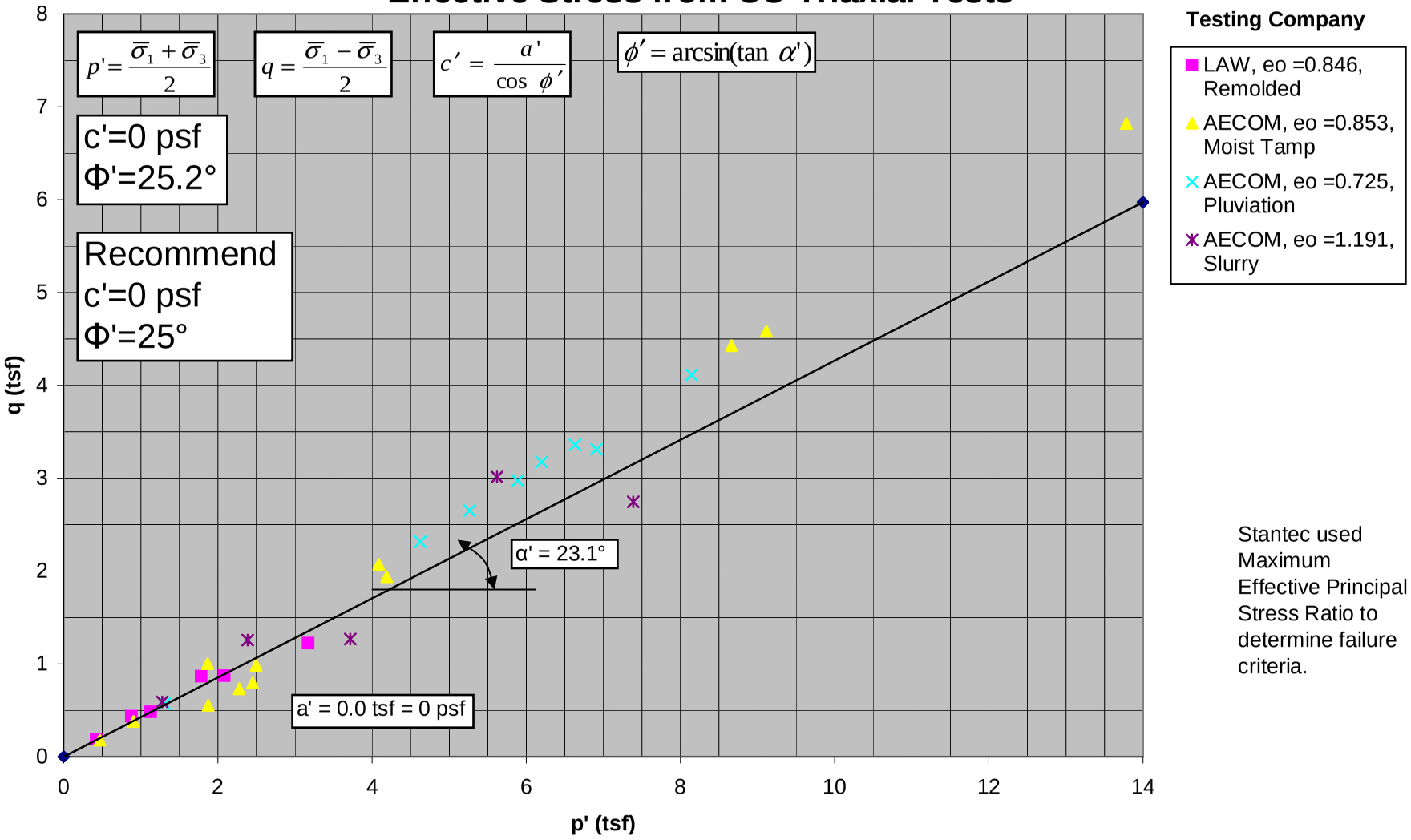
SPT Correlation Tables and Mohr Plots

- Attachment 1 – Effective Stress (Mohr) P-Q Plots
- Attachment 2 – SPT Correlation Tables

Attachment 1

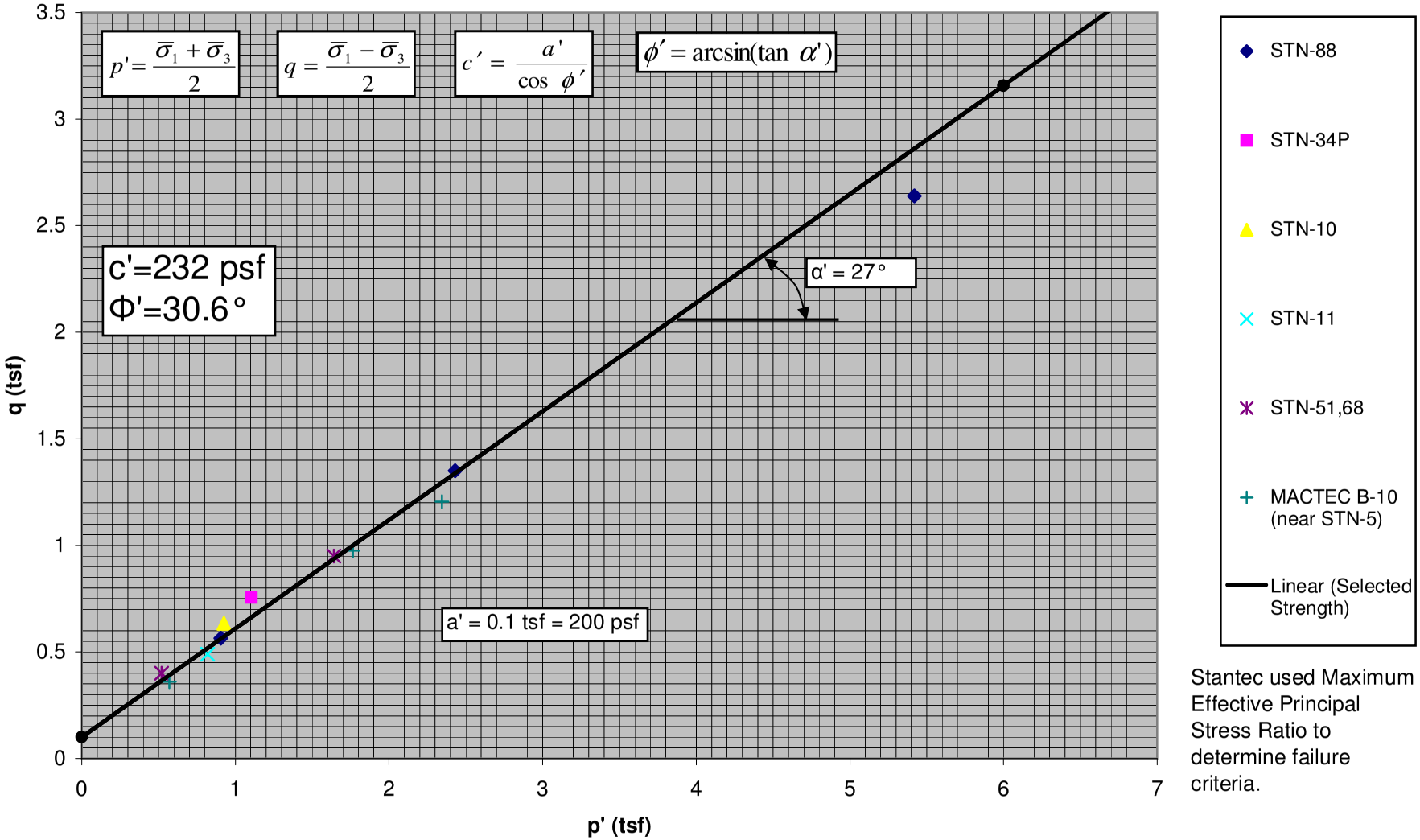
Effective Stress (Mohr)
P-Q Plots

KINGSTON FOSSIL PLANT
Hydraulically Placed Ash
Effective Stress from CU Triaxial Tests



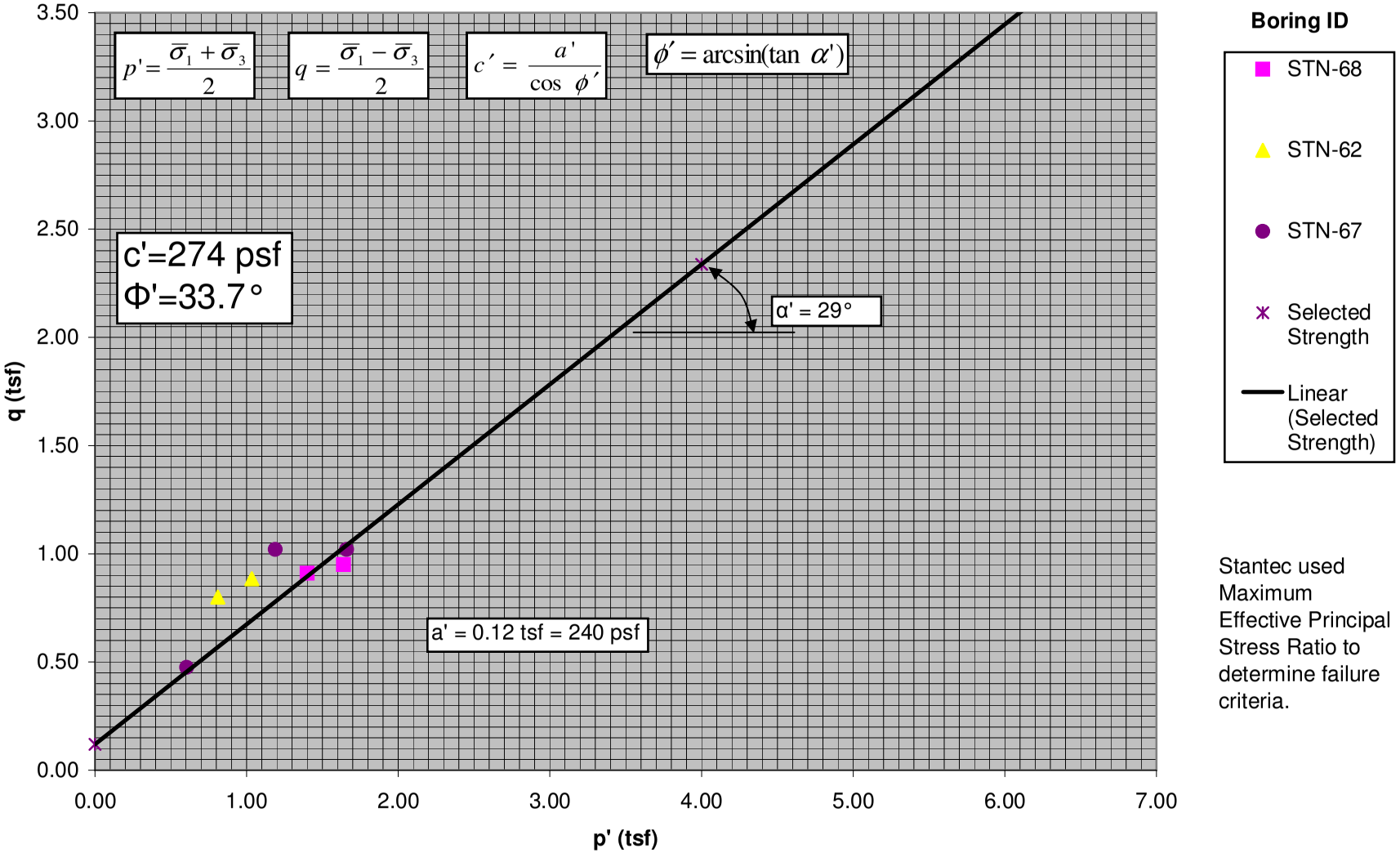
Stantec used Maximum Effective Principal Stress Ratio to determine failure criteria.

Lean Clay (Alluvium) (CL): 2/3 Rule
Effective Stress from CU Triaxial Tests



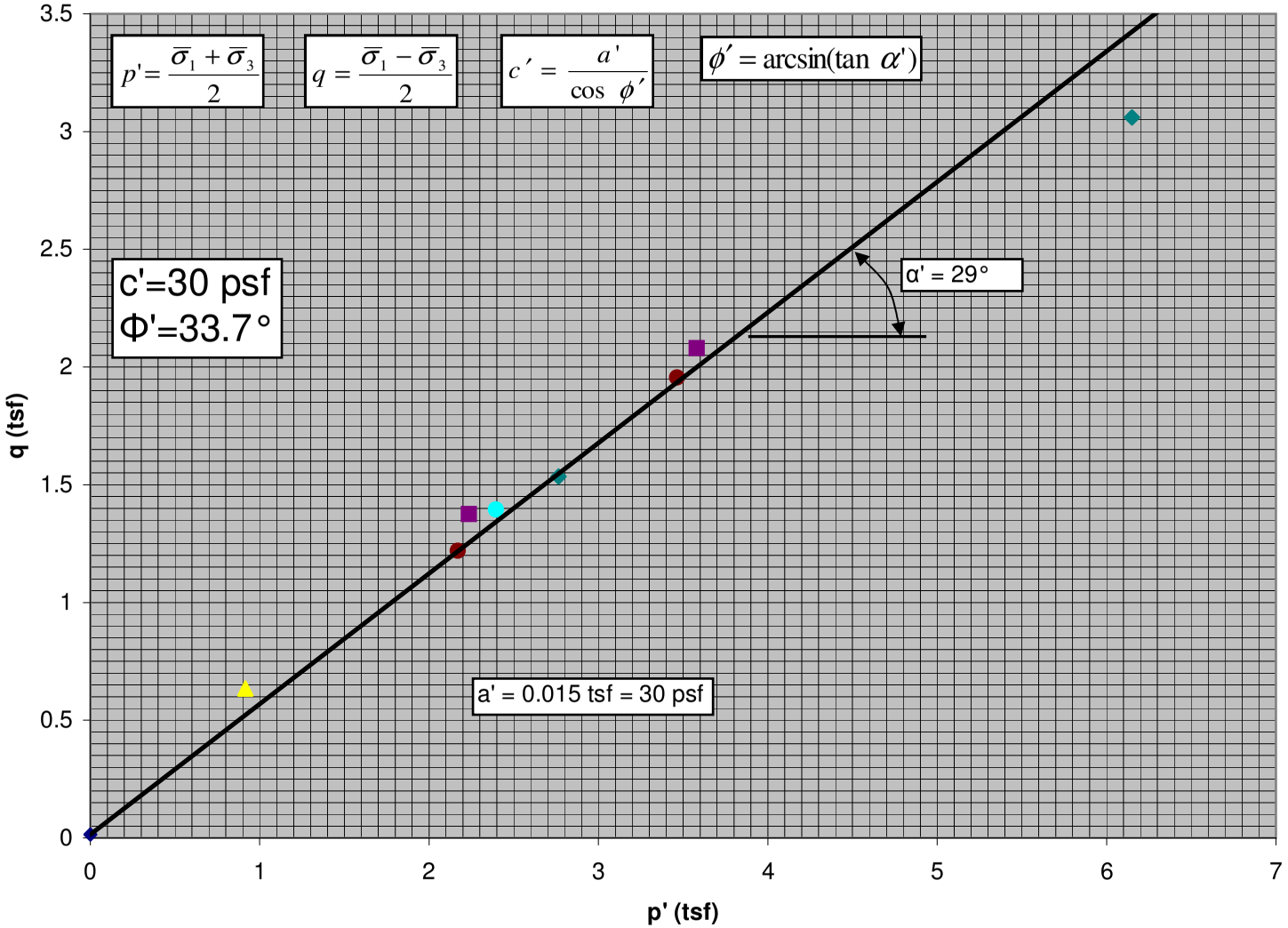
Stantec used Maximum Effective Principal Stress Ratio to determine failure criteria.

Lean Clay (Fill) (CL): 2/3 Rule
Effective Stress from CU Triaxial Tests



Stantec used Maximum Effective Principal Stress Ratio to determine failure criteria.

Sandy Lean Clay (Alluvium): 2/3 Rule
Effective Stress from CU Triaxial Tests

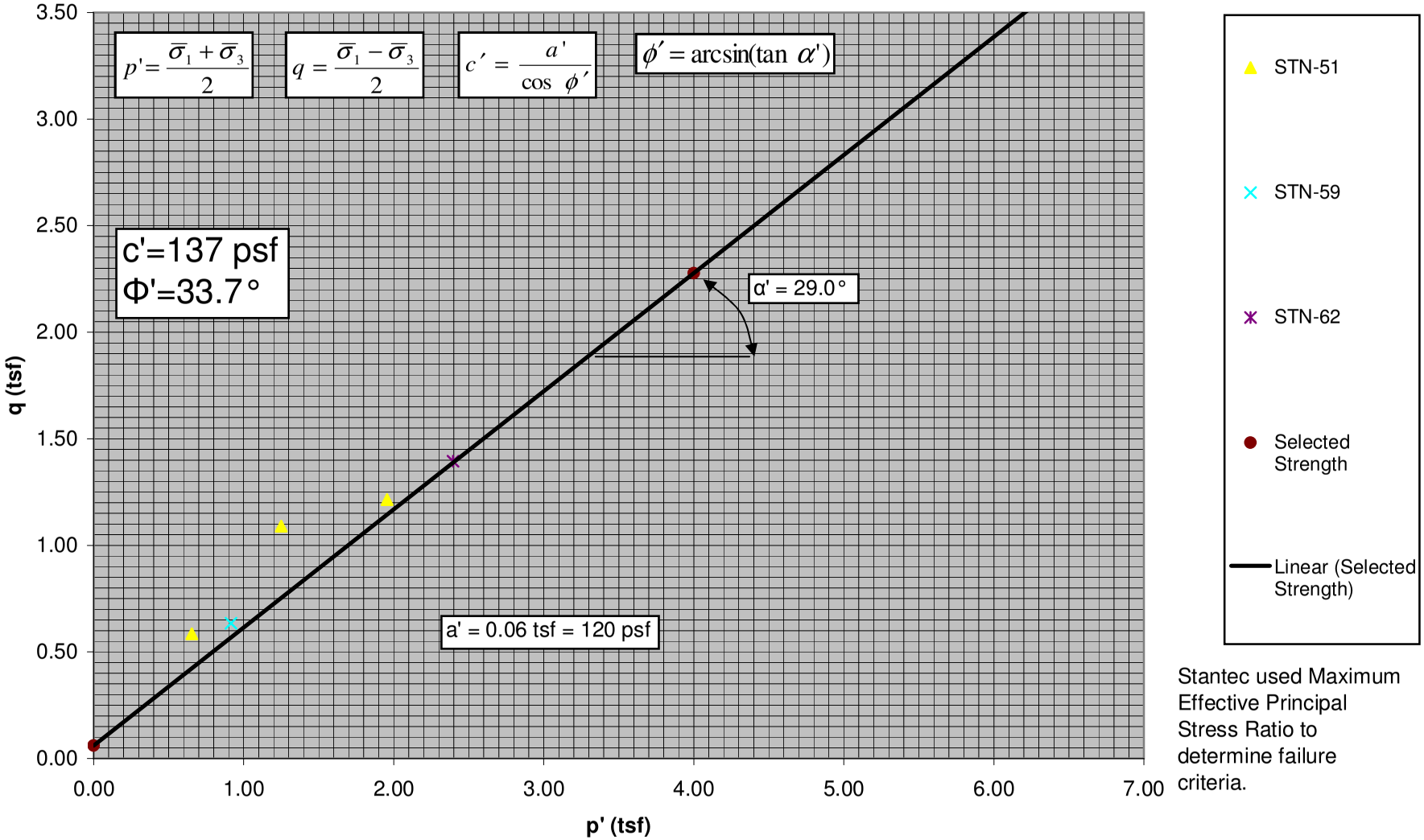


Boring ID

- Selected Strength
- STN-59
- STN-62
- STN-10
- STN-11
- STN-34P
- Linear (Selected Strength)

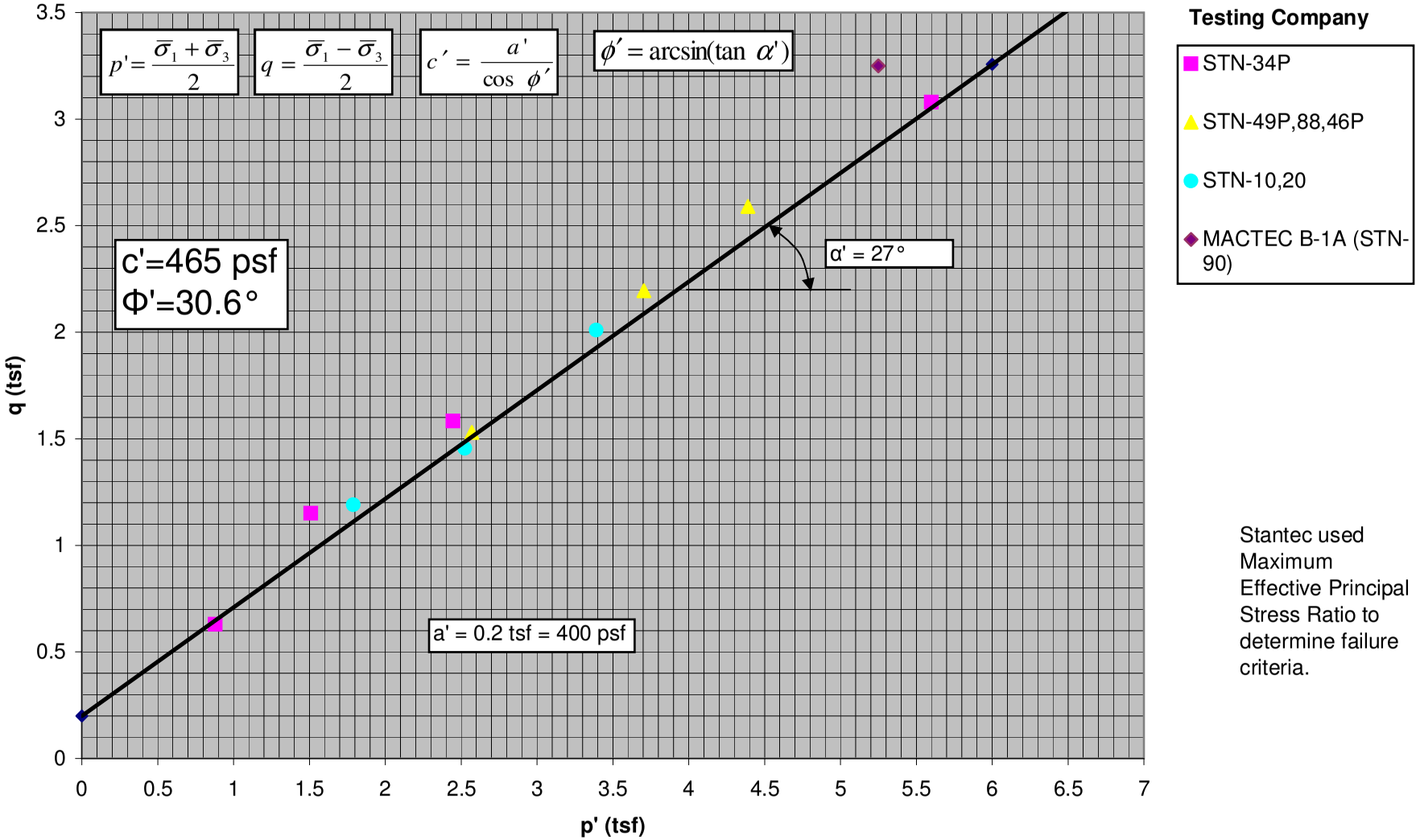
Stantec used Maximum Effective Principal Stress Ratio to determine failure criteria.

Sandy Lean Clay (Fill) (CL): 2/3 Rule
Effective Stress from CU Triaxial Tests



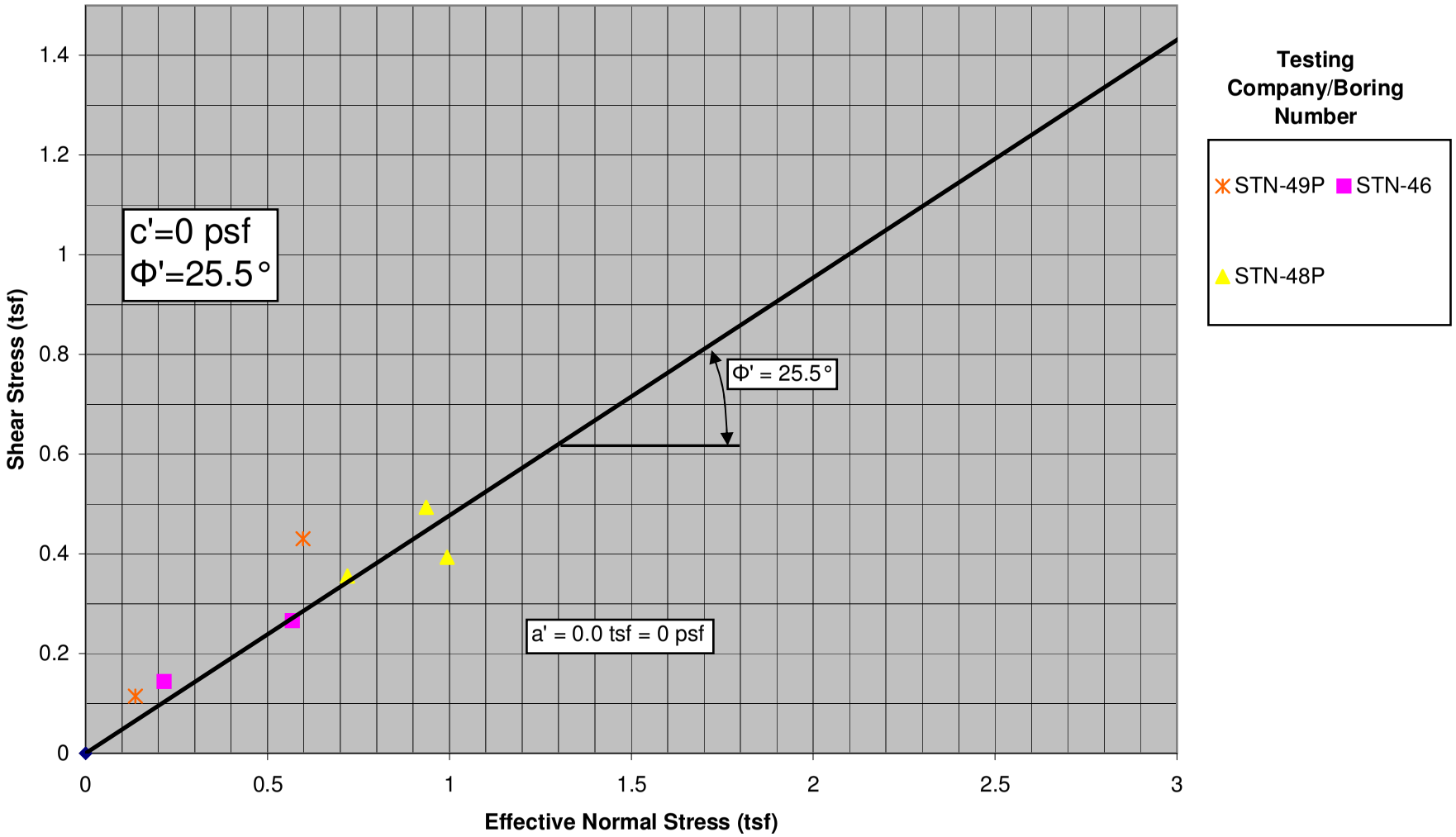
Stantec used Maximum Effective Principal Stress Ratio to determine failure criteria.

Sluiced Fly Ash: 2/3 Rule
Effective Stress from CU Triaxial Tests



Stantec used Maximum Effective Principal Stress Ratio to determine failure criteria.

Sluiced Fly Ash: 2/3 Rule
Effective Stress from Direct Simple Shear Tests



Attachment 2
SPT Correlation Tables

Project No: 172679015
File Name: V:\1714\active\171468118\environmental\Bull Run - 172679015\Engineering Analysis\Parameter Derivation\SPT Correction BRF Bottom Ash Stack.xls

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval		Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_t	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
				Input Required											
STN-1			water =	21.5											
0.0 - 1.5		0.75	107	0.04	16	21	1.00	21	68	SM	33.5	100	6.5	107	0.67
1.5 - 3.0		2.25	116	0.13	18	24	1.00	24	73	SM	34	101	15.3	116	0.65
3.0 - 4.5		3.75	117	0.22	30	40	1.00	40	89	SM	36	105	11.9	117	0.6
4.5 - 6.0		5.25	123	0.31	17	23	1.00	23	70	SM	34	101	22	123	0.65
6.0 - 7.5		6.75	140	0.41	36	48	1.00	48	95	SM	37	107	30.7	140	0.56
7.5 - 9.0		8.25	125	0.51	29	39	1.00	39	87	SM	36	105	19.3	125	0.6
9.0 - 10.5		9.75	126	0.60	29	39	1.00	39	87	SM	36	105	20.1	126	0.6
10.5 - 12.0		11.25	126	0.70	20	27	1.00	27	75	SM	34.5	102	23.3	126	0.63
12.0 - 13.5		12.75	122	0.79	22	29	1.00	29	79	SM	34.5	102	20	122	0.63
13.5 - 15.0		14.25	132	0.89	27	36	1.00	36	86	SM	36	105	25.3	132	0.6
15.0 - 16.5		15.75	122	0.98	27	36	1.00	36	86	SM	36	105	16.2	122	0.6
16.5 - 18.0		17.25	123	1.07	20	27	0.97	26	74	SM	34	101	21.5	123	0.65
18.0 - 19.5		18.75	128	1.17	12	16	0.93	15	56	SM	32.5	98	30.9	128	0.7
19.5 - 21.0		20.25	121	1.26	17	23	0.89	20	67	ML	32.5	91	33.3	121	0.83
21.0 - 22.5		21.75	118	1.30	8	11	0.88	9	44	ML	30	87	36.1	118	0.93
22.5 - 24.0		23.25	125	1.35	11	15	0.86	13	52	ML	31	88.5	41.5	125	0.89
24.0 - 25.5		24.75	122	1.39	4	5	0.85	5	27	ML	28.5	84	45.2	122	0.99
25.5 - 27.0		26.25	119	1.43	3	4	0.84	3	24	ML	28	83	43.4	119	1.01
27.0 - 28.5		27.75	118	1.47	2	3	0.82	2	18	ML	27.5	82	43.5	118	1.03
28.5 - 30.0		29.25	128	1.52	2	3	0.81	2	18	ML	27.5	82	56.3	128	1.03
30.0 - 31.5		30.75	114	1.56	1	1	0.80	1	11	ML	27	81	40.5	114	1.05
31.5 - 33.0		32.25	114	1.60	5	7	0.79	5	32	ML	29	85	34.3	114	0.97
33.0 - 34.5		33.75	138	1.66	15	20	0.78	16	58	SM	32.5	98	41.2	138	0.7
34.5 - 36.0		35.25	131	1.71	10	13	0.76	10	47	SM	31	96	36.2	131	0.74
36.0 - 37.5		36.75	121	1.75	14	19	0.76	14	56	SM	32.5	98	23.1	121	0.7
37.5 - 39.0		38.25	118	1.80	9	12	0.75	9	44	SM	30.5	95	24.7	118	0.76
39.0 - 40.5		39.75	122	1.84	3	4	0.74	3	18	SM	28	90	35.9	122	0.85
40.5 - 42.0		41.25	128	1.89	3	4	0.73	3	18	ML	27.5	82	55.5	128	1.03
42.0 - 43.5		42.75	120	1.93	5	7	0.72	5	27	ML	28.5	84	47.3	124	0.99
43.5 - 45.0		44.25	120	1.98	3	4	0.71	3	18	ML	27.5	82	44	118	1.03
45.0 - 46.5		45.75	120	2.02	0	0	0.70	1	11	ML	27	81	39.1	113	1.05
46.5 - 48.0		47.25	120	2.06	0	0	0.70	1	11	ML	27	81	38.8	112	1.05
48.0 - 49.5		48.75	120	2.10	12	16	0.69	11	47	ML	30.5	88	16.9	103	0.91
49.5 - 51.0		50.25	120	2.15	12	16	0.68	11	47	CL	FALSE	NA	18.5	NA	NA
51.0 - 52.5		51.75	120	2.19	14	19	0.68	13	52	SM	32	97	20.6	117	0.72
52.5 - 54.0		53.25	120	2.23	6	8	0.67	5	32	SM	29.5	93	21.9	113	0.8
54.0 - 55.5		54.75	112	2.27	0	0	0.66	1	11	SM	27.5	89.5	25.2	112	0.87
55.5 - 57.0		56.25	120	2.31	13	17	0.66	11	47	SM	31	96	24.5	120	0.74
57.0 - 58.5		57.75	120	2.36	2	3	0.65	2	11	SM	27.5	89.5	25.6	112	0.87
58.5 - 60.0		59.25	120	2.40	2	3	0.65	2	11	CL	FALSE	NA	24.4	NA	NA
60.0 - 61.5		60.75	120	2.44	0	0	0.64	1	11	CL	FALSE	NA	24.7	NA	NA
61.5 - 63.0		62.25	120	2.49	0	0	0.63	1	11	CL	FALSE	NA	27.1	NA	NA
63.0 - 64.5		63.75	120	2.53	18	24	0.63	15	58	CL	FALSE	NA	26.8	NA	NA
64.5 - 66.0		65.25	120	2.57	5	7	0.62	4	27	SW	30	106.5	9.1	116	0.57
66.0 - 67.5		66.75	130	2.62	0	0	0.62	1	11	SW	28.4	104	25	130	0.6
67.5 - 69.0		68.25	152	2.69	0	0	0.61	1	11	SW	28.4	104	46.2	152	0.6
69.0 - 70.5		69.75	120	2.74	4	5	0.60	3	24	SW	29.5	106	35.8	144	0.58
70.5 - 71.5		71	120	2.77	50	67	0.60	40	89	SW	38.5	120.5	10.3	133	0.39

Project No: 172679015
File Name: \\us1243-f01\workgroup\1714\active\171468118\environmental\Bull Run - 172679015\Engineering Analysis\Parameter Derivation\SPT Correction BRF Bottom Ash Stack.xls

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval		Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
				Input Required											
STN-2			water =	16.2											
0.0 - 1.5		0.75	129	0.05	13	17	1.00	17	60	SM	33	99	30.4	129	0.69
1.5 - 3.0		2.25	126	0.14	16	21	1.00	21	68	SM	33.5	100	25.7	126	0.67
3.0 - 4.5		3.75	121	0.23	16	21	1.00	21	68	SM	33.5	100	21.3	121	0.67
4.5 - 6.0		5.25	131	0.33	21	28	1.00	28	77	SM	34.5	102	28.8	131	0.63
6.0 - 7.5		6.75	132	0.43	35	47	1.00	47	95	SM	37	107	23.2	132	0.56
7.5 - 9.0		8.25	137	0.53	44	59	1.00	59	100	SM	38	108	27.3	137	0.55
9.0 - 10.5		9.75	135	0.64	21	28	1.00	28	77	SM	34.5	102	32.1	135	0.63
10.5 - 12.0		11.25	109	0.72	57	76	1.00	76	100	ML	36	98	11.2	109	0.7
12.0 - 13.5		12.75	134	0.82	99	132	1.00	132	100	SP	40.7	124	8.2	134	0.35
13.5 - 15.0		14.25	117	0.91	33	44	1.00	44	93	SM	36.5	106	10.5	117	0.58
15.0 - 16.5		15.75	121	1.00	23	31	1.00	31	79	SM	34.5	102	18.5	121	0.63
16.5 - 18.0		17.25	120	1.04	34	45	0.98	45	93	ML	35	96	24.8	120	0.74
18.0 - 19.5		18.75	122	1.08	21	28	0.96	27	75	ML	33.5	93	31.3	122	0.8
19.5 - 21.0		20.25	120	1.13	11	15	0.94	14	53	ML	31	88.5	35.6	120	0.89
21.0 - 22.5		21.75	134	1.18	14	19	0.92	17	60	SM	33	99	35.4	134	0.69
22.5 - 24.0		23.25	124	1.23	9	12	0.90	11	47	SM	31	96	29.3	124	0.74
24.0 - 25.5		24.75	112	1.26	3	4	0.89	4	24	SM	28.5	91	22.9	112	0.83
25.5 - 27.0		26.25	102	1.29	1	1	0.88	1	11	ML	27	81	25.8	102	1.05
27.0 - 28.5		27.75	129	1.34	2	3	0.86	2	18	ML	27.5	82	57.9	129	1.03
28.5 - 30.0		29.25	118	1.39	2	3	0.85	2	18	ML	27.5	82	44.3	118	1.03
30.0 - 31.5		30.75	116	1.43	1	1	0.84	1	11	ML	27	81	43.6	116	1.05
31.5 - 33.0		32.25	113	1.46	0	0	0.83	1	11	ML	27	81	39.2	113	1.05
33.0 - 34.5		33.75	120	1.51	2	3	0.81	2	18	CL	FALSE	NA	20.7	NA	NA
34.5 - 36.0		35.25	120	1.55	5	7	0.80	5	32	CL	FALSE	NA	21.9	NA	NA
36.0 - 37.5		36.75	133	1.60	5	7	0.79	5	32	SW	30.8	108	23.2	133	0.55
37.5 - 39.0		38.25	135	1.66	5	7	0.78	5	32	SW	30.8	108	25.3	135	0.55
39.0 - 40.5		39.75	135	1.71	4	5	0.76	4	27	SW	30	106.5	27.0	135	0.57
40.5 - 42.0		41.25	131	1.76	4	5	0.75	4	27	SW	30	106.5	22.9	131	0.57
42.0 - 43.5		42.75	132	1.82	6	8	0.74	6	32	SW	30.8	108	21.9	132	0.55
43.5 - 45.0		44.25	139	1.87	15	20	0.73	15	56	SW	34.4	113	23.2	139	0.48
45.0 - 46.5		45.75	134	1.93	17	23	0.72	16	60	SW	35	114	17.8	134	0.46
46.5 - 48.0		47.25	115	1.97	11	15	0.71	11	47	SC	31	96	20.2	115	0.74
48.0 - 49.5		48.75	133	2.02	16	21	0.70	15	58	SW	34.4	113	17.9	133	0.48
49.5 - 51.0		50.25	133	2.07	3	4	0.69	3	18	SM	28	90	47.9	133	0.85
51.0 - 52.5		51.75	90	2.09	0	0	0.69	1	11	SM	27.5	89.5		90	0.87
52.5 - 54.0		53.25	104	2.13	38	51	0.69	35	84	SM	35.5	104		104	0.61
54.0 - 55.5		54.75	120	2.17	45	60	0.68	41	89	SHALE	FALSE	NA	13.5	NA	NA

Project No: 172679015
File Name: \\us1243-f01\workgroup\1714\active\171468118\environmental\Bull Run - 172679015\Engineering Analysis\Parameter Derivation\SPT Correction BRF Bottom Ash Stack.xls

BULL RUN FOSSIL PLANT
CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS
FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w
					Input Required										
STN-3				water =	12.0										
0.0	-	1.5	0.75	120	0.05	25	33	1.00	33	84	CL	FALSE	NA	10.4	NA
1.5	-	3.0	2.25	120	0.14	24	32	1.00	32	82	CL	FALSE	NA	20.1	NA
3.0	-	4.5	3.75	120	0.23	17	23	1.00	23	70	CL	FALSE	NA	15.1	NA
4.5	-	6.5	5.5	120	0.33		0	1.00	1	11	CL	FALSE	NA	18.8	NA
6.5	-	8.0	7.25	120	0.44	7	9	1.00	9	44	CL	FALSE	NA	19.8	NA
8.0	-	9.5	8.75	120	0.53	8	11	1.00	11	47	CL	FALSE	NA	22.2	NA
9.5	-	11.5	10.5	120	0.63		0	1.00	1	11	CL	FALSE	NA	19.7	NA
11.5	-	13.0	12.25	120	0.68	15	20	1.00	20	67	SM	33.5	100		100
13.0	-	14.5	13.75	120	0.72	11	15	1.00	15	56	SM	32.5	98		98
14.5	-	16.5	15.5	126	0.78		0	1.00	1	11	SM	27.5	89.5	40.9	126
16.5	-	18.0	17.25	120	0.83	9	12	1.00	12	52	SM	32	97	40.0	136
18.0	-	19.5	18.75	120	0.87	4	5	1.00	5	32	ML	29	85	43.1	122
19.5	-	21.5	20.5	111	0.92		0	1.00	1	11	ML	27	81	30.3	111
21.5	-	23.0	22.25	120	0.97	17	23	1.00	23	70	GC	37	121	9.1	132
23.0	-	24.5	23.75	120	1.01	11	15	1.00	15	56	CL	FALSE	NA	11.7	NA
24.5	-	26.0	25.25	120	1.05	8	11	0.97	10	47	CL	FALSE	NA	21.6	NA
26.0	-	27.5	26.75	120	1.10	10	13	0.96	13	52	CL	FALSE	NA		NA
27.5	-	29.0	28.25	120	1.14	16	21	0.94	20	67	CL	FALSE	NA	20.7	NA
29.0	-	30.5	29.75	120	1.18	7	9	0.92	9	41	SC	30.5	95	20.8	115
30.5	-	32.0	31.25	120	1.23	8	11	0.90	10	44	SC	30.5	95	21.4	115
32.0	-	33.5	32.75	120	1.27	15	20	0.89	18	60	SC	33	99	20.6	119
33.5	-	35.0	34.25	120	1.31	5	7	0.87	6	32	SW	30.8	108	23.4	133
35.0	-	36.5	35.75	120	1.35	13	17	0.86	15	56	SW	34.4	113	23.2	139
36.5	-	38.0	37.25	120	1.40	22	29	0.85	25	73	SW	36.2	116.5	16.9	136
38.0	-	39.5	38.75	120	1.44	4	5	0.83	4	27	SW	30	106.5		107
39.5	-	40.8	40.15	120	1.48	71	95	0.82	78	100	SW	40.7	124	32.4	164

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval		Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
					Input Required										
STN-5			water =	29.0											
0.0 - 1.5		0.75	120	0.05	9	12	1.00	12	52	CL	FALSE	NA	14.2	NA	NA
1.5 - 3.0		2.25	106	0.12	14	19	1.00	19	63	SM	33	99	7.3	106	0.69
3.0 - 4.5		3.75	118	0.21	92	123	1.00	123	100	SM	38	108	8.8	118	0.55
4.5 - 6.0		5.25	123	0.30	57	76	1.00	76	100	SM	38	108	13.5	123	0.55
6.0 - 7.5		6.75	122	0.40	72	96	1.00	96	100	SM	38	108	13.4	122	0.55
7.5 - 9.0		8.25	120	0.49	39	52	1.00	52	98	SM	37	107	12.2	120	0.56
9.0 - 10.5		9.75	116	0.57	22	29	1.00	29	79	SM	34.5	102	13.6	116	0.63
10.5 - 12.0		11.25	125	0.67	29	39	1.00	39	87	SM	36	105	19.5	125	0.6
12.0 - 13.5		12.75	131	0.77	41	55	1.00	55	99	SM	37	107	22.4	131	0.56
13.5 - 15.0		14.25	133	0.87	53	71	1.00	71	100	SM	38	108	22.9	133	0.55
15.0 - 16.5		15.75	127	0.96	20	27	1.00	27	75	SM	34.5	102	24.1	127	0.63
16.5 - 18.0		17.25	128	1.06	29	39	0.97	38	87	SM	36	105	21.8	128	0.6
18.0 - 19.5		18.75	130	1.15	37	49	0.93	46	93	SM	36.5	106	22.5	130	0.58
19.5 - 21.0		20.25	122	1.25	19	25	0.90	23	70	SM	34	101	21.1	122	0.65
21.0 - 22.5		21.75	126	1.34	29	39	0.86	33	84	SM	35.5	104	20.7	126	0.61
22.5 - 24.0		23.25	132	1.44	29	39	0.83	32	82	SM	35.5	104	27.1	132	0.61
24.0 - 25.5		24.75	118	1.53	16	21	0.81	17	60	SM	33	99	19.4	118	0.69
25.5 - 27.0		26.25	114	1.61	8	11	0.79	8	41	SM	30.5	95	19.8	114	0.76
27.0 - 28.5		27.75	124	1.71	11	15	0.77	11	47	SM	31	96	29.1	124	0.74
28.5 - 30.0		29.25	118	1.75	8	11	0.76	8	41	ML	30	87	36.1	118	0.93
30.0 - 31.5		30.75	115	1.79	5	7	0.75	5	32	ML	29	85	35.2	115	0.97
31.5 - 33.0		32.25	123	1.83	3	4	0.74	3	24	ML	28	83	48.4	123	1.01
33.0 - 34.5		33.75	118	1.87	2	3	0.73	2	11	ML	27	81	45.7	118	1.05
34.5 - 36.0		35.25	110	1.91	2	3	0.72	2	11	ML	27	81	35.4	110	1.05
36.0 - 37.5		36.75	112	1.95	0	0	0.72	1	11	ML	27	81	38.5	112	1.05
37.5 - 39.0		38.25	114	1.99	0	0	0.71	1	11	ML	27	81	41.3	114	1.05
39.0 - 40.5		39.75	120	2.03	0	0	0.70	1	11	ML	27	81	25.6	102	1.05
40.5 - 42.0		41.25	120	2.07	26	35	0.69	24	73	SM	34	101	20.9	122	0.65
42.0 - 43.5		42.75	120	2.12	31	41	0.69	28	77	ML	33.5	93	23.5	115	0.8
43.5 - 45.0		44.25	120	2.16	23	31	0.68	21	67	ML	32.5	91	22.6	112	0.83
45.0 - 46.5		45.75	120	2.20	3	4	0.67	3	18	SM	28	90	35.4	122	0.85
46.5 - 48.0		47.25	120	2.25	7	9	0.67	6	35	SM	30	94	36.9	129	0.78
48.0 - 49.5		48.75	120	2.29	9	12	0.66	8	41	SM	30.5	95	40.2	133	0.76
49.5 - 51.0		50.25	120	2.33	3	4	0.65	3	18	SM	28	90	33.2	120	0.85
51.0 - 52.5		51.75	110	2.37	0	0	0.65	1	11	ML	27	81	35.5	110	1.05
52.5 - 54.0		53.25	111	2.40	0	0	0.65	1	11	ML	27	81	36.6	111	1.05
54.0 - 55.5		54.75	112	2.44	0	0	0.64	1	11	ML	27	81	38.1	112	1.05
55.5 - 57.0		56.25	114	2.48	0	0	0.64	1	11	ML	27	81	41.1	114	1.05
57.0 - 58.5		57.75	120	2.52	0	0	0.63	1	11	ML	27	81	30.5	106	1.05
58.5 - 60.0		59.25	120	2.57	12	16	0.62	10	47	CL	FALSE	NA	27.7	NA	NA
60.0 - 61.5		60.75	120	2.61	7	9	0.62	6	32	CL	FALSE	NA	16.0	NA	NA
61.5 - 63.0		62.25	120	2.65	7	9	0.61	6	32	CL	FALSE	NA	13.9	NA	NA
63.0 - 64.5		63.75	120	2.70	6	8	0.61	5	27	CL	FALSE	NA	20.3	NA	NA
64.5 - 66.0		65.25	120	2.74	7	9	0.60	6	32	CL	FALSE	NA	21.2	NA	NA
66.0 - 67.5		66.75	120	2.78	5	7	0.60	4	27	SW	30	106.5	21.8	130	0.57
67.5 - 69.0		68.25	120	2.83	0	0	0.59	1	11	SW	28.4	104	21.0	126	0.6
69.0 - 70.5		69.75	128	2.87	0	0	0.59	1	11	SW	28.4	104	23.0	128	0.6
70.5 - 72.0		71.25	120	2.92	7	9	0.59	6	32	SW	30.8	108	22.0	132	0.55
72.0 - 73.5		72.75	120	2.96	16	21	0.58	12	52	SW	33.6	112	21.3	136	0.49
73.5 - 74.4		73.95	120	3.00	50	67				SW			10.3		

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval		Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
				Input Required											
STN-6			water =	15.0											
0.0 - 1.5		0.75	114	0.04	8	11	1.00	11	47	SM	31	96	18.4	114	0.74
1.5 - 3.0		2.25	110	0.12	15	20	1.00	20	67	SM	33.5	100	9.7	110	0.67
3.0 - 4.5		3.75	106	0.20	11	15	1.00	15	56	ML	31.5	89.5	18.1	106	0.87
4.5 - 6.0		5.25	106	0.28	10	13	1.00	13	53	ML	31	88.5	19.9	106	0.89
6.0 - 7.5		6.75	115	0.37	19	25	1.00	25	74	ML	33	92	25.4	115	0.82
7.5 - 9.0		8.25	114	0.46	26	35	1.00	35	84	ML	34	94	21.8	114	0.77
9.0 - 10.5		9.75	118	0.54	18	24	1.00	24	73	ML	33	92	28.7	118	0.82
10.5 - 12.0		11.25	117	0.63	68	91	1.00	91	100	ML	36	98	19.7	117	0.7
12.0 - 13.5		12.75	123	0.73	62	83	1.00	83	100	SM	38	108	14.1	123	0.55
13.5 - 15.0		14.25	113	0.81	16	21	1.00	21	68	SM	33.5	100	12.5	113	0.67
15.0 - 16.5		15.75	110	0.85	7	9	1.00	9	44	SM	30.5	95	15.9	110	0.76
16.5 - 18.0		17.25	118	0.89	18	24	1.00	24	73	ML	33	92	28.0	118	0.82
18.0 - 19.5		18.75	117	0.93	8	11	1.00	11	47	ML	30.5	88	32.9	117	0.91
19.5 - 21.0		20.25	111	0.96	9	12	1.00	12	52	SM	32	97	14.3	111	0.72
21.0 - 22.5		21.75	113	1.00	4	5	1.00	5	32	SM	29.5	93	21.3	113	0.8
22.5 - 24.0		23.25	115	1.04	4	5	0.98	5	32	SM	29.5	93	23.6	115	0.8
24.0 - 25.5		24.75	111	1.08	1	1	0.96	1	11	ML	27	81	36.6	111	1.05
25.5 - 27.0		26.25	120	1.12	2	3	0.94	3	18	SM	28	90	32.9	120	0.85
27.0 - 28.5		27.75	125	1.17	0	0	0.93	1	11	SM	27.5	89.5	39.8	125	0.87
28.5 - 30.0		29.25	113	1.21	0	0	0.91	1	11	ML	27	81	39.2	113	1.05
30.0 - 31.5		30.75	81	1.22	0	0	0.91	1	11	ML	27	81		81	1.05
31.5 - 33.0		32.25	98	1.25	2	3	0.90	2	18	ML	27.5	82	19.1	98	1.03
33.0 - 34.5		33.75	114	1.28	14	19	0.88	17	60	SC	33	99	15.4	114	0.69
34.5 - 36.0		35.25	110	1.32	9	12	0.87	10	47	SC	31	96	14.3	110	0.74
36.0 - 37.5		36.75	114	1.36	10	13	0.86	11	47	SC	31	96	18.4	114	0.74
37.5 - 39.0		38.25	115	1.40	10	13	0.85	11	47	SC	31	96	20.3	115	0.74
39.0 - 40.5		39.75	110	1.43	5	7	0.83	6	32	SC	29.5	93	18.7	110	0.8
40.5 - 42.0		41.25	134	1.49	6	8	0.82	7	35	SW	31.5	109	22.5	134	0.54
42.0 - 43.5		42.75	134	1.54	8	11	0.81	9	41	SW	32.3	110	22.2	134	0.52
43.5 - 45.0		44.25	132	1.59	9	12	0.79	10	44	SW	32.3	110	20.1	132	0.52
45.0 - 46.5		45.75	135	1.65	10	13	0.78	10	47	SW	33	111	22.0	135	0.5
46.5 - 48.0		47.25	151	1.72	16	21	0.76	16	60	GW	37.5	133	13.7	151	0.25
48.0 - 49.5		48.75	145	1.78	7	9	0.75	7	39	GW	33	126	15.3	145	0.33
49.5 - 50.8		50.15	163	1.85	68	91	0.74	67	100	GW	45	147	10.8	163	0.13

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval	Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
		Input Required												
STN-7		water =	13.0											
0.0 - 1.5	0.75	120	0.05	12	16	1.00	16	60	CL	FALSE	NA	9.9	NA	NA
1.5 - 3.0	2.25	120	0.14	13	17	1.00	17	60	CL	FALSE	NA	17.2	NA	NA
3.0 - 4.5	3.75	120	0.23	15	20	1.00	20	67	CL	FALSE	NA	21.2	NA	NA
4.5 - 6.0	5.25	120	0.32	5	7	1.00	7	35	CL	FALSE	NA	21.1	NA	NA
6.0 - 7.5	6.75	120	0.41	8	11	1.00	11	47	CL	FALSE	NA	19.6	NA	NA
7.5 - 9.0	8.25	120	0.50	7	9	1.00	9	44	CL	FALSE	NA	23.9	NA	NA
9.0 - 10.5	9.75	126	0.59	3	4	1.00	4	27	SM	29	92	36.5	126	0.82
10.5 - 12.0	11.25	119	0.68	3	4	1.00	4	27	SM	29	92	29.8	119	0.82
12.0 - 13.5	12.75	114	0.76	4	5	1.00	5	32	SM	29.5	93	23.0	114	0.8
13.5 - 15.0	14.25	124	0.81	2	3	1.00	3	18	SM	28	90	37.4	124	0.85
15.0 - 16.5	15.75	113	0.85	4	5	1.00	5	32	ML	29	85	32.4	113	0.97
16.5 - 18.0	17.25	120	0.89	14	19	1.00	19	63	CH-CL	FALSE	NA	20.4	NA	NA
18.0 - 19.5	18.75	120	0.93	15	20	1.00	20	67	CH-CL	FALSE	NA	22.9	NA	NA
19.5 - 21.0	20.25	120	0.98	14	19	1.00	19	63	CH-CL	FALSE	NA	19.6	NA	NA
21.0 - 22.5	21.75	120	1.02	9	12	0.99	12	47	CH-CL	FALSE	NA	19.6	NA	NA
22.5 - 24.0	23.25	120	1.06	11	15	0.97	14	56	CH-CL	FALSE	NA	19.9	NA	NA
24.0 - 25.5	24.75	120	1.11	11	15	0.95	14	53	CH-CL	FALSE	NA	19.6	NA	NA
25.5 - 27.0	26.25	115	1.15	6	8	0.93	8	41	SC	30.5	95	21.2	115	0.76
27.0 - 28.5	27.75	116	1.19	8	11	0.92	10	44	SC	30.5	95	22.4	116	0.76
28.5 - 30.0	29.25	112	1.22	4	5	0.90	5	27	SC	29	92	21.8	112	0.82
30.0 - 31.5	30.75	131	1.28	5	7	0.89	6	32	SP	30.8	108	21.6	131	0.55
31.5 - 33.0	32.25	134	1.33	7	9	0.87	8	41	SW	32.3	110	22.2	134	0.52
33.0 - 34.5	33.75	132	1.38	5	7	0.85	6	32	SW	30.8	108	22.2	132	0.55
34.5 - 36.0	35.25	135	1.44	5	7	0.83	6	32	SW	30.8	108	25.0	135	0.55
36.0 - 37.5	36.75	120	1.48	5	7	0.82	6	32	CH-CL	FALSE	NA	21.2	NA	NA
37.5 - 39.0	38.25	120	1.52	5	7	0.81	5	32	CH-CL	FALSE	NA	21.2	NA	NA
39.0 - 40.5	39.75	120	1.57	5	7	0.80	5	32	CH-CL	FALSE	NA	21.1	NA	NA
40.5 - 42.0	41.25	120	1.61	12	16	0.79	13	52	CH-CL	FALSE	NA	22.9	NA	NA
42.0 - 43.5	42.75	140	1.67	88	117	0.77	91	100	SW	40.7	124	13.3	140	0.35
43.5 - 44.3	43.9	120	1.70	50	67	0.77	51	98	SHALE	FALSE	NA	11.0	NA	NA

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BULL RUN FOSSIL PLANT
CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS
FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
					Input Required											
STN-8				water =	16.5											
0.0	-	1.5	0.75	113	0.04	15	20	1.00	20	67	SM	33.5	100	12.7	113	0.67
1.5	-	3.0	2.25	124	0.14	24	32	1.00	32	82	SM	35.5	104	19.7	124	0.61
3.0	-	4.5	3.75	129	0.23	56	75	1.00	75	100	SM	38	108	19.9	129	0.55
4.5	-	6.0	5.25	114	0.32	30	40	1.00	40	89	SM	36	105	8.4	114	0.6
6.0	-	7.5	6.75	131	0.42	52	69	1.00	69	100	SM	38	108	21.0	131	0.55
7.5	-	9.0	8.25	130	0.51	24	32	1.00	32	82	SM	35.5	104	24.7	130	0.61
9.0	-	10.5	9.75	132	0.61	47	63	1.00	63	100	SM	38	108	22.1	132	0.55
10.5	-	12.0	11.25	132	0.71	43	57	1.00	57	100	SM	38	108	22.0	132	0.55
12.0	-	13.5	12.75	144	0.82	25	33	1.00	33	84	SM	35.5	104	38.6	144	0.61
13.5	-	15.0	14.25	147	0.93	18	24	1.00	24	73	SM	34	101	45.9	147	0.65
15.0	-	16.5	15.75	139	1.03	8	11	0.98	11	47	SM	31	96	45.0	139	0.74
16.5	-	18.0	17.25	149	1.10	6	8	0.95	8	41	SM	30.5	95	56.6	149	0.76
18.0	-	19.5	18.75	121	1.14	7	9	0.94	9	41	ML	30	87	39.1	121	0.93
19.5	-	21.0	20.25	112	1.18	3	4	0.92	4	24	ML	28	83	34.5	112	1.01
21.0	-	22.5	21.75	134	1.23	2	3	0.90	2	18	SM	28	90	48.9	134	0.85
22.5	-	24.0	23.25	132	1.29	2	3	0.88	2	18	SM	28	90	46.3	132	0.85
24.0	-	25.5	24.75	116	1.33	2	3	0.87	2	18	ML	27.5	82	41.6	116	1.03
25.5	-	27.0	26.25	113	1.36	2	3	0.86	2	18	ML	27.5	82	38.0	113	1.03
27.0	-	28.5	27.75	112	1.40	3	4	0.84	3	24	ML	28	83	35.5	112	1.01
28.5	-	30.0	29.25	117	1.44	2	3	0.83	2	18	ML	27.5	82	42.8	117	1.03
30.0	-	31.5	30.75	113	1.48	0	0	0.82	1	11	ML	27	81	39.6	113	1.05
31.5	-	33.0	32.25	113	1.52	2	3	0.81	2	18	ML	27.5	82	38.3	113	1.03
33.0	-	34.5	33.75	117	1.56	0	0	0.80	1	11	ML	27	81	44.1	117	1.05
34.5	-	36.0	35.25	111	1.60	0	0	0.79	1	11	ML	27	81	37.6	111	1.05
36.0	-	37.5	36.75	111	1.63	0	0	0.78	1	11	ML	27	81	37.4	111	1.05
37.5	-	39.0	38.25	112	1.67	0	0	0.77	1	11	ML	27	81	38.4	112	1.05
39.0	-	40.5	39.75	110	1.71	4	5	0.77	4	27	ML	28.5	84	31.1	110	0.99
40.5	-	42.0	41.25	120	1.75	3	4	0.76	3	24	CL	FALSE	NA	30.6	NA	NA
42.0	-	43.5	42.75	120	1.79	5	7	0.75	5	32	CL	FALSE	NA	27.0	NA	NA
43.5	-	45.0	44.25	120	1.84	4	5	0.74	4	24	CL	FALSE	NA	27.1	NA	NA
45.0	-	46.5	45.75	120	1.88	7	9	0.73	7	35	CL	FALSE	NA	25.3	NA	NA
46.5	-	48.0	47.25	120	1.92	6	8	0.72	6	32	CL	FALSE	NA	22.3	NA	NA
48.0	-	49.5	48.75	120	1.97	7	9	0.71	7	35	CL	FALSE	NA	22.0	NA	NA
49.5	-	51.0	50.25	120	2.01	4	5	0.71	4	24	CL	FALSE	NA	24.8	NA	NA
51.0	-	51.8	51.4	168	2.07	50	67	0.70	46	95	GW	44	145	15.9	168	0.15

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval		Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_{ll}	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
				Input Required											
STN-9			water =	25.0											
0.0 - 1.5		0.75	115	0.04	11	15	1.00	15	56	SM	32.5	98	17.3	115	0.7
1.5 - 3.0		2.25	122	0.13	64	85	1.00	85	100	SM	38	108	12.7	122	0.55
3.0 - 4.5		3.75	125	0.23	38	51	1.00	51	98	SM	37	107	17	125	0.56
4.5 - 6.0		5.25	128	0.32	24	32	1.00	32	82	SM	35.5	104	22.9	128	0.61
6.0 - 7.5		6.75	116	0.41	24	32	1.00	32	82	SM	35.5	104	11.8	116	0.61
7.5 - 9.0		8.25	111	0.49	22	29	1.00	29	79	SM	34.5	102	8.9	111	0.63
9.0 - 10.5		9.75	117	0.58	19	25	1.00	25	74	SM	34	101	15.4	117	0.65
10.5 - 12.0		11.25	115	0.67	22	29	1.00	29	79	SM	34.5	102	12.7	115	0.63
12.0 - 13.5		12.75	133	0.77	34	45	1.00	45	93	SM	36.5	106	25.5	133	0.58
13.5 - 15.0		14.25	125	0.86	37	49	1.00	49	97	SM	37	107	17.2	125	0.56
15.0 - 16.5		15.75	131	0.96	32	43	1.00	43	91	SM	36.5	106	23.5	131	0.58
16.5 - 18.0		17.25	122	1.05	25	33	0.98	33	82	SM	35.5	104	16.9	122	0.61
18.0 - 19.5		18.75	123	1.14	25	33	0.94	31	81	SM	35.5	104	18.1	123	0.61
19.5 - 21.0		20.25	117	1.23	11	15	0.90	13	53	SM	32	97	20.4	117	0.72
21.0 - 22.5		21.75	118	1.32	11	15	0.87	13	52	SM	32	97	21.2	118	0.72
22.5 - 24.0		23.25	109	1.40	10	13	0.84	11	47	ML	30.5	88	23.7	109	0.91
24.0 - 25.5		24.75	109	1.48	4	5	0.82	4	27	ML	28.5	84	30.1	109	0.99
25.5 - 27.0		26.25	117	1.52	5	7	0.81	5	32	ML	29	85	37.6	117	0.97
27.0 - 28.5		27.75	117	1.57	4	5	0.80	4	27	ML	28.5	84	39.8	117	0.99
28.5 - 30.0		29.25	121	1.61	3	4	0.79	3	24	ML	28	83	46.3	121	1.01
30.0 - 31.5		30.75	127	1.66	0	0	0.78	1	11	ML	27	81	56.5	127	1.05
31.5 - 33.0		32.25	111	1.69	0	0	0.77	1	11	ML	27	81	37	111	1.05
33.0 - 34.5		33.75	111	1.73	0	0	0.76	1	11	ML	27	81	37.1	111	1.05
34.5 - 36.0		35.25	112	1.77	11	15	0.75	11	47	ML	30.5	88	27	112	0.91
36.0 - 37.5		36.75	128	1.82	18	24	0.74	18	60	SM	33	99	29.5	128	0.69
37.5 - 39.0		38.25	126	1.86	17	23	0.73	17	60	SM	33	99	27.5	126	0.69
39.0 - 40.5		39.75	119	1.91	10	13	0.72	10	44	ML	30	87	36.4	119	0.93
40.5 - 42.0		41.25	122	1.95	22	29	0.72	21	68	ML	32.5	91	34.6	122	0.83
42.0 - 43.5		42.75	117	1.99	7	9	0.71	7	35	ML	29.5	86	36.2	117	0.95
43.5 - 45.0		44.25	125	2.04	10	13	0.70	9	44	ML	30	87	44.1	125	0.93
45.0 - 46.5		45.75	113	2.08	2	3	0.69	2	11	ML	27	81	39.5	113	1.05
46.5 - 48.0		47.25	123	2.12	5	7	0.69	5	27	ML	28.5	84	46.4	123	0.99
48.0 - 49.5		48.75	125	2.17	3	4	0.68	3	18	ML	27.5	82	52.6	125	1.03
49.5 - 51.0		50.25	118	2.21	0	0	0.67	1	11	ML	27	81	45.4	118	1.05
51.0 - 52.5		51.75	114	2.25	0	0	0.67	1	11	ML	27	81	41	114	1.05
52.5 - 54.0		53.25	98	2.28	4	5	0.66	4	24	ML	28	83	18.5	98	1.01
54.0 - 55.5		54.75	120	2.32	9	12	0.66	8	41	CL	FALSE	NA	20	NA	NA
55.5 - 57.0		56.25	120	2.36	8	11	0.65	7	35	CL	FALSE	NA	19.6	NA	NA
57.0 - 58.5		57.75	120	2.41	14	19	0.64	12	52	CL	FALSE	NA	19	NA	NA
58.5 - 60.0		59.25	120	2.45	16	21	0.64	14	53	CL	FALSE	NA	19.3	NA	NA
60.0 - 61.5		60.75	120	2.49	11	15	0.63	9	44	CL	FALSE	NA	19.8	NA	NA
61.5 - 63.0		62.25	120	2.54	15	20	0.63	13	52	CL	FALSE	NA	19.8	NA	NA
63.0 - 64.5		63.75	120	2.58	12	16	0.62	10	47	CL	FALSE	NA	20.3	NA	NA
64.5 - 66.0		65.25	120	2.62	5	7	0.62	4	27	CL	FALSE	NA	22.3	NA	NA
66.0 - 67.5		66.75	120	2.67	7	9	0.61	6	32	CL	FALSE	NA	21.8	NA	NA
67.5 - 69.0		68.25	120	2.71	7	9	0.61	6	32	CL	FALSE	NA	23.1	NA	NA
69.0 - 70.5		69.75	120	2.75	0	0	0.60	1	11	SW	28.4	104	25.5	131	0.6
70.5 - 72.0		71.25	120	2.80	4	5	0.60	3	24	SW	29.5	106	18	125	0.58
72.0 - 72.9		72.45	120	2.83	50	67	0.59	40	89	SW	38.5	120.5	12.5	136	0.39

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
					Input Required											
STN-10				water =	15.5											
0.0	-	1.5	0.75	99	0.04	14	19	1.00	19	63	ML	32	90	10.2	99	0.85
1.5	-	3.0	2.25	112	0.12	34	45	1.00	45	93	ML	35	96	16.7	112	0.74
3.0	-	4.5	3.75	114	0.21	24	32	1.00	32	82	ML	34	94	21.8	114	0.77
4.5	-	6.0	5.25	116	0.29	44	59	1.00	59	100	ML	36	98	18.4	116	0.7
6.0	-	7.5	6.75	118	0.38	78	104	1.00	104	100	ML	36	98	20.2	118	0.7
7.5	-	9.0	8.25	117	0.47	19	25	1.00	25	74	ML	33	92	26.9	117	0.82
9.0	-	10.5	9.75	129	0.57	12	16	1.00	16	60	ML	32	90	42.8	129	0.85
10.5	-	12.0	11.25	123	0.66	14	19	1.00	19	63	ML	32	90	37.1	123	0.85
12.0	-	13.5	12.75	137	0.76	38	51	1.00	51	98	SM	37	107	28.1	137	0.56
13.5	-	15.0	14.25	127	0.86	52	69	1.00	69	100	SM	38	108	17.5	127	0.55
15.0	-	16.5	15.75	121	0.90	61	81	1.00	81	100	SM	38	108	12.0	121	0.55
16.5	-	18.0	17.25	120	0.94	27	36	1.00	36	86	SM	36	105	14.6	120	0.6
18.0	-	18.5	18.25	120	0.97	ST	NA	1.00	NA	NA	CL	NA	NA	19.2	115	NA
18.5	-	20.0	19.25	115	1.00	16	21	1.00	21	68	SM	33.5	100	23.8	124	0.67
20.0	-	21.5	20.75	117	1.04	16	21	0.98	21	67	SM	33.5	100	16.9	117	0.67
21.5	-	23.0	22.25	116	1.08	17	23	0.96	22	68	SM	33.5	100	15.9	116	0.67
23.0	-	24.5	23.75	127	1.13	11	15	0.94	14	53	SM	32	97	30.7	127	0.72
24.5	-	26.5	25.5	120	1.18	ST	NA	0.92	NA	NA	ML	36	69.3	43.0	99	#N/A
26.5	-	28.5	27.5	110	1.23	ST	NA	0.90	NA	NA	ML	36	69.3	32.1	110	#N/A
28.5	-	30.5	29.5	125	1.29	ST	NA	0.88	NA	NA	CL	32	NA	23.4	125	NA
30.5	-	32.5	31.5	128	1.35	ST	NA	0.86	NA	NA	CL	32	96.8	21.3	128	NA
32.5	-	34.5	33.5	126	1.42	ST	NA	0.84	NA	NA	CL	32	107.5	22.2	126	NA
34.5	-	36.5	35.5	126	1.48	ST	NA	0.82	NA	NA	CL	32	NA	21.8	126	NA
36.5	-	38.5	37.5	127	1.55	ST	NA	0.80	NA	NA	CL	32	106.1	22.2	127	NA
38.5	-	40.5	39.5	128	1.61	ST	NA	0.79	NA	NA	CL	32	NA	22.4	128	NA
40.5	-	42.5	41.5	125	1.67	ST	NA	0.77	NA	NA	CL	32	NA	23.7	125	NA
42.5	-	44.5	43.5	130	1.74	ST	NA	0.76	NA	NA	CL	32	NA	20.1	130	NA
44.5	-	46.0	45.25	127	1.80	ST	NA	0.75	NA	NA	CL	NA	NA	20.8	127	NA
46.0	-	47.5	46.75	140	1.86	22	29	0.73	22	68	SW	35.5	115	22.0	140	0.45
47.5	-	49.0	48.25	138	1.91	28	37	0.72	27	77	SW	37	117.5	17.9	138	0.42
49.0	-	50.5	49.75	166	1.99	60	80	0.71	57	100	GW	45	147	12.9	166	0.13

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
					Input Required											
STN-11				water =	8.5											
0.0	-	1.5	0.75	120	0.05	10	13	1.00	13	53	CL	FALSE	NA	22.3	NA	NA
1.5	-	3.0	2.25	120	0.14	10	13	1.00	13	53	CL	FALSE	NA	19.6	NA	NA
3.0	-	4.5	3.75	120	0.23	10	13	1.00	13	53	CL	FALSE	NA	19.8	NA	NA
4.5	-	6.5	5.5	120	0.33	ST	NA	1.00	NA	NA	CL	NA	NA	17.9	128	NA
6.5	-	8.0	7.25	120	0.44	4	5	1.00	5	32	CL	FALSE	NA	22.6	NA	NA
8.0	-	9.5	8.75	120	0.48	4	5	1.00	5	32	CL	FALSE	NA	30.1	NA	NA
9.5	-	11.5	10.5	120	0.53	ST	NA	1.00	NA	NA	CL	NA	NA	35.7	NA	NA
11.5	-	13.0	12.25	147	0.60	2	3	1.00	3	18	SP	29	105	39.9	147	0.59
13.0	-	14.5	13.75	132	0.66	4	5	1.00	5	32	SM	29.5	93	42.4	132	0.8
14.5	-	16.0	15.25	108	0.69	2	3	1.00	3	18	ML	27.5	82	31.5	108	1.03
16.0	-	17.5	16.75	120	0.73	13	17	1.00	17	60	CL	FALSE	NA	17.9	NA	NA
17.5	-	19.0	18.25	113	0.77	27	36	1.00	36	86	ML	34.5	95	19.4	113	0.75
19.0	-	20.5	19.75	120	0.81	20	27	1.00	27	75	CL	FALSE	NA	21.2	NA	NA
20.5	-	22.5	21.5	120	0.86	ST	NA	1.00	NA	NA	CL	NA	NA	22.9	123	NA
22.5	-	24.0	23.25	120	0.91	12	16	1.00	16	60	CL	FALSE	NA	24.0	NA	NA
24.0	-	25.5	24.75	120	0.96	12	16	1.00	16	60	CL	FALSE	NA	26.9	NA	NA
25.5	-	27.5	26.5	120	1.01	ST	NA	1.00	NA	NA	CL	NA	NA	22.7	126	NA
27.5	-	29.0	28.25	120	1.06	12	16	0.97	16	58	CL	FALSE	NA	26.6	NA	NA
29.0	-	30.5	29.75	120	1.10	16	21	0.95	20	67	CL	FALSE	NA	28.2	NA	NA
30.5	-	32.0	31.25	120	1.15	12	16	0.93	15	58	CL	FALSE	NA	22.8	NA	NA
32.0	-	33.5	32.75	120	1.19	7	9	0.92	9	41	CL	FALSE	NA	23.5	NA	NA
33.5	-	35.5	34.5	120	1.24	ST	NA	0.90	NA	NA	CL	NA	NA	23.2	126	NA
35.5	-	37.0	36.25	120	1.29	8	11	0.88	9	44	CL	FALSE	NA	28.4	NA	NA
37.0	-	38.5	37.75	120	1.33	7	9	0.87	8	41	CL	FALSE	NA	28.0	NA	NA
38.5	-	40.0	39.25	143	1.39	11	15	0.85	12	52	SP	33.6	112	27.4	143	0.49
40.0	-	40.3	40.15	120	1.42	50	67	0.84	56	100	Limestone	FALSE	NA	17.2	NA	NA

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_{cl}	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
					Input Required											
STN-13				water =	21.0											
0.0	-	1.5	0.75	110	0.04	2	3	1.00	3	18	SM	28	90	22.3	110	0.85
1.5	-	3.0	2.25	118	0.13	12	16	1.00	16	60	SM	33	99	19.6	118	0.69
3.0	-	4.5	3.75	115	0.22	17	23	1.00	23	70	SM	34	101	14.1	115	0.65
4.5	-	6.0	5.25	128	0.31	33	44	1.00	44	93	SM	36.5	106	13.9	128	0.58
6.0	-	7.5	6.75	126	0.41	45	60	1.00	60	100	SM	38	108	16.5	126	0.55
7.5	-	9.0	8.25	132	0.51	37	49	1.00	49	97	SM	37	107	23.5	132	0.56
9.0	-	10.5	9.75	118	0.59	39	52	1.00	52	98	SM	37	107	10.7	118	0.56
10.5	-	12.0	11.25	120	0.69	34	45	1.00	45	93	SM	36.5	106	13.6	120	0.58
12.0	-	13.5	12.75	122	0.78	43	57	1.00	57	100	SM	38	108	13.4	122	0.55
13.5	-	15.0	14.25	130	0.87	84	112	1.00	112	100	SM	38	108	20.3	130	0.55
15.0	-	16.5	15.75	111	0.96	24	32	1.00	32	82	ML	34	94	17.6	111	0.77
16.5	-	18.0	17.25	126	1.05	21	28	0.97	27	77	SM	34.5	102	24.0	126	0.63
18.0	-	19.5	18.75	129	1.15	15	20	0.93	19	63	SM	33	99	30.5	129	0.69
19.5	-	21.0	20.25	123	1.24	5	7	0.90	6	35	ML	29.5	86	37.1	123	0.95
21.0	-	22.5	21.75	119	1.28	6	8	0.88	7	39	ML	29.5	86	38.2	119	0.95
22.5	-	24.0	23.25	119	1.33	5	7	0.87	6	32	ML	29	85	40.4	119	0.97
24.0	-	25.5	24.75	126	1.37	2	3	0.85	2	18	ML	27.5	82	43.5	126	1.03
25.5	-	27.0	26.25	118	1.42	1	1	0.84	1	11	ML	27	81	45.4	118	1.05
27.0	-	28.5	27.75	121	1.46	0	0	0.83	1	11	ML	27	81	49.4	121	1.05
28.5	-	30.0	29.25	122	1.50	2	3	0.82	2	18	ML	27.5	82	49.2	122	1.03
30.0	-	31.5	30.75	147	1.57	2	3	0.80	2	18	ML	27.5	82	79.2	147	1.03
31.5	-	33.0	32.25	126	1.62	1	1	0.79	1	11	ML	27	81	42	126	1.05
33.0	-	34.5	33.75	121	1.66	2	3	0.78	2	18	ML	27.5	82	47.2	121	1.03
34.5	-	36.0	35.25	118	1.70	2	3	0.77	2	18	ML	27.5	82	44.2	118	1.03
36.0	-	37.5	36.75	131	1.75	4	5	0.76	4	27	ML	28.5	84	56.1	131	0.99
37.5	-	39.0	38.25	167	1.83	7	9	0.74	7	35	ML	29.5	86	94.5	167	0.95
39.0	-	40.5	39.75	139	1.89	1	1	0.73	1	11	ML	27	81	71.0	139	1.05
40.5	-	42.0	41.25	123	1.93	4	5	0.72	4	24	ML	28	83	48.1	123	1.01
42.0	-	43.5	42.75	134	1.99	4	5	0.71	4	24	ML	28	83	61.5	134	1.01
43.5	-	45.0	44.25	142	2.05	3	4	0.70	3	18	ML	27.5	82	73.4	142	1.03
45.0	-	46.5	45.75	125	2.09	0	0	0.69	1	11	ML	27	81	54.7	125	1.05
46.5	-	48.0	47.25	123	2.14	0	0	0.68	1	11	ML	27	81	52.0	123	1.05
48.0	-	49.5	48.75	126	2.19	0	0	0.68	1	11	ML	27	81	55.0	126	1.05
49.5	-	51.0	50.25	117	2.23	0	0	0.67	1	11	ML	27	81	45	117	1.05
51.0	-	52.5	51.75	117	2.27	0	0	0.66	1	11	ML	27	81	44.5	117	1.05
52.5	-	54.0	53.25	117	2.31	0	0	0.66	1	11	ML	27	81	44.3	117	1.05
54.0	-	55.5	54.75	120	2.35	0	0	0.65	1	11	ML	27	81	26.3	102	1.05
55.5	-	57.0	56.25	120	2.40	4	5	0.65	3	24	CL	FALSE	NA	25.3	NA	NA
57.0	-	58.5	57.75	120	2.44	6	8	0.64	5	32	CL	FALSE	NA	27	NA	NA
58.5	-	60.0	59.25	120	2.48	6	8	0.63	5	32	CL	FALSE	NA	29.4	NA	NA
60.0	-	61.5	60.75	120	2.53	5	7	0.63	4	27	CL	FALSE	NA	25.8	NA	NA
61.5	-	63.0	62.25	120	2.57	5	7	0.62	4	27	CL	FALSE	NA	21.9	NA	NA
63.0	-	64.5	63.75	120	2.61	8	11	0.62	7	35	SW	31.5	109	30.3	142	0.54
64.5	-	66.0	65.25	120	2.66	23	31	0.61	19	63	SW	35	114	18.3	135	0.46
66.0	-	67.5	66.75	120	2.70	38	51	0.61	31	79	SW	37	117.5	11.9	131	0.42
67.5	-	69.0	68.25	120	2.74	60	80	0.60	48	95	SW	40	123	10.6	136	0.36

BULL RUN FOSSIL PLANT
CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS
FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_e	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
						Input Required										
STN-14				water =	35.0											
0.0	-	1.5	0.75	106	0.04	11	15	1.00	15	56	SC	32.5	98	8.5	106	0.7
1.5	-	3.0	2.25	109	0.12	21	28	1.00	28	77	SC	34.5	102	6.6	109	0.63
3.0	-	4.5	3.75	120	0.21	15	20	1.00	20	67	SC	33.5	100	10.1	110	0.67
4.5	-	6.0	5.25	120	0.30	9	12	1.00	12	52	SC	32	97	11.9	109	0.72
6.0	-	7.5	6.75	120	0.39	8	11	1.00	11	47	SC	31	96	14.5	110	0.74
7.5	-	9.0	8.25	120	0.48	14	19	1.00	19	63	SC	33	99	14.7	114	0.69
9.0	-	10.5	9.75	120	0.57	17	23	1.00	23	70	ML	33	92	16.1	107	0.82
10.5	-	12.0	11.25	120	0.66	19	25	1.00	25	74	ML	33	92	20.9	111	0.82
12.0	-	13.5	12.75	120	0.75	46	61	1.00	61	100	ML	36	98	16.5	114	0.7
13.5	-	15.0	14.25	120	0.84	34	45	1.00	45	93	ML	35	96	19	114	0.74
15.0	-	16.5	15.75	115	0.93	38	51	1.00	51	98	ML	35.5	97	18.5	115	0.72
16.5	-	18.0	17.25	122	1.02	67	89	0.99	89	100	SM	38	108	12.9	122	0.55
18.0	-	19.5	18.75	120	1.11	24	32	0.95	30	79	SM	34.5	102	16.1	118	0.63
19.5	-	21.0	20.25	120	1.20	8	11	0.91	10	44	SM	30.5	95	8.8	103	0.76
21.0	-	22.5	21.75	120	1.29	25	33	0.88	29	79	SM	34.5	102	15.1	117	0.63
22.5	-	24.0	23.25	120	1.38	22	29	0.85	25	74	SM	34	101	15.2	116	0.65
24.0	-	25.5	24.75	120	1.47	18	24	0.83	20	65	SM	33.5	100	16.6	117	0.67
25.5	-	27.0	26.25	120	1.56	21	28	0.80	22	70	SM	34	101	16.3	117	0.65
27.0	-	28.5	27.75	120	1.65	47	63	0.78	49	95	SM	37	107	24.9	134	0.56
28.5	-	30.0	29.25	120	1.74	32	43	0.76	32	82	SM	35.5	104	17.9	123	0.61
30.0	-	31.5	30.75	120	1.83	7	9	0.74	7	35	SM	30	94	19.6	112	0.78
31.5	-	33.0	32.25	120	1.92	7	9	0.72	7	35	SM	30	94	19.3	112	0.78
33.0	-	34.5	33.75	120	2.01	6	8	0.71	6	32	SM	29.5	93	19	111	0.8
34.5	-	36.0	35.25	120	2.05	3	4	0.70	3	18	SM	28	90	38.8	125	0.85
36.0	-	37.5	36.75	120	2.10	5	7	0.69	5	27	ML	28.5	84	43.3	120	0.99
37.5	-	39.0	38.25	120	2.14	3	4	0.68	3	18	ML	27.5	82	36.6	112	1.03
39.0	-	40.5	39.75	120	2.18	2	3	0.68	2	11	ML	27	81	37.5	111	1.05
40.5	-	42.0	41.25	120	2.23	0	0	0.67	1	11	ML	27	81	83.7	149	1.05
42.0	-	43.5	42.75	140	2.28	0	0	0.66	1	11	ML	27	81	72.4	140	1.05
43.5	-	45.0	44.25	120	2.33	0	0	0.66	1	11	ML	27	81	43.4	116	1.05
45.0	-	46.5	45.75	120	2.37	7	9	0.65	6	35	SM	30	94	63	153	0.78
46.5	-	48.0	47.25	120	2.41	3	4	0.64	3	18	SM	28	90	64	148	0.85
48.0	-	49.5	48.75	120	2.46	11	15	0.64	9	44	SM	30.5	95	52.8	145	0.76
49.5	-	51.0	50.25	120	2.50	6	8	0.63	5	32	ML	29	85	45.9	124	0.97
51.0	-	52.5	51.75	120	2.54	8	11	0.63	7	35	ML	29.5	86	35.5	117	0.95
52.5	-	54.0	53.25	120	2.59	9	12	0.62	8	41	ML	30	87	34.6	117	0.93
54.0	-	55.5	54.75	120	2.63	3	4	0.62	3	18	ML	27.5	82	36.1	112	1.03
55.5	-	57.0	56.25	120	2.67	4	5	0.61	3	24	ML	28	83	36.9	114	1.01
57.0	-	58.5	57.75	120	2.72	3	4	0.61	2	18	ML	27.5	82	52.4	125	1.03
58.5	-	60.0	59.25	120	2.76	3	4	0.60	2	18	ML	27.5	82	55.9	128	1.03
60.0	-	61.5	60.75	115	2.80	0	0	0.60	1	11	ML	27	81	41.9	115	1.05
61.5	-	63.0	62.25	114	2.84	0	0	0.59	1	11	ML	27	81	40.3	114	1.05
63.0	-	64.5	63.75	120	2.88	11	15	0.59	9	41	ML	30	87	19.5	104	0.93
64.5	-	66.0	65.25	120	2.92	2	3	0.58	2	11	CL	FALSE	NA	22.1	NA	NA
66.0	-	67.5	66.75	120	2.97	0	0	0.58	1	11	CL	FALSE	NA	23.8	NA	NA
67.5	-	69.0	68.25	120	3.01	0	0	0.58	1	11	CL	FALSE	NA	23.6	NA	NA
69.0	-	70.5	69.75	120	3.05	2	3	0.57	2	11	CL	FALSE	NA	25.6	NA	NA
70.5	-	72.0	71.25	120	3.10	0	0	0.57	1	11	CL	FALSE	NA	24.5	NA	NA
72.0	-	73.5	72.75	120	3.14	3	4	0.56	2	18	CL	FALSE	NA	24.2	NA	NA
73.5	-	75.0	74.25	120	3.18	2	3	0.56	2	11	CL	FALSE	NA	23.4	NA	NA
75.0	-	76.5	75.75	120	3.22	1	1	0.56	1	#N/A	CL	FALSE	NA	25.7	NA	NA
76.5	-	78.0	77.25	120	3.27	2	3	0.55	2	11	CL	FALSE	NA	28.1	NA	NA
78.0	-	79.5	78.75	120	3.31	0	0	0.55	1	11	CL	FALSE	NA	28.3	NA	NA
79.5	-	81.0	80.25	120	3.35	0	0	0.55	1	11	CL	FALSE	NA	33.8	NA	NA
81.0	-	82.5	81.75	120	3.40	2	3	0.54	1	11	SW	28.4	104	39.6	145	0.6
82.5	-	84.0	83.25	120	3.44	3	4	0.54	2	18	SW	29	105	23.9	130	0.59
84.0	-	85.5	84.75	120	3.48	50	67	0.54	36	86	SW	38.5	120.5	9.9	132	0.39

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BULL RUN FOSSIL PLANT
CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS
FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
					Input Required											
STN-15				water =	12.5											
0.0	-	1.5	0.75	108	0.04	16	21	1.00	21	68	ML	32.5	91	19.0	108	0.83
1.5	-	3.0	2.25	117	0.13	23	31	1.00	31	79	ML	33.5	93	26.3	117	0.8
3.0	-	4.5	3.75	120	0.22	30	40	1.00	40	89	ML	34.5	95	31.0	124	0.75
4.5	-	6.0	5.25	120	0.31	27	36	1.00	36	86	ML	34.5	95	25.6	119	0.75
6.0	-	7.5	6.75	120	0.40	99	132	1.00	132	100	ML	36	98	22.3	120	0.7
7.5	-	9.0	8.25	120	0.49	19	25	1.00	25	74	ML	33	92	32.1	122	0.82
9.0	-	10.5	9.75	120	0.58	17	23	1.00	23	70	ML	33	92	39.8	129	0.82
10.5	-	12.0	11.25	120	0.67	15	20	1.00	20	67	SM	33.5	100	34.7	135	0.67
12.0	-	13.5	12.75	120	0.71	38	51	1.00	51	98	SM	37	107	24.6	133	0.56
13.5	-	35.4	24.45	120	1.05	20	27	0.98	26	75	SM	34.5	102	17.1	119	0.63
15.0	-	16.5	15.75	122	0.79	13	17	1.00	17	60	SM	33	99	22.9	122	0.69
16.5	-	18.0	17.25	121	0.84	16	21	1.00	21	68	ML	32.5	91	33.3	121	0.83
18.0	-	19.0	18.5	120	0.87	ST	NA	1.00	NA	NA	ML	#N/A	#N/A	22.4	#N/A	#N/A
19.0	-	20.5	19.75	137	0.92	16	21	1.00	21	68	SP	35.5	115	18.8	137	0.45
20.5	-	22.0	21.25	137	0.97	21	28	1.00	28	77	SP	37	117.5	16.9	137	0.42
22.0	-	23.5	22.75	134	1.03	20	27	0.99	26	75	SP	37	117.5	13.7	134	0.42
23.5	-	25.0	24.25	131	1.08	12	16	0.96	15	58	SP	34.4	113	16.2	131	0.48
25.0	-	26.5	25.75	136	1.13	11	15	0.94	14	53	SP	33.6	112	21.3	136	0.49
26.5	-	28.0	27.25	122	1.18	15	20	0.92	18	63	ML	32	90	35.1	122	0.85
28.0	-	29.5	28.75	126	1.23	6	8	0.90	7	39	ML	29.5	86	46.2	126	0.95
29.5	-	31.0	30.25	125	1.27	2	3	0.89	2	18	ML	27.5	82	52.2	125	1.03
31.0	-	32.5	31.75	133	1.33	6	8	0.87	7	35	ML	29.5	86	55.0	133	0.95
32.5	-	34.0	33.25	120	1.37	14	19	0.85	16	60	CH	FALSE	NA	24.2	NA	NA
34.0	-	35.5	34.75	120	1.41	10	13	0.84	11	47	CL	FALSE	NA	25.4	NA	NA
35.5	-	37.0	36.25	120	1.46	9	12	0.83	10	44	CL	FALSE	NA	23.1	NA	NA
37.0	-	38.5	37.75	120	1.50	17	23	0.82	19	63	CL	FALSE	NA	21.2	NA	NA
38.5	-	40.0	39.25	120	1.54	16	21	0.81	17	60	CL	FALSE	NA	22.6	NA	NA
40.0	-	41.5	40.75	120	1.59	10	13	0.79	11	47	CL	FALSE	NA	24.7	NA	NA
41.5	-	43.0	42.25	120	1.63	15	20	0.78	16	58	CL	FALSE	NA	23.2	NA	NA
43.0	-	44.5	43.75	120	1.67	9	12	0.77	9	44	CL	FALSE	NA	26.8	NA	NA
44.5	-	46.0	45.25	120	1.71	4	5	0.76	4	27	CL	FALSE	NA	26.8	NA	NA
46.0	-	47.5	46.75	120	1.76	7	9	0.75	7	39	CL	FALSE	NA	28.8	NA	NA
47.5	-	49.0	48.25	124	1.80	8	11	0.74	8	41	SW	32.3	110	12.6	124	0.52
49.0	-	50.5	49.75	129	1.85	16	21	0.73	16	58	SW	34.4	113	14.1	129	0.48
50.5	-	51.3	50.9	144	1.90	50	67	0.73	48	95	SW	40	123	17.4	144	0.36

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval	Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
		Input Required												
STN-16		water =	7.0											
0.0 - 1.5	0.75	120	0.05	11	15	1.00	15	56	CL	FALSE	NA	13.9	NA	NA
1.5 - 3.0	2.25	120	0.14	9	12	1.00	12	52	CL	FALSE	NA	20.1	NA	NA
3.0 - 4.5	3.75	120	0.23	11	15	1.00	15	56	CL	FALSE	NA	17.6	NA	NA
4.5 - 6.0	5.25	138	0.33	6	8	1.00	8	41	GC	32.8	114	20.8	138	0.47
6.0 - 7.5	6.75	142	0.43	6	8	1.00	8	41	GC	32.8	114	24.3	142	0.47
7.5 - 9.0	8.25	132	0.49	2	3	1.00	3	18	SP	29	105	25.5	132	0.59
9.0 - 10.5	9.75	137	0.54	2	3	1.00	3	18	SP	29	105	30.1	137	0.59
10.5 - 12.0	11.25	141	0.60	1	1	1.00	1	11	SP	28.4	104	35.5	141	0.6
12.0 - 13.5	12.75	127	0.65	4	5	1.00	5	32	ML	29	85	49.0	127	0.97
13.5 - 15.0	14.25	132	0.70	10	13	1.00	13	53	ML	31	88.5	49.2	132	0.89
15.0 - 16.5	15.75	122	0.75	12	16	1.00	16	60	ML	32	90	35.4	122	0.85
16.5 - 18.0	17.25	118	0.79	27	36	1.00	36	86	ML	34.5	95	23.7	118	0.75
18.0 - 19.5	18.75	115	0.83	8	11	1.00	11	47	ML	30.5	88	30.5	115	0.91
19.5 - 21.0	20.25	109	0.86	7	9	1.00	9	44	ML	30	87	25.2	109	0.93
21.0 - 22.5	21.75	120	0.90	13	17	1.00	17	60	CL	FALSE	NA	24.9	NA	NA
22.5 - 24.0	23.25	120	0.95	7	9	1.00	9	44	CL	FALSE	NA	22.5	NA	NA
24.0 - 25.5	24.75	120	0.99	14	19	1.00	19	63	CL	FALSE	NA	22.0	NA	NA
25.5 - 27.0	26.25	120	1.03	20	27	0.98	26	75	CL	FALSE	NA	24.1	NA	NA
27.0 - 28.5	27.75	120	1.08	25	33	0.96	32	82	CL	FALSE	NA	24.8	NA	NA
28.5 - 30.0	29.25	120	1.12	18	24	0.94	23	70	CL	FALSE	NA	24.3	NA	NA
30.0 - 31.5	30.75	120	1.16	7	9	0.93	9	41	CL	FALSE	NA	25.8	NA	NA
31.5 - 33.0	32.25	120	1.21	15	20	0.91	18	63	CL	FALSE	NA	24.5	NA	NA
33.0 - 34.5	33.75	120	1.25	12	16	0.89	14	56	CL	FALSE	NA	25.0	NA	NA
34.5 - 36.0	35.25	120	1.29	5	7	0.88	6	32	CL	FALSE	NA	25.1	NA	NA
36.0 - 37.5	36.75	120	1.34	11	15	0.86	13	52	CL	FALSE	NA	25.8	NA	NA
37.5 - 39.0	38.25	120	1.38	8	11	0.85	9	44	CL	FALSE	NA	25.8	NA	NA
39.0 - 40.5	39.75	140	1.44	3	4	0.83	3	24	SP	29.5	106	32.4	140	0.58
40.5 - 42.0	41.25	137	1.49	46	61	0.82	50	98	SP	40	123	11.3	137	0.36
42.0 - 42.7	42.35	120	1.53	50	67	0.81	54	99	Shale	FALSE	NA	14.7	NA	NA

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BULL RUN FOSSIL PLANT
CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS
FOR COARSE GRAINED SOILS

Sample Interval		Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
					Input Required										
STN-18			water =	16.0											
0.0 - 1.5		0.75	120	0.05	14	19	1.00	19	63	CL	FALSE	NA	13.9	NA	NA
1.5 - 3.0		2.25	121	0.14	18	24	1.00	24	73	SM	34	101	20.1	121	0.65
3.0 - 4.5		3.75	120	0.23	23	31	1.00	31	79	SM	34.5	102	17.6	120	0.63
4.5 - 6.0		5.25	121	0.32	15	20	1.00	20	67	SM	33.5	100	20.8	121	0.67
6.0 - 7.5		6.75	132	0.42	34	45	1.00	45	93	SM	36.5	106	24.3	132	0.58
7.5 - 9.0		8.25	133	0.52	32	43	1.00	43	91	SM	36.5	106	25.5	133	0.58
9.0 - 10.5		9.75	141	0.62	52	69	1.00	69	100	SM	38	108	30.1	141	0.55
10.5 - 12.0		11.25	146	0.73	52	69	1.00	69	100	SM	38	108	35.5	146	0.55
12.0 - 13.5		12.75	161	0.85	70	93	1.00	93	100	SM	38	108	49.0	161	0.55
13.5 - 15.0		14.25	152	0.97	22	29	1.00	29	79	SM	34.5	102	49.2	152	0.63
15.0 - 16.5		15.75	129	1.06	7	9	0.97	9	44	SM	30.5	95	35.4	129	0.76
16.5 - 18.0		17.25	118	1.10	6	8	0.95	8	41	SM	30.5	95	23.7	118	0.76
18.0 - 19.5		18.75	121	1.15	4	5	0.93	5	32	SM	29.5	93	30.5	121	0.8
19.5 - 21.0		20.25	103	1.18	2	3	0.92	3	18	ML	27.5	82	25.2	103	1.03
21.0 - 22.5		21.75	102	1.21	2	3	0.91	2	18	ML	27.5	82	24.9	102	1.03
22.5 - 24.0		23.25	102	1.24	3	4	0.90	4	24	ML	28	83	22.5	102	1.01
24.0 - 25.5		24.75	111	1.27	3	4	0.89	4	24	SM	28.5	91	22.0	111	0.83
25.5 - 27.0		26.25	113	1.31	3	4	0.87	4	24	SM	28.5	91	24.1	113	0.83
27.0 - 28.5		27.75	115	1.35	4	5	0.86	5	27	SM	29	92	24.8	115	0.82
28.5 - 30.0		29.25	114	1.39	4	5	0.85	5	27	SM	29	92	24.3	114	0.82
30.0 - 31.5		30.75	118	1.43	6	8	0.84	7	35	SM	30	94	25.8	118	0.78
31.5 - 33.0		32.25	115	1.47	4	5	0.82	4	27	SM	29	92	24.5	115	0.82
33.0 - 34.5		33.75	115	1.51	4	5	0.81	4	27	SM	29	92	25.0	115	0.82
34.5 - 36.0		35.25	114	1.55	3	4	0.80	3	24	SM	28.5	91	25.1	114	0.83
36.0 - 37.5		36.75	118	1.59	6	8	0.79	6	35	SM	30	94	25.8	118	0.78
37.5 - 39.0		38.25	120	1.63	7	9	0.78	7	39	CL	FALSE	NA	25.8	NA	NA
39.0 - 40.5		39.75	120	1.68	9	12	0.77	9	44	CL	FALSE	NA	32.4	NA	NA
40.5 - 42.0		41.25	120	1.72	8	11	0.76	8	41	CL	FALSE	NA	11.3	NA	NA
42.0 - 43.5		42.75	120	1.76	3	4	0.75	3	24	CL	FALSE	NA	14.7	NA	NA
43.5 - 45.0		44.25	120	1.81	5	7	0.74	5	32	CL	FALSE	NA	26.7	NA	NA
45.0 - 46.5		45.75	120	1.85	6	8	0.74	6	32	CL	FALSE	NA	23.6	NA	NA
46.5 - 48.0		47.25	120	1.89	8	11	0.73	8	41	CL	FALSE	NA	22.6	NA	NA
48.0 - 49.5		48.75	120	1.94	8	11	0.72	8	41	CL	FALSE	NA	21.6	NA	NA
49.5 - 51.0		50.25	140	1.99	35	47	0.71	33	84	SW	37.8	119	18.0	140	0.4
51.0 - 52.5		51.75	138	2.05	35	47	0.70	33	82	SW	37.8	119	15.8	138	0.4

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval	Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
		Input Required												
STN-19		water =	9.0											
0.0 - 1.5	0.75	144	0.05	14	19	1.00	19	63	GP	36	122.5	17.4	144	122.5
1.5 - 3.0	2.25	120	0.14	15	20	1.00	20	67	CL	FALSE	NA	24	NA	NA
3.0 - 4.5	3.75	120	0.23	22	29	1.00	29	79	CL	FALSE	NA	18.4	NA	NA
4.5 - 6.0	5.25	120	0.32	8	11	1.00	11	47	CL	FALSE	NA	20.8	NA	NA
6.0 - 7.5	6.75	120	0.41	15	20	1.00	20	67	CL	FALSE	NA	22	NA	NA
7.5 - 9.0	8.25	120	0.50	11	15	1.00	15	56	CL	FALSE	NA	26	NA	NA
9.0 - 10.5	9.75	115	0.54	4	5	1.00	5	32	SM	29.5	93	23.8	115	0.8
10.5 - 12.0	11.25	122	0.59	21	28	1.00	28	77	SM	34.5	102	19.9	122	0.63
12.0 - 13.5	12.75	120	0.63	30	40	1.00	40	89	CL	FALSE	NA	20.5	NA	NA
13.5 - 15.0	14.25	120	0.67	8	11	1.00	11	47	CL	FALSE	NA	18.6	NA	NA
15.0 - 16.5	15.75	120	0.72	5	7	1.00	7	35	CL	FALSE	NA	20.6	NA	NA
16.5 - 18.0	17.25	120	0.76	7	9	1.00	9	44	CL	FALSE	NA	22.2	NA	NA
18.0 - 19.5	18.75	120	0.80	19	25	1.00	25	74	CL	FALSE	NA	23.9	NA	NA
19.5 - 21.0	20.25	120	0.85	4	5	1.00	5	32	CL	FALSE	NA	22.7	NA	NA
21.0 - 22.5	21.75	120	0.89	7	9	1.00	9	44	CL	FALSE	NA	25.9	NA	NA
22.5 - 24.0	23.25	120	0.93	13	17	1.00	17	60	CL	FALSE	NA	23.4	NA	NA
24.0 - 25.5	24.75	120	0.98	13	17	1.00	17	60	CL	FALSE	NA	21.2	NA	NA
25.5 - 27.0	26.25	120	1.02	16	21	0.99	21	68	CL	FALSE	NA	21.4	NA	NA
27.0 - 28.5	27.75	120	1.06	14	19	0.97	18	63	CL	FALSE	NA	20.3	NA	NA
28.5 - 30.0	29.25	120	1.11	11	15	0.95	14	53	CL	FALSE	NA	20.8	NA	NA
30.0 - 31.5	30.75	120	1.15	9	12	0.93	11	47	CL	FALSE	NA	19.9	NA	NA
31.5 - 33.0	32.25	120	1.19	13	17	0.92	16	58	CL	FALSE	NA	25	NA	NA
33.0 - 34.5	33.75	120	1.24	14	19	0.90	17	60	CL	FALSE	NA	19.1	NA	NA
34.5 - 36.0	35.25	120	1.28	7	9	0.88	8	41	CL	FALSE	NA	21.4	NA	NA
36.0 - 37.5	36.75	120	1.32	4	5	0.87	5	27	CL	FALSE	NA	21	NA	NA
37.5 - 39.0	38.25	120	1.37	2	3	0.86	2	18	CL	FALSE	NA	23.3	NA	NA
39.0 - 40.5	39.75	120	1.41	6	8	0.84	7	35	CL	FALSE	NA	22.6	NA	NA
40.5 - 42.0	41.25	142	1.47	5	7	0.83	6	32	GW	32.2	124	14.8	142	0.34
42.0 - 43.5	42.75	171	1.55	53	71	0.80	57	100	GW	45	147	16.1	171	0.13
43.5 - 44.4	43.95	165	1.61	50	67	0.79	53	98	GW	44	145	13.7	165	0.15

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval		Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
				Input Required											
STN-20			water =	16.0											
0.0 - 1.5		0.75	117	0.04	20	27	1.00	27	75	SM	34.5	102	14.6	117	0.63
1.5 - 3.0		2.25	127	0.14	42	56	1.00	56	100	SM	38	108	17.8	127	0.55
3.0 - 4.5		3.75	127	0.23	51	68	1.00	68	100	SM	38	108	17.7	127	0.55
4.5 - 6.0		5.25	119	0.32	29	39	1.00	39	87	SM	36	105	13.2	119	0.6
6.0 - 7.5		6.75	120	0.41	24	32	1.00	32	82	SM	35.5	104	15.7	120	0.61
7.5 - 9.0		8.25	124	0.51	45	60	1.00	60	100	SM	38	108	15.2	124	0.55
9.0 - 10.5		9.75	129	0.60	43	57	1.00	57	100	SM	38	108	19.5	129	0.55
10.5 - 12.0		11.25	123	0.70	21	28	1.00	28	77	SM	34.5	102	20.1	123	0.63
12.0 - 13.5		12.75	128	0.79	17	23	1.00	23	70	SM	34	101	27.1	128	0.65
13.5 - 15.0		14.25	125	0.89	7	9	1.00	9	44	SM	30.5	95	31.3	125	0.76
15.0 - 16.5		15.75	127	0.98	5	7	1.00	7	35	SM	30	94	35.2	127	0.78
16.5 - 18.0		17.25	131	1.03	5	7	0.98	7	35	SM	30	94	39.0	131	0.78
18.0 - 19.5		18.75	124	1.08	0	0	0.96	1	11	SM	27.5	89.5	38.1	124	0.87
19.5 - 21.0		20.25	111	1.11	1	1	0.95	1	11	ML	27	81	36.6	111	1.05
21.0 - 22.5		21.75	108	1.15	0	0	0.93	1	11	ML	27	81	33.7	108	1.05
22.5 - 24.0		23.25	116	1.19	1	1	0.92	1	11	ML	27	81	42.9	116	1.05
24.0 - 26.0		25	105	1.23	ST	NA	0.90	NA	NA	ML	36	76.9	36.1	105	#N/A
26.0 - 27.5		26.75	116	1.27	2	3	0.89	2	18	ML	27.5	82	41.1	116	1.03
27.5 - 29.0		28.25	122	1.32	9	12	0.87	11	47	ML	30.5	88	38.7	122	0.91
29.0 - 31.0		30	107	1.36	ST	NA	0.86	NA	NA	ML	36	76.7	40.6	107	#N/A
31.0 - 32.5		31.75	116	1.40	2	3	0.84	2	18	ML	27.5	82	41.9	116	1.03
32.5 - 34.0		33.25	116	1.44	2	3	0.83	2	18	ML	27.5	82	41.4	116	1.03
34.0 - 35.5		34.75	112	1.48	0	0	0.82	1	11	ML	27	81	38.2	112	1.05
35.5 - 37.0		36.25	113	1.52	1	1	0.81	1	11	ML	27	81	39.7	113	1.05
37.0 - 38.5		37.75	115	1.56	0	0	0.80	1	11	ML	27	81	42.1	115	1.05
38.5 - 40.0		39.25	110	1.59	0	0	0.79	1	11	ML	27	81	35.5	110	1.05
40.0 - 41.5		40.75	111	1.63	0	0	0.78	1	11	ML	27	81	37.6	111	1.05
41.5 - 43.0		42.25	120	1.67	2	3	0.77	2	18	CL	FALSE	NA	39.0	NA	NA
43.0 - 44.5		43.75	120	1.72	3	4	0.76	3	24	CL	FALSE	NA	28.1	NA	NA
44.5 - 46.5		45.5	120	1.77	ST	NA	0.75	NA	NA	CL	NA	NA	30.4	117	NA
46.5 - 48.0		47.25	120	1.82	3	4	0.74	3	24	CL	FALSE	NA	22.3	NA	NA
48.0 - 49.5		48.75	120	1.86	10	13	0.73	10	44	CL	FALSE	NA	22.0	NA	NA
49.5 - 51.5		50.5	120	1.91	ST	NA	0.72	NA	NA	CL	NA	NA	24.6	125	NA
51.5 - 52.6		52.05	120	1.96	27	36	0.72	0.19	#N/A	GW	#N/A	#N/A	14.5	#N/A	#N/A

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval	Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
		Input Required												
STN-21		water =	12.4											
0.0 - 1.5	0.75	137	0.05	32	43	1.00	43	91	SP	39.3	121.5	12.6	137	0.37
1.5 - 3.0	2.25	148	0.16	42	56	1.00	56	100	SP	40.7	124	19.6	148	0.35
3.0 - 4.5	3.75	137	0.27	21	28	1.00	28	77	SP	37	117.5	16.4	137	0.42
4.5 - 6.0	5.25	143	0.37	10	13	1.00	13	53	SP	33.6	112	27.4	143	0.49
6.0 - 7.5	6.75	118	0.46	13	17	1.00	17	60	ML	32	90	30.8	118	0.85
7.5 - 9.0	8.25	106	0.54	5	7	1.00	7	35	ML	29.5	86	22.8	106	0.95
9.0 - 10.5	9.75	107	0.62	8	11	1.00	11	47	ML	30.5	88	21.6	107	0.91
10.5 - 12.0	11.25	168	0.75	14	19	1.00	19	63	SP	35	114	47.3	168	0.46
12.0 - 13.5	12.75	151	0.81	10	13	1.00	13	53	SP	33.6	112	35.0	151	0.49
13.5 - 15.0	14.25	120	0.86	6	8	1.00	8	41	ML	30	87	37.7	120	0.93
15.0 - 16.5	15.75	124	0.90	4	5	1.00	5	32	ML	29	85	45.4	124	0.97
16.5 - 18.0	17.25	120	0.94	6	8	1.00	8	41	ML	30	87	38.3	120	0.93
18.0 - 19.5	18.75	110	0.98	10	13	1.00	13	53	ML	31	88.5	24.6	110	0.89
19.5 - 21.0	20.25	120	1.02	13	17	0.99	17	60	CH	FALSE	NA	24.2	NA	NA
21.0 - 22.5	21.75	120	1.07	20	27	0.97	26	74	CH	FALSE	NA	23.3	NA	NA
22.5 - 24.0	23.25	120	1.11	22	29	0.95	28	77	CH	FALSE	NA	20.5	NA	NA
24.0 - 25.5	24.75	120	1.15	4	5	0.93	5	32	CL	FALSE	NA	23.4	NA	NA
25.5 - 27.0	26.25	120	1.20	4	5	0.91	5	27	CL	FALSE	NA	24.4	NA	NA
27.0 - 28.5	27.75	114	1.24	3	4	0.90	4	24	SC	28.5	91	25.3	114	0.83
28.5 - 30.0	29.25	111	1.27	3	4	0.89	4	24	SC	28.5	91	22.4	111	0.83
30.0 - 31.5	30.75	115	1.31	6	8	0.87	7	39	SC	30	94	22.7	115	0.78
31.5 - 33.0	32.25	117	1.35	6	8	0.86	7	35	SC	30	94	24.0	117	0.78
33.0 - 34.5	33.75	115	1.39	5	7	0.85	6	32	SC	29.5	93	23.9	115	0.8
34.5 - 36.0	35.25	112	1.43	1	1	0.84	1	11	SC	27.5	89.5	25.3	112	0.87
36.0 - 37.5	36.75	118	1.47	8	11	0.82	9	41	SC	30.5	95	24.4	118	0.76
37.5 - 39.0	38.25	138	1.53	7	9	0.81	8	41	SW	32.3	110	25.6	138	0.52
39.0 - 40.5	39.75	138	1.58	14	19	0.79	15	56	SW	34.4	113	21.7	138	0.48
40.5 - 42.0	41.25	142	1.64	44	59	0.78	46	93	SW	39.3	121.5	17.0	142	0.37
42.0 - 43.5	42.75	161	1.72	41	55	0.76	42	91	GW	43	143	12.8	161	0.16
43.5 - 44.8	44.15	160	1.79	50	67	0.75	50	97	GW	44	145	10.5	160	0.15

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
					Input Required											
STN-22				water =	40.0											
0.0	-	1.5	0.75	113	0.04	5	7	1.00	7	35	SM	30	94	20.4	113	0.78
1.5	-	3.0	2.25	112	0.13	8	11	1.00	11	47	SM	31	96	16.6	112	0.74
3.0	-	4.5	3.75	119	0.22	9	12	1.00	12	52	SM	32	97	22.8	119	0.72
4.5	-	6.0	5.25	116	0.30	4	5	1.00	5	32	SM	29.5	93	24.5	116	0.8
6.0	-	7.5	6.75	117	0.39	6	8	1.00	8	41	SM	30.5	95	23.5	117	0.76
7.5	-	9.0	8.25	120	0.48	7	9	1.00	9	44	CH	FALSE	NA	22.8	NA	NA
9.0	-	10.5	9.75	120	0.57	8	11	1.00	11	47	CH	FALSE	NA	21.6	NA	NA
10.5	-	12.0	11.25	120	0.66	8	11	1.00	11	47	CH	FALSE	NA	21.3	NA	NA
12.0	-	13.5	12.75	120	0.75	15	20	1.00	20	67	CH	FALSE	NA	22.2	NA	NA
13.5	-	15.0	14.25	120	0.84	13	17	1.00	17	60	CH	FALSE	NA	24.7	NA	NA
15.0	-	16.5	15.75	120	0.93	10	13	1.00	13	53	CH	FALSE	NA		NA	NA
16.5	-	18.0	17.25	120	1.02	12	16	0.99	16	58	CH	FALSE	NA	22.9	NA	NA
18.0	-	19.5	18.75	120	1.11	11	15	0.95	14	53	CH	FALSE	NA	21.9	NA	NA
19.5	-	21.0	20.25	120	1.20	6	8	0.91	7	39	CH	FALSE	NA	22.6	NA	NA
21.0	-	22.5	21.75	120	1.29	7	9	0.88	8	41	CH	FALSE	NA	23.3	NA	NA
22.5	-	24.0	23.25	120	1.38	9	12	0.85	10	47	CH	FALSE	NA	26.2	NA	NA
24.0	-	25.5	24.75	120	1.47	6	8	0.82	7	35	CH	FALSE	NA	24.0	NA	NA
25.5	-	27.0	26.25	120	1.56	2	3	0.80	2	18	CH	FALSE	NA	25.0	NA	NA
27.0	-	28.5	27.75	116	1.65	2	3	0.78	2	18	SC	28	90	29.4	116	0.85
28.5	-	30.0	29.25	133	1.75	4	5	0.76	4	27	SP	30	106.5	25.1	133	0.57
30.0	-	31.5	30.75	138	1.85	11	15	0.74	11	47	SP	33	111	23.9	138	0.5
31.5	-	33.0	32.25	134	1.95	43	57	0.72	41	91	SW	39.3	121.5	10.2	134	0.37
33.0	-	34.5	33.75	135	2.05	84	112	0.70	78	100	SW	40.7	124	9.2	135	0.35

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval		Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_{cl}	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
				Input Required											
STN-23			water =	30.1											
0.0 - 1.5		0.75	120	0.05	8	11	1.00	11	47	CH	FALSE	NA	17.1	NA	NA
1.5 - 3.0		2.25	120	0.14	12	16	1.00	16	60	CH	FALSE	NA	23.6	NA	NA
3.0 - 4.5		3.75	120	0.23	12	16	1.00	16	60	CH	FALSE	NA	28.3	NA	NA
4.5 - 6.0		5.25	120	0.32	11	15	1.00	15	56	CH	FALSE	NA	20.9	NA	NA
6.0 - 7.5		6.75	120	0.41	9	12	1.00	12	52	CH	FALSE	NA	26.7	NA	NA
7.5 - 9.0		8.25	120	0.50	7	9	1.00	9	44	CH	FALSE	NA	24.8	NA	NA
9.0 - 10.5		9.75	120	0.59	3	4	1.00	4	27	CH	FALSE	NA	18.7	NA	NA
10.5 - 12.0		11.25	120	0.68	39	52	1.00	52	98	CH	FALSE	NA	13.5	NA	NA
12.0 - 13.5		12.75	121	0.77	26	35	1.00	35	84	SM	35.5	104	16.6	121	0.61
13.5 - 15.0		14.25	111	0.85	4	5	1.00	5	32	SM	29.5	93	19.5	111	0.8
15.0 - 16.5		15.75	117	0.94	3	4	1.00	4	27	SM	29	92	26.7	117	0.82
16.5 - 18.0		17.25	104	1.01	1	1	0.99	1	11	SM	27.5	89.5	16.6	104	0.87
18.0 - 19.5		18.75	113	1.10	2	3	0.95	3	18	SM	28	90	25.7	113	0.85
19.5 - 21.0		20.25	115	1.19	4	5	0.92	5	27	SM	29	92	24.5	115	0.82
21.0 - 22.5		21.75	127	1.28	10	13	0.88	12	47	SM	31	96	32.2	127	0.74
22.5 - 24.0		23.25	120	1.37	7	9	0.85	8	41	ML	30	87	37.4	120	0.93
24.0 - 25.5		24.75	126	1.47	3	4	0.83	3	24	ML	28	83	52.2	126	1.01
25.5 - 27.0		26.25	123	1.56	5	7	0.80	5	32	ML	29	85	44.7	123	0.97
27.0 - 28.5		27.75	124	1.65	5	7	0.78	5	32	ML	29	85	46.2	124	0.97
28.5 - 30.0		29.25	120	1.74	4	5	0.76	4	27	ML	28.5	84	NA	#VALUE!	0.99
30.0 - 31.5		30.75	120	1.78	8	11	0.75	8	41	ML	30	87	28.5	112	0.93
31.5 - 33.0		32.25	120	1.83	8	11	0.74	8	41	ML	30	87	22.3	106	0.93
33.0 - 34.5		33.75	100	1.86	0	0	0.73	1	11	ML	27	81	23.6	100	1.05
34.5 - 36.0		35.25	109	1.89	0	0	0.73	1	11	ML	27	81	34.5	109	1.05
36.0 - 37.5		36.75	120	1.93	2	3	0.72	2	11	ML	27	81	42	115	1.05
37.5 - 39.0		38.25	120	1.98	4	5	0.71	4	24	SM	28.5	91	57.2	143	0.83
39.0 - 40.5		39.75	120	2.02	5	7	0.70	5	27	SM	29	92	43.7	132	0.82
40.5 - 42.0		41.25	120	2.06	1	1	0.70	1	NA	SM	NA	NA	36.1	NA	#N/A
42.0 - 43.5		42.75	120	2.11	2	3	0.69	2	11	SM	27.5	89.5	38	124	0.87
43.5 - 45.0		44.25	120	2.15	2	3	0.68	2	11	SM	27.5	89.5	42.2	127	0.87
45.0 - 46.5		45.75	124	2.20	0	0	0.67	1	11	SM	27.5	89.5	38.2	124	0.87
46.5 - 48.0		47.25	108	2.23	0	0	0.67	1	11	ML	27	81	33.6	108	1.05
48.0 - 49.5		48.75	107	2.26	0	0	0.66	1	11	ML	27	81	32.2	107	1.05
49.5 - 51.0		50.25	109	2.30	0	0	0.66	1	11	ML	27	81	34	109	1.05
51.0 - 52.5		51.75	110	2.33	0	0	0.65	1	11	ML	27	81	35.5	110	1.05
52.5 - 54.0		53.25	111	2.37	0	0	0.65	1	11	ML	27	81	37.6	111	1.05
54.0 - 55.5		54.75	120	2.41	7	9	0.64	6	35	CL	FALSE	NA	24	NA	NA
55.5 - 57.0		56.25	120	2.46	7	9	0.64	6	35	CL	FALSE	NA	26.6	NA	NA
57.0 - 58.5		57.75	120	2.50	14	19	0.63	12	47	CL	FALSE	NA	22.7	NA	NA
58.5 - 60.0		59.25	120	2.54	11	15	0.63	9	44	CL	FALSE	NA	23.3	NA	NA
60.0 - 61.5		60.75	120	2.59	12	16	0.62	10	44	CL	FALSE	NA	21.6	NA	NA
61.5 - 63.0		62.25	120	2.63	14	19	0.62	12	47	CL	FALSE	NA	21.5	NA	NA
63.0 - 64.5		63.75	120	2.67	15	20	0.61	12	52	CL	FALSE	NA	20.4	NA	NA
64.5 - 66.0		65.25	120	2.72	6	8	0.61	5	27	CL	FALSE	NA	26.1	NA	NA
66.0 - 67.5		66.75	120	2.76	5	7	0.60	4	27	SW	30	106.5	27.2	135	0.57
67.5 - 69.0		68.25	120	2.80	68	91	0.60	54	99	SW	40	123	17	144	0.36

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w
					Input Required										
STN-24				water =	13.5										
0.0	-	1.5	0.75	144	0.05	7	9	1.00	9	44	GP	33	118	21.8	144
1.5	-	3.0	2.25	120	0.14	12	16	1.00	16	60	CL	FALSE	NA	19.6	NA
3.0	-	4.5	3.75	120	0.23	9	12	1.00	12	52	CL	FALSE	NA	20.7	NA
4.5	-	6.0	5.25	128	0.33	11	15	1.00	15	56	CL	FALSE	NA	22.1	128
6.0	-	7.5	6.75	120	0.42	15	20	1.00	20	67	CL	FALSE	NA	22.3	NA
7.5	-	9.0	8.25	120	0.51	18	24	1.00	24	73	CL	FALSE	NA	22.7	NA
9.0	-	10.5	9.75	120	0.60	5	7	1.00	7	35	CL	FALSE	NA	25.1	NA
10.5	-	12.0	11.25	120	0.69	5	7	1.00	7	35	CL	FALSE	NA	27.6	NA
12.0	-	13.5	12.75	120	0.78	11	15	1.00	15	56	CL	FALSE	NA	24.9	NA
13.5	-	15.0	14.25	141	0.84	13	17	1.00	17	60	SM	33	99	42.5	141
15.0	-	16.5	15.75	125	0.89	0	0	1.00	1	11	SM	27.5	89.5	46.1	125
16.5	-	18.0	17.25	132	0.94	0	0	1.00	1	11	SM	27.5	89.5	47.2	132
18.0	-	19.5	18.75	126	0.99	3	4	1.00	4	27	SM	29	92	41.9	126
19.5	-	21.0	20.25	142	1.05	7	9	0.98	9	44	SM	30.5	95	49.7	142
21.0	-	22.5	21.75	124	1.09	3	4	0.96	4	24	SM	28.5	91	35.9	124
22.5	-	24.0	23.25	127	1.14	4	5	0.94	5	32	CL	FALSE	NA	25.3	127
24.0	-	25.5	24.75	120	1.18	5	7	0.92	6	35	CL	FALSE	NA	23.3	NA
25.5	-	27.0	26.25	120	1.23	2	3	0.90	2	18	CL	FALSE	NA	23.1	NA
27.0	-	28.5	27.75	120	1.27	4	5	0.89	5	27	CL	FALSE	NA	25.5	NA
28.5	-	30.0	29.25	108	1.30	8	11	0.88	9	44	ML	30	87	23.6	108
30.0	-	31.5	30.75	103	1.33	2	3	0.87	2	18	ML	27.5	82	25.9	103
31.5	-	33.0	32.25	109	1.37	8	11	0.85	9	44	ML	30	87	24.8	109
33.0	-	34.5	33.75	115	1.41	7	9	0.84	8	41	ML	30	87	32.4	115
34.5	-	36.0	35.25	116	1.45	8	11	0.83	9	41	ML	30	87	33.3	116
36.0	-	37.5	36.75	117	1.49	14	19	0.82	15	58	ML	31.5	89.5	30.6	117
37.5	-	39.0	38.25	111	1.53	8	11	0.81	9	41	ML	30	87	27.9	111
39.0	-	40.5	39.75	110	1.56	8	11	0.80	9	41	ML	30	87	25.9	110
40.5	-	42.0	41.25	120	1.60	5	7	0.79	5	32	CL	FALSE	NA	21.6	NA
42.0	-	43.5	42.75	132	1.66	9	12	0.78	9	44	SW	32.3	110	20	132
43.5	-	45.0	44.25	138	1.71	50	67	0.76	51	98	SW	40	123	12	138

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval		Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
				Input Required									
STN-25			water =	18.0									
0.0 - 1.5		0.75	120	0.05	13	17	1.00	17	60	CL	FALSE	NA	15.9
1.5 - 3.0		2.25	122	0.14	19	25	1.00	25	74	SM	34	101	20.3
3.0 - 4.5		3.75	129	0.23	20	27	1.00	27	75	SM	34.5	102	26.5
4.5 - 6.0		5.25	124	0.33	17	23	1.00	23	70	SM	34	101	22.3
6.0 - 7.5		6.75	130	0.42	20	27	1.00	27	75	SM	34.5	102	27.3
7.5 - 9.0		8.25	123	0.52	26	35	1.00	35	84	SM	35.5	104	18.6
9.0 - 10.5		9.75	126	0.61	24	32	1.00	32	82	SM	35.5	104	21.6
10.5 - 12.0		11.25	135	0.71	26	35	1.00	35	84	SM	35.5	104	29.9
12.0 - 13.5		12.75	134	0.81	56	75	1.00	75	100	SM	38	108	24
13.5 - 15.0		14.25	134	0.91	20	27	1.00	27	75	SM	34.5	102	31.3
15.0 - 16.5		15.75	152	1.03	18	24	0.99	24	71	SM	34	101	50.7
16.5 - 18.0		17.25	148	1.14	20	27	0.94	25	74	SM	34	101	47
18.0 - 19.5		18.75	138	1.19	14	19	0.91	17	60	SM	33	99	39.4
19.5 - 21.0		20.25	138	1.25	7	9	0.89	8	41	SM	30.5	95	45.2
21.0 - 22.5		21.75	137	1.31	10	13	0.87	12	47	SM	31	96	43
22.5 - 24.0		23.25	133	1.36	18	24	0.86	21	67	SM	33.5	100	32.7
24.0 - 25.5		24.75	114	1.40	4	5	0.85	5	27	ML	28.5	84	35.9
25.5 - 27.0		26.25	115	1.44	14	19	0.83	16	58	ML	31.5	89.5	28.3
27.0 - 28.5		27.75	110	1.47	6	8	0.82	7	35	ML	29.5	86	28.2
28.5 - 30.0		29.25	111	1.51	3	4	0.81	3	24	ML	28	83	34
30.0 - 31.5		30.75	161	1.59	0	0	0.79	1	11	SM	27.5	89.5	80.3
31.5 - 33.0		32.25	159	1.66	0	0	0.78	1	11	SM	27.5	89.5	77.9
33.0 - 34.5		33.75	167	1.74	2	3	0.76	2	18	SM	28	90	85.1
34.5 - 36.0		35.25	134	1.79	0	0	0.75	1	11	SM	27.5	89.5	49.5
36.0 - 37.5		36.75	144	1.85	0	0	0.74	1	11	SM	27.5	89.5	60.8
37.5 - 39.0		38.25	134	1.90	1	1	0.72	1	11	SM	27.5	89.5	50.2
39.0 - 40.5		39.75	142	1.96	1	1	0.71	1	11	SM	27.5	89.5	58.6
40.5 - 42.0		41.25	126	2.01	0	0	0.70	1	11	SM	27.5	89.5	40.9
42.0 - 43.5		42.75	120	2.06	1	1	0.70	1	11	ML	27	81	27.3
43.5 - 45.0		44.25	120	2.10	2	3	0.69	2	11	ML	27	81	26.3
45.0 - 46.5		45.75	120	2.14	2	3	0.68	2	11	ML	27	81	24.9
46.5 - 48.0		47.25	120	2.18	7	9	0.68	6	35	ML	29.5	86	32.7
48.0 - 49.5		48.75	120	2.23	11	15	0.67	10	44	CL	FALSE	NA	25.9
49.5 - 51.0		50.25	120	2.27	2	3	0.66	2	11	CL	FALSE	NA	25.5
51.0 - 52.5		51.75	120	2.31	6	8	0.66	5	32	CL	FALSE	NA	23.4
52.5 - 54.0		53.25	120	2.36	6	8	0.65	5	32	CL	FALSE	NA	21.9
54.0 - 55.5		54.75	120	2.40	7	9	0.65	6	35	CL	FALSE	NA	21.5
55.5 - 57.0		56.25	120	2.44	6	8	0.64	5	32	CL	FALSE	NA	22.8
57.0 - 58.5		57.75	135	2.50	8	11	0.63	7	35	SW	31.5	109	23.9
58.5 - 60.0		59.25	120	2.54	26	35	0.63	22	68	SW	35.5	115	19.5

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
						Input Required								
STN-25P				water =	19.0									
0.0	-	1.5	0.75	120	0.05	10	13	1.00	13	53	CL	FALSE	NA	20.1
1.5	-	3.0	2.25	120	0.14	13	17	1.00	17	60	CL	FALSE	NA	19.9
3.0	-	4.5	3.75	120	0.23	11	15	1.00	15	56	CL	FALSE	NA	25.8
4.5	-	6.5	5.5	120	0.33	ST	NA	1.00	NA	NA	CL	NA	NA	16.7
6.5	-	8.0	7.25	120	0.44	9	12	1.00	12	52	CL	FALSE	NA	22.0
8.0	-	9.5	8.75	120	0.53	19	25	1.00	25	74	CL	FALSE	NA	17.0
9.5	-	11.0	10.25	142	0.63	22	29	1.00	29	79	SP	37	117.5	20.5
11.0	-	12.5	11.75	120	0.72	27	36	1.00	36	86	CH	FALSE	NA	20.4
12.5	-	14.0	13.25	120	0.81	23	31	1.00	31	79	CH	FALSE	NA	24.5
14.0	-	15.5	14.75	120	0.90	8	11	1.00	11	47	CH	FALSE	NA	21.2
15.5	-	17.5	16.5	120	1.01	ST	NA	1.00	NA	NA	CH	NA	NA	24.8
17.5	-	19.0	18.25	120	1.11	5	7	0.95	6	35	CH	FALSE	NA	28.0
19.0	-	21.0	20	120	1.16	ST	NA	0.93	NA	NA	CH	NA	NA	25.0
21.0	-	22.5	21.75	120	1.21	7	9	0.91	9	41	CH	FALSE	NA	27.3
22.5	-	24.0	23.25	120	1.26	19	25	0.89	23	70	CH	FALSE	NA	23.8
24.0	-	26.0	25	120	1.31	ST	NA	0.88	NA	NA	CH	NA	NA	22.2
26.0	-	27.5	26.75	120	1.36	6	8	0.86	7	35	CH	FALSE	NA	20.7
27.5	-	29.0	28.25	120	1.40	7	9	0.85	8	41	CH	FALSE	NA	20.6
29.0	-	30.5	29.75	132	1.45	1	1	0.83	1	11	SW	28.4	104	26.5
30.5	-	32.0	31.25	130	1.50	4	5	0.82	4	27	SW	30	106.5	21.8
32.0	-	33.5	32.75	137	1.56	7	9	0.80	8	41	SW	32.3	110	24.5
33.5	-	35.0	34.25	126	1.61	3	4	0.79	3	24	SW	29.5	106	18.7
35.0	-	36.5	35.75	129	1.65	5	7	0.78	5	32	SW	30.8	108	19.2
36.5	-	38.0	37.25	127	1.70	4	5	0.77	4	27	SW	30	106.5	19.2
38.0	-	39.5	38.75	126	1.75	3	4	0.76	3	24	SW	29.5	106	19.2
39.5	-	41.0	40.25	127	1.80	4	5	0.75	4	27	SW	30	106.5	19.5
41.0	-	42.5	41.75	122	1.84	4	5	0.74	4	24	SW	29.5	106	15.4
42.5	-	44.0	43.25	140	1.90	37	49	0.72	36	86	SW	38.5	120.5	16.1
44.0	-	44.5	44.25	135	1.94	50	67	0.72	48	95	SW	40	123	9.6

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
						Input Required								
STN-26				water =	10.0									
0.0	-	1.5	0.75	120	0.05	5	7	1.00	7	35	CL	FALSE	NA	19.7
1.5	-	3.0	2.25	115	0.13	6	8	1.00	8	41	SM	30.5	95	21
3.0	-	4.5	3.75	128	0.23	16	21	1.00	21	68	SM	33.5	100	28.3
4.5	-	6.0	5.25	129	0.32	12	16	1.00	16	60	SM	33	99	30.3
6.0	-	7.5	6.75	121	0.42	31	41	1.00	41	91	SM	36.5	106	14.4
7.5	-	9.0	8.25	122	0.51	24	32	1.00	32	82	SM	35.5	104	17.4
9.0	-	10.5	9.75	108	0.59	5	7	1.00	7	35	SM	30	94	15.2
10.5	-	12.0	11.25	122	0.63	3	4	1.00	4	27	SM	29	92	32.6
12.0	-	13.5	12.75	136	0.69	4	5	1.00	5	32	SM	29.5	93	45.8
13.5	-	15.0	14.25	116	0.73	3	4	1.00	4	27	ML	28.5	84	38.3
15.0	-	16.5	15.75	128	0.78	2	3	1.00	3	18	ML	27.5	82	55.9
16.5	-	18.0	17.25	120	0.82	1	1	1.00	1	11	CL	FALSE	NA	32.9
18.0	-	19.5	18.75	134	0.87	1	1	1.00	1	11	SM	27.5	89.5	50.2
19.5	-	21.0	20.25	132	0.93	3	4	1.00	4	27	SM	29	92	43.1
21.0	-	22.5	21.75	141	0.98	3	4	1.00	4	27	SM	29	92	53.1
22.5	-	24.0	23.25	149	1.05	2	3	0.98	3	18	SM	28	90	65.5
24.0	-	25.5	24.75	140	1.11	2	3	0.95	3	18	SM	28	90	55.4
25.5	-	27.0	26.25	114	1.15	2	3	0.93	3	18	SM	28	90	27
27.0	-	28.5	27.75	120	1.19	4	5	0.92	5	27	CL	FALSE	NA	26.6
28.5	-	30.0	29.25	120	1.23	3	4	0.90	4	24	CL	FALSE	NA	28.5
30.0	-	31.5	30.75	120	1.28	1	1	0.89	1	11	CL	FALSE	NA	23.8
31.5	-	33.0	32.25	120	1.32	3	4	0.87	4	24	CL	FALSE	NA	31.9
33.0	-	34.5	33.75	120	1.36	16	21	0.86	18	63	CL	FALSE	NA	22
34.5	-	36.0	35.25	120	1.41	13	17	0.84	15	56	CL	FALSE	NA	22.1
36.0	-	37.5	36.75	120	1.45	19	25	0.83	21	68	CL	FALSE	NA	20.7
37.5	-	39.0	38.25	120	1.49	22	29	0.82	24	73	CL	FALSE	NA	20.7
39.0	-	40.5	39.75	120	1.54	9	12	0.81	10	44	CL	FALSE	NA	23.5
40.5	-	42.0	41.25	120	1.58	11	15	0.80	12	47	CL	FALSE	NA	23.4
42.0	-	43.5	42.75	120	1.62	16	21	0.79	17	60	CL	FALSE	NA	22.8
43.5	-	45.0	44.25	120	1.67	5	7	0.77	5	32	CL	FALSE	NA	24
45.0	-	46.5	45.75	103	1.70	2	3	0.77	2	18	ML	27.5	82	25.2
46.5	-	48.0	47.25	102	1.72	0	0	0.76	1	11	ML	27	81	25.5
48.0	-	49.5	48.75	120	1.77	3	4	0.75	3	24	CL	FALSE	NA	25.3
49.5	-	51.0	50.25	120	1.81	4	5	0.74	4	27	CL	FALSE	NA	24.3
51.0	-	52.5	51.75	120	1.85	35	47	0.73	34	84	CL	FALSE	NA	10.6
52.5	-	54.0	53.25	120	1.90	50	67	0.73	48	95	CL	FALSE	NA	8.6

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_a	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
					Input Required									
STN-27				water =	25.0									
0.0	-	1.5	0.75	120	0.05	5	7	1.00	7	35	CL	FALSE	NA	16.8
1.5	-	3.0	2.25	116	0.13	6	8	1.00	8	41	SM	30.5	95	22
3.0	-	4.5	3.75	117	0.22	16	21	1.00	21	68	SM	33.5	100	17
4.5	-	6.0	5.25	115	0.31	12	16	1.00	16	60	SM	33	99	16.4
6.0	-	7.5	6.75	131	0.40	31	41	1.00	41	91	SM	36.5	106	23.5
7.5	-	9.0	8.25	128	0.50	24	32	1.00	32	82	SM	35.5	104	22.8
9.0	-	10.5	9.75	112	0.58	5	7	1.00	7	35	SM	30	94	18.7
10.5	-	12.0	11.25	105	0.66	3	4	1.00	4	27	SM	29	92	13.9
12.0	-	13.5	12.75	113	0.75	4	5	1.00	5	32	SM	29.5	93	21.7
13.5	-	15.0	14.25	110	0.83	3	4	1.00	4	27	SM	29	92	19.9
15.0	-	16.5	15.75	102	0.91	2	3	1.00	3	18	SM	28	90	13.5
16.5	-	18.0	17.25	115	0.99	1	1	1.00	1	11	SM	27.5	89.5	28.2
18.0	-	19.5	18.75	118	1.08	1	1	0.96	1	11	SM	27.5	89.5	32.1
19.5	-	21.0	20.25	116	1.17	3	4	0.93	4	24	SM	28.5	91	28
21.0	-	22.5	21.75	129	1.27	3	4	0.89	4	24	SM	28.5	91	42.3
22.5	-	24.0	23.25	125	1.36	2	3	0.86	2	18	SM	28	90	39.2
24.0	-	25.5	24.75	134	1.46	2	3	0.83	2	18	SM	28	90	48.9
25.5	-	27.0	26.25	113	1.50	2	3	0.82	2	18	ML	27.5	82	37.9
27.0	-	28.5	27.75	127	1.55	4	5	0.80	4	27	ML	28.5	84	51.3
28.5	-	30.0	29.25	114	1.59	3	4	0.79	3	24	ML	28	83	37.2
30.0	-	31.5	30.75	110	1.62	1	1	0.79	1	11	ML	27	81	35.7
31.5	-	33.0	32.25	163	1.70	3	4	0.77	3	24	SM	28.5	91	78.9
33.0	-	34.5	33.75	152	1.76	16	21	0.75	16	60	SM	33	99	53.5
34.5	-	36.0	35.25	124	1.81	13	17	0.74	13	52	ML	31	88.5	39.7
36.0	-	37.5	36.75	140	1.87	19	25	0.73	19	63	SM	33	99	41.1
37.5	-	39.0	38.25	127	1.92	22	29	0.72	21	68	ML	32.5	91	39.4
39.0	-	40.5	39.75	118	1.96	9	12	0.71	9	41	ML	30	87	35.6
40.5	-	42.0	41.25	120	2.00	11	15	0.71	10	47	CL	FALSE	NA	26
42.0	-	43.5	42.75	120	2.04	16	21	0.70	15	56	CL	FALSE	NA	25.6
43.5	-	45.0	44.25	120	2.09	5	7	0.69	5	27	CL	FALSE	NA	20.3
45.0	-	46.5	45.75	120	2.13	2	3	0.69	2	11	CL	FALSE	NA	21.8
46.5	-	48.0	47.25	120	2.17	0	0	0.68	1	11	CL	FALSE	NA	20.6
48.0	-	49.5	48.75	120	2.22	3	4	0.67	3	18	CL	FALSE	NA	20
49.5	-	51.0	50.25	120	2.26	4	5	0.67	4	24	CL	FALSE	NA	20.3
51.0	-	52.5	51.75	120	2.30	35	47	0.66	31	79	CL	FALSE	NA	21.4
52.5	-	54.0	53.25	151	2.37	50	67	0.65	43	91	SW	39.3	121.5	23.9
54.0	-	55.5	54.75	138	2.43	7	9	0.64	6	35	SW	31.5	109	26.6
55.5	-	57.0	56.25	136	2.48	6	8	0.63	5	32	SW	30.8	108	25.9
57.0	-	58.5	57.75	137	2.54	8	11	0.63	7	35	SW	31.5	109	26
58.5	-	60.0	59.25	141	2.60	26	35	0.62	22	68	SW	35.5	115	23
60.0	-	61.5	60.75	128	2.65	0	0	0.61	1	11	SW	28.4	104	23.2
61.5	-	63.0	62.25	147	2.71	0	0	0.61	1	11	GW	29.5	120	22.1
63.0	-	64.5	63.75	130	2.76	0	0	0.60	1	11	GW	29.5	120	8.7
64.5	-	65.8	65.15	131	2.81	0	0	0.60	1	11	GW	29.5	120	9.5

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
					Input Required									
STN-28				water =	10.0									
0.0	-	1.5	0.75	120	0.05	6	8	1.00	8	41	CL	FALSE	NA	20.3
1.5	-	3.0	2.25	109	0.13	14	19	1.00	19	63	ML	32	90	21.2
3.0	-	4.5	3.75	115	0.21	21	28	1.00	28	77	ML	33.5	93	23.5
4.5	-	6.0	5.25	112	0.30	9	12	1.00	12	52	ML	31	88.5	26.4
6.0	-	7.5	6.75	114	0.38	12	16	1.00	16	60	ML	32	90	26.2
7.5	-	9.0	8.25	117	0.47	19	25	1.00	25	74	ML	33	92	26.7
9.0	-	10.5	9.75	113	0.55	6	8	1.00	8	41	ML	30	87	30.4
10.5	-	12.0	11.25	123	0.60	5	7	1.00	7	35	SM	30	94	31
12.0	-	13.5	12.75	130	0.65	3	4	1.00	4	27	SM	29	92	41.2
13.5	-	15.0	14.25	118	0.69	3	4	1.00	4	27	ML	28.5	84	39.9
15.0	-	16.5	15.75	122	0.74	4	5	1.00	5	32	ML	29	85	43
16.5	-	18.0	17.25	120	0.78	2	3	1.00	3	18	CH	FALSE	NA	37.7
18.0	-	19.5	18.75	120	0.82	1	1	1.00	1	11	CH	FALSE	NA	35.6
19.5	-	21.0	20.25	119	0.87	1	1	1.00	1	11	ML	27	81	46.6
21.0	-	22.5	21.75	107	0.90	0	0	1.00	1	11	ML	27	81	32.7
22.5	-	24.0	23.25	124	0.94	2	3	1.00	3	18	ML	27.5	82	51
24.0	-	25.5	24.75	124	0.99	1	1	1.00	1	11	ML	27	81	53
25.5	-	27.0	26.25	129	1.04	0	0	0.98	1	11	ML	27	81	59.2
27.0	-	28.5	27.75	116	1.08	0	0	0.96	1	11	ML	27	81	43.2
28.5	-	30.0	29.25	104	1.11	1	1	0.95	1	11	ML	27	81	28.4
30.0	-	31.5	30.75	120	1.16	4	5	0.93	5	32	CL	FALSE	NA	27.5
31.5	-	33.0	32.25	120	1.20	7	9	0.91	9	41	CL	FALSE	NA	26.7
33.0	-	34.5	33.75	120	1.24	13	17	0.90	16	58	CL	FALSE	NA	23.2
34.5	-	36.0	35.25	120	1.29	11	15	0.88	13	52	CL	FALSE	NA	20.7
36.0	-	37.5	36.75	120	1.33	16	21	0.87	19	63	CL	FALSE	NA	21.7
37.5	-	39.0	38.25	120	1.37	14	19	0.85	16	58	CL	FALSE	NA	22.4
39.0	-	40.5	39.75	120	1.41	8	11	0.84	9	44	CL	FALSE	NA	23.6
40.5	-	42.0	41.25	120	1.46	9	12	0.83	10	44	CL	FALSE	NA	23.7
42.0	-	43.5	42.75	120	1.50	5	7	0.82	5	32	CL	FALSE	NA	23.2
43.5	-	45.0	44.25	120	1.54	8	11	0.80	9	41	CL	FALSE	NA	24.1
45.0	-	46.5	45.75	120	1.59	4	5	0.79	4	27	CL	FALSE	NA	23.4
46.5	-	48.0	47.25	120	1.63	5	7	0.78	5	32	CL	FALSE	NA	24.8
48.0	-	49.5	48.75	120	1.67	13	17	0.77	13	53	CL	FALSE	NA	24.3
49.5	-	51.0	50.25	120	1.72	15	20	0.76	15	58	CL	FALSE	NA	14.6
51.0	-	52.2	51.6	120	1.76	50	67	0.75	50	98	CL	FALSE	NA	13.4

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
					Input Required									
STN-29				water =	9.0									
0.0	-	1.5	0.75	120	0.05	10	13	1.00	13	53	CL	FALSE	NA	10.9
1.5	-	3.0	2.25	115	0.13	13	17	1.00	17	60	SM	33	99	16
3.0	-	4.5	3.75	111	0.21	12	16	1.00	16	60	SM	33	99	12.3
4.5	-	6.0	5.25	111	0.30	9	12	1.00	12	52	SM	32	97	14.6
6.0	-	7.5	6.75	121	0.39	20	27	1.00	27	75	SM	34.5	102	18.6
7.5	-	9.0	8.25	115	0.48	12	16	1.00	16	60	SM	33	99	16.4
9.0	-	10.5	9.75	115	0.51	5	7	1.00	7	35	SM	30	94	22.7
10.5	-	12.0	11.25	118	0.56	4	5	1.00	5	32	SM	29.5	93	27.1
12.0	-	13.5	12.75	129	0.61	2	3	1.00	3	18	SM	28	90	43
13.5	-	15.0	14.25	119	0.65	2	3	1.00	3	18	ML	27.5	82	45.7
15.0	-	16.5	15.75	119	0.69	1	1	1.00	1	11	ML	27	81	46.9
16.5	-	18.0	17.25	113	0.73	0	0	1.00	1	11	ML	27	81	39
18.0	-	19.5	18.75	112	0.77	0	0	1.00	1	11	ML	27	81	37.7
19.5	-	21.0	20.25	130	0.82	1	1	1.00	1	11	ML	27	81	60.8
21.0	-	22.5	21.75	130	0.87	3	4	1.00	4	27	ML	28.5	84	54.9
22.5	-	24.0	23.25	127	0.92	2	3	1.00	3	18	ML	27.5	82	54.9
24.0	-	25.5	24.75	136	0.97	2	3	1.00	3	18	SM	28	90	50.8
25.5	-	27.0	26.25	142	1.03	2	3	0.98	3	18	SM	28	90	58
27.0	-	28.5	27.75	113	1.07	0	0	0.97	1	11	ML	27	81	39.1
28.5	-	30.0	29.25	120	1.11	1	1	0.95	1	11	CL	FALSE	NA	27.6
30.0	-	31.5	30.75	120	1.16	2	3	0.93	3	18	CL	FALSE	NA	26.2
31.5	-	33.0	32.25	120	1.20	6	8	0.91	7	39	CL	FALSE	NA	23.5
33.0	-	34.5	33.75	120	1.24	9	12	0.90	11	47	CL	FALSE	NA	23.2
34.5	-	36.0	35.25	120	1.28	15	20	0.88	18	60	SHALE	FALSE	NA	26.1
36.0	-	37.5	36.75	120	1.33	14	19	0.87	16	60	SHALE	FALSE	NA	28.3
37.5	-	38.4	37.95	120	1.36	50	67	0.86	57	100	SHALE	FALSE	NA	16.4

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BULL RUN FOSSIL PLANT
CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS
FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
						Input Required								
STN-29P				water =	9.0									
0.0	-	2.0	1	120	0.06	10	13	1.00	13	53	CL	FALSE	NA	10.9
2.0	-	4.0	3	115	0.17	13	17	1.00	17	60	SM	33	99	16
4.0	-	6.0	5	111	0.29	12	16	1.00	16	60	SM	33	99	12.3
6.0	-	8.0	7	111	0.40	9	12	1.00	12	52	SM	32	97	14.6
8.0	-	10.0	9	121	0.52	20	27	1.00	27	75	SM	34.5	102	18.6
10.0	-	12.0	11	115	0.57	12	16	1.00	16	60	SM	33	99	16.4
12.0	-	14.0	13	115	0.62	5	7	1.00	7	35	SM	30	94	22.7
14.0	-	16.0	15	118	0.68	4	5	1.00	5	32	SM	29.5	93	27.1
16.0	-	18.0	17	129	0.75	2	3	1.00	3	18	SM	28	90	43
18.0	-	20.0	19	119	0.80	2	3	1.00	3	18	ML	27.5	82	45.7
20.0	-	22.0	21	119	0.86	1	1	1.00	1	11	ML	27	81	46.9
22.0	-	24.0	23	113	0.91	0	0	1.00	1	11	ML	27	81	39
24.0	-	26.0	25	112	0.96	0	0	1.00	1	11	ML	27	81	37.7
26.0	-	28.0	27	130	1.03	1	1	0.99	1	11	ML	27	81	60.8
28.0	-	30.0	29	129	1.09	3	4	0.96	4	24	ML	28	83	54.9
30.0	-	32.0	31	127	1.16	2	3	0.93	3	18	ML	27.5	82	54.9
32.0	-	34.0	33	136	1.23	2	3	0.90	2	18	SM	28	90	50.8
34.0	-	35.0	34.5	142	1.29	2	3	0.88	2	18	SM	28	90	58
35.0	-	37.0	36	113	1.33	0	0	0.87	1	11	ML	27	81	39.1
37.0	-	39.0	38	120	1.39	1	1	0.85	1	11	CL	FALSE	NA	27.6
39.0	-	41.0	40	120	1.44	2	3	0.83	2	18	CL	FALSE	NA	26.2
41.0	-	43.0	42	120	1.50	6	8	0.82	7	35	CL	FALSE	NA	23.5
43.0	-	45.0	44	120	1.56	9	12	0.80	10	44	CL	FALSE	NA	23.2
45.0	-	47.0	46	120	1.62	15	20	0.79	16	58	SHALE	FALSE	NA	26.1
47.0	-	49.0	48	120	1.67	14	19	0.77	14	56	SHALE	FALSE	NA	28.3
49.0	-	51.0	50	120	1.73	50	67	0.76	51	98	SHALE	FALSE	NA	16.4

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval		Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
				Input Required									
STN-30			water =	19.0									
0.0 - 1.5		0.75	120	0.05	17	23	1.00	23	70	CL	FALSE	NA	22.7
1.5 - 3.0		2.25	124	0.14	26	35	1.00	35	84	SM	35.5	104	19.6
3.0 - 4.5		3.75	128	0.23	32	43	1.00	43	91	SM	36.5	106	21.2
4.5 - 6.0		5.25	121	0.33	16	21	1.00	21	68	SM	33.5	100	21.2
6.0 - 7.5		6.75	120	0.42	14	19	1.00	19	63	SM	33	99	21.3
7.5 - 9.0		8.25	129	0.51	21	28	1.00	28	77	SM	34.5	102	26.7
9.0 - 10.5		9.75	118	0.60	14	19	1.00	19	63	SM	33	99	19.5
10.5 - 12.0		11.25	127	0.70	21	28	1.00	28	77	SM	34.5	102	24.5
12.0 - 13.5		12.75	127	0.79	20	27	1.00	27	75	SM	34.5	102	24.9
13.5 - 15.0		14.25	145	0.90	18	24	1.00	24	73	SM	34	101	43.1
15.0 - 16.5		15.75	143	1.01	13	17	1.00	17	60	SM	33	99	44.8
16.5 - 18.0		17.25	146	1.12	13	17	0.95	16	60	SM	33	99	47
18.0 - 19.5		18.75	136	1.22	3	4	0.91	4	24	SM	28.5	91	49.6
19.5 - 21.0		20.25	138	1.28	0	0	0.89	1	11	SM	27.5	89.5	54.3
21.0 - 22.5		21.75	138	1.33	2	3	0.87	2	18	SM	28	90	52.9
22.5 - 24.0		23.25	111	1.37	1	1	0.85	1	11	ML	27	81	37.4
24.0 - 25.5		24.75	117	1.41	3	4	0.84	3	24	ML	28	83	40.7
25.5 - 27.0		26.25	112	1.45	1	1	0.83	1	11	ML	27	81	38.8
27.0 - 28.5		27.75	116	1.49	1	1	0.82	1	11	ML	27	81	42.7
28.5 - 30.0		29.25	111	1.52	4	5	0.81	4	27	ML	28.5	84	32.7
30.0 - 31.5		30.75	109	1.56	2	3	0.80	2	18	ML	27.5	82	33.4
31.5 - 33.0		32.25	107	1.59	0	0	0.79	1	11	ML	27	81	32.3
33.0 - 34.5		33.75	122	1.64	0	0	0.78	1	11	ML	27	81	50.5
34.5 - 36.0		35.25	118	1.68	0	0	0.77	1	11	ML	27	81	45.7
36.0 - 37.5		36.75	122	1.72	0	0	0.76	1	11	ML	27	81	50
37.5 - 39.0		38.25	122	1.77	0	0	0.75	1	11	ML	27	81	50
39.0 - 40.5		39.75	120	1.81	0	0	0.74	1	11	ML	27	81	48.2
40.5 - 42.0		41.25	108	1.85	0	0	0.74	1	11	ML	27	81	33.4
42.0 - 43.5		42.75	116	1.89	0	0	0.73	1	11	ML	27	81	43.5
43.5 - 45.0		44.25	120	1.93	0	0	0.72	1	11	CL	FALSE	NA	37.8
45.0 - 46.5		45.75	120	1.97	4	5	0.71	4	24	CL	FALSE	NA	31.6
46.5 - 48.0		47.25	120	2.02	9	12	0.70	9	41	CL	FALSE	NA	27.2
48.0 - 49.5		48.75	120	2.06	11	15	0.70	10	47	CL	FALSE	NA	25.3
49.5 - 51.0		50.25	120	2.10	13	17	0.69	12	52	CL	FALSE	NA	23.6
51.0 - 52.5		51.75	120	2.14	13	17	0.68	12	47	CL	FALSE	NA	24.7
52.5 - 54.0		53.25	120	2.19	13	17	0.68	12	47	CL	FALSE	NA	27.7
54.0 - 55.5		54.75	120	2.23	9	12	0.67	8	41	CL	FALSE	NA	28.2
55.5 - 57.0		56.25	138	2.29	7	9	0.66	6	35	SW	31.5	109	26.4
57.0 - 58.5		57.75	141	2.35	25	33	0.65	22	68	SW	35.5	115	22.4
58.5 - 60.0		59.25	165	2.42	50	67	0.64	43	91	GW	43	143	15.2

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w
					Input Required										
STN-31				water =	15.5										
0.0	-	1.5	0.75	120	0.05	13	17	1.00	17	60	CL	FALSE	NA	18.2	NA
1.5	-	3.0	2.25	128	0.14	24	32	1.00	32	82	SM	35.5	104	22.9	128
3.0	-	4.5	3.75	124	0.23	19	25	1.00	25	74	SM	34	101	23.2	124
4.5	-	6.0	5.25	128	0.33	18	24	1.00	24	73	SM	34	101	21.5	128
6.0	-	7.5	6.75	131	0.43	34	45	1.00	45	93	SM	36.5	106	23.9	131
7.5	-	9.0	8.25	130	0.53	38	51	1.00	51	98	SM	37	107	21.3	130
9.0	-	10.5	9.75	131	0.62	24	32	1.00	32	82	SM	35.5	104	25.9	131
10.5	-	12.0	11.25	133	0.72	15	20	1.00	20	67	SM	33.5	100	32.5	133
12.0	-	13.5	12.75	135	0.83	17	23	1.00	23	70	SM	34	101	33.9	135
13.5	-	15.0	14.25	153	0.94	12	16	1.00	16	60	SM	33	99	54.8	153
15.0	-	16.5	15.75	125	0.99	7	9	1.00	9	44	ML	30	87	36.8	125
16.5	-	18.0	17.25	121	1.03	5	7	0.98	7	35	ML	29.5	86	40.5	121
18.0	-	19.5	18.75	126	1.08	7	9	0.96	9	44	ML	30	87	37.4	126
19.5	-	21.0	20.25	113	1.12	1	1	0.95	1	11	ML	27	81	39.2	113
21.0	-	22.5	21.75	114	1.15	2	3	0.93	3	18	ML	27.5	82	38.5	114
22.5	-	24.0	23.25	127	1.20	2	3	0.91	2	18	ML	27.5	82	38.2	127
24.0	-	25.5	24.75	107	1.24	0	0	0.90	1	11	ML	27	81	32.3	107
25.5	-	27.0	26.25	108	1.27	0	0	0.89	1	11	ML	27	81	32.8	108
27.0	-	28.5	27.75	112	1.31	1	1	0.87	1	11	ML	27	81	38.5	112
28.5	-	30.0	29.25	129	1.36	2	3	0.86	2	18	ML	27.5	82	57	129
30.0	-	31.5	30.75	116	1.40	0	0	0.85	1	11	ML	27	81	42.8	116
31.5	-	33.0	32.25	129	1.45	1	1	0.83	1	11	ML	27	81	59.1	129
33.0	-	34.5	33.75	143	1.51	1	1	0.81	1	11	ML	27	81	76.7	143
34.5	-	36.0	35.25	125	1.55	0	0	0.80	1	11	ML	27	81	54	125
36.0	-	37.5	36.75	119	1.60	0	0	0.79	1	11	ML	27	81	47.2	119
37.5	-	39.0	38.25	122	1.64	0	0	0.78	1	11	ML	27	81	50	122
39.0	-	40.5	39.75	119	1.68	0	0	0.77	1	11	ML	27	81	46.3	119
40.5	-	42.0	41.25	115	1.72	0	0	0.76	1	11	ML	27	81	42.3	115
42.0	-	43.5	42.75	114	1.76	0	0	0.75	1	11	ML	27	81	40.5	114
43.5	-	45.0	44.25	128	1.81	4	5	0.74	4	27	SM	29	92	38.7	128
45.0	-	46.5	45.75	124	1.86	11	15	0.73	11	47	SM	31	96	29.2	124
46.5	-	48.0	47.25	114	1.90	11	15	0.73	11	47	ML	30.5	88	29.4	114
48.0	-	49.5	48.75	109	1.93	2	3	0.72	2	11	ML	27	81	34.9	109
49.5	-	51.0	50.25	120	1.97	3	4	0.71	3	18	CL	FALSE	NA	27.4	NA
51.0	-	52.5	51.75	120	2.02	9	12	0.70	8	41	CL	FALSE	NA	27.8	NA
52.5	-	54.0	53.25	120	2.06	8	11	0.70	7	39	CL	FALSE	NA	30.1	NA
54.0	-	55.5	54.75	120	2.10	0	0	0.69	1	11	CH	FALSE	NA	25.8	NA
55.5	-	57.0	56.25	120	2.15	4	5	0.68	4	24	CH	FALSE	NA	24.2	NA
57.0	-	58.5	57.75	120	2.19	6	8	0.68	5	32	CH	FALSE	NA	39.9	NA
58.5	-	60.0	59.25	120	2.23	69	92	0.67	62	100	SHALE	FALSE	NA	11.7	NA

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w
					Input Required										
STN-32				water =	19.0										
0.0	-	1.5	0.75	120	0.05	10	13	1.00	13	53	CL	FALSE	NA	20.1	NA
1.5	-	3.0	2.25	120	0.14	13	17	1.00	17	60	CL	FALSE	NA	19.9	NA
3.0	-	4.5	3.75	120	0.23	11	15	1.00	15	56	CL	FALSE	NA	25.8	NA
4.5	-	6.5	5.5	120	0.33	ST	NA	1.00	NA	NA	CL	NA	NA	16.7	128
6.5	-	8.0	7.25	120	0.44	9	12	1.00	12	52	CL	FALSE	NA	22.0	NA
8.0	-	9.5	8.75	120	0.53	19	25	1.00	25	74	CL	FALSE	NA	17.0	NA
9.5	-	11.0	10.25	123	0.62	22	29	1.00	29	79	SM	34.5	102	20.5	123
11.0	-	12.5	11.75	120	0.71	27	36	1.00	36	86	CL	FALSE	NA	20.4	NA
12.5	-	14.0	13.25	120	0.80	23	31	1.00	31	79	CL	FALSE	NA	24.5	NA
14.0	-	15.5	14.75	120	0.89	8	11	1.00	11	47	CL	FALSE	NA	21.2	NA
15.5	-	17.5	16.5	120	0.99	ST	NA	1.00	NA	NA	CL	NA	NA	24.8	125
17.5	-	19.0	18.25	120	1.10	5	7	0.95	6	35	CL	FALSE	NA	28.0	NA
19.0	-	21.0	20	120	1.15	ST	NA	0.93	NA	NA	CL	NA	NA	25.0	126
21.0	-	22.5	21.75	120	1.20	7	9	0.91	9	41	CL	FALSE	NA	27.3	NA
22.5	-	24.0	23.25	120	1.24	19	25	0.90	23	70	CL	FALSE	NA	23.8	NA
24.0	-	26.0	25	120	1.29	ST	NA	0.88	NA	NA	CL	NA	NA	22.0	127
26.0	-	27.5	26.75	120	1.34	6	8	0.86	7	35	CL	FALSE	NA	20.7	NA
27.5	-	29.0	28.25	120	1.39	7	9	0.85	8	41	CL	FALSE	NA	20.6	NA
29.0	-	30.5	29.75	132	1.44	1	1	0.83	1	11	SW	28.4	104	26.5	132
30.5	-	32.0	31.25	130	1.49	4	5	0.82	4	27	SW	30	106.5	21.8	130
32.0	-	33.5	32.75	137	1.54	7	9	0.80	8	41	SW	32.3	110	24.5	137
33.5	-	35.0	34.25	126	1.59	3	4	0.79	3	24	SW	29.5	106	18.7	126
35.0	-	36.5	35.75	129	1.64	5	7	0.78	5	32	SW	30.8	108	19.2	129
36.5	-	38.0	37.25	127	1.69	4	5	0.77	4	27	SW	30	106.5	19.2	127
38.0	-	39.5	38.75	108	1.72	3	4	0.76	3	24	SM	28.5	91	19.2	108
39.5	-	41.0	40.25	110	1.76	4	5	0.75	4	27	SM	29	92	19.5	110
41.0	-	42.5	41.75	106	1.79	4	5	0.75	4	27	SM	29	92	15.4	106
42.5	-	44.0	43.25	122	1.84	37	49	0.74	36	86	SM	36	105	16.1	122
44.0	-	44.5	44.25	117	1.86	50	67	0.73	49	95	SM	37	107	9.6	117

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS FOR COARSE GRAINED SOILS

Sample Interval		Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_e	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w
				Input Required										
STN-33			water =	28.0										
0.0 - 1.5		0.75	120	0.05	20	27	1.00	27	75	CL	FALSE	NA	20.1	NA
1.5 - 3.0		2.25	127	0.14	33	44	1.00	44	93	SM	36.5	106	19.9	127
3.0 - 4.5		3.75	136	0.24	80	107	1.00	107	100	SM	38	108	25.8	136
4.5 - 6.0		5.25	128	0.34	16	21	1.00	21	68	SM	33.5	100	16.7	128
6.0 - 7.5		6.75	124	0.43	23	31	1.00	31	79	SM	34.5	102	22.0	124
7.5 - 9.0		8.25	124	0.52	33	44	1.00	44	93	SM	36.5	106	17.0	124
9.0 - 10.5		9.75	123	0.62	22	29	1.00	29	79	SM	34.5	102	20.5	123
10.5 - 12.0		11.25	126	0.71	29	39	1.00	39	87	SM	36	105	20.4	126
12.0 - 13.5		12.75	131	0.81	30	40	1.00	40	89	SM	36	105	24.5	131
13.5 - 15.0		14.25	124	0.90	21	28	1.00	28	77	SM	34.5	102	21.2	124
15.0 - 16.5		15.75	125	1.00	29	39	1.00	39	87	SM	36	105	24.8	125
16.5 - 18.0		17.25	137	1.10	40	53	0.95	51	98	SM	37	107	28.0	137
18.0 - 19.5		18.75	126	1.19	17	23	0.92	21	67	SM	33.5	100	25.0	126
19.5 - 21.0		20.25	120	1.28	6	8	0.88	7	39	SM	30	94	27.3	120
21.0 - 22.5		21.75	115	1.37	5	7	0.85	6	32	SM	29.5	93	23.8	115
22.5 - 24.0		23.25	127	1.46	5	7	0.83	6	32	ML	29	85	22.2	127
24.0 - 25.5		24.75	101	1.54	4	5	0.81	4	27	ML	28.5	84	20.7	101
25.5 - 27.0		26.25	104	1.62	6	8	0.79	6	35	ML	29.5	86	20.6	104
27.0 - 28.5		27.75	104	1.70	2	3	0.77	2	18	ML	27.5	82	26.5	104
28.5 - 30.0		29.25	99	1.72	0	0	0.76	1	11	ML	27	81	21.8	99
30.0 - 31.5		30.75	102	1.75	2	3	0.76	2	18	ML	27.5	82	24.5	102
31.5 - 33.0		32.25	99	1.78	3	4	0.75	3	24	ML	28	83	18.7	99
33.0 - 34.5		33.75	97	1.81	1	1	0.74	1	11	ML	27	81	19.2	97
34.5 - 36.0		35.25	97	1.83	0	0	0.74	1	11	ML	27	81	19.2	97
36.0 - 37.5		36.75	97	1.86	0	0	0.73	1	11	ML	27	81	19.2	97
37.5 - 39.0		38.25	97	1.88	0	0	0.73	1	11	ML	27	81	19.5	97
39.0 - 40.5		39.75	93	1.91	2	3	0.72	2	11	ML	27	81	15.4	93
40.5 - 42.0		41.25	104	1.94	3	4	0.72	3	18	SM	28	90	16.1	104
42.0 - 43.5		42.75	104	1.97	9	12	0.71	9	41	SM	30.5	95	9.6	104
43.5 - 45.0		44.25	91	1.99	4	5	0.71	4	24	SM	28.5	91		91
45.0 - 46.5		45.75	120	2.03	1	1	0.70	1	#N/A	SM	#N/A	#N/A		#N/A
46.5 - 48.0		47.25	120	2.08	1	1	0.69	1	#N/A	SM	#N/A	#N/A		#N/A
48.0 - 49.5		48.75	81	2.09	0	0	0.69	1	11	ML	27	81		81
49.5 - 51.0		50.25	81	2.10	0	0	0.69	1	11	ML	27	81		81
51.0 - 52.5		51.75	81	2.12	0	0	0.69	1	11	ML	27	81		81
52.5 - 54.0		53.25	81	2.13	0	0	0.68	1	11	ML	27	81		81
54.0 - 55.5		54.75	81	2.15	0	0	0.68	1	11	ML	27	81		81
55.5 - 57.0		56.25	81	2.16	0	0	0.68	1	11	ML	27	81		81
57.0 - 58.5		57.75	81	2.17	0	0	0.68	1	11	ML	27	81		81
58.5 - 60.0		59.25	81	2.19	0	0	0.68	1	11	ML	27	81		81
60.0 - 61.5		60.75	81	2.20	0	0	0.67	1	11	ML	27	81		81
61.5 - 63.0		62.25	120	2.25	1	1	0.67	1	#N/A	ML	#N/A	#N/A		#N/A
63.0 - 64.5		63.75	120	2.29	7	9	0.66	6	35	CL	FALSE	NA	24.7	NA
64.5 - 66.0		65.25	120	2.33	11	15	0.65	10	44	CL	FALSE	NA	26.6	NA
66.0 - 67.5		66.75	120	2.38	6	8	0.65	5	32	CL	FALSE	NA	28.6	NA
67.5 - 69.0		68.25	#N/A	#N/A	10	13	#N/A	#N/A	#N/A	SW	#N/A	#N/A	18.9	#N/A
69.0 - 70.4		69.7	#N/A	#N/A	50	67	#N/A	#N/A	#N/A	SW	#N/A	#N/A	14.7	#N/A

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_e	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
						Input Required										
STN-34				water =	20.0											
0.0	-	1.5	0.75	120	0.05	12	16	1.00	16	60	CL	FALSE	NA	25.8	NA	NA
1.5	-	3.0	2.25	130	0.14	25	33	1.00	33	84	SM	35.5	104	25.3	130	0.61
3.0	-	4.5	3.75	136	0.24	34	45	1.00	45	93	SM	36.5	106	28.2	136	0.58
4.5	-	6.0	5.25	123	0.34	16	21	1.00	21	68	SM	33.5	100	22.6	123	0.67
6.0	-	7.5	6.75	132	0.44	36	48	1.00	48	95	SM	37	107	23.4	132	0.56
7.5	-	9.0	8.25	130	0.53	41	55	1.00	55	99	SM	37	107	21.7	130	0.56
9.0	-	10.5	9.75	129	0.63	25	33	1.00	33	84	SM	35.5	104	24.4	129	0.61
10.5	-	12.0	11.25	134	0.73	38	51	1.00	51	98	SM	37	107	24.8	134	0.56
12.0	-	13.5	12.75	144	0.84	27	36	1.00	36	86	SM	36	105	36.7	144	0.6
13.5	-	15.0	14.25	128	0.93	15	20	1.00	20	67	SM	33.5	100	28.4	128	0.67
15.0	-	16.5	15.75	170	1.06	20	27	0.97	26	74	SM	34	101	68.0	170	0.65
16.5	-	18.0	17.25	180	1.20	27	36	0.91	33	82	SM	35.5	104	73.2	180	0.61
18.0	-	19.5	18.75	145	1.31	15	20	0.88	18	60	SM	33	99	46.1	145	0.69
19.5	-	21.0	20.25	117	1.35	12	16	0.86	14	53	SM	32	97	20.2	117	0.72
21.0	-	22.5	21.75	162	1.42	20	27	0.84	22	70	SM	34	101	60.2	162	0.65
22.5	-	24.0	23.25	142	1.48	23	31	0.82	25	74	SM	34	101	40.5	142	0.65
24.0	-	25.5	24.75	128	1.53	26	35	0.81	28	77	SM	34.5	102	25.7	128	0.63
25.5	-	27.0	26.25	115	1.57	25	33	0.80	27	75	ML	33.5	93	23.3	115	0.8
27.0	-	28.5	27.75	96	1.59	1	1	0.79	1	11	ML	27	81	18.8	96	1.05
28.5	-	30.0	29.25	178	1.68	1	1	0.77	1	11	ML	27	81	119.8	178	1.05
30.0	-	31.5	30.75	122	1.73	0	0	0.76	1	11	ML	27	81	51.1	122	1.05
31.5	-	33.0	32.25	123	1.77	0	0	0.75	1	11	SM	27.5	89.5	37.9	123	0.87
33.0	-	34.5	33.75	81	1.79	0	0	0.75	1	11	ML	27	81		81	1.05
34.5	-	36.0	35.25	81	1.80	0	0	0.75	1	11	ML	27	81		81	1.05
36.0	-	37.5	36.75	104	1.83	0	0	0.74	1	11	ML	27	81	28.7	104	1.05
37.5	-	39.0	38.25	107	1.86	3	4	0.73	3	18	ML	27.5	82	30.1	107	1.03
39.0	-	40.5	39.75	105	1.90	2	3	0.73	2	11	ML	27	81	29.9	105	1.05
40.5	-	42.0	41.25	120	1.94	1	1	0.72	1	11	SM	27.5	89.5	30.2	117	0.87
42.0	-	43.5	42.75	111	1.98	0	0	0.71	1	11	SM	27.5	89.5	23.5	111	0.87
43.5	-	45.0	44.25	120	2.02	13	17	0.70	12	52	CL	FALSE	NA	4.1	NA	NA
45.0	-	46.5	45.75	120	2.06	10	13	0.70	9	44	CL	FALSE	NA	23.4	NA	NA
46.5	-	48.0	47.25	120	2.11	17	23	0.69	16	58	CL	FALSE	NA	24.7	NA	NA
48.0	-	49.5	48.75	120	2.15	16	21	0.68	15	56	CL	FALSE	NA	23.9	NA	NA
49.5	-	51.0	50.25	120	2.19	9	12	0.68	8	41	CL	FALSE	NA	24.2	NA	NA
51.0	-	52.5	51.75	120	2.23	0	0	0.67	1	11	CL	FALSE	NA	26.1	NA	NA
52.5	-	54.0	53.25	120	2.28	3	4	0.66	3	18	CL	FALSE	NA	24.0	NA	NA
54.0	-	55.5	54.75	120	2.32	6	8	0.66	5	32	CL	FALSE	NA	25.4	NA	NA
55.5	-	57.0	56.25	120	2.36	0	0	0.65	1	11	CL	FALSE	NA		NA	NA
57.0	-	58.5	57.75	120	2.41	4	5	0.64	3	24	CL	FALSE	NA		NA	NA
58.5	-	60.0	59.25	120	2.45	25	33	0.64	21	68	SW	35.5	115		115	0.45
60.0	-	61.5	60.75	120	2.49	20	27	0.63	17	60	SW	35	114		114	0.46
61.5	-	63.0	62.25	120	2.54	50	67	0.63	42	91	SHALE	FALSE	NA		NA	NA

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_e	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
						Input Required										
STN-34				water =	20.0											
0.0	-	1.5	0.75	120	0.05	12	16	1.00	16	60	CL	FALSE	NA	25.8	NA	NA
1.5	-	3.0	2.25	130	0.14	25	33	1.00	33	84	SM	35.5	104	25.3	130	0.61
3.0	-	4.5	3.75	136	0.24	34	45	1.00	45	93	SM	36.5	106	28.2	136	0.58
4.5	-	6.0	5.25	123	0.34	16	21	1.00	21	68	SM	33.5	100	22.6	123	0.67
6.0	-	7.5	6.75	132	0.44	36	48	1.00	48	95	SM	37	107	23.4	132	0.56
7.5	-	9.0	8.25	130	0.53	41	55	1.00	55	99	SM	37	107	21.7	130	0.56
9.0	-	10.5	9.75	129	0.63	25	33	1.00	33	84	SM	35.5	104	24.4	129	0.61
10.5	-	12.0	11.25	134	0.73	38	51	1.00	51	98	SM	37	107	24.8	134	0.56
12.0	-	13.5	12.75	144	0.84	27	36	1.00	36	86	SM	36	105	36.7	144	0.6
13.5	-	15.0	14.25	128	0.93	15	20	1.00	20	67	SM	33.5	100	28.4	128	0.67
15.0	-	16.5	15.75	170	1.06	20	27	0.97	26	74	SM	34	101	68.0	170	0.65
16.5	-	18.0	17.25	180	1.20	27	36	0.91	33	82	SM	35.5	104	73.2	180	0.61
18.0	-	19.5	18.75	145	1.31	15	20	0.88	18	60	SM	33	99	46.1	145	0.69
19.5	-	21.0	20.25	117	1.35	12	16	0.86	14	53	SM	32	97	20.2	117	0.72
21.0	-	22.5	21.75	162	1.42	20	27	0.84	22	70	SM	34	101	60.2	162	0.65
22.5	-	24.0	23.25	142	1.48	23	31	0.82	25	74	SM	34	101	40.5	142	0.65
24.0	-	25.5	24.75	128	1.53	26	35	0.81	28	77	SM	34.5	102	25.7	128	0.63
25.5	-	27.0	26.25	115	1.57	25	33	0.80	27	75	ML	33.5	93	23.3	115	0.8
27.0	-	28.5	27.75	96	1.59	1	1	0.79	1	11	ML	27	81	18.8	96	1.05
28.5	-	30.0	29.25	178	1.68	1	1	0.77	1	11	ML	27	81	119.8	178	1.05
30.0	-	31.5	30.75	122	1.73	0	0	0.76	1	11	ML	27	81	51.1	122	1.05
31.5	-	33.0	32.25	123	1.77	0	0	0.75	1	11	SM	27.5	89.5	37.9	123	0.87
33.0	-	34.5	33.75	81	1.79	0	0	0.75	1	11	ML	27	81		81	1.05
34.5	-	36.0	35.25	81	1.80	0	0	0.75	1	11	ML	27	81		81	1.05
36.0	-	37.5	36.75	104	1.83	0	0	0.74	1	11	ML	27	81	28.7	104	1.05
37.5	-	39.0	38.25	107	1.86	3	4	0.73	3	18	ML	27.5	82	30.1	107	1.03
39.0	-	40.5	39.75	105	1.90	2	3	0.73	2	11	ML	27	81	29.9	105	1.05
40.5	-	42.0	41.25	120	1.94	1	1	0.72	1	11	SM	27.5	89.5	30.2	117	0.87
42.0	-	43.5	42.75	111	1.98	0	0	0.71	1	11	SM	27.5	89.5	23.5	111	0.87
43.5	-	45.0	44.25	120	2.02	13	17	0.70	12	52	CL	FALSE	NA	4.1	NA	NA
45.0	-	46.5	45.75	120	2.06	10	13	0.70	9	44	CL	FALSE	NA	23.4	NA	NA
46.5	-	48.0	47.25	120	2.11	17	23	0.69	16	58	CL	FALSE	NA	24.7	NA	NA
48.0	-	49.5	48.75	120	2.15	16	21	0.68	15	56	CL	FALSE	NA	23.9	NA	NA
49.5	-	51.0	50.25	120	2.19	9	12	0.68	8	41	CL	FALSE	NA	24.2	NA	NA
51.0	-	52.5	51.75	120	2.23	0	0	0.67	1	11	CL	FALSE	NA	26.1	NA	NA
52.5	-	54.0	53.25	120	2.28	3	4	0.66	3	18	CL	FALSE	NA	24.0	NA	NA
54.0	-	55.5	54.75	120	2.32	6	8	0.66	5	32	CL	FALSE	NA	25.4	NA	NA
55.5	-	57.0	56.25	120	2.36	0	0	0.65	1	11	CL	FALSE	NA		NA	NA
57.0	-	58.5	57.75	120	2.41	4	5	0.64	3	24	CL	FALSE	NA		NA	NA
58.5	-	60.0	59.25	120	2.45	25	33	0.64	21	68	SW	35.5	115		115	0.45
60.0	-	61.5	60.75	120	2.49	20	27	0.63	17	60	SW	35	114		114	0.46
61.5	-	63.0	62.25	120	2.54	50	67	0.63	42	91	SHALE	FALSE	NA		NA	NA

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
						Input Required								
STN-35				water =	12.7									
0.0	-	1.5	0.75	120	0.05	12	16	1.00	16	60	CL	FALSE	NA	21.3
1.5	-	3.0	2.25	120	0.14	14	19	1.00	19	63	CL	FALSE	NA	25.2
3.0	-	4.5	3.75	120	0.23	15	20	1.00	20	67	CL	FALSE	NA	24.4
4.5	-	6.0	5.25	120	0.32	10	13	1.00	13	53	CL	FALSE	NA	25.4
6.0	-	7.5	6.75	120	0.41	11	15	1.00	15	56	CL	FALSE	NA	26.3
7.5	-	9.0	8.25	120	0.50	10	13	1.00	13	53	CL	FALSE	NA	25.2
9.0	-	10.5	9.75	120	0.59	10	13	1.00	13	53	CL	FALSE	NA	28.7
10.5	-	12.0	11.25	120	0.68	15	20	1.00	20	67	CL	FALSE	NA	28.8
12.0	-	13.5	12.75	172	0.76	29	39	1.00	39	87	GW	42	141	22.0
13.5	-	15.0	14.25	145	0.82	5	7	1.00	7	35	GW	33	126	15.4
15.0	-	16.5	15.75	120	0.86	9	12	1.00	12	52	CL	FALSE	NA	25.7
16.5	-	18.0	17.25	120	0.91	2	3	1.00	3	18	CL	FALSE	NA	26.0
18.0	-	19.5	18.75	120	0.95	9	12	1.00	12	52	CL	FALSE	NA	24.8
19.5	-	21.0	20.25	120	0.99	13	17	1.00	17	60	CL	FALSE	NA	21.8
21.0	-	22.5	21.75	120	1.04	22	29	0.98	29	77	CL	FALSE	NA	23.8
22.5	-	24.0	23.25	120	1.08	21	28	0.96	27	77	CL	FALSE	NA	22.3
24.0	-	25.5	24.75	120	1.12	15	20	0.94	19	63	CL	FALSE	NA	24.4
25.5	-	27.0	26.25	120	1.17	26	35	0.93	32	82	CL	FALSE	NA	20.8
27.0	-	28.5	27.75	120	1.21	15	20	0.91	18	63	CL	FALSE	NA	20.4
28.5	-	30.0	29.25	120	1.25	3	4	0.89	4	24	CL	FALSE	NA	25.3
30.0	-	31.5	30.75	120	1.29	6	8	0.88	7	39	CL	FALSE	NA	25.0
31.5	-	33.0	32.25	120	1.34	2	3	0.86	2	18	CL	FALSE	NA	25.2
33.0	-	34.5	33.75	120	1.38	3	4	0.85	3	24	CL	FALSE	NA	24.8
34.5	-	36.0	35.25	120	1.42	1	1	0.84	1	11	CL	FALSE	NA	23.9
36.0	-	37.5	36.75	120	1.47	2	3	0.83	2	18	CL	FALSE	NA	29.1
37.5	-	39.0	38.25	120	1.51	2	3	0.81	2	18	CL	FALSE	NA	26.8
39.0	-	40.5	39.75	120	1.55	2	3	0.80	2	18	CL	FALSE	NA	24.7
40.5	-	42.0	41.25	120	1.60	6	8	0.79	6	35	CL	FALSE	NA	27.3
42.0	-	43.5	42.75	136	1.65	16	21	0.78	17	60	SW	35	114	19.6
43.5	-	44.7	44.1	137	1.70	50	67	0.77	51	98	SW	40	123	11.5

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BULL RUN FOSSIL PLANT
CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS
FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
					Input Required									
STN-36				water =	NA									
0.0	-	1.5	0.75	120	0.05	7	9	1.00	9	44	CL	FALSE	NA	30.2
1.5	-	3.0	2.25	120	0.14	11	15	1.00	15	56	CL	FALSE	NA	22.5
3.0	-	4.5	3.75	120	0.23	23	31	1.00	31	79	CL	FALSE	NA	20.0
4.5	-	6.0	5.25	120	0.32	8	11	1.00	11	47	CL	FALSE	NA	17.5
6.0	-	7.5	6.75	120	0.41	13	17	1.00	17	60	CL	FALSE	NA	23.9
7.5	-	9.0	8.25	120	0.50	13	17	1.00	17	60	CL	FALSE	NA	27.0
9.0	-	10.5	9.75	116	0.58	3	4	1.00	4	27	SM	29	92	26.6
10.5	-	12.0	11.25	121	0.67	12	16	1.00	16	60	SM	33	99	22.6
12.0	-	13.5	12.75	120	0.76	21	28	1.00	28	77	CL	FALSE	NA	22.3
13.5	-	15.0	14.25	120	0.85	12	16	1.00	16	60	CL	FALSE	NA	23.4
15.0	-	16.5	15.75	120	0.94	8	11	1.00	11	47	CL	FALSE	NA	23.7
16.5	-	18.0	17.25	120	1.03	16	21	0.98	21	68	CL	FALSE	NA	22.3
18.0	-	19.5	18.75	120	1.12	10	13	0.94	13	52	CL	FALSE	NA	20.8
19.5	-	21.0	20.25	120	1.21	7	9	0.91	9	41	CL	FALSE	NA	23.2
21.0	-	22.5	21.75	120	1.30	3	4	0.88	4	24	CL	FALSE	NA	25.5
22.5	-	24.0	23.25	120	1.39	3	4	0.85	3	24	CL	FALSE	NA	27.6
24.0	-	25.5	24.75	120	1.48	4	5	0.82	4	27	CL	FALSE	NA	26.5
25.5	-	27.0	26.25	120	1.57	3	4	0.80	3	24	CL	FALSE	NA	26.1
27.0	-	28.5	27.75	138	1.68	7	9	0.77	7	39	SW	31.5	109	26.2
28.5	-	30.0	29.25	132	1.78	2	3	0.75	2	18	SW	29	105	25.4
30.0	-	31.5	30.75	130	1.87	3	4	0.73	3	18	SW	29	105	24.0
31.5	-	33.0	32.25	134	1.97	5	7	0.71	5	27	SW	30	106.5	25.7
33.0	-	34.5	33.75	137	2.08	9	12	0.69	8	41	SW	32.3	110	24.7
34.5	-	36.0	35.25	#N/A	#N/A	34	45	#N/A	#N/A	#N/A	SW	#N/A	#N/A	24.2

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval	Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
		Input Required												
STN-38		water =	31.8											
0.0 - 1.5	0.75	120	0.05	8	11	1.00	11	47	CL	FALSE	NA	24.1	NA	NA
1.5 - 3.0	2.25	120	0.14	15	20	1.00	20	67	CL	FALSE	NA	20.5	NA	NA
3.0 - 4.5	3.75	120	0.23	20	27	1.00	27	75	CL	FALSE	NA	26.0	NA	NA
4.5 - 6.0	5.25	120	0.32	9	12	1.00	12	52	CL	FALSE	NA	25.2	NA	NA
6.0 - 7.5	6.75	120	0.41	8	11	1.00	11	47	CL	FALSE	NA	25.9	NA	NA
7.5 - 9.0	8.25	120	0.50	19	25	1.00	25	74	CL	FALSE	NA	23.9	NA	NA
9.0 - 10.5	9.75	109	0.58	6	8	1.00	8	41	ML	30	87	25.6	109	0.93
10.5 - 12.0	11.25	113	0.66	11	15	1.00	15	56	ML	31.5	89.5	26.8	113	0.87
12.0 - 13.5	12.75	119	0.75	15	20	1.00	20	67	ML	32.5	91	30.9	119	0.83
13.5 - 15.0	14.25	120	0.84	14	19	1.00	19	63	CL	FALSE	NA	28.3	NA	NA
15.0 - 16.5	15.75	120	0.93	6	8	1.00	8	41	CL	FALSE	NA	24.6	NA	NA
16.5 - 18.0	17.25	120	1.02	9	12	0.99	12	47	CH	FALSE	NA	26.1	NA	NA
18.0 - 19.5	18.75	120	1.11	10	13	0.95	13	52	CH	FALSE	NA	24.3	NA	NA
19.5 - 21.0	20.25	120	1.20	7	9	0.91	9	41	CH	FALSE	NA	26.0	NA	NA
21.0 - 22.5	21.75	120	1.29	11	15	0.88	13	52	CH	FALSE	NA	27.1	NA	NA
22.5 - 24.0	23.25	120	1.38	13	17	0.85	15	56	CH	FALSE	NA	26.7	NA	NA
24.0 - 25.5	24.75	120	1.47	9	12	0.82	10	44	CH	FALSE	NA	25.2	NA	NA
25.5 - 27.0	26.25	120	1.56	18	24	0.80	19	65	CH	FALSE	NA	25.6	NA	NA
27.0 - 28.5	27.75	120	1.65	12	16	0.78	13	52	CH	FALSE	NA	29.5	NA	NA
28.5 - 30.0	29.25	120	1.74	20	27	0.76	20	67	CH	FALSE	NA	24.1	NA	NA
30.0 - 31.5	30.75	120	1.83	11	15	0.74	11	47	CH	FALSE	NA	29.5	NA	NA
31.5 - 33.0	32.25	120	1.87	13	17	0.73	13	52	CH	FALSE	NA	28.3	NA	NA
33.0 - 34.5	33.75	120	1.92	13	17	0.72	13	52	CH	FALSE	NA	23.1	NA	NA
34.5 - 36.0	35.25	120	1.96	8	11	0.71	8	41	CH	FALSE	NA	22.3	NA	NA
36.0 - 37.5	36.75	132	2.01	4	5	0.70	4	24	SW	29.5	106	24.6	132	0.58
37.5 - 39.0	38.25	120	2.06	12	16	0.70	11	47	CH	FALSE	NA	22.6	NA	NA
39.0 - 40.5	39.75	133	2.11	8	11	0.69	7	39	SW	31.5	109	21.8	133	0.54
40.5 - 42.0	41.25	132	2.16	12	16	0.68	11	47	SW	33	111	18.7	132	0.5
42.0 - 43.5	42.75	138	2.22	18	24	0.67	16	60	SW	35	114	21.0	138	0.46
43.5 - 44.3	43.9	140	2.26	50	67	0.66	44	93	SW	39.3	121.5	15.3	140	0.37

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BULL RUN FOSSIL PLANT
CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS
FOR COARSE GRAINED SOILS

Sample Interval		Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (γ_t) (pcf)	Vertical Effective Stress (σ') (tsf)	SPT N Value (N_{80})	SPT N Value (N_{60})	Correction Factor (C_N)	Corrected N-Value ($(N_1)_{60}$)	Relative Density (D_r) (%)	Unified Soil Classification	Internal Angle of Friction (ϕ') (degrees)	Unit Weight Dry (γ_d) (pcf)	Moisture Content (%)	Revised In-situ Unit Weight (γ_w) (pcf)	Void Ratio
				Input Required									m		e
STN-39			water =	20.0											
0.0 - 1.5		0.75	120	0.05	12	16	1.00	16	60	CL	FALSE	NA	22.1	NA	NA
1.5 - 3.0		2.25	120	0.14	17	23	1.00	23	70	CL	FALSE	NA	12.6	NA	NA
3.0 - 4.5		3.75	123	0.23	36	48	1.00	48	95	SM	37	107	15.2	123	0.56
4.5 - 6.0		5.25	124	0.32	36	48	1.00	48	95	SM	37	107	15.9	124	0.56
6.0 - 7.5		6.75	124	0.41	53	71	1.00	71	100	SM	38	108	14.7	124	0.55
7.5 - 9.0		8.25	124	0.51	63	84	1.00	84	100	SM	38	108	15.1	124	0.55
9.0 - 10.5		9.75	125	0.60	34	45	1.00	45	93	SM	36.5	106	18.2	125	0.58
10.5 - 12.0		11.25	123	0.69	34	45	1.00	45	93	SM	36.5	106	16.1	123	0.58
12.0 - 13.5		12.75	132	0.79	34	45	1.00	45	93	SM	36.5	106	24.2	132	0.58
13.5 - 15.0		14.25	129	0.89	32	43	1.00	43	91	SM	36.5	106	21.7	129	0.58
15.0 - 16.5		15.75	124	0.98	30	40	1.00	40	89	SM	36	105	18.4	124	0.6
16.5 - 18.0		17.25	116	1.07	19	25	0.97	25	73	SM	34	101	14.6	116	0.65
18.0 - 19.5		18.75	126	1.16	16	21	0.93	20	65	SM	33.5	100	26.4	126	0.67
19.5 - 21.0		20.25	121	1.21	13	17	0.91	16	58	SM	32.5	98	23.3	121	0.7
21.0 - 22.5		21.75	123	1.25	4	5	0.89	5	27	SM	29	92	34.2	123	0.82
22.5 - 24.0		23.25	120	1.30	11	15	0.88	13	52	ML	31	88.5	35.9	120	0.89
24.0 - 25.5		24.75	120	1.34	3	4	0.86	4	24	ML	28	83	44.9	120	1.01
25.5 - 27.0		26.25	111	1.38	2	3	0.85	2	18	ML	27.5	82	34.9	111	1.03
27.0 - 28.5		27.75	123	1.42	2	3	0.84	2	18	ML	27.5	82	50.2	123	1.03
28.5 - 30.0		29.25	119	1.46	2	3	0.83	2	18	ML	27.5	82	45	119	1.03
30.0 - 31.5		30.75	108	1.50	0	0	0.82	1	11	ML	27	81	33	108	1.05
31.5 - 33.0		32.25	106	1.53	2	3	0.81	2	18	ML	27.5	82	29.8	106	1.03
33.0 - 34.5		33.75	118	1.57	4	5	0.80	4	27	ML	28.5	84	40.7	118	0.99
34.5 - 36.0		35.25	112	1.61	2	3	0.79	2	18	ML	27.5	82	37	112	1.03
36.0 - 37.5		36.75	116	1.65	0	0	0.78	1	11	ML	27	81	43.8	116	1.05
37.5 - 39.0		38.25	113	1.69	0	0	0.77	1	11	ML	27	81	39.4	113	1.05
39.0 - 40.5		39.75	123	1.73	3	4	0.76	3	24	ML	28	83	47.6	123	1.01
40.5 - 42.0		41.25	124	1.78	2	3	0.75	2	18	SM	28	90	38.3	124	0.85
42.0 - 43.5		42.75	140	1.84	2	3	0.74	2	18	SM	28	90	55.6	140	0.85
43.5 - 45.0		44.25	134	1.89	0	0	0.73	1	11	SM	27.5	89.5	49.8	134	0.87
45.0 - 46.5		45.75	130	1.94	0	0	0.72	1	11	SM	27.5	89.5	45.8	130	0.87
46.5 - 48.0		47.25	120	1.99	9	12	0.71	9	41	CL	FALSE	NA	22	NA	NA
48.0 - 49.5		48.75	120	2.03	15	20	0.70	14	56	CL	FALSE	NA	20.3	NA	NA
49.5 - 51.0		50.25	120	2.07	7	9	0.69	7	35	CL	FALSE	NA	20.9	NA	NA
51.0 - 52.5		51.75	120	2.12	11	15	0.69	10	47	CL	FALSE	NA	20.9	NA	NA
52.5 - 54.0		53.25	120	2.16	15	20	0.68	14	53	CL	FALSE	NA	19.6	NA	NA
54.0 - 55.5		54.75	120	2.20	16	21	0.67	14	56	CL	FALSE	NA	20.1	NA	NA
55.5 - 57.0		56.25	120	2.25	16	21	0.67	14	56	CL	FALSE	NA	20.1	NA	NA
57.0 - 58.5		57.75	134	2.30	8	11	0.66	7	39	SW	31.5	109	23.2	134	0.54
58.5 - 60.0		59.25	133	2.35	5	7	0.65	4	27	SW	30	106.5	24.7	133	0.57
60.0 - 61.5		60.75	130	2.40	2	3	0.65	2	11	SW	28.4	104	24.8	130	0.6
61.5 - 63.0		62.25	130	2.45	3	4	0.64	3	18	SW	29	105	24.2	130	0.59
63.0 - 64.5		63.75	130	2.50	3	4	0.63	3	18	SW	29	105	23.9	130	0.59
64.5 - 66.0		65.25	133	2.56	3	4	0.63	3	18	SW	29	105	26.3	133	0.59
66.0 - 67.5		66.75	130	2.61	2	3	0.62	2	11	SW	28.4	104	25.3	130	0.6
67.5 - 69.0		68.25	144	2.67	34	45	0.61	28	77	SW	37	117.5	22.5	144	0.42
69.0 - 70.5		69.75	148	2.73	15	20	0.60	12	52	GW	35.8	130	13.8	148	0.28
70.5 - 72.0		71.25	150	2.80	8	11	0.60	6	35	GW	33	126	18.7	150	0.33
72.0 - 73.2		72.6	162	2.87	50	67	0.59	39	89	GW	42	141	15	162	0.18

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (γ_e) (pcf)	Vertical Effective Stress (σ') (tsf)	SPT N Value (N_{80})	SPT N Value (N_{60})	Correction Factor (C_N)	Corrected N-Value ($(N_1)_{60}$)	Relative Density (D_r) (%)	Unified Soil Classification	Internal Angle of Friction (ϕ) (degrees)	Unit Weight Dry (γ_d) (pcf)	Moisture Content (m) (%)	Revised In-situ Unit Weight (γ_w) (pcf)	Void Ratio (e)
					Input Required											
STN-40				water =	19.3											
0.0	-	1.5	0.75	120	0.05	16	21	1.00	21	68	CL	FALSE	NA		NA	NA
1.5	-	3.0	2.25	120	0.14	35	47	1.00	47	95	CL	FALSE	NA	14	NA	NA
3.0	-	4.5	3.75	127	0.23	32	43	1.00	43	91	SM	36.5	106	19.9	127	0.58
4.5	-	6.0	5.25	124	0.32	18	24	1.00	24	73	SM	34	101	22.7	124	0.65
6.0	-	7.5	6.75	127	0.42	26	35	1.00	35	84	SM	35.5	104	22.5	127	0.61
7.5	-	9.0	8.25	130	0.52	30	40	1.00	40	89	SM	36	105	23.6	130	0.6
9.0	-	10.5	9.75	123	0.61	22	29	1.00	29	79	SM	34.5	102	20.4	123	0.63
10.5	-	12.0	11.25	128	0.70	29	39	1.00	39	87	SM	36	105	22	128	0.6
12.0	-	13.5	12.75	130	0.80	32	43	1.00	43	91	SM	36.5	106	22.5	130	0.58
13.5	-	15.0	14.25	138	0.90	16	21	1.00	21	68	SM	33.5	100	37.5	138	0.67
15.0	-	16.5	15.75	154	1.02	8	11	0.99	11	47	SM	31	96	60.7	154	0.74
16.5	-	18.0	17.25	164	1.14	7	9	0.94	9	41	SM	30.5	95	72.9	164	0.76
18.0	-	19.5	18.75	154	1.26	9	12	0.89	11	47	SM	31	96	60	154	0.74
19.5	-	21.0	20.25	151	1.33	5	7	0.87	6	32	SM	29.5	93	61.9	151	0.8
21.0	-	22.5	21.75	132	1.38	3	4	0.85	3	24	SM	28.5	91	45.5	132	0.83
22.5	-	24.0	23.25	121	1.42	4	5	0.84	5	27	ML	28.5	84	44	121	0.99
24.0	-	25.5	24.75	123	1.47	3	4	0.83	3	24	ML	28	83	48.1	123	1.01
25.5	-	27.0	26.25	120	1.51	1	1	0.81	1	11	ML	27	81	48.6	120	1.05
27.0	-	28.5	27.75	108	1.54	0	0	0.80	1	11	ML	27	81	33.3	108	1.05
28.5	-	30.0	29.25	114	1.58	2	3	0.79	2	18	ML	27.5	82	38.6	114	1.03
30.0	-	31.5	30.75	127	1.63	1	1	0.78	1	11	ML	27	81	57.3	127	1.05
31.5	-	33.0	32.25	124	1.68	2	3	0.77	2	18	ML	27.5	82	51.7	124	1.03
33.0	-	34.5	33.75	118	1.72	1	1	0.76	1	11	ML	27	81	45.1	118	1.05
34.5	-	36.0	35.25	113	1.76	0	0	0.75	1	11	ML	27	81	39.6	113	1.05
36.0	-	37.5	36.75	115	1.80	0	0	0.75	1	11	ML	27	81	41.4	115	1.05
37.5	-	39.0	38.25	115	1.84	0	0	0.74	1	11	ML	27	81	41.8	115	1.05
39.0	-	40.5	39.75	116	1.88	0	0	0.73	1	11	ML	27	81	42.6	116	1.05
40.5	-	42.0	41.25	114	1.91	3	4	0.72	3	18	ML	27.5	82	39.3	114	1.03
42.0	-	43.5	42.75	109	1.95	2	3	0.72	2	11	ML	27	81	34.4	109	1.05
43.5	-	45.0	44.25	120	1.99	3	4	0.71	3	18	CL	FALSE	NA	27.7	NA	NA
45.0	-	46.5	45.75	120	2.04	0	0	0.70	1	11	CL	FALSE	NA		NA	NA
46.5	-	48.0	47.25	120	2.08	3	4	0.69	3	18	CL	FALSE	NA	28.3	NA	NA
48.0	-	49.5	48.75	120	2.12	11	15	0.69	10	47	CL	FALSE	NA	29	NA	NA
49.5	-	51.0	50.25	120	2.17	10	13	0.68	9	44	CL	FALSE	NA	35.6	NA	NA
51.0	-	52.5	51.75	120	2.21	17	23	0.67	15	58	CL	FALSE	NA	30.7	NA	NA
52.5	-	54.0	53.25	120	2.25	9	12	0.67	8	41	CL	FALSE	NA	31.6	NA	NA
54.0	-	55.5	54.75	120	2.30	19	25	0.66	17	60	CL	FALSE	NA	33.4	NA	NA
55.5	-	57.0	56.25	120	2.34	14	19	0.65	12	52	CL	FALSE	NA	29	NA	NA
57.0	-	58.5	57.75	120	2.38	9	12	0.65	8	41	CL	FALSE	NA	28.3	NA	NA
58.5	-	60.0	59.25	120	2.42	8	11	0.64	7	35	CL	FALSE	NA	23.4	NA	NA
60.0	-	61.5	60.75	120	2.47	10	13	0.64	9	41	CL	FALSE	NA	34	NA	NA
61.5	-	62.8	62.15	120	2.51	50	67	0.63	42	91	CL	FALSE	NA	12.6	NA	NA

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval	Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
		Input Required												
STN-41		water =	14.8											
0.0 - 1.5	0.75	120	0.05	11	15	1.00	15	56	CL	FALSE	NA	20.4	NA	NA
1.5 - 3.0	2.25	120	0.14	20	27	1.00	27	75	CL	FALSE	NA	28.4	NA	NA
3.0 - 4.5	3.75	120	0.23	21	28	1.00	28	77	CL	FALSE	NA	30.1	NA	NA
4.5 - 6.0	5.25	120	0.32	21	28	1.00	28	77	CL	FALSE	NA	21.8	NA	NA
6.0 - 7.5	6.75	120	0.41	10	13	1.00	13	53	CL	FALSE	NA	24.6	NA	NA
7.5 - 9.0	8.25	120	0.50	18	24	1.00	24	73	CL	FALSE	NA	22.4	NA	NA
9.0 - 10.5	9.75	120	0.59	9	12	1.00	12	52	CL	FALSE	NA	29.3	NA	NA
10.5 - 12.0	11.25	120	0.68	18	24	1.00	24	73	CL	FALSE	NA	26.2	NA	NA
12.0 - 13.5	12.75	120	0.77	22	29	1.00	29	79	CL	FALSE	NA	29.3	NA	NA
13.5 - 15.0	14.25	141	0.87	23	31	1.00	31	79	SM	34.5	102	38.1	141	0.63
15.0 - 16.5	15.75	139	0.93	10	13	1.00	13	53	GW	35.8	130	6.9	139	0.28
16.5 - 18.0	17.25	150	0.99	8	11	1.00	11	47	GW	35	129	16.6	150	0.3
18.0 - 19.5	18.75	120	1.04	10	13	0.98	13	53	CH	FALSE	NA	28.0	NA	NA
19.5 - 21.0	20.25	120	1.08	13	17	0.96	17	60	CH	FALSE	NA	24.6	NA	NA
21.0 - 22.5	21.75	120	1.12	16	21	0.94	20	67	CH	FALSE	NA	25.7	NA	NA
22.5 - 24.0	23.25	120	1.17	12	16	0.93	15	56	CH	FALSE	NA	26.3	NA	NA
24.0 - 25.5	24.75	120	1.21	7	9	0.91	9	41	CH	FALSE	NA	26.7	NA	NA
25.5 - 27.0	26.25	120	1.25	14	19	0.89	17	60	CH	FALSE	NA	25.6	NA	NA
27.0 - 28.5	27.75	120	1.30	14	19	0.88	16	60	CH	FALSE	NA	25.8	NA	NA
28.5 - 30.0	29.25	120	1.34	12	16	0.86	14	53	CH	FALSE	NA	26.3	NA	NA
30.0 - 31.5	30.75	120	1.38	11	15	0.85	13	52	CH	FALSE	NA		NA	NA
31.5 - 33.0	32.25	120	1.43	23	31	0.84	26	74	CH	FALSE	NA	27.6	NA	NA
33.0 - 34.5	33.75	120	1.47	15	20	0.82	17	60	CH	FALSE	NA	27.6	NA	NA
34.5 - 36.0	35.25	120	1.51	9	12	0.81	10	44	CH	FALSE	NA	24.2	NA	NA
36.0 - 37.5	36.75	120	1.56	18	24	0.80	19	65	CH	FALSE	NA	26.1	NA	NA
37.5 - 39.0	38.25	120	1.60	14	19	0.79	15	56	CH	FALSE	NA	28.2	NA	NA
39.0 - 40.5	39.75	120	1.64	15	20	0.78	16	58	CH	FALSE	NA	72.2	NA	NA
40.5 - 42.0	41.25	120	1.69	14	19	0.77	14	56	CL	FALSE	NA	23.7	NA	NA
42.0 - 43.5	42.75	120	1.73	13	17	0.76	13	53	CL	FALSE	NA	20.6	NA	NA
43.5 - 45.0	44.25	167	1.81	50	67	0.74	50	97	GW	44	145	15.5	167	0.15

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_e	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
					Input Required											
STN-43				water =	18.6											
0.0	-	1.5	0.75	120	0.05	11	15	1.00	15	56	CL	FALSE	NA	20.1	NA	NA
1.5	-	3.0	2.25	106	0.12	12	16	1.00	16	60	ML	32	90	17.9	106	0.85
3.0	-	4.5	3.75	108	0.21	6	8	1.00	8	41	ML	30	87	24	108	0.93
4.5	-	6.0	5.25	108	0.29	5	7	1.00	7	35	ML	29.5	86	25.5	108	0.95
6.0	-	7.5	6.75	113	0.37	12	16	1.00	16	60	ML	32	90	25.5	113	0.85
7.5	-	9.0	8.25	117	0.46	13	17	1.00	17	60	ML	32	90	29.5	117	0.85
9.0	-	10.5	9.75	115	0.54	28	37	1.00	37	87	ML	34.5	95	20.9	115	0.75
10.5	-	12.0	11.25	115	0.63	29	39	1.00	39	87	ML	34.5	95	21.4	115	0.75
12.0	-	13.5	12.75	116	0.72	30	40	1.00	40	89	ML	34.5	95	21.9	116	0.75
13.5	-	15.0	14.25	128	0.81	24	32	1.00	32	82	SM	35.5	104	22.8	128	0.61
15.0	-	16.5	15.75	121	0.90	14	19	1.00	19	63	SM	33	99	21.8	121	0.69
16.5	-	18.0	17.25	115	0.99	13	17	1.00	17	60	SM	33	99	15.9	115	0.69
18.0	-	19.5	18.75	108	1.02	10	13	0.99	13	53	SM	32	97	11.6	108	0.72
19.5	-	21.0	20.25	100	1.05	6	8	0.97	8	41	GP	33	0	12.1	0	118
21.0	-	22.5	21.75	100	1.08	8	11	0.96	10	47	GP	34	0	11.9	0	119
22.5	-	24.0	23.25	100	1.11	7	9	0.95	9	41	GP	33	0	11.8	0	118
24.0	-	25.5	24.75	100	1.14	6	8	0.94	8	41	GP	33	0	12.9	0	118
25.5	-	27.0	26.25	100	1.17	6	8	0.93	7	39	GP	32.3	0	11.4	0	116.5
27.0	-	28.5	27.75	100	1.19	5	7	0.92	6	35	GP	32.3	0	11.7	0	116.5
28.5	-	30.0	29.25	100	1.22	7	9	0.90	8	41	GP	33	0	11.6	0	118
30.0	-	31.5	30.75	100	1.25	0	0	0.89	1	11	GP	29	0		#VALUE!	111
31.5	-	33.0	32.25	100	1.28	8	11	0.88	9	44	GP	33	0	11.4	0	118
33.0	-	34.5	33.75	100	1.31	9	12	0.87	11	47	GP	34	0	11.5	0	119
34.5	-	36.0	35.25	100	1.33	15	20	0.87	17	60	GP	36	0	11.6	0	122.5
36.0	-	37.5	36.75	100	1.36	19	25	0.86	22	68	GP	37	0	9.8	0	124
37.5	-	39.0	38.25	100	1.39	11	15	0.85	12	52	GP	34.5	0	11.1	0	120
39.0	-	40.5	39.75	110	1.43	0	0	0.84	1	11	ML	27	81	36.2	110	1.05
40.5	-	42.0	41.25	100	1.46	0	0	0.83	1	11	ML	27	81		#VALUE!	1.05
42.0	-	43.5	42.75	109	1.49	0	0	0.82	1	11	ML	27	81	34.8	109	1.05
43.5	-	45.0	44.25	100	1.52	8	11	0.81	9	41	ML	30	87	23.7	108	0.93
45.0	-	46.5	45.75	100	1.55	1	1	0.80	1	11	ML	27	81	10.4	89	1.05
46.5	-	48.0	47.25	100	1.58	8	11	0.80	9	41	ML	30	87	21.6	106	0.93
48.0	-	49.5	48.75	100	1.60	10	13	0.79	11	47	SC	31	96	22.9	118	0.74
49.5	-	51.0	50.25	100	1.63	3	4	0.78	3	24	SC	28.5	91	23.1	112	0.83
51.0	-	52.5	51.75	100	1.66	3	4	0.78	3	24	SC	28.5	91	24.1	113	0.83
52.5	-	54.0	53.25	100	1.69	6	8	0.77	6	35	SC	30	94	24.9	117	0.78
54.0	-	55.5	54.75	100	1.72	11	15	0.76	11	47	SC	31	96	24.1	119	0.74
55.5	-	57.0	56.25	100	1.74	2	3	0.76	2	18	SW	29	105	23.9	130	0.59
57.0	-	58.5	57.75	153	1.81	0	0	0.74	1	11	GW	29.5	120	27.1	153	0.39
58.5	-	60.0	59.25	100	1.84	5	7	0.74	5	27	GW	31.3	123	37.2	169	0.36
60.0	-	61.1	60.55	100	1.86	50	67	0.73	49	95	GW	44	145	14.6	166	0.15

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval	Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_{tot}	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
			Input Required											
STN-44		water =	26.0											
0.0 - 1.5	0.75	120	0.05	25	33	1.00	33	84	CL	FALSE	NA	22.8	NA	NA
1.5 - 3.0	2.25	117	0.13	35	47	1.00	47	95	ML	35.5	97	21	117	0.72
3.0 - 4.5	3.75	114	0.22	44	59	1.00	59	100	ML	36	98	16.4	114	0.7
4.5 - 6.0	5.25	122	0.31	29	39	1.00	39	87	SM	36	105	16	122	0.6
6.0 - 7.5	6.75	124	0.40	40	53	1.00	53	99	SM	37	107	16	124	0.56
7.5 - 9.0	8.25	126	0.50	42	56	1.00	56	100	SM	38	108	16.9	126	0.55
9.0 - 10.5	9.75	123	0.59	32	43	1.00	43	91	SM	36.5	106	16.2	123	0.58
10.5 - 12.0	11.25	129	0.69	44	59	1.00	59	100	SM	38	108	19.3	129	0.55
12.0 - 13.5	12.75	129	0.78	52	69	1.00	69	100	SM	38	108	19.2	129	0.55
13.5 - 15.0	14.25	128	0.88	49	65	1.00	65	100	SM	38	108	18.7	128	0.55
15.0 - 16.5	15.75	133	0.98	35	47	1.00	47	95	SM	37	107	24.2	133	0.56
16.5 - 18.0	17.25	121	1.07	40	53	0.97	52	98	ML	35.5	97	24.7	121	0.72
18.0 - 19.5	18.75	120	1.16	29	39	0.93	36	86	ML	34.5	95	26.3	120	0.75
19.5 - 21.0	20.25	116	1.25	22	29	0.90	26	75	ML	33.5	93	24.7	116	0.8
21.0 - 22.5	21.75	122	1.34	18	24	0.86	21	67	ML	32.5	91	33.8	122	0.83
22.5 - 24.0	23.25	141	1.44	30	40	0.83	33	84	SM	35.5	104	35.5	141	0.61
24.0 - 25.5	24.75	122	1.54	19	25	0.81	20	67	SM	33.5	100	21.9	122	0.67
25.5 - 27.0	26.25	139	1.59	19	25	0.79	20	67	SM	33.5	100	38.6	139	0.67
27.0 - 28.5	27.75	141	1.65	28	37	0.78	29	79	SM	34.5	102	38.2	141	0.63
28.5 - 30.0	29.25	128	1.70	10	13	0.77	10	47	SM	31	96	33.2	128	0.74
30.0 - 31.5	30.75	133	1.75	17	23	0.76	17	60	SM	33	99	34.7	133	0.69
31.5 - 33.0	32.25	128	1.80	23	31	0.74	23	70	SM	34	101	26.9	128	0.65
33.0 - 34.5	33.75	126	1.85	7	9	0.74	7	35	SM	30	94	34.3	126	0.78
34.5 - 36.0	35.25	123	1.90	5	7	0.73	5	27	ML	28.5	84	46.2	123	0.99
36.0 - 37.5	36.75	105	1.93	2	3	0.72	2	11	ML	27	81	30	105	1.05
37.5 - 39.0	38.25	113	1.97	4	5	0.71	4	24	ML	28	83	36.4	113	1.01
39.0 - 40.5	39.75	120	2.01	8	11	0.71	8	41	ML	30	87	38.1	120	0.93
40.5 - 42.0	41.25	120	2.05	8	11	0.70	7	39	ML	29.5	86	39.4	120	0.95
42.0 - 43.5	42.75	124	2.10	9	12	0.69	8	41	ML	30	87	42.8	124	0.93
43.5 - 45.0	44.25	124	2.15	5	7	0.68	5	27	ML	28.5	84	47.8	124	0.99
45.0 - 46.5	45.75	110	2.18	0	0	0.68	1	11	ML	27	81	35.3	110	1.05
46.5 - 48.0	47.25	104	2.21	6	8	0.67	5	32	ML	29	85	22.2	104	0.97
48.0 - 49.5	48.75	110	2.25	13	17	0.67	12	47	ML	30.5	88	24.9	110	0.91
49.5 - 51.0	50.25	120	2.29	17	23	0.66	15	58	CL	FALSE	NA	23.8	NA	NA
51.0 - 52.5	51.75	120	2.33	25	33	0.65	22	68	CL	FALSE	NA	22.5	NA	NA
52.5 - 54.0	53.25	120	2.38	24	32	0.65	21	67	CL	FALSE	NA	22.4	NA	NA
54.0 - 55.5	54.75	120	2.42	16	21	0.64	14	53	CL	FALSE	NA	22.9	NA	NA
55.5 - 57.0	56.25	120	2.46	16	21	0.64	14	53	CL	FALSE	NA	22.9	NA	NA
57.0 - 58.5	57.75	120	2.51	21	28	0.63	18	60	CL	FALSE	NA	22.7	NA	NA
58.5 - 60.0	59.25	120	2.55	26	35	0.63	22	68	CL	FALSE	NA	20.3	NA	NA
60.0 - 61.5	60.75	120	2.59	19	25	0.62	16	58	CL	FALSE	NA	21.1	NA	NA
61.5 - 63.0	62.25	136	2.65	22	29	0.61	18	63	CL	FALSE	NA	18.4	NA	NA
63.0 - 64.5	63.75	136	2.70	20	27	0.61	16	60	CL	FALSE	NA	20.7	NA	NA
64.5 - 66.0	65.25	136	2.76	16	21	0.60	13	52	GW	35.8	130	21.2	158	0.28
66.0 - 66.1	66.05	#NUM!	#NUM!	50	67	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!	11.8	#NUM!	#NUM!

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval	Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
			Input Required											
STN-45		water =	16.5											
0.0 - 1.5	0.75	120	0.05	9	12	1.00	12	52	CL	FALSE	NA	19.6	NA	NA
1.5 - 3.0	2.25	113	0.13	16	21	1.00	21	68	ML	32.5	91	24.2	113	0.83
3.0 - 4.5	3.75	117	0.22	24	32	1.00	32	82	ML	34	94	24.1	117	0.77
4.5 - 6.0	5.25	116	0.30	23	31	1.00	31	79	ML	33.5	93	24.3	116	0.8
6.0 - 7.5	6.75	119	0.39	34	45	1.00	45	93	ML	35	96	24.1	119	0.74
7.5 - 9.0	8.25	119	0.48	41	55	1.00	55	99	ML	35.5	97	22.5	119	0.72
9.0 - 10.5	9.75	110	0.56	17	23	1.00	23	70	ML	33	92	19.5	110	0.82
10.5 - 12.0	11.25	147	0.68	23	31	1.00	31	79	SP	37	117.5	25	147	0.42
12.0 - 13.5	12.75	149	0.79	34	45	1.00	45	93	SP	39.3	121.5	22.5	149	0.37
13.5 - 15.0	14.25	145	0.90	27	36	1.00	36	86	SP	38.5	120.5	20	145	0.39
15.0 - 16.5	15.75	145	1.00	21	28	1.00	28	77	SP	37	117.5	23.4	145	0.42
16.5 - 18.0	17.25	155	1.07	25	33	0.97	32	82	SP	37.8	119	30.3	155	0.4
18.0 - 19.5	18.75	157	1.14	19	25	0.93	24	71	SP	36.2	116.5	34.7	157	0.43
19.5 - 21.0	20.25	164	1.22	7	9	0.91	8	41	SP	32.3	110	49.1	164	0.52
21.0 - 22.5	21.75	120	1.26	7	9	0.89	8	41	SP	32.3	110		#VALUE!	0.52
22.5 - 24.0	23.25	120	1.31	8	11	0.87	9	44	SP	32.3	110	22.3	135	0.52
24.0 - 25.5	24.75	108	1.34	0	0	0.86	1	11	ML	27	81	33.5	108	1.05
25.5 - 27.0	26.25	120	1.38	4	5	0.85	5	27	ML	28.5	84	33.2	112	0.99
27.0 - 28.5	27.75	120	1.43	4	5	0.84	5	27	ML	28.5	84	30.3	109	0.99
28.5 - 30.0	29.25	120	1.47	5	7	0.82	6	32	ML	29	85	54.4	131	0.97
30.0 - 31.5	30.75	120	1.51	1	1	0.81	1	11	ML	27	81	35.1	109	1.05
31.5 - 33.0	32.25	120	1.56	2	3	0.80	2	18	ML	27.5	82	42.7	117	1.03
33.0 - 34.5	33.75	120	1.60	3	4	0.79	3	24	ML	28	83	51.3	126	1.01
34.5 - 36.0	35.25	125	1.65	0	0	0.78	1	11	ML	27	81	53.9	125	1.05
36.0 - 37.5	36.75	113	1.69	0	0	0.77	1	11	ML	27	81	39.9	113	1.05
37.5 - 39.0	38.25	120	1.73	6	8	0.76	6	35	CL	FALSE	NA	24.9	NA	NA
39.0 - 40.5	39.75	120	1.77	16	21	0.75	16	60	CL	FALSE	NA	30.2	NA	NA
40.5 - 42.0	41.25	120	1.81	1	1	0.74	1	11	CL	FALSE	NA	28.3	NA	NA
42.0 - 43.5	42.75	120	1.86	26	35	0.73	25	74	CL	FALSE	NA	29.9	NA	NA
43.5 - 45.0	44.25	120	1.90	23	31	0.73	22	70	CL	FALSE	NA	26.2	NA	NA
45.0 - 46.5	45.75	120	1.94	16	21	0.72	15	58	CL	FALSE	NA	26.7	NA	NA
46.5 - 48.0	47.25	120	1.99	17	23	0.71	16	60	CL	FALSE	NA	25.1	NA	NA
48.0 - 49.5	48.75	120	2.03	12	16	0.70	11	47	CL	FALSE	NA	24	NA	NA
49.5 - 51.0	50.25	120	2.07	9	12	0.69	8	41	CL	FALSE	NA	24.4	NA	NA
51.0 - 52.5	51.75	120	2.12	12	16	0.69	11	47	CL	FALSE	NA	25	NA	NA
52.5 - 54.0	53.25	120	2.16	8	11	0.68	7	39	CL	FALSE	NA	24.7	NA	NA
54.0 - 55.5	54.75	120	2.20	0	0	0.67	1	11	CL	FALSE	NA	26.2	NA	NA
55.5 - 57.0	56.25	120	2.25	30	40	0.67	27	75	CL	FALSE	NA	16.1	NA	NA
57.0 - 58.2	57.6	120	2.29	50	67	0.66	44	93	CL	FALSE	NA	17.4	NA	NA

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
					Input Required											
STN-46				water =	2.0											
0.0	-	1.5	0.75	120	0.05	2	3	1.00	3	18	CH	FALSE	NA	36.2	NA	NA
1.5	-	3.0	2.25	138	0.10	3	4	1.00	4	27	SP	30	106.5	29.9	138	0.57
3.0	-	4.5	3.75	148	0.17	2	3	1.00	3	18	SP	29	105	40.7	148	0.59
4.5	-	6.0	5.25	156	0.24	2	3	1.00	3	18	SP	29	105	48.6	156	0.59
6.0	-	7.5	6.75	153	0.30	1	1	1.00	1	11	SP	28.4	104	46.7	153	0.6
7.5	-	9.0	8.25	114	0.34	1	1	1.00	1	11	ML	27	81	40.8	114	1.05
9.0	-	10.5	9.75	121	0.39	0	0	1.00	1	11	ML	27	81	49.4	121	1.05
10.5	-	12.0	11.25	115	0.43	1	1	1.00	1	11	ML	27	81	41.4	115	1.05
12.0	-	13.5	12.75	120	0.47	4	5	1.00	5	32	ML	29	85	41.7	120	0.97
13.5	-	15.0	14.25	119	0.51	2	3	1.00	3	18	ML	27.5	82	44.8	119	1.03
15.0	-	16.5	15.75	113	0.55	1	1	1.00	1	11	ML	27	81	40	113	1.05
16.5	-	18.0	17.25	117	0.59	1	1	1.00	1	11	ML	27	81	44.2	117	1.05
18.0	-	19.5	18.75	123	0.64	0	0	1.00	1	11	ML	27	81	52	123	1.05
19.5	-	21.0	20.25	121	0.68	0	0	1.00	1	11	ML	27	81	48.8	121	1.05
21.0	-	22.5	21.75	111	0.72	0	0	1.00	1	11	ML	27	81	37.1	111	1.05
22.5	-	24.0	23.25	106	0.75	0	0	1.00	1	11	ML	27	81	31.3	106	1.05
24.0	-	25.5	24.75	120	0.79	4	5	1.00	5	32	CL	FALSE	NA	27.5	NA	NA
25.5	-	27.0	26.25	120	0.84	11	15	1.00	15	56	CL	FALSE	NA	29	NA	NA
27.0	-	28.5	27.75	120	0.88	16	21	1.00	21	68	CL	FALSE	NA	30.1	NA	NA
28.5	-	30.0	29.25	120	0.92	20	27	1.00	27	75	CL	FALSE	NA	30.3	NA	NA
30.0	-	31.5	30.75	120	0.97	18	24	1.00	24	73	CL	FALSE	NA	27.8	NA	NA
31.5	-	33.0	32.25	120	1.01	19	25	1.00	25	74	CL	FALSE	NA	25.9	NA	NA
33.0	-	34.5	33.75	120	1.05	21	28	0.98	27	77	CL	FALSE	NA	24.5	NA	NA
34.5	-	36.0	35.25	120	1.09	8	11	0.96	10	47	CL	FALSE	NA	24.9	NA	NA
36.0	-	37.5	36.75	120	1.14	9	12	0.94	11	47	CL	FALSE	NA	23.6	NA	NA
37.5	-	39.0	38.25	120	1.18	8	11	0.92	10	44	CL	FALSE	NA	24	NA	NA
39.0	-	40.5	39.75	120	1.22	4	5	0.90	5	27	CL	FALSE	NA	26.7	NA	NA
40.5	-	42.0	41.25	120	1.27	50	67	0.89	59	100	CL	FALSE	NA	25.5	NA	NA

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
					Input Required											
STN-46				water =	2.0											
0.0	-	1.5	0.75	120	0.05	2	3	1.00	3	18	CH	FALSE	NA	36.2	NA	NA
1.5	-	3.0	2.25	138	0.10	3	4	1.00	4	27	SP	30	106.5	29.9	138	0.57
3.0	-	4.5	3.75	148	0.17	2	3	1.00	3	18	SP	29	105	40.7	148	0.59
4.5	-	6.0	5.25	156	0.24	2	3	1.00	3	18	SP	29	105	48.6	156	0.59
6.0	-	7.5	6.75	153	0.30	1	1	1.00	1	11	SP	28.4	104	46.7	153	0.6
7.5	-	9.0	8.25	114	0.34	1	1	1.00	1	11	ML	27	81	40.8	114	1.05
9.0	-	10.5	9.75	121	0.39	0	0	1.00	1	11	ML	27	81	49.4	121	1.05
10.5	-	12.0	11.25	115	0.43	1	1	1.00	1	11	ML	27	81	41.4	115	1.05
12.0	-	13.5	12.75	120	0.47	4	5	1.00	5	32	ML	29	85	41.7	120	0.97
13.5	-	15.0	14.25	119	0.51	2	3	1.00	3	18	ML	27.5	82	44.8	119	1.03
15.0	-	16.5	15.75	113	0.55	1	1	1.00	1	11	ML	27	81	40	113	1.05
16.5	-	18.0	17.25	117	0.59	1	1	1.00	1	11	ML	27	81	44.2	117	1.05
18.0	-	19.5	18.75	123	0.64	0	0	1.00	1	11	ML	27	81	52	123	1.05
19.5	-	21.0	20.25	121	0.68	0	0	1.00	1	11	ML	27	81	48.8	121	1.05
21.0	-	22.5	21.75	111	0.72	0	0	1.00	1	11	ML	27	81	37.1	111	1.05
22.5	-	24.0	23.25	106	0.75	0	0	1.00	1	11	ML	27	81	31.3	106	1.05
24.0	-	25.5	24.75	120	0.79	4	5	1.00	5	32	CL	FALSE	NA	27.5	NA	NA
25.5	-	27.0	26.25	120	0.84	11	15	1.00	15	56	CL	FALSE	NA	29	NA	NA
27.0	-	28.5	27.75	120	0.88	16	21	1.00	21	68	CL	FALSE	NA	30.1	NA	NA
28.5	-	30.0	29.25	120	0.92	20	27	1.00	27	75	CL	FALSE	NA	30.3	NA	NA
30.0	-	31.5	30.75	120	0.97	18	24	1.00	24	73	CL	FALSE	NA	27.8	NA	NA
31.5	-	33.0	32.25	120	1.01	19	25	1.00	25	74	CL	FALSE	NA	25.9	NA	NA
33.0	-	34.5	33.75	120	1.05	21	28	0.98	27	77	CL	FALSE	NA	24.5	NA	NA
34.5	-	36.0	35.25	120	1.09	8	11	0.96	10	47	CL	FALSE	NA	24.9	NA	NA
36.0	-	37.5	36.75	120	1.14	9	12	0.94	11	47	CL	FALSE	NA	23.6	NA	NA
37.5	-	39.0	38.25	120	1.18	8	11	0.92	10	44	CL	FALSE	NA	24	NA	NA
39.0	-	40.5	39.75	120	1.22	4	5	0.90	5	27	CL	FALSE	NA	26.7	NA	NA
40.5	-	42.0	41.25	120	1.27	50	67	0.89	59	100	CL	FALSE	NA	25.5	NA	NA

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval	Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_{cl}	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
			Input Required											
STN-47		water =	27.5											
0.0 - 1.5	0.75	120	0.05	11	15	1.00	15	56	CL	FALSE	NA	24.9	NA	NA
1.5 - 3.0	2.25	113	0.13	36	48	1.00	48	95	ML	35.5	97	16.4	113	0.72
3.0 - 4.5	3.75	116	0.22	37	49	1.00	49	97	ML	35.5	97	19.7	116	0.72
4.5 - 6.0	5.25	114	0.30	41	55	1.00	55	99	ML	35.5	97	17.2	114	0.72
6.0 - 7.5	6.75	116	0.39	43	57	1.00	57	100	ML	36	98	18.3	116	0.7
7.5 - 9.0	8.25	115	0.48	51	68	1.00	68	100	ML	36	98	17.4	115	0.7
9.0 - 10.5	9.75	150	0.59	51	68	1.00	68	100	SW	40.7	124	20.7	150	0.35
10.5 - 12.0	11.25	149	0.70	54	72	1.00	72	100	SW	40.7	124	20.1	149	0.35
12.0 - 13.5	12.75	150	0.81	54	72	1.00	72	100	SW	40.7	124	20.9	150	0.35
13.5 - 15.0	14.25	148	0.92	33	44	1.00	44	93	SW	39.3	121.5	21.5	148	0.37
15.0 - 16.5	15.75	115	1.01	29	39	1.00	39	87	ML	34.5	95	21.1	115	0.75
16.5 - 18.0	17.25	119	1.10	37	49	0.95	47	95	ML	35.5	97	23	119	0.72
18.0 - 19.5	18.75	119	1.19	36	48	0.92	44	93	ML	35	96	23.7	119	0.74
19.5 - 21.0	20.25	112	1.27	21	28	0.89	25	73	ML	33	92	22.1	112	0.82
21.0 - 22.5	21.75	114	1.36	21	28	0.86	24	73	ML	33	92	23.4	114	0.82
22.5 - 24.0	23.25	127	1.45	25	33	0.83	28	77	ML	33.5	93	36.2	127	0.8
24.0 - 25.5	24.75	120	1.54	24	32	0.81	26	74	ML	33	92	30.8	120	0.82
25.5 - 27.0	26.25	123	1.63	15	20	0.78	16	58	ML	31.5	89.5	37.9	123	0.87
27.0 - 28.5	27.75	121	1.68	15	20	0.77	15	58	ML	31.5	89.5	35.4	121	0.87
28.5 - 30.0	29.25	119	1.72	5	7	0.76	5	32	ML	29	85	39.6	119	0.97
30.0 - 31.5	30.75	113	1.76	3	4	0.75	3	24	ML	28	83	36.3	113	1.01
31.5 - 33.0	32.25	119	1.80	3	4	0.75	3	24	ML	28	83	43.2	119	1.01
33.0 - 34.5	33.75	112	1.84	4	5	0.74	4	24	ML	28	83	35.2	112	1.01
34.5 - 36.0	35.25	107	1.87	4	5	0.73	4	24	ML	28	83	29.5	107	1.01
36.0 - 37.5	36.75	106	1.90	3	4	0.72	3	18	ML	27.5	82	28.9	106	1.03
37.5 - 39.0	38.25	109	1.94	4	5	0.72	4	24	ML	28	83	31.5	109	1.01
39.0 - 40.5	39.75	114	1.98	5	7	0.71	5	27	ML	28.5	84	35.2	114	0.99
40.5 - 42.0	41.25	115	2.02	6	8	0.70	6	32	ML	29	85	34.9	115	0.97
42.0 - 43.5	42.75	124	2.06	5	7	0.70	5	27	ML	28.5	84	47.6	124	0.99
43.5 - 45.0	44.25	134	2.12	3	4	0.69	3	18	ML	27.5	82	63	134	1.03
45.0 - 46.5	45.75	127	2.17	4	5	0.68	4	24	ML	28	83	53.1	127	1.01
46.5 - 48.0	47.25	125	2.21	4	5	0.67	4	24	ML	28	83	51.2	125	1.01
48.0 - 49.5	48.75	112	2.25	0	0	0.67	1	11	ML	27	81	38.7	112	1.05
49.5 - 51.0	50.25	132	2.30	4	5	0.66	4	24	ML	28	83	59.1	132	1.01
51.0 - 52.5	51.75	120	2.35	15	20	0.65	13	53	CL	FALSE	NA	27.3	NA	NA
52.5 - 54.0	53.25	120	2.39	11	15	0.65	10	44	CL	FALSE	NA	26.2	NA	NA
54.0 - 55.5	54.75	120	2.43	8	11	0.64	7	35	CL	FALSE	NA	26.4	NA	NA
55.5 - 57.0	56.25	120	2.48	12	16	0.64	10	47	CL	FALSE	NA	22.4	NA	NA
57.0 - 58.5	57.75	120	2.52	14	19	0.63	12	47	CL	FALSE	NA	20.5	NA	NA
58.5 - 60.0	59.25	120	2.56	21	28	0.62	18	60	CL	FALSE	NA	21.2	NA	NA
60.0 - 61.5	60.75	120	2.60	19	25	0.62	16	58	CL	FALSE	NA	21.6	NA	NA
61.5 - 63.0	62.25	120	2.65	18	24	0.61	15	56	CL	FALSE	NA	19.4	NA	NA
63.0 - 64.5	63.75	131	2.70	10	13	0.61	8	41	CL	FALSE	NA	23.7	NA	NA
64.5 - 66.0	65.25	131	2.75	5	7	0.60	4	27	CL	FALSE	NA	23.9	NA	NA
66.0 - 67.5	66.75	131	2.80	21	28	0.60	17	60	CL	FALSE	NA	24.5	NA	NA
67.5 - 69.0	68.25	131	2.85	23	31	0.59	18	63	CL	FALSE	NA	24.4	NA	NA
69.0 - 69.9	69.45	131	2.90	50	67	0.59	39	89	SM	36	105	13.9	120	0.6

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_e	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
					Input Required											
STN-48				water =	18.0											
0.0	-	1.5	0.75	120	0.05	8	11	1.00	11	47	CL	FALSE	NA	28.5	NA	NA
1.5	-	3.0	2.25	116	0.13	34	45	1.00	45	93	ML	35	96	21	116	0.74
3.0	-	4.5	3.75	112	0.22	25	33	1.00	33	84	ML	34	94	18.9	112	0.77
4.5	-	6.0	5.25	114	0.30	21	28	1.00	28	77	ML	33.5	93	22.3	114	0.8
6.0	-	7.5	6.75	116	0.39	30	40	1.00	40	89	ML	34.5	95	22	116	0.75
7.5	-	9.0	8.25	117	0.48	31	41	1.00	41	91	ML	35	96	22.2	117	0.74
9.0	-	10.5	9.75	120	0.57	23	31	1.00	31	79	ML	33.5	93	29.1	120	0.8
10.5	-	12.0	11.25	120	0.66	24	32	1.00	32	82	ML	34	94	28	120	0.77
12.0	-	13.5	12.75	114	0.74	25	33	1.00	33	84	ML	34	94	21.5	114	0.77
13.5	-	15.0	14.25	117	0.83	18	24	1.00	24	73	ML	33	92	27.1	117	0.82
15.0	-	16.5	15.75	121	0.92	17	23	1.00	23	70	ML	33	92	31.6	121	0.82
16.5	-	18.0	17.25	120	1.01	14	19	0.99	19	63	ML	32	90	33.6	120	0.85
18.0	-	19.5	18.75	116	1.05	7	9	0.98	9	44	ML	30	87	33.4	116	0.93
19.5	-	21.0	20.25	125	1.10	4	5	0.95	5	32	ML	29	85	47.4	125	0.97
21.0	-	22.5	21.75	123	1.14	5	7	0.93	6	35	ML	29.5	86	43.6	123	0.95
22.5	-	24.0	23.25	118	1.19	6	8	0.92	7	39	ML	29.5	86	37.3	118	0.95
24.0	-	25.5	24.75	118	1.23	7	9	0.90	8	41	ML	30	87	36.1	118	0.93
25.5	-	27.0	26.25	118	1.27	9	12	0.89	11	47	ML	30.5	88	34.2	118	0.91
27.0	-	28.5	27.75	100	1.30	1	1	0.88	1	11	ML	27	100	29.5	130	1.05
28.5	-	30.0	29.25	110	1.33	1	1	0.87	1	11	ML	27	81	35.8	110	1.05
30.0	-	31.5	30.75	133	1.39	1	1	0.85	1	11	ML	27	81	63.8	133	1.05
31.5	-	33.0	32.25	124	1.43	1	1	0.84	1	11	ML	27	81	52.8	124	1.05
33.0	-	34.5	33.75	125	1.48	1	1	0.82	1	11	ML	27	81	54.1	125	1.05
34.5	-	36.0	35.25	122	1.52	0	0	0.81	1	11	ML	27	81	50.2	122	1.05
36.0	-	37.5	36.75	142	1.58	2	3	0.79	2	18	ML	27.5	82	72.9	142	1.03
37.5	-	39.0	38.25	127	1.63	2	3	0.78	2	18	ML	27.5	82	54.5	127	1.03
39.0	-	40.5	39.75	132	1.68	0	0	0.77	1	11	ML	27	81	62.5	132	1.05
40.5	-	42.0	41.25	123	1.73	0	0	0.76	1	11	ML	27	81	51.7	123	1.05
42.0	-	43.5	42.75	110	1.76	4	5	0.75	4	27	ML	28.5	84	31	110	0.99
43.5	-	45.0	44.25	120	1.81	6	8	0.74	6	35	CL	FALSE	NA	32.5	NA	NA
45.0	-	46.5	45.75	120	1.85	8	11	0.74	8	41	CL	FALSE	NA	24.8	NA	NA
46.5	-	48.0	47.25	120	1.89	12	16	0.73	12	47	CL	FALSE	NA	26.8	NA	NA
48.0	-	49.5	48.75	120	1.94	13	17	0.72	13	52	CL	FALSE	NA	21.4	NA	NA
49.5	-	51.0	50.25	120	1.98	15	20	0.71	14	56	CL	FALSE	NA	22.8	NA	NA
51.0	-	52.5	51.75	120	2.02	25	33	0.70	23	71	CL	FALSE	NA	22.8	NA	NA
52.5	-	54.0	53.25	120	2.07	26	35	0.70	24	73	CL	FALSE	NA	24	NA	NA
54.0	-	55.5	54.75	120	2.11	11	15	0.69	10	47	CL	FALSE	NA	23	NA	NA
55.5	-	57.0	56.25	120	2.15	9	12	0.68	8	41	CL	FALSE	NA	23.4	NA	NA
57.0	-	58.5	57.75	120	2.20	7	9	0.67	6	35	CL	FALSE	NA	24.8	NA	NA
58.5	-	60.0	59.25	109	2.23	8	11	0.67	7	39	ML	29.5	86	27	109	0.95
60.0	-	60.4	60.2	105	2.25	50	67	0.67	44	93	ML	35	96	9.2	105	0.74

Project No: 172679015
File Name: \\us1243-f01\workgroup\1714\active\171468118\environmental\Bull Run - 172679015\Engineering Analysis\Parameter Derivation\SPT Correction_BRF Gypsum Stack.xls

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_e	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
					Input Required											
STN-48				water =	18.0											
0.0	-	1.5	0.75	120	0.05	8	11	1.00	11	47	CL	FALSE	NA	28.5	NA	NA
1.5	-	3.0	2.25	116	0.13	34	45	1.00	45	93	ML	35	96	21	116	0.74
3.0	-	4.5	3.75	112	0.22	25	33	1.00	33	84	ML	34	94	18.9	112	0.77
4.5	-	6.0	5.25	114	0.30	21	28	1.00	28	77	ML	33.5	93	22.3	114	0.8
6.0	-	7.5	6.75	116	0.39	30	40	1.00	40	89	ML	34.5	95	22	116	0.75
7.5	-	9.0	8.25	117	0.48	31	41	1.00	41	91	ML	35	96	22.2	117	0.74
9.0	-	10.5	9.75	120	0.57	23	31	1.00	31	79	ML	33.5	93	29.1	120	0.8
10.5	-	12.0	11.25	120	0.66	24	32	1.00	32	82	ML	34	94	28	120	0.77
12.0	-	13.5	12.75	114	0.74	25	33	1.00	33	84	ML	34	94	21.5	114	0.77
13.5	-	15.0	14.25	117	0.83	18	24	1.00	24	73	ML	33	92	27.1	117	0.82
15.0	-	16.5	15.75	121	0.92	17	23	1.00	23	70	ML	33	92	31.6	121	0.82
16.5	-	18.0	17.25	120	1.01	14	19	0.99	19	63	ML	32	90	33.6	120	0.85
18.0	-	19.5	18.75	116	1.05	7	9	0.98	9	44	ML	30	87	33.4	116	0.93
19.5	-	21.0	20.25	125	1.10	4	5	0.95	5	32	ML	29	85	47.4	125	0.97
21.0	-	22.5	21.75	123	1.14	5	7	0.93	6	35	ML	29.5	86	43.6	123	0.95
22.5	-	24.0	23.25	118	1.19	6	8	0.92	7	39	ML	29.5	86	37.3	118	0.95
24.0	-	25.5	24.75	118	1.23	7	9	0.90	8	41	ML	30	87	36.1	118	0.93
25.5	-	27.0	26.25	118	1.27	9	12	0.89	11	47	ML	30.5	88	34.2	118	0.91
27.0	-	28.5	27.75	100	1.30	1	1	0.88	1	11	ML	27	100	29.5	130	1.05
28.5	-	30.0	29.25	110	1.33	1	1	0.87	1	11	ML	27	81	35.8	110	1.05
30.0	-	31.5	30.75	133	1.39	1	1	0.85	1	11	ML	27	81	63.8	133	1.05
31.5	-	33.0	32.25	124	1.43	1	1	0.84	1	11	ML	27	81	52.8	124	1.05
33.0	-	34.5	33.75	125	1.48	1	1	0.82	1	11	ML	27	81	54.1	125	1.05
34.5	-	36.0	35.25	122	1.52	0	0	0.81	1	11	ML	27	81	50.2	122	1.05
36.0	-	37.5	36.75	142	1.58	2	3	0.79	2	18	ML	27.5	82	72.9	142	1.03
37.5	-	39.0	38.25	127	1.63	2	3	0.78	2	18	ML	27.5	82	54.5	127	1.03
39.0	-	40.5	39.75	132	1.68	0	0	0.77	1	11	ML	27	81	62.5	132	1.05
40.5	-	42.0	41.25	123	1.73	0	0	0.76	1	11	ML	27	81	51.7	123	1.05
42.0	-	43.5	42.75	110	1.76	4	5	0.75	4	27	ML	28.5	84	31	110	0.99
43.5	-	45.0	44.25	120	1.81	6	8	0.74	6	35	CL	FALSE	NA	32.5	NA	NA
45.0	-	46.5	45.75	120	1.85	8	11	0.74	8	41	CL	FALSE	NA	24.8	NA	NA
46.5	-	48.0	47.25	120	1.89	12	16	0.73	12	47	CL	FALSE	NA	26.8	NA	NA
48.0	-	49.5	48.75	120	1.94	13	17	0.72	13	52	CL	FALSE	NA	21.4	NA	NA
49.5	-	51.0	50.25	120	1.98	15	20	0.71	14	56	CL	FALSE	NA	22.8	NA	NA
51.0	-	52.5	51.75	120	2.02	25	33	0.70	23	71	CL	FALSE	NA	22.8	NA	NA
52.5	-	54.0	53.25	120	2.07	26	35	0.70	24	73	CL	FALSE	NA	24	NA	NA
54.0	-	55.5	54.75	120	2.11	11	15	0.69	10	47	CL	FALSE	NA	23	NA	NA
55.5	-	57.0	56.25	120	2.15	9	12	0.68	8	41	CL	FALSE	NA	23.4	NA	NA
57.0	-	58.5	57.75	120	2.20	7	9	0.67	6	35	CL	FALSE	NA	24.8	NA	NA
58.5	-	60.0	59.25	109	2.23	8	11	0.67	7	39	ML	29.5	86	27	109	0.95
60.0	-	60.4	60.2	105	2.25	50	67	0.67	44	93	ML	35	96	9.2	105	0.74

Project No: 172679015
File Name: \\us1243-f01\workgroup\1714\active\171468118\environmental\Bull Run - 172679015\Engineering Analysis\Parameter Derivation\SPT Correction_BRF Gypsum Stack.xls

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval	Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
		Input Required												
STN-49		water =	2.0											
0.0 - 1.5	0.75	110	0.04	0	0	1.00	1	11	CH	FALSE	NA	35.2	110	NA
1.5 - 3.0	2.25	109	0.08	2	3	1.00	3	18	ML	27.5	82	32.6	109	1.03
3.0 - 4.5	3.75	107	0.11	2	3	1.00	3	18	ML	27.5	82	30.8	107	1.03
4.5 - 6.0	5.25	119	0.15	0	0	1.00	1	11	ML	27	81	46.6	119	1.05
6.0 - 7.5	6.75	115	0.19	0	0	1.00	1	11	ML	27	81	42.5	115	1.05
7.5 - 9.0	8.25	122	0.24	0	0	1.00	1	11	ML	27	81	50.1	122	1.05
9.0 - 10.5	9.75	112	0.27	0	0	1.00	1	11	ML	27	81	38	112	1.05
10.5 - 12.0	11.25	113	0.31	0	0	1.00	1	11	ML	27	81	39	113	1.05
12.0 - 13.5	12.75	162	0.39	1	1	1.00	1	11	SP	28.4	104	55.4	162	0.6
13.5 - 15.0	14.25	175	0.47	0	0	1.00	1	11	SP	28.4	104	67.9	175	0.6
15.0 - 16.5	15.75	166	0.55	0	0	1.00	1	11	SP	28.4	104	59.3	166	0.6
16.5 - 18.0	17.25	100	0.57	0	0	1.00	1	11	ML	27	81	45.2	100	1.05
18.0 - 19.5	18.75	100	0.60	0	0	1.00	1	11	ML	27	81	44.6	100	1.05
19.5 - 21.0	20.25	100	0.63	0	0	1.00	1	11	ML	27	81	55.2	100	1.05
21.0 - 22.5	21.75	100	0.66	0	0	1.00	1	11	ML	27	81	48.6	100	1.05
22.5 - 24.0	23.25	100	0.69	0	0	1.00	1	11	ML	27	81	51	100	1.05
24.0 - 25.5	24.75	100	0.72	0	0	1.00	1	11	ML	27	81	46.7	100	1.05
25.5 - 27.0	26.25	100	0.74	0	0	1.00	1	11	ML	27	81	38.6	100	1.05
27.0 - 28.5	27.75	120	0.79	7	9	1.00	9	44	CL	FALSE	NA	25.5	NA	NA
28.5 - 30.0	29.25	120	0.83	10	13	1.00	13	53	CL	FALSE	NA	24.8	NA	NA
30.0 - 31.5	30.75	120	0.87	6	8	1.00	8	41	CL	FALSE	NA	24.8	NA	NA
31.5 - 33.0	32.25	120	0.92	22	29	1.00	29	79	CL	FALSE	NA	21.5	NA	NA
33.0 - 34.5	33.75	120	0.96	22	29	1.00	29	79	CL	FALSE	NA	24.2	NA	NA
34.5 - 36.0	35.25	120	1.00	13	17	1.00	17	60	CL	FALSE	NA	24.4	NA	NA
36.0 - 37.5	36.75	120	1.05	8	11	0.98	10	47	CL	FALSE	NA	23.6	NA	NA
37.5 - 39.0	38.25	120	1.09	14	19	0.96	18	60	CL	FALSE	NA	25.1	NA	NA
39.0 - 40.5	39.75	120	1.13	3	4	0.94	4	24	CL	FALSE	NA	26.5	NA	NA
40.5 - 42.0	41.25	134	1.19	11	15	0.92	14	53	SW	33.6	112	19.9	134	0.49
42.0 - 43.5	42.75	144	1.25	43	57	0.90	51	98	SW	40	123	17.1	144	0.36
43.5 - 44.2	43.85	138	1.29	50	67	0.88	59	100	SW	40.7	124	11.5	138	0.35
44.2 - 44.5	44.35	120	1.30	NA	#VALUE!	0.88	#VALUE!	#VALUE!	STONE FRAGME	FALSE	NA		NA	NA
44.5 - 49.5	47	120	1.38	NA	#VALUE!	0.85	#VALUE!	#VALUE!	SHALE	FALSE	NA		NA	NA

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval	Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
		Input Required												
STN-49		water =	2.0											
0.0 - 1.5	0.75	110	0.04	0	0	1.00	1	11	CH	FALSE	NA	35.2	110	NA
1.5 - 3.0	2.25	109	0.08	2	3	1.00	3	18	ML	27.5	82	32.6	109	1.03
3.0 - 4.5	3.75	107	0.11	2	3	1.00	3	18	ML	27.5	82	30.8	107	1.03
4.5 - 6.0	5.25	119	0.15	0	0	1.00	1	11	ML	27	81	46.6	119	1.05
6.0 - 7.5	6.75	115	0.19	0	0	1.00	1	11	ML	27	81	42.5	115	1.05
7.5 - 9.0	8.25	122	0.24	0	0	1.00	1	11	ML	27	81	50.1	122	1.05
9.0 - 10.5	9.75	112	0.27	0	0	1.00	1	11	ML	27	81	38	112	1.05
10.5 - 12.0	11.25	113	0.31	0	0	1.00	1	11	ML	27	81	39	113	1.05
12.0 - 13.5	12.75	162	0.39	1	1	1.00	1	11	SP	28.4	104	55.4	162	0.6
13.5 - 15.0	14.25	175	0.47	0	0	1.00	1	11	SP	28.4	104	67.9	175	0.6
15.0 - 16.5	15.75	166	0.55	0	0	1.00	1	11	SP	28.4	104	59.3	166	0.6
16.5 - 18.0	17.25	100	0.57	0	0	1.00	1	11	ML	27	81	45.2	100	1.05
18.0 - 19.5	18.75	100	0.60	0	0	1.00	1	11	ML	27	81	44.6	100	1.05
19.5 - 21.0	20.25	100	0.63	0	0	1.00	1	11	ML	27	81	55.2	100	1.05
21.0 - 22.5	21.75	100	0.66	0	0	1.00	1	11	ML	27	81	48.6	100	1.05
22.5 - 24.0	23.25	100	0.69	0	0	1.00	1	11	ML	27	81	51	100	1.05
24.0 - 25.5	24.75	100	0.72	0	0	1.00	1	11	ML	27	81	46.7	100	1.05
25.5 - 27.0	26.25	100	0.74	0	0	1.00	1	11	ML	27	81	38.6	100	1.05
27.0 - 28.5	27.75	120	0.79	7	9	1.00	9	44	CL	FALSE	NA	25.5	NA	NA
28.5 - 30.0	29.25	120	0.83	10	13	1.00	13	53	CL	FALSE	NA	24.8	NA	NA
30.0 - 31.5	30.75	120	0.87	6	8	1.00	8	41	CL	FALSE	NA	24.8	NA	NA
31.5 - 33.0	32.25	120	0.92	22	29	1.00	29	79	CL	FALSE	NA	21.5	NA	NA
33.0 - 34.5	33.75	120	0.96	22	29	1.00	29	79	CL	FALSE	NA	24.2	NA	NA
34.5 - 36.0	35.25	120	1.00	13	17	1.00	17	60	CL	FALSE	NA	24.4	NA	NA
36.0 - 37.5	36.75	120	1.05	8	11	0.98	10	47	CL	FALSE	NA	23.6	NA	NA
37.5 - 39.0	38.25	120	1.09	14	19	0.96	18	60	CL	FALSE	NA	25.1	NA	NA
39.0 - 40.5	39.75	120	1.13	3	4	0.94	4	24	CL	FALSE	NA	26.5	NA	NA
40.5 - 42.0	41.25	134	1.19	11	15	0.92	14	53	SW	33.6	112	19.9	134	0.49
42.0 - 43.5	42.75	144	1.25	43	57	0.90	51	98	SW	40	123	17.1	144	0.36
43.5 - 44.2	43.85	138	1.29	50	67	0.88	59	100	SW	40.7	124	11.5	138	0.35
44.2 - 44.5	44.35	120	1.30	NA	#VALUE!	0.88	#VALUE!	#VALUE!	STONE FRAGME	FALSE	NA		NA	NA
44.5 - 49.5	47	120	1.38	NA	#VALUE!	0.85	#VALUE!	#VALUE!	SHALE	FALSE	NA		NA	NA

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_s	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
					Input Required											
STN-50				water =	19.4											
0.0	-	1.5	0.75	120	0.05	14	19	1.00	19	63	CL	FALSE	NA	18.7	NA	NA
1.5	-	3.0	2.25	161	0.17	17	23	1.00	23	70	SP	36.2	116.5	20.8	161	0.43
3.0	-	4.5	3.75	163	0.29	23	31	1.00	31	79	SP	37	117.5	15.8	163	0.42
4.5	-	6.0	5.25	212	0.45	23	31	1.00	31	79	SP	37	117.5	26.7	212	0.42
6.0	-	7.5	6.75	184	0.59	31	41	1.00	41	91	SP	39.3	121.5	25.3	184	0.37
7.5	-	9.0	8.25	206	0.74	33	44	1.00	44	93	SP	39.3	121.5	46.3	206	0.37
9.0	-	10.5	9.75	191	0.88	20	27	1.00	27	75	SP	37	117.5	21.9	191	0.42
10.5	-	12.0	11.25	205	1.04	28	37	0.98	37	86	SP	38.5	120.5	25.9	205	0.39
12.0	-	13.5	12.75	191	1.18	32	43	0.92	39	89	SP	38.5	120.5	22.6	191	0.39
13.5	-	15.0	14.25	183	1.32	38	51	0.87	44	93	SP	39.3	121.5	25.3	183	0.37
15.0	-	16.5	15.75	181	1.45	28	37	0.83	31	81	SP	37.8	119	41.7	181	0.4
16.5	-	18.0	17.25	178	1.59	23	31	0.79	24	73	SP	36.2	116.5	43.2	178	0.43
18.0	-	19.5	18.75	168	1.71	24	32	0.76	25	73	SP	36.2	116.5	38.1	168	0.43
19.5	-	21.0	20.25	160	1.79	9	12	0.75	9	44	SP	32.3	110	33.3	160	0.52
21.0	-	22.5	21.75	154	1.85	9	12	0.73	9	41	SP	32.3	110	41.5	154	0.52
22.5	-	24.0	23.25	141	1.91	11	15	0.72	11	47	SP	33	111	32.9	141	0.5
24.0	-	25.5	24.75	112	1.95	9	12	0.72	9	41	ML	30	87	41.5	112	0.93
25.5	-	27.0	26.25	107	1.99	3	4	0.71	3	18	ML	27.5	82	38.2	107	1.03
27.0	-	28.5	27.75	110	2.02	8	11	0.70	8	41	ML	30	87	39	110	0.93
28.5	-	30.0	29.25	103	2.05	2	3	0.70	2	11	ML	27	81	80.4	103	1.05
30.0	-	31.5	30.75	99	2.08	2	3	0.69	2	11	ML	27	81	51.2	99	1.05
31.5	-	33.0	32.25	100	2.11	3	4	0.69	3	18	ML	27.5	82	69.8	100	1.03
33.0	-	34.5	33.75	103	2.14	5	7	0.68	5	27	ML	28.5	84	62.6	103	0.99
34.5	-	36.0	35.25	95	2.16	5	7	0.68	5	27	ML	28.5	84	69.9	95	0.99
36.0	-	37.5	36.75	120	2.20	3	4	0.67	3	18	ML	27.5	82	58.1	#VALUE!	1.03
37.5	-	39.0	38.25	120	2.25	2	3	0.67	2	11	ML	27	81	50.9	#REF!	1.05
39.0	-	40.5	39.75	120	2.29	2	3	0.66	2	11	ML	27	81	52.4	#REF!	1.05
40.5	-	42.0	41.25	120	2.33	0	0	0.65	1	11	ML	27	81	52.8	#REF!	1.05
42.0	-	43.5	42.75	120	2.38	0	0	0.65	1	11	ML	27	81	44.4	#REF!	1.05
43.5	-	45.0	44.25	120	2.42	2	3	0.64	2	11	ML	27	81	45.6	#REF!	1.05
45.0	-	46.5	45.75	120	2.46	0	0	0.64	1	11	ML	27	81	40.1	#REF!	1.05
46.5	-	48.0	47.25	120	2.51	1	1	0.63	1	#N/A	ML	#N/A	#N/A	27.4	#N/A	#N/A
48.0	-	49.5	48.75	120	2.55	5	7	0.63	4	27	CL	FALSE	NA	29.3	NA	NA
49.5	-	51.0	50.25	120	2.59	5	7	0.62	4	27	CL	FALSE	NA	30.5	NA	NA
51.0	-	52.5	51.75	120	2.64	10	13	0.62	8	41	CL	FALSE	NA	26.4	NA	NA
52.5	-	54.0	53.25	120	2.68	10	13	0.61	8	41	CL	FALSE	NA	27.3	NA	NA
54.0	-	55.5	54.75	120	2.72	11	15	0.61	9	41	CL	FALSE	NA	22.1	NA	NA
55.5	-	57.0	56.25	120	2.77	9	12	0.60	7	39	CL	FALSE	NA	22.1	NA	NA
57.0	-	58.5	57.75	120	2.81	10	13	0.60	8	41	SW	32.3	110	22.4	#REF!	0.52
58.5	-	60.0	59.25	120	2.85	22	29	0.59	17	60	SW	35	114	13.2	#REF!	0.46
60.0	-	60.2	60.1	120	2.88	50	67	0.59	39	89	SW	38.5	120.5	NA	#REF!	0.39

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval	Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w
			Input Required										
STN-51		water =	13.0										
0.0 - 1.5	0.75	120	0.05	7	9	1.00	9	44	CL	FALSE	NA	20.7	NA
1.5 - 3.0	2.25	120	0.14	10	10	1.00	10	47	CL	FALSE	NA	21.8	NA
3.0 - 4.5	3.75	120	0.23	21	28	1.00	28	77	CL	FALSE	NA	25.7	NA
4.5 - 6.5	5.5	125	0.33		0	1.00	1	11	ML	28.6	101.5	22.5	124
6.5 - 8.0	7.25	120	0.44	10	13	1.00	13	53	CL	FALSE	NA	23.8	NA
8.0 - 9.5	8.75	120	0.53	17	23	1.00	23	70	CL	FALSE	NA	21.5	NA
9.5 - 11.5												23.1	124
11.5 - 13.0	12.25	120	0.73	7	9	1.00	9	44	SM	30.5	95	25.9	120
13.0 - 14.5	13.75	125	0.78	7	9	1.00	9	44	SM	30.5	95	32.0	125
14.5 - 16.0	15.25	110	0.82	15	20	1.00	20	67	SM	33.5	100	9.9	110
16.0 - 17.5	16.75	120	0.86	6	8	1.00	8	41	CL	FALSE	NA	26.8	NA
17.5 - 19.0	18.25	120	0.90	6	8	1.00	8	41	CL	FALSE	NA	27.6	NA
19.0 - 21.0	20	120	0.95		0	1.00	1	11	CL-CH	FALSE	NA	27.8	NA
21.0 - 22.5	21.75	120	1.00	16	21	1.00	21	68	CL	FALSE	NA	19.5	NA
22.5 - 24.0	23.25	120	1.05	23	31	0.98	30	79	CL	FALSE	NA	21.0	NA
24.0 - 26.0	25	125	1.10		0	0.95	1	11	CL	FALSE	NA	20.9	125
26.0 - 27.5	26.75	120	1.15	9	12	0.93	11	47	CL	FALSE	NA	22.8	NA
27.5 - 29.0	28.25	120	1.19	14	19	0.92	17	60	CL	FALSE	NA	21.4	NA
29.0 - 30.5	29.75	120	1.24	7	9	0.90	8	41	CL	FALSE	NA	23.6	NA
30.5 - 32.0	31.25	120	1.28	5	7	0.88	6	32	CL	FALSE	NA	24.3	NA
32.0 - 33.5	32.75	120	1.32	10	13	0.87	12	47	CL	FALSE	NA	45.5	NA
33.5 - 35.0	34.25	120	1.37	5	7	0.86	6	32	CL	FALSE	NA	28.1	NA
35.0 - 36.5	35.75	120	1.41	3	4	0.84	3	24	CL	FALSE	NA	24.1	NA
36.5 - 38.0	37.25	120	1.45	13	17	0.83	14	56	CL	FALSE	NA	22.8	NA
38.0 - 39.5	38.75	120	1.50	16	21	0.82	17	60	CL	FALSE	NA	24.9	NA
39.5 - 41.0	40.25	120	1.54	8	11	0.81	9	41	CL	FALSE	NA	25.2	NA
41.0 - 42.5	41.75	120	1.58	14	19	0.79	15	56	CL	FALSE	NA	27.6	NA
42.5 - 44.0	43.25	120	1.63	16	21	0.78	17	60	CL	FALSE	NA	27.1	NA
44.0 - 45.5	44.75	120	1.67	12	16	0.77	12	52	CL	FALSE	NA	26.1	NA
45.5 - 47.0	46.25	120	1.71	13	17	0.76	13	53	CL	FALSE	NA	26.6	NA
47.0 - 48.5	47.75	120	1.76	10	13	0.75	10	47	CL	FALSE	NA	27.5	NA
48.5 - 50.0	49.25	120	1.80	47	63	0.75	47	95	CL	FALSE	NA	11.7	NA

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
					Input Required									
STN-52				water =	13.7									
0.0	-	1.5	0.75	120	0.05	15	20	1.00	20	67	CL	FALSE	NA	18.3
1.5	-	3.0	2.25	120	0.14	19	10	1.00	10	47	CL	FALSE	NA	16.0
3.0	-	4.5	3.75	120	0.23	22	29	1.00	29	79	CL	FALSE	NA	47.9
4.5	-	6.0	5.25	120	0.32	9	12	1.00	12	52	CL	FALSE	NA	18.5
6.0	-	7.5	6.75	120	0.41	12	16	1.00	16	60	CL	FALSE	NA	21.0
7.5	-	9.0	8.25	120	0.50	21	28	1.00	28	77	CL	FALSE	NA	22.8
9.0		10.5	9.75	120	0.59	10	13	1.00	13	53	CL	FALSE	NA	26.0
10.5	-	12.0	11.25	120	0.68	12	16	1.00	16	60	CL	FALSE	NA	34.1
12.0	-	13.5	12.75	120	0.77	10	13	1.00	13	53	CL	FALSE	NA	28.7
13.5	-	15.0	14.25	0	0.72	16	21	1.00	21	68	GP	37	0	8.2
15.0	-	16.5	15.75	120	0.76	4	5	1.00	5	32	CH	FALSE	NA	24.4
16.5	-	18.0	17.25	120	0.80	9	12	1.00	12	52	CH	FALSE	NA	24.8
18.0	-	19.5	18.75	114	0.84	11	15	1.00	15	56	ML	31.5	89.5	27.2
19.5	-	21.0	20.25	120	0.89	6	8	1.00	8	41	CH	FALSE	NA	23.9
21.0	-	22.5	21.75	120	0.93	13	17	1.00	17	60	CH	FALSE	NA	24.4
22.5	-	24.0	23.25	120	0.97	11	15	1.00	15	56	CH	FALSE	NA	24.7
24.0	-	25.5	24.75	120	1.02	11	15	0.99	15	56	CH	FALSE	NA	26.9
25.5	-	27.0	26.25	120	1.06	20	27	0.97	26	74	CH	FALSE	NA	24.5
27.0	-	28.5	27.75	120	1.10	20	27	0.95	25	74	CH	FALSE	NA	23.6
28.5	-	30.0	29.25	120	1.15	14	19	0.93	17	60	CH	FALSE	NA	24.3
30.0	-	31.5	30.75	120	1.19	18	24	0.92	22	70	CH	FALSE	NA	25.7
31.5	-	33.0	32.25	120	1.23	19	25	0.90	23	70	CH	FALSE	NA	28.6
33.0	-	34.5	33.75	120	1.28	12	16	0.89	14	56	CH	FALSE	NA	26.7
34.5	-	36.0	35.25	120	1.32	8	11	0.87	9	44	CH	FALSE	NA	27.6
36.0	-	37.5	36.75	120	1.36	8	11	0.86	9	44	CH	FALSE	NA	26.8
37.5	-	39.0	38.25	120	1.40	6	8	0.84	7	35	CH	FALSE	NA	27.9
39.0	-	40.5	39.75	120	1.45	6	8	0.83	7	35	CH	FALSE	NA	25.3
40.5	-	42.0	41.25	120	1.49	7	9	0.82	8	41	CH	FALSE	NA	24.3
42.0	-	43.5	42.75	120	1.53	3	4	0.81	3	24	CH	FALSE	NA	26.3
43.5	-	45.0	44.25	138	1.59	20	27	0.79	21	68	SP	35.5	115	20.3

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
					Input Required									
STN-53				water =	9.0									
0.0	-	1.5	0.75	120	0.05	12	16	1.00	16	60	CL	FALSE	NA	15
1.5	-	3.0	2.25	120	0.14	22	10	1.00	10	47	CL	FALSE	NA	16.2
3.0	-	4.5	3.75	120	0.23	19	25	1.00	25	74	CL	FALSE	NA	20.9
4.5	-	6.0	5.25	120	0.32	16	21	1.00	21	68	CL	FALSE	NA	19.6
6.0	-	7.5	6.75	120	0.41	21	28	1.00	28	77	CL	FALSE	NA	21
7.5	-	9.0	8.25	120	0.50	19	25	1.00	25	74	CL	FALSE	NA	27.5
9.0		10.5	9.75	0	0.45	8	11	1.00	11	47	CL	FALSE	NA	22.4
10.5	-	12.0	11.25	120	0.49	5	7	1.00	7	35	CL	FALSE	NA	23.4
12.0	-	13.5	12.75	120	0.53	8	11	1.00	11	47	CL	FALSE	NA	22.2
13.5	-	15.0	14.25	120	0.58	7	9	1.00	9	44	CL	FALSE	NA	23.6
15.0	-	16.5	15.75	120	0.62	9	12	1.00	12	52	CL	FALSE	NA	23.6
16.5	-	18.0	17.25	120	0.66	16	21	1.00	21	68	CL	FALSE	NA	23
18.0	-	19.5	18.75	120	0.71	11	15	1.00	15	56	CL	FALSE	NA	24.1
19.5	-	21.0	20.25	120	0.75	5	7	1.00	7	35	CL	FALSE	NA	24.5
21.0	-	22.5	21.75	120	0.79	11	15	1.00	15	56	CL	FALSE	NA	26.3
22.5	-	24.0	23.25	120	0.84	8	11	1.00	11	47	CL	FALSE	NA	28.5
24.0	-	25.5	24.75	120	0.88	8	11	1.00	11	47	CL	FALSE	NA	27
25.5	-	27.0	26.25	120	0.92	3	4	1.00	4	27	CL	FALSE	NA	28.2
27.0	-	28.5	27.75	120	0.97	5	7	1.00	7	35	CL	FALSE	NA	25.1
28.5	-	30.0	29.25	120	1.01	4	5	1.00	5	32	CL	FALSE	NA	24.4
30.0	-	31.5	30.75	120	1.05	4	5	0.97	5	32	CL	FALSE	NA	26.3
31.5	-	33.0	32.25	120	1.10	2	3	0.96	3	18	CL	FALSE	NA	25.2
33.0	-	34.5	33.75	120	1.14	2	3	0.94	3	18	CL	FALSE	NA	25.7
34.5	-	36.0	35.25	120	1.18	4	5	0.92	5	27	CL	FALSE	NA	24.6
36.0	-	37.5	36.75	137	1.24	12	16	0.90	14	56	SW	34.4	113	20.9
37.5	-	39.0	38.25	144	1.30	50	67	0.88	59	100	SW	40.7	124	16.2

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
						Input Required								
STN-54				water =	4.0									
0.0	-	1.5	0.75	119	0.04	8	11	1.00	11	47	SP	33	111	7.2
1.5	-	3.0	2.25	130	0.14	15	10	1.00	10	47	SP	33	111	17.2
3.0	-	4.5	3.75	150	0.25	6	8	1.00	8	41	SP	32.3	110	36.4
4.5	-	6.0	5.25	154	0.32	12	16	1.00	16	60	SP	35	114	35.3
6.0	-	7.5	6.75	142	0.38	19	25	1.00	25	74	SP	36.2	116.5	22
7.5	-	9.0	8.25	139	0.44	19	25	1.00	25	74	SP	36.2	116.5	19.4
9.0		10.5	9.75	0	0.39	19	25	1.00	25	74	SP	36.2	116.5	30.3
10.5	-	12.0	11.25	152	0.46	12	16	1.00	16	60	SP	35	114	33.2
12.0	-	13.5	12.75	152	0.53	12	16	1.00	16	60	SP	35	114	32.9
13.5	-	15.0	14.25	153	0.60	6	8	1.00	8	41	SP	32.3	110	38.7
15.0	-	16.5	15.75	157	0.67	4	5	1.00	5	32	SP	30.8	108	45.1
16.5	-	18.0	17.25	154	0.74	5	7	1.00	7	35	SP	31.5	109	41.7
18.0	-	19.5	18.75	144	0.80	3	4	1.00	4	27	SP	30	106.5	34.8
19.5	-	21.0	20.25	160	0.87	3	4	1.00	4	27	SP	30	106.5	50.7
21.0	-	22.5	21.75	159	0.94	3	4	1.00	4	27	SP	30	106.5	49.1
22.5	-	24.0	23.25	155	1.01	4	5	0.99	5	32	SP	30.8	108	43.3
24.0	-	25.5	24.75	179	1.10	3	4	0.95	4	24	SP	29.5	106	69.1
25.5	-	27.0	26.25	165	1.18	23	31	0.92	28	77	SP	37	117.5	40.6
27.0	-	28.5	27.75	120	1.22	16	21	0.91	19	65	CL	FALSE	NA	27.8
28.5	-	30.0	29.25	120	1.26	15	20	0.89	18	60	CL	FALSE	NA	26.9
30.0	-	31.5	30.75	120	1.31	10	13	0.88	12	47	CL	FALSE	NA	25.6
31.5	-	33.0	32.25	120	1.35	15	20	0.86	17	60	CL	FALSE	NA	25.2
33.0	-	34.5	33.75	120	1.39	11	15	0.85	12	52	CL	FALSE	NA	24
34.5	-	36.0	35.25	120	1.44	14	19	0.83	16	58	CL	FALSE	NA	25
36.0	-	37.5	36.75	120	1.48	19	25	0.82	21	67	CL	FALSE	NA	23.9
37.5	-	39.0	38.25	120	1.52	16	21	0.81	17	60	CL	FALSE	NA	24
39.0	-	40.5	39.75	120	1.56	10	13	0.80	11	47	CL	FALSE	NA	26.3
40.5	-	42.0	41.25	120	1.61	9	12	0.79	10	44	CL	FALSE	NA	24.7
42.0	-	43.5	42.75	120	1.65	9	12	0.78	9	44	CL	FALSE	NA	26.7
43.5	-	44.8	44.15	148	1.71	50	67	0.76	51	98	SW	40	123	20.3

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
					Input Required									
STN-55				water =	13.0									
0.0	-	1.5	0.75	120	0.05	13	17	1.00	17	60	CL	FALSE	NA	17.6
1.5	-	3.0	2.25	120	0.14	13	10	1.00	10	47	CL	FALSE	NA	24.7
3.0	-	4.5	3.75	120	0.23	18	24	1.00	24	73	CL	FALSE	NA	22.6
4.5	-	6.0	5.25	120	0.32	7	9	1.00	9	44	CL	FALSE	NA	26.8
6.0	-	7.5	6.75	120	0.41	19	25	1.00	25	74	CL	FALSE	NA	24.3
7.5	-	9.0	8.25	120	0.50	16	21	1.00	21	68	CL	FALSE	NA	24.5
9.0		10.5	9.75	0	0.50	10	13	1.00	13	53		FALSE	NA	24.0
10.5	-	12.0	11.25	120	0.59	17	23	1.00	23	70	CL	FALSE	NA	25.6
12.0	-	13.5	12.75	120	0.68	18	24	1.00	24	73	CL	FALSE	NA	26.5
13.5	-	15.0	14.25	161	0.75	20	27	1.00	27	75	SP	37	117.5	37.2
15.0	-	16.5	15.75	120	0.79	22	29	1.00	29	79	CL	FALSE	NA	32.8
16.5	-	18.0	17.25	120	0.84	4	5	1.00	5	32	CL	FALSE	NA	26.4
18.0	-	19.5	18.75	120	0.88	10	13	1.00	13	53	CL	FALSE	NA	25.4
19.5	-	21.0	20.25	120	0.92	7	9	1.00	9	44	CL	FALSE	NA	28.3
21.0	-	22.5	21.75	120	0.97	13	17	1.00	17	60	CL	FALSE	NA	27.3
22.5	-	24.0	23.25	120	1.01	21	28	1.00	28	77	CL	FALSE	NA	24.1
24.0	-	25.5	24.75	120	1.05	17	23	0.98	22	70	CL	FALSE	NA	26.6
25.5	-	27.0	26.25	120	1.09	19	25	0.96	24	73	CL	FALSE	NA	22.8
27.0	-	28.5	27.75	120	1.14	13	17	0.94	16	60	CL	FALSE	NA	22.9
28.5	-	30.0	29.25	120	1.18	3	4	0.92	4	24	CL	FALSE	NA	23.5
30.0	-	31.5	30.75	120	1.22	3	4	0.90	4	24	CL	FALSE	NA	25.0
31.5	-	33.0	32.25	120	1.27	0	0	0.89	1	11	CL	FALSE	NA	24.9
33.0	-	34.5	33.75	120	1.31	0	0	0.87	1	11	CL	FALSE	NA	25.3
34.5	-	36.0	35.25	120	1.35	0	0	0.86	1	11	CL	FALSE	NA	26.0
36.0	-	37.5	36.75	120	1.40	0	0	0.85	1	11	CL	FALSE	NA	25.8
37.5	-	39.0	38.25	120	1.44	3	4	0.83	3	24	CL	FALSE	NA	24.8
39.0	-	40.5	39.75	120	1.48	0	0	0.82	1	11	CL	FALSE	NA	23.1
40.5	-	42.0	41.25	120	1.53	2	3	0.81	2	18	CL	FALSE	NA	23.2
42.0	-	43.5	42.75	120	1.57	21	28	0.80	22	70	CL	FALSE	NA	12.6
43.5	-	45.0	44.25	120	1.61	12	16	0.79	13	52	CL	FALSE	NA	13.9
45.0	-	46.5	45.75	120	1.66	50	67	0.78	52	98	CL	FALSE	NA	13.7
			0	120	-1.09		0	#NUM!	1	11	CL	FALSE	NA	

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
					Input Required									
STN-56				water =	5.0									
0.0	-	1.5	0.75	120	0.05	13	17	1.00	17	60	CL	FALSE	NA	23.7
1.5	-	3.0	2.25	120	0.14	18	10	1.00	10	47	CL	FALSE	NA	20.4
3.0	-	4.5	3.75	120	0.23	28	37	1.00	37	87	CL	FALSE	NA	21.8
4.5	-	6.0	5.25	120	0.27	19	25	1.00	25	74	CL	FALSE	NA	22.2
6.0	-	7.5	6.75	120	0.31	16	21	1.00	21	68	CL	FALSE	NA	24.7
7.5	-	9.0	8.25	120	0.35	19	25	1.00	25	74	CH	FALSE	NA	25.4
9.0		10.5	9.75	0	0.31	14	19	1.00	19	63	CH	FALSE	NA	21.4
10.5	-	12.0	11.25	120	0.35	4	5	1.00	5	32	CL	FALSE	NA	23.2
12.0	-	13.5	12.75	120	0.39	13	17	1.00	17	60	CL	FALSE	NA	25.4
13.5	-	15.0	14.25	120	0.44	17	23	1.00	23	70	CL	FALSE	NA	24.4
15.0	-	16.5	15.75	120	0.48	13	17	1.00	17	60	CL	FALSE	NA	22.1
16.5	-	18.0	17.25	120	0.52	14	19	1.00	19	63	CH	FALSE	NA	26.3
18.0	-	19.5	18.75	120	0.57	20	27	1.00	27	75	CH	FALSE	NA	25.7
19.5	-	21.0	20.25	120	0.61	3	4	1.00	4	27	CH	FALSE	NA	23.8
21.0	-	22.5	21.75	120	0.65	3	4	1.00	4	27	CH	FALSE	NA	21.3
22.5	-	24.0	23.25	120	0.70	4	5	1.00	5	32	CH	FALSE	NA	21.5
24.0	-	25.5	24.75	120	0.74	3	4	1.00	4	27	CH	FALSE	NA	23.1
25.5	-	27.0	26.25	120	0.78	2	3	1.00	3	18	CH	FALSE	NA	25.7
27.0	-	28.5	27.75	120	0.83	4	5	1.00	5	32	CH	FALSE	NA	23.1
28.5	-	30.0	29.25	120	0.87	1	1	1.00	1	11	CH	FALSE	NA	22.4
30.0	-	31.5	30.75	128	0.92	1	1	1.00	1	11	SP	28.4	104	23.1
31.5	-	33.0	32.25	132	0.97	3	4	1.00	4	27	SP	30	106.5	23.8
33.0	-	34.5	33.75	112	1.01	6	8	1.00	8	41	SP	32.3	110	1.6
34.5	-	36.0	35.25	131	1.06	15	20	0.97	19	65	SP	35.5	115	14.1
36.0	-	37.5	36.75	138	1.12	75	100	0.95	95	100	SP	40.7	124	11.5

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
					Input Required									
STN-58				water =	16.0									
0.0	-	1.5	0.75	120	0.05	11	15	1.00	15	56	CL	FALSE	NA	20.8
1.5	-	3.0	2.25	120	0.14	12	10	1.00	10	47	CL	FALSE	NA	22.1
3.0	-	4.5	3.75	120	0.23	18	24	1.00	24	73	CL	FALSE	NA	24.6
4.5	-	6.0	5.25	120	0.32	12	16	1.00	16	60	CL	FALSE	NA	23.0
6.0	-	7.5	6.75	120	0.41	21	28	1.00	28	77	CL	FALSE	NA	25.8
7.5	-	9.0	8.25	120	0.50	19	25	1.00	25	74	CL	FALSE	NA	25.2
9.0		10.5	9.75	120	0.59	12	16	1.00	16	60	CL	FALSE	NA	23.8
10.5	-	12.0	11.25	120	0.68	11	15	1.00	15	56	CL	FALSE	NA	26.6
12.0	-	13.5	12.75	120	0.77	18	24	1.00	24	73	CL	FALSE	NA	25.9
13.5	-	15.0	14.25	160	0.88	24	32	1.00	32	82	SW	37.8	119	34.2
15.0	-	16.5	15.75	157	1.00	14	19	1.00	19	63	SW	35	114	37.7
16.5	-	18.0	17.25	143	1.06	2	3	0.97	3	18	SW	29	105	35.8
18.0	-	19.5	18.75	120	1.11	1	1	0.95	1	11	CH	FALSE	NA	36.0
19.5	-	21.0	20.25	120	1.15	4	5	0.93	5	32	CH	FALSE	NA	32.1
21.0	-	22.5	21.75	120	1.19	8	11	0.92	10	44	CH	FALSE	NA	32.2
22.5	-	24.0	23.25	120	1.24	18	24	0.90	22	68	CH	FALSE	NA	26.6
24.0	-	25.5	24.75	120	1.28	22	29	0.88	26	74	CL	FALSE	NA	24.5
25.5	-	27.0	26.25	120	1.32	12	16	0.87	14	53	CL	FALSE	NA	23.2
27.0	-	28.5	27.75	120	1.37	10	13	0.86	11	47	CL	FALSE	NA	21.8
28.5	-	30.0	29.25	120	1.41	7	9	0.84	8	41	CH	FALSE	NA	23.0
30.0	-	31.5	30.75	120	1.45	7	9	0.83	8	41	CH	FALSE	NA	24.1
31.5	-	33.0	32.25	127	1.50	1	1	0.82	1	11	SW	28.4	104	22.1
33.0	-	34.5	33.75	133	1.55	5	7	0.80	5	32	SW	30.8	108	23.0
34.5	-	36.0	35.25	131	1.60	2	3	0.79	2	18	SW	29	105	24.7
36.0	-	37.5	36.75	130	1.65	2	3	0.78	2	18	SW	29	105	23.4
37.5	-	39.0	38.25	128	1.70	1	1	0.77	1	11	SW	28.4	104	23.1
39.0	-	40.5	39.75	128	1.75	1	1	0.76	1	11	SW	28.4	104	23.5
40.5	-	42.0	41.25	129	1.80	0	0	0.74	1	11	SW	28.4	104	24.0
42.0	-	43.5	42.75	131	1.85	2	3	0.73	2	18	SW	29	105	24.7
43.5	-	45.0	44.25	119	1.90	3	4	0.73	3	18	SW	29	105	13.4
45.0	-	46.5	45.75	0	1.85	19	25	0.74	19	63	GP	36	0	35.5
46.5	-	47.3	46.9	120	1.88	50	67	0.73	49	95	SHALE	FALSE	NA	20.9

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
					Input Required											
STN-89				water =	28.7											
0.0	-	1.5	0.75	128	0.05	17	23	1.00	23	70	SP	36.2	116.5	9.6	128	0.43
2.5	-	4.0	3.25	140	0.22	52	69	1.00	69	100	SP	40.7	124	13.3	140	0.35
5.0	-	6.5	5.75	139	0.40	48	64	1.00	64	100	SP	40.7	124	12	139	0.35
7.5	-	9.0	8.25	125	0.55	17	23	1.00	23	70	SP	36.2	116.5	7	125	0.43
10.0	-	11.5	10.75	127	0.71	23	31	1.00	31	79	SP	37	117.5	8	127	0.42
12.5	-	14.0	13.25	141	0.89	31	41	1.00	41	91	SP	39.3	121.5	16.3	141	0.37
15.0	-	16.5	15.75	139	1.06	6	8	0.97	8	41	SP	32.3	110	26.4	139	0.52
17.5	-	19.0	18.25	142	1.24	30	40	0.90	36	86	SP	38.5	120.5	17.9	142	0.39
20.0	-	21.5	20.75	138	1.41	19	25	0.84	21	68	SP	35.5	115	20.1	138	0.45
22.5	-	24.0	23.25	154	1.60	16	21	0.79	17	60	SP	35	114	34.8	154	0.46
25.0	-	26.5	25.75	119	1.75	7	9	0.76	7	39	ML	29.5	86	38.9	119	0.95
27.5	-	29.0	28.25	117	1.90	10	13	0.73	10	44	ML	30	87	34.6	117	0.93
30.0	-	31.5	30.75	118	1.97	12	16	0.71	11	47	ML	30.5	88	34.4	118	0.91
32.5	-	34.0	33.25	115	2.04	6	8	0.70	6	32	ML	29	85	35.1	115	0.97
35.0	-	36.5	35.75	114	2.10	7	9	0.69	6	35	ML	29.5	86	32.3	114	0.95

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BULL RUN FOSSIL PLANT
CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS
FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf)	Vertical Effective Stress (tsf)	SPT N Value	SPT N Value	Correction Factor	Corrected N-Value	Relative Density (%)	Unified Soil Classification	Internal Angle of Friction (degrees)	Unit Weight Dry (pcf)	Moisture Content (%)	Revised In-situ Unit Weight (pcf)
				γ_w	σ'	N_{80}	N_{60}	C_N	$(N_1)_{60}$	D_r		ϕ'	γ_d	m	γ_w
						Input Required									
STN-59				water =	12.0										
0.0	-	1.5	0.75	120	0.05	11	15	1.00	15	56	CL	FALSE	NA	21.5	NA
1.5	-	3.0	2.25	120	0.14	24	10	1.00	10	47	CL	FALSE	NA	21.2	NA
3.0	-	4.5	3.75	120	0.23	27	36	1.00	36	86	CL	FALSE	NA	20.1	NA
4.5	-	6.5	5.5	124	0.33		0	1.00	1	11	CL	FALSE	NA	21.5	124
6.5	-	8.0	7.25	120	0.44	13	17	1.00	17	60	CL	FALSE	NA	25.7	NA
8.0	-	9.5	8.75	120	0.53	12	16	1.00	16	60	CL	FALSE	NA	20.9	NA
9.5		11.0	10.25	120	0.62	10	13	1.00	13	53	CL	FALSE	NA	23.8	NA
11.0	-	12.5	11.75	114	0.70	14	19	1.00	19	63	ML	32	90	26.5	114
12.5	-	14.5	13.5	120	0.75		0	1.00	1	11	ML	27	81	26.8	120
14.5	-	16.0	15.25	120	0.80	13	17	1.00	17	60	CH	FALSE	NA	30.2	NA
16.0	-	17.5	16.75	120	0.85	15	20	1.00	20	67	CH	FALSE	NA	24.4	NA
17.5	-	19.0	18.25	120	0.89	15	20	1.00	20	67	CH	FALSE	NA	26.6	NA
19.0	-	21.0	20	119	0.94		0	1.00	1	11	CH	FALSE	NA	30.8	119
21.0	-	22.5	21.75	120	0.99	1	1	1.00	1	11	CH	FALSE	NA	22.8	NA
22.5	-	24.0	23.25	120	1.03	3	4	0.98	4	24	CH	FALSE	NA	24.5	NA
24.0	-	25.5	24.75	120	1.08	2	3	0.96	3	18	CH	FALSE	NA	22.3	NA
25.5	-	27.0	26.25	110	1.11	3	4	0.95	4	24	SM	28.5	91	21.3	110
27.0	-	28.5	27.75	113	1.15	4	5	0.93	5	32	SM	29.5	93	21.8	113
28.5	-	30.0	29.25	125	1.20	1	1	0.91	1	11	SW	28.4	104	20.6	125
30.0	-	31.5	30.75	128	1.25	3	4	0.90	4	24	SW	29.5	106	20.8	128
31.5	-	33.0	32.25	120	1.29	5	7	0.88	6	32	CH	FALSE	NA	22.5	NA
33.0	-	34.5	33.75	120	1.33		0	0.87	1	11	CH	FALSE	NA		NA
35.0	-	36.5	35.75	125	1.40	8	11	0.85	9	44	SW	32.3	110	14.0	125
36.5	-	38.0	37.25	120	1.44	54	72	0.83	60	100	SHALE	FALSE	NA	11.8	NA

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
					Input Required									
STN-60				water =	34.0									
0.0	-	1.5	0.75	120	0.05	9	12	1.00	12	52	CL	FALSE	NA	24.2
1.5	-	3.0	2.25	120	0.14	20	10	1.00	10	47	CL	FALSE	NA	26.2
3.0	-	4.5	3.75	120	0.23	21	28	1.00	28	77	CL	FALSE	NA	24.4
4.5	-	6.0	5.25	120	0.32	11	15	1.00	15	56	CL	FALSE	NA	24.9
6.0	-	7.5	6.75	120	0.41	15	20	1.00	20	67	CL	FALSE	NA	24.0
7.5	-	9.0	8.25	120	0.50	15	20	1.00	20	67	CL	FALSE	NA	26.8
9.0		10.5	9.75	120	0.59	5	7	1.00	7	35	CL	FALSE	NA	24.7
10.5	-	12.0	11.25	120	0.68	19	25	1.00	25	74	CL	FALSE	NA	23.9
12.0	-	13.5	12.75	120	0.77	24	32	1.00	32	82	CL	FALSE	NA	26.2
13.5	-	15.0	14.25	120	0.86	14	19	1.00	19	63	CL	FALSE	NA	23.9
15.0	-	16.5	15.75	120	0.95	14	19	1.00	19	63	CL	FALSE	NA	26.9
16.5	-	18.0	17.25	120	1.04	18	24	0.98	24	71	CL	FALSE	NA	23.3
18.0	-	19.5	18.75	120	1.13	15	20	0.94	19	63	CL	FALSE	NA	25.1
19.5	-	21.0	20.25	120	1.22	8	11	0.91	10	44	CH	FALSE	NA	21.7
21.0	-	22.5	21.75	120	1.31	13	17	0.88	15	58	CH	FALSE	NA	31.8
22.5	-	24.0	23.25	120	1.40	12	16	0.85	14	53	CH	FALSE	NA	26.2
24.0	-	25.5	24.75	120	1.49	8	11	0.82	9	41	CH	FALSE	NA	29.1
25.5	-	27.0	26.25	120	1.58	23	31	0.80	24	73	CH	FALSE	NA	23.5
27.0	-	28.5	27.75	120	1.67	19	25	0.77	20	65	CH	FALSE	NA	24.0
28.5	-	30.0	29.25	120	1.76	21	28	0.75	21	68	CH	FALSE	NA	
30.0	-	31.5	30.75	120	1.85	10	13	0.74	10	44	CH	FALSE	NA	24.5
31.5	-	33.0	32.25	120	1.94	14	19	0.72	13	53	CH	FALSE	NA	22.2
33.0	-	34.5	33.75	135	2.04	13	17	0.70	12	52	SW	33.6	112	20.5
34.5	-	36.0	35.25	127	2.08	6	8	0.69	6	32	SW	30.8	108	17.9
36.0	-	37.5	36.75	114	2.12	7	9	0.69	6	35	SM	30	94	21.0
37.5	-	39.0	38.25	107	2.16	2	3	0.68	2	11	SM	27.5	89.5	19.4
39.0	-	40.5	39.75	112	2.19	5	7	0.68	5	27	SM	29	92	21.3
40.5	-	42.0	41.25	115	2.23	8	11	0.67	7	39	SM	30	94	22.7
42.0	-	43.5	42.75	114	2.27	5	7	0.66	4	27	SM	29	92	24.2
43.5	-	45.0	44.25	115	2.31	13	17	0.66	11	47	SM	31	96	19.6
45.0	-	46.5	45.75	151	2.38	14	19	0.65	12	52	GW	35.8	130	15.8
46.5	-	48.0	47.25	120	2.42	50	67	0.64	43	91	SHALE	FALSE	NA	13.1

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
						Input Required								
STN-61				water =	NA									
0.0	-	1.5	0.75	120	0.05	8	11	1.00	11	47	CL	FALSE	NA	24.5
1.5	-	3.0	2.25	120	0.14	11	10	1.00	10	47	CL	FALSE	NA	24.0
3.0	-	4.5	3.75	120	0.23	13	17	1.00	17	60	CL	FALSE	NA	24.0
4.5	-	6.0	5.25	120	0.32	9	12	1.00	12	52	CL	FALSE	NA	26.6
6.0	-	7.5	6.75	120	0.41	13	17	1.00	17	60	CL	FALSE	NA	26.2
7.5	-	9.0	8.25	120	0.50	13	17	1.00	17	60	CL	FALSE	NA	27.0
9.0		10.5	9.75	120	0.59	3	4	1.00	4	27	CL	FALSE	NA	27.6
10.5	-	12.0	11.25	120	0.68	6	8	1.00	8	41	CL	FALSE	NA	24.6
12.0	-	13.5	12.75	120	0.77	12	16	1.00	16	60	CL	FALSE	NA	24.7
13.5	-	15.0	14.25	120	0.86	10	13	1.00	13	53	CL	FALSE	NA	27.0
15.0	-	16.5	15.75	120	0.95	12	16	1.00	16	60	CL	FALSE	NA	25.9
16.5	-	18.0	17.25	120	1.04	6	8	0.98	8	41	CL	FALSE	NA	23.0
18.0	-	19.5	18.75	124	1.13	23	31	0.94	29	77	SC	34.5	102	21.4
19.5	-	21.0	20.25	117	1.22	9	12	0.91	11	47	SC	31	96	21.5
21.0	-	22.5	21.75	117	1.30	8	11	0.88	9	44	SC	30.5	95	22.9
22.5	-	24.0	23.25	117	1.39	7	9	0.85	8	41	SM	30.5	95	23.1
24.0	-	25.5	24.75	112	1.47	3	4	0.82	3	24	SM	28.5	91	22.6
25.5	-	27.0	26.25	120	1.56	14	19	0.80	15	56	SM	32.5	98	22.4
27.0	-	28.5	27.75	152	1.68	4	5	0.77	4	27	GW	31.3	123	23.4
28.5	-	30.0	29.25	151	1.79	4	5	0.75	4	27	GW	31.3	123	23.0
30.0	-	31.5	30.75	150	1.90	4	5	0.72	4	24	GW	30.7	122	22.9
31.5	-	33.0	32.25	151	2.02	4	5	0.70	4	24	GW	30.7	122	23.5
33.0	-	34.5	33.75	156	2.13	8	11	0.68	7	39	GW	33	126	23.5
34.5	-	36.0	35.25	143	2.24	3	4	0.67	3	18	GW	30	121	18.4
36.0	-	37.5	36.75	125	2.33	8	11	0.65	7	39	SP	31.5	109	14.6
37.5	-	39.0	38.25	135	2.44	18	24	0.64	15	58	SP	34.4	113	19.7
39.0	-	40.4	39.7	132	2.53	13	17	0.63	11	47	SP	33	111	18.8

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w
					Input Required										
STN-62				water =	15.5										
0.0	-	1.5	0.75	120	0.05	8	11	1.00	11	47	CL	FALSE	NA	14.1	NA
1.5	-	3.0	2.25	120	0.14	12	10	1.00	10	47	CL	FALSE	NA		NA
3.0	-	4.5	3.75	120	0.23	22	29	1.00	29	79	CL	FALSE	NA	28.2	NA
4.5	-	6.5	5.5	124	0.33		0	1.00	1	11	CL	FALSE	NA	24.6	124
6.5	-	8.0	7.25	120	0.44	14	19	1.00	19	63	CL	FALSE	NA	23.8	NA
8.0	-	9.5	8.75	120	0.53	22	29	1.00	29	79	CL	FALSE	NA	24.3	NA
9.5		11.5	10.5	126	0.64		0	1.00	1	11	CL	FALSE	NA	22.5	126
11.5	-	13.0	12.25	120	0.74	8	11	1.00	11	47	CL	FALSE	NA	25.2	NA
13.0	-	14.5	13.75	134	0.84	24	32	1.00	32	82	SM	35.5	104	28.5	134
14.5	-	16.0	15.25	133	0.94	30	40	1.00	40	89	SM	36	105	26.8	133
16.0	-	17.5	16.75	149	1.01	9	12	1.00	12	47	SP	33	111	34.1	149
17.5	-	19.0	18.25	148	1.07	5	7	0.97	6	35	SP	31.5	109	35.9	148
19.0	-	20.5	19.75	0	1.03	7	9	0.99	9	44	GP	33	0	44.9	0
20.5	-	22.0	21.25	0	0.98	6	8	1.00	8	41	GP	33	0	23.7	0
22.0	-	23.5	22.75	120	1.02	10	13	0.99	13	53	CH	FALSE	NA	28.9	NA
23.5	-	25.5	24.5	120	1.07		0	0.97	1	11	CH	FALSE	NA	17.5	NA
25.5	-	27.0	26.25	120	1.12	16	21	0.94	20	67	CH	FALSE	NA	30.4	NA
27.0	-	28.5	27.75	120	1.17	31	41	0.93	38	87	CH	FALSE	NA	26.7	NA
28.5	-	30.0	29.25	120	1.21	14	19	0.91	17	60	CH	FALSE	NA	25.1	NA
30.0	-	31.5	30.75	120	1.25	6	8	0.89	7	39	CH	FALSE	NA	25.4	NA
31.5	-	33.0	32.25	120	1.30	9	12	0.88	11	47	CH	FALSE	NA	21.7	NA
33.0	-	34.5	33.75	120	1.34	5	7	0.86	6	32	CH	FALSE	NA	24.8	NA
34.5	-	36.0	35.25	120	1.38	9	12	0.85	10	47	CH	FALSE	NA	23.9	NA
36.0	-	37.5	36.75	120	1.43	15	20	0.84	17	60	CH	FALSE	NA	23.4	NA
37.5	-	39.0	38.25	120	1.47	16	21	0.83	18	60	CH	FALSE	NA	22.6	NA
39.0	-	41.0	40	125	1.52		0	0.81	1	11	CH	FALSE	NA	23.0	125
41.0	-	42.5	41.75	131	1.58	3	4	0.79	3	24	SW	29.5	106	23.5	131
42.5	-	44.0	43.25	132	1.64	5	7	0.78	5	32	SW	30.8	108	22.4	132
44.0	-	45.5	44.75	154	1.71	31	41	0.77	32	81	GW	41	140	10.3	154
45.5	-	46.7	46.1	120	1.74	93	124	0.76	94	100	SHALE	FALSE	NA	17.5	NA

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
						Input Required								
STN-63				water =	24.0									
0.0	-	1.5	0.75	120	0.05	4	5	1.00	5	32	CL	FALSE	NA	24.4
1.5	-	3.0	2.25	120	0.14	13	10	1.00	10	47	CL	FALSE	NA	21.0
3.0	-	4.5	3.75	120	0.23	24	32	1.00	32	82	CL	FALSE	NA	22.3
4.5	-	6.0	5.25	120	0.32	9	12	1.00	12	52	CL	FALSE	NA	22.8
6.0	-	7.5	6.75	120	0.41	13	17	1.00	17	60	CL	FALSE	NA	26.2
7.5	-	9.0	8.25	120	0.50	18	24	1.00	24	73	CL	FALSE	NA	21.2
9.0		10.5	9.75	120	0.59	8	11	1.00	11	47	CL	FALSE	NA	21.7
10.5	-	12.0	11.25	120	0.68	9	12	1.00	12	52	CL	FALSE	NA	23.5
12.0	-	13.5	12.75	120	0.77	17	23	1.00	23	70	CL	FALSE	NA	24.9
13.5	-	15.0	14.25	120	0.86	7	9	1.00	9	44	CL	FALSE	NA	24.9
15.0	-	16.5	15.75	120	0.95	11	15	1.00	15	56	CL	FALSE	NA	22.4
16.5	-	18.0	17.25	120	1.04	20	27	0.98	26	75	CL	FALSE	NA	26.8
18.0	-	19.5	18.75	120	1.13	28	37	0.94	35	86	CL	FALSE	NA	24.6
19.5	-	21.0	20.25	120	1.22	11	15	0.91	13	53	CL	FALSE	NA	24.0
21.0	-	22.5	21.75	120	1.31	22	29	0.88	26	74	CL	FALSE	NA	23.8
22.5	-	24.0	23.25	120	1.40	23	31	0.85	26	75	CL	FALSE	NA	23.3
24.0	-	25.5	24.75	120	1.44	4	5	0.83	4	27	CH	FALSE	NA	25.9
25.5	-	27.0	26.25	120	1.48	6	8	0.82	7	35	CH	FALSE	NA	24.4
27.0	-	28.5	27.75	120	1.52	9	12	0.81	10	44	CH	FALSE	NA	25.1
28.5	-	30.0	29.25	120	1.57	9	12	0.80	10	44	CH	FALSE	NA	23.1
30.0	-	31.5	30.75	120	1.61	10	13	0.79	11	47	CH	FALSE	NA	23.0
31.5	-	33.0	32.25	120	1.65	13	17	0.78	14	53	CH	FALSE	NA	22.7
33.0	-	34.5	33.75	120	1.70	12	16	0.77	12	52	CH	FALSE	NA	24.1
34.5	-	36.0	35.25	120	1.74	6	8	0.76	6	35	SC-SM	30	94	27.3
36.0	-	37.5	36.75	116	1.78	23	31	0.75	23	71	SC-SM	34	101	15.2
37.5	-	39.0	38.25	118	1.82	25	33	0.74	25	73	SC-SM	34	101	16.7
39.0	-	41.5	40.25	120	1.88		0	0.73	1	11	SHALE	FALSE	NA	

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
						Input Required								
STN-65				water =	14.9									
0.0	-	1.5	0.75	120	0.05	6	8	1.00	8	41	CL	FALSE	NA	20.4
1.5	-	3.0	2.25	120	0.14	10	10	1.00	10	47	CL	FALSE	NA	23.3
3.0	-	4.5	3.75	120	0.23	9	12	1.00	12	52	CL	FALSE	NA	23.7
4.5	-	6.0	5.25	120	0.32	10	13	1.00	13	53	CL	FALSE	NA	21.9
6.0	-	7.5	6.75	120	0.41	10	13	1.00	13	53	CL	FALSE	NA	26.2
7.5	-	9.0	8.25	120	0.50	5	7	1.00	7	35	CL	FALSE	NA	
9.0		10.5	9.75	0	0.50	12	16	1.00	16	60	CL	FALSE	NA	22.1
10.5	-	12.0	11.25	143	0.60	22	29	1.00	29	79	SP	37	117.5	21.8
12.0	-	13.5	12.75	155	0.72	29	39	1.00	39	87	SP	38.5	120.5	28.9
13.5	-	15.0	14.25	155	0.83	15	20	1.00	20	67	SP	35.5	115	34.5
15.0	-	16.5	15.75	150	0.90	10	13	1.00	13	53	SP	33.6	112	33.7
16.5	-	18.0	17.25	161	0.97	5	7	1.00	7	35	SP	31.5	109	47.8
18.0	-	19.5	18.75	120	1.02	7	9	0.99	9	44	CH	FALSE	NA	40.3
19.5	-	21.0	20.25	120	1.06	8	11	0.97	10	47	CH	FALSE	NA	23.2
21.0	-	22.5	21.75	150	1.13	15	20	0.94	19	63	SP	35	114	31.3
22.5	-	24.0	23.25	139	1.18	11	15	0.92	14	53	SP	33.6	112	24.2
24.0	-	25.5	24.75	120	1.23	13	17	0.90	16	58	CL	FALSE	NA	20.7
25.5	-	27.0	26.25	120	1.27	27	36	0.89	32	81	CL	FALSE	NA	23.2
27.0	-	28.5	27.75	120	1.31	24	32	0.87	28	77	CL	FALSE	NA	25.4
28.5	-	30.0	29.25	120	1.36	9	12	0.86	10	47	CL	FALSE	NA	26.1
30.0	-	31.5	30.75	120	1.40	9	12	0.85	10	47	CL	FALSE	NA	25.8
31.5	-	33.0	32.25	120	1.44	9	12	0.83	10	47	CL	FALSE	NA	27.3
33.0	-	34.5	33.75	120	1.49	12	16	0.82	13	53	CL	FALSE	NA	29.0
34.5	-	36.0	35.25	120	1.53	9	12	0.81	10	44	CL	FALSE	NA	25.8
36.0	-	37.5	36.75	120	1.57	11	15	0.80	12	47	CL	FALSE	NA	25.1
37.5	-	39.0	38.25	120	1.62	7	9	0.79	7	39	CL	FALSE	NA	32.7
39.0	-	40.5	39.75	120	1.66	6	8	0.78	6	35	CL	FALSE	NA	27.2
40.5	-	42.0	41.25	120	1.70	18	24	0.77	18	63	CL	FALSE	NA	42.0
42.0	-	43.0	42.5	165	1.77	50	67	0.75	50	98	GW	44	145	13.5

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
						Input Required								
STN-66				water =	33.0									
0.0	-	1.5	0.75	120	0.05	3	4	1.00	4	27	CL	FALSE	NA	25.3
1.5	-	3.0	2.25	120	0.14	14	10	1.00	10	47	CL	FALSE	NA	22.6
3.0	-	4.5	3.75	120	0.23	17	23	1.00	23	70	CL	FALSE	NA	24.7
4.5	-	6.0	5.25	108	0.31	7	9	1.00	9	44	ML	30	87	23.7
6.0	-	7.5	6.75	112	0.39	14	19	1.00	19	63	ML	32	90	24.2
7.5	-	9.0	8.25	120	0.48	21	28	1.00	28	77	CL	FALSE	NA	23.0
9.0		10.5	9.75	0	0.48	18	24	1.00	24	73	CL	FALSE	NA	24.9
10.5	-	12.0	11.25	120	0.57	15	20	1.00	20	67	CL	FALSE	NA	21.6
12.0	-	13.5	12.75	120	0.66	27	36	1.00	36	86	CL	FALSE	NA	22.7
13.5	-	15.0	14.25	120	0.75	10	13	1.00	13	53	CL	FALSE	NA	25.9
15.0	-	16.5	15.75	120	0.84	10	13	1.00	13	53	CL	FALSE	NA	20.2
16.5	-	18.0	17.25	116	0.93	18	24	1.00	24	73	ML	33	92	26.2
18.0	-	19.5	18.75	117	1.01	24	32	0.99	32	81	ML	34	94	24.5
19.5	-	21.0	20.25	109	1.10	9	12	0.96	12	47	ML	30.5	88	24.3
21.0	-	22.5	21.75	120	1.19	18	24	0.92	22	70	CL	FALSE	NA	24.1
22.5	-	24.0	23.25	120	1.28	20	27	0.89	24	71	CL	FALSE	NA	24.7
24.0	-	25.5	24.75	120	1.37	9	12	0.86	10	47	CL	FALSE	NA	22.9
25.5	-	27.0	26.25	120	1.46	11	15	0.83	12	52	CL	FALSE	NA	22.7
27.0	-	28.5	27.75	120	1.55	18	24	0.80	19	65	CL	FALSE	NA	23.5
28.5	-	30.0	29.25	109	1.63	5	7	0.78	5	32	ML	29	85	27.8
30.0	-	31.5	30.75	120	1.72	2	3	0.76	2	18	CL	FALSE	NA	28.3
31.5	-	33.0	32.25	120	1.81	6	8	0.74	6	32	CL	FALSE	NA	48.3
33.0	-	34.3	33.65	120	1.85	75	100	0.74	74	100	SHALE	FALSE	NA	14.1

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
						Input Required								
STN-67				water =	4.4									
0.0	-	1.5	0.75	120	0.05	11	15	1.00	15	56	CL	FALSE	NA	15.5
1.5	-	3.0	2.25	120	0.14	10	10	1.00	10	47	CL	FALSE	NA	17.9
3.0	-	4.5	3.75	120	0.23	15	20	1.00	20	67	CL	FALSE	NA	36
4.5	-	6.5	5.5	120	0.28	ST	NA	1.00	NA	NA	CL	NA	NA	23.8
6.5	-	8.0	7.25	120	0.33	10	13	1.00	13	53	CL	FALSE	NA	23.8
8.0	-	9.5	8.75	120	0.37	11	15	1.00	15	56	CL	FALSE	NA	21.8
9.5		11.5	10.5	120	0.42	ST	NA	1.00	NA	NA	CL	NA	NA	
11.5	-	13.0	12.25	120	0.47	6	8	1.00	8	41	CL	FALSE	NA	29.2
13.0	-	14.5	13.75	120	0.51	12	16	1.00	16	60	SP	35	114	
14.5	-	16.0	15.25	120	0.56	7	9	1.00	9	44	GW	34	127.5	8.2
16.0	-	17.5	16.75	120	0.60	4	5	1.00	5	32	CL	FALSE	NA	27.9
17.5	-	19.0	18.25	120	0.64	12	16	1.00	16	60	CL	FALSE	NA	25.7
19.0	-	21.0	20	120	0.69	ST	NA	1.00	NA	NA	CL	NA	NA	27.2
21.0	-	22.5	21.75	120	0.74	11	15	1.00	15	56	CL	FALSE	NA	23.5
22.5	-	24.0	23.25	120	0.79	19	25	1.00	25	74	CL	FALSE	NA	23.1
24.0	-	26.0	25	120	0.84	ST	NA	1.00	NA	NA	CL	NA	NA	24.7
26.0	-	27.5	26.75	120	0.89	16	21	1.00	21	68	CL	FALSE	NA	27.2
27.5	-	29.0	28.25	120	0.93	24	32	1.00	32	82	CL	FALSE	NA	26.5
29.0	-	30.5	29.75	120	0.97	12	16	1.00	16	60	CL	FALSE	NA	25.5

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS FOR COARSE GRAINED SOILS

Sample Interval	Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
			Input Required									
STN-68		water =										
0.0 - 1.5	0.75	120	0.02	3	4	1.00	4	27	CL	FALSE	NA	24.9
1.5 - 3.0	2.25	120	0.06	16	10	1.00	10	47	CL	FALSE	NA	21.4
3.0 - 4.5	3.75	120	0.11	26	35	1.00	35	84	CL	FALSE	NA	22.6
4.5 - 6.0	5.25	120	0.15	14	19	1.00	19	63	CL	FALSE	NA	21.7
6.0 - 7.5	6.75	120	0.19	25	33	1.00	33	84	CL	FALSE	NA	22.5
7.5 - 9.0	8.25	120	0.24	28	37	1.00	37	87	CL	FALSE	NA	22.6
9.0 11.0	10	126	0.29		0	1.00	1	11	CL	FALSE	NA	24.1
11.0 - 12.5	11.75	120	0.34	12	16	1.00	16	60	CL	FALSE	NA	27.0
12.5 - 14.0	13.25	120	0.39	22	29	1.00	29	79	CL	FALSE	NA	24.0
14.0 - 15.5	14.75	120	0.43	13	17	1.00	17	60	CL	FALSE	NA	24.6
15.5 - 17.0	16.25	120	0.47	10	13	1.00	13	53	CL	FALSE	NA	24.1
17.0 - 18.5	17.75	120	0.52	23	31	1.00	31	79	CL	FALSE	NA	24.2
18.5 - 20.0	19.25	120	0.56	28	37	1.00	37	87	CL	FALSE	NA	25.5
20.0 - 22.0	21	125	0.61		0	1.00	1	11	CL	FALSE	NA	23.4
22.0 - 23.5	22.75	120	0.66	13	17	1.00	17	60	CL	FALSE	NA	27.4
23.5 - 25.0	24.25	120	0.71	8	11	1.00	11	47	CL	FALSE	NA	25.1
25.0 - 27.0	26	121	0.76		0	1.00	1	11	CL	FALSE	NA	27.0
27.0 - 28.5	27.75	120	0.81	11	15	1.00	15	56	CL	FALSE	NA	23.7
28.5 - 30.0	29.25	120	0.85	5	7	1.00	7	35	CL	FALSE	NA	24.6
30.0 - 32.0	31	120	0.90		0	1.00	1	11	CL	FALSE	NA	27.9
32.0 - 33.5	32.75	120	0.95	8	11	1.00	11	47	CL	FALSE	NA	26.5
33.5 - 35.0	34.25	120	1.00	10	13	1.00	13	53	CL	FALSE	NA	29.2
35.0 - 36.2	35.6	120	1.04	75	100	0.98	98	100	SHALE	FALSE	NA	16.3

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m
						Input Required								
STN-70				water =	23.5									
0.0	-	1.5	0.75	120	0.05	18	24	1.00	24	73	CL	FALSE	NA	15.3
1.5	-	3.0	2.25	120	0.14	16	10	1.00	10	47	CL	FALSE	NA	20.8
3.0	-	4.5	3.75	120	0.23	18	24	1.00	24	73	CL	FALSE	NA	25.2
4.5	-	6.0	5.25	120	0.32	11	15	1.00	15	56	CL	FALSE	NA	14.8
6.0	-	7.5	6.75	120	0.41	10	13	1.00	13	53	CL	FALSE	NA	21.3
7.5	-	9.0	8.25	120	0.50	26	35	1.00	35	84	CL	FALSE	NA	21.8
9.0		10.5	9.75	120	0.59	21	28	1.00	28	77	CL	FALSE	NA	18.1
10.5	-	12.0	11.25	120	0.68	20	27	1.00	27	75	CL	FALSE	NA	24.0
12.0	-	13.5	12.75	120	0.77	21	28	1.00	28	77	CL	FALSE	NA	26.0
13.5	-	15.0	14.25	120	0.86	19	25	1.00	25	74	CH	FALSE	NA	25.9
15.0	-	16.5	15.75	120	0.95	6	8	1.00	8	41	CH	FALSE	NA	25.0
16.5	-	18.0	17.25	120	1.04	17	23	0.98	22	70	CH	FALSE	NA	21.8
18.0	-	19.5	18.75	120	1.13	16	21	0.94	20	67	CH	FALSE	NA	23.5
19.5	-	21.0	20.25	120	1.22	9	12	0.91	11	47	CH	FALSE	NA	20.3
21.0	-	22.5	21.75	120	1.31	16	21	0.88	19	63	CH	FALSE	NA	24.8
22.5	-	24.0	23.25	145	1.41	12	16	0.84	14	53	SP	33.6	112	29.8
24.0	-	25.5	24.75	120	1.46	2	3	0.83	2	18	CH	FALSE	NA	34.9
25.5	-	27.0	26.25	120	1.50	30	40	0.82	33	82	CH	FALSE	NA	25.0
27.0	-	28.5	27.75	120	1.54	20	27	0.80	22	68	CH	FALSE	NA	
28.5	-	30.0	29.25	120	1.59	4	5	0.79	4	27	CH	FALSE	NA	33.4
30.0	-	31.5	30.75	120	1.63	12	16	0.78	13	52	CH	FALSE	NA	29.9
31.5	-	33.0	32.25	120	1.67	20	27	0.77	21	67	CL	FALSE	NA	25.4
33.0	-	34.5	33.75	120	1.72	20	27	0.76	20	67	CL	FALSE	NA	28.2
34.5	-	36.0	35.25	120	1.76	16	21	0.75	16	60	CL	FALSE	NA	31.7
36.0	-	37.5	36.75	120	1.80	11	15	0.74	11	47	CH	FALSE	NA	25.8
37.5	-	39.0	38.25	120	1.85	6	8	0.74	6	32	CH	FALSE	NA	27.2
39.0	-	40.5	39.75	116	1.89	3	4	0.73	3	18	SC	28	90	28.4
40.5	-	42.0	41.25	#N/A	#N/A	1	1	#N/A	#N/A	#N/A	SC	#N/A	#N/A	26.3
42.0	-	43.5	42.75	#N/A	#N/A	24	32	#N/A	#N/A	#N/A	SC	#N/A	#N/A	13.8
43.5	-	45.0	44.25	120	#N/A		0	#N/A	1	11	SHALE	FALSE	NA	

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BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval	Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
		Input Required												
STN-71		water =	15.0											
0.0 - 1.5	0.75	120	0.05	9	12	1.00	12	52	CH	FALSE	NA	34.4	NA	NA
1.5 - 3.0	2.25	139	0.15	30	40	1.00	40	89	ML	34.5	95	46.5	139	0.75
3.0 - 4.5	3.75	142	0.26	21	28	1.00	28	77	ML	33.5	93	53.0	142	0.8
4.5 - 6.0	5.25	141	0.36	19	25	1.00	25	74	ML	33	92	53.6	141	0.82
6.0 - 7.5	6.75	176	0.49	22	29	1.00	29	79	SP	37	117.5	49.8	176	0.42
7.5 - 9.0	8.25	158	0.61	34	45	1.00	45	93	ML	35	96	64.5	158	0.74
9.0 - 10.5	9.75	120	0.70	41	55	1.00	55	99	ML	35.5	97	23.5	120	0.72
10.5 - 12.0	11.25	91	0.77	16	21	1.00	21	68	ML	32.5	91		91	0.83
12.0 - 13.5	12.75	115	0.86	20	27	1.00	27	75	ML	33.5	93	24.1	115	0.8
13.5 - 15.0	14.25	149	0.97	29	39	1.00	39	87	ML	34.5	95	56.4	149	0.75
15.0 - 16.5	15.75	180	1.06	31	41	0.97	40	89	SP	38.5	120.5	49.2	180	0.39
16.5 - 18.0	17.25	188	1.15	20	27	0.93	25	73	SP	36.2	116.5	61.3	188	0.43
18.0 - 19.5	18.75	166	1.23	13	17	0.90	16	58	SP	34.4	113	47.2	166	0.48
19.5 - 21.0	20.25	138	1.29	5	7	0.88	6	32	SP	30.8	108	27.8	138	0.55
21.0 - 22.5	21.75	137	1.34	4	5	0.86	5	27	SP	30	106.5	29.1	137	0.57
22.5 - 24.0	23.25	135	1.40	5	7	0.85	6	32	SP	30.8	108	25.1	135	0.55
24.0 - 25.5	24.75	130	1.45	3	4	0.83	3	24	SP	29.5	106	22.8	130	0.58
25.5 - 27.0	26.25	102	1.48	2	3	0.82	2	18	ML	27.5	82	24.1	102	1.03
27.0 - 28.5	27.75	97	1.50	3	4	0.82	3	24	ML	28	83	16.3	97	1.01
28.5 - 30.0	29.25	95	1.53	1	1	0.81	1	11	ML	27	81	16.7	95	1.05
30.0 - 31.5	30.75	109	1.56	2	3	0.80	2	18	ML	27.5	82	33.4	109	1.03
31.5 - 33.0	32.25	104	1.59	2	3	0.79	2	18	ML	27.5	82	27.3	104	1.03
33.0 - 34.5	33.75	111	1.63	2	3	0.78	2	18	ML	27.5	82	35.7	111	1.03
34.5 - 36.0	35.25	116	1.67	2	3	0.77	2	18	ML	27.5	82	41.0	116	1.03
36.0 - 37.5	36.75	110	1.71	0	0	0.77	1	11	ML	27	81	36.2	110	1.05
37.5 - 39.0	38.25	99	1.73	0	0	0.76	1	11	ML	27	81	22.1	99	1.05
39.0 - 40.5	39.75	106	1.77	0	0	0.75	1	11	ML	27	81	30.9	106	1.05
40.5 - 42.0	41.25	111	1.80	0	0	0.74	1	11	ML	27	81	37.1	111	1.05
42.0 - 43.5	42.75	91	1.82	1	1	0.74	1	11	ML	27	81	12.5	91	1.05
43.5 - 44.3	43.9	120	1.86	7	9	0.73	7	35	CL	FALSE	NA	9.5	NA	NA

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval	Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
			Input Required											
STN-87		water =	15.0											
0.0 - 1.5	0.75	120	0.05	9	12	1.00	12	52	CH	FALSE	NA	27.2	NA	NA
1.5 - 3.0	2.25	112	0.13	30	40	1.00	40	89	ML	34.5	95	18.3	112	0.75
3.0 - 4.5	3.75	110	0.21	21	28	1.00	28	77	ML	33.5	93	17.9	110	0.8
4.5 - 6.0	5.25	106	0.29	19	25	1.00	25	74	ML	33	92	14.9	106	0.82
6.0 - 7.5	6.75	139	0.40	22	29	1.00	29	79	SP	37	117.5	18.6	139	0.42
7.5 - 9.0	8.25	119	0.48	34	45	1.00	45	93	ML	35	96	24.1	119	0.74
9.0 - 10.5	9.75	119	0.57	41	55	1.00	55	99	ML	35.5	97	22.5	119	0.72
10.5 - 12.0	11.25	113	0.66	16	21	1.00	21	68	ML	32.5	91	24.6	113	0.83
12.0 - 13.5	12.75	112	0.74	20	27	1.00	27	75	ML	33.5	93	19.9	112	0.8
13.5 - 15.0	14.25	115	0.83	29	39	1.00	39	87	ML	34.5	95	21.4	115	0.75
15.0 - 16.5	15.75	157	0.90	31	41	1.00	41	91	SP	39.3	121.5	29.5	157	0.37
16.5 - 18.0	17.25	158	0.97	20	27	1.00	27	75	SP	37	117.5	34.1	158	0.42
18.0 - 19.5	18.75	154	1.04	13	17	0.98	17	60	SP	35	114	35.3	154	0.46
19.5 - 21.0	20.25	156	1.11	5	7	0.95	6	35	SP	31.5	109	43.4	156	0.54
21.0 - 22.5	21.75	155	1.18	4	5	0.92	5	27	SP	30	106.5	45.8	155	0.57
22.5 - 24.0	23.25	155	1.25	5	7	0.89	6	35	SP	31.5	109	41.8	155	0.54
24.0 - 25.5	24.75	151	1.32	3	4	0.87	4	24	SP	29.5	106	42.2	151	0.58
25.5 - 27.0	26.25	113	1.35	2	3	0.86	2	18	ML	27.5	82	38.2	113	1.03
27.0 - 28.5	27.75	115	1.39	3	4	0.85	3	24	ML	28	83	39.1	115	1.01
28.5 - 30.0	29.25	128	1.44	1	1	0.83	1	11	ML	27	81	58.6	128	1.05
30.0 - 31.5	30.75	120	1.49	2	3	0.82	2	18	ML	27.5	82	45.8	120	1.03
31.5 - 33.0	32.25	128	1.54	2	3	0.81	2	18	ML	27.5	82	56.2	128	1.03
33.0 - 34.5	33.75	122	1.58	2	3	0.80	2	18	ML	27.5	82	49.3	122	1.03
34.5 - 36.0	35.25	120	1.62	2	3	0.78	2	18	ML	27.5	82	46.5	120	1.03
36.0 - 37.5	36.75	81	1.64	0	0	0.78	1	11	ML	27	81		81	1.05
37.5 - 39.0	38.25	116	1.68	0	0	0.77	1	11	ML	27	81	43.4	116	1.05
39.0 - 40.5	39.75	118	1.72	0	0	0.76	1	11	ML	27	81	45.2	118	1.05
40.5 - 42.0	41.25	115	1.76	0	0	0.75	1	11	ML	27	81	42.5	115	1.05
42.0 - 43.5	42.75	108	1.79	1	1	0.75	1	11	ML	27	81	33.2	108	1.05
43.5 - 45.0	44.25	120	1.84	7	9	0.74	7	35	CL	FALSE	NA	30.9	NA	NA
45.0 - 46.5	45.75	120	1.88	16	21	0.73	16	58	CL	FALSE	NA	29.9	NA	NA
46.5 - 48.0	47.25	120	1.92	24	32	0.72	23	71	CL	FALSE	NA	27.6	NA	NA
48.0 - 49.5	48.75	120	1.97	11	15	0.71	11	47	CL	FALSE	NA	25.4	NA	NA
49.5 - 51.0	50.25	120	2.01	16	21	0.71	15	58	CL	FALSE	NA	23.5	NA	NA
51.0 - 52.5	51.75	120	2.05	19	25	0.70	18	60	CL	FALSE	NA	22.6	NA	NA
52.5 - 54.0	53.25	120	2.10	18	24	0.69	17	60	CL	FALSE	NA	22.1	NA	NA
54.0 - 55.5	54.75	120	2.14	12	16	0.68	11	47	CL	FALSE	NA	93.0	NA	NA
55.5 - 57.0	56.25	120	2.18	7	9	0.68	6	35	CL	FALSE	NA	25.5	NA	NA
57.0 - 58.5	57.75	120	2.23	6	8	0.67	5	32	CL	FALSE	NA	24.4	NA	NA
58.5 - 59.4	58.95	120	2.26	50	67	0.67	44	93	SP	39.3	121.5	23.8	150	0.37

Project No: 172679015
File Name: V:\1714\active\171468118\environmental\Bull Run - 172679015\Engineering Analysis\Parameter Derivation\SPT Correction_BRF Gypsum Stack.xls

BULL RUN FOSSIL PLANT
CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS
FOR COARSE GRAINED SOILS

Sample Interval		Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
					Input Required										
STN-88			water =	2.0											
0.0 - 2.0		1	120	0.06	ST	NA	1.00	NA	NA		NA	NA	39.6	NA	NA
2.0 - 4.0		3	120	0.12	ST	NA	1.00	NA	NA		NA	NA		NA	NA
4.0 - 6.0		5	120	0.18	ST	NA	1.00	NA	NA		NA	NA		NA	NA
6.0 - 8.0		7	120	0.23	ST	NA	1.00	NA	NA		NA	68.25	43	102	NA
8.0 - 10.0		9	120	0.29	ST	NA	1.00	NA	NA		NA	76.13	47.4	105	NA
10.0 - 12.0		11	120	0.35	ST	NA	1.00	NA	NA		NA	73.6	47.8	105	NA
12.0 - 14.0		13	120	0.41	ST	NA	1.00	NA	NA		NA	68.3	47	99	NA
14.0 - 16.0		15	120	0.46	ST	NA	1.00	NA	NA		NA	66.93	38.4	99	NA
16.0 - 18.0		17	120	0.52	ST	NA	1.00	NA	NA		NA	66.93	49.9	103	NA
18.0 - 20.0		19	120	0.58	ST	NA	1.00	NA	NA		NA	70.4	46.7	103	NA
20.0 - 22.0		21	120	0.64	ST	NA	1.00	NA	NA		NA	NA	39.3	105	NA
22.0 - 24.0		23	120	0.69	ST	NA	1.00	NA	NA	CL	NA	NA	37.0	108	NA
24.0 - 26.0		25	120	0.75	ST	NA	1.00	NA	NA	CL	NA	NA	30.0	117	NA
26.0 - 28.0		27	120	0.81	ST	NA	1.00	NA	NA	CL	NA	NA	34.9	NA	NA
28.0 - 30.0		29	120	0.87	ST	NA	1.00	NA	NA	CL	NA	NA	27.7	NA	NA
30.0 - 31.5		30.75	120	0.92	10	13	1.00	13	53	CL	FALSE	NA	27.6	NA	NA
31.5 - 33.0		32.25	120	0.96	13	17	1.00	17	60	CL	FALSE	NA	24.5	NA	NA
33.0 - 34.5		33.75	120	1.00	23	31	1.00	31	79	CL	FALSE	NA	23.5	NA	NA
34.5 - 36.0		35.25	120	1.05	15	20	0.98	20	65	CL	FALSE	NA	24.7	NA	NA
36.0 - 37.5		36.75	120	1.09	13	17	0.96	17	60	CL	FALSE	NA	21.5	NA	NA
37.5 - 39.0		38.25	120	1.13	12	16	0.94	15	58	SW	34.4	113	25.8	142	0.48
39.0 - 40.5		39.75	120	1.18	5	7	0.92	6	35	SW	31.5	109	26.4	138	0.54
40.5 - 42.0		41.25	120	1.22	7	9	0.91	9	41	SW	32.3	110	25.3	138	0.52
42.0 - 43.5		42.75	120	1.26	10	13	0.89	12	47	SW	33	111	23.3	137	0.5
43.5 - 44.3		43.9	120	1.30	50	67	0.88	59	100	SW	40.7	124	12.9	140	0.35

Project No: 172679015
File Name: \\us1243-f01\workgroup\1714\active\171468118\environmental\Bull Run - 172679015\Engineering Analysis\Parameter Derivation\SPT Correction_BRF Gypsum Stack.xls

BULL RUN FOSSIL PLANT

CORRELATION OF SPT DATA TO UNIT WEIGHTS AND SHEAR STRENGTHS

FOR COARSE GRAINED SOILS

Sample Interval			Depth of Mid. Pt. of Sample (ft.)	Assumed Estimated Unit Weight (pcf) γ_w	Vertical Effective Stress (tsf) σ'	SPT N Value N_{80}	SPT N Value N_{60}	Correction Factor C_N	Corrected N-Value $(N_1)_{60}$	Relative Density (%) D_r	Unified Soil Classification	Internal Angle of Friction (degrees) ϕ'	Unit Weight Dry (pcf) γ_d	Moisture Content (%) m	Revised In-situ Unit Weight (pcf) γ_w	Void Ratio e
					Input Required											
STN-90				water =	25.0											
0.0	-	1.5	0.75	140	0.05	16	21	1.00	21	68	SP	35.5	115	21.4	140	0.45
2.5	-	4.0	3.25	145	0.23	69	92	1.00	92	100	SP	40.7	124	16.6	145	0.35
5.0	-	6.5	5.75	139	0.41	52	69	1.00	69	100	SP	40.7	124	12.2	139	0.35
7.5	-	9.0	8.25	143	0.59	37	49	1.00	49	97	SP	40	123	16.6	143	0.36
10.0	-	11.5	10.75	140	0.76	60	80	1.00	80	100	SP	40.7	124	12.6	140	0.35
12.5	-	14.0	13.25	146	0.94	65	87	1.00	87	100	SP	40.7	124	17.7	146	0.35
15.0	-	16.5	15.75	139	1.12	35	47	0.95	44	93	SP	39.3	121.5	14.2	139	0.37
17.5	-	19.0	18.25	152	1.31	6	8	0.87	7	39	SP	31.5	109	39.9	152	0.54
20.0	-	21.5	20.75	144	1.49	49	65	0.82	54	99	SP	40	123	16.9	144	0.36
22.5	-	24.0	23.25	146	1.67	13	17	0.77	13	53	SP	33.6	112	30.3	146	0.49
25.0	-	26.5	25.75	117	1.74	9	12	0.76	9	44	ML	30	87	34.3	117	0.93
27.5	-	29.0	28.25	146	1.84	9	12	0.74	9	41	ML	30	87	68.3	146	0.93

Appendix H

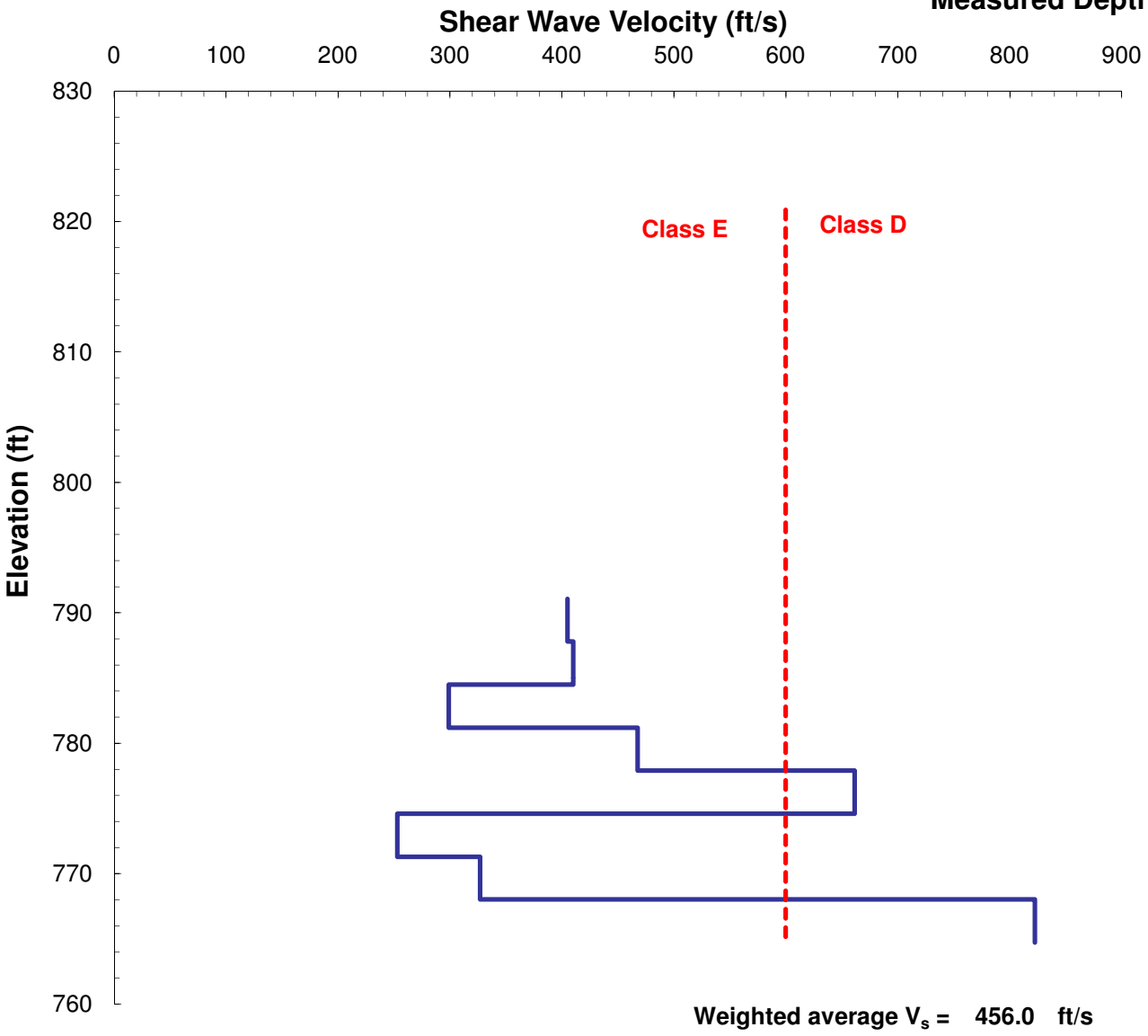
CPT Testing

Stantec

Jacques Whitford

SHEAR WAVE VELOCITY

Incremental Between Measured Depths



Shear Wave Velocity, V_s

- The "shear wave velocity" of a soil represents the speed at which any shear wave will travel within this soil (or medium).

- The shear wave velocity at specific depths is measured by inducing a shear wave at surface and measuring the arrival time of the wave at depth.

- The incremental V_s values were calculated as

$$V_s = \frac{L_2 - L_1}{t_2 - t_1}$$

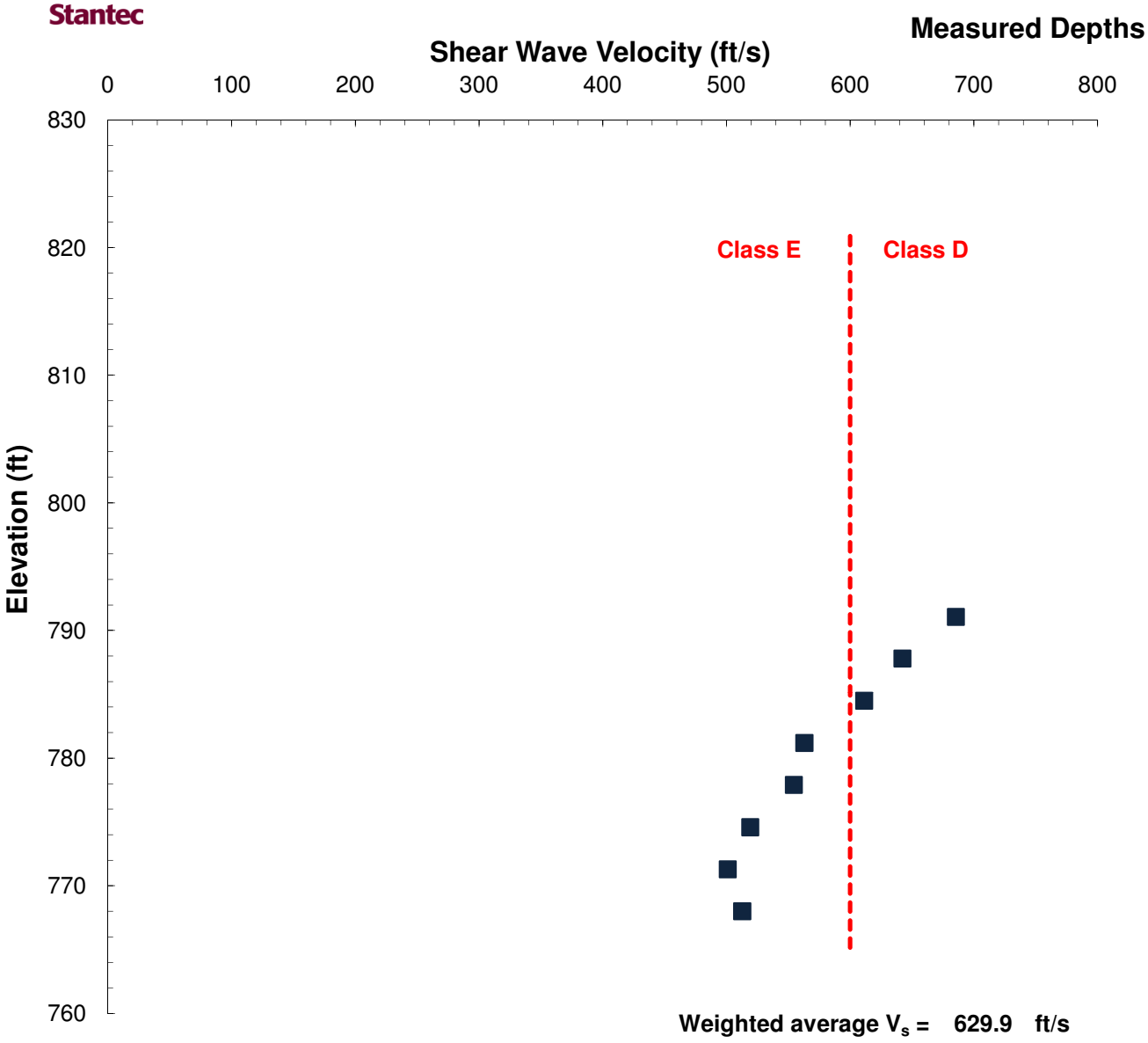
where L_2 and L_1 are the shear wave travel length at two depths and t_2 and t_1 are the arrival times of the waves on the trace plots for the two corresponding depths.

Project No. 172679015
STN-25

Stantec

Jacques Whitford

SHEAR WAVE VELOCITY



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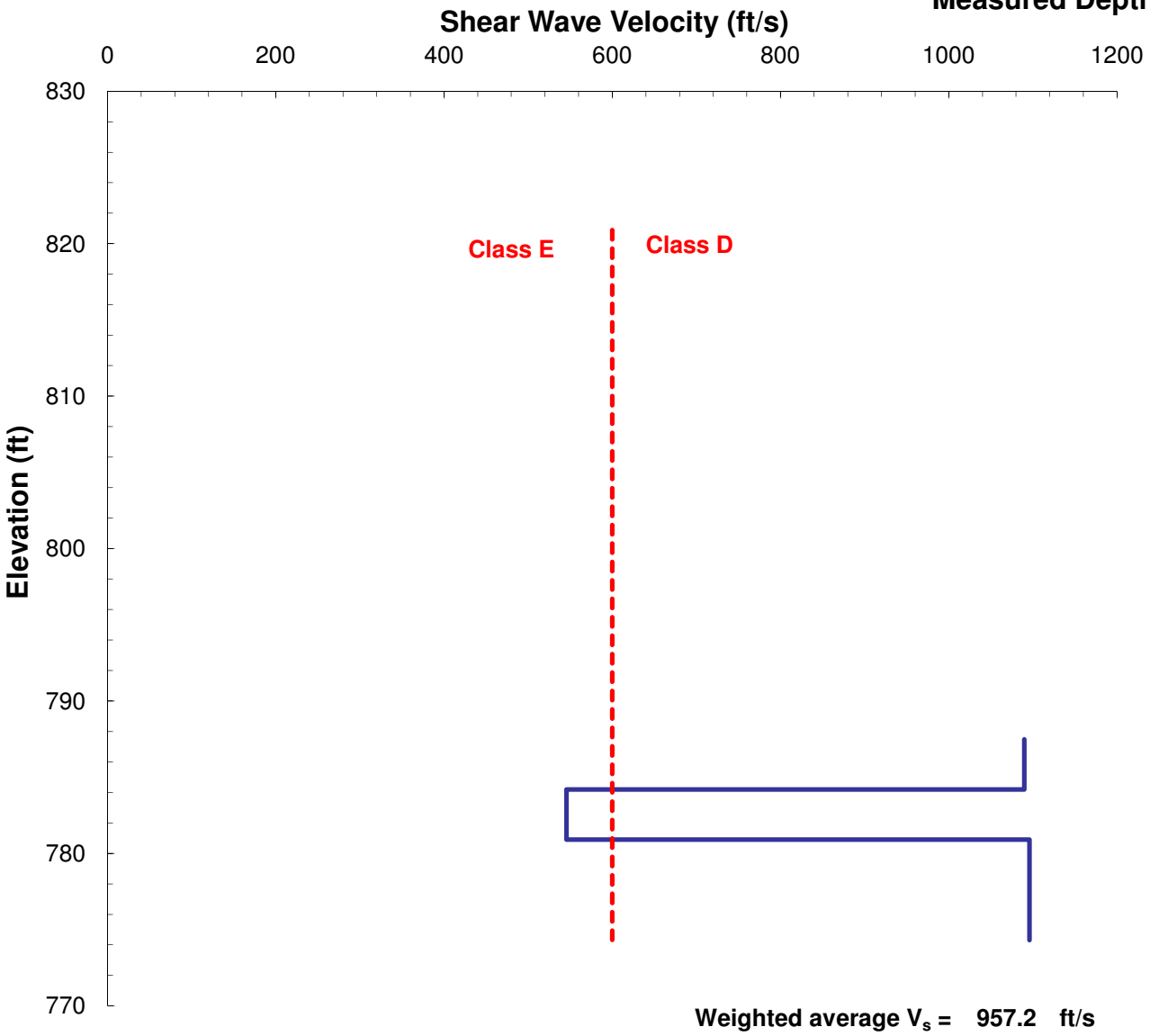
Project No. 172679015
STN-25

Stantec

Jacques Whitford

SHEAR WAVE VELOCITY

Incremental Between Measured Depths



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- The incremental V_s values were calculated as

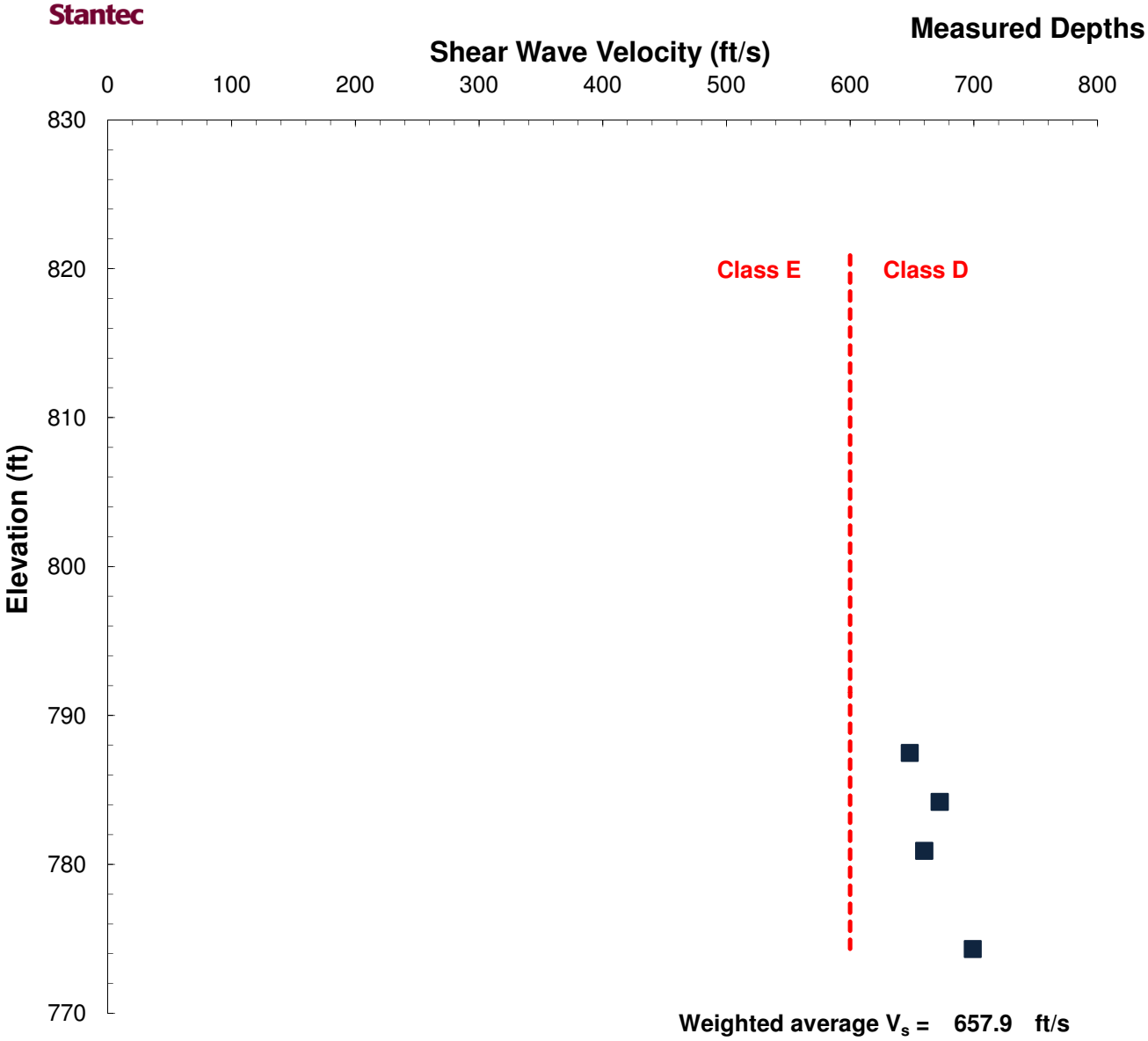
$$V_s = \frac{L_2 - L_1}{t_2 - t_1}$$

where L_2 and L_1 are the shear wave travel length at two depths and t_2 and t_1 are the arrival times of the waves on the trace plots for the two corresponding depths.

Stantec

Jacques Whitford

SHEAR WAVE VELOCITY



Shear Wave Velocity, V_s

- The "shear wave velocity" of a soil represents the speed at which any shear wave will travel within this soil (or medium).

- The shear wave velocity at specific depths is measured by inducing a shear wave at surface and measuring the arrival time of the wave at depth.

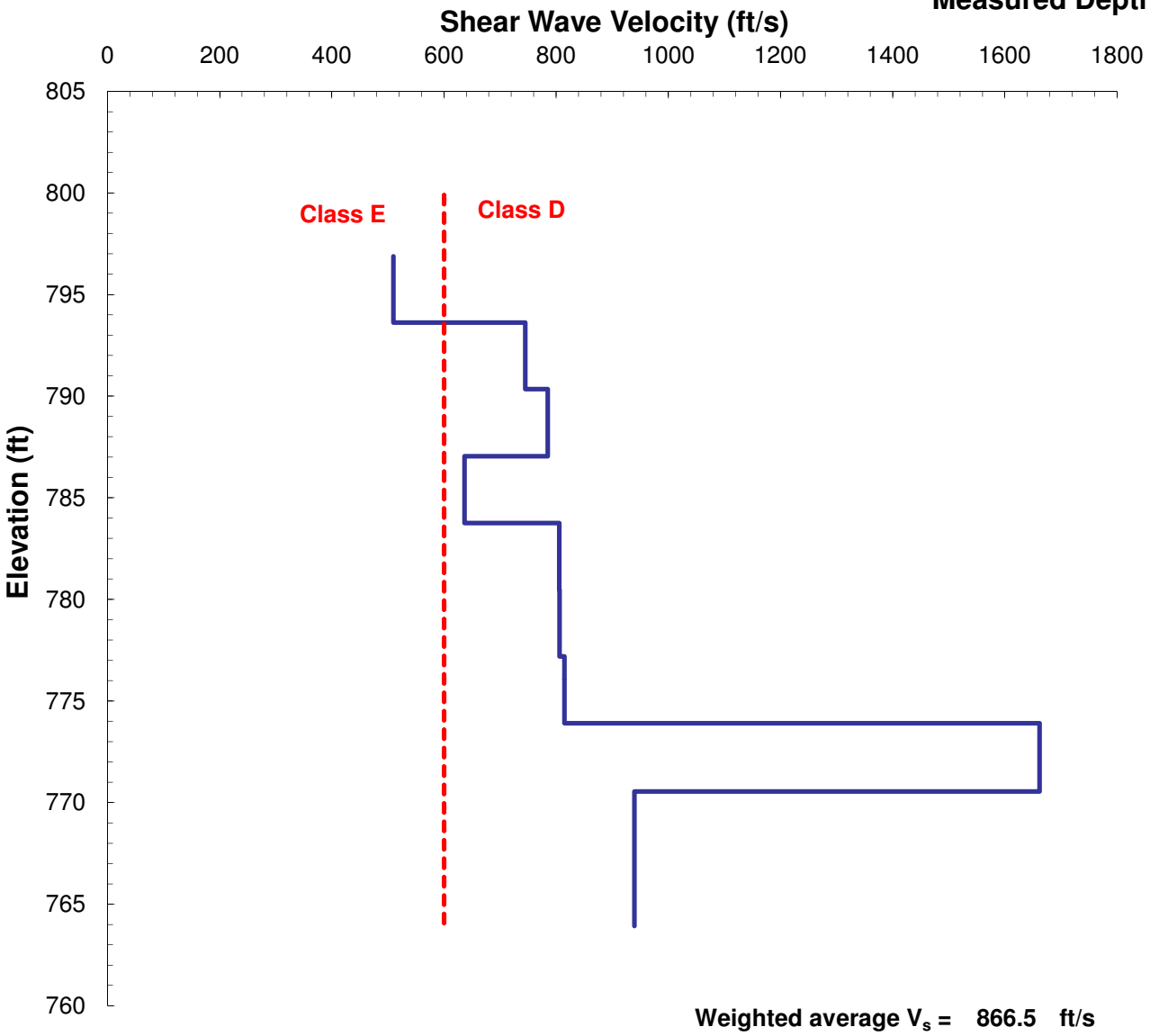
Project No. 172679015
STN-10

Stantec

Jacques Whitford

SHEAR WAVE VELOCITY

Incremental Between Measured Depths



Shear Wave Velocity, V_s

- The "shear wave velocity" of a soil represents the speed at which any shear wave will travel within this soil (or medium).

- The shear wave velocity at specific depths is measured by inducing a shear wave at surface and measuring the arrival time of the wave at depth.

- The incremental V_s values were calculated as

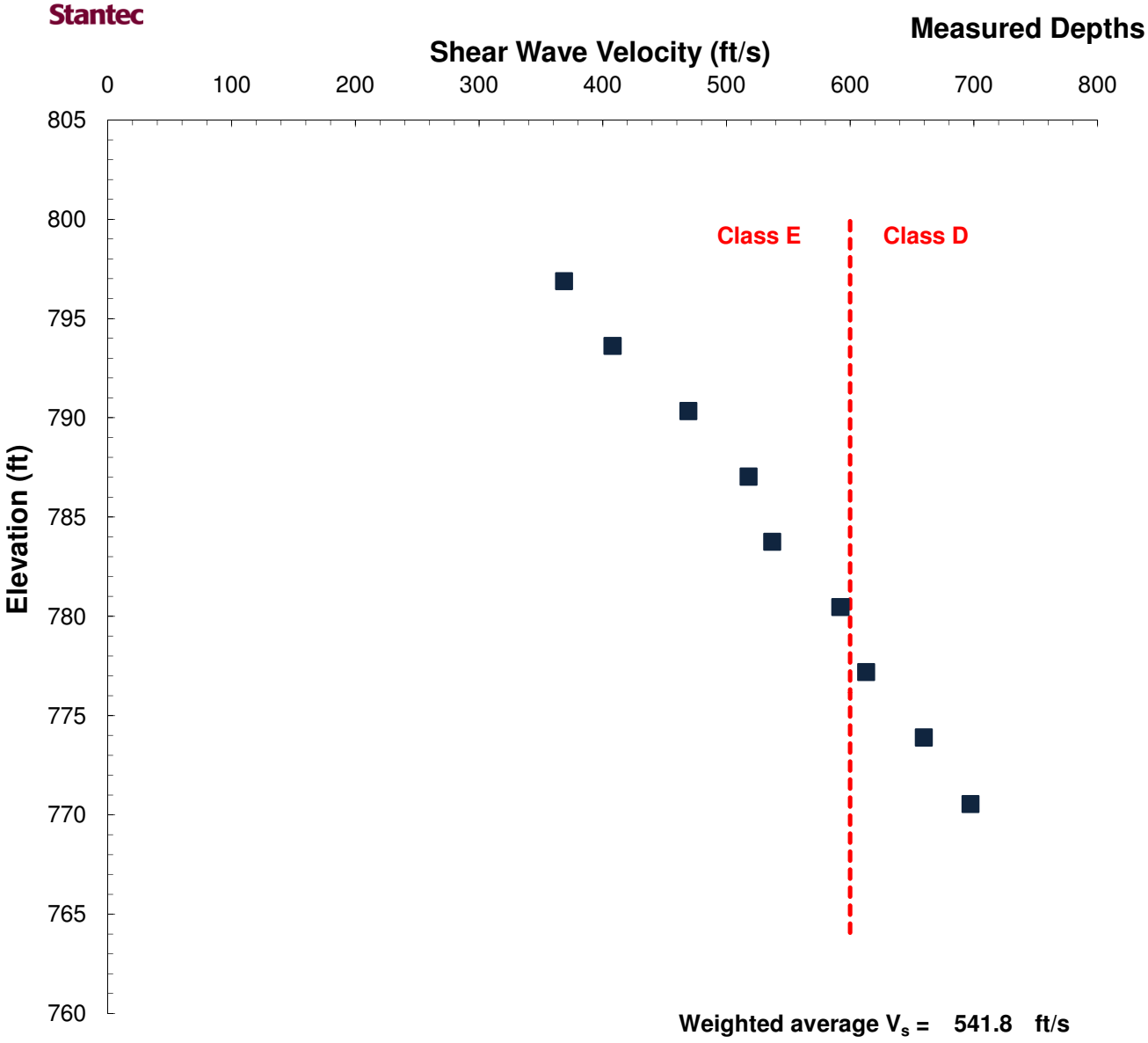
$$V_s = \frac{L_2 - L_1}{t_2 - t_1}$$

where L_2 and L_1 are the shear wave travel length at two depths and t_2 and t_1 are the arrival times of the waves on the trace plots for the two corresponding depths.

Stantec

Jacques Whitford

SHEAR WAVE VELOCITY



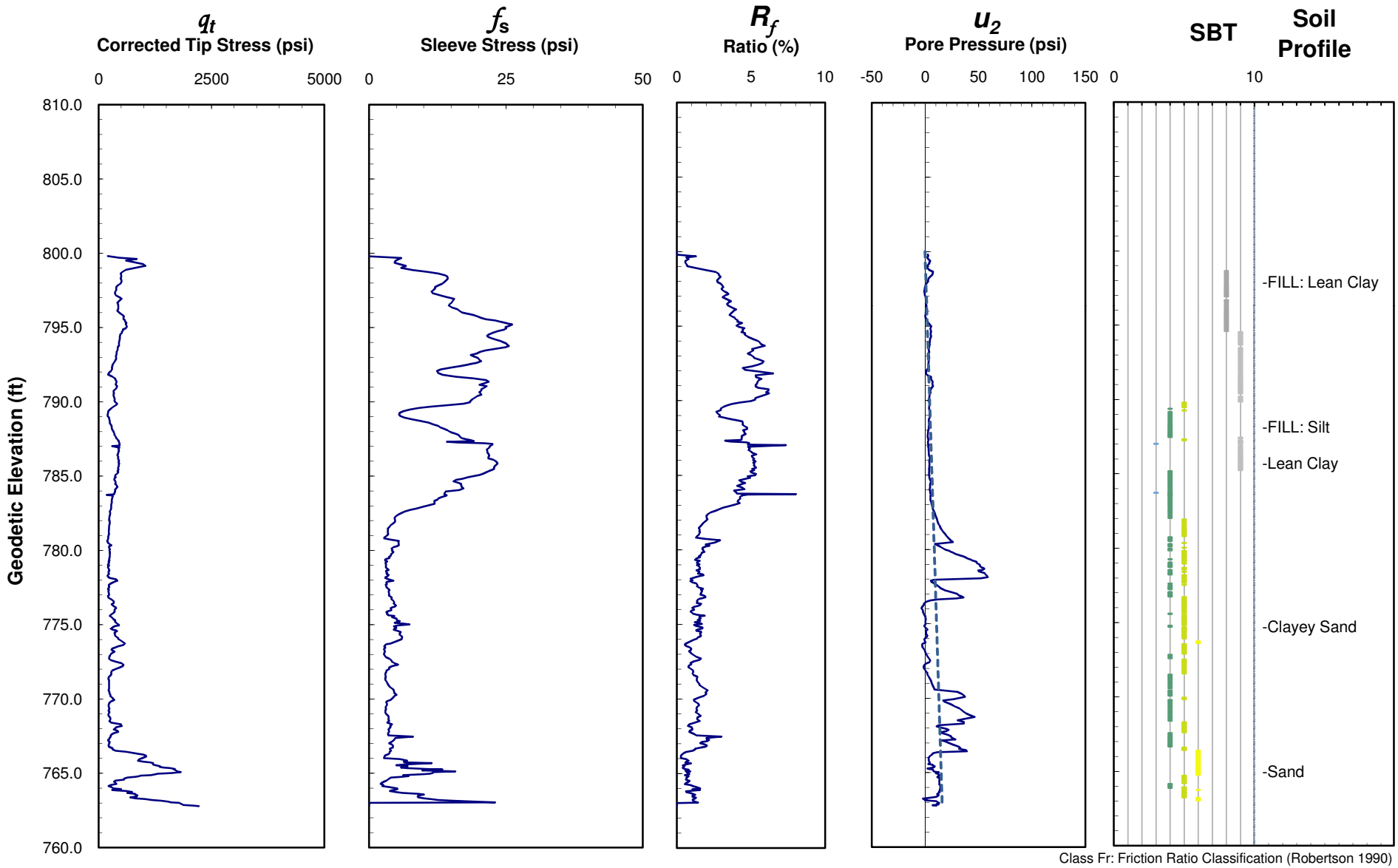
Shear Wave Velocity, V_s

- The "shear wave velocity" of a soil represents the speed at which any shear wave will travel within this soil (or medium).

- The shear wave velocity at specific depths is measured by inducing a shear wave at surface and measuring the arrival time of the wave at depth.

Project No. 172679015
STN-59

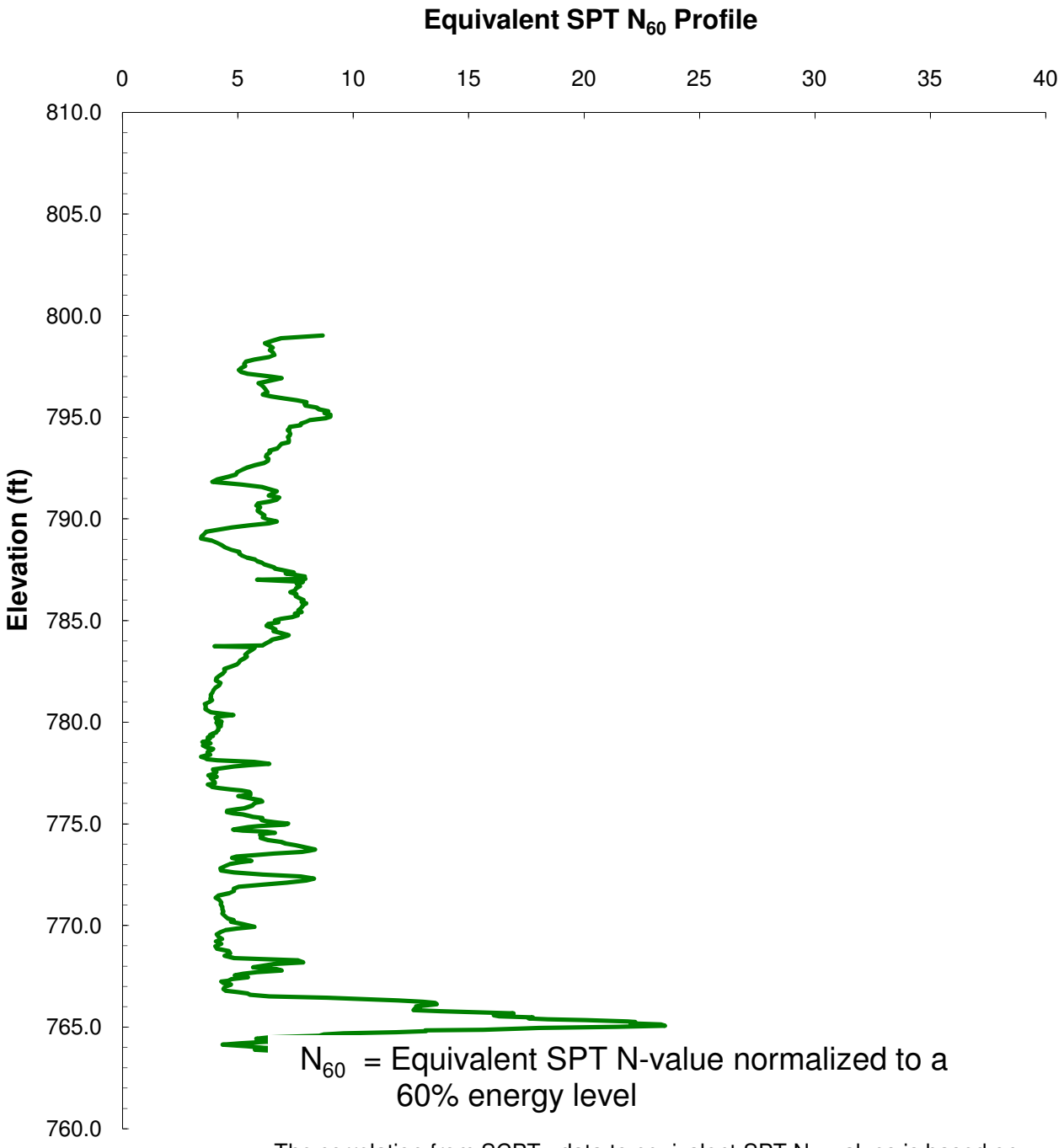
Stantec Consulting Inc.	Elevation: 800.00 ft SCPTu Start Elevation: 800.00 ft Groundwater Elevation: 800.00 ft	Test Date: August 7, 2009 Project No. 172679015	STN-59
	Client: TVA Project: Bull Run		



Class Fr: Friction Ratio Classification (Robertson 1990)

SCPTu Results

SCPTu N_{60} Values



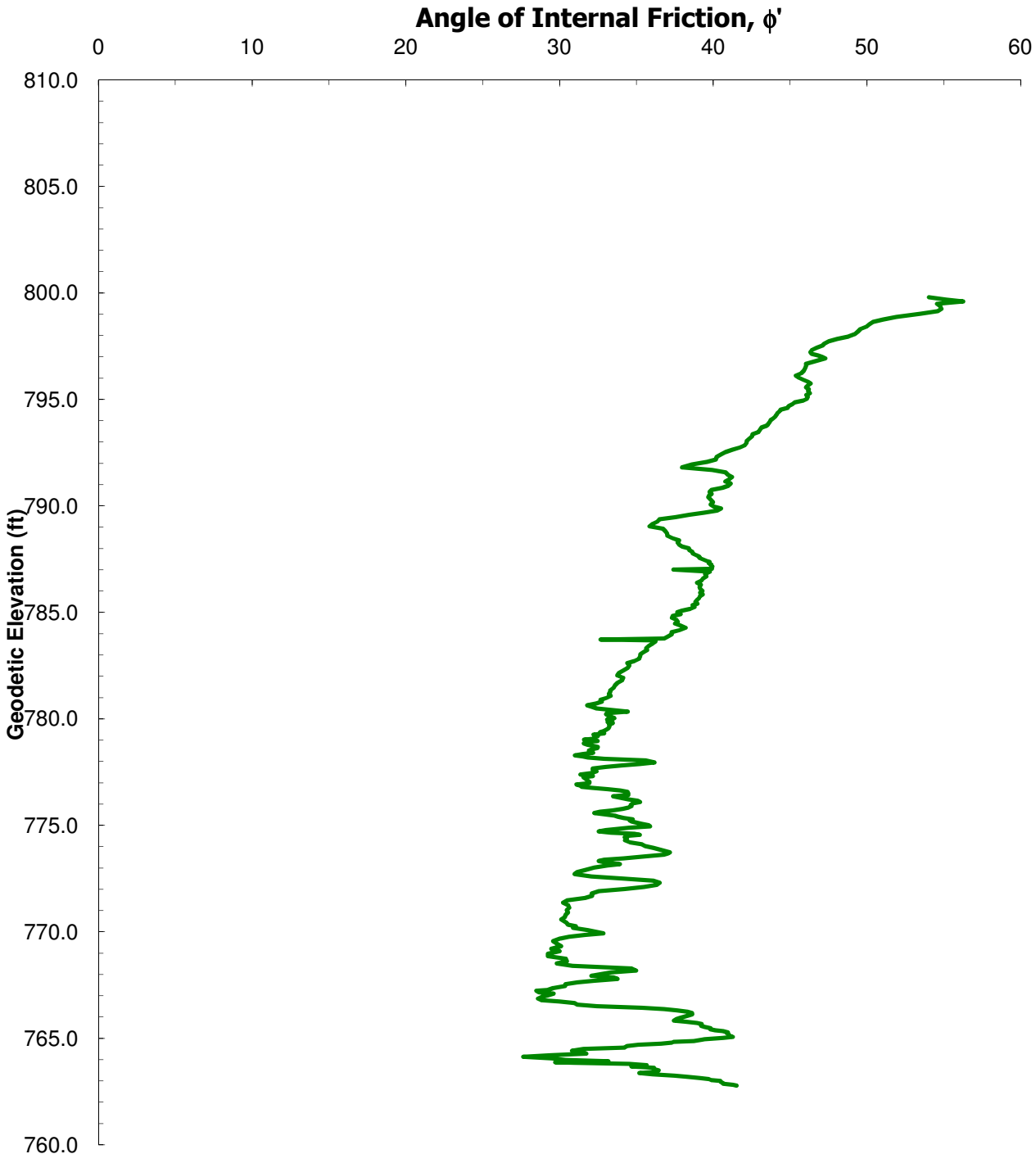
The correlation from SCPTu data to equivalent SPT N_{60} values is based on the Jefferies and Davies (1993) approach.

Project No. 172679015

STN-59

SCPTu RESULTS

Effective Angle of Internal Friction

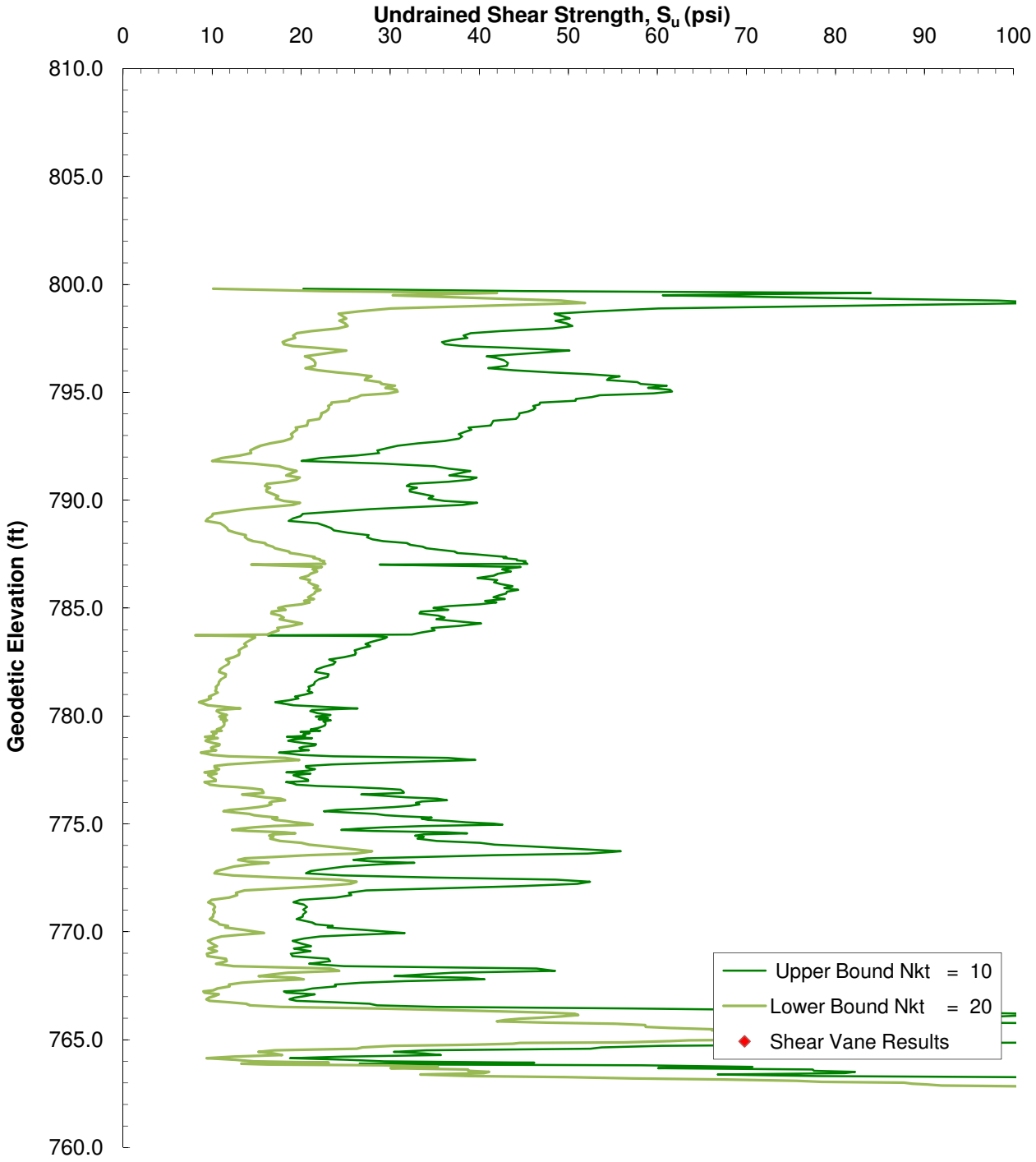


Project No. 172679015

STN-59

SCPTu RESULTS

Undrained Shear Strength, S_u

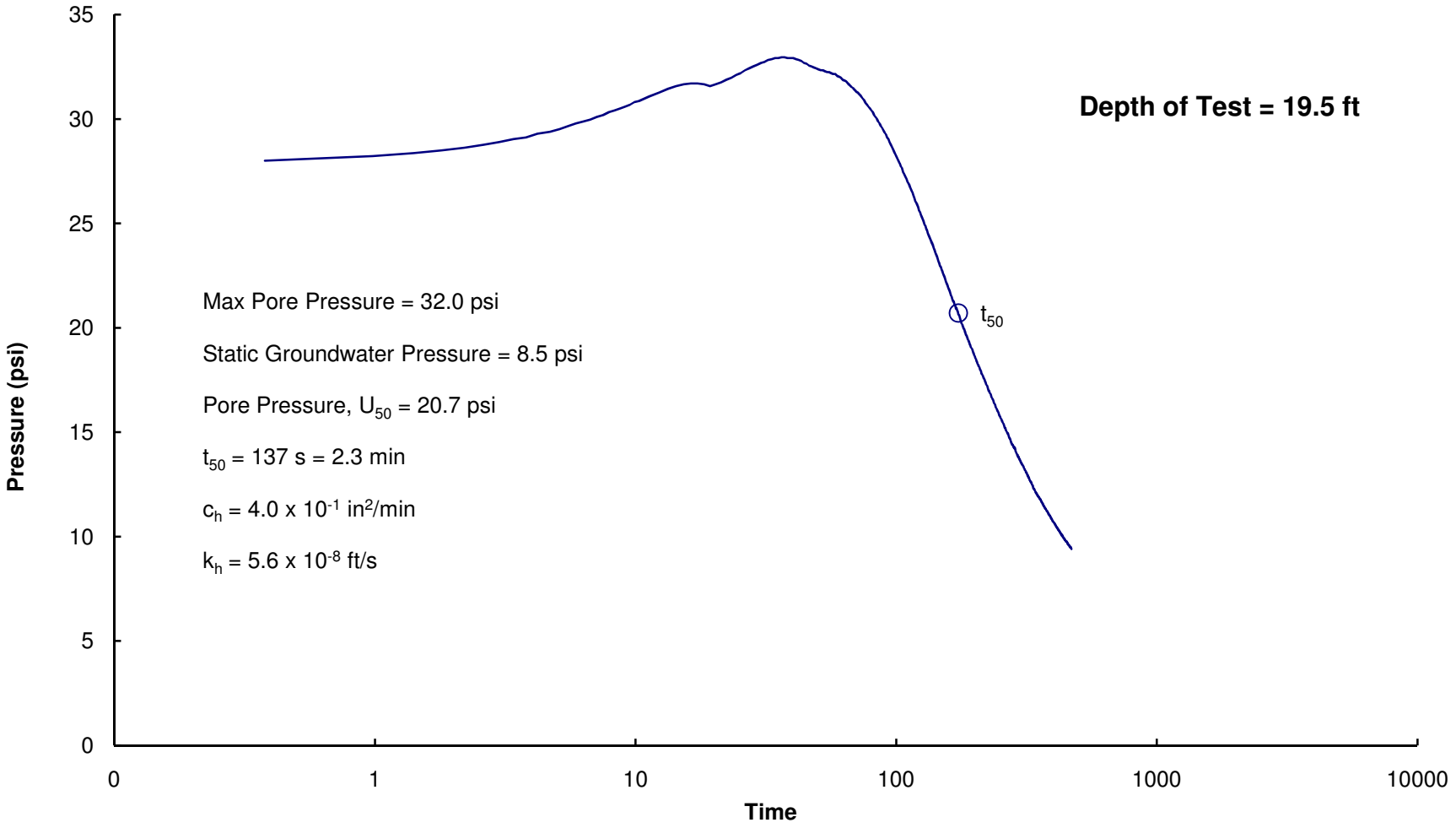


Project No. 172679015

STN-59

Stantec Consulting Inc.

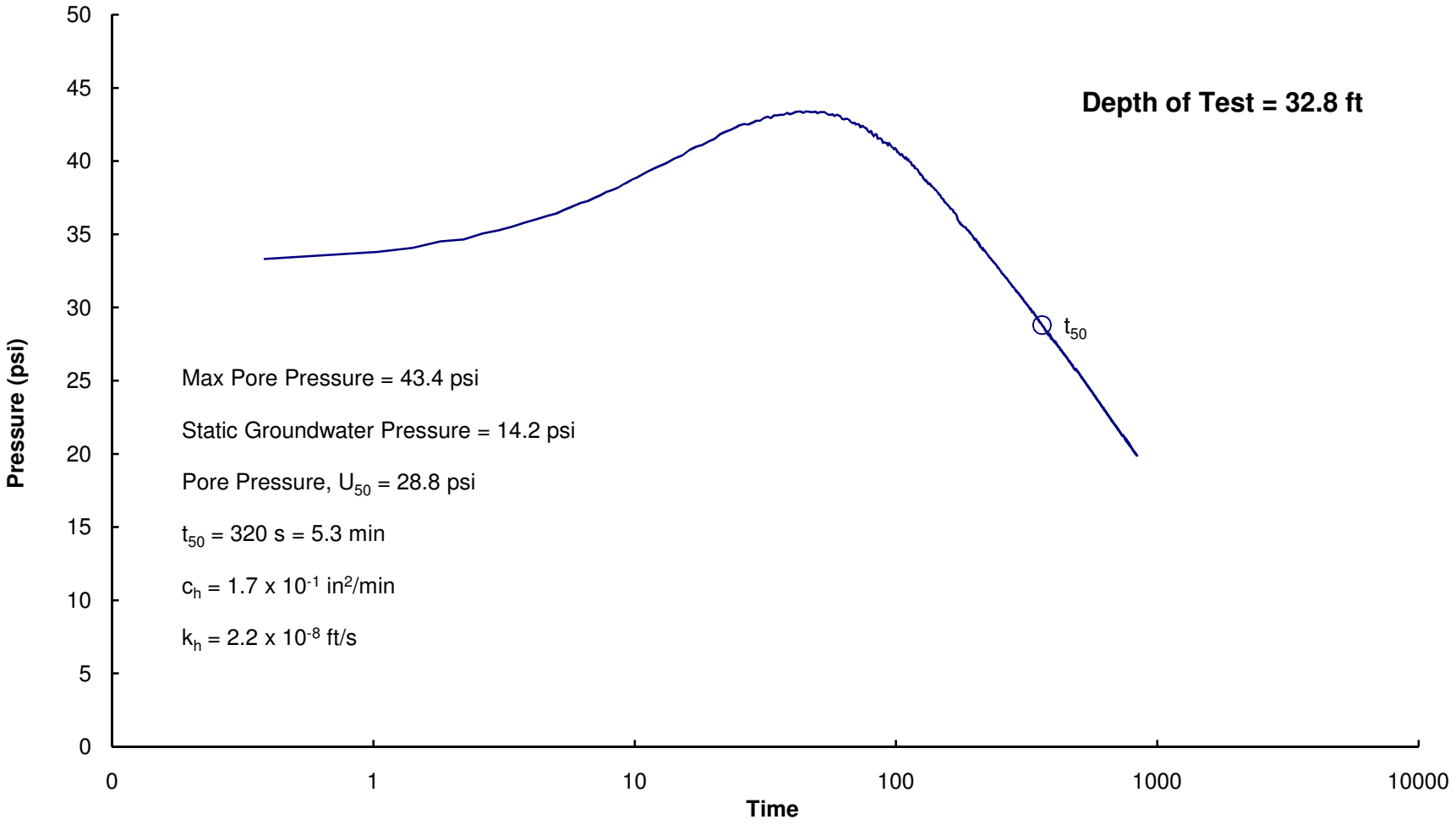
SCPTu DISSIPATION RESULTS
Coefficient of Consolidation



Project No. 172679015
STN-59

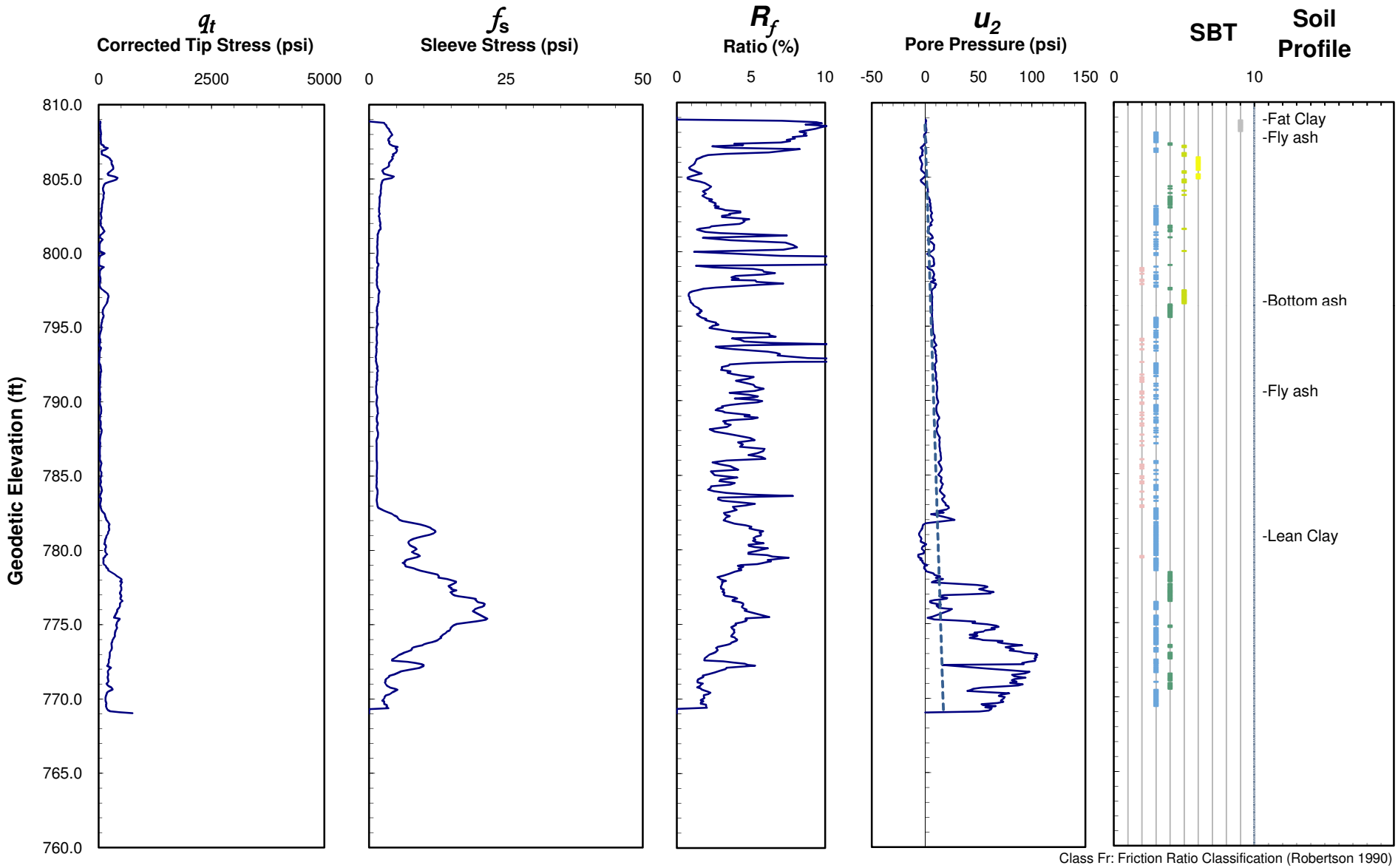
Stantec Consulting Inc.

SCPTu DISSIPATION RESULTS
Coefficient of Consolidation



Project No. 172679015
STN-59

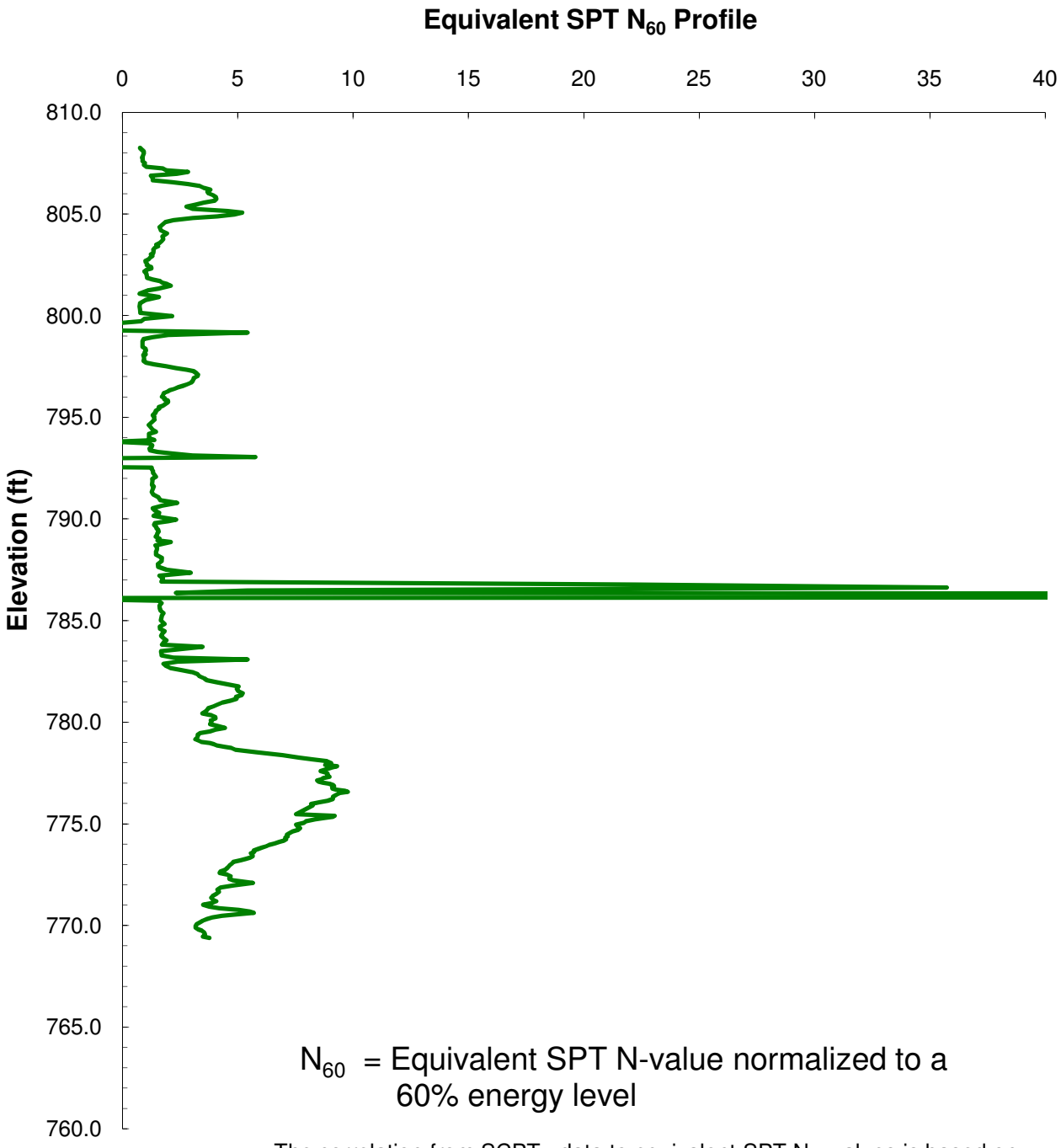
Stantec Consulting Inc.	Elevation: 809.00 ft SCPTu Start Elevation: 809.00 ft Groundwater Elevation: 808.50 ft	Test Date: July 22, 2009 Project No. 172679015	STN-49
	Client: TVA Project: Bull Run Fossil Plant		



Class Fr: Friction Ratio Classification (Robertson 1990)

SCPTu Results

SCPTu N_{60} Values



N_{60} = Equivalent SPT N-value normalized to a 60% energy level

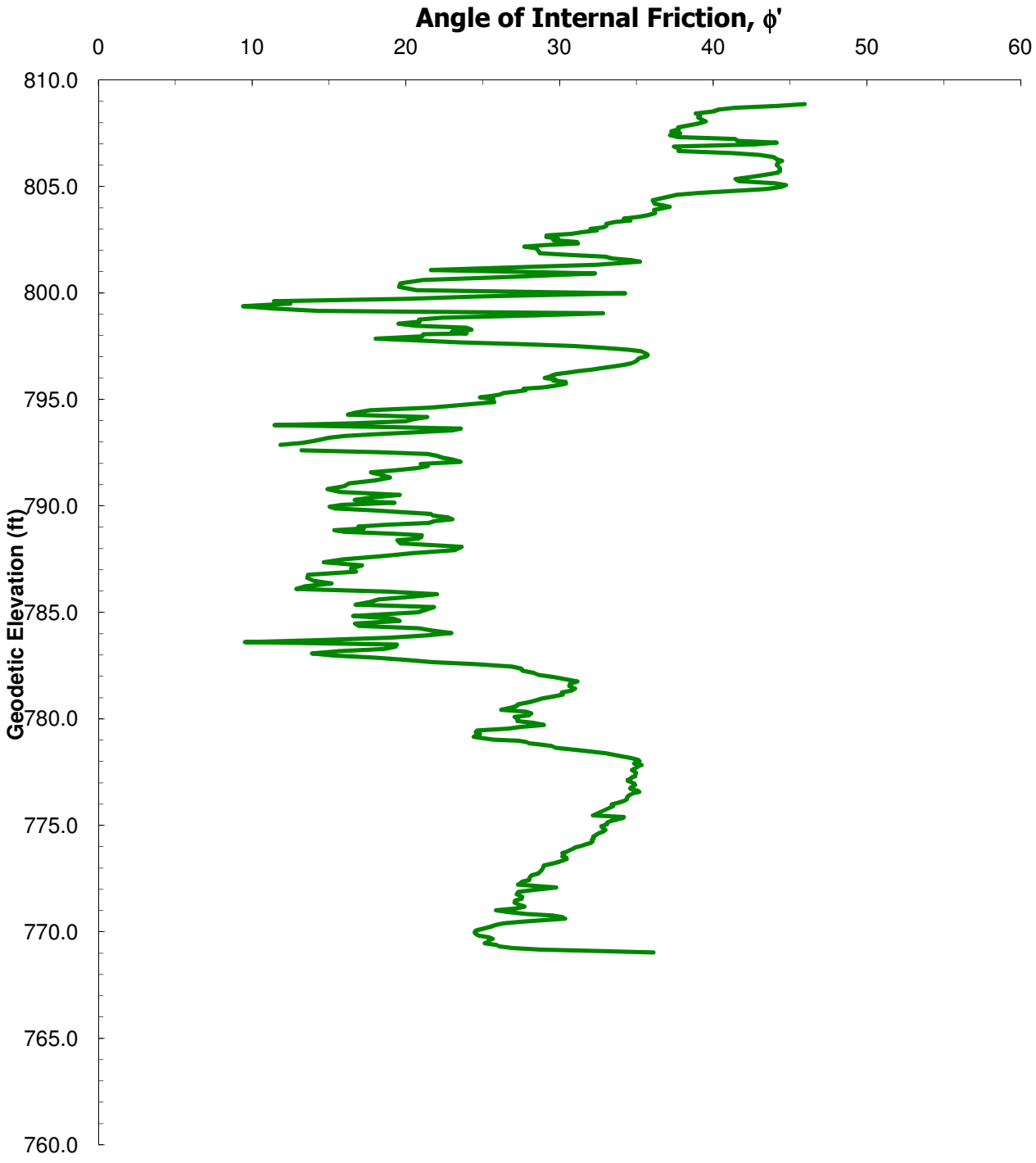
The correlation from SCPTu data to equivalent SPT N_{60} values is based on the Jefferies and Davies (1993) approach.

Project No. 172679015

STN-49

SCPTu RESULTS

Effective Angle of Internal Friction

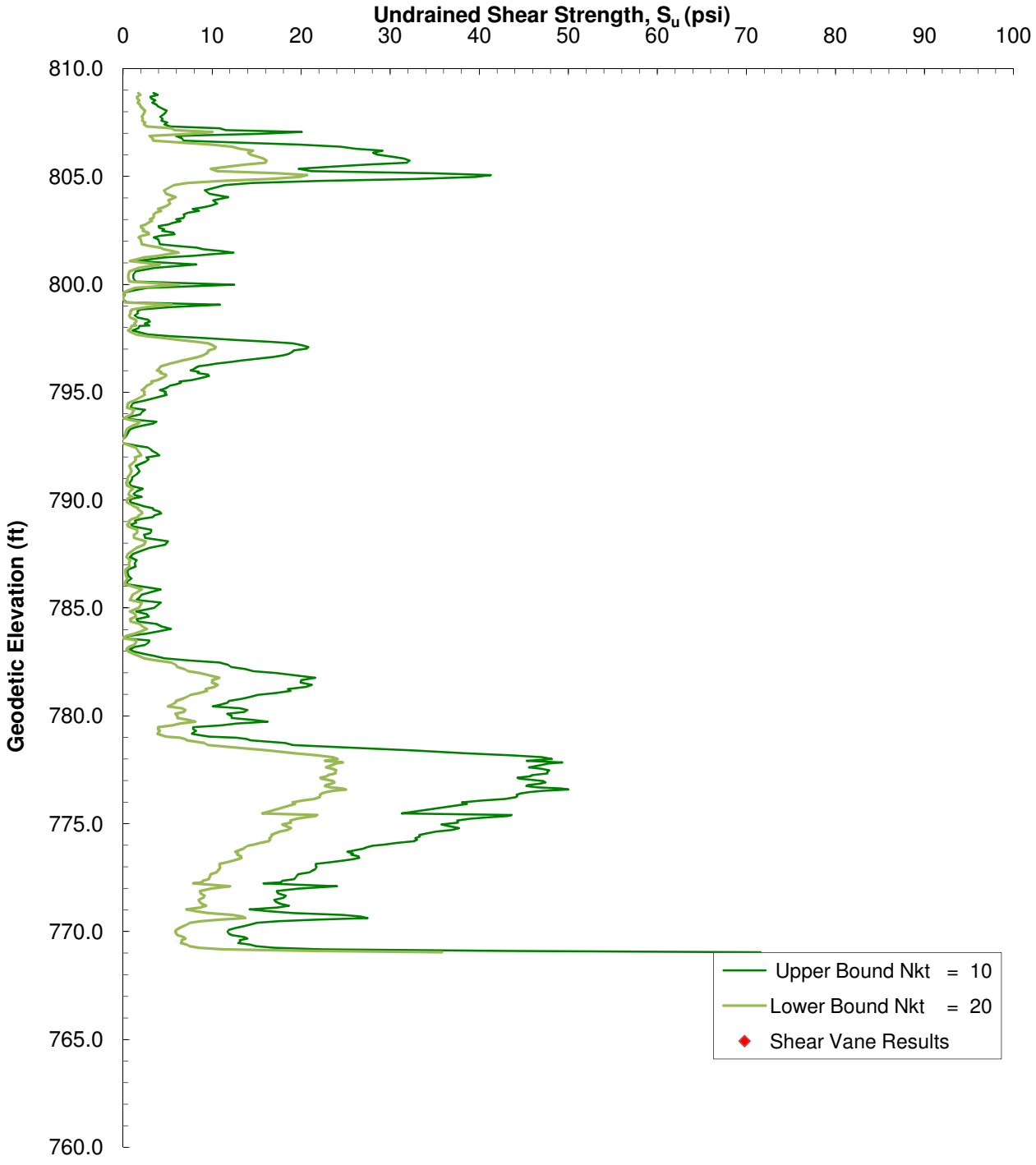


Project No. 172679015

STN-49

SCPTu RESULTS

Undrained Shear Strength, S_u

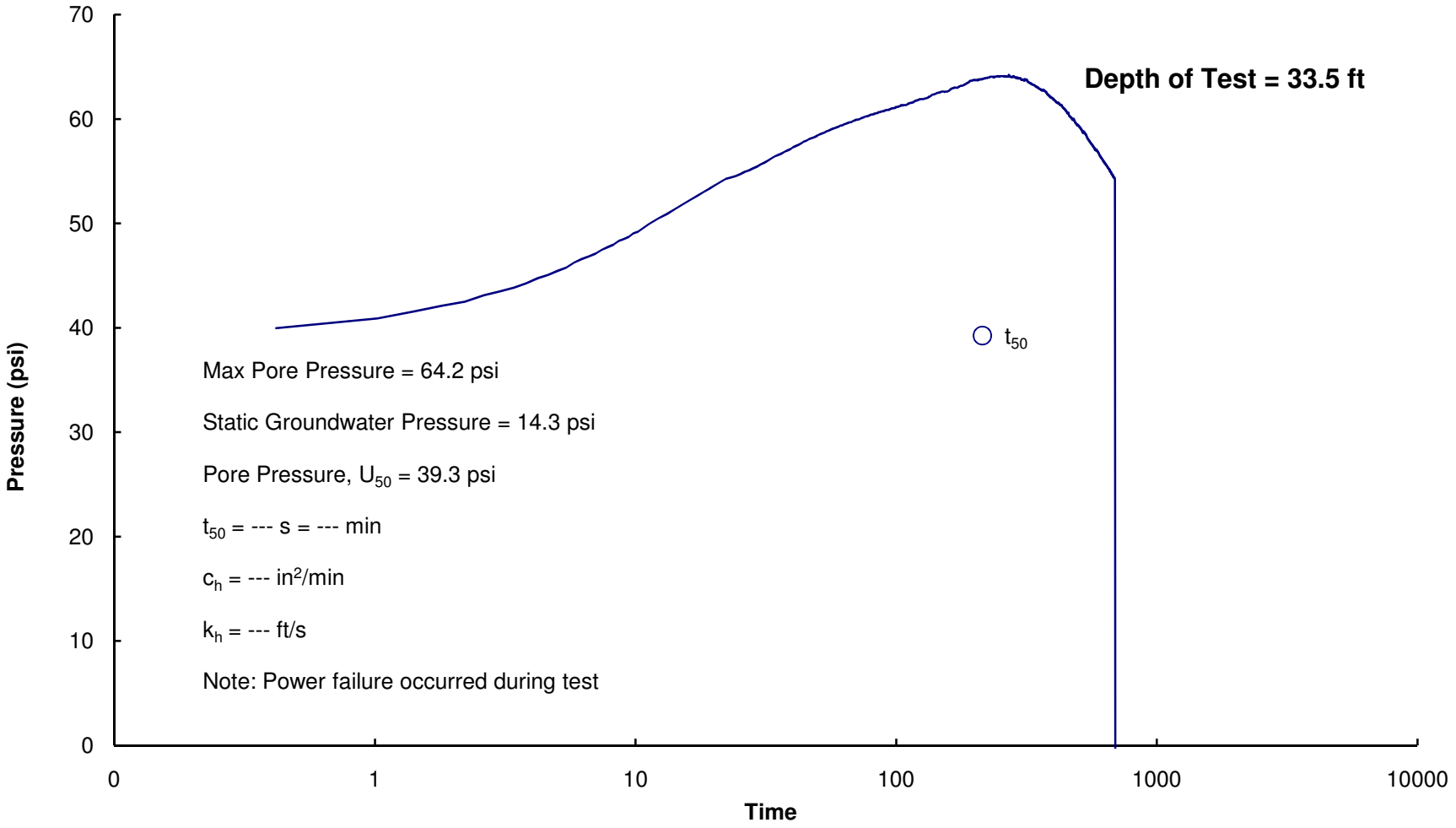


Project No. 172679015

STN-49

Stantec Consulting Inc.

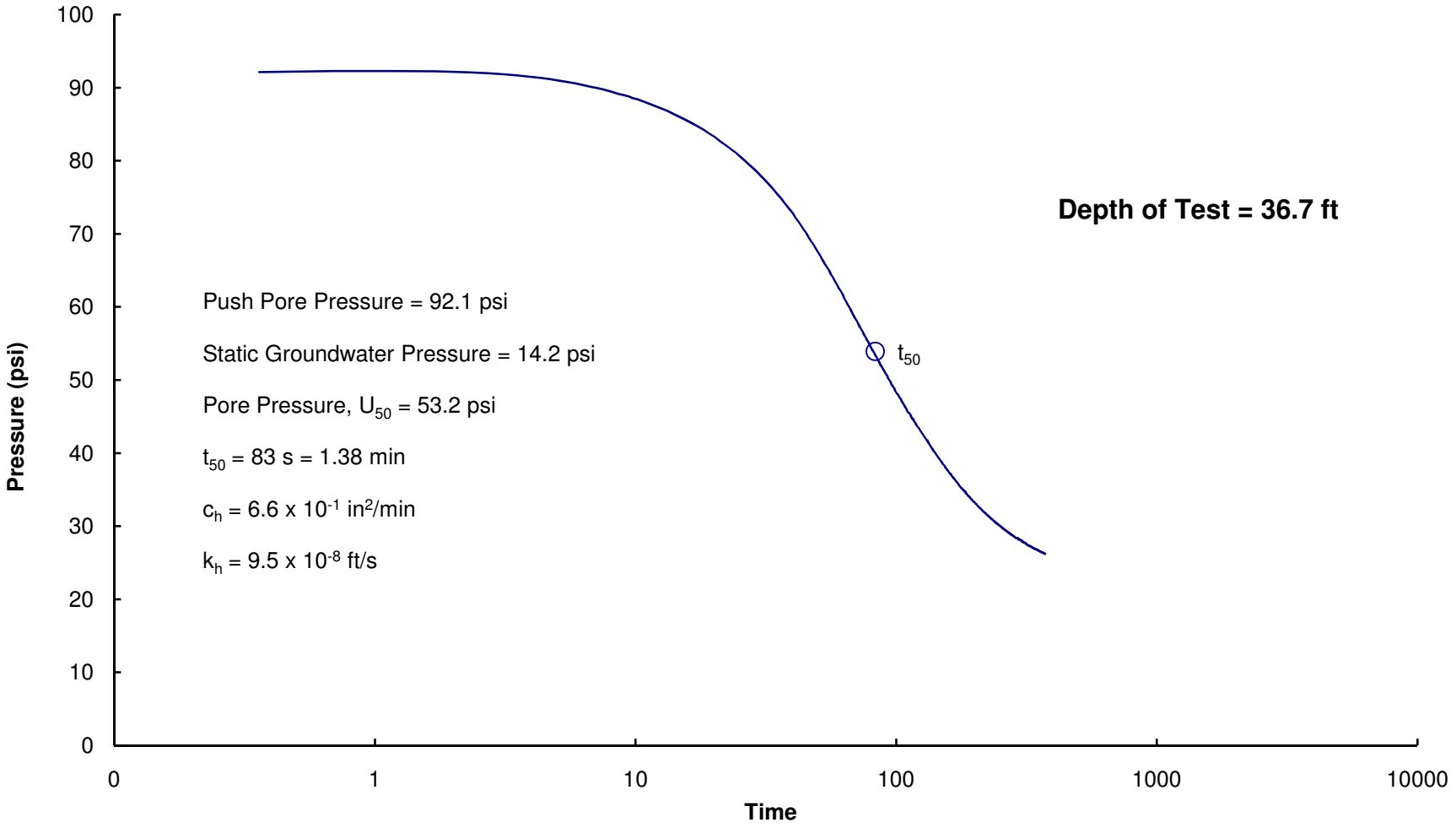
SCPTu DISSIPATION RESULTS
Coefficient of Consolidation



Project No. 172679015
STN-49

Stantec Consulting Inc.

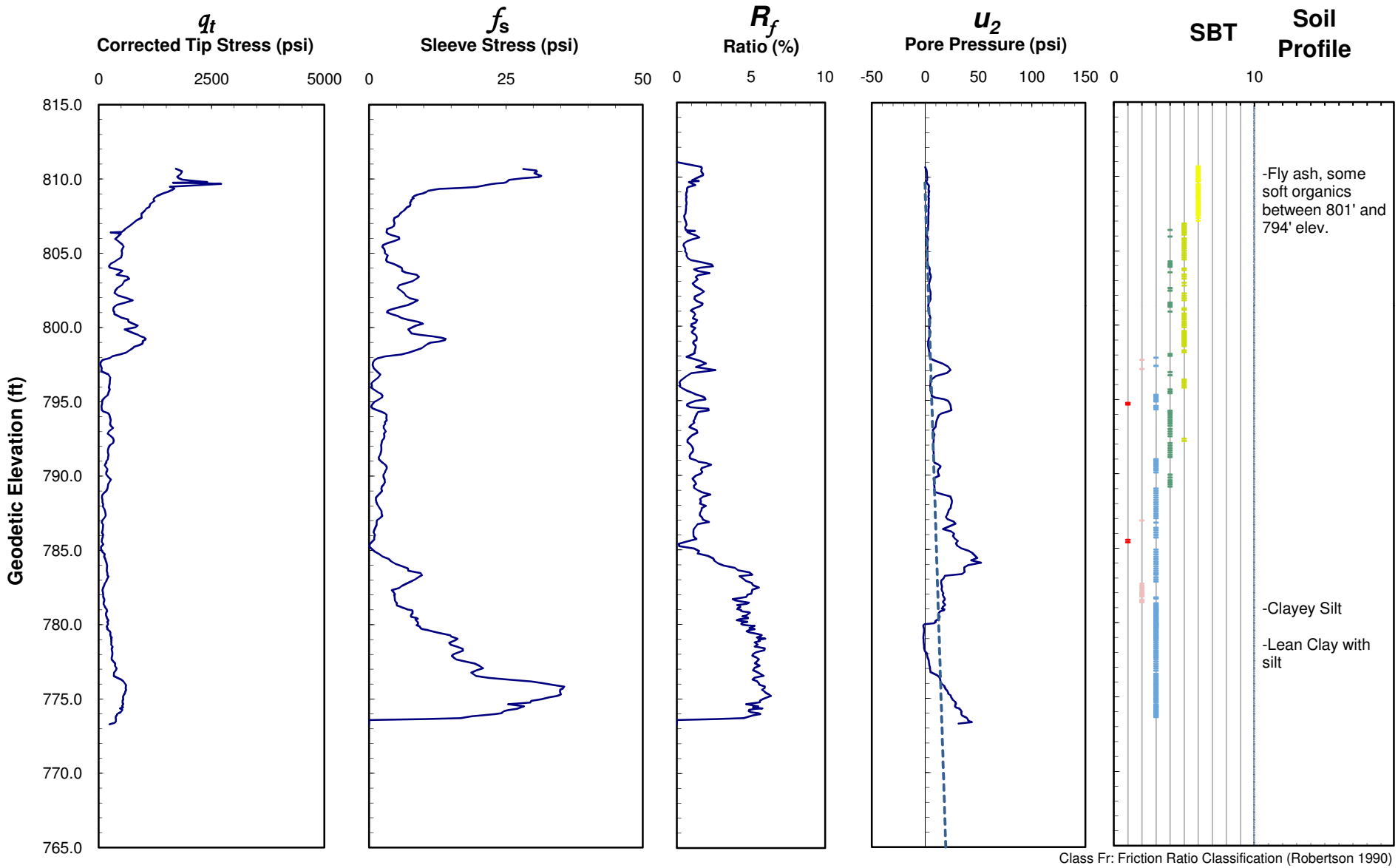
SCPTu DISSIPATION RESULTS
Coefficient of Consolidation



Project No. 172679015
STN-49

D:\CPT-BR\STN-49\STN-49.xlsm

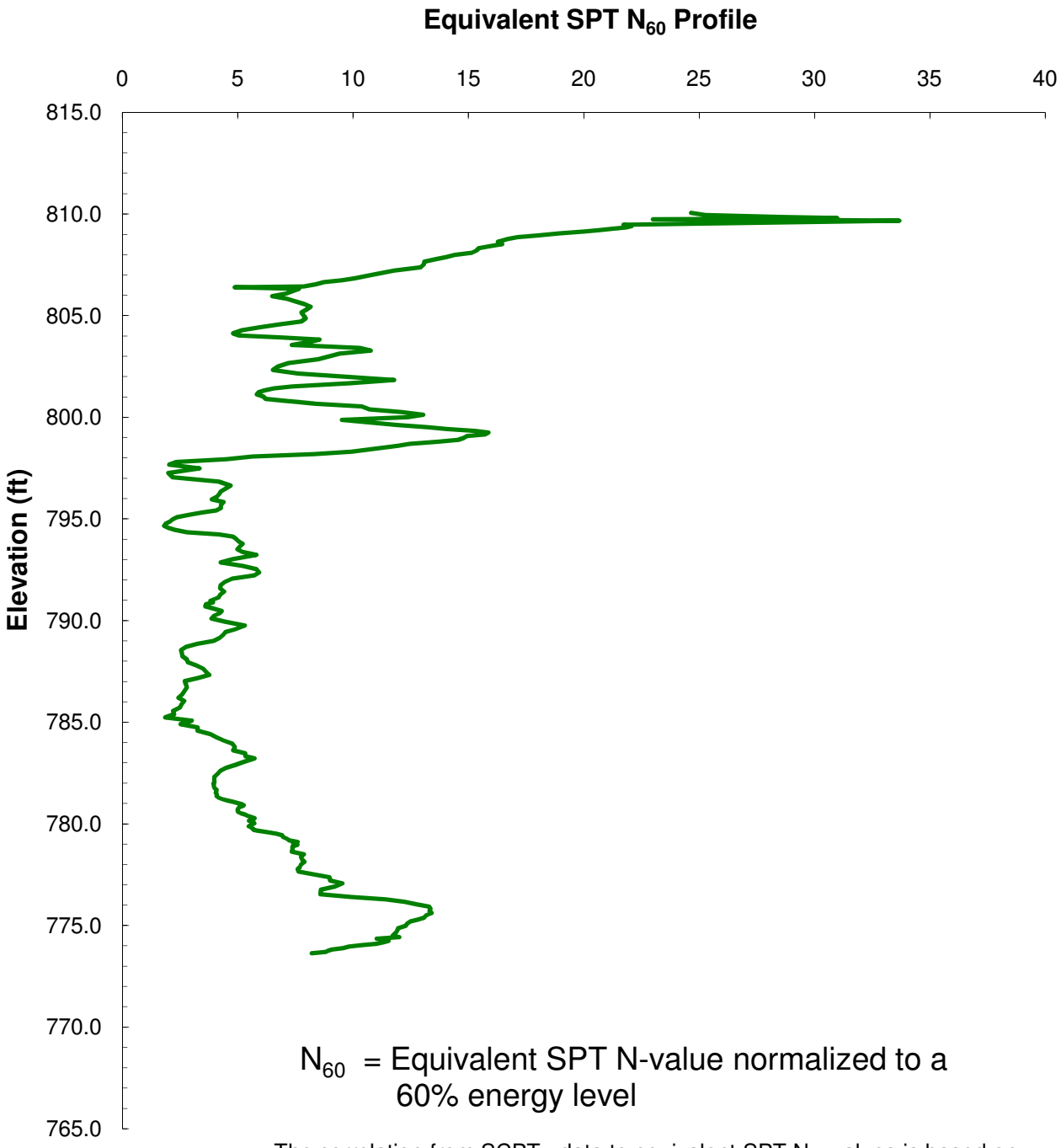
Stantec Consulting Inc.	Elevation: 826.00 ft SCPTu Start Elevation: 811.00 ft Groundwater Elevation: 809.60 ft	Test Date: August 5, 2009 Project No. 172679015	STN-48
	Client: TVA Project: Bull Run		



Class Fr: Friction Ratio Classification (Robertson 1990)

SCPTu Results

SCPTu N_{60} Values



N_{60} = Equivalent SPT N-value normalized to a 60% energy level

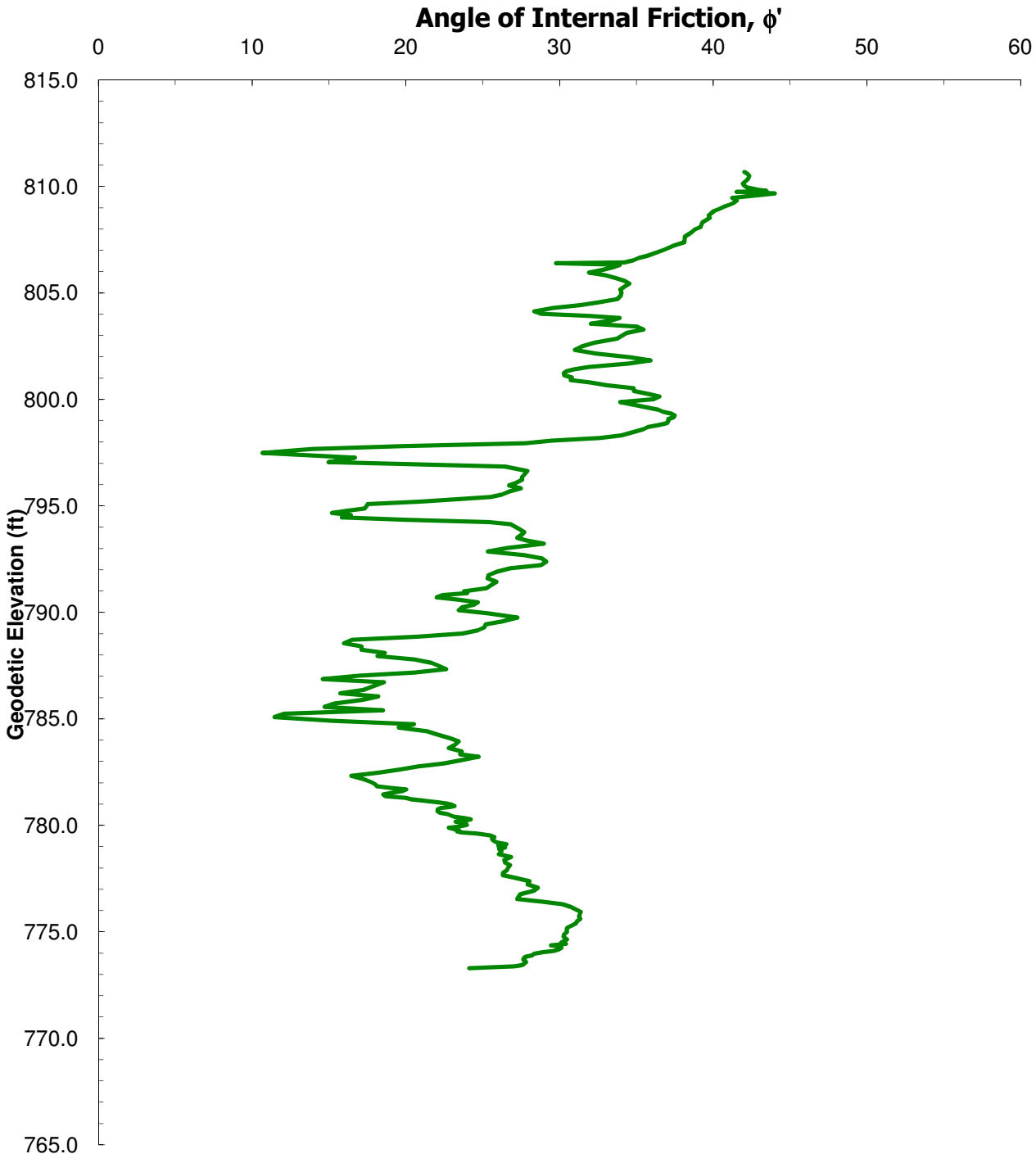
The correlation from SCPTu data to equivalent SPT N_{60} values is based on the Jefferies and Davies (1993) approach.

Project No. 172679015

STN-48

SCPTu RESULTS

Effective Angle of Internal Friction

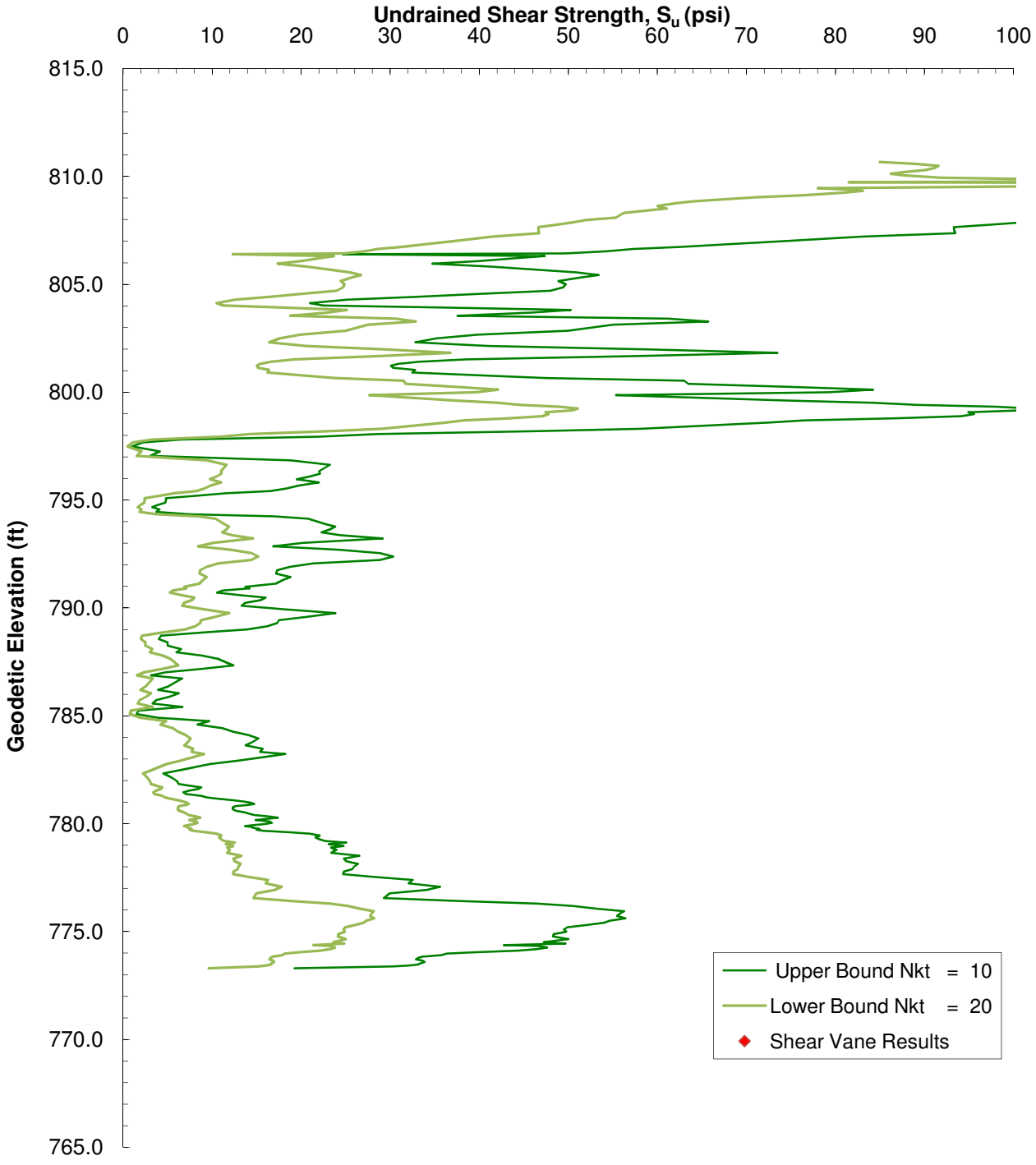


Project No. 172679015

STN-48

SCPTu RESULTS

Undrained Shear Strength, S_u

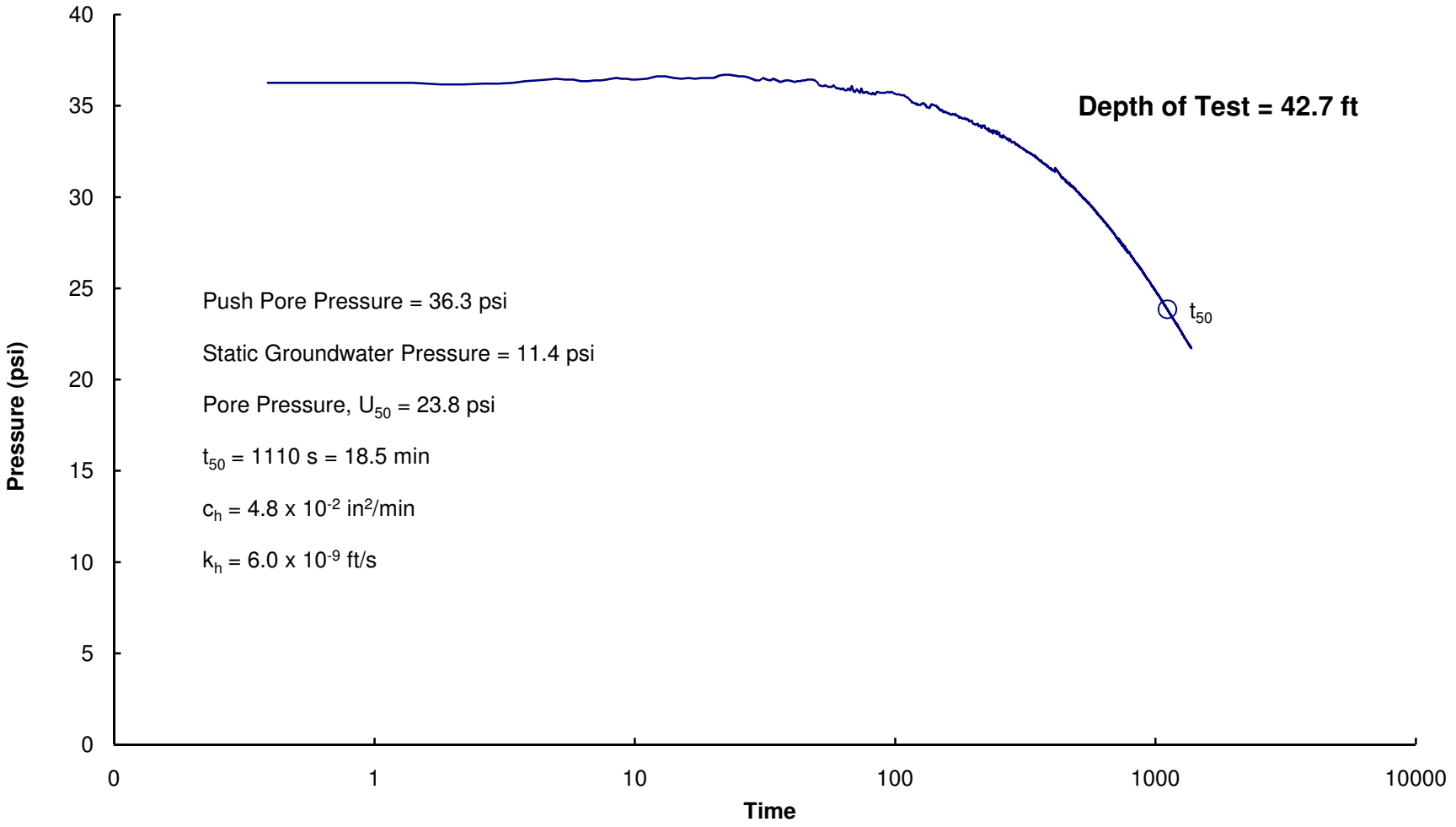


Project No. 172679015

STN-48

Stantec Consulting Inc.

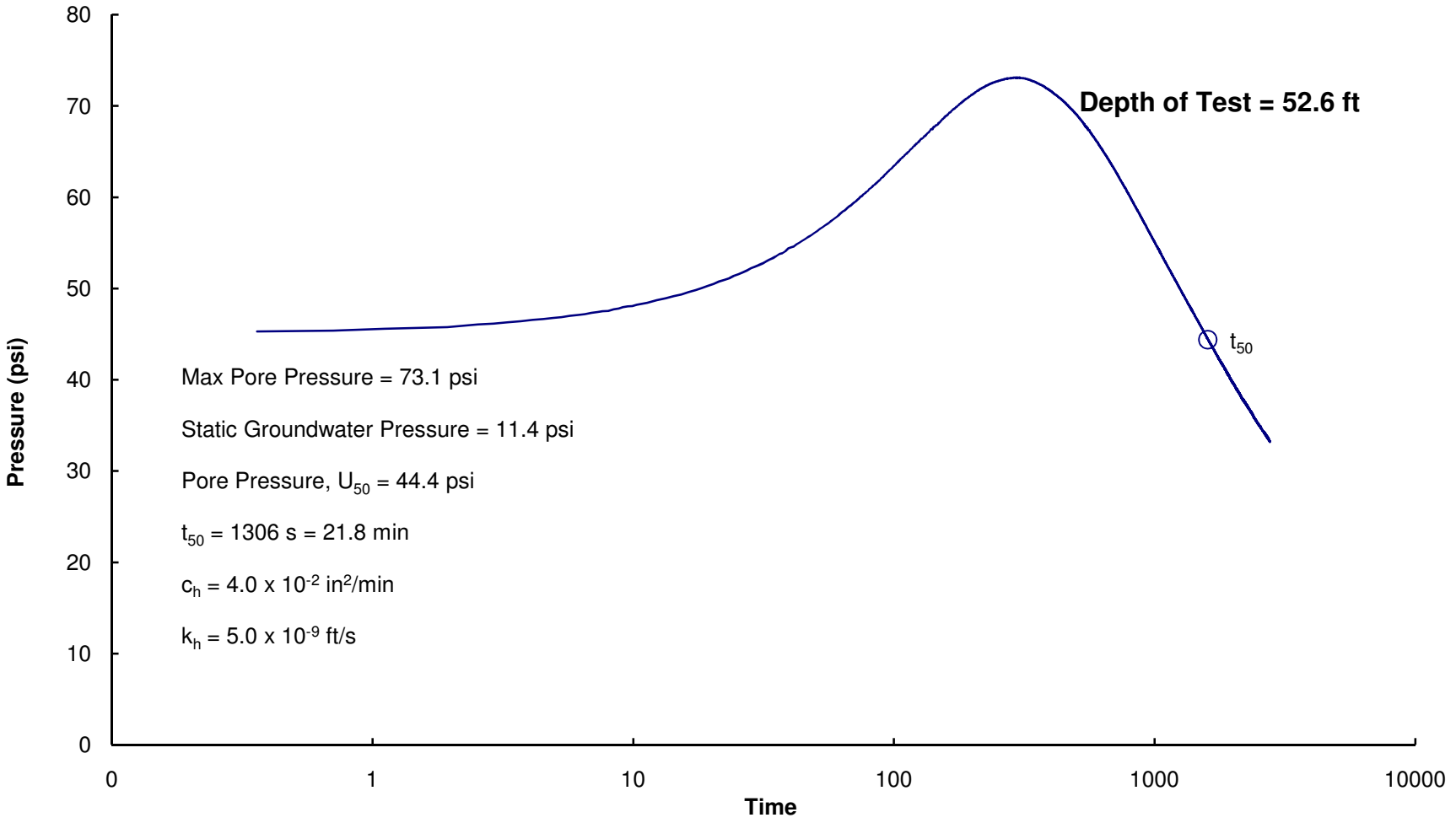
SCPTu DISSIPATION RESULTS
Coefficient of Consolidation



Project No. 172679015
STN-48

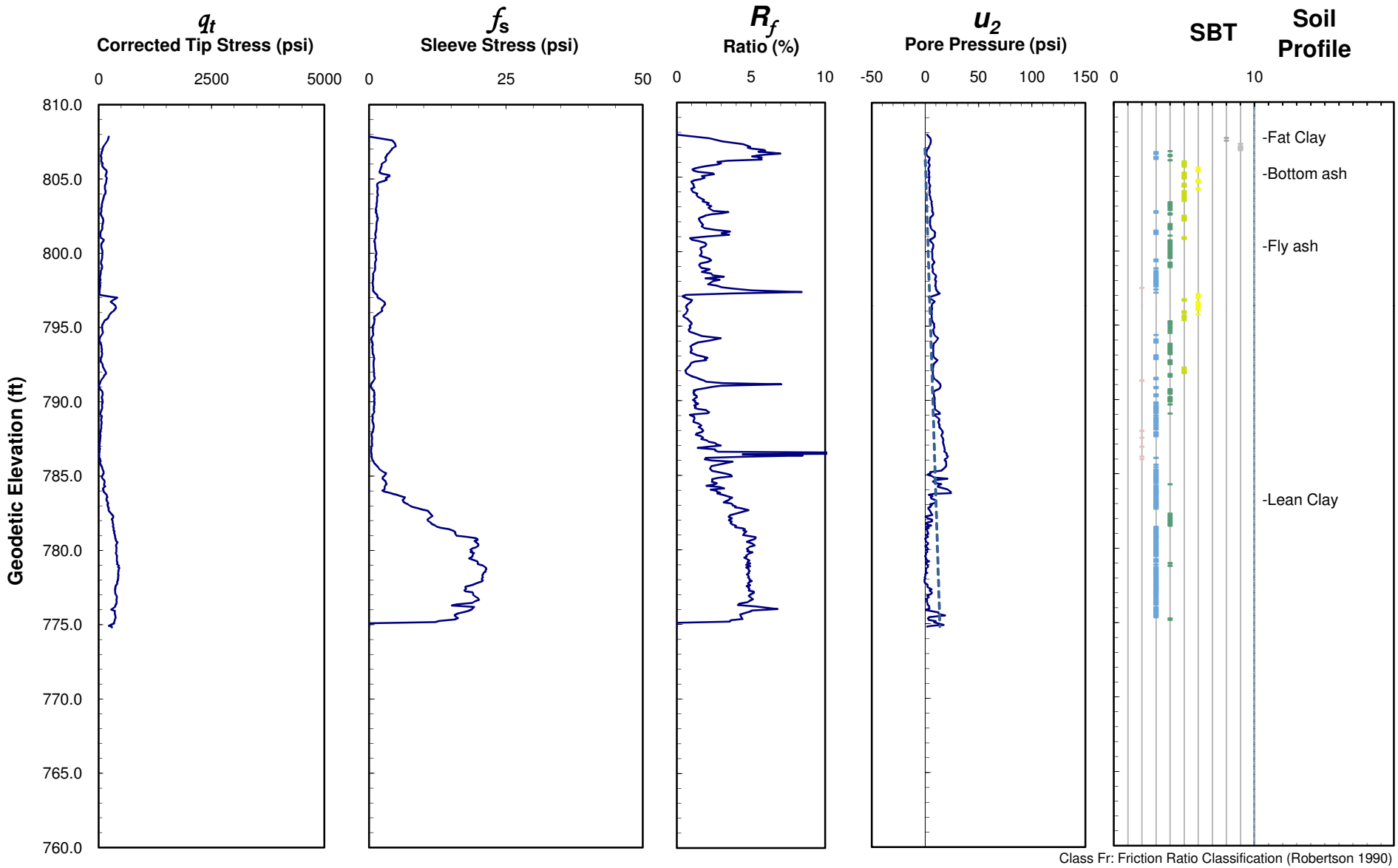
Stantec Consulting Inc.

SCPTu DISSIPATION RESULTS
Coefficient of Consolidation



Project No. 172679015
STN-48

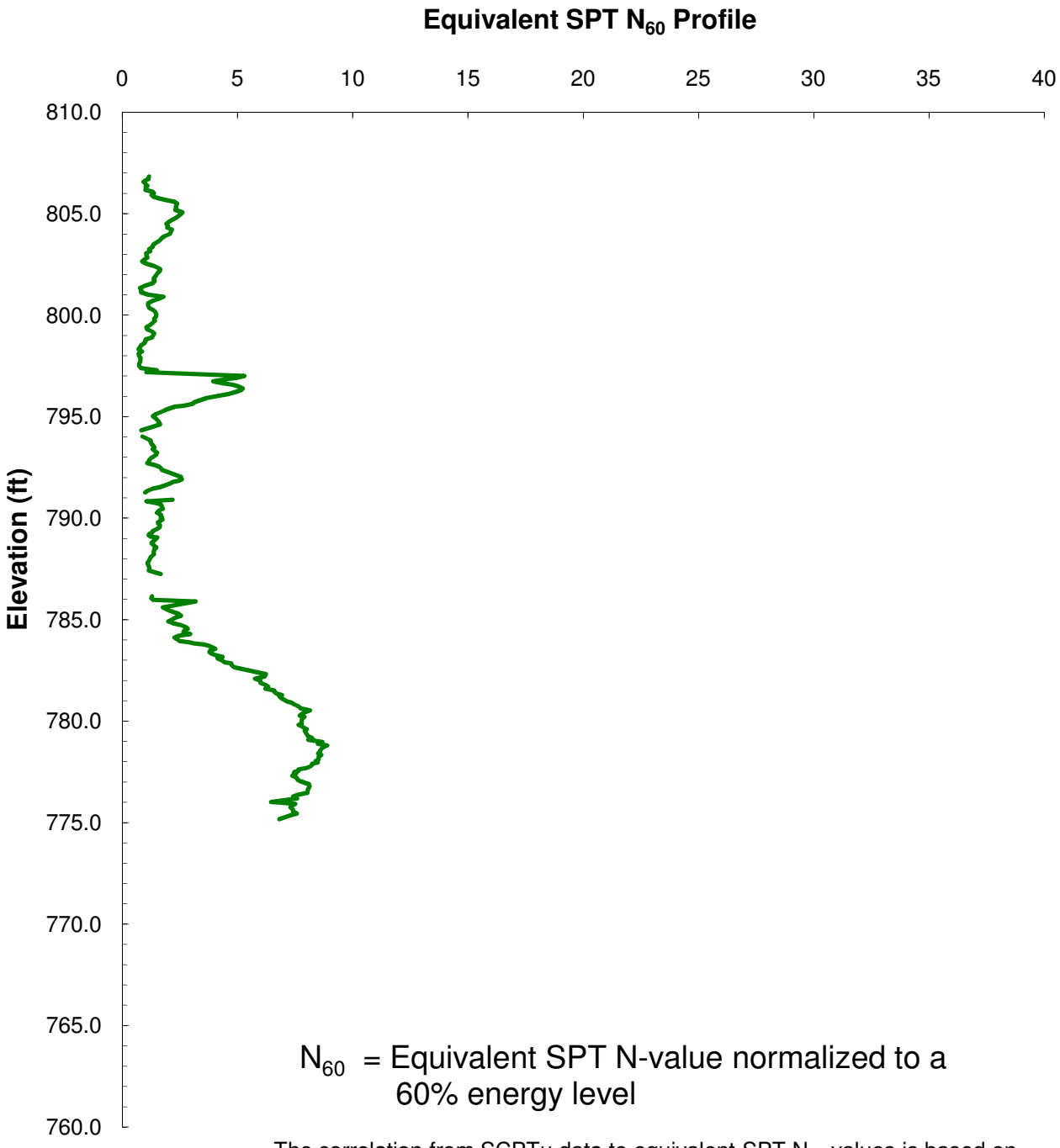
Stantec Consulting Inc.	Elevation: 808.00 ft SCPTu Start Elevation: 808.00 ft Groundwater Elevation: 806.90 ft	Test Date: July 24, 2009 Project No. 172679015	STN-46
	Client: TVA Project: Bull Run Fossil Plant		



Class Fr: Friction Ratio Classification (Robertson 1990)

SCPTu Results

SCPTu N_{60} Values



N_{60} = Equivalent SPT N-value normalized to a 60% energy level

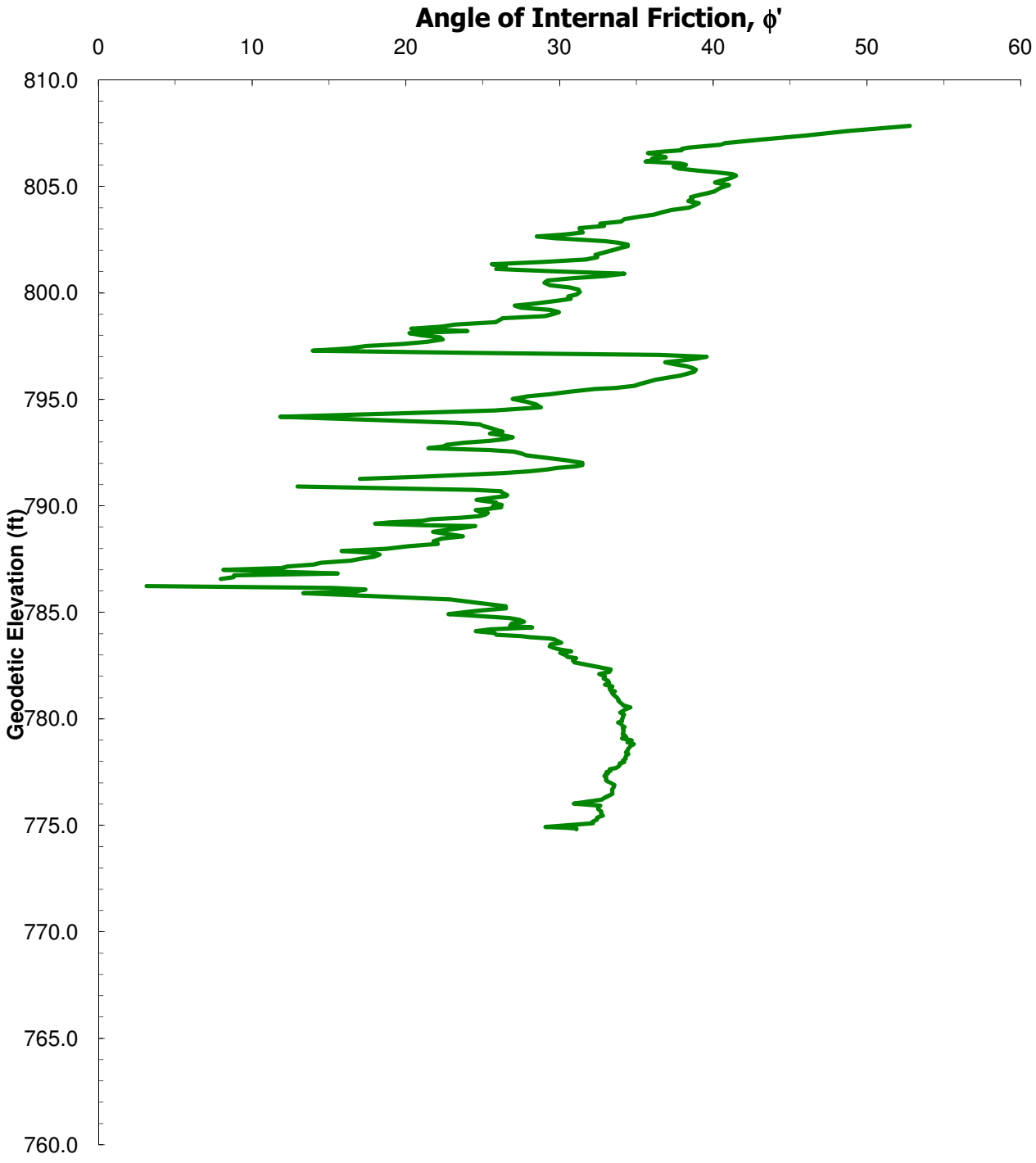
The correlation from SCPTu data to equivalent SPT N_{60} values is based on the Jefferies and Davies (1993) approach.

Project No. 172679015

STN-46

SCPTu RESULTS

Effective Angle of Internal Friction

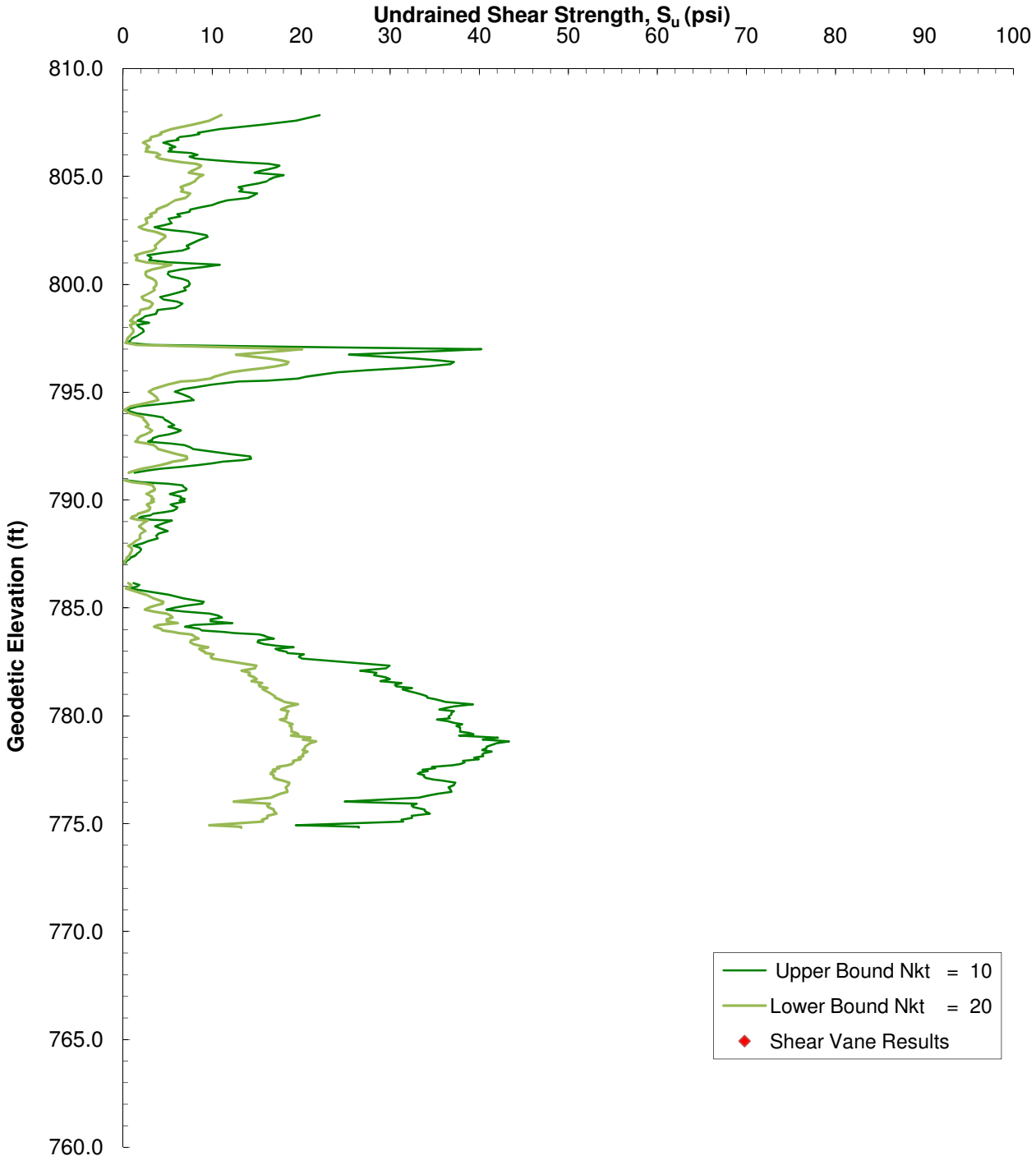


Project No. 172679015

STN-46

SCPTu RESULTS

Undrained Shear Strength, S_u

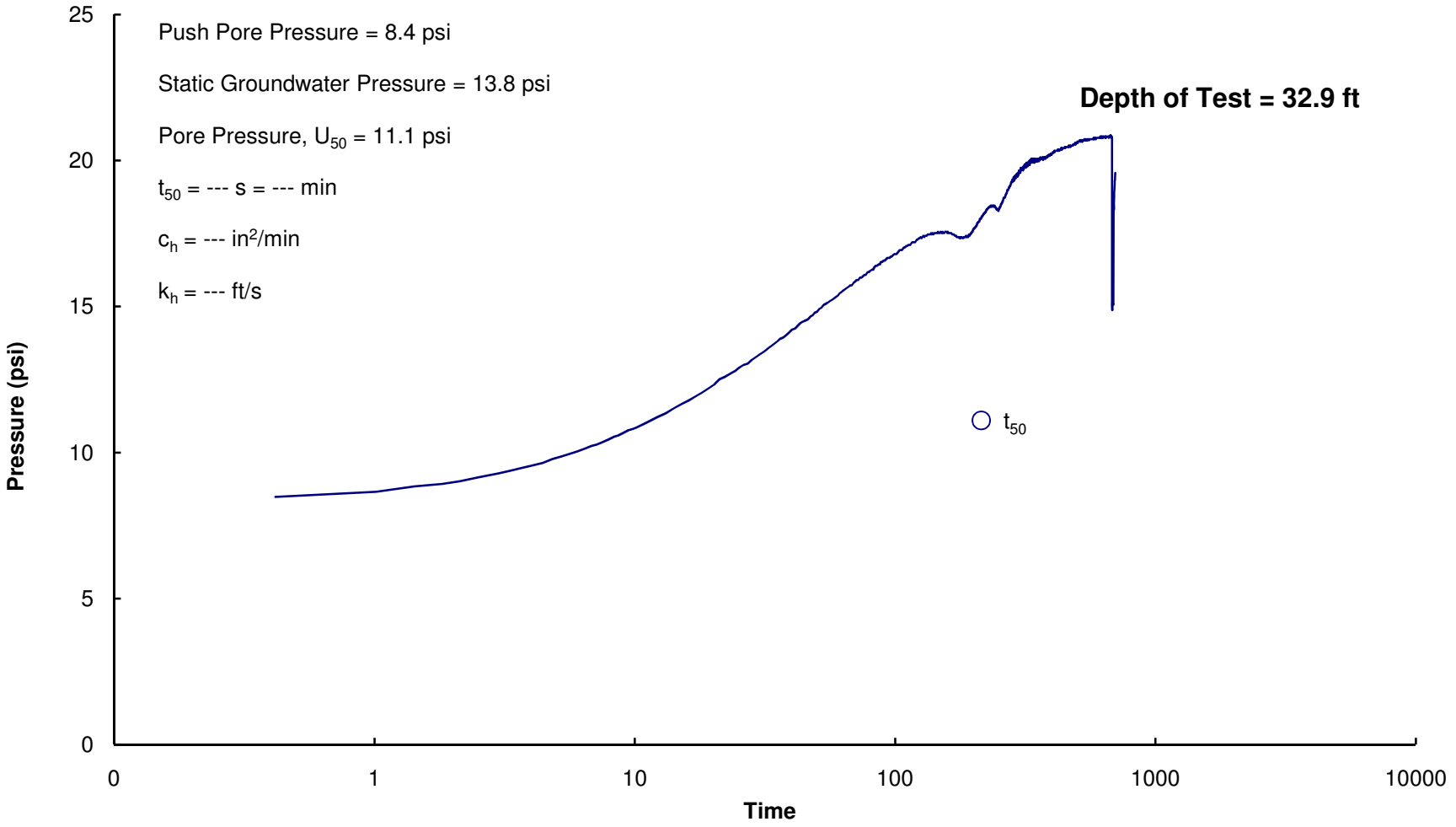


Project No. 172679015

STN-46

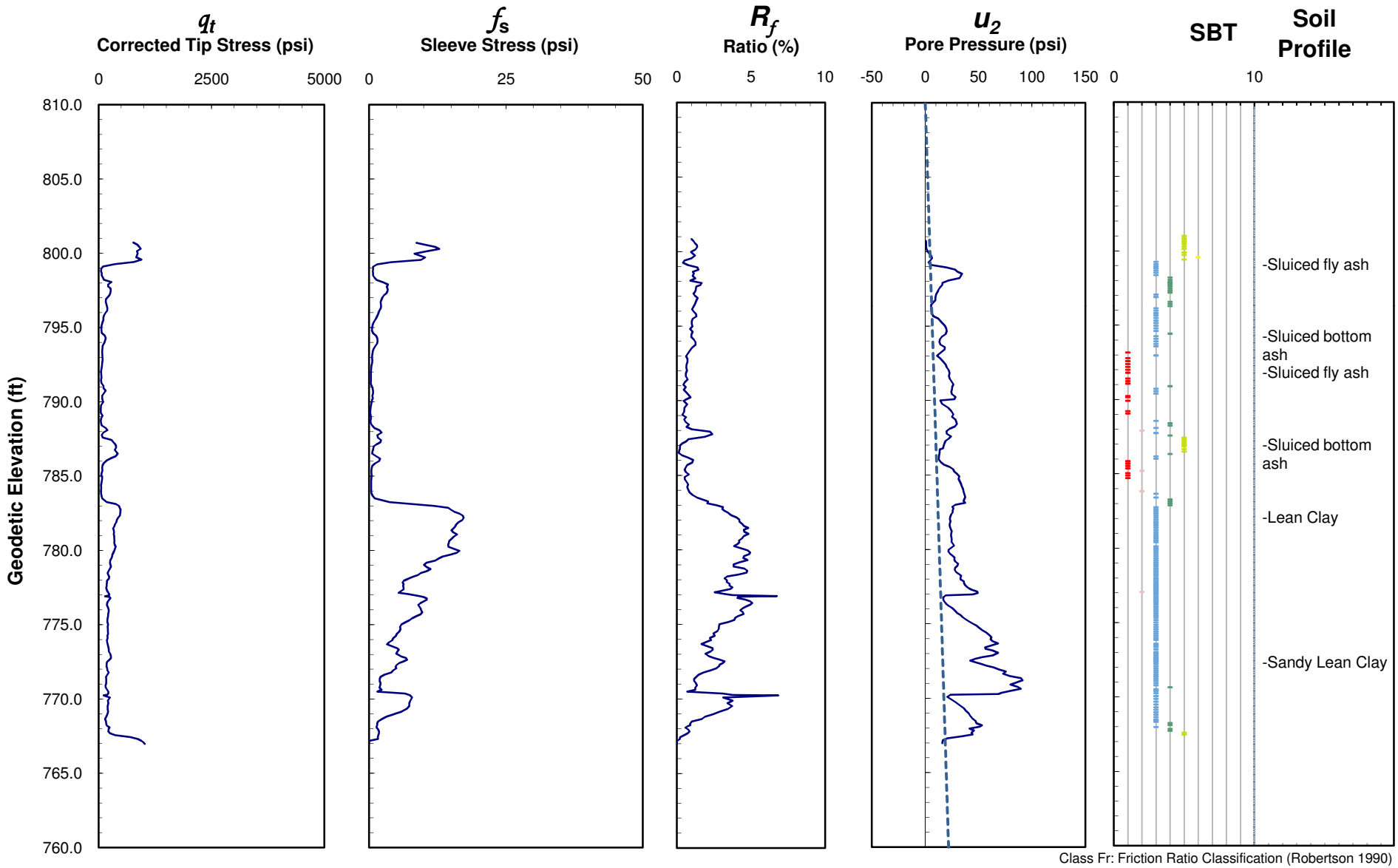
Stantec Consulting Inc.

SCPTu DISSIPATION RESULTS
Coefficient of Consolidation



Project No. 172679015
STN-46

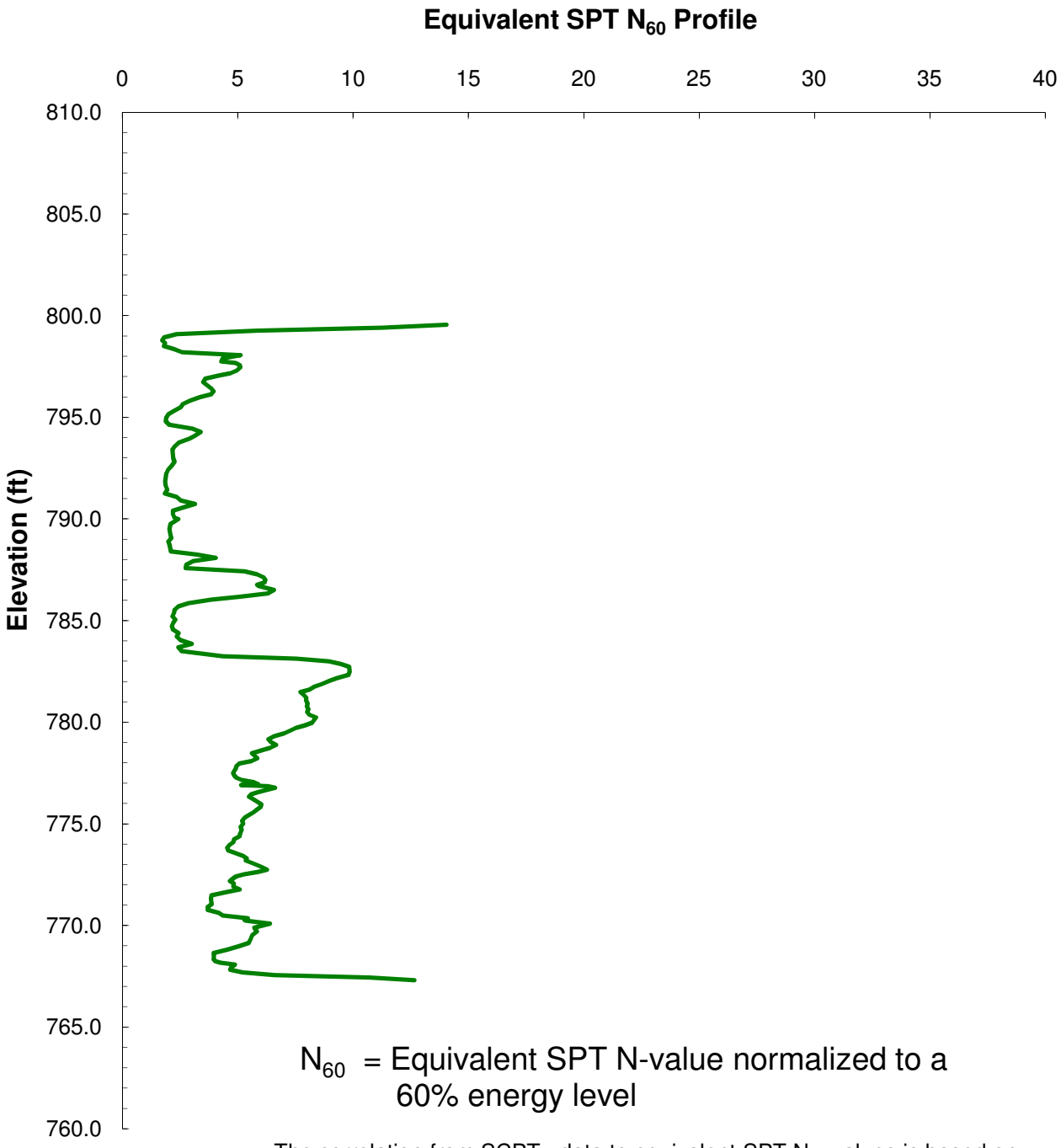
Stantec Consulting Inc.	Elevation: 826.00 ft SCPTu Start Elevation: 801.00 ft Groundwater Elevation: 810.70 ft	Test Date: August 5, 2009 Project No. 172679015	STN-34
	Client: TVA Project: Bull Run		



Class Fr: Friction Ratio Classification (Robertson 1990)

SCPTu Results

SCPTu N_{60} Values



N_{60} = Equivalent SPT N-value normalized to a 60% energy level

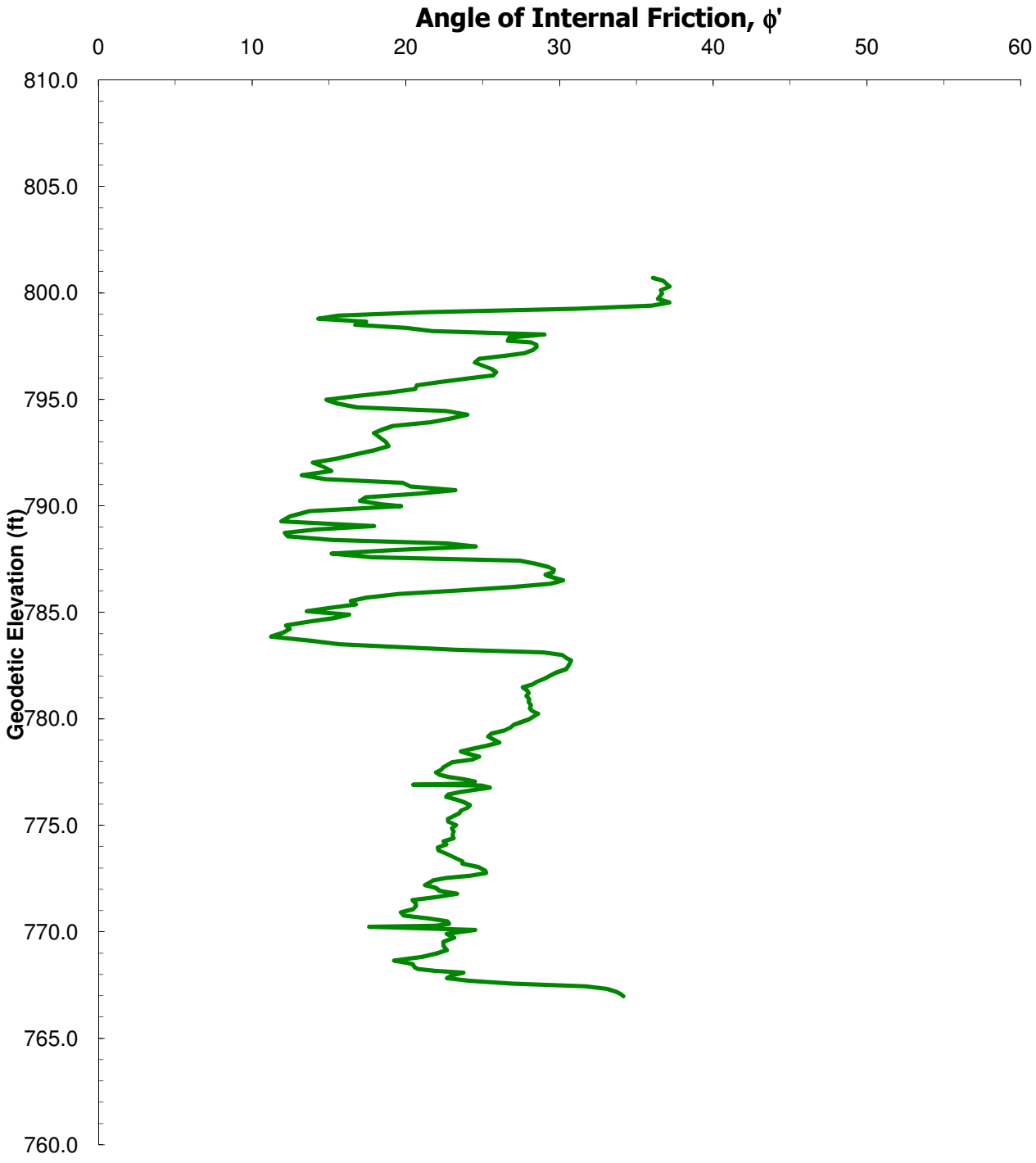
The correlation from SCPTu data to equivalent SPT N_{60} values is based on the Jefferies and Davies (1993) approach.

Project No. 172679015

STN-34

SCPTu RESULTS

Effective Angle of Internal Friction

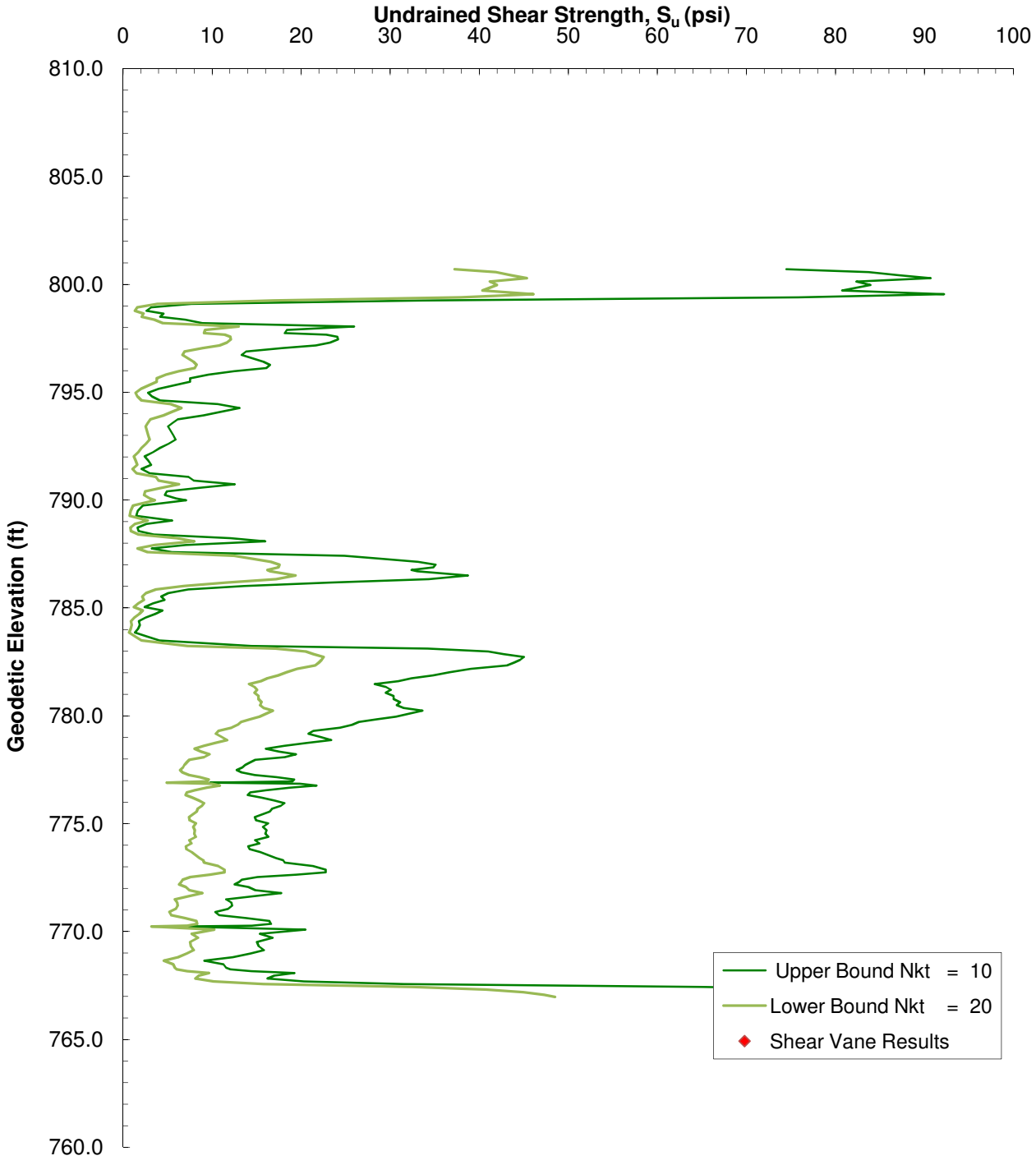


Project No. 172679015

STN-34

SCPTu RESULTS

Undrained Shear Strength, S_u

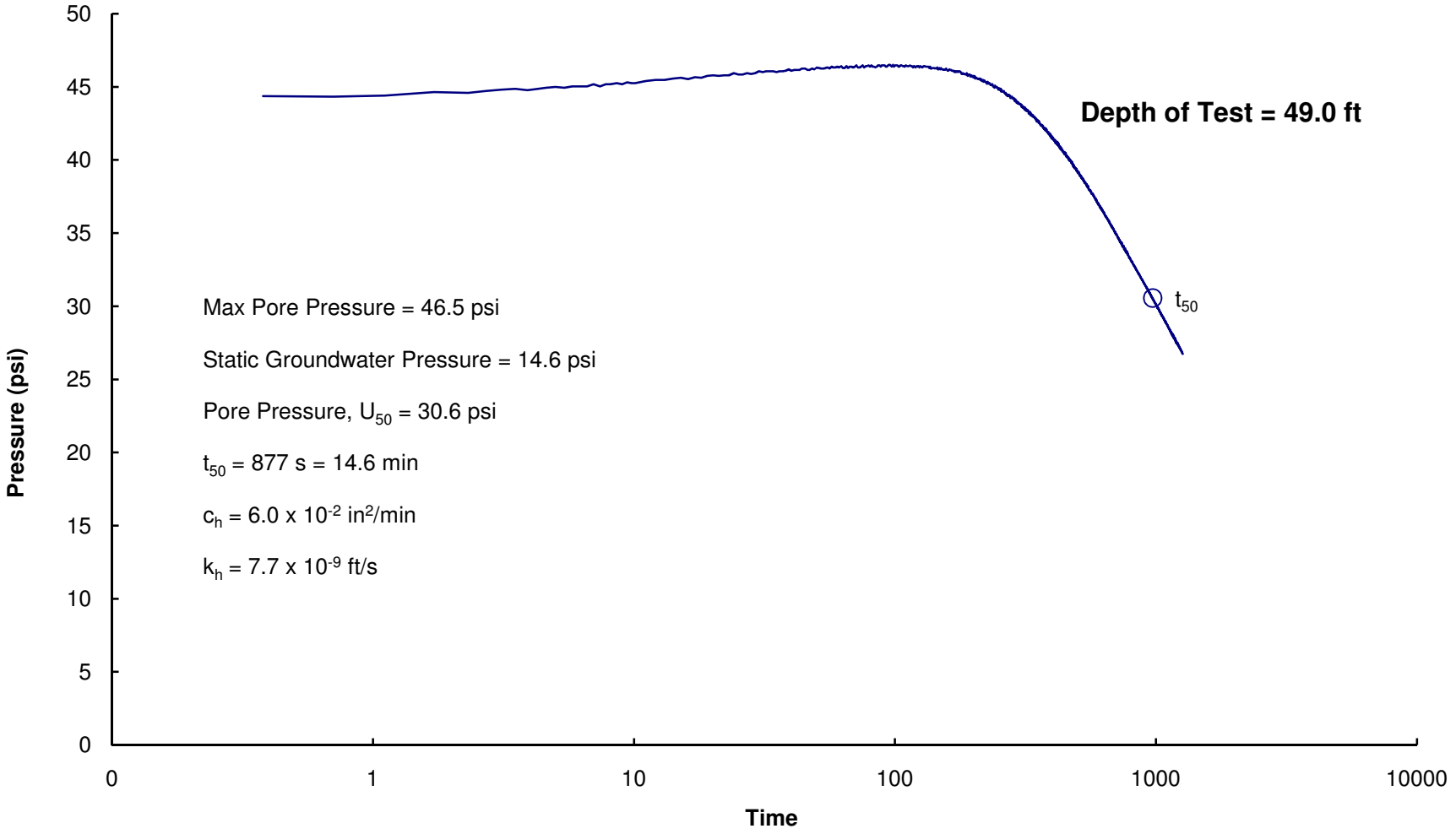


Project No. 172679015

STN-34

Stantec Consulting Inc.

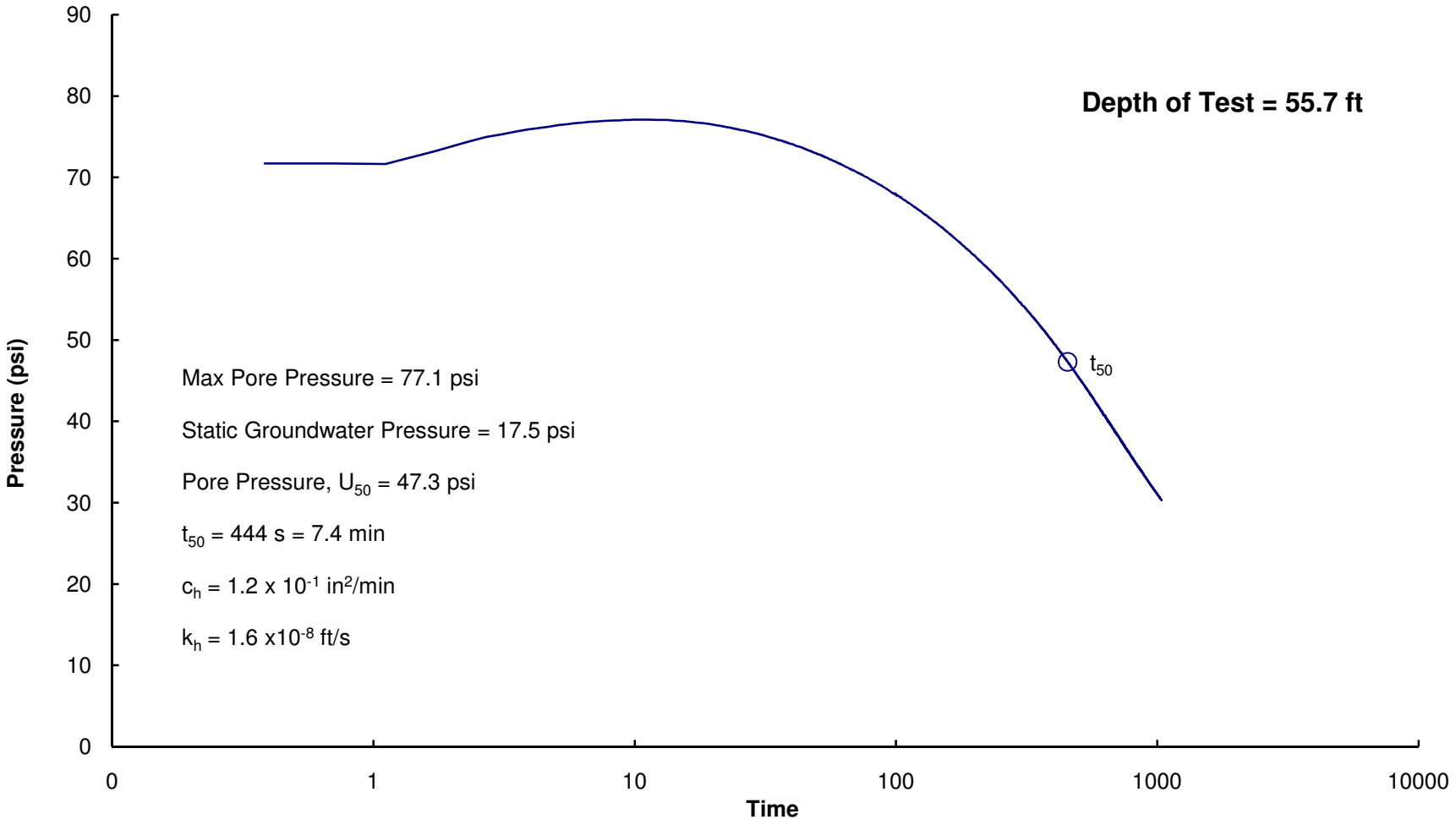
SCPTu DISSIPATION RESULTS
Coefficient of Consolidation



Project No. 172679015
STN-34

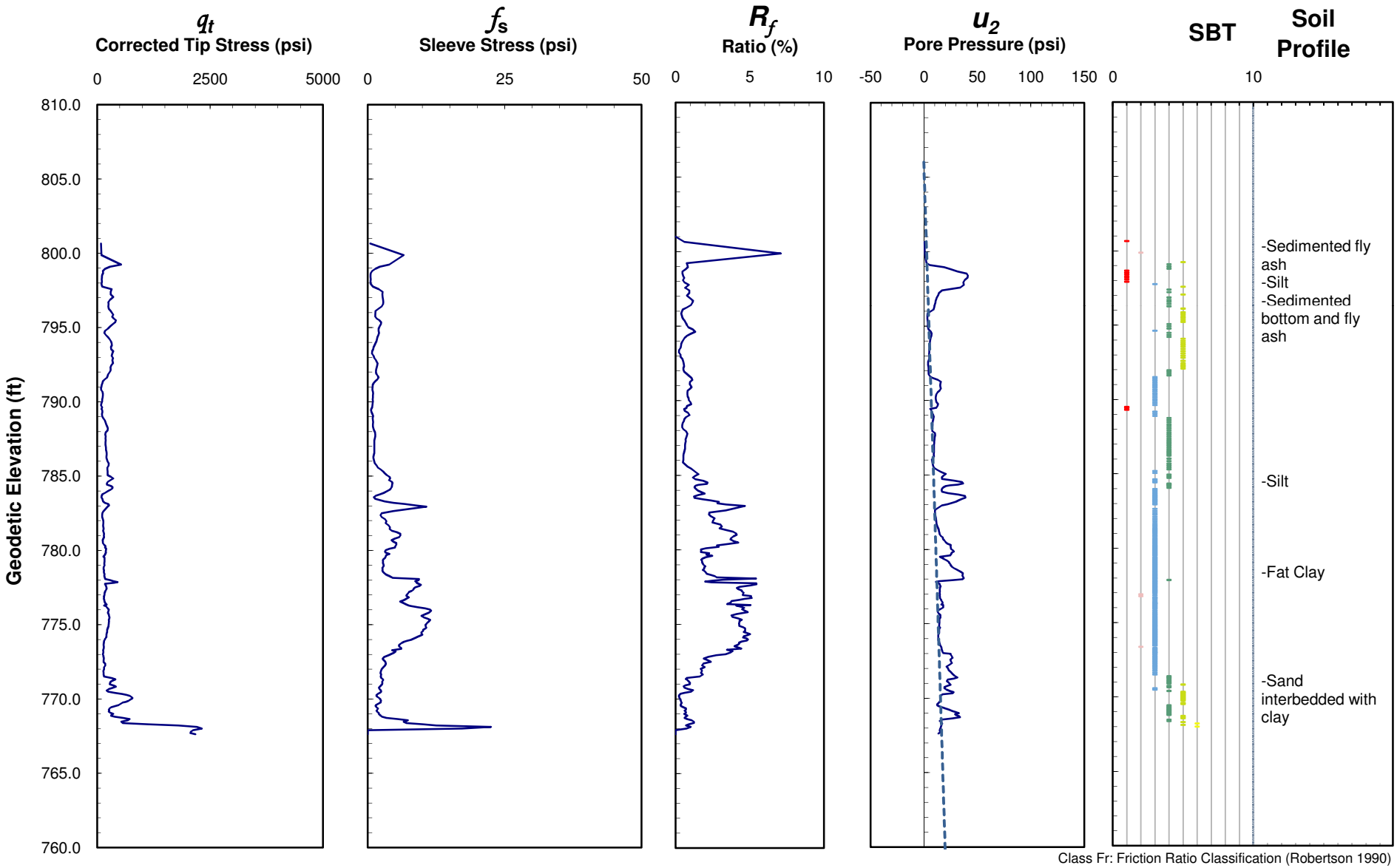
Stantec Consulting Inc.

SCPTu DISSIPATION RESULTS
Coefficient of Consolidation



Project No. 172679015
STN-34

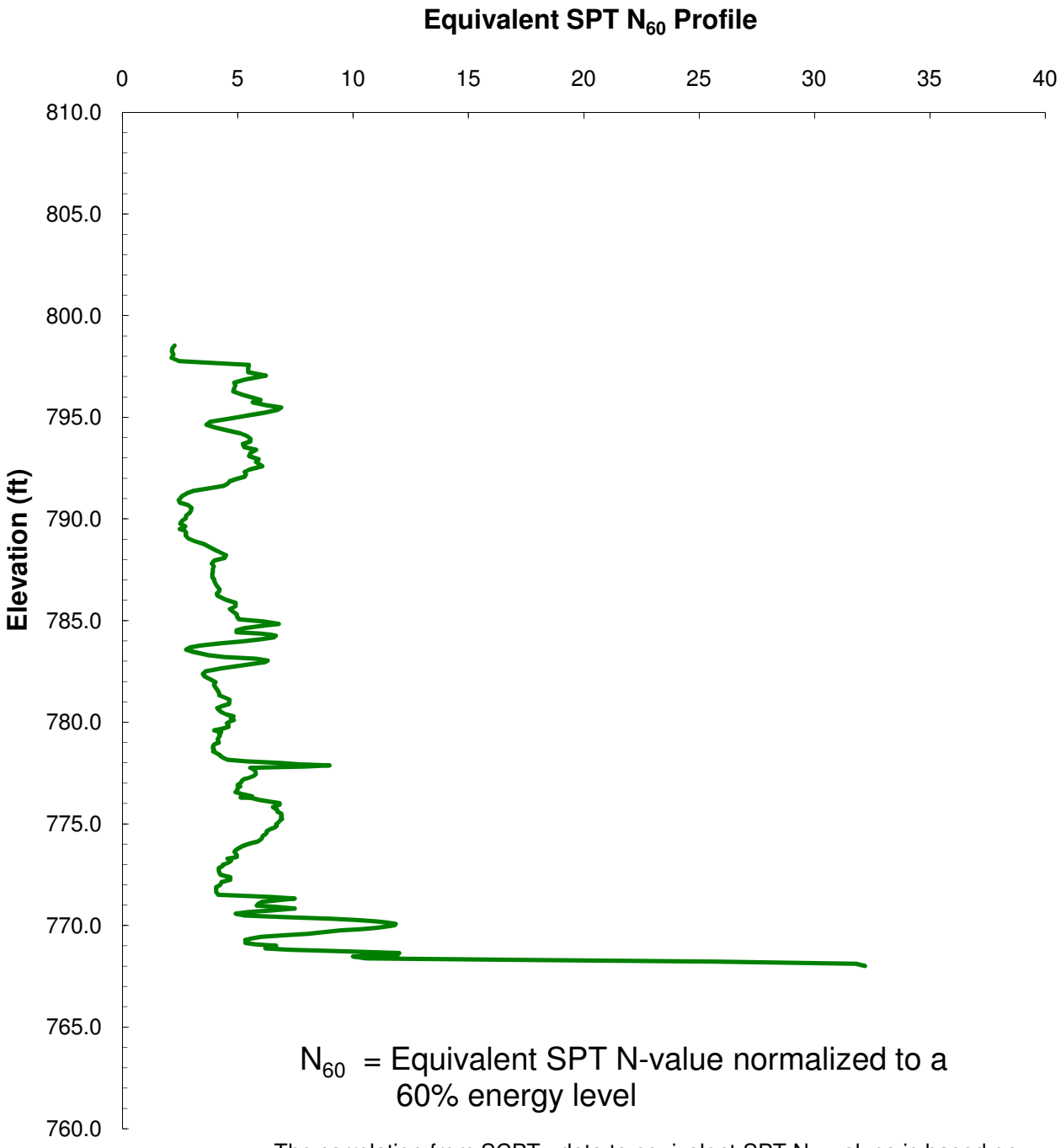
Stantec Consulting Inc.	Elevation: 826.00 ft SCPTu Start Elevation: 801.00 ft Groundwater Elevation: 806.00 ft	Test Date: August 5, 2009 Project No. 172679015	STN-25
	Client: TVA Project: Bull Run		



Class Fr: Friction Ratio Classification (Robertson 1990)

SCPTu Results

SCPTu N_{60} Values



N_{60} = Equivalent SPT N-value normalized to a 60% energy level

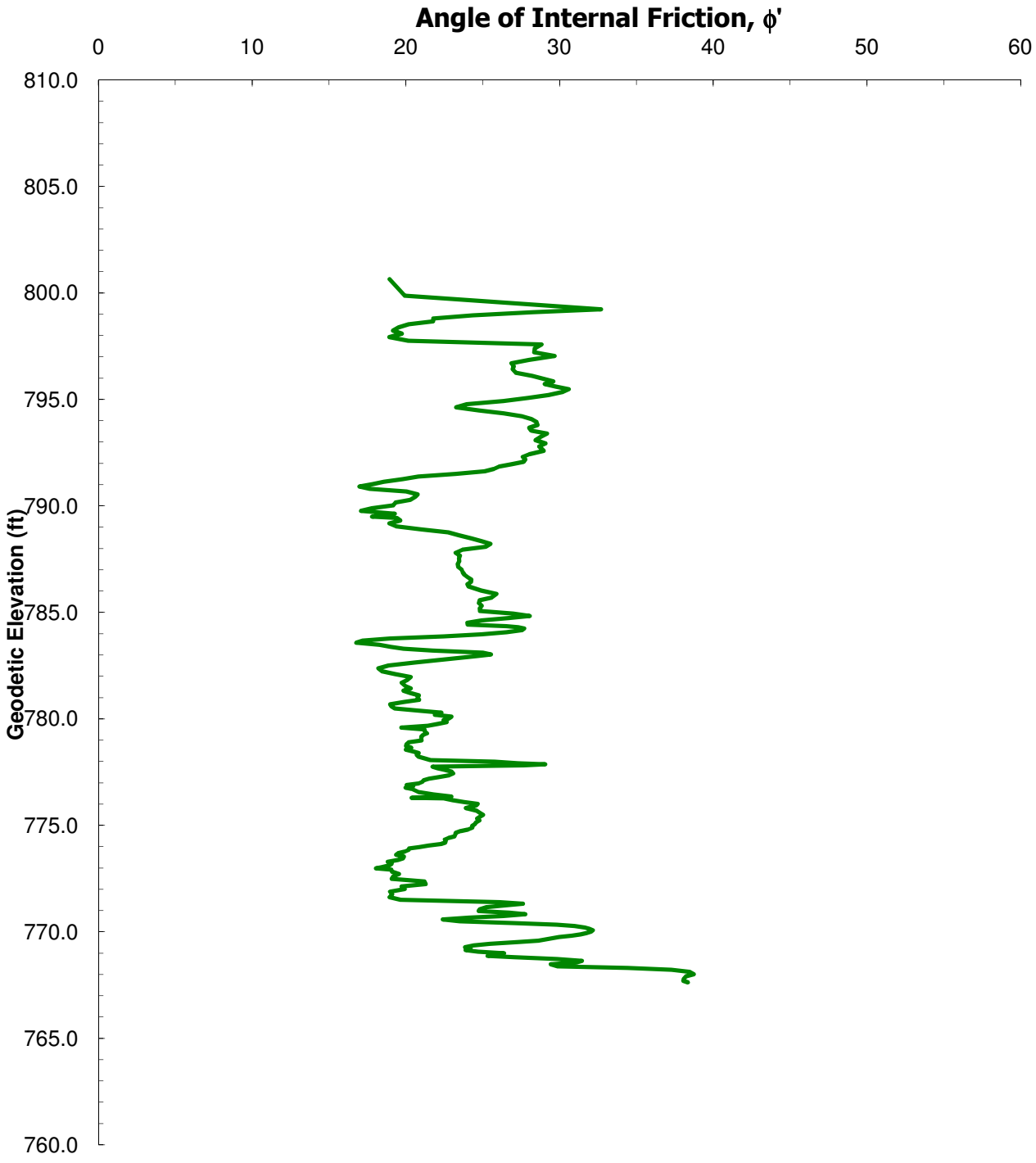
The correlation from SCPTu data to equivalent SPT N_{60} values is based on the Jefferies and Davies (1993) approach.

Project No. 172679015

STN-25

SCPTu RESULTS

Effective Angle of Internal Friction

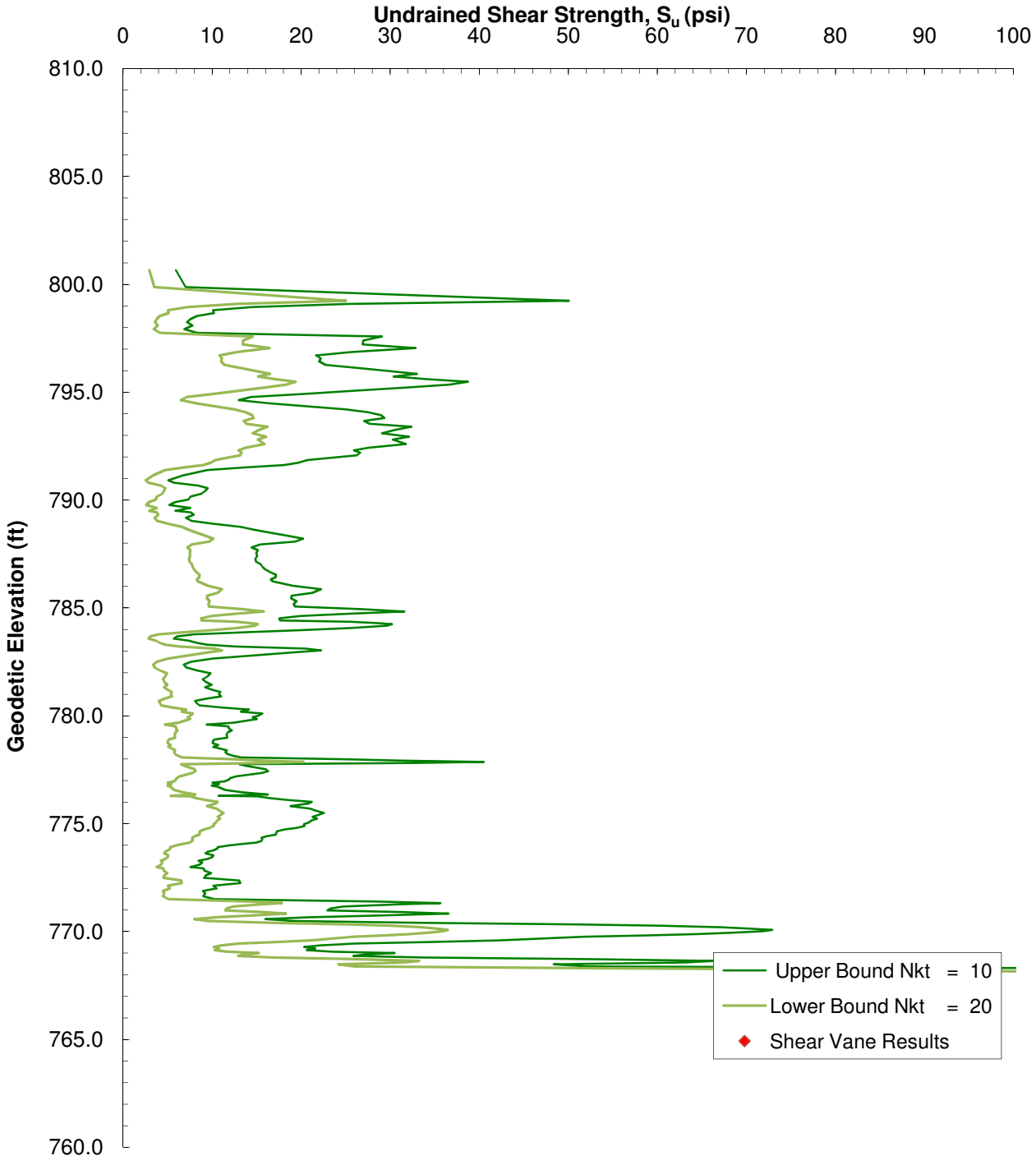


Project No. 172679015

STN-25

SCPTu RESULTS

Undrained Shear Strength, S_u

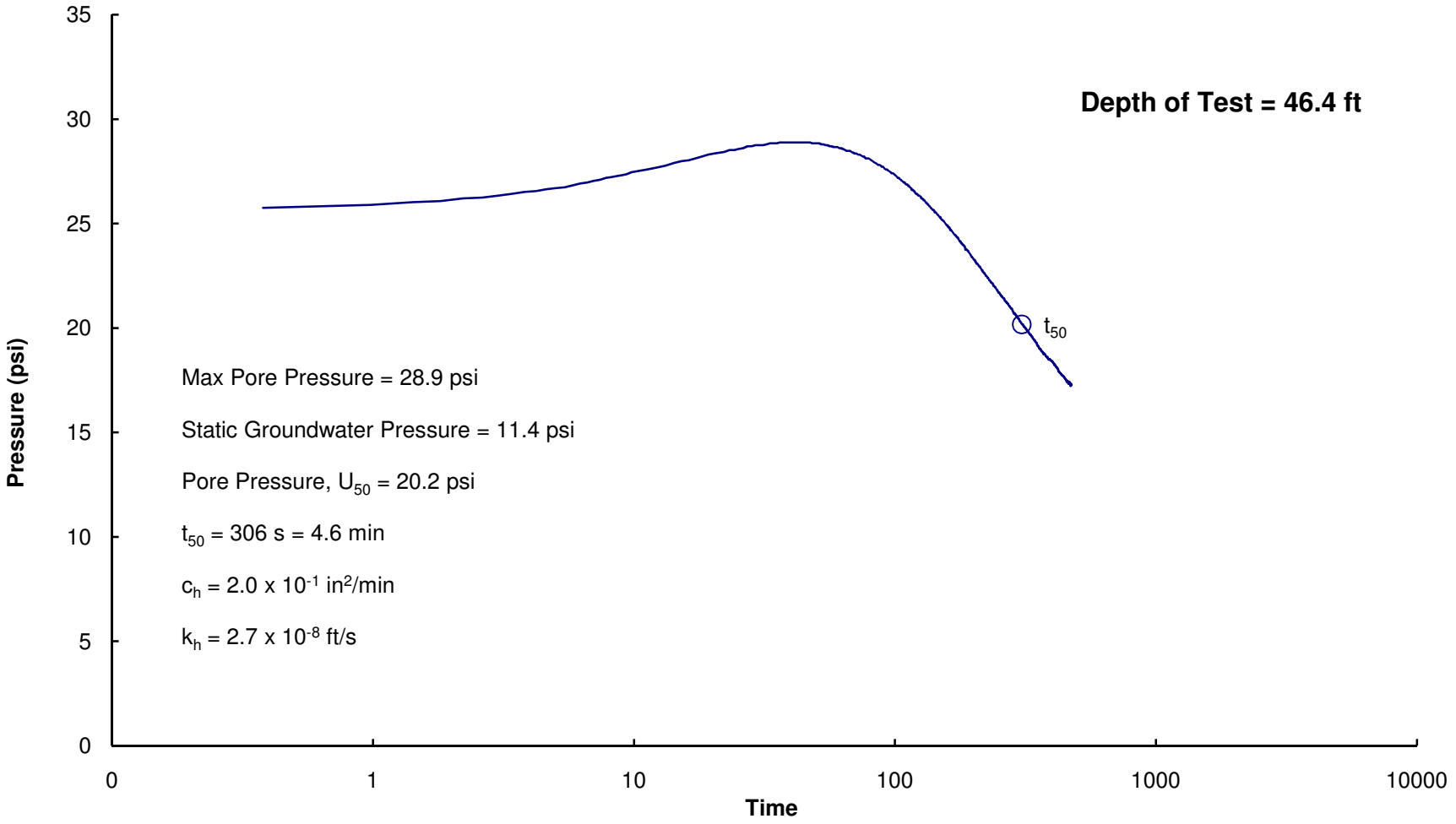


Project No. 172679015

STN-25

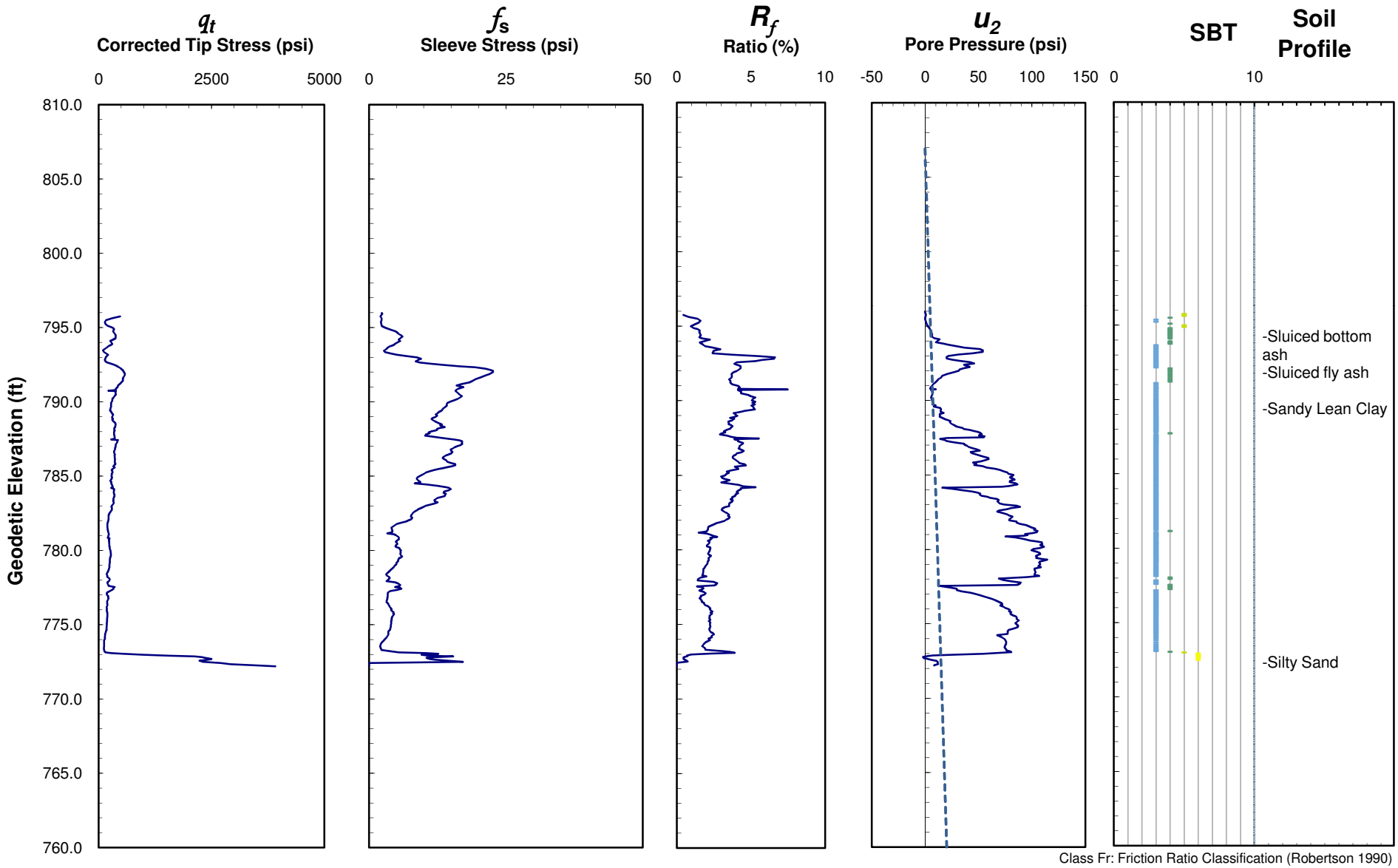
Stantec Consulting Inc.

SCPTu DISSIPATION RESULTS
Coefficient of Consolidation



Project No. 172679015
STN-25

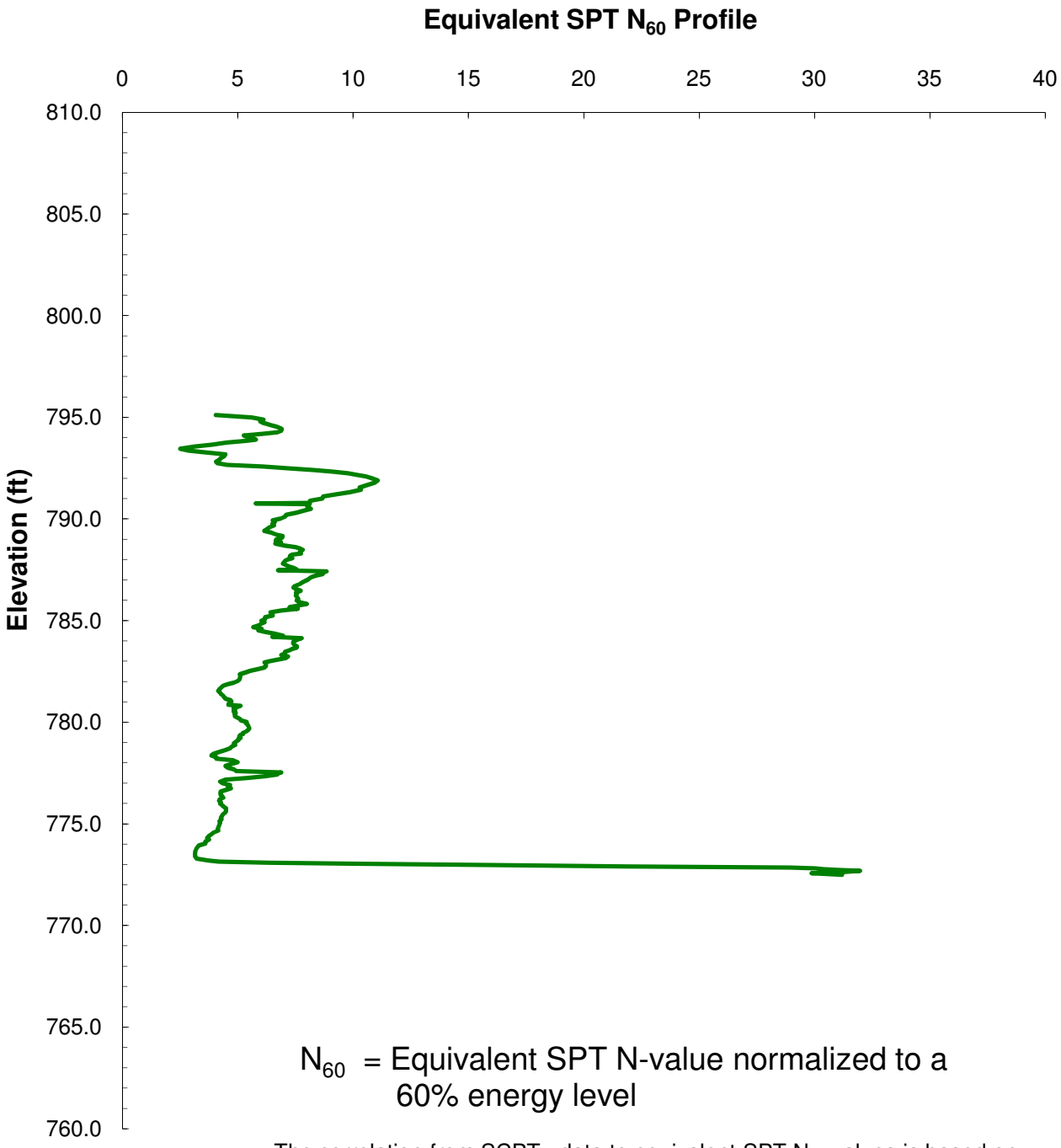
Stantec Consulting Inc.	Elevation: 821.00 ft SCPTu Start Elevation: 796.00 ft Groundwater Elevation: 806.90 ft	Test Date: August 7, 2009 Project No. 172679015	STN-10
	Client: TVA Project: Bull Run Fossil Plant		



Class Fr: Friction Ratio Classification (Robertson 1990)

SCPTu Results

SCPTu N_{60} Values



N_{60} = Equivalent SPT N-value normalized to a 60% energy level

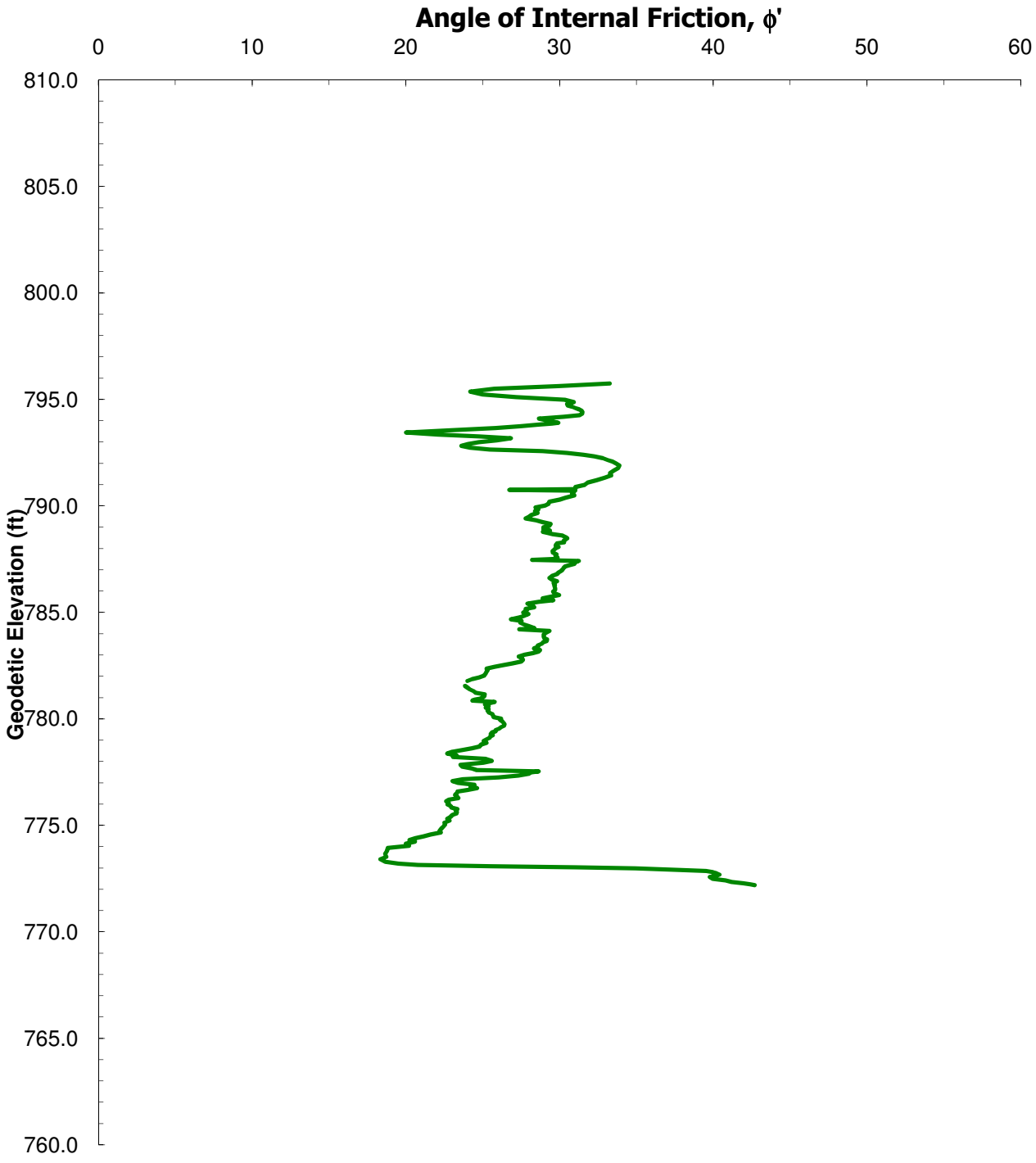
The correlation from SCPTu data to equivalent SPT N_{60} values is based on the Jefferies and Davies (1993) approach.

Project No. 172679015

STN-10

SCPTu RESULTS

Effective Angle of Internal Friction

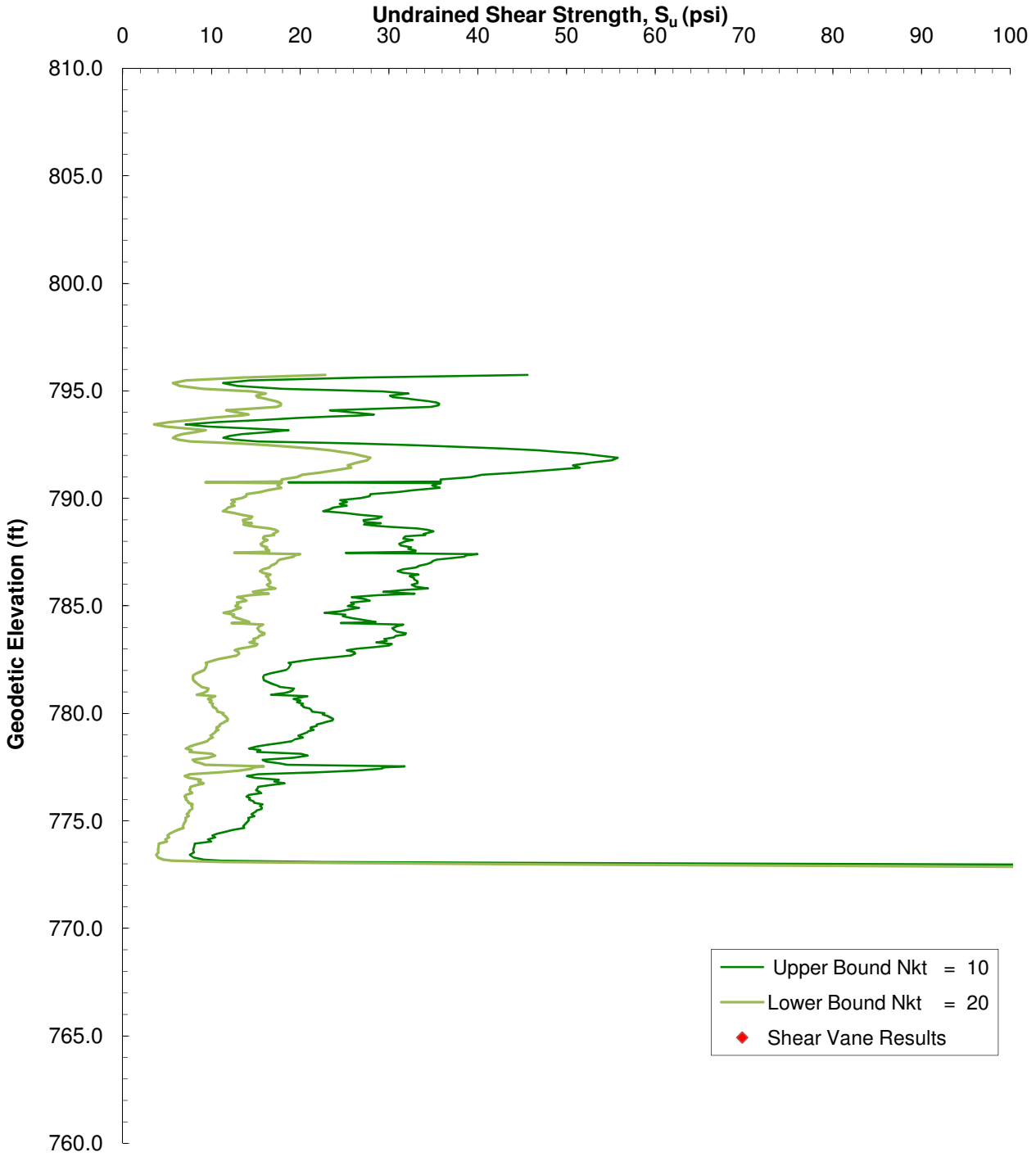


Project No. 172679015

STN-10

SCPTu RESULTS

Undrained Shear Strength, S_u

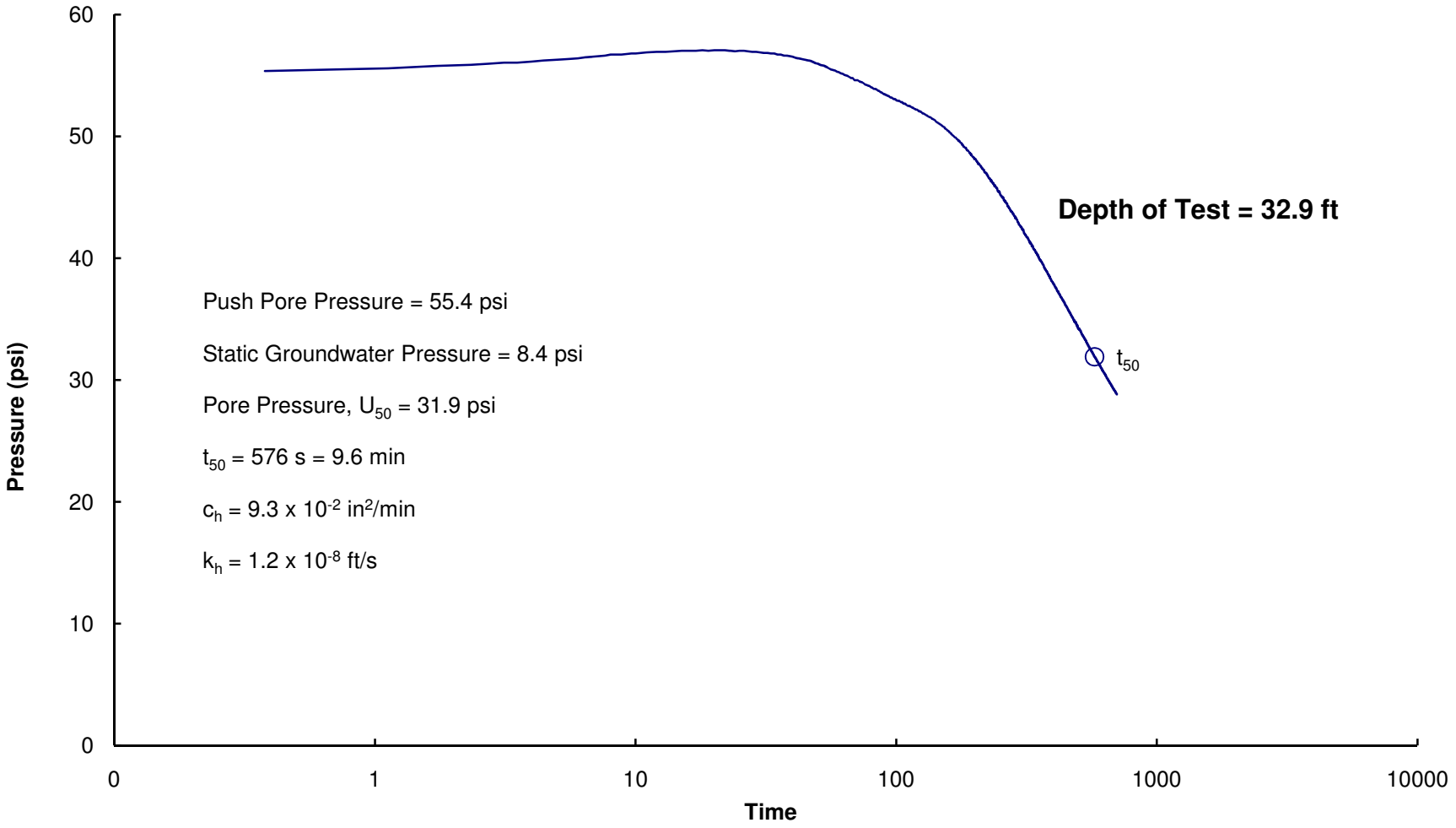


Project No. 172679015

STN-10

Stantec Consulting Inc.

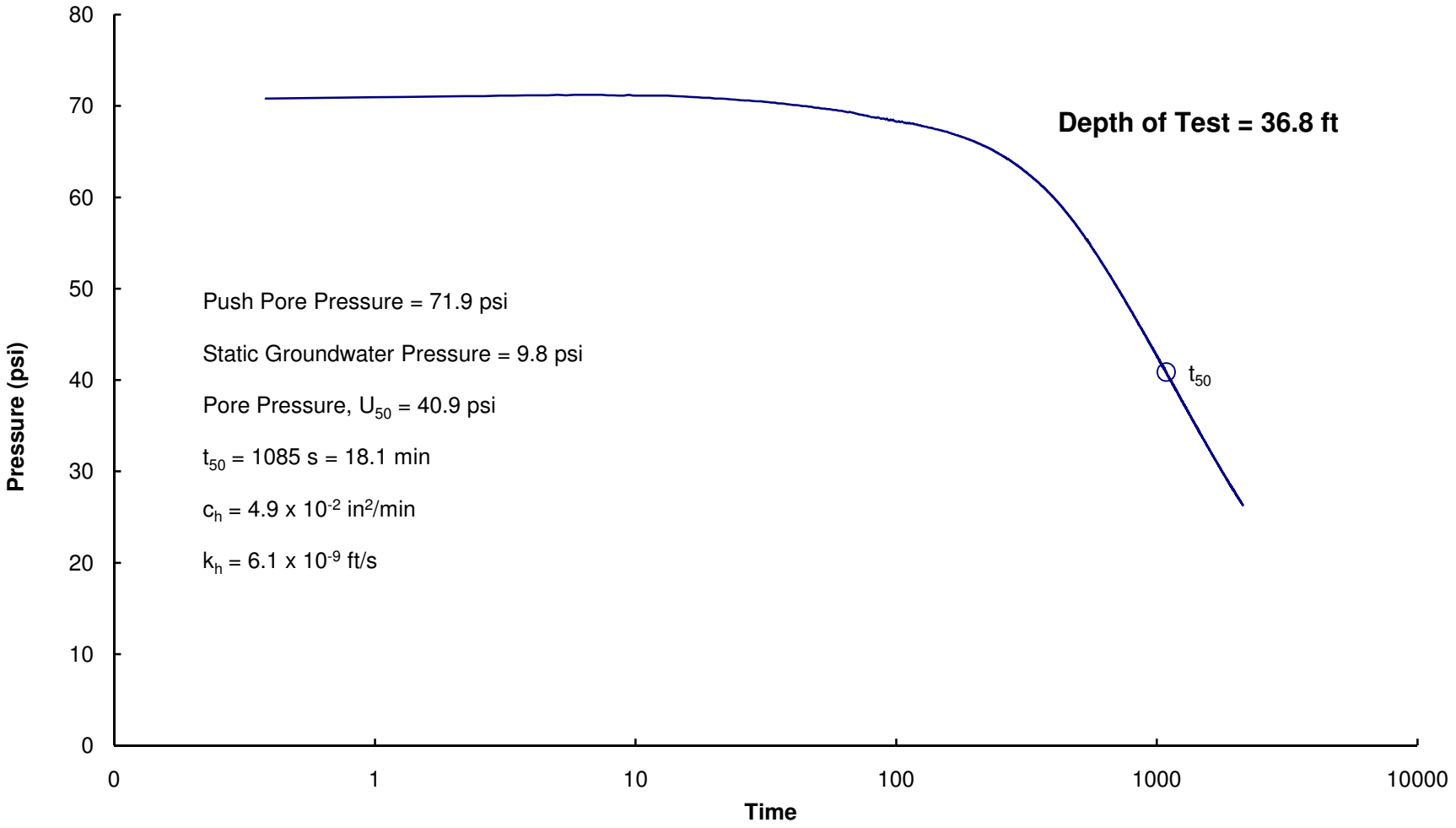
SCPTu DISSIPATION RESULTS
Coefficient of Consolidation



Project No. 172679015
STN-10

Stantec Consulting Inc.

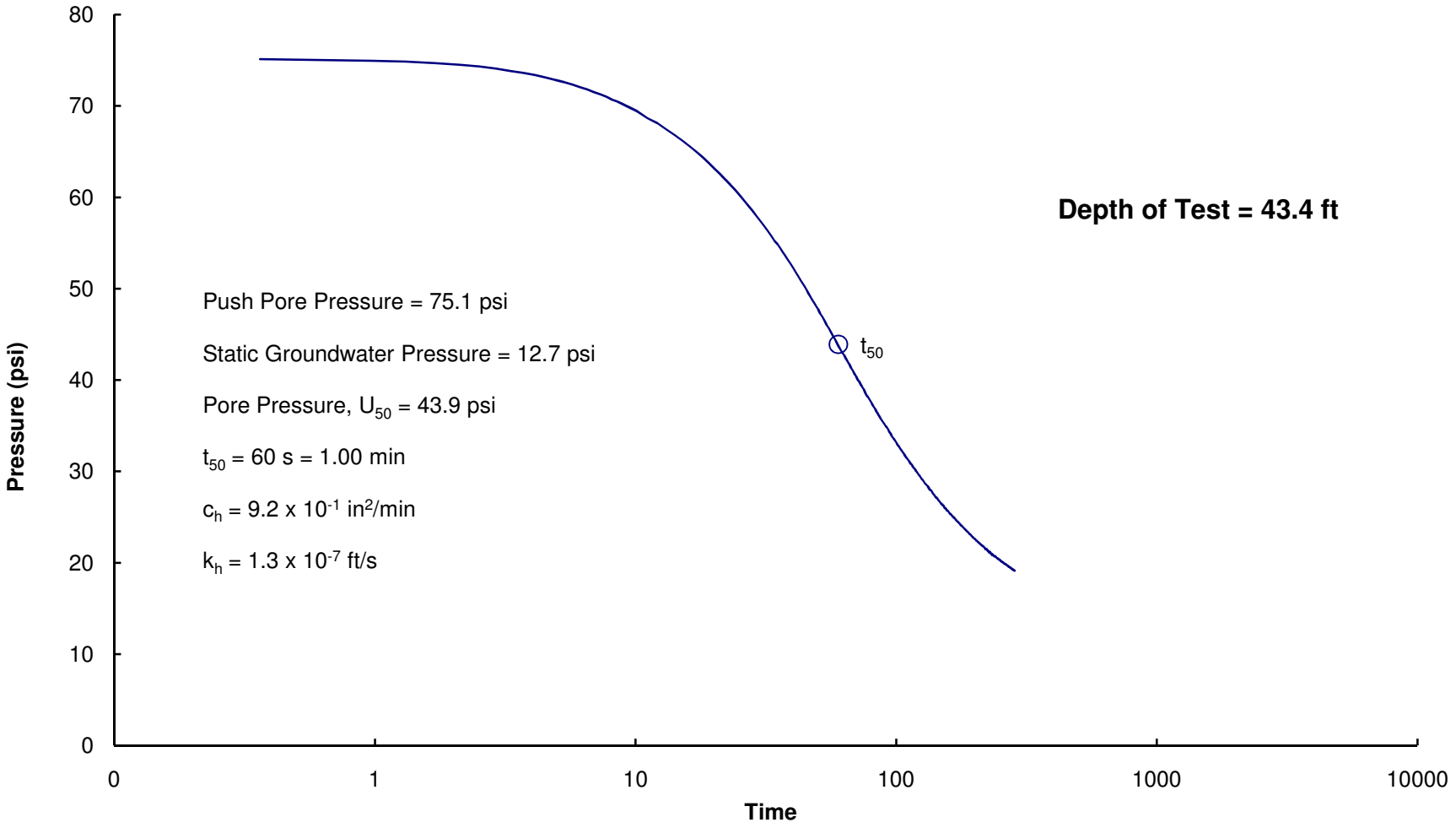
SCPTu DISSIPATION RESULTS
Coefficient of Consolidation



Project No. 172679015
STN-10

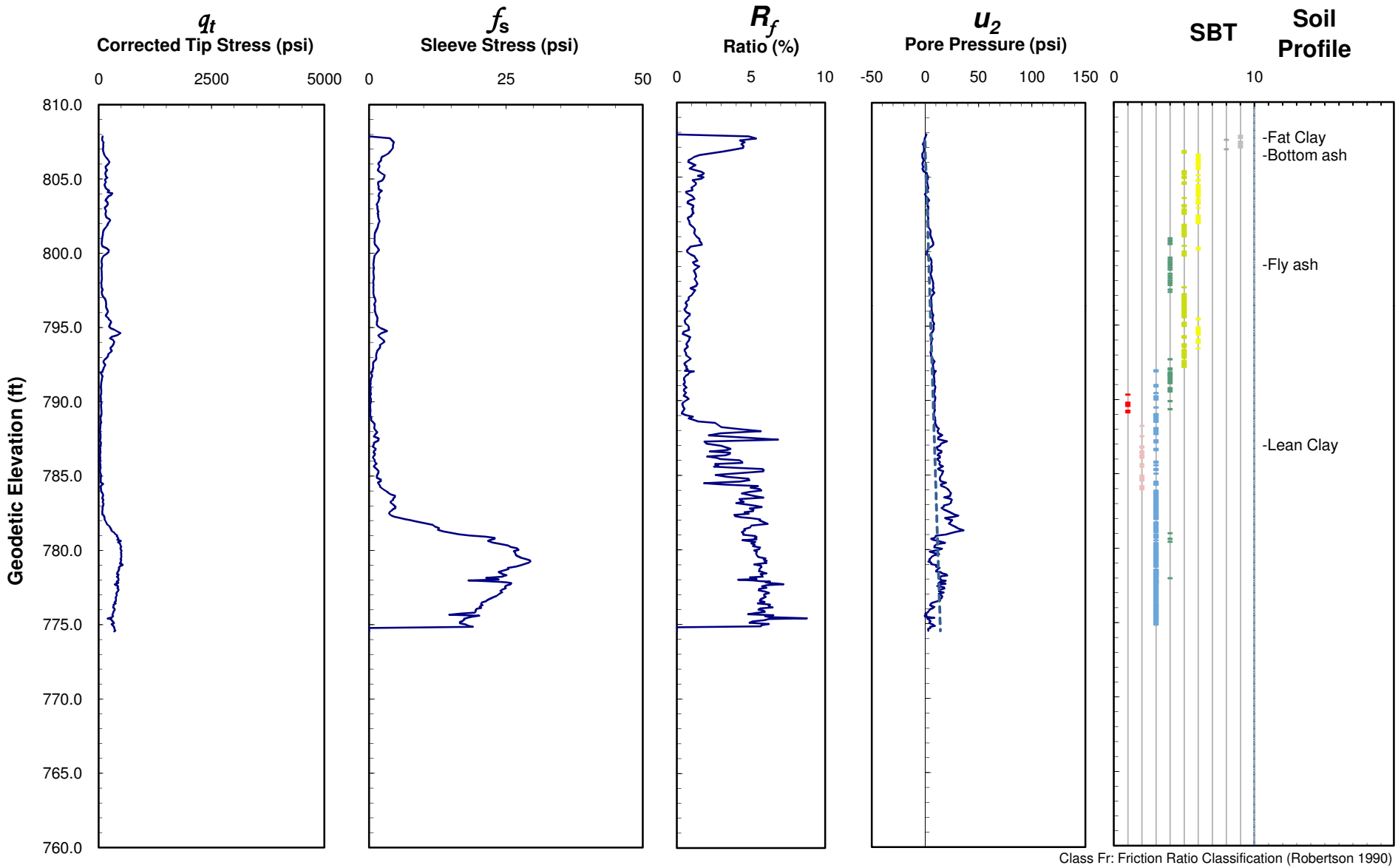
Stantec Consulting Inc.

SCPTu DISSIPATION RESULTS
Coefficient of Consolidation



Project No. 172679015
STN-10

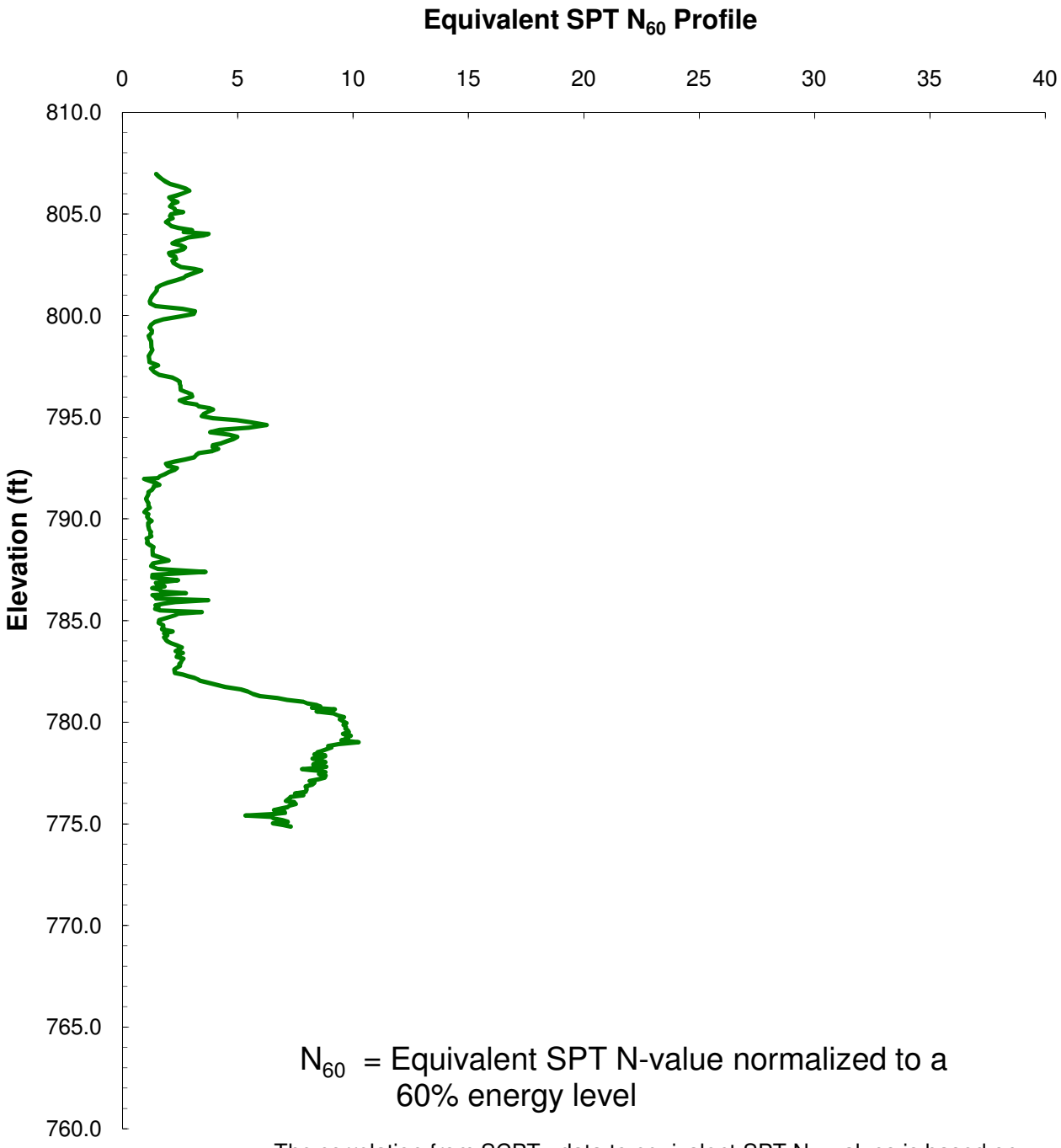
Stantec Consulting Inc.	Elevation: 808.00 ft SCPTu Start Elevation: 808.00 ft Groundwater Elevation: 807.40 ft	Test Date: August 5, 2009 Project No. 172679015	STN-88
	Client: TVA Project: Bull Run		



Class Fr: Friction Ratio Classification (Robertson 1990)

SCPTu Results

SCPTu N_{60} Values



N_{60} = Equivalent SPT N-value normalized to a 60% energy level

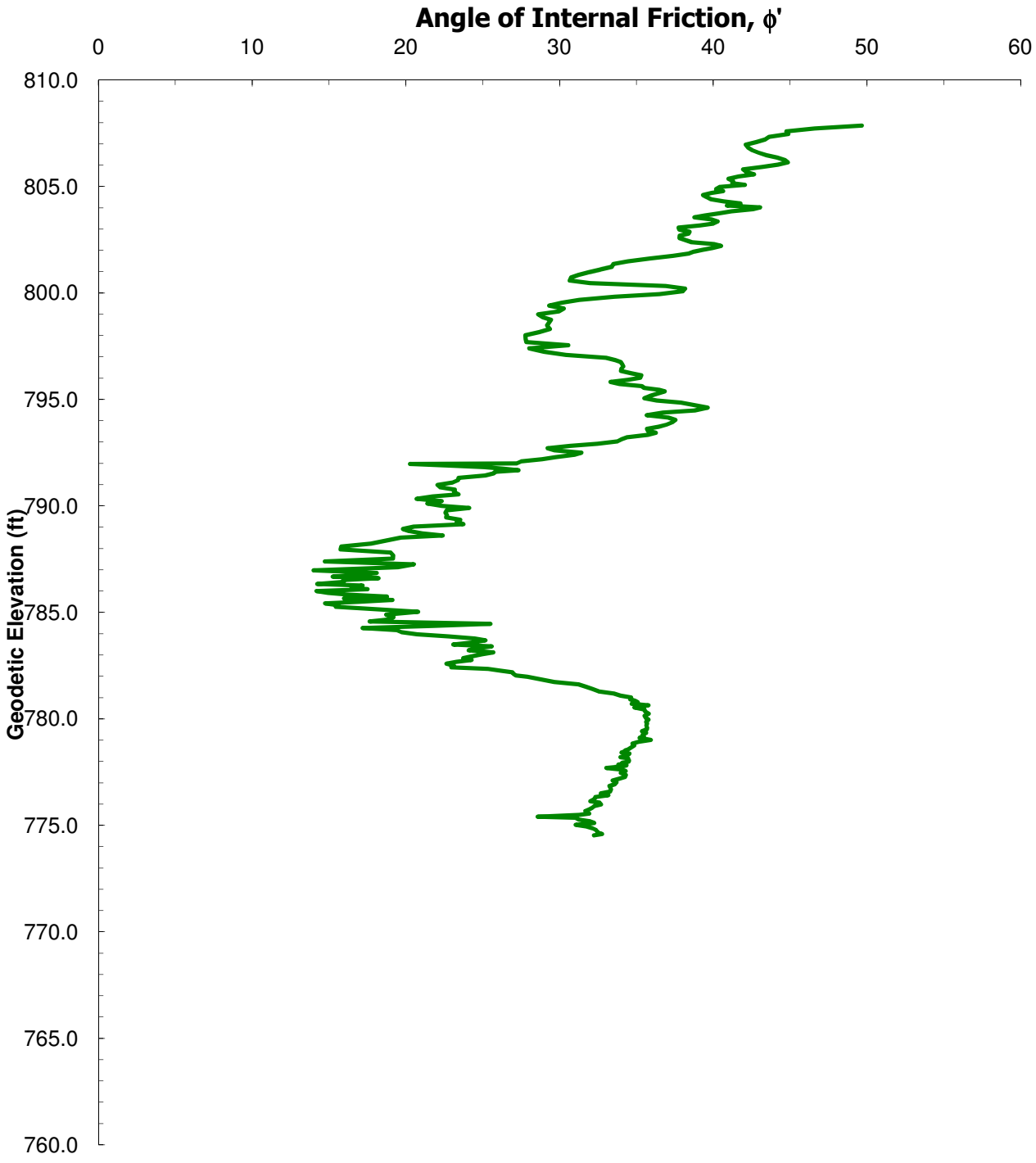
The correlation from SCPTu data to equivalent SPT N_{60} values is based on the Jefferies and Davies (1993) approach.

Project No. 172679015

STN-88

SCPTu RESULTS

Effective Angle of Internal Friction

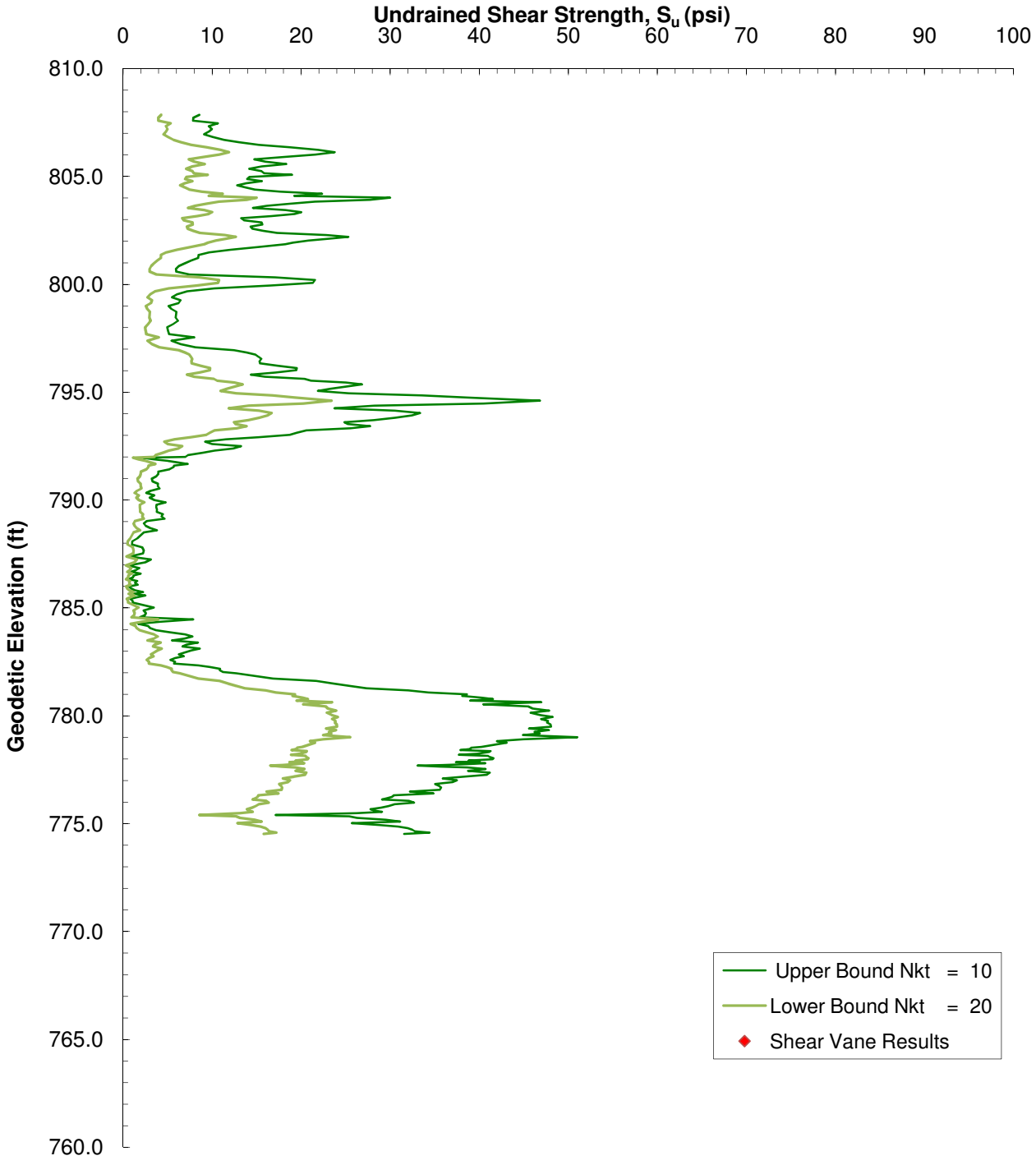


Project No. 172679015

STN-88

SCPTu RESULTS

Undrained Shear Strength, S_u

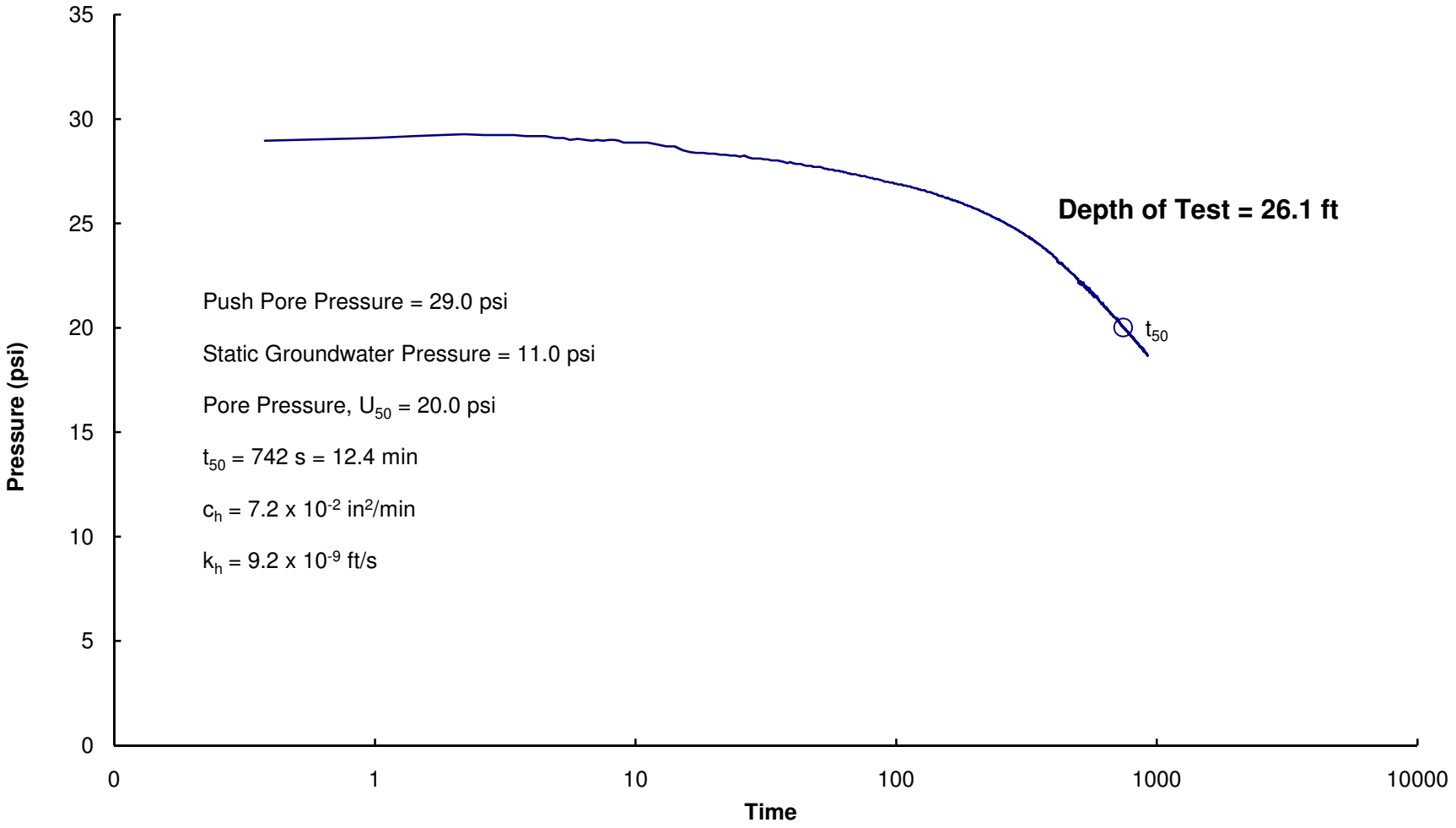


Project No. 172679015

STN-88

Stantec Consulting Inc.

SCPTu DISSIPATION RESULTS
Coefficient of Consolidation



Project No. 172679015
STN-88

Appendix I

Engineering Analysis Results

Slope Stability

Cross-Section D-D'
Bottom Ash Disposal Area 1

Bull Run Fossil Plant
Tennessee Valley Authority

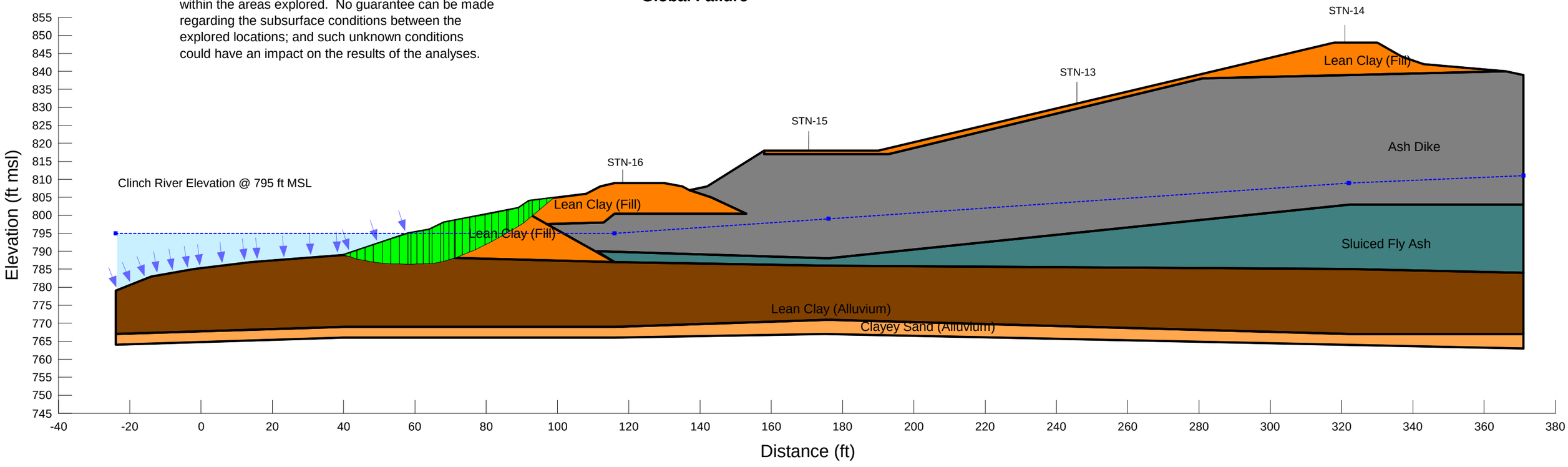
February 2010
Method: Modified Spencer
File Name: Section D-D' existing conditions (Perimeter Dike Failure).gsz

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Factor of Safety: 2.1
Center: (59.188, 839.874) ft
Radius: 29.08809 ft
Minimum Slip Surface Depth: 10 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Lean Clay (Fill)	125	126	0	33
Ash Dike	100	105	0	33
Sluiced Ash	100	105	0	25
Lean Clay (Alluvium)	123	123	0	31
Clayey Sand (Alluvium)	112	112	0	33

Existing Conditions
Global Failure



V:\1714\active\171468118\environmental\Bull Run - 172679015\Report\Engineering Analysis\Sect D-D'\Section D-D' existing conditions (Perimeter Dike Failure).gsz

Slope Stability

Cross-Section D-D'
Bottom Ash Disposal Area 1

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Modified Spencer
File Name: Section D-D' existing conditions.gsz

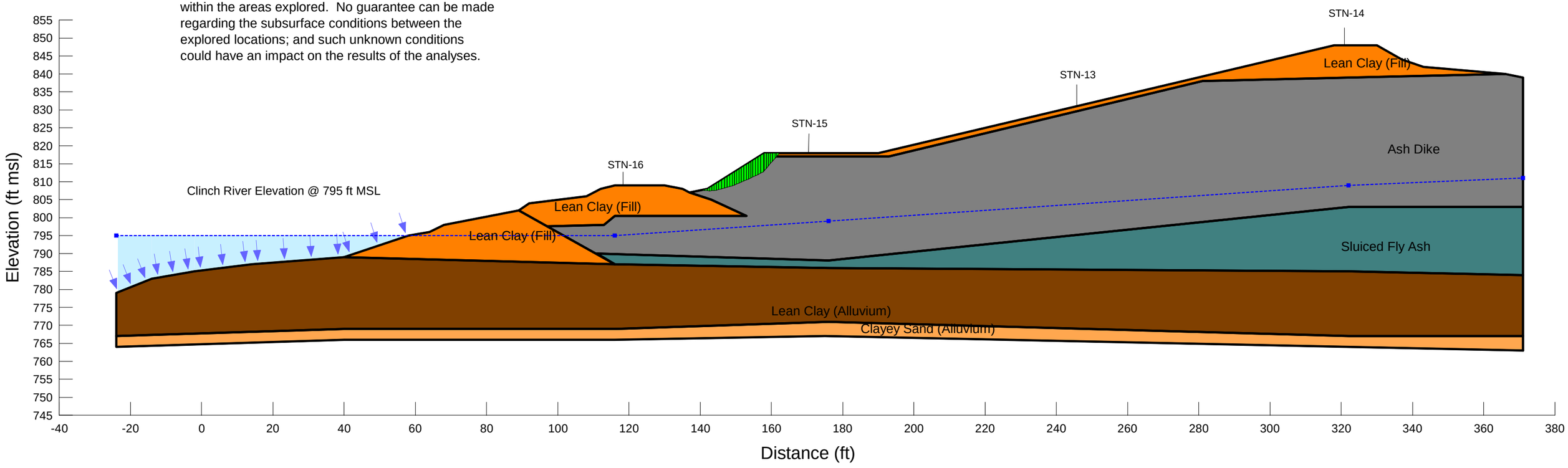
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Factor of Safety: 1.4
Center: (134.162, 858.475) ft
Radius: 13.78136 ft
Minimum Slip Surface Depth: 5 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Lean Clay (Fill)	126	125	0	33
Ash Dike	100	105	0	33
Sluiced Ash	100	105	0	25
Lean Clay (Alluvium)	123	123	0	31
Clayey Sand (Alluvium)	112	112	0	33

Existing Conditions

Non-Global Failure



V:\1714\active\171468118\environmental\Bull Run - 172679015\Report\Engineering Analysis\Sect D-D'\Section D-D' existing conditions.gsz

Slope Stability

Cross-Section D-D'
Bottom Ash Disposal Area 1

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Modified Spencer
File Name: Section D-D' with slope regrade to 2.5H to1V.gsz

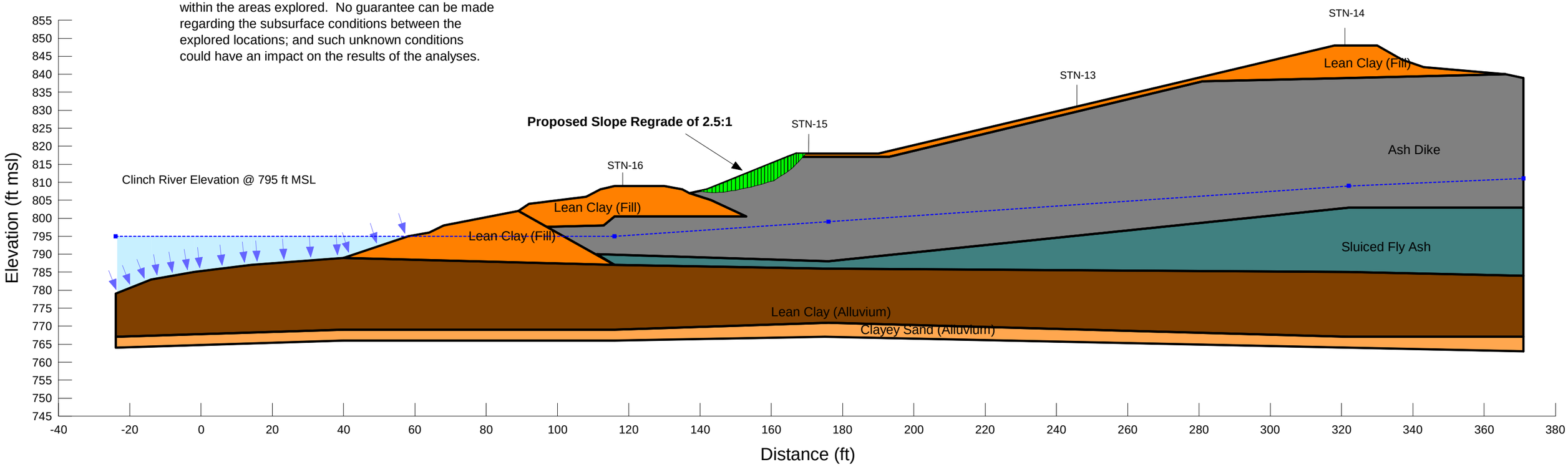
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Factor of Safety: 1.9
Center: (151.748, 836.074) ft
Radius: 16.26878 ft
Minimum Slip Surface Depth: 5 ft

Material Types	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Lean Clay (Fill)	125	126	0	33
Ash Dike	100	105	0	33
Sluiced Ash	100	105	0	25
Lean Clay (Alluvium)	123	123	0	31
Clayey Sand (Alluvium)	112	112	0	33

Proposed Slope Regrade to 2.5H:1V

Non-Global Failure



V:\1714\active\171468118\environmental\Bull Run - 172679015\Report\Engineering Analysis\Sect D-D'\Section D-D' with slope regrade to 2.5H to1V.gsz

SEEP/W Analysis

Cross-Section F-F'
Gypsum Disposal Area 2A / Bottom Ash Disposal Area 1

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section F-F' existing conditions.gsz

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Ash Dike	6.5e-008	0.04	0.46
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
Bottom Ash Base	6.5e-008	0.04	0.46
Silt (Alluvium)	6.95e-005	0.05	0.39
Lean Clay (Alluvium)	4.6e-007	0.05	0.41
Sand (Alluvium)	5.35e-006	0.02	0.39

Note:
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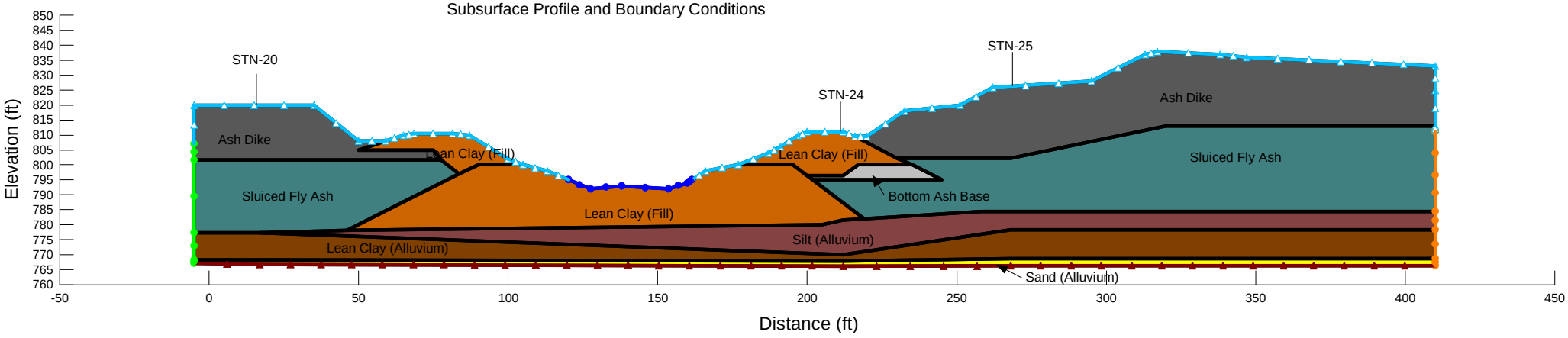
Existing Conditions

Subsurface Profile and Boundary Conditions



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SEEP/W Analysis

Cross-Section F-F'
Gypsum Disposal Area 2A / Bottom Ash Disposal Area 1

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section F-F' existing conditions.gsz

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Ash Dike	6.5e-008	0.04	0.46
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
Bottom Ash Base	6.5e-008	0.04	0.46
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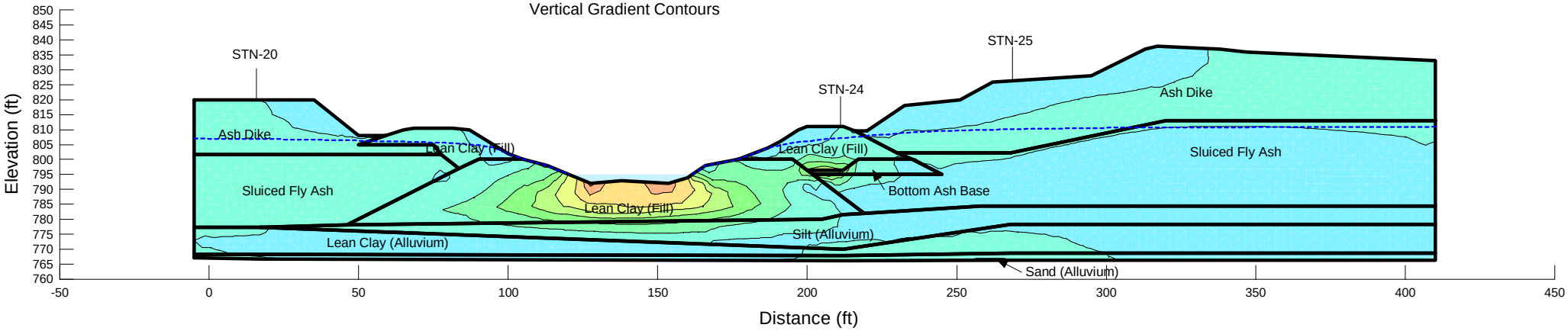
Existing Conditions

Vertical Gradient Contours



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SEEP/W Analysis

Cross-Section F-F'
Gypsum Disposal Area 2A / Bottom Ash Disposal Area 1

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section F-F' existing conditions.gsz

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Ash Dike	6.5e-008	0.04	0.46
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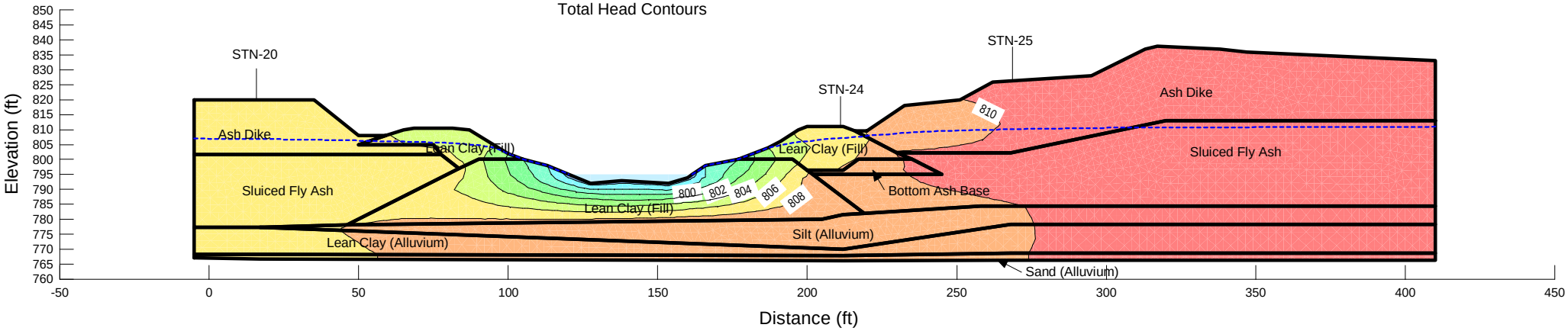
Existing Conditions

Total Head Contours



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SEEP/W Analysis

Cross-Section F-F'
Gypsum Disposal Area 2A / Bottom Ash Disposal Area 1

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section F-F' existing conditions.gsz

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Ash Dike	6.5e-008	0.04	0.46
Sluiced Fly Ash	1.6e-005	0.02	0.46
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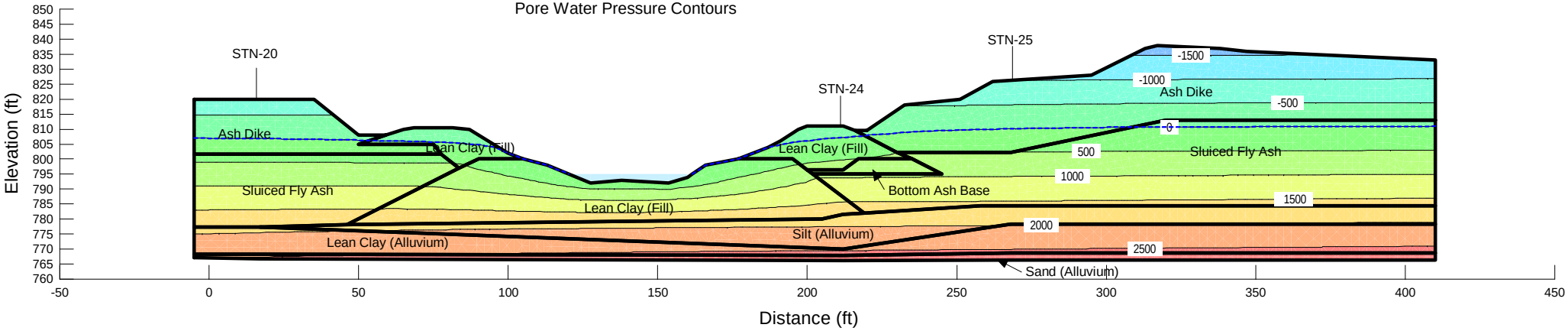
Existing Conditions

Pore Water Pressure Contours



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Slope Stability

Factor of Safety: 1.4
Center: (220.598, 829.443) ft
Radius: 20.38 ft
Minimum Slip Surface Depth: 5 ft

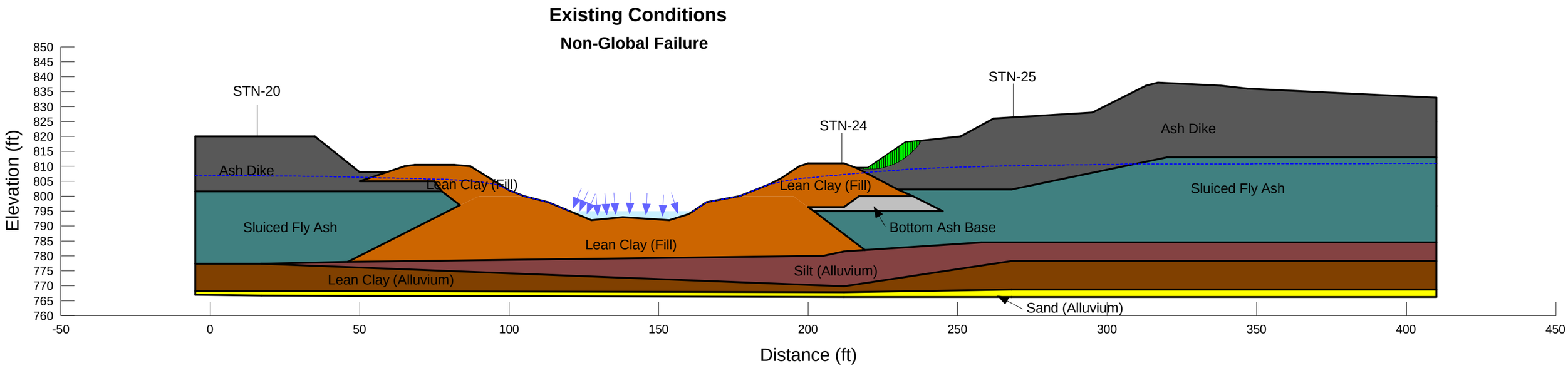
Cross-Section F-F'
Gypsum Disposal Area 2A / Bottom Ash Disposal Area 1

Bull Run Fossil Plant
Tennessee Valley Authority

Material Type	Moist Unit Weight (pcf)	Saturated Unit Weight (pcf)	Cohesion	Friction Angle
Ash Dike	100	105	0	33
Sluiced Fly Ash	100	105	0	25
Lean Clay (Fill)	125	126	0	33
Bottom Ash Base	100	105	0	33
Silt (Alluvium)	108	109	0	28
Lean Clay (Alluvium)	123	123	0	31
Sand (Alluvium)	120	120	0	33

February 2010
Method: Modified Spencer
File Name: Section F-F' existing conditions.gsz

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.



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SEEP/W Analysis

Cross-Section F-F'
Gypsum Disposal Area 2A / Bottom Ash Disposal Area 1

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section F-F' Laid Back.gsz

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Ash Dike	6.5e-008	0.04	0.46
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
Bottom Ash Base	6.5e-008	0.04	0.46
Silt (Alluvium)	6.95e-005	0.05	0.39
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Note:
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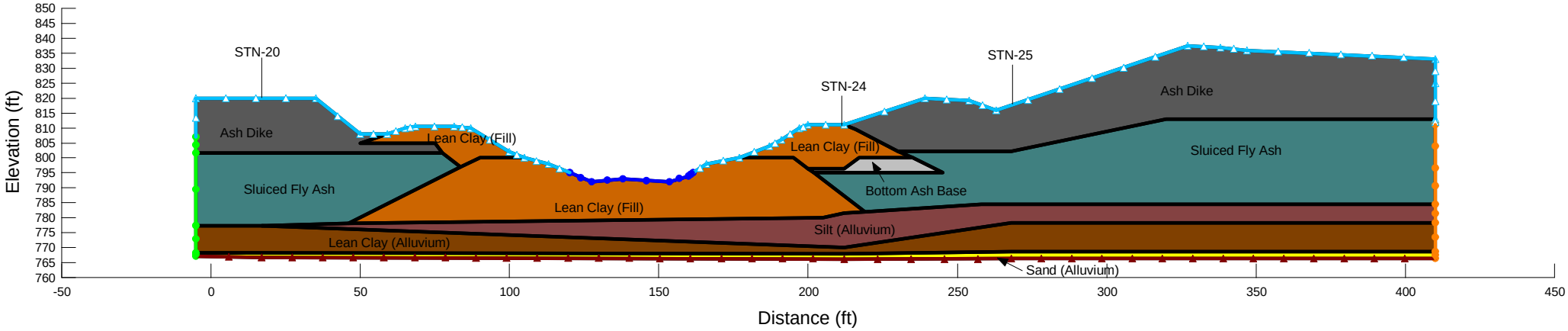
Proposed Ash Dikes Slopes Laid Back to 3:1 Above Elevation 810'

Subsurface Profile and Boundary Conditions



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SEEP/W Analysis

Cross-Section F-F'
Gypsum Disposal Area 2A / Bottom Ash Disposal Area 1

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section F-F' Laid Back.gsz

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Ash Dike	6.5e-008	0.04	0.46
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
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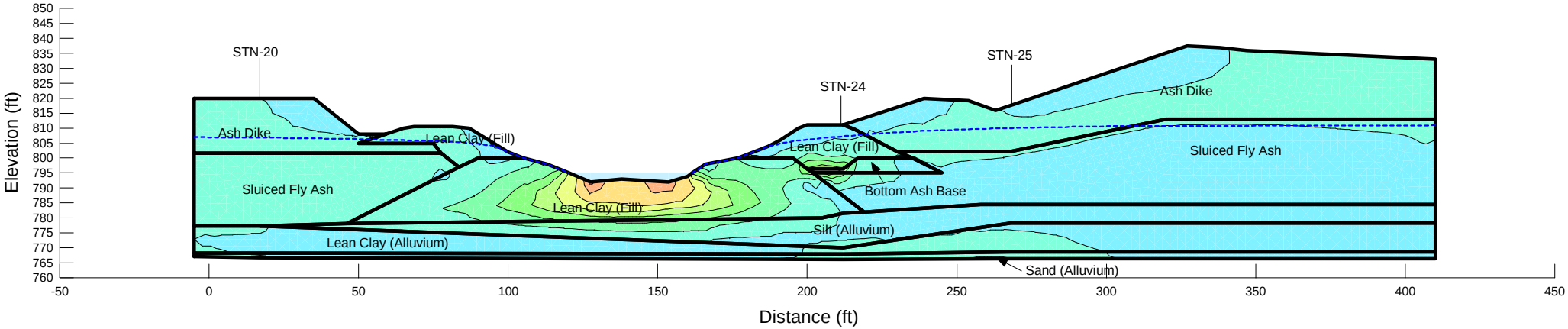
Proposed Ash Dikes Slopes Laid Back to 3:1 Above Elevation 810'

Vertical Gradient Contours



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SEEP/W Analysis

Cross-Section F-F'
Gypsum Disposal Area 2A / Bottom Ash Disposal Area 1

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section F-F' Laid Back.gsz

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Ash Dike	6.5e-008	0.04	0.46
Sluiced Fly Ash	1.6e-005	0.02	0.46
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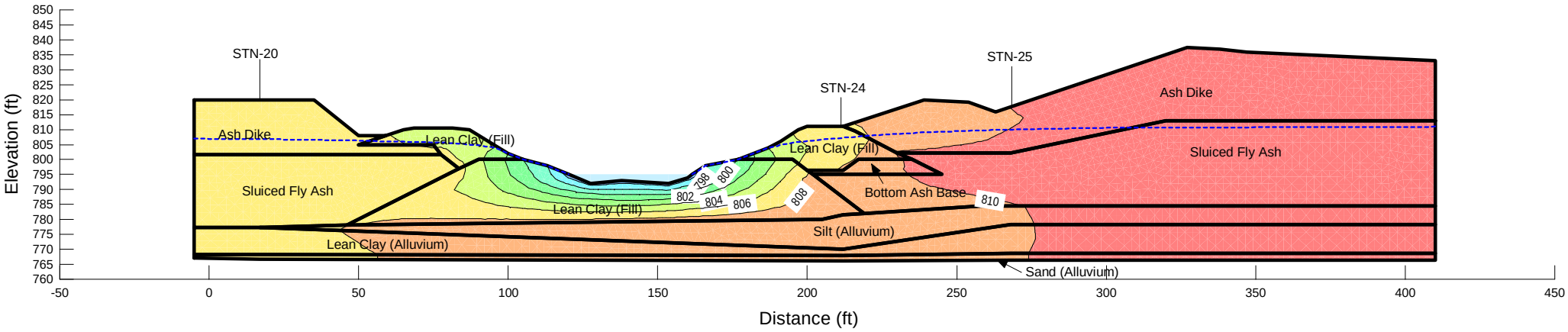
Proposed Ash Dikes Slopes Laid Back to 3:1 Above Elevation 810'

Total Head Contours



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SEEP/W Analysis

Cross-Section F-F'
Gypsum Disposal Area 2A / Bottom Ash Disposal Area 1

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section F-F' Laid Back.gsz

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Ash Dike	6.5e-008	0.04	0.46
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
Bottom Ash Base	6.5e-008	0.04	0.46
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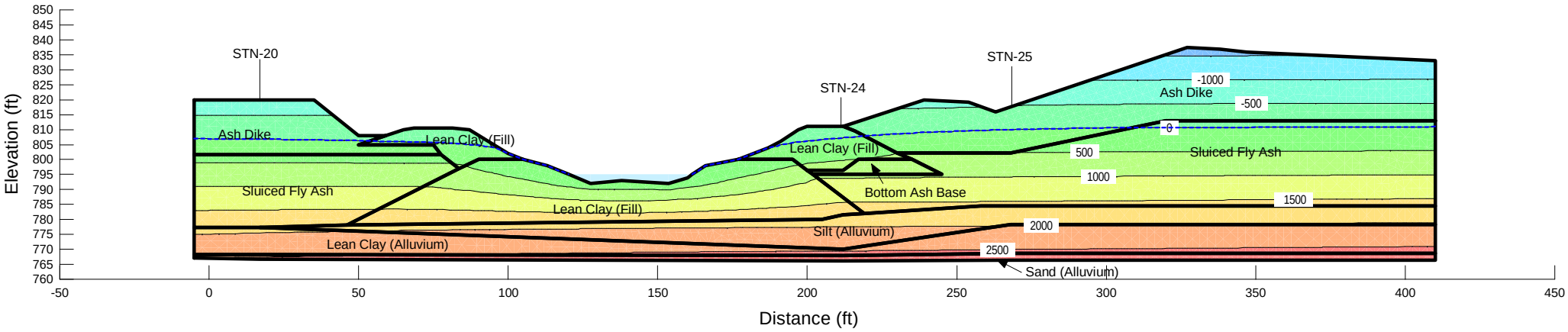
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Proposed Ash Dikes Slopes Laid Back to 3:1 Above Elevation 810'

Pore Water Pressure Contours



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Slope Stability

Cross-Section F-F'
Gypsum Disposal Area 2A / Bottom Ash Disposal Area 1

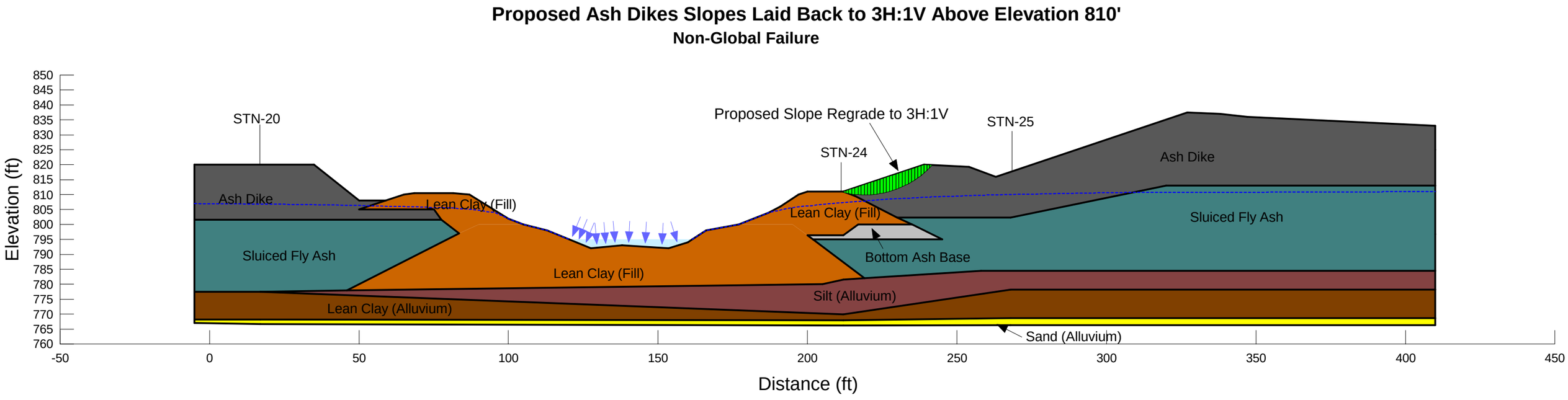
Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Modified Spencer
File Name: Section F-F' Slope Regrade.gsz

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Factor of Safety: 2.3
Center: (219.075, 840.702) ft
Radius: 30.828 ft
Minimum Slip Surface Depth: 5 ft

Material Type	Moist Unit Weight (pcf)	Saturated Unit Weight (pcf)	Cohesion	Friction Angle
Ash Dike	100	105	0	33
Sluiced Fly Ash	100	105	0	25
Lean Clay (Fill)	125	126	0	33
Bottom Ash Base	100	105	0	33
Silt (Alluvium)	108	109	0	28
Lean Clay (Alluvium)	123	123	0	31
Sand (Alluvium)	120	120	0	33



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SEEP/W Analysis

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section I-I' existing conditions (global).gsz

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (385,794)
Total Head = 795 ft
At (385.90,789.93)
Total Head = 797.77 ft
dH = 2.77 ft dl = 5.07 ft
i = 0.546 i(criticial) = 1.0
FSpiping = 1.8

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
Gravel (Alluvium)	5.3e-006	0.02	0.39
Clayey Sand (Alluvium)	1.6e-006	0.02	0.39
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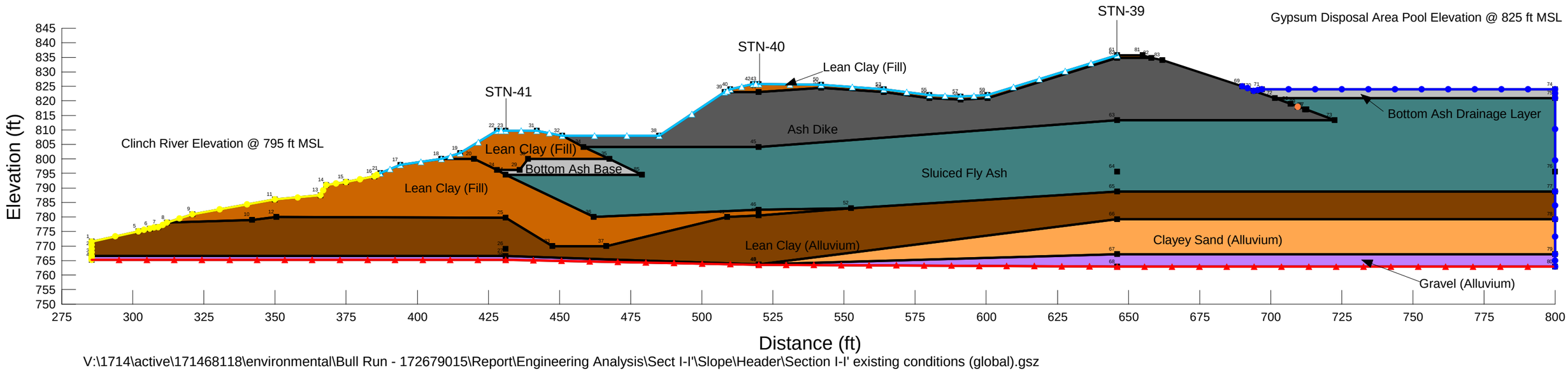
Bottom Ash Base	6.5e-005	0.04	0.46
Ash Dike	6.5e-005	0.1	0.46

Existing Conditions

Subsurface Profile and Boundary Conditions



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SEEP/W Analysis

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section I-I' existing conditions (global).gsz

Note:
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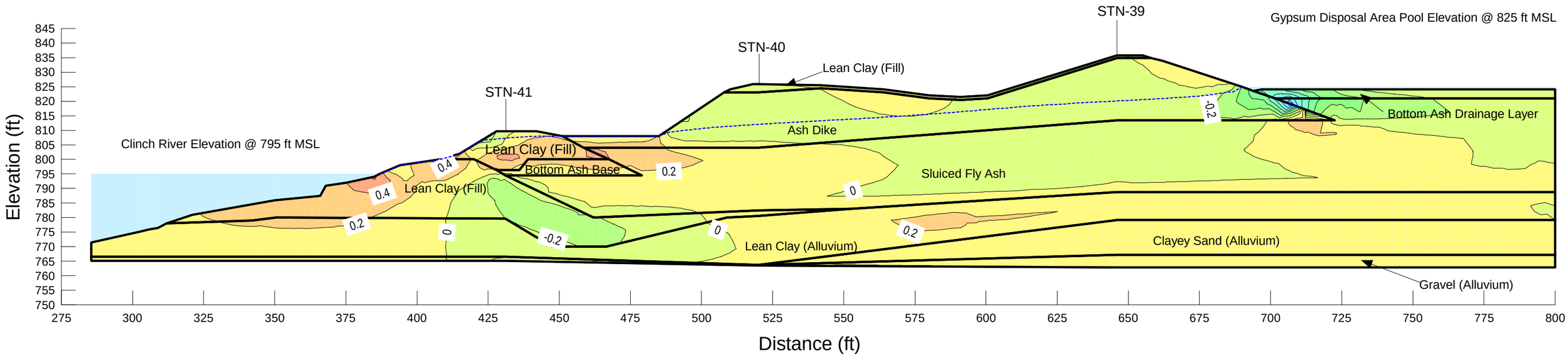
Existing Conditions

Vertical Gradient Contours



SEEP/W Analysis

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section I-I' existing conditions (global).gsz

Note:
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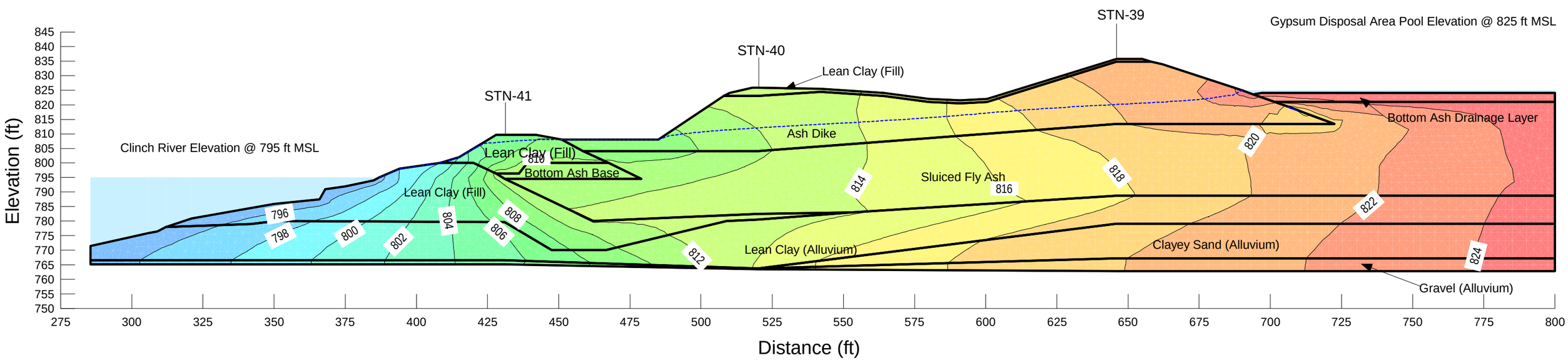
Ash Dike	6.5e-005	0.1	0.46

Existing Conditions

Total Head Contours



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SEEP/W Analysis

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section I-I' existing conditions (global).gsz

Note:
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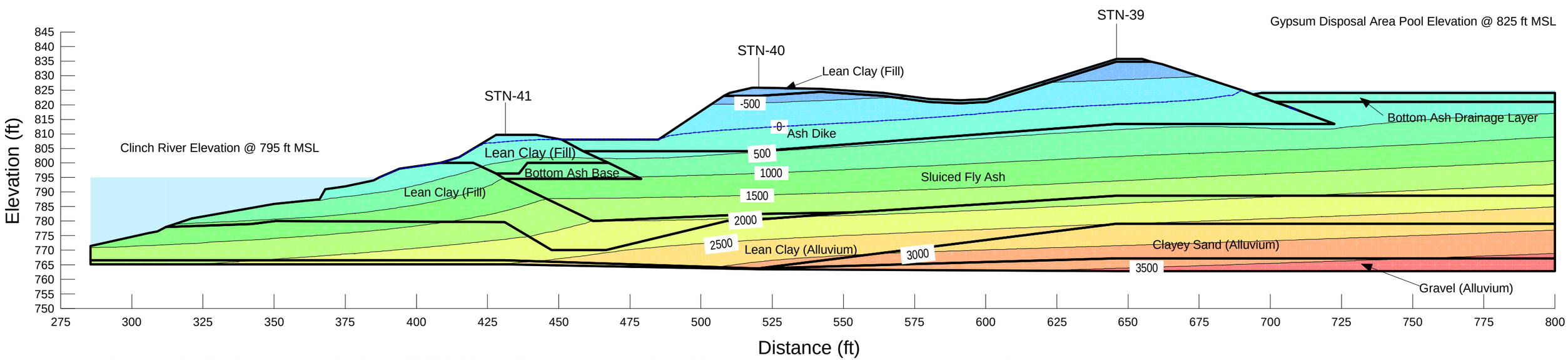
Existing Conditions

Pore Water Pressure Contours



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Slope Stability dMin=20

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

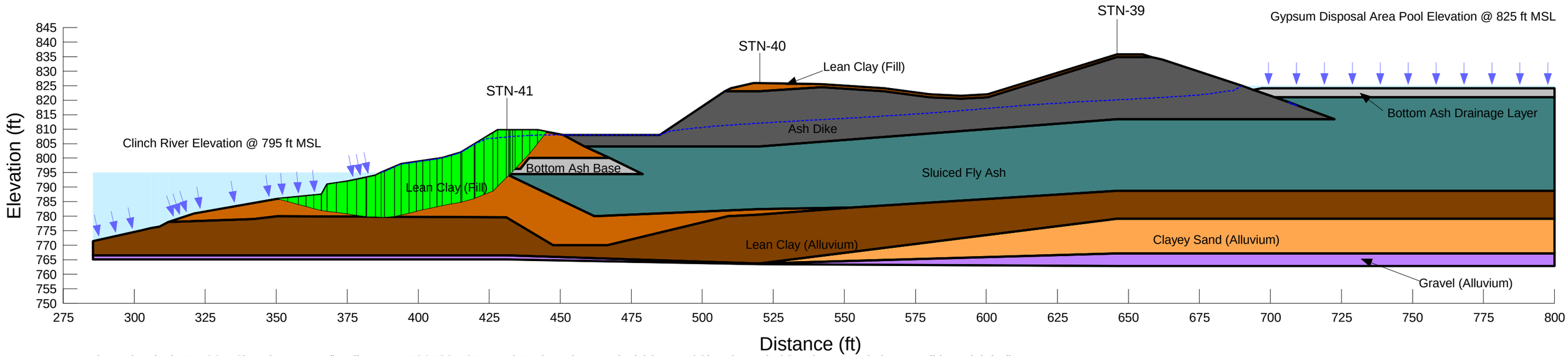
February 2010
Method: Modified Spencer
File Name: Section I-I' existing conditions (global).gsz

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Factor of Safety: 1.2
Center: (390.5, 849.25) ft
Radius: 45.95482 ft
Minimum Slip Surface Depth: 20 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Sluiced Fly Ash	100	105	0	25
Lean Clay (Fill)	125	126	0	33
Gravel (Alluvium)	135	135	0	40
Clayey Sand (Alluvium)	112	112	0	33
Lean Clay (Alluvium)	123	123	0	31
Bottom Ash Base	100	105	0	33
Ash Dike	100	105	0	33

Existing Conditions
Global Failure



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Slope Stability

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

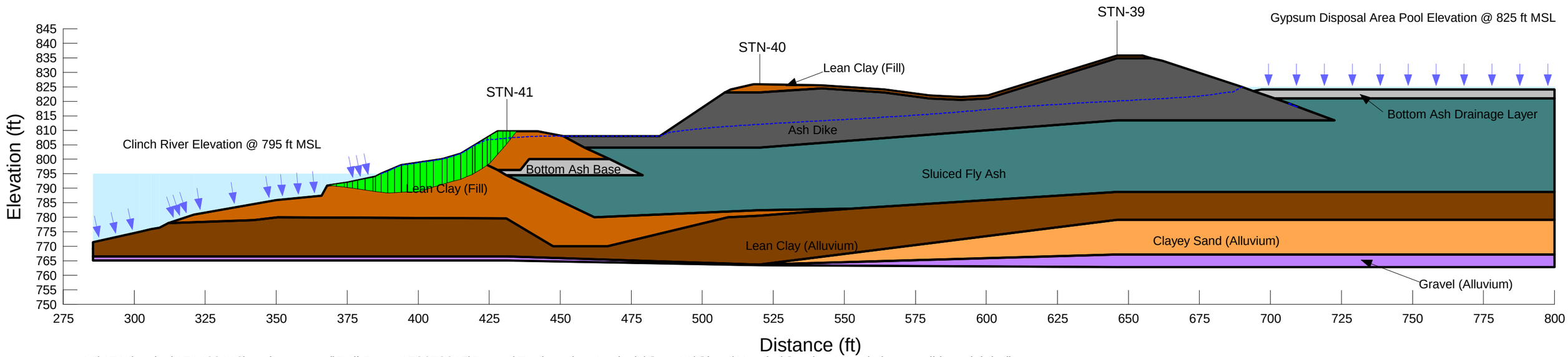
February 2010
Method: Modified Spencer
File Name: Section I-I' existing conditions (global).gsz

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Factor of Safety: 1.0
Center: (390.5, 844.25) ft
Radius: 33.17688 ft
Minimum Slip Surface Depth: 10 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Sluiced Fly Ash	100	105	0	25
Lean Clay (Fill)	125	126	0	33
Gravel (Alluvium)	135	135	0	40
Clayey Sand (Alluvium)	112	112	0	33
Lean Clay (Alluvium)	123	123	0	31
Bottom Ash Base	100	105	0	33
Ash Dike	100	105	0	33

Existing Conditions
Non-Global Failure (Perimeter Dike)



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Slope Stability (Ash Failure)

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

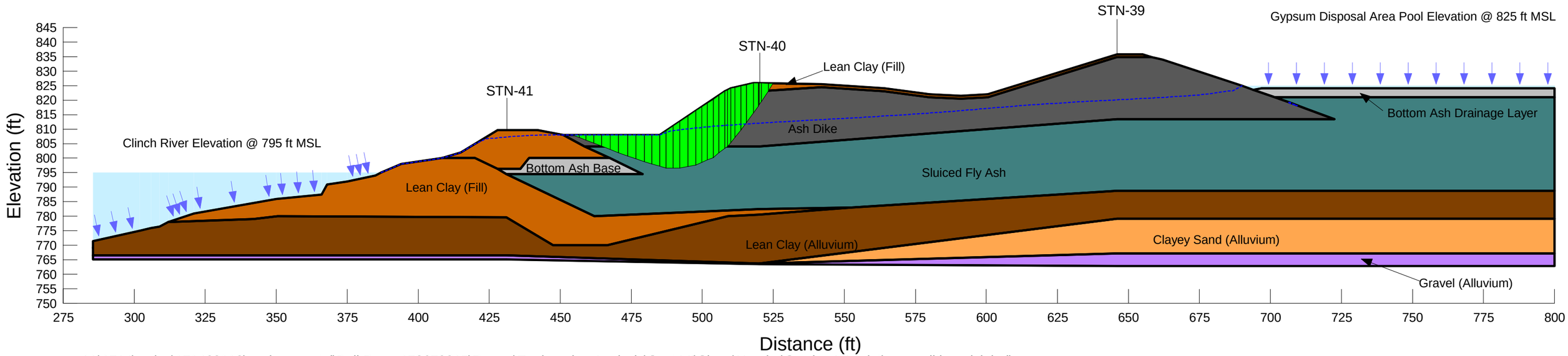
February 2010
Method: Modified Spencer
File Name: Section I-I' existing conditions (global).gsz

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Factor of Safety: 1.1
Center: (488.286, 838.489) ft
Radius: 37.40835 ft
Minimum Slip Surface Depth: 20 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Sluiced Fly Ash	100	105	0	25
Lean Clay (Fill)	125	126	0	33
Gravel (Alluvium)	135	135	0	40
Clayey Sand (Alluvium)	112	112	0	33
Lean Clay (Alluvium)	123	123	0	31
Bottom Ash Base	100	105	0	33
Ash Dike	100	105	0	33

Existing Conditions
Non-Global Failure (Ash Embankment)



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SEEP/W Analysis

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section I-I' buttress.gsz

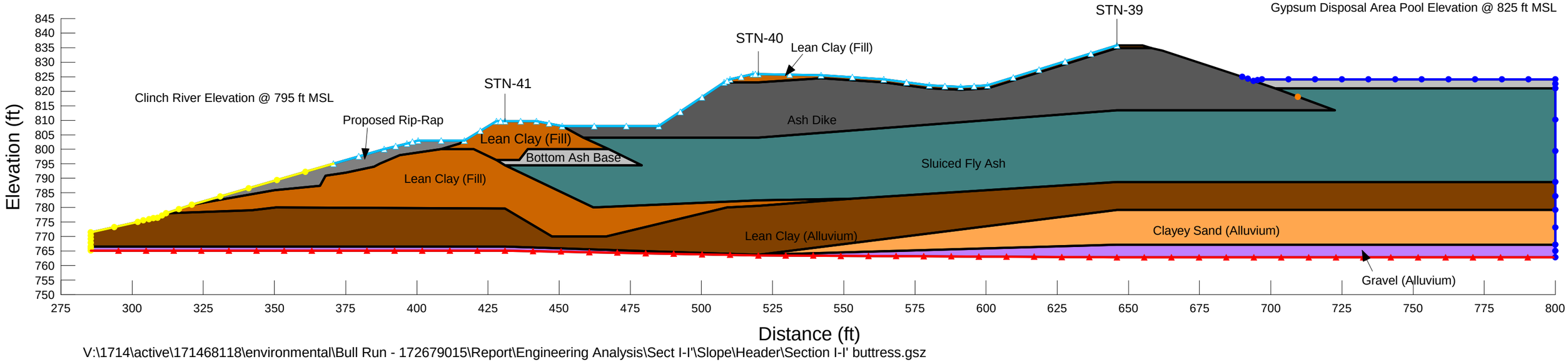
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (316.5,779.5)
Total Head = 795 ft
At (317.14,773.22)
Total Head = 796.05 ft
dH = 1.05 ft dl = 6.28 ft
i = 0.167 i(criticial) = 1.0
FSpiping = 6.0

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6076e-005	0.02	0.46
Lean Clay (Fill)	2.297e-007	0.1	0.41
Gravel (Alluvium)	5.3477e-006	0.02	0.23
Clayey Sand (Alluvium)	1.64e-006	0.02	0.39
Lean Clay (Alluvium)	4.59e-007	0.05	0.41
Bottom Ash Base	6.5e-005	0.04	0.46
Ash Dike	6.5e-005	0.1	0.46
Rip Rap	0.01	1	0.4

Proposed Rip-Rap Buttress

Subsurface Profile and Boundary Conditions



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SEEP/W Analysis

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section I-I' buttress.gsz

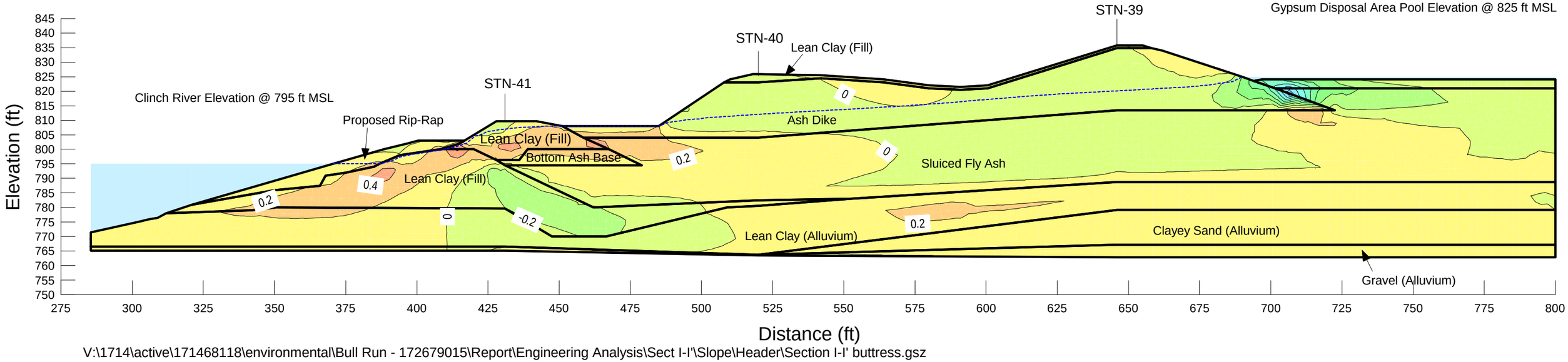
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (316.5,779.5)
Total Head = 795 ft
At (317.14,773.22)
Total Head = 796.05 ft
dH = 1.05 ft dl = 6.28 ft
i = 0.167 i(criticial) = 1.0
FSpiping = 6.0

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6076e-005	0.02	0.46
Lean Clay (Fill)	2.297e-007	0.1	0.41
Gravel (Alluvium)	5.3477e-006	0.02	0.23
Clayey Sand (Alluvium)	1.64e-006	0.02	0.39
Lean Clay (Alluvium)	4.59e-007	0.05	0.41
Bottom Ash Base	6.5e-005	0.04	0.46
Ash Dike	6.5e-005	0.1	0.46
Rip Rap	0.01	1	0.4

Proposed Rip-Rap Buttress

Vertical Gradient Contours



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SEEP/W Analysis

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section I-I' buttress.gsz

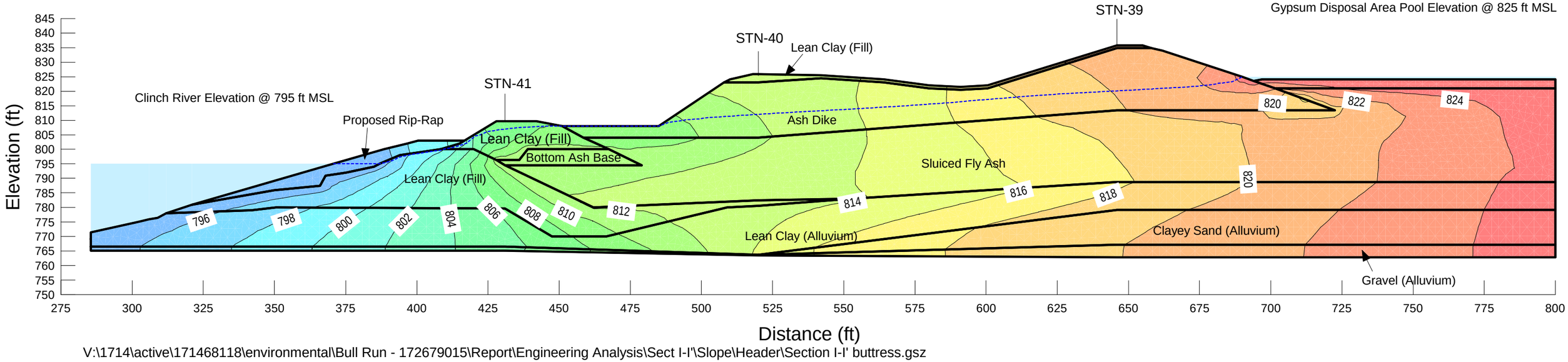
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (316.5,779.5)
Total Head = 795 ft
At (317.14,773.22)
Total Head = 796.05 ft
dH = 1.05 ft dl = 6.28 ft
i = 0.167 i(criticial) = 1.0
FSpiping = 6.0

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6076e-005	0.02	0.46
Lean Clay (Fill)	2.297e-007	0.1	0.41
Gravel (Alluvium)	5.3477e-006	0.02	0.23
Clayey Sand (Alluvium)	1.64e-006	0.02	0.39
Lean Clay (Alluvium)	4.59e-007	0.05	0.41
Bottom Ash Base	6.5e-005	0.04	0.46
Ash Dike	6.5e-005	0.1	0.46
Rip Rap	0.01	1	0.4

Proposed Rip-Rap Buttress

Total Head Contours



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SEEP/W Analysis

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section I-I' buttress.gsz

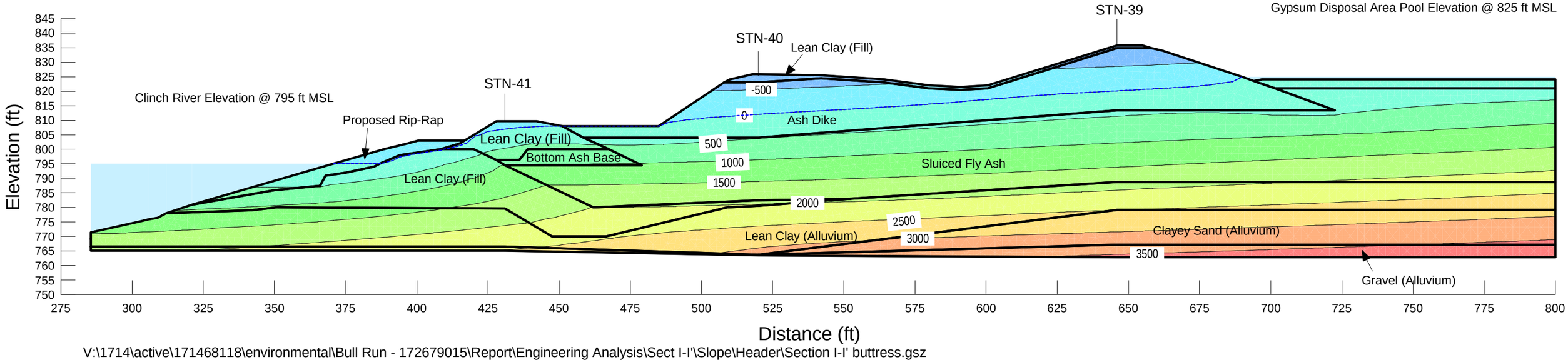
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (316.5,779.5)
Total Head = 795 ft
At (317.14,773.22)
Total Head = 796.05 ft
dH = 1.05 ft dl = 6.28 ft
i = 0.167 i(criticial) = 1.0
FSpiping = 6.0

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6076e-005	0.02	0.46
Lean Clay (Fill)	2.297e-007	0.1	0.41
Gravel (Alluvium)	5.3477e-006	0.02	0.23
Clayey Sand (Alluvium)	1.64e-006	0.02	0.39
Lean Clay (Alluvium)	4.59e-007	0.05	0.41
Bottom Ash Base	6.5e-005	0.04	0.46
Ash Dike	6.5e-005	0.1	0.46
Rip Rap	0.01	1	0.4

Proposed Rip-Rap Buttress

Pore Water Pressure Contours



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Slope Stability dMin=15

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

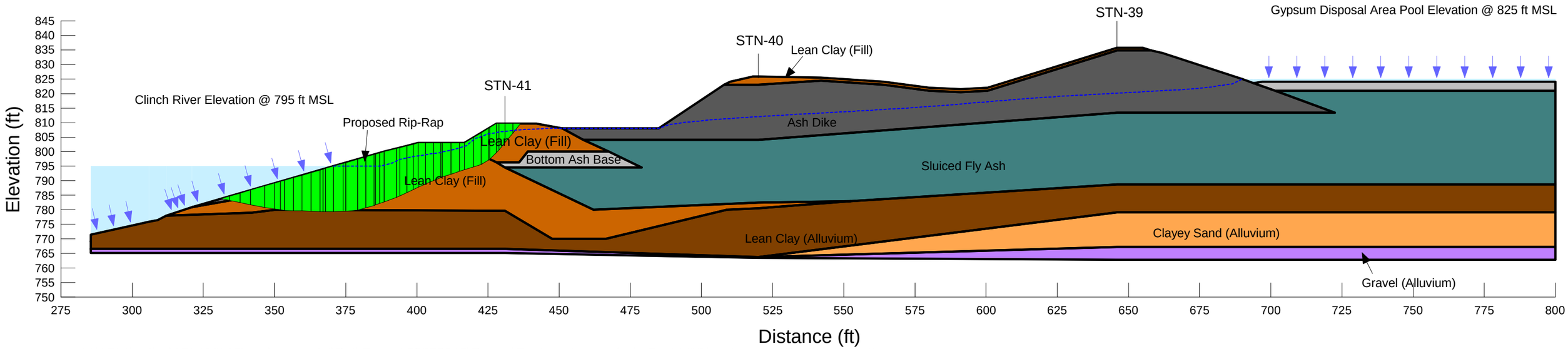
February 2010
Method: Modified Spencer
File Name: Section I-I' buttress.gsz

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Factor of Safety: 1.5
Center: (372.5, 853.75) ft
Radius: 50.08418 ft
Minimum Slip Surface Depth: 15 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Sluiced Fly Ash	100	105	0	25
Lean Clay (Fill)	125	126	0	33
Gravel (Alluvium)	135	135	0	40
Clayey Sand (Alluvium)	112	112	0	33
Lean Clay (Alluvium)	123	123	0	31
Bottom Ash Base	100	105	0	33
Ash Dike	100	105	0	33
Rip Rap	115	115	0	40

Proposed Rip-Rap Buttress
Global Failure



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SEEP/W Analysis

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section I-I' Embankment Regrade.gsz

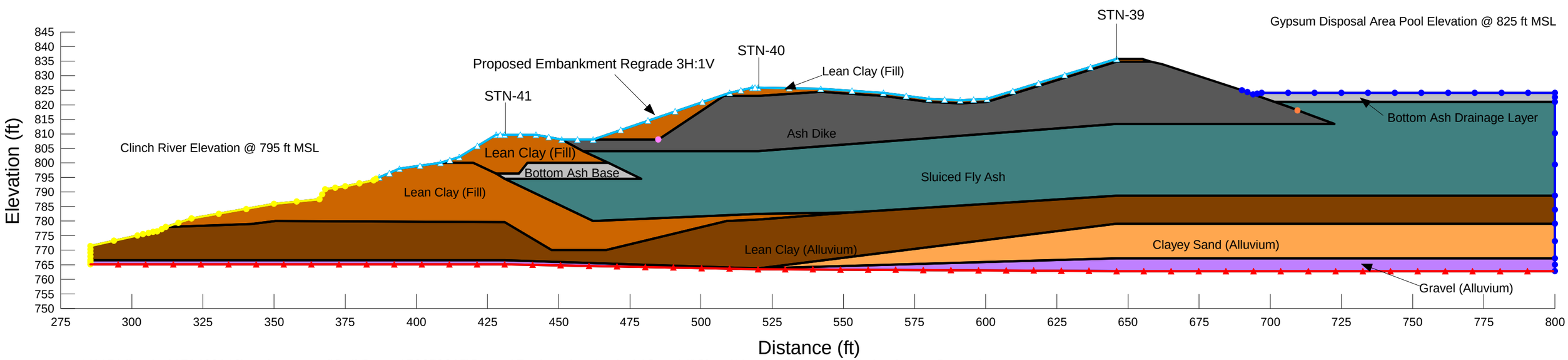
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (385,794)
Total Head = 795 ft
At (385.90,789.93)
Total Head = 797.77 ft
dH = 2.77 ft dl = 5.07 ft
i = 0.546 i(criticial) = 1.0
FSpiping = 1.8

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
Gravel (Alluvium)	5.3e-006	0.02	0.39
Clayey Sand (Alluvium)	1.6e-006	0.02	0.39
Lean Clay (Alluvium)	4.6e-007	0.05	0.41
Bottom Ash Base	6.5e-005	0.04	0.46
Ash Dike	6.5e-005	0.1	0.46

Proposed Embankment Regrade 3H:1V

Subsurface Profile and Boundary Conditions



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SEEP/W Analysis

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section I-I' Embankment Regrade.gsz

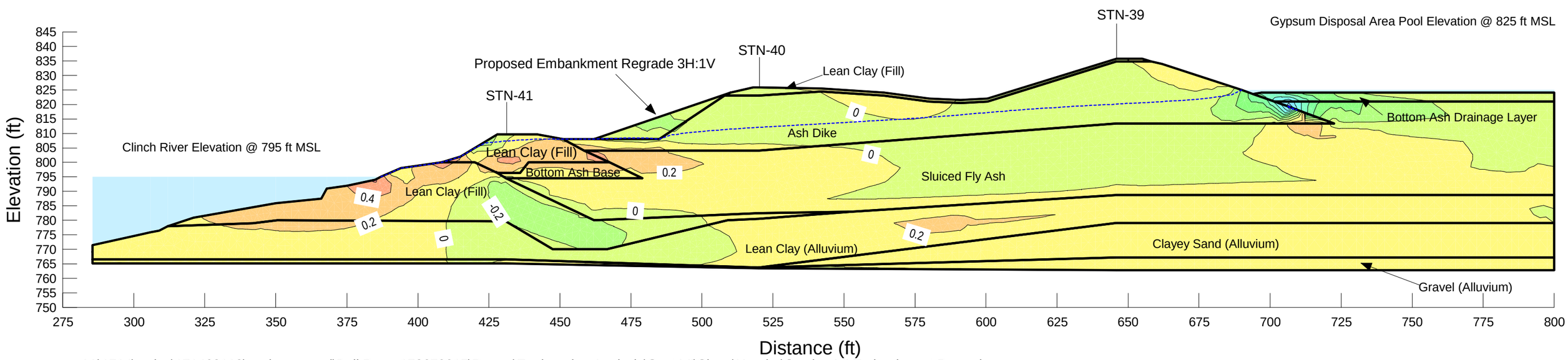
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (385,794)
Total Head = 795 ft
At (385.90,789.93)
Total Head = 797.77 ft
dH = 2.77 ft dl = 5.07 ft
i = 0.546 i(criticial) = 1.0
FSpiping = 1.8

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
Gravel (Alluvium)	5.3e-006	0.02	0.39
Clayey Sand (Alluvium)	1.6e-006	0.02	0.39
Lean Clay (Alluvium)	4.6e-007	0.05	0.41
Bottom Ash Base	6.5e-005	0.04	0.46
Ash Dike	6.5e-005	0.1	0.46

Proposed Embankment Regrade 3H:1V

Vertical Gradient Contours



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SEEP/W Analysis

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section I-I' Embankment Regrade.gsz

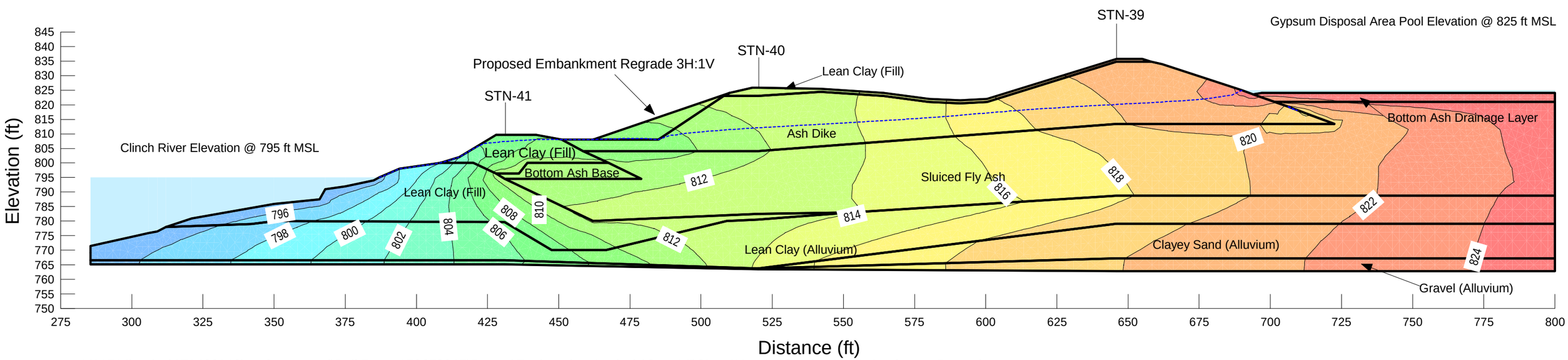
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (385,794)
Total Head = 795 ft
At (385.90,789.93)
Total Head = 797.77 ft
dH = 2.77 ft dl = 5.07 ft
i = 0.546 i(criticial) = 1.0
FSpiping = 1.8

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
Gravel (Alluvium)	5.3e-006	0.02	0.39
Clayey Sand (Alluvium)	1.6e-006	0.02	0.39
Lean Clay (Alluvium)	4.6e-007	0.05	0.41
Bottom Ash Base	6.5e-005	0.04	0.46
Ash Dike	6.5e-005	0.1	0.46

Proposed Embankment Regrade 3H:1V

Total Head Contours



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SEEP/W Analysis

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section I-I' Embankment Regrade.gsz

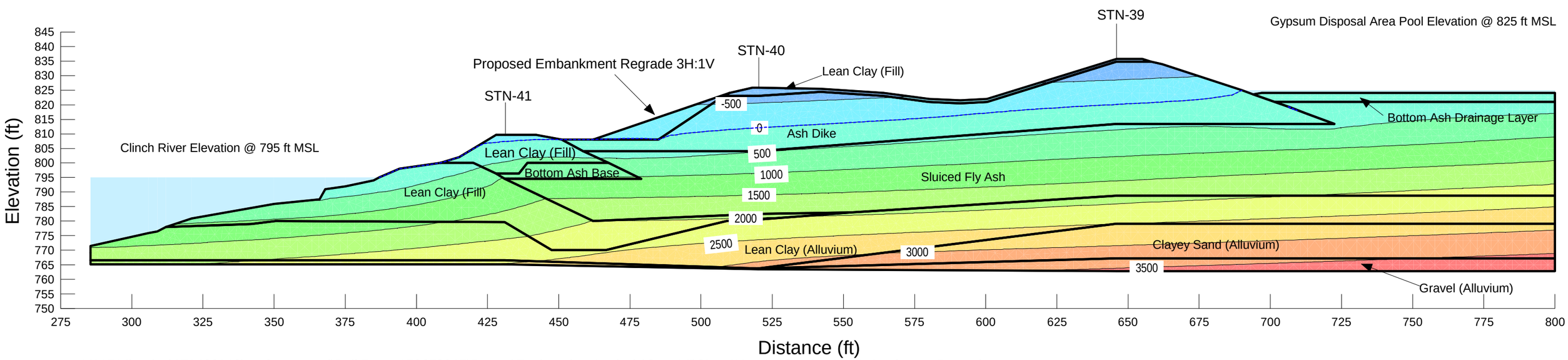
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (385,794)
Total Head = 795 ft
At (385.90,789.93)
Total Head = 797.77 ft
dH = 2.77 ft dl = 5.07 ft
i = 0.546 i(criticial) = 1.0
FSpiping = 1.8

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
Gravel (Alluvium)	5.3e-006	0.02	0.39
Clayey Sand (Alluvium)	1.6e-006	0.02	0.39
Lean Clay (Alluvium)	4.6e-007	0.05	0.41
Bottom Ash Base	6.5e-005	0.04	0.46
Ash Dike	6.5e-005	0.1	0.46

Proposed Embankment Regrade 3H:1V

Pore Water Pressure Contours



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Slope Stability (Ash Failure)

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

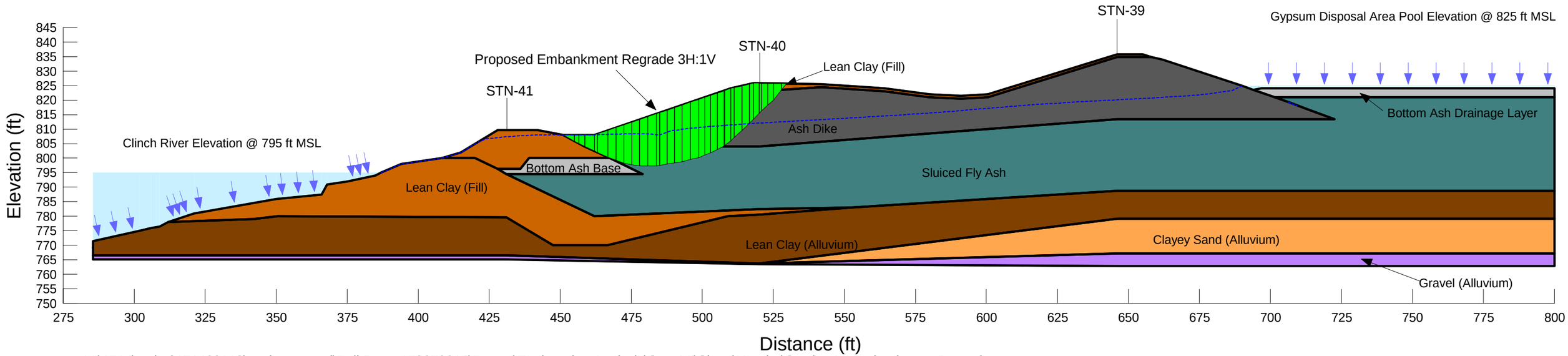
February 2010
Method: Modified Spencer
File Name: Section I-I' Embankment Regrade.gsz

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Factor of Safety: 1.6
Center: (482.296, 855.842) ft
Radius: 39.01048 ft
Minimum Slip Surface Depth: 20 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Sluiced Fly Ash	100	105	0	25
Lean Clay (Fill)	125	126	0	33
Gravel (Alluvium)	135	135	0	40
Clayey Sand (Alluvium)	112	112	0	33
Lean Clay (Alluvium)	123	123	0	31
Bottom Ash Base	100	105	0	33
Ash Dike	100	105	0	33

Proposed Embankment Regrade 3H:1V
Non-Global Failure



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SEEP/W Analysis

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section I-I' 30' Deep Slurry Wall.gsz

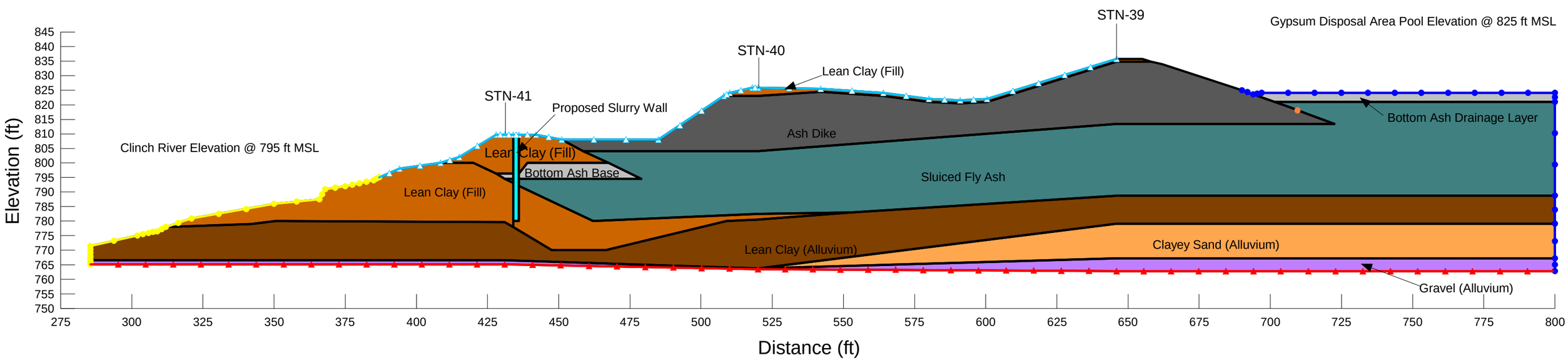
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (385,794)
Total Head = 795 ft
At (385.90,789.93)
Total Head = 796.91 ft
dH = 1.91 ft dl = 5.07 ft
i = 0.377 i(critical) = 1.0
FSpiping = 2.7

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
Gravel (Alluvium)	5.3e-006	0.02	0.39
Clayey Sand (Alluvium)	1.6e-006	0.02	0.39
Lean Clay (Alluvium)	4.6e-007	0.05	0.41
Bottom Ash Base	6.5e-005	0.04	0.46
Ash Dike	6.5e-005	0.1	0.46

Proposed 30 Ft Deep Slurry Wall to Elevation 780'

Subsurface Profile and Boundary Conditions



V:\1714\active\171468118\environmental\Bull Run - 172679015\Report\Engineering Analysis\Sect I-I'\Slope\Header\Section I-I' 30' Deep Slurry Wall.gsz

SEEP/W Analysis

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section I-I' 30' Deep Slurry Wall.gsz

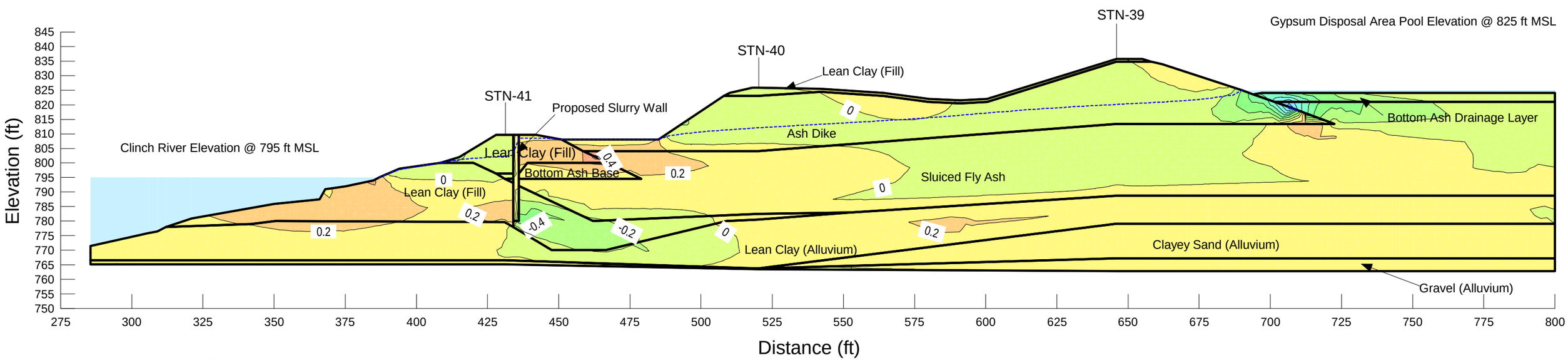
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (385,794)
Total Head = 795 ft
At (385.90,789.93)
Total Head = 796.91 ft
dH = 1.91 ft dl = 5.07 ft
i = 0.377 i(critical) = 1.0
FSpiping = 2.7

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
Gravel (Alluvium)	5.3e-006	0.02	0.39
Clayey Sand (Alluvium)	1.6e-006	0.02	0.39
Lean Clay (Alluvium)	4.6e-007	0.05	0.41
Bottom Ash Base	6.5e-005	0.04	0.46
Ash Dike	6.5e-005	0.1	0.46

Proposed 30 Ft Deep Slurry Wall to Elevation 780'

Vertical Gradient Contours



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SEEP/W Analysis

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section I-I' 30' Deep Slurry Wall.gsz

Note:
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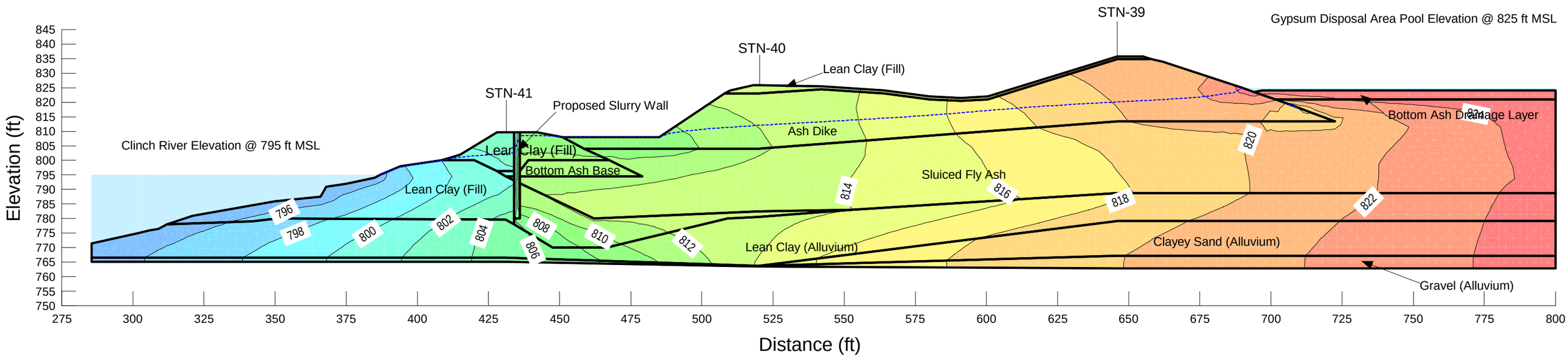
Bottom Ash Base	6.5e-005	0.04	0.46
Ash Dike	6.5e-005	0.1	0.46

Proposed 30 Ft Deep Slurry Wall to Elevation 780'

Total Head Contours



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SEEP/W Analysis

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section I-I' 30' Deep Slurry Wall.gsz

Note:
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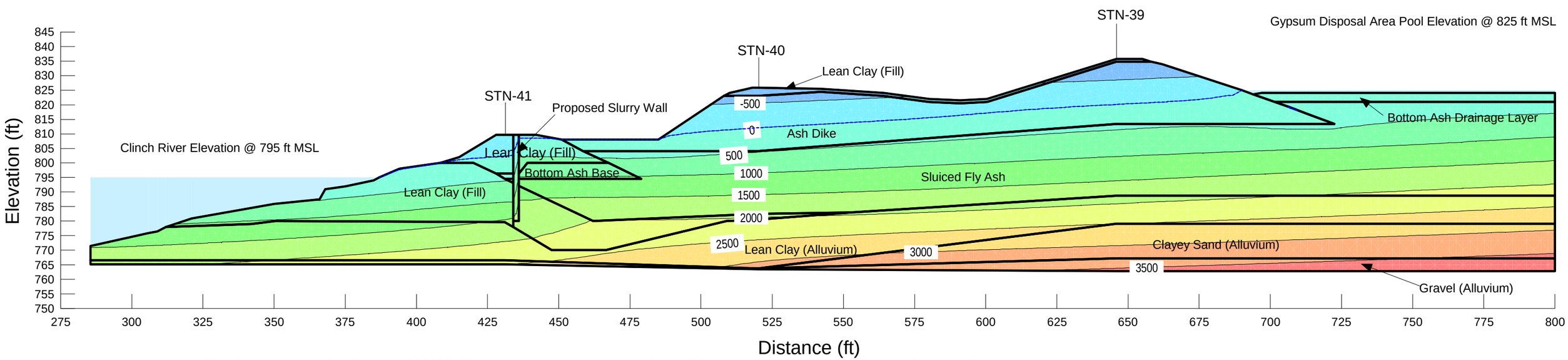
Ash Dike	6.5e-005	0.1	0.46

Proposed 30 Ft Deep Slurry Wall to Elevation 780'

Pore Water Pressure Contours



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Slope Stability dMin=20

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Modified Spencer
File Name: Section I-I' 30' Deep Slurry Wall.gsz

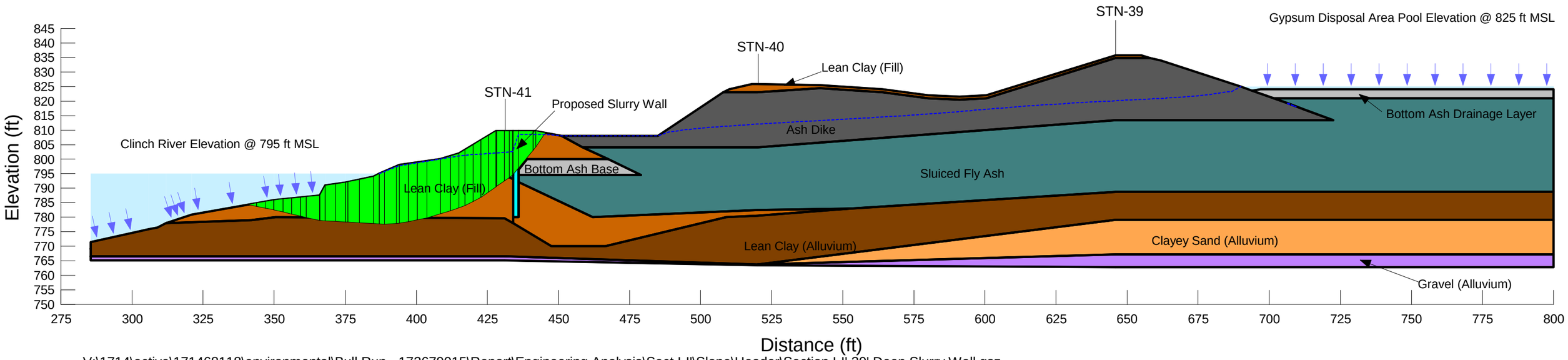
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Factor of Safety: 1.5
Center: (381.5, 855.25) ft
Radius: 50.52097 ft
Minimum Slip Surface Depth: 20 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Sluiced Fly Ash	100	105	0	25
Lean Clay (Fill)	125	126	0	33
Gravel (Alluvium)	135	135	0	40
Clayey Sand (Alluvium)	112	112	0	33
Lean Clay (Alluvium)	123	123	0	31
Bottom Ash Base	100	105	0	33
Ash Dike	100	105	0	33

Proposed 30 Ft Deep Slurry Wall to Elevation 780'

Global Failure



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SEEP/W Analysis

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section I-I' Dike Regrade & Slurry Wall with Pool at 830'.gsz

Piping Potential
Maximum Exit Gradient occurs at (385,794)
Total Head = 795 ft
At (385.90,789.93)
Total Head = 796.89 ft
dH = 1.89 ft dl = 5.07 ft
i = 0.373 i(criticial) = 1.0
FSpiping = 2.7

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
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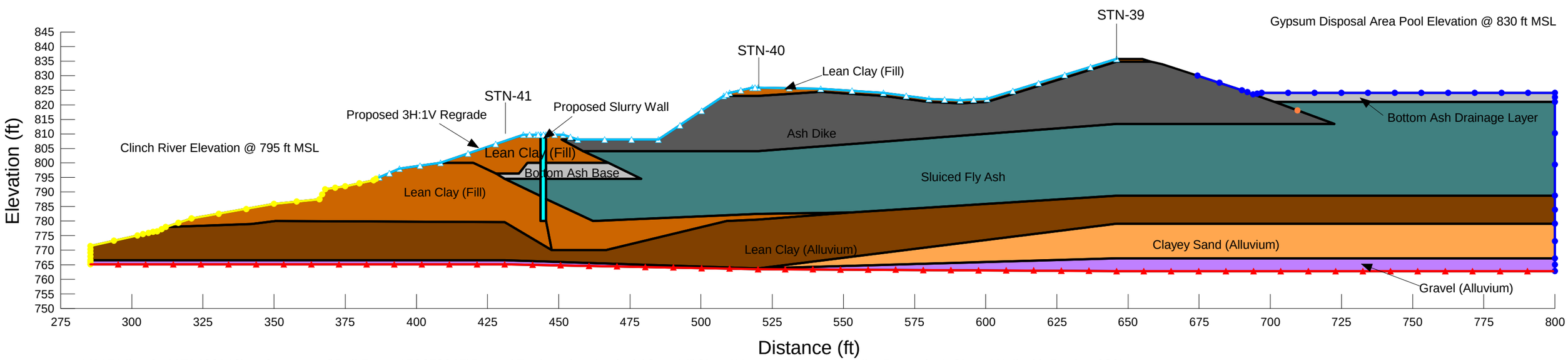
Proposed 3H:1V Upper Dike Regrade and 30' Slurry Wall with Pool at Elevation 830'

Subsurface Profile and Boundary Conditions



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SEEP/W Analysis

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section I-I' Dike Regrade & Slurry Wall with Pool at 830'.gsz

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

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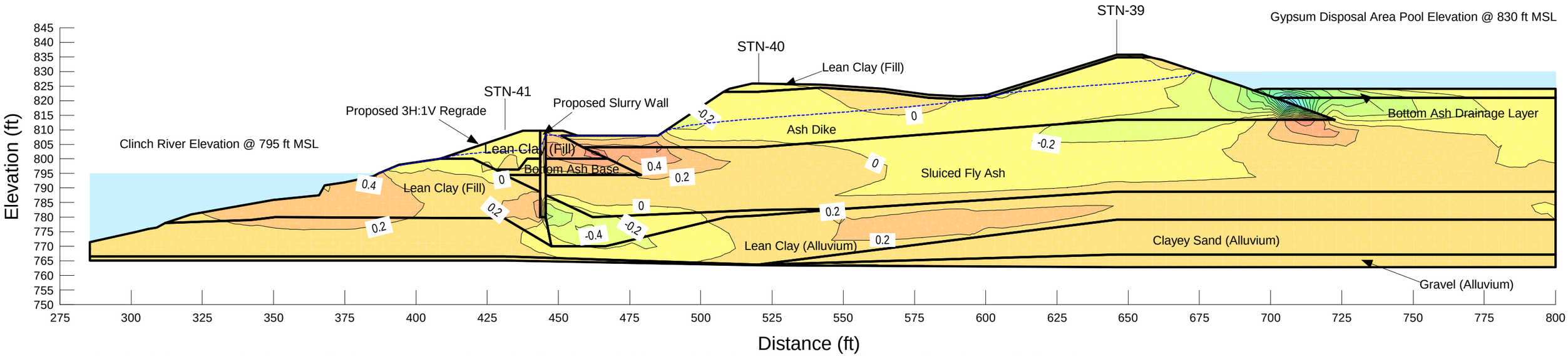
Ash Dike	6.5e-005	0.1	0.46

Proposed 3H:1V Upper Dike Regrade and 30' Slurry Wall with Pool at Elevation 830'

Vertical Gradient Contours



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SEEP/W Analysis

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section I-I' Dike Regrade & Slurry Wall with Pool at 830'.gsz

Piping Potential
Maximum Exit Gradient occurs at (385,794)
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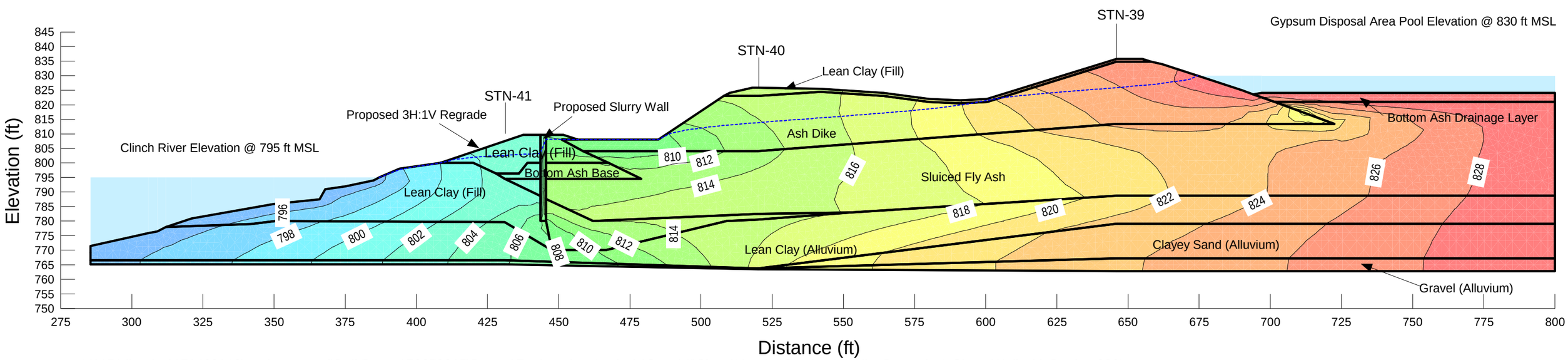
Proposed 3H:1V Upper Dike Regrade and 30' Slurry Wall with Pool at Elevation 830'

Total Head Contours



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SEEP/W Analysis

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Section I-I' Dike Regrade & Slurry Wall with Pool at 830'.gsz

Piping Potential
Maximum Exit Gradient occurs at (385,794)
Total Head = 795 ft
At (385.90,789.93)
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dH = 1.89 ft dl = 5.07 ft
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Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
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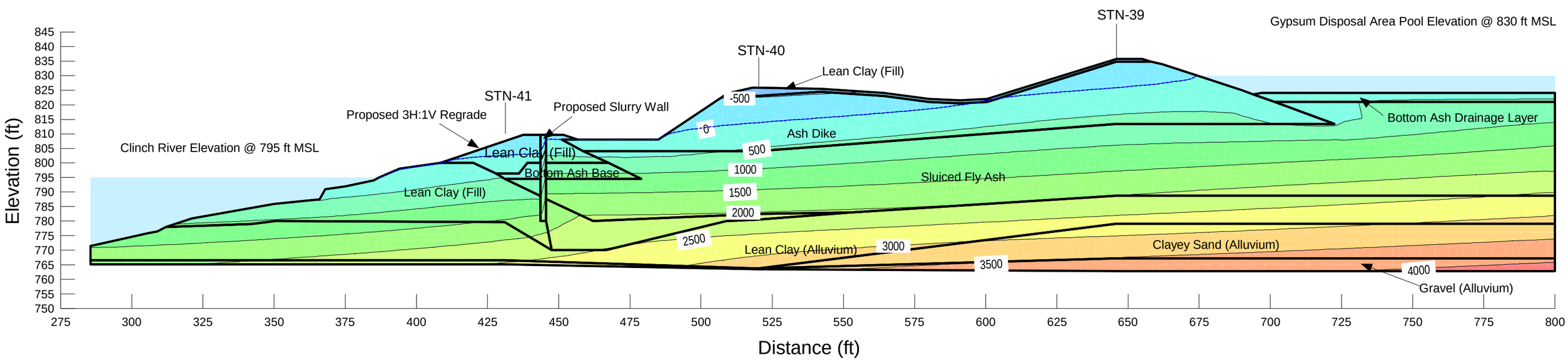
Proposed 3H:1V Upper Dike Regrade and 30' Slurry Wall with Pool at Elevation 830'

Pore Water Pressure Contours



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Slope Stability dMin=20

Cross-Section I-I'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Modified Spencer
File Name: Section I-I' Dike Regrade & Slurry Wall with Pool at 830'.gsz

Note:
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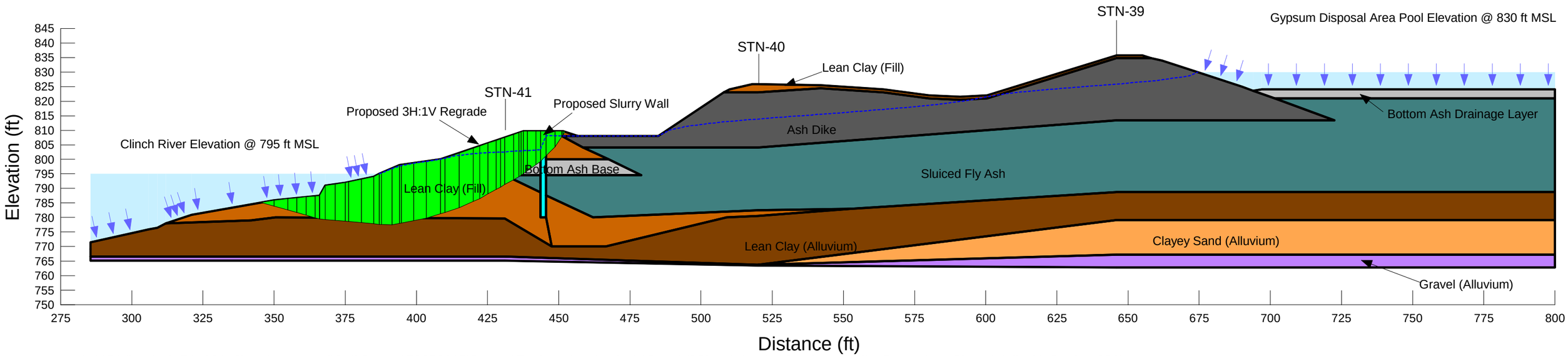
Factor of Safety: 1.6
Center: (386, 856) ft
Radius: 51.28833 ft
Minimum Slip Surface Depth: 20 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Sluiced Fly Ash	100	105	0	25
Lean Clay (Fill)	125	126	0	33
Gravel (Alluvium)	135	135	0	40
Clayey Sand (Alluvium)	112	112	0	33
Lean Clay (Alluvium)	123	123	0	31
Bottom Ash Base	100	105	0	33
Ash Dike	100	105	0	33

Proposed 3H:1V Upper Dike Regrade and 30' Slurry Wall with Pool at Elevation 830'

Global Failure



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SEEP/W Analysis

Cross-Section K-K'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 1A.gsz
(See workplan for file name convention)

Piping Potential
Maximum Exit Gradient occurs at (387.33,808.25)
Total Head = 808.25 ft
At (387.41,802.10)
Total Head = 810.58 ft
dH = 2.25 ft dl = 6.15 ft
i = 0.379 i(criticial) = 0.708
FSpiping = 1.9

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Ash Dike	6.5e-008	0.04	0.46
Silty Sand to Sandy Silt (Alluvium)	0.00226	0.05	0.39
Lean Clay (Alluvium)	4.59e-007	0.05	0.41
Silt (Alluvium)	6.95e-005	0.05	0.39
Sluiced Fly Ash	1.6076e-005	0.02	0.46

Note:
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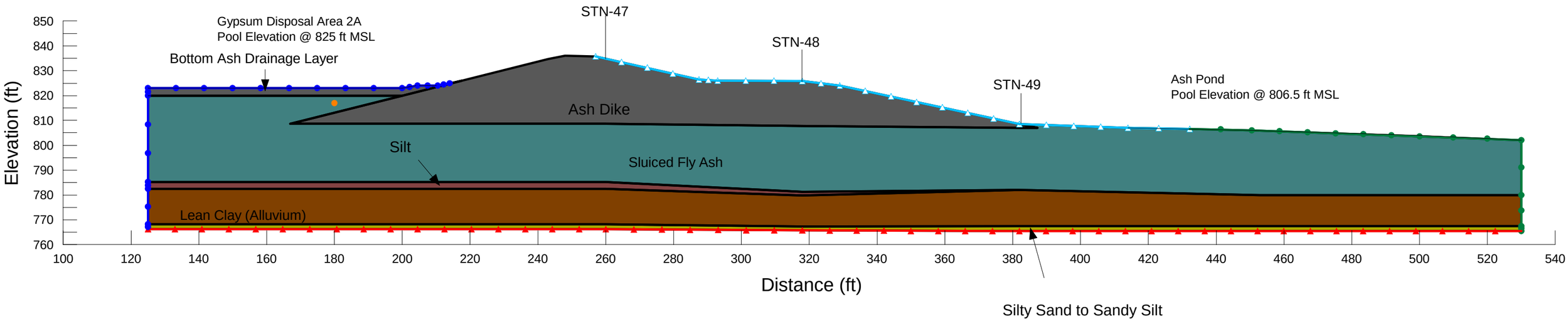
Existing Condition

Subsurface Profile and Boundary Conditions



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SEEP/W Analysis

Cross-Section K-K'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 1A.gsz
(See workplan for file name convention)

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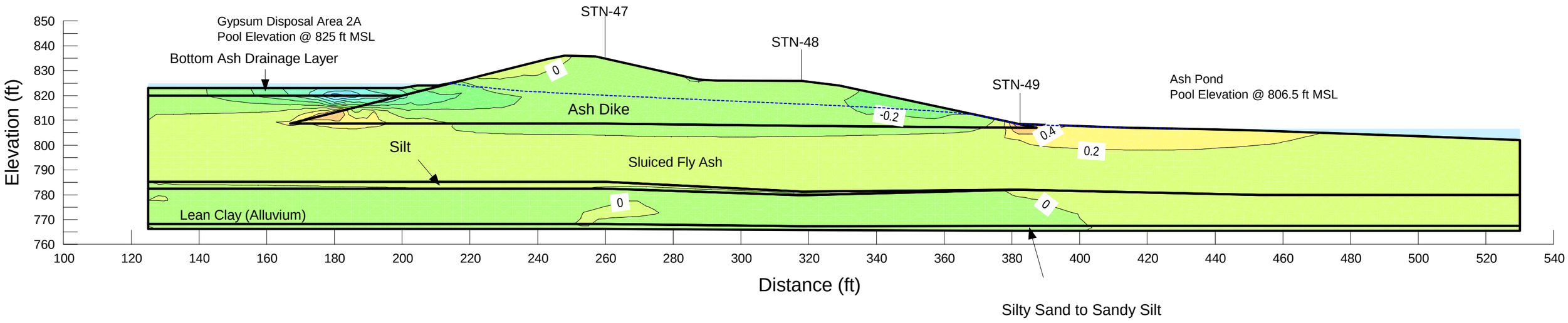
Existing Condition
Vertical Gradient Contours



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SEEP/W Analysis

Cross-Section K-K'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 1A.gsz
(See workplan for file name convention)

Piping Potential
Maximum Exit Gradient occurs at (387.33,808.25)
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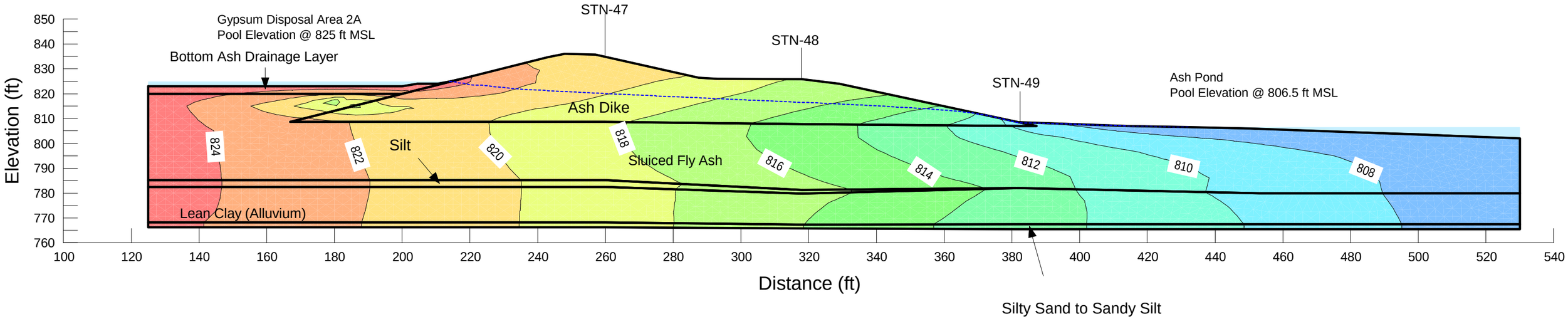
Existing Condition
Total Head Contours



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SEEP/W Analysis

Cross-Section K-K'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 1A.gsz
(See workplan for file name convention)

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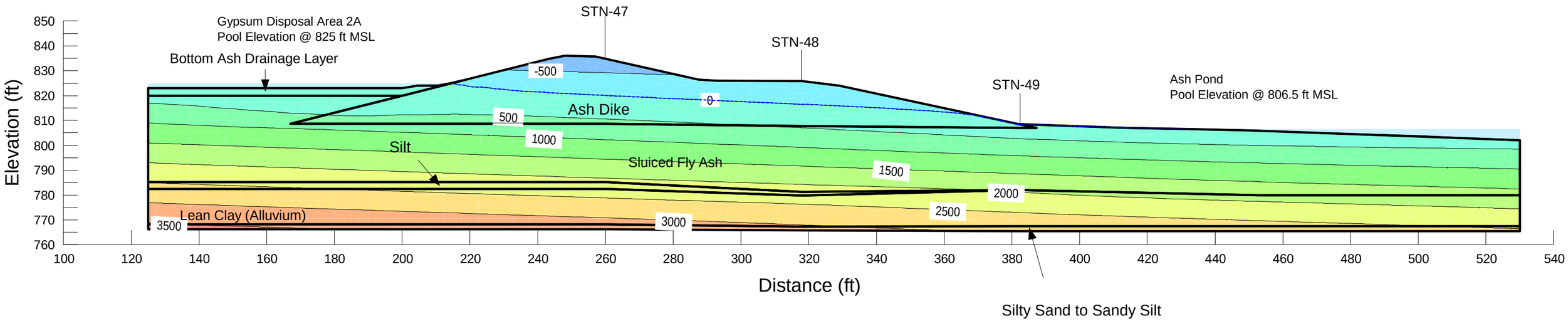
Sluiced Fly Ash	1.6076e-005	0.02	0.46

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Existing Condition
Pore Water Pressure Contours



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Slope Stability

Cross-Section K-K'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

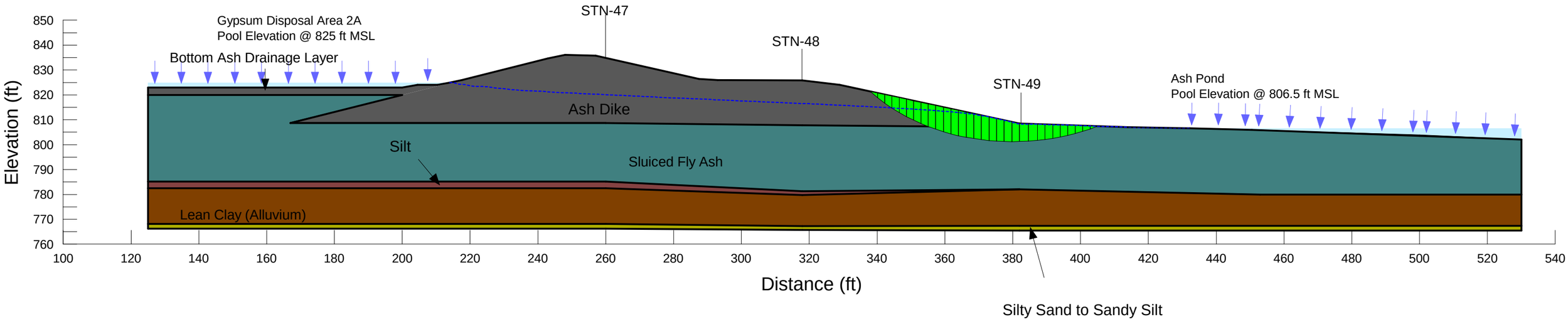
Factor of Safety: 1.2
Center: (380, 855) ft
Radius: 53.802 ft
Minimum Slip Surface Depth: 10 ft

February 2010
Method: Modified Spencer
File Name: 1A.gsz
(See workplan for file name convention)

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Ash Dike	100	105	0	33
Silty Sand to Sandy Silt (Alluvium)	106	107	0	29
Lean Clay (Alluvium)	123	123	0	31
Silt (Alluvium)	108	109	0	28
Sluiced Fly Ash	100	105	0	25

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Existing Condition



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SEEP/W Analysis

Cross-Section K-K'
Gypsum Disposal Area 2A

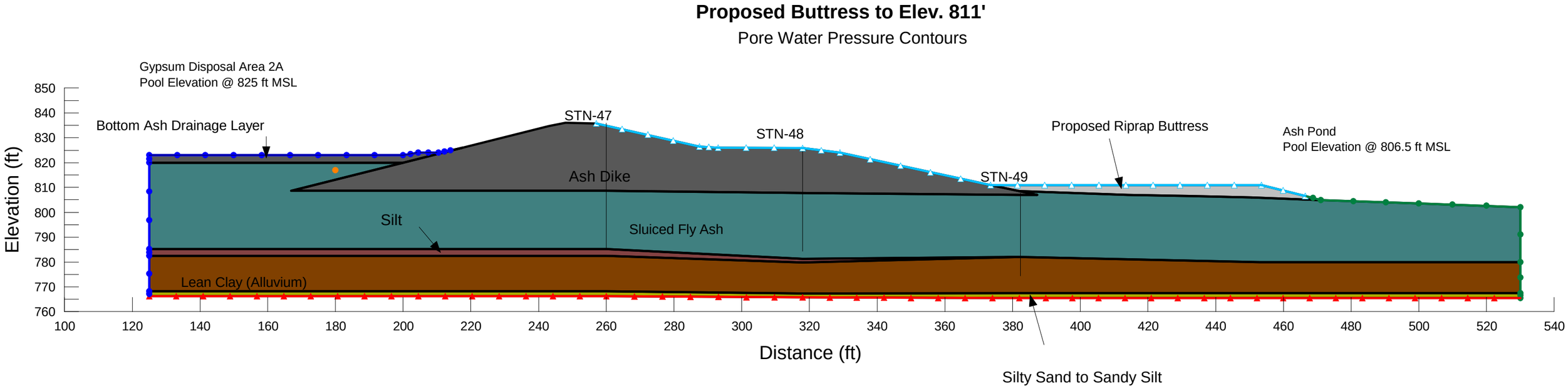
Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 1B.gsz
(See workplan for file name convention)

Piping Potential
Maximum Exit Gradient occurs at (373.45,811)
Total Head = 808.91 ft
At (372.15,807.12)
Total Head = 810.92 ft
dH = 2.01 ft dl = 3.88 ft
i = 0.518 i(criticial) = 0.708
FSpiping = 1.37

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Ash Dike	6.5e-008	0.04	0.36
Silty Sand to Sandy Silt (Alluvium)	0.00226	0.05	0.21
Lean Clay (Alluvium)	4.59e-007	0.05	0.26
Silt (Alluvium)	6.95e-005	0.05	0.21
Sluiced Fly Ash	1.6076e-005	0.02	0.46

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.



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SEEP/W Analysis

Cross-Section K-K'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 1B.gsz
(See workplan for file name convention)

Piping Potential
Maximum Exit Gradient occurs at (373.45,811)
Total Head = 808.91 ft
At (372.15,807.12)
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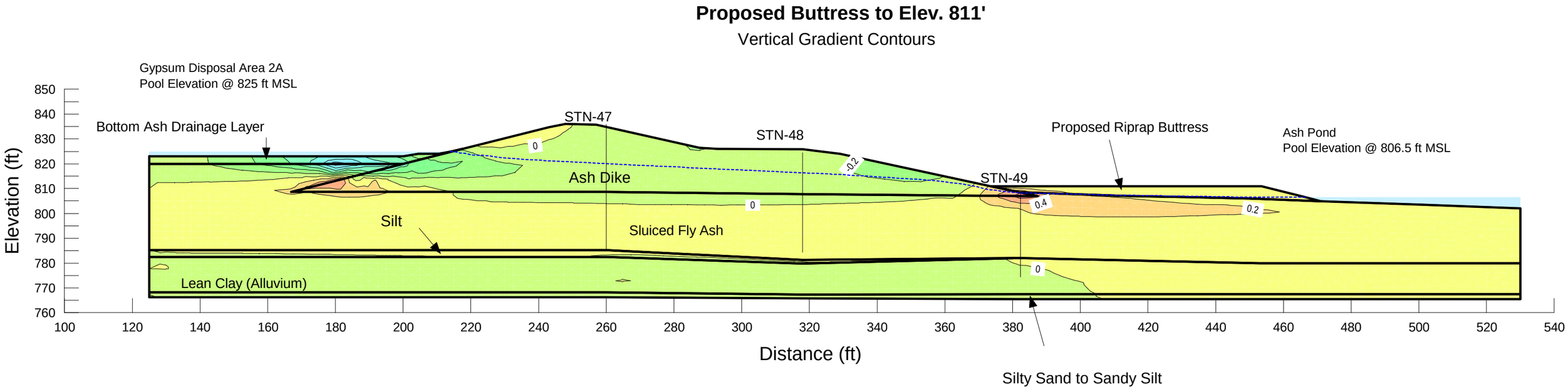

SEEP/W Analysis

Cross-Section K-K'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 1B.gsz
(See workplan for file name convention)

Piping Potential
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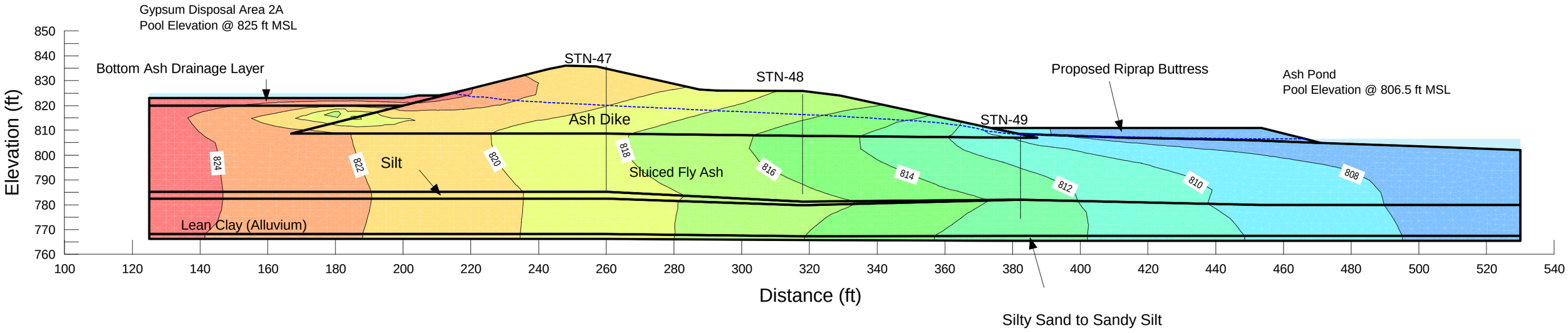
Proposed Buttress to Elev. 811'

Total Head Contours



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SEEP/W Analysis

Cross-Section K-K'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 1B.gsz
(See workplan for file name convention)

Piping Potential
Maximum Exit Gradient occurs at (373.45,811)
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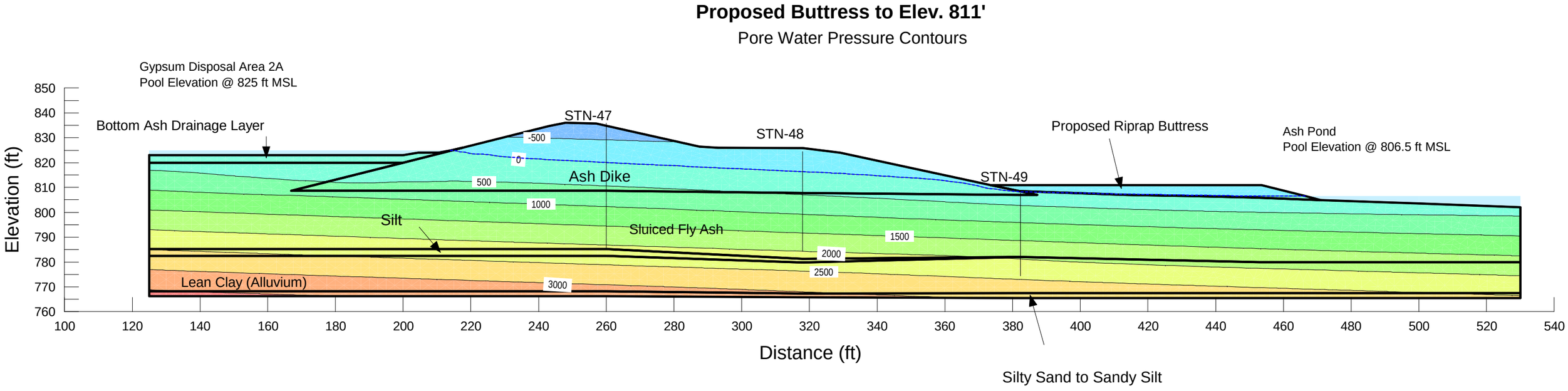


Slope Stability

Cross-Section K-K'
Gypsum Disposal Area 2A

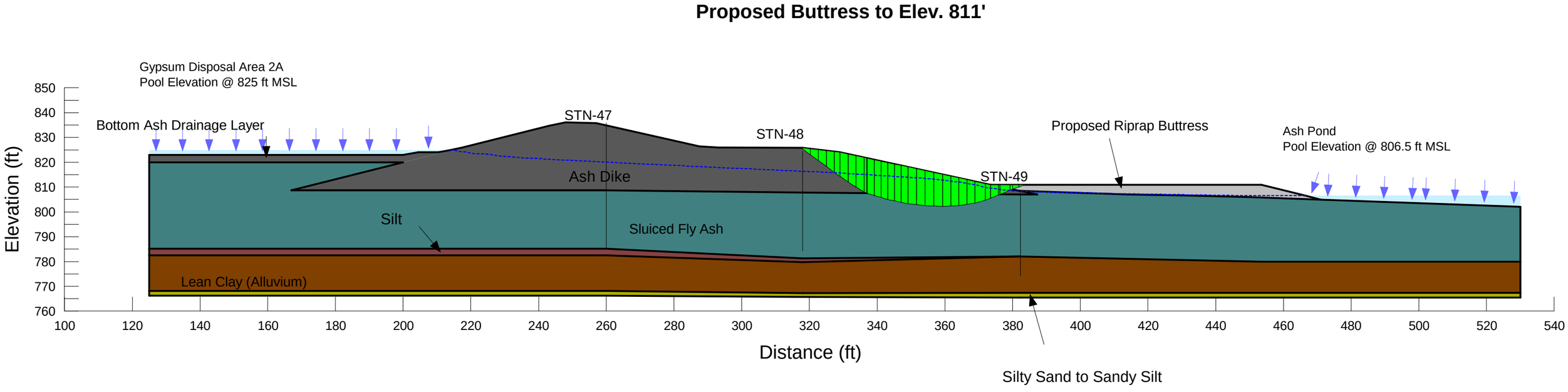
Bull Run Fossil Plant
Tennessee Valley Authority

Factor of Safety: 1.7
Center: (357.5, 850) ft
Radius: 32.66393 ft
Minimum Slip Surface Depth: 10 ft

February 2010
Method: Modified Spencer
File Name: 1B.gsz
(See workplan for file name convention)

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Ash Dike	100	105	0	33
Silty Sand to Sandy Silt (Alluvium)	106	107	0	29
Lean Clay (Alluvium)	123	123	0	31
Silt (Alluvium)	108	109	0	28
Sluiced Fly Ash	100	105	0	25

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.



SEEP/W Analysis

Cross-Section K-K'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 1C.gsz
(See workplan for file name convention)

Piping Potential
Maximum Exit Gradient occurs at (373.45,811)
Total Head = 809.11 ft
At (372.15,807.12)
Total Head = 811.9 ft
dH = 2.79 ft dl = 3.88 ft
i = 0.719 i(criticial) = 0.708
FSpiping = 0.98

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Ash Dike	6.5e-008	0.04	0.36
Silty Sand to Sandy Silt (Alluvium)	0.00226	0.05	0.21
Lean Clay (Alluvium)	4.59e-007	0.05	0.26
Silt (Alluvium)	6.95e-005	0.05	0.21
Sluiced Fly Ash	1.6076e-005	0.02	0.46

Note:
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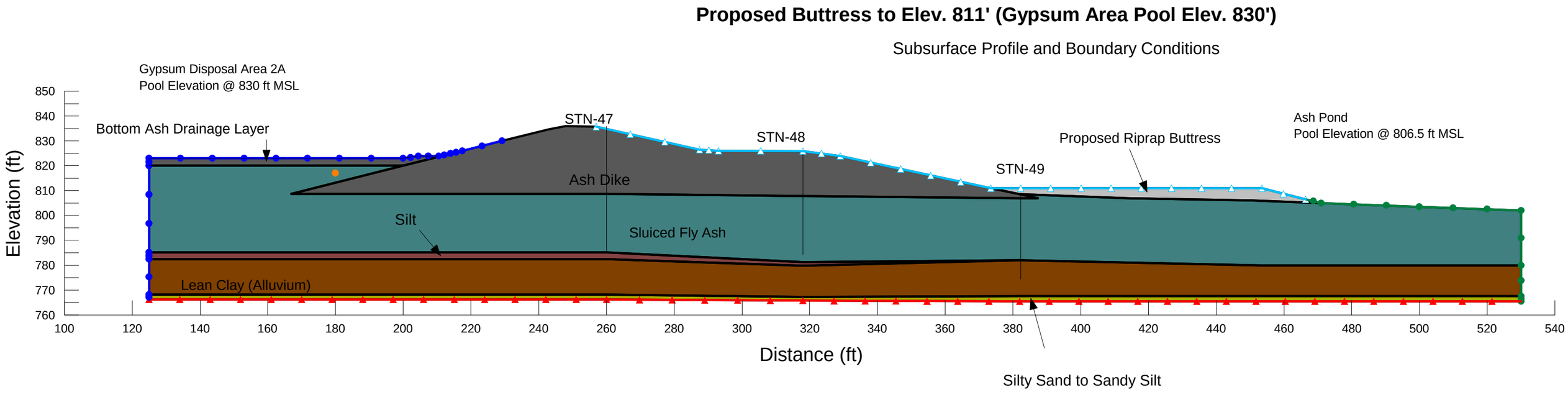

SEEP/W Analysis

Cross-Section K-K'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 1C.gsz
(See workplan for file name convention)

Piping Potential
Maximum Exit Gradient occurs at (373.45,811)
Total Head = 809.11 ft
At (372.15,807.12)
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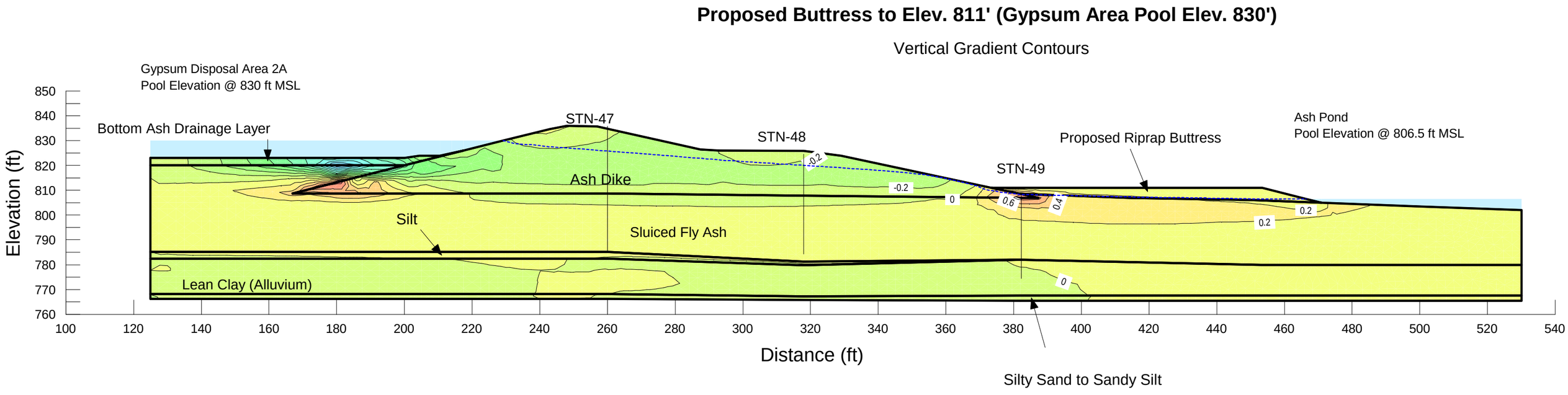

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SEEP/W Analysis

Cross-Section K-K'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 1C.gsz
(See workplan for file name convention)

Piping Potential
Maximum Exit Gradient occurs at (373.45,811)
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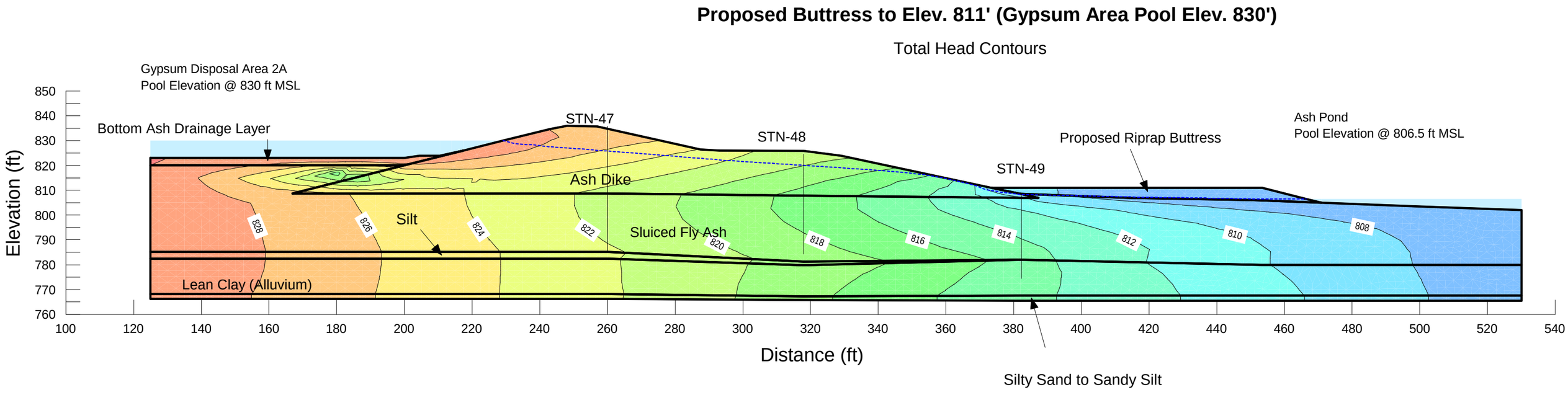

SEEP/W Analysis

Cross-Section K-K'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 1C.gsz
(See workplan for file name convention)

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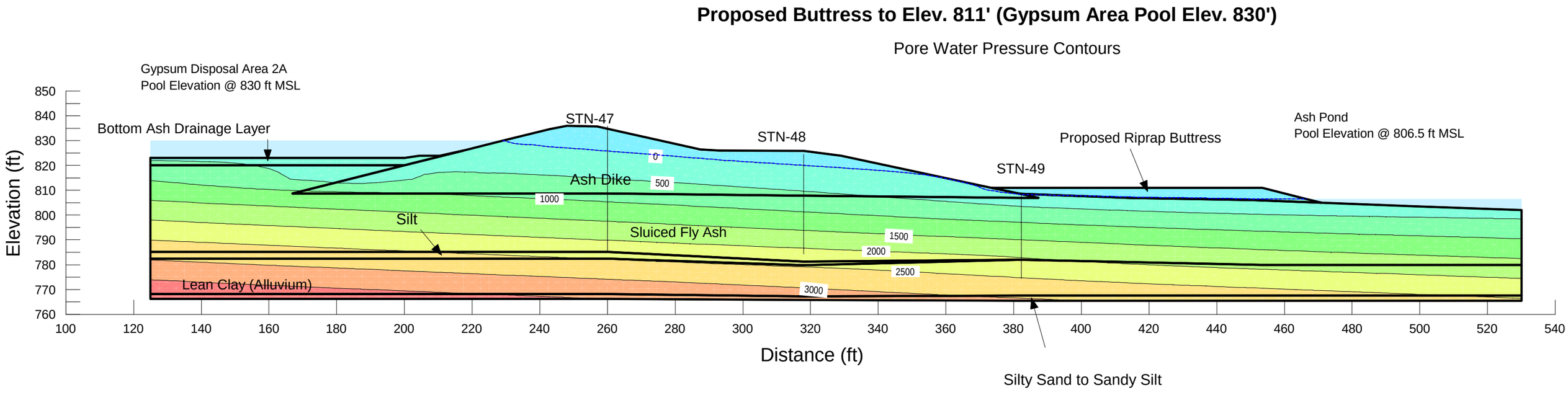

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Slope Stability

Cross-Section K-K'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

Factor of Safety: 1.5
Center: (357.5, 850) ft
Radius: 30.56362 ft
Minimum Slip Surface Depth: 10 ft

February 2010
Method: Modified Spencer
File Name: 1C.gsz
(See workplan for file name convention)

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Ash Dike	100	105	0	33
Silty Sand to Sandy Silt (Alluvium)	106	107	0	29
Lean Clay (Alluvium)	123	123	0	31
Silt (Alluvium)	108	109	0	28
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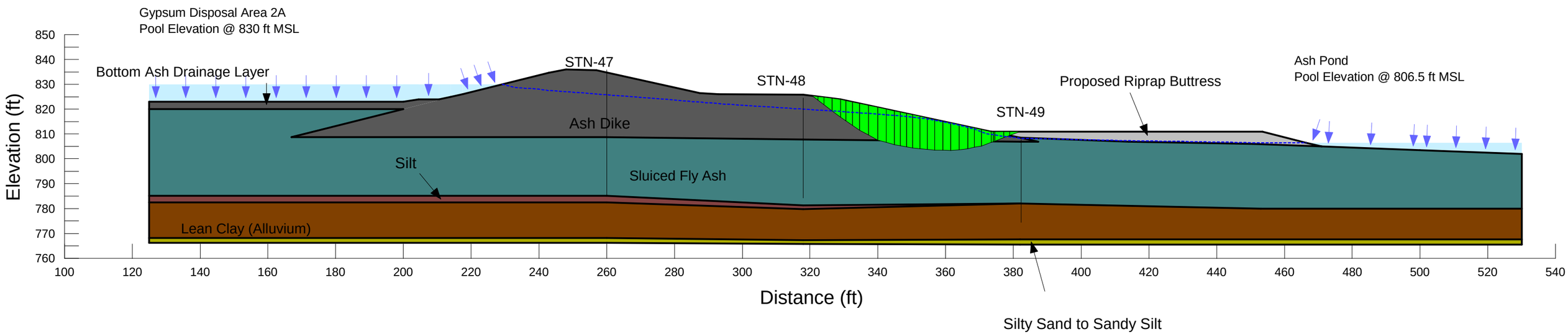
Proposed Buttress to Elev. 811' (Gypsum Area Pool Elev. 830')



SEEP/W Analysis

Cross-Section L-L'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 2A.gsz
(See Workplan for file name convention)

Note:
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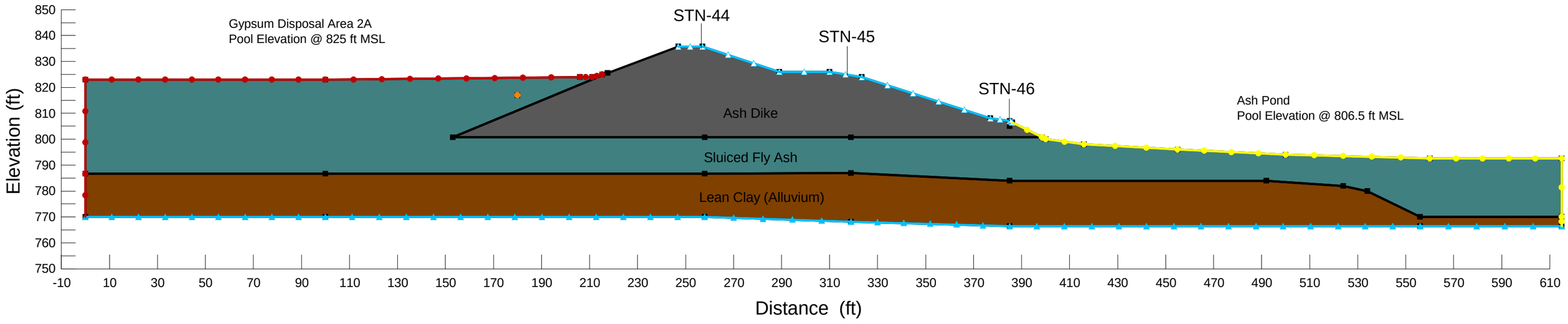
Piping Potential
Maximum Exit Gradient occurs at (400,800)
Total Head = 806.50 ft
At (399.44,796.39)
Total Head = 807.50 ft
dH = 1.0 ft dl = 3.61 ft
i = 0.277 i(criticial) = 0.708
FSpiping = 2.6

Material Type	Ksat	Kratio	Wsat
Lean Clay (Alluvium)	4.593e-007	0.05	0.41
Sluiced Fly Ash	1.61e-005	0.02	0.46
Ash Dike	6.5e-008	0.04	0.46

Existing Condition

Subsurface Profile and Boundary Conditions



SEEP/W Analysis

Cross-Section L-L'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 2A.gsz
(See Workplan for file name convention)

Note:
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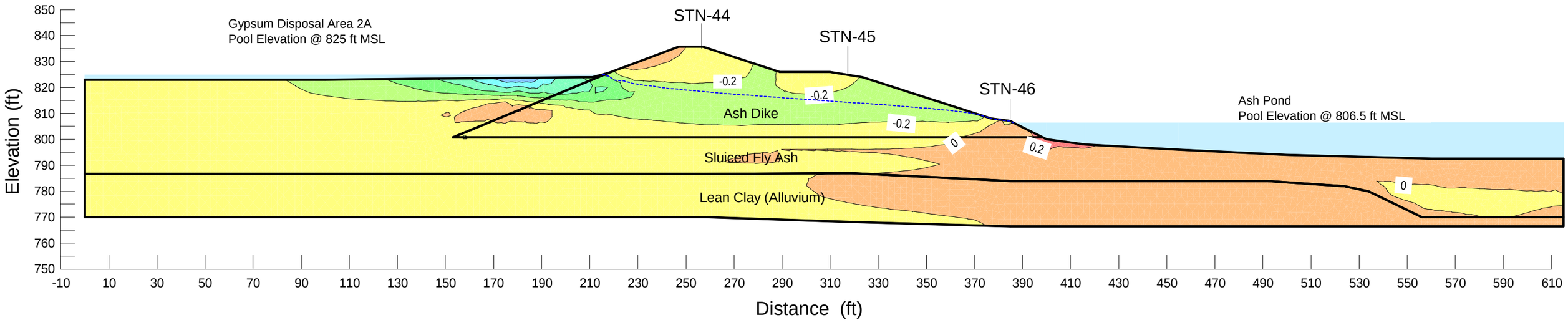
Ash Dike	6.5e-008	0.04	0.46

Existing Condition

Vertical Gradient Contours



SEEP/W Analysis

Cross-Section L-L'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 2A.gsz
(See Workplan for file name convention)

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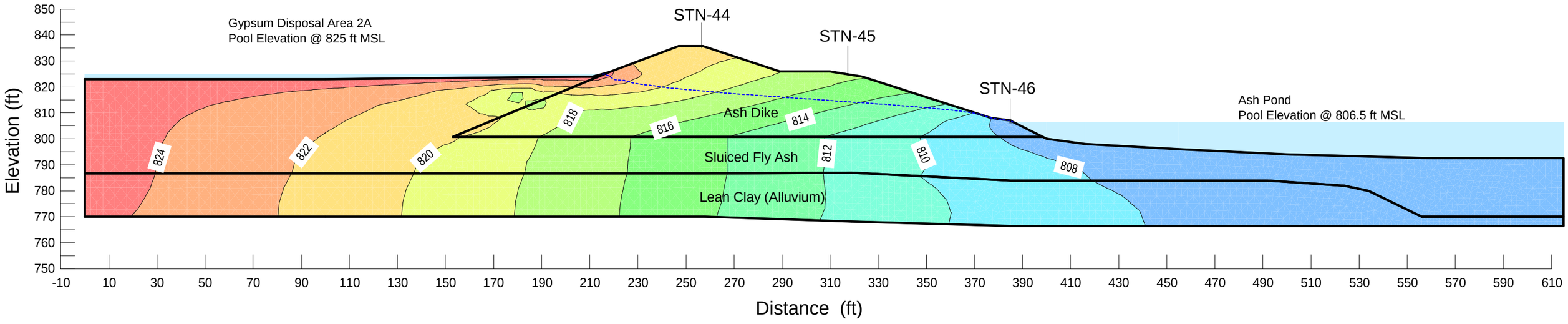
Ash Dike	6.5e-008	0.04	0.46

Existing Condition

Total Head Contours



SEEP/W Analysis

Cross-Section L-L'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 2A.gsz
(See Workplan for file name convention)

Note:
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Total Head = 807.50 ft
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Material Type	Ksat	Kratio	Wsat
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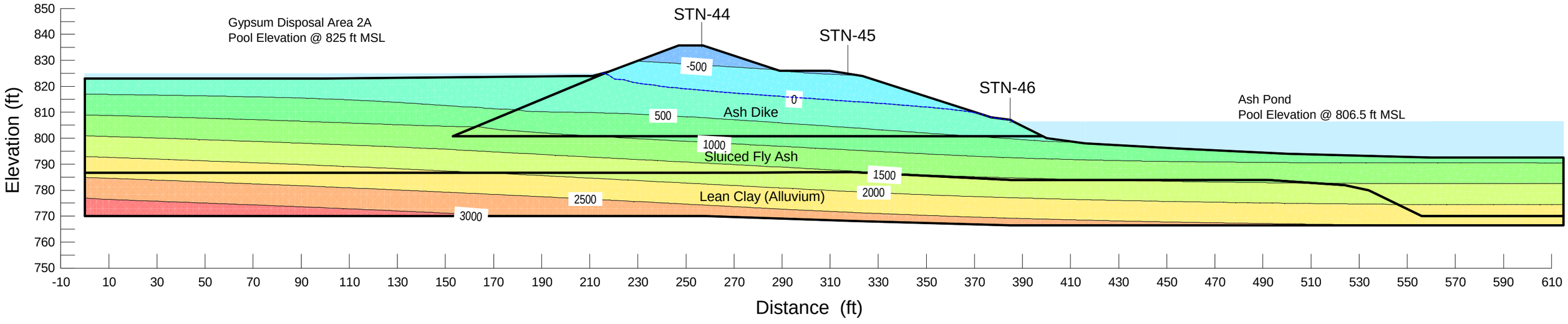
Sluiced Fly Ash	1.61e-005	0.02	0.46
Ash Dike	6.5e-008	0.04	0.46

Existing Condition

Pore Water Pressure Contours



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Slope Stability

Cross-Section L-L'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

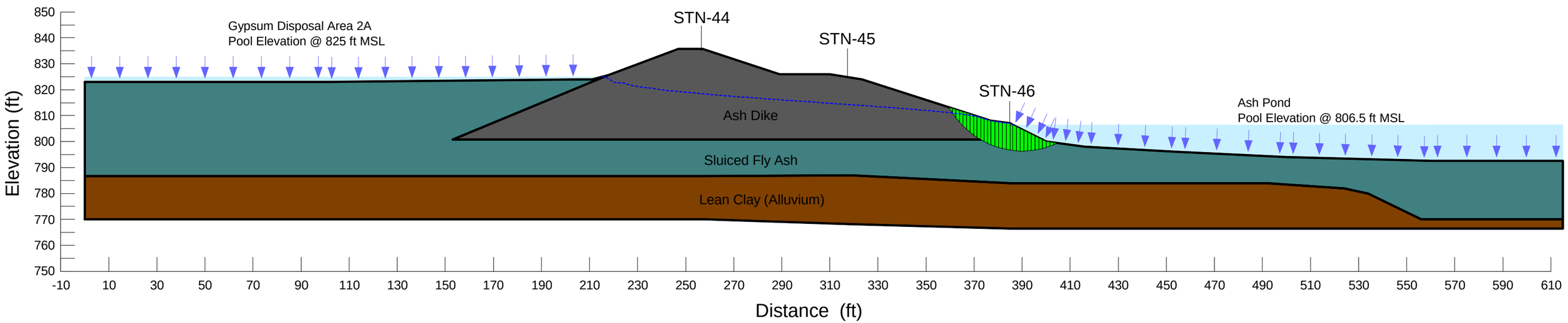
February 2010
Method: Modified Spencer
File Name: 2A.gsz
(See workplan for file name convention)

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Factor of Safety: 1.1
Center: (390, 832.2) ft
Radius: 35.877 ft
Minimum Slip Surface Depth: 10 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Lean Clay (Alluvium)	123	123	0	31
Sluiced Fly Ash	100	105	0	25
Ash Dike	100	105	0	33

Existing Condition



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SEEP/W Analysis

Cross-Section L-L'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 2B.gsz
(See workplan for file name convention)

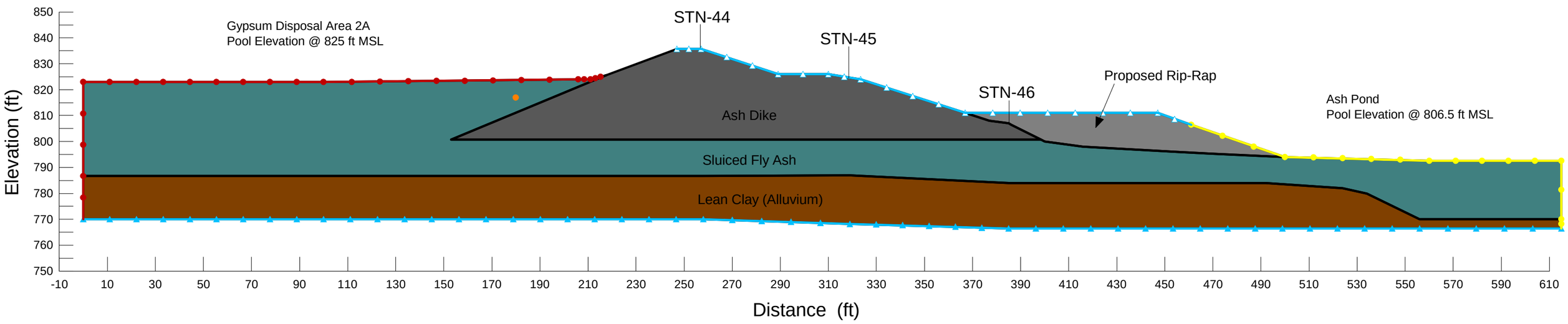
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Material Type	Ksat	Kratio	Wsat
Lean Clay (Alluvium)	4.593e-007	0.05	0.41
Sluiced Fly Ash	1.61e-005	0.02	0.46
Ash Dike	6.5e-008	0.04	0.46
Rip Rap	0.01	1	0.4

Piping Potential
Maximum Exit Gradient occurs at (505,793.88
Total Head = 806.50 ft
At (504.07,788.16)
Total Head = 806.73 ft
dH = 0.23 ft dl = 5.72 ft
i = 0.04 i(criticial) = 0.708
FSpiping = 17.7

Proposed Buttress to Elev. 811'

Subsurface Profile and Boundary Conditions



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SEEP/W Analysis

Cross-Section L-L'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 2B.gsz
(See workplan for file name convention)

Note:
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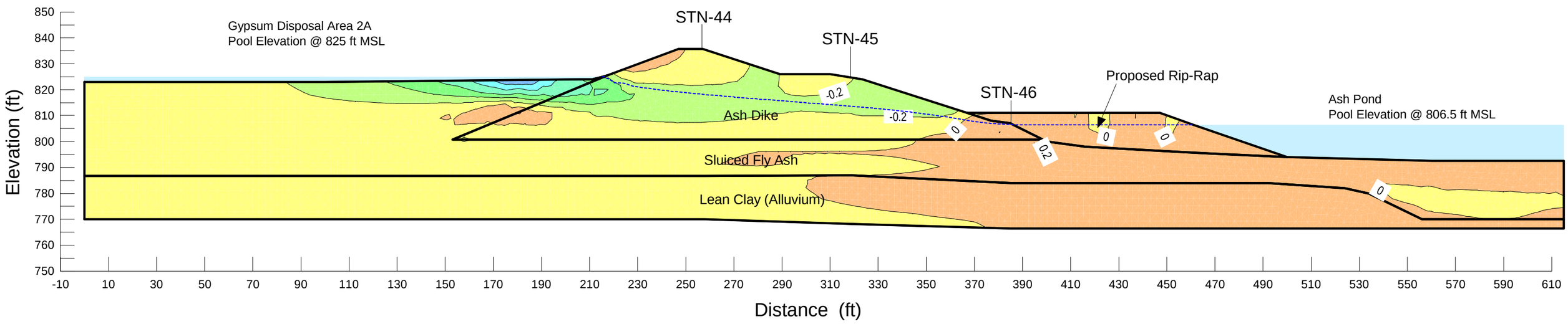
Proposed Buttress to Elev. 811'

Vertical Gradient Contours



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SEEP/W Analysis

Cross-Section L-L'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 2B.gsz
(See workplan for file name convention)

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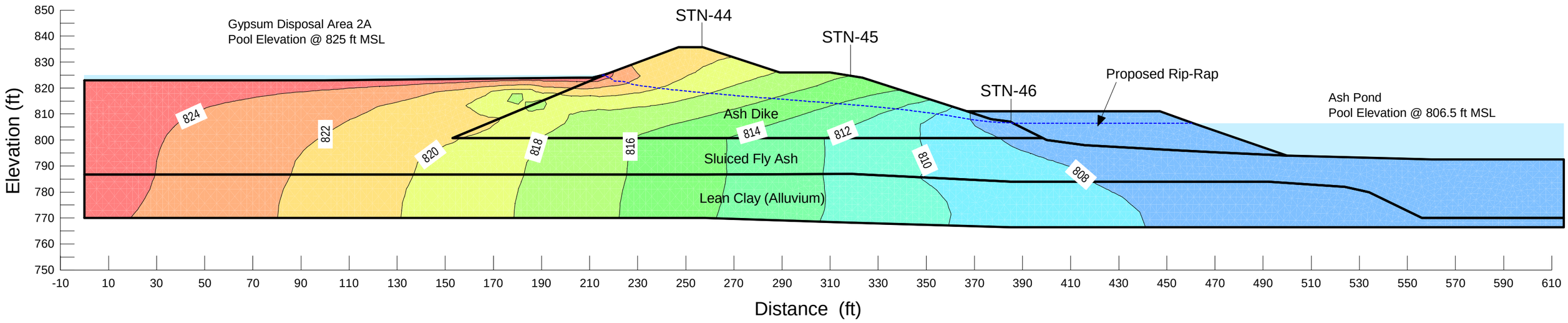
i = 0.04 i(criticial) = 0.708
FSpiping = 17.7

Proposed Buttress to Elev. 811'

Total Head Contours



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SEEP/W Analysis

Cross-Section L-L'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 2B.gsz
(See workplan for file name convention)

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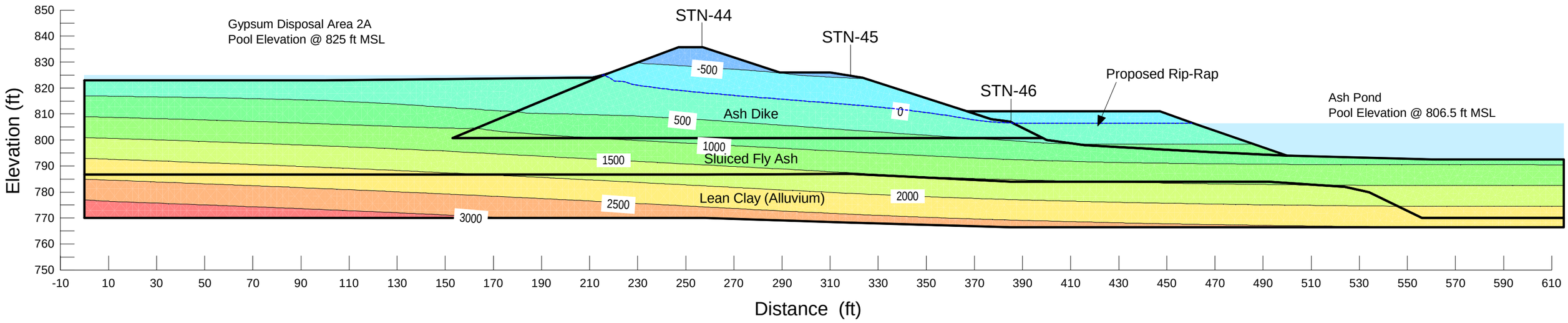
FSpiping = 17.7

Proposed Buttress to Elev. 811'

Pore Water Pressure Contours



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Slope Stability (Slope Failure)

Cross-Section L-L'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Modified Spencer
File Name: 2B.gsz
(See workplan for file name convention)

Note:
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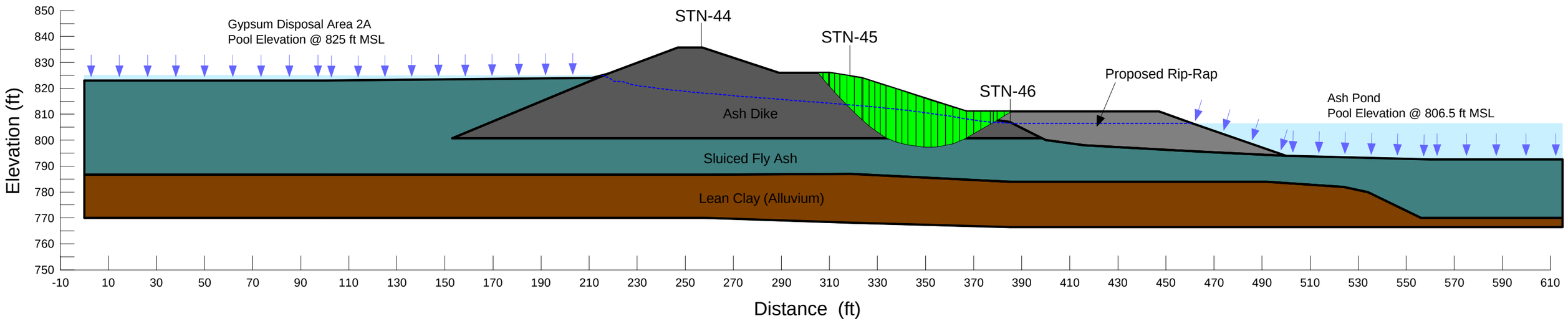
Factor of Safety: 2.3
Center: (350.966, 843.553) ft
Radius: 39.00674 ft
Minimum Slip Surface Depth: 10 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Lean Clay (Alluvium)	123	123	0	31
Sluiced Fly Ash	100	105	0	25
Ash Dike	100	105	0	33
Rip Rap	115	115	0	40

Proposed Buttress to Elev. 811'



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SEEP/W Analysis

Cross-Section L-L'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 2C.gsz
(See workplan for file name convention)

Note:
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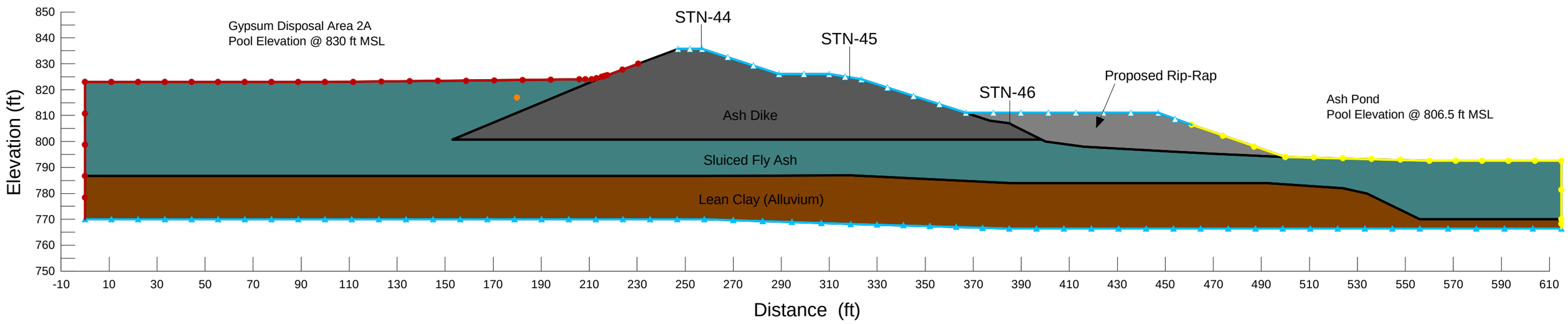
Material Type	Ksat	Kratio	Wsat
Lean Clay (Alluvium)	4.593e-007	0.05	0.41
Sluiced Fly Ash	1.61e-005	0.02	0.46
Ash Dike	6.5e-008	0.04	0.46
Rip Rap	0.01	1	0.4

Piping Potential
Maximum Exit Gradient occurs at (505,793.88)
Total Head = 806.50 ft
At (504.07,788.16)
Total Head = 806.79 ft
dH = 0.29 ft dl = 5.72 ft
i = 0.05 i(criticial) = 0.708
FSpiping = 14.2

Proposed Buttress to Elev. 811', Gypsum Pool Area Elev. 830'

Subsurface Profile and Boundary Conditions



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SEEP/W Analysis

Cross-Section L-L'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 2C.gsz
(See workplan for file name convention)

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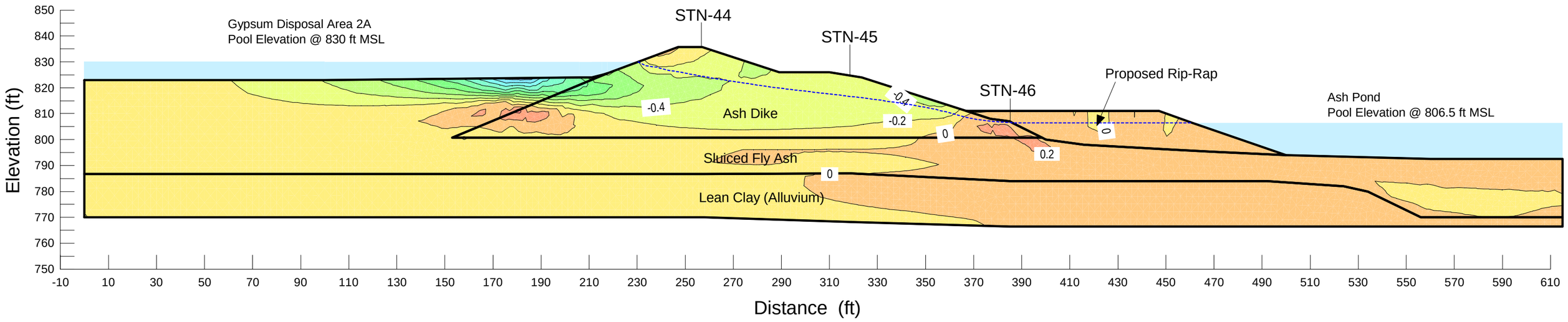
FSpiping = 14.2

Proposed Buttress to Elev. 811', Gypsum Pool Area Elev. 830'

Vertical Gradient Contours



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SEEP/W Analysis

Cross-Section L-L'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 2C.gsz
(See workplan for file name convention)

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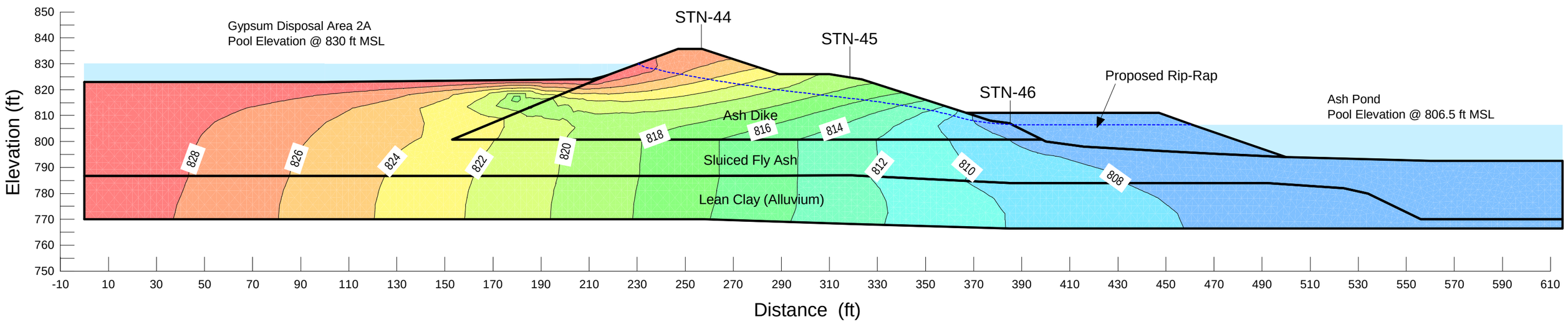
Proposed Buttress to Elev. 811', Gypsum Pool Area Elev. 830'

Total Head Contours



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SEEP/W Analysis

Cross-Section L-L'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: 2C.gsz
(See workplan for file name convention)

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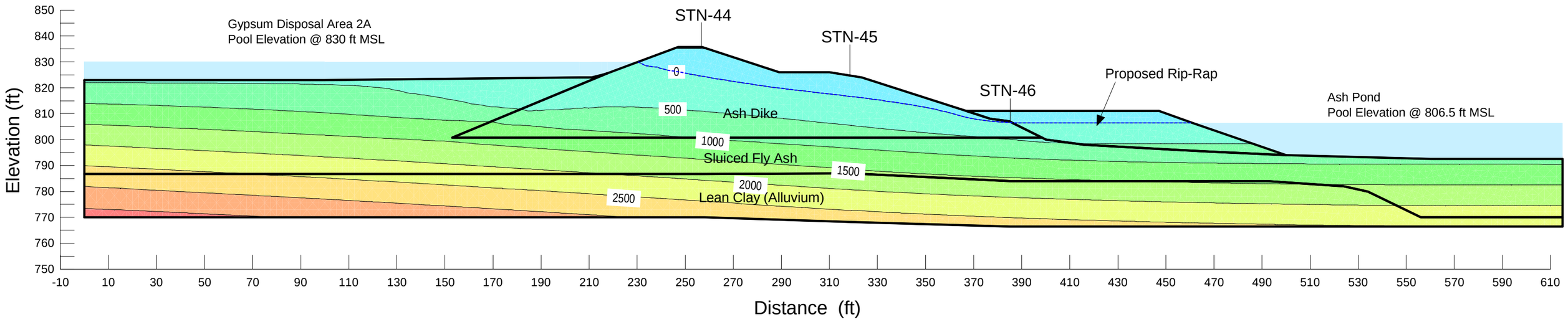
FSpiping = 14.2

Proposed Buttress to Elev. 811', Gypsum Pool Area Elev. 830'

Pore Water Pressure Contours



V:\1714\active\171468118\environmental\Bull Run - 172679015\Report\Engineering Analysis\Sect L-L'\Slope\2C.gsz

Slope Stability (Slope Failure)

Cross-Section L-L'
Gypsum Disposal Area 2A

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Modified Spencer
File Name: 2C.gsz
(See workplan for file name convention)

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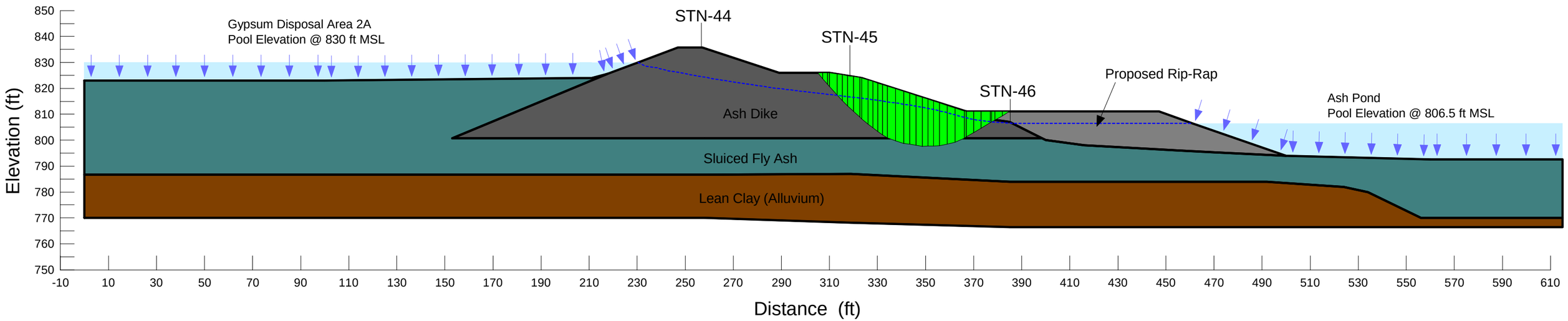
Factor of Safety: 2.2
Center: (350.966, 843.553) ft
Radius: 38.62748 ft
Minimum Slip Surface Depth: 10 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Lean Clay (Alluvium)	123	123	0	31
Sluiced Fly Ash	100	105	0	25
Ash Dike	100	105	0	33
Rip Rap	115	115	0	40

Proposed Buttress to Elev. 811', Gypsum Pool Area Elev. 830'



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SEEP/W Analysis

Cross-Section N-N'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section N-N' existing conditions (Global).gsz

Note:
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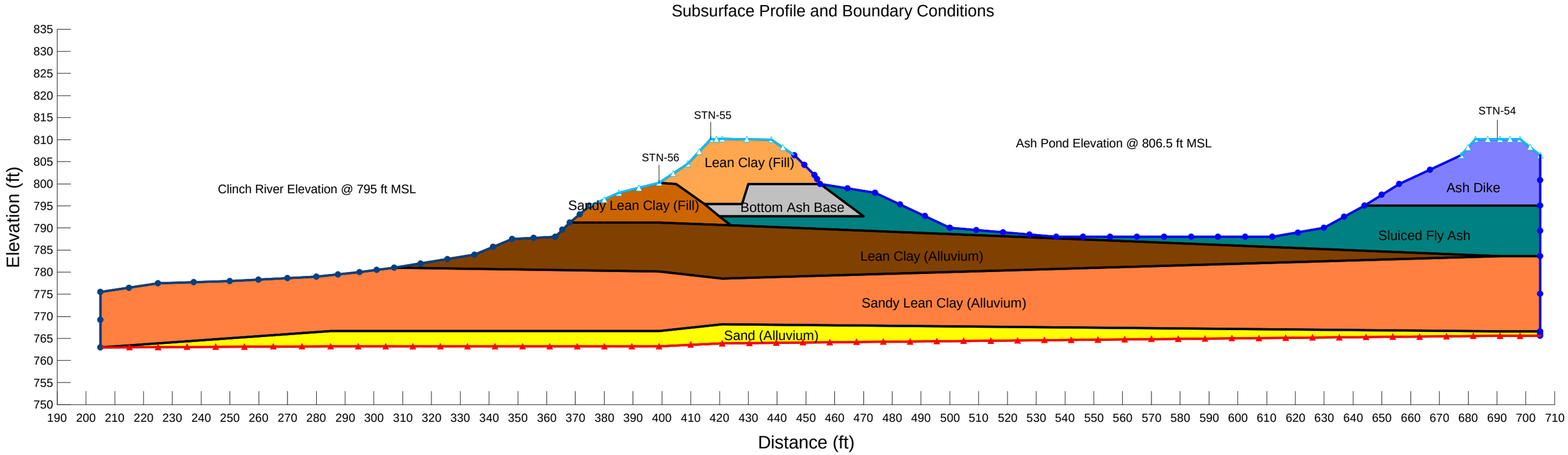
Piping Potential
Maximum Exit Gradient occurs at (375,795)
Total Head = 795 ft
At (373.17,791.2)
Total Head = 795.86 ft
dH = 0.86 ft dl = 3.8 ft
i = 0.226 i(criticial) = 1.046
FSpiping = 4.6

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Ash Dike	6.5e-008	0.04	0.46
Sluiced Fly Ash	1.6e-005	0.02	0.46
Sandy Lean Clay (Fill)	2.8e-007	0.1	0.38
Lean Clay (Fill)	2.3e-007	0.1	0.41
Lean Clay (Alluvium)	4.6e-007	0.05	0.41
Sand (Alluvium)	5.3e-006	0.02	0.39
Sandy Lean Clay (Alluvium)	2.8e-007	0.05	0.38
Bottom Ash Base	6.5e-008	0.04	0.46

Existing Conditions



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SEEP/W Analysis

Cross-Section N-N'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section N-N' existing conditions (Global).gsz

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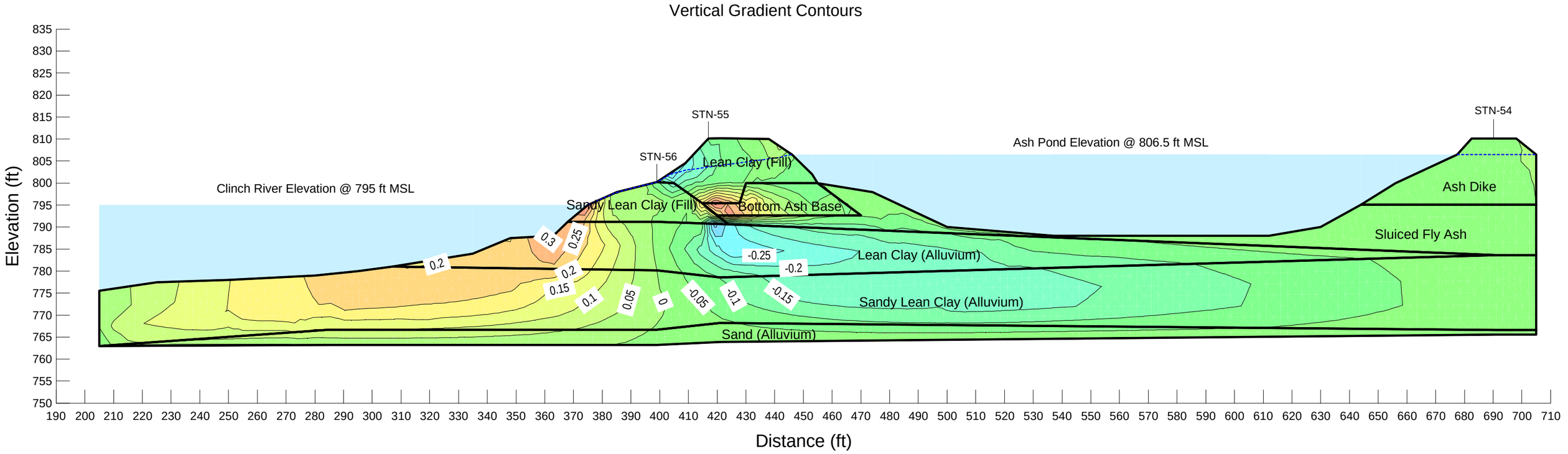

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SEEP/W Analysis

Cross-Section N-N'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section N-N' existing conditions (Global).gsz

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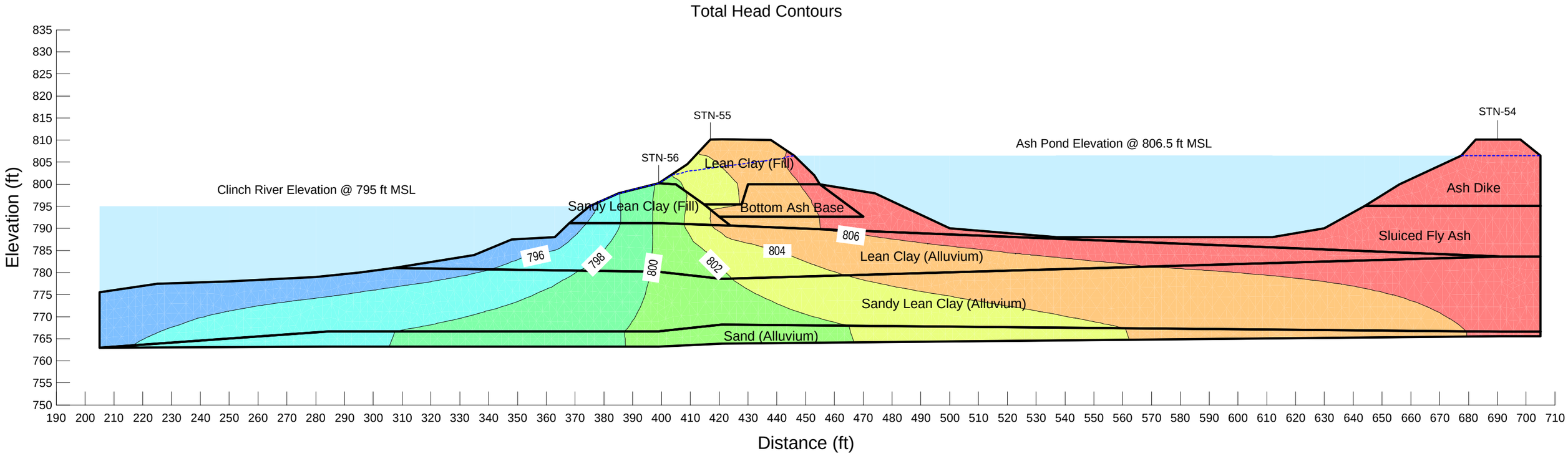
Existing Conditions



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SEEP/W Analysis

Cross-Section N-N'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section N-N' existing conditions (Global).gsz

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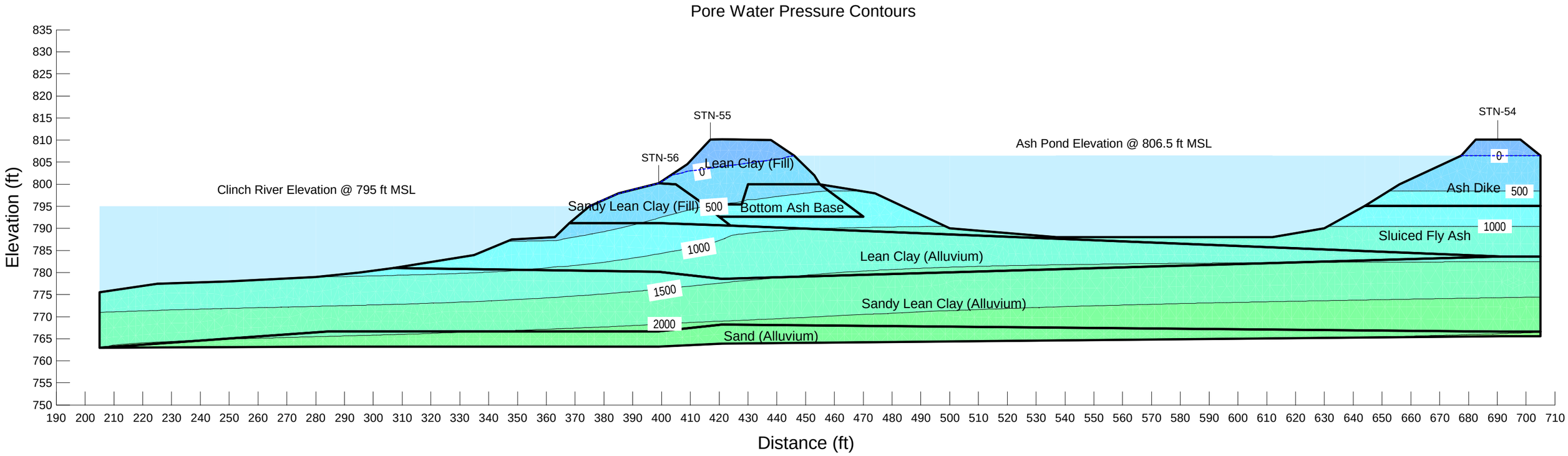
Sand (Alluvium)	5.3e-006	0.02	0.39
Sandy Lean Clay (Alluvium)	2.8e-007	0.05	0.38
Bottom Ash Base	6.5e-008	0.04	0.46

Existing Conditions



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Slope Stability dMin=20

Cross-Section N-N'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

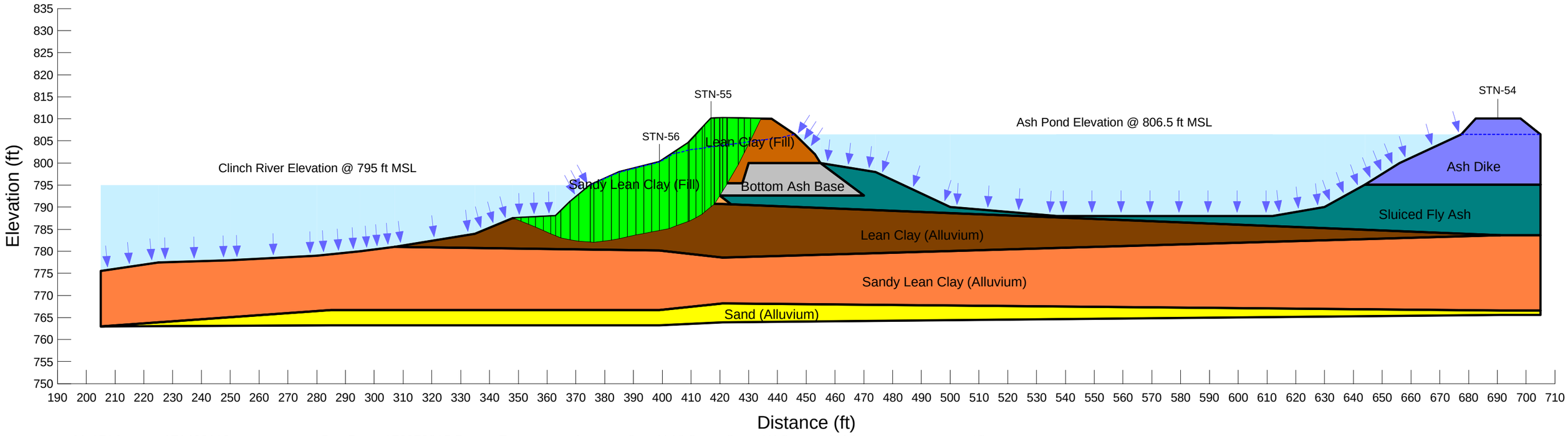
February 2010
Method: Modified Spencer
File Name: Slope W Section N-N' existing conditions (Global).gsz

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Factor of Safety: 1.4
Center: (381.645, 858.5) ft
Radius: 43.19965 ft
Minimum Slip Surface Depth: 20 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Ash Dike	100	105	0	25
Sluiced Fly Ash	100	105	0	25
Sandy Lean Clay (Fill)	125	126	0	33
Lean Clay (Fill)	125	126	0	33
Lean Clay (Alluvium)	123	123	0	31
Sand (Alluvium)	120	120	0	33
Sandy Lean Clay (Alluvium)	126	127	0	33
Bottom Ash Base	100	105	0	33

Existing Conditions
Global Failure



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Slope Stability dMin=10

Cross-Section N-N'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

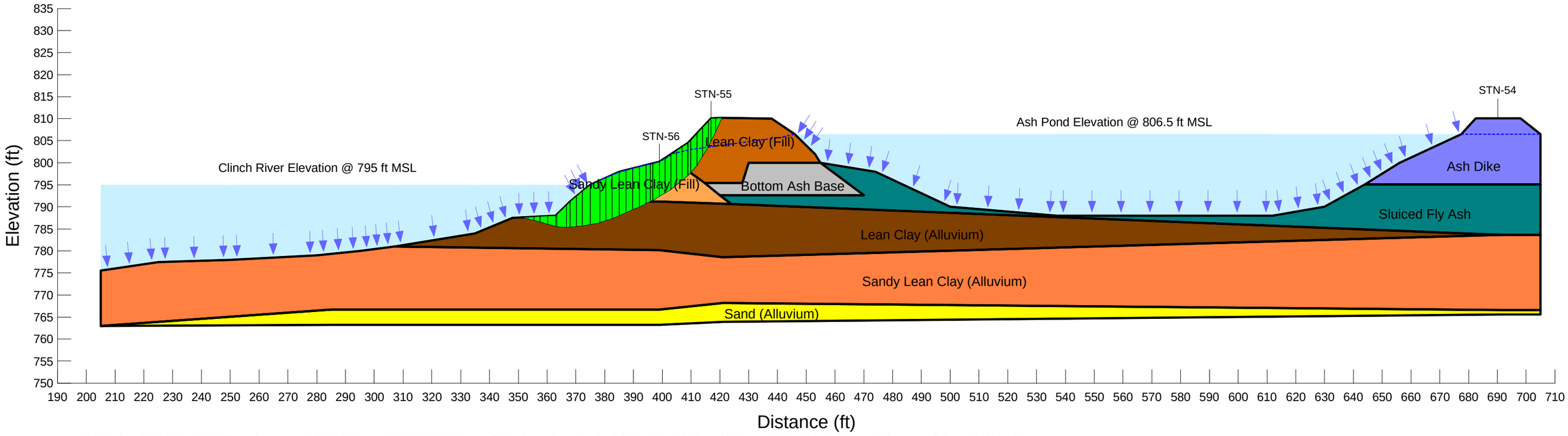
February 2010
Method: Modified Spencer
File Name: Slope W Section N-N' existing conditions (Global).gsz

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Factor of Safety: 1.1
Center: (373.645, 842) ft
Radius: 36.5009 ft
Minimum Slip Surface Depth: 10 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Ash Dike	100	105	0	25
Sluiced Fly Ash	100	105	0	25
Sandy Lean Clay (Fill)	125	126	0	33
Lean Clay (Fill)	125	126	0	33
Lean Clay (Alluvium)	123	123	0	31
Sand (Alluvium)	120	120	0	33
Sandy Lean Clay (Alluvium)	126	127	0	33
Bottom Ash Base	100	105	0	33

Existing Conditions
Non-Global Failure



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SEEP/W Analysis

Cross-Section N-N'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section N-N' buttress.gsz

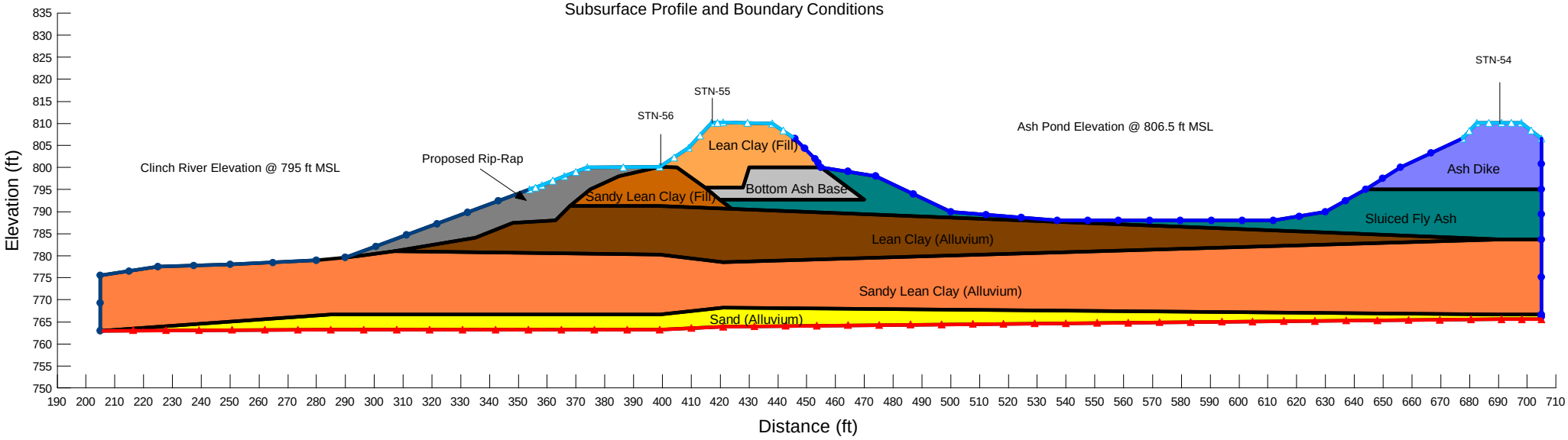
Piping Potential
Maximum Exit Gradient occurs at (280,779)
Total Head = 795 ft
At (278.94,772.05)
Total Head = 796.43 ft
dH = 1.43 ft dl = 6.95 ft
i = 0.206 i(criticial) = 1.046
FSpiping = 5.08

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Ash Dike	6.496e-008	0.04	0.46
Sluiced Fly Ash	1.6076e-005	0.02	0.46
Sandy Lean Clay (Fill)	2.7887e-007	0.1	0.38
Lean Clay (Fill)	2.297e-007	0.1	0.41
Lean Clay (Alluvium)	4.593e-007	0.05	0.41
Sand (Alluvium)	5.3477e-006	0.02	0.39
Sandy Lean Clay (Alluvium)	2.7887e-007	0.05	0.38
Bottom Ash Base	6.5e-008	0.04	0.46
Rip Rap	0.01	1	0.4

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Proposed Rip-Rap Buttress

Subsurface Profile and Boundary Conditions



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SEEP/W Analysis

Cross-Section N-N'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section N-N' buttress.gsz

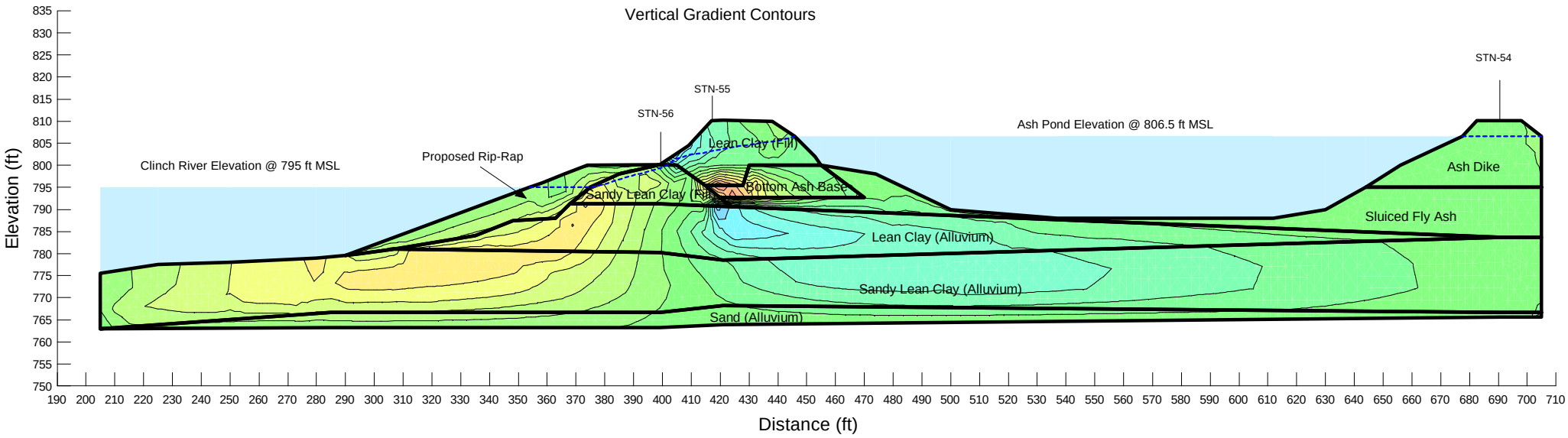
Piping Potential
Maximum Exit Gradient occurs at (280,779)
Total Head = 795 ft
At (278.94,772.05)
Total Head = 796.43 ft
dH = 1.43 ft dl = 6.95 ft
i = 0.206 i(criticial) = 1.046
FSpiping = 5.08

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Ash Dike	6.496e-008	0.04	0.46
Sluiced Fly Ash	1.6076e-005	0.02	0.46
Sandy Lean Clay (Fill)	2.7887e-007	0.1	0.38
Lean Clay (Fill)	2.297e-007	0.1	0.41
Lean Clay (Alluvium)	4.593e-007	0.05	0.41
Sand (Alluvium)	5.3477e-006	0.02	0.39
Sandy Lean Clay (Alluvium)	2.7887e-007	0.05	0.38
Bottom Ash Base	6.5e-008	0.04	0.46
Rip Rap	0.01	1	0.4

Proposed Rip-Rap Buttress

Vertical Gradient Contours



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SEEP/W Analysis

Cross-Section N-N'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section N-N' buttress.gsz

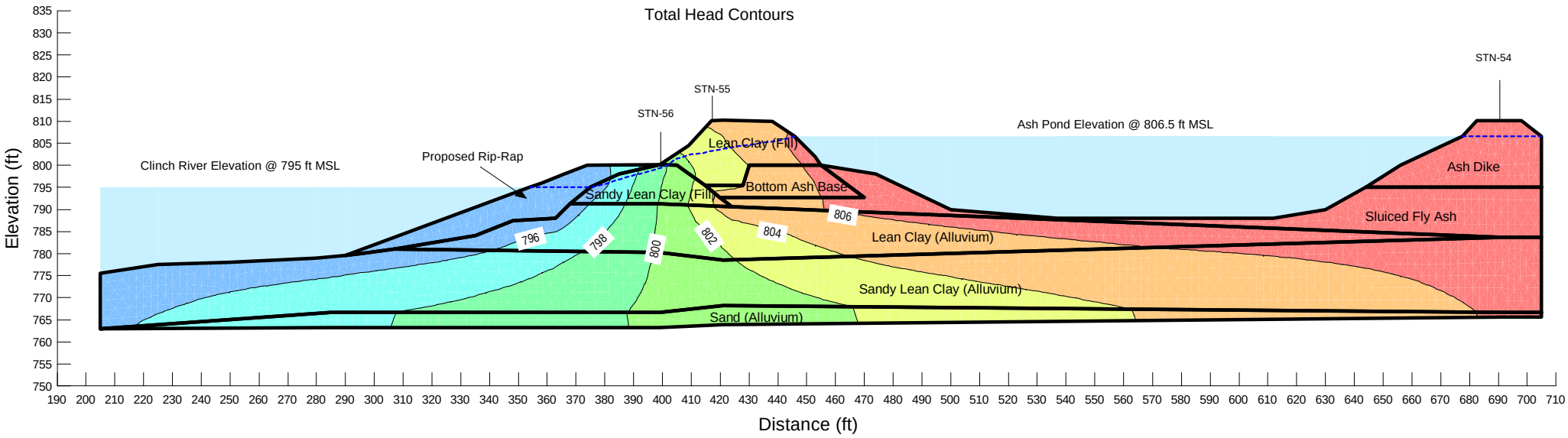
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (280,779)
Total Head = 795 ft
At (278.94,772.05)
Total Head = 796.43 ft
dH = 1.43 ft dl = 6.95 ft
i = 0.206 i(criticial) = 1.046
FSpiping = 5.08

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Ash Dike	6.496e-008	0.04	0.46
Sluiced Fly Ash	1.6076e-005	0.02	0.46
Sandy Lean Clay (Fill)	2.7887e-007	0.1	0.38
Lean Clay (Fill)	2.297e-007	0.1	0.41
Lean Clay (Alluvium)	4.593e-007	0.05	0.41
Sand (Alluvium)	5.3477e-006	0.02	0.39
Sandy Lean Clay (Alluvium)	2.7887e-007	0.05	0.38
Bottom Ash Base	6.5e-008	0.04	0.46
Rip Rap	0.01	1	0.4

Proposed Rip-Rap Buttress

Total Head Contours



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SEEP/W Analysis

Cross-Section N-N'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section N-N' buttress.gsz

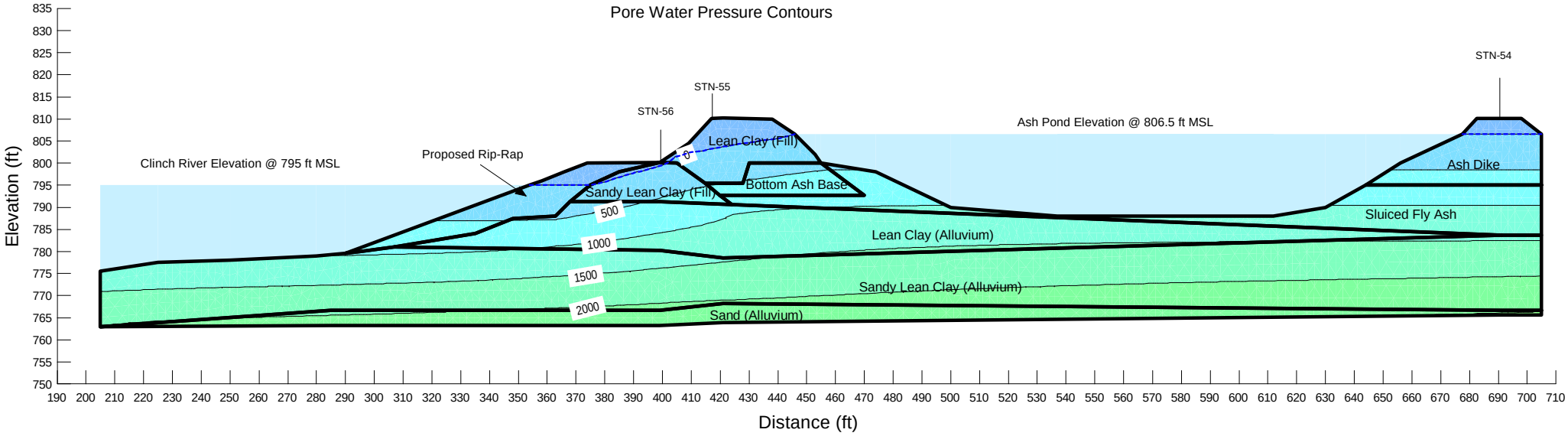
Piping Potential
Maximum Exit Gradient occurs at (280,779)
Total Head = 795 ft
At (278.94,772.05)
Total Head = 796.43 ft
dH = 1.43 ft dl = 6.95 ft
i = 0.206 i(criticial) = 1.046
FSpiping = 5.08

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Ash Dike	6.496e-008	0.04	0.46
Sluiced Fly Ash	1.6076e-005	0.02	0.46
Sandy Lean Clay (Fill)	2.7887e-007	0.1	0.38
Lean Clay (Fill)	2.297e-007	0.1	0.41
Lean Clay (Alluvium)	4.593e-007	0.05	0.41
Sand (Alluvium)	5.3477e-006	0.02	0.39
Sandy Lean Clay (Alluvium)	2.7887e-007	0.05	0.38
Bottom Ash Base	6.5e-008	0.04	0.46
Rip Rap	0.01	1	0.4

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Proposed Rip-Rap Buttress

Pore Water Pressure Contours



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Slope Stability

Cross-Section N-N'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

January 2010
Method: Modified Spencer
File Name: Slope W Section N-N' buttress.gsz

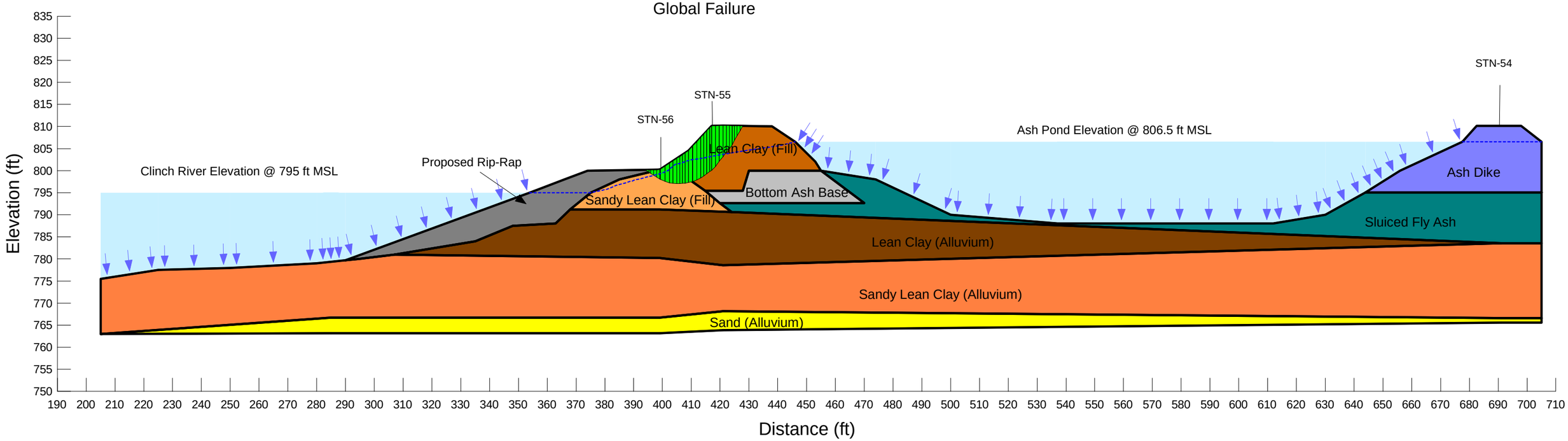
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Factor of Safety: 1.7
Center: (405, 831) ft
Radius: 17.91326 ft
Minimum Slip Surface Depth: 10 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Ash Dike	100	105	0	25
Sluiced Fly Ash	100	105	0	25
Sandy Lean Clay (Fill)	125	126	0	33
Lean Clay (Fill)	125	126	0	33
Lean Clay (Alluvium)	123	123	0	31
Sand (Alluvium)	120	120	0	33
Sandy Lean Clay (Alluvium)	126	127	0	33
Bottom Ash Base	100	105	0	33
Rip Rap	115	115	0	40

Proposed Rip-Rap Buttress

Global Failure



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SEEP/W Analysis

Cross-Section N-N'
Fly Ash Disposal Area 2

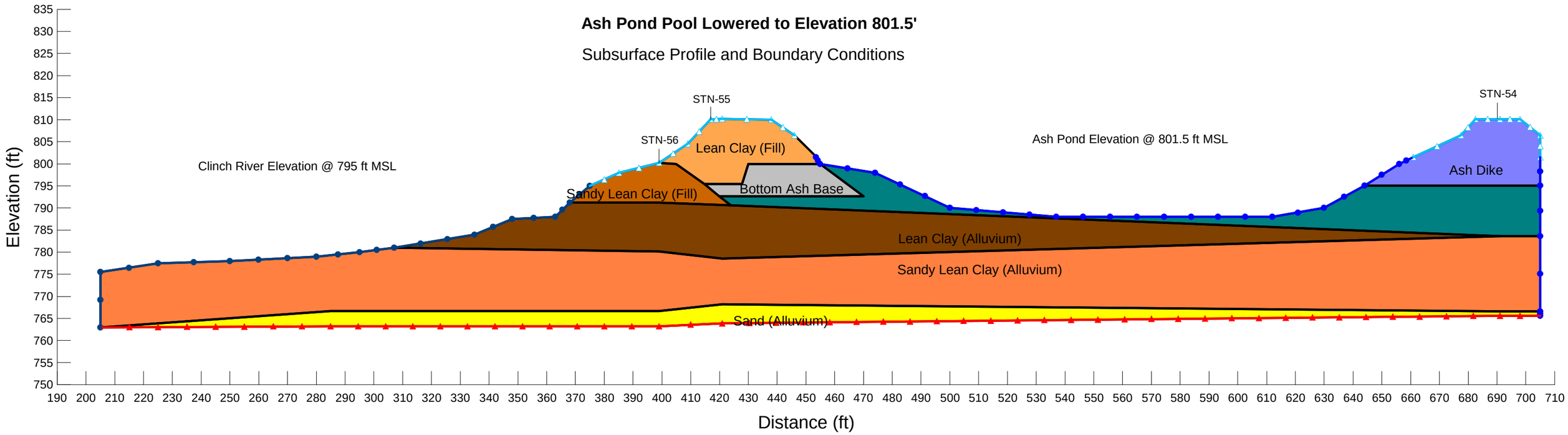
Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section N-N' Ash Pond Pool 801.5' (Global).gsz

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (375,795)
Total Head = 795 ft
At (373.17,791.2)
Total Head = 795.52 ft
dH = 0.52 ft dl = 3.8 ft
i = 0.137 i(criticial) = 1.046
FSpiping = 7.6

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Ash Dike	6.5e-008	0.04	0.46
Sluiced Fly Ash	1.6e-005	0.02	0.46
Sandy Lean Clay (Fill)	2.8e-007	0.1	0.38
Lean Clay (Fill)	2.3e-007	0.1	0.41
Lean Clay (Alluvium)	4.6e-007	0.05	0.41
Sand (Alluvium)	5.3e-006	0.02	0.39
Sandy Lean Clay (Alluvium)	2.8e-007	0.05	0.38
Bottom Ash Base	6.5e-008	0.04	0.46



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SEEP/W Analysis

Cross-Section N-N'
Fly Ash Disposal Area 2

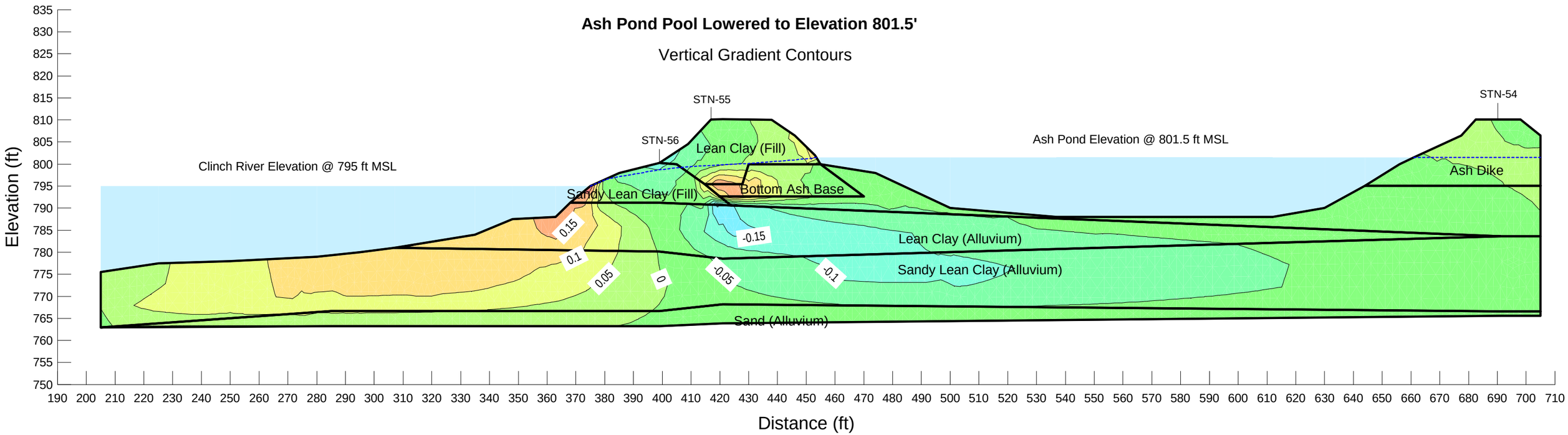
Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section N-N' Ash Pond Pool 801.5' (Global).gsz

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (375,795)
Total Head = 795 ft
At (373.17,791.2)
Total Head = 795.52 ft
dH = 0.52 ft dl = 3.8 ft
i = 0.137 i(criticial) = 1.046
FSpiping = 7.6

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Ash Dike	6.5e-008	0.04	0.46
Sluiced Fly Ash	1.6e-005	0.02	0.46
Sandy Lean Clay (Fill)	2.8e-007	0.1	0.38
Lean Clay (Fill)	2.3e-007	0.1	0.41
Lean Clay (Alluvium)	4.6e-007	0.05	0.41
Sand (Alluvium)	5.3e-006	0.02	0.39
Sandy Lean Clay (Alluvium)	2.8e-007	0.05	0.38
Bottom Ash Base	6.5e-008	0.04	0.46



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SEEP/W Analysis

Cross-Section N-N'
Fly Ash Disposal Area 2

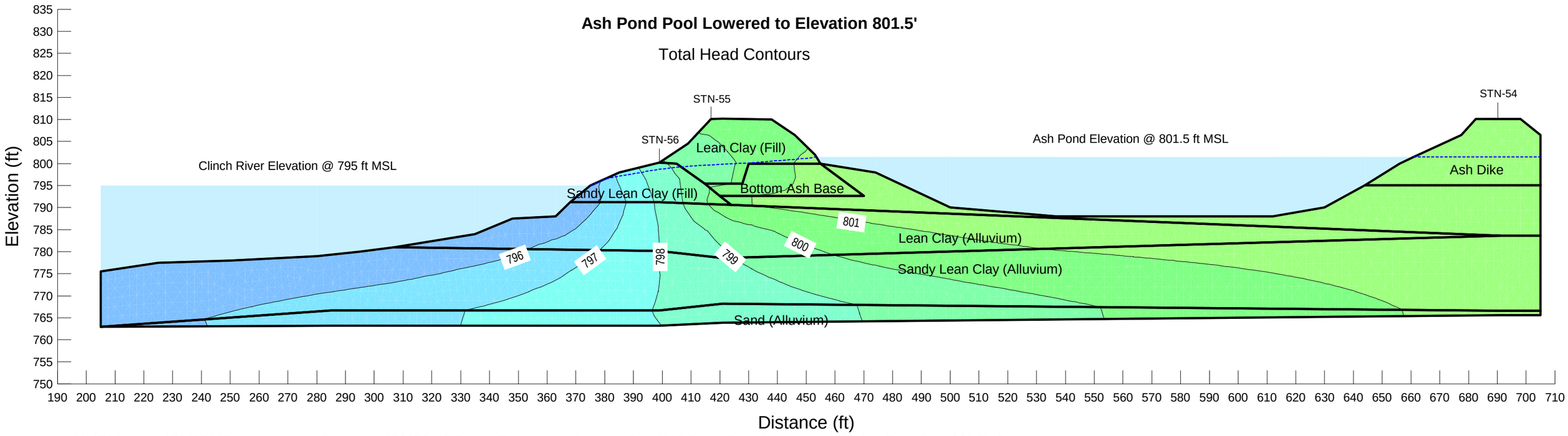
Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section N-N' Ash Pond Pool 801.5' (Global).gsz

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (375,795)
Total Head = 795 ft
At (373.17,791.2)
Total Head = 795.52 ft
dH = 0.52 ft dl = 3.8 ft
i = 0.137 i(criticial) = 1.046
FSpiping = 7.6

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Ash Dike	6.5e-008	0.04	0.46
Sluiced Fly Ash	1.6e-005	0.02	0.46
Sandy Lean Clay (Fill)	2.8e-007	0.1	0.38
Lean Clay (Fill)	2.3e-007	0.1	0.41
Lean Clay (Alluvium)	4.6e-007	0.05	0.41
Sand (Alluvium)	5.3e-006	0.02	0.39
Sandy Lean Clay (Alluvium)	2.8e-007	0.05	0.38
Bottom Ash Base	6.5e-008	0.04	0.46



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SEEP/W Analysis

Cross-Section N-N'
Fly Ash Disposal Area 2

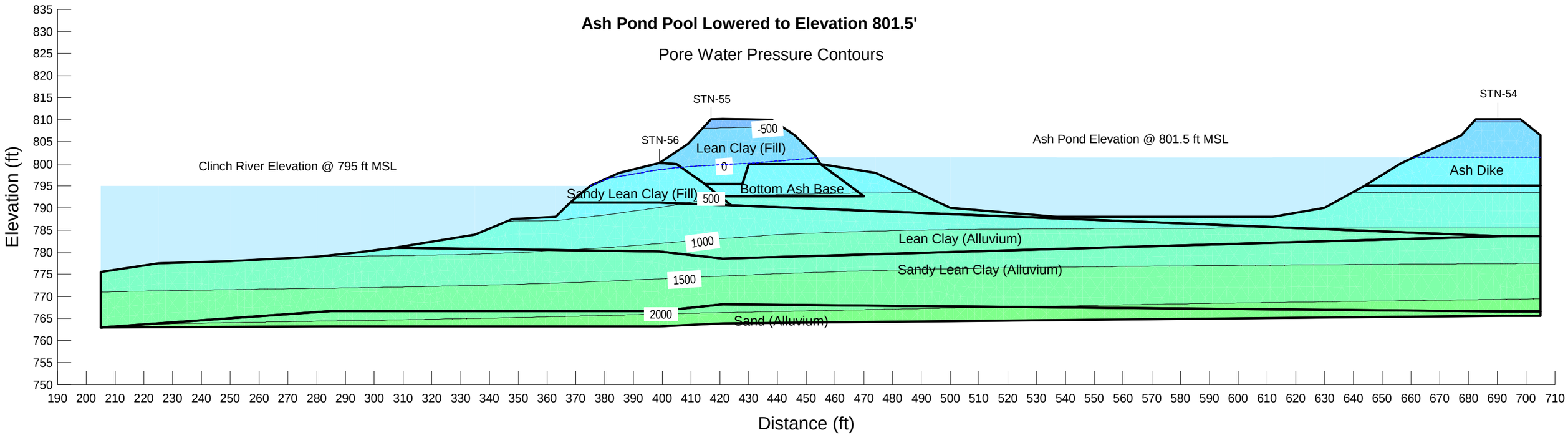
Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section N-N' Ash Pond Pool 801.5' (Global).gsz

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (375,795)
Total Head = 795 ft
At (373.17,791.2)
Total Head = 795.52 ft
dH = 0.52 ft dl = 3.8 ft
i = 0.137 i(criticial) = 1.046
FSpiping = 7.6

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Ash Dike	6.5e-008	0.04	0.46
Sluiced Fly Ash	1.6e-005	0.02	0.46
Sandy Lean Clay (Fill)	2.8e-007	0.1	0.38
Lean Clay (Fill)	2.3e-007	0.1	0.41
Lean Clay (Alluvium)	4.6e-007	0.05	0.41
Sand (Alluvium)	5.3e-006	0.02	0.39
Sandy Lean Clay (Alluvium)	2.8e-007	0.05	0.38
Bottom Ash Base	6.5e-008	0.04	0.46



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Slope Stability dMin=20

Cross-Section N-N'
Fly Ash Disposal Area 2

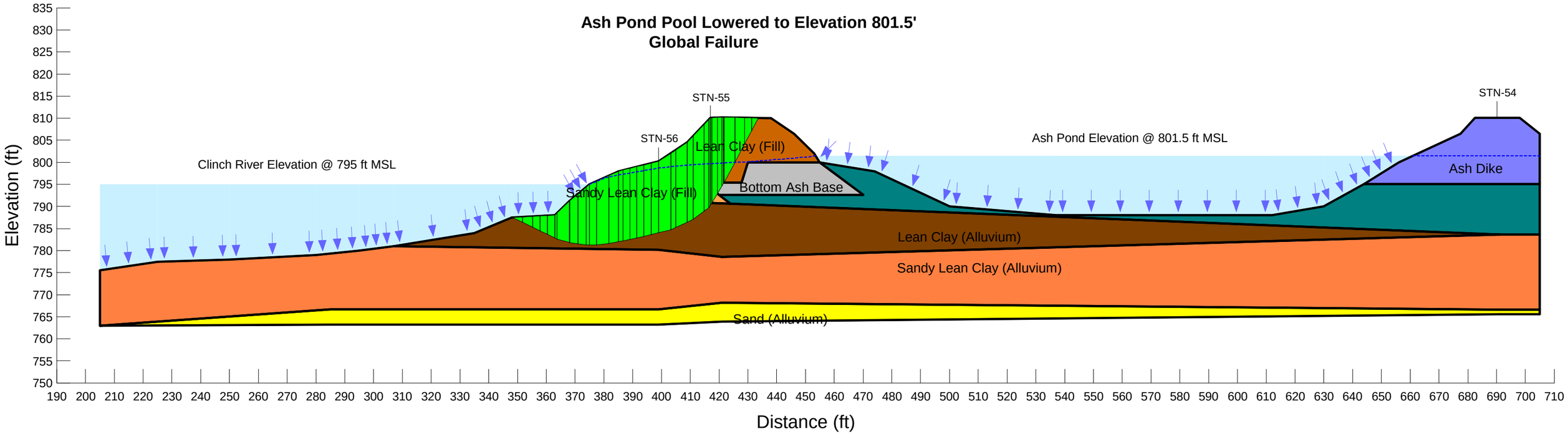
Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Modified Spencer
File Name: Slope W Section N-N' Ash Pond Pool 801.5' (Global).gsz

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Factor of Safety: 1.6
Center: (381, 853) ft
Radius: 42.83189 ft
Minimum Slip Surface Depth: 20 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Ash Dike	100	105	0	25
Sluiced Fly Ash	100	105	0	25
Sandy Lean Clay (Fill)	125	126	0	33
Lean Clay (Fill)	125	126	0	33
Lean Clay (Alluvium)	123	123	0	31
Sand (Alluvium)	120	120	0	33
Sandy Lean Clay (Alluvium)	126	127	0	33
Bottom Ash Base	100	105	0	33



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SEEP/W Analysis

Cross-Section O-O'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

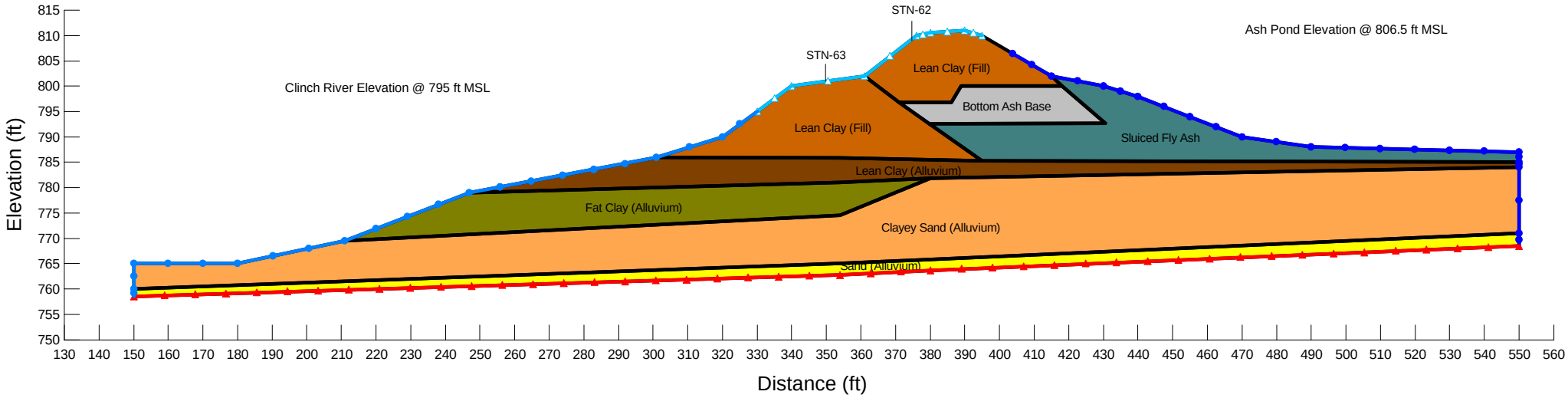
February 2010
Method: Steady-State Seepage
File Name: Slope W Section O-O' existing conditions.gsz

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (214,770.29)
Total Head = 795 ft
At (213.74,767.05)
Total Head = 795.71 ft
dH = 0.71 ft dl = 3.24 ft
i = 0.219 i(criticial) = 1.018
FSpiping = 4.65

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.3e-007	0.1	0.41
Sluiced Fly Ash	1.607e-005	0.02	0.46
Lean Clay (Alluvium)	4.593e-007	0.05	0.41
Fat Clay (Alluvium)	3.674e-008	0.05	0.41
Clayey Sand (Alluvium)	1.64e-006	0.02	0.39
Bottom Ash Base	6.5e-008	0.04	0.46
Sand (Alluvium)	5.345e-006	0.02	0.39

Existing Conditions
Subsurface Profile and Boundary Conditions



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SEEP/W Analysis

Cross-Section O-O'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section O-O' existing conditions.gsz

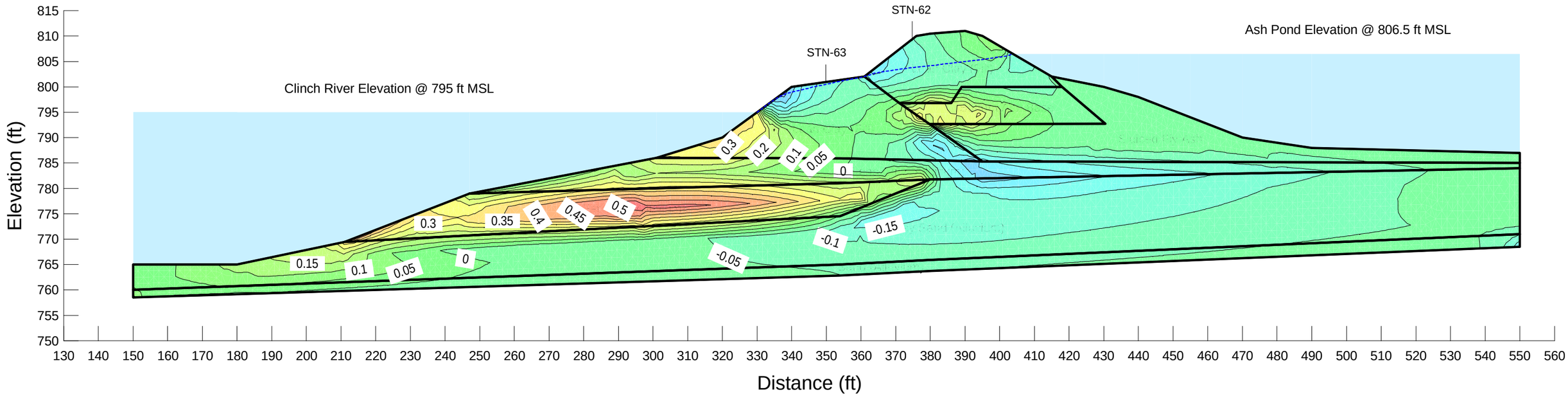
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (214,770.29)
Total Head = 795 ft
At (213.74,767.05)
Total Head = 795.71 ft
dH = 0.71 ft dl = 3.24 ft
i = 0.219 i(criticial) = 1.018
FSpiping = 4.7

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.3e-007	0.1	0.41
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Alluvium)	4.6e-007	0.05	0.41
Fat Clay (Alluvium)	3.7e-008	0.05	0.41
Clayey Sand (Alluvium)	1.6e-006	0.02	0.39
Bottom Ash Base	6.5e-008	0.04	0.46
Sand (Alluvium)	5.3e-006	0.02	0.39

Existing Conditions

Vertical Gradient Contours



SEEP/W Analysis

Cross-Section O-O'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section O-O' existing conditions.gsz

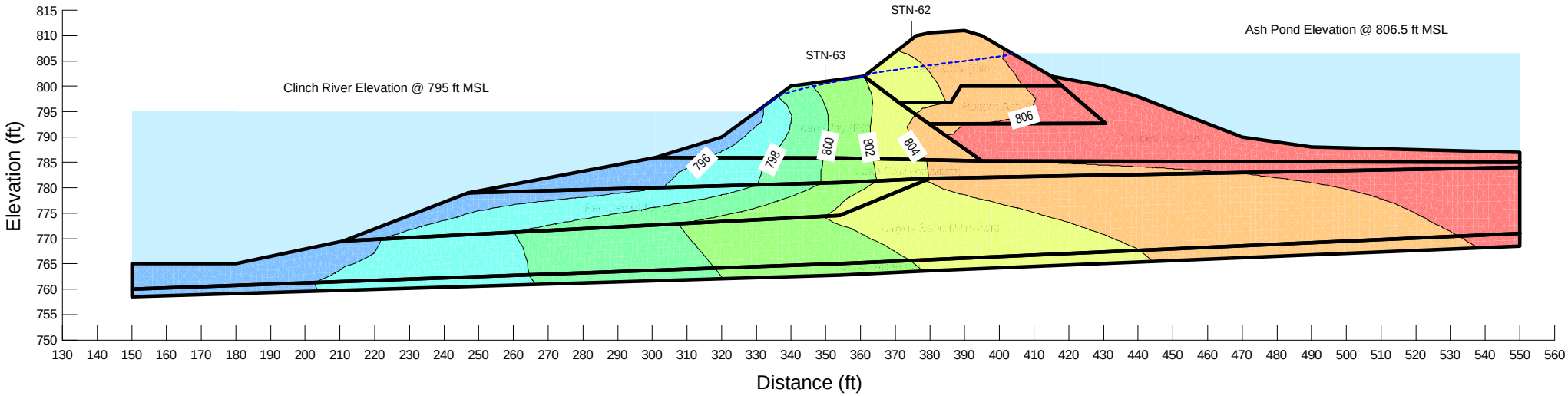
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (214,770.29)
Total Head = 795 ft
At (213.74,767.05)
Total Head = 795.71 ft
dH = 0.71 ft dl = 3.24 ft
i = 0.219 i(criticial) = 1.018
FSpiping = 4.65

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.3e-007	0.1	0.41
Sluiced Fly Ash	1.607e-005	0.02	0.46
Lean Clay (Alluvium)	4.593e-007	0.05	0.41
Fat Clay (Alluvium)	3.674e-008	0.05	0.41
Clayey Sand (Alluvium)	1.64e-006	0.02	0.39
Bottom Ash Base	6.5e-008	0.04	0.46
Sand (Alluvium)	5.345e-006	0.02	0.39

Existing Conditions

Total Head Contours



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SEEP/W Analysis

Cross-Section O-O'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section O-O' existing conditions.gsz

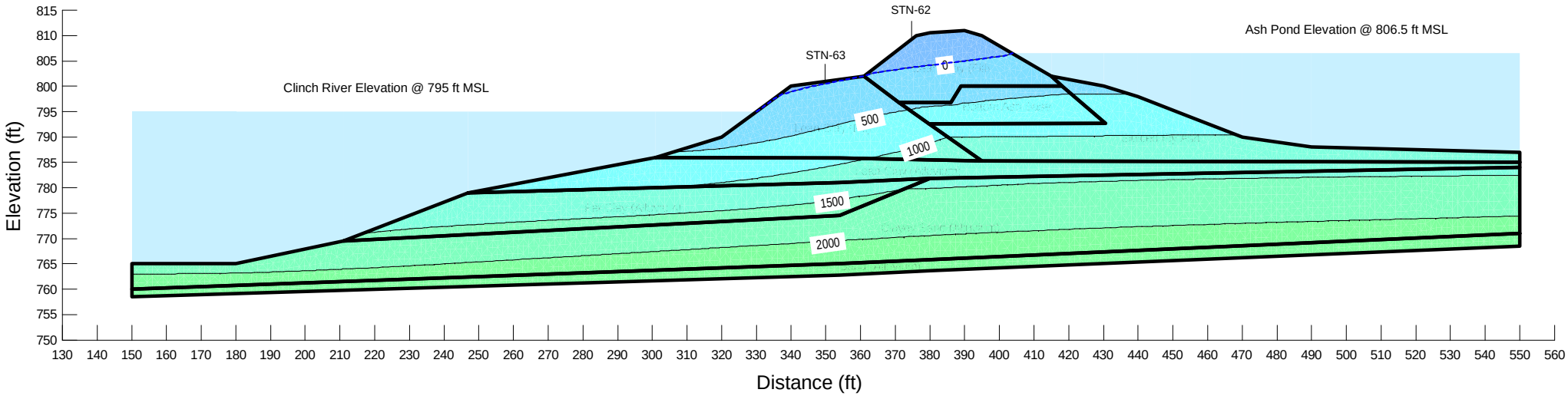
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (214,770.29)
Total Head = 795 ft
At (213.74,767.05)
Total Head = 795.71 ft
dH = 0.71 ft dl = 3.24 ft
i = 0.219 i(criticial) = 1.018
FSpiping = 4.65

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.3e-007	0.1	0.41
Sluiced Fly Ash	1.607e-005	0.02	0.46
Lean Clay (Alluvium)	4.593e-007	0.05	0.41
Fat Clay (Alluvium)	3.674e-008	0.05	0.41
Clayey Sand (Alluvium)	1.64e-006	0.02	0.39
Bottom Ash Base	6.5e-008	0.04	0.46
Sand (Alluvium)	5.345e-006	0.02	0.39

Existing Conditions

Pore Water Pressure Contours



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Slope Stability (Entry-Exit)

Cross-Section O-O'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

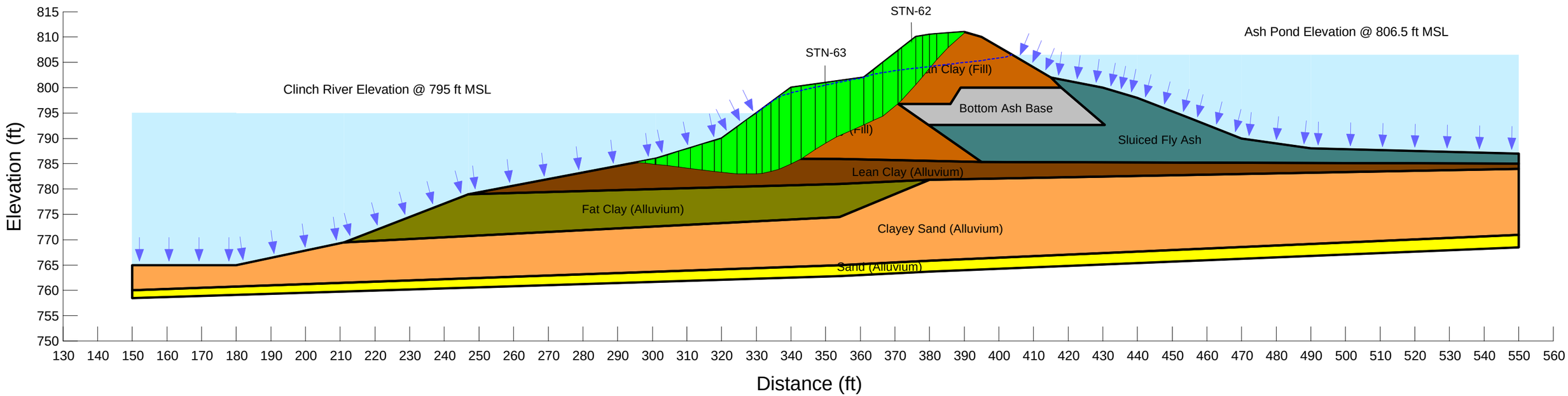
February 2010
Method: Modified Spencer
File Name: Slope W Section O-O' existing conditions (Global).gsz

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Factor of Safety: 1.4
Center: (321.002, 882.058) ft
Radius: 46.03329 ft
Minimum Slip Surface Depth: 15 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Lean Clay (Fill)	125	126	0	33
Sluiced Fly Ash	100	105	0	25
Lean Clay (Alluvium)	123	123	0	31
Fat Clay (Alluvium)	117	121	0	30
Clayey Sand (Alluvium)	112	112	0	33
Bottom Ash Base	100	105	0	33
Sand (Alluvium)	120	120	0	33

Existing Conditions
Global Failure



Slope Stability

Cross-Section O-O'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Modified Spencer
File Name: Slope W Section O-O' existing conditions.gsz

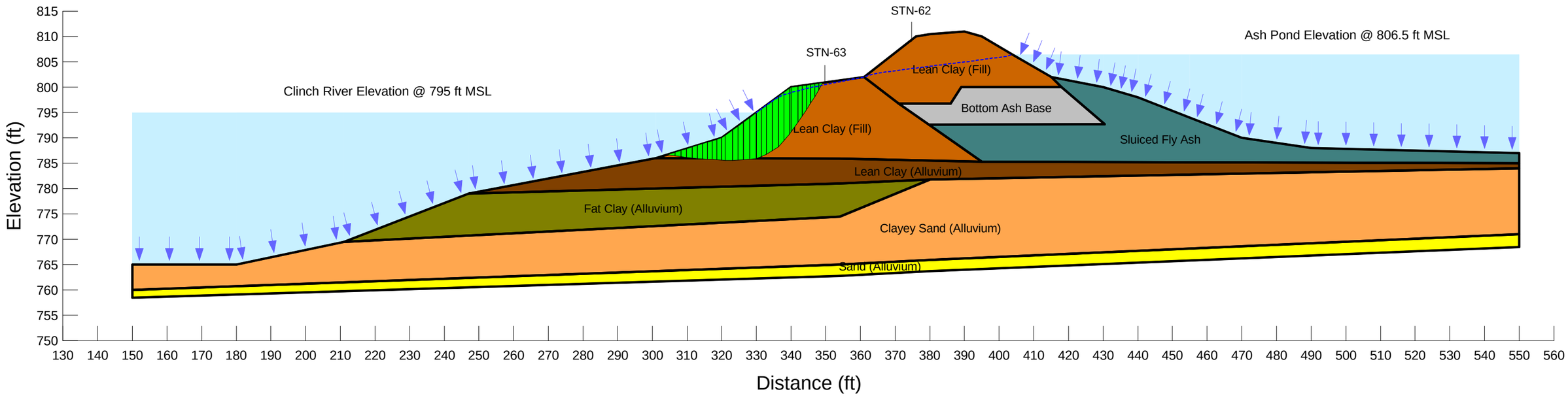
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Factor of Safety: 1.1
Center: (321.667, 823.667) ft
Radius: 23.87803 ft
Minimum Slip Surface Depth: 10 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Lean Clay (Fill)	125	126	0	33
Sluiced Fly Ash	100	105	0	25
Lean Clay (Alluvium)	123	123	0	31
Fat Clay (Alluvium)	117	121	0	30
Clayey Sand (Alluvium)	112	112	0	33
Bottom Ash Base	100	105	0	33
Sand (Alluvium)	120	120	0	33

Existing Conditions

Non-Global Failure



SEEP/W Analysis

Cross-Section O-O'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

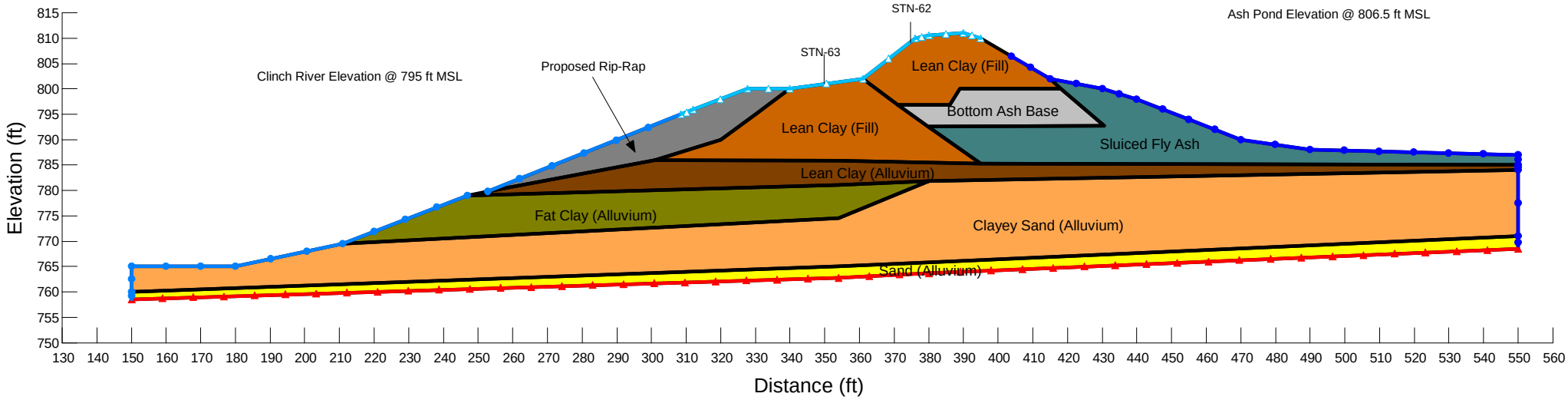
February 2010
Method: Steady-State Seepage
File Name: Slope W Section O-O' buttress.gsz

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (214,770.29)
Total Head = 795 ft
At (213.74,767.05)
Total Head = 795.71 ft
dH = 0.71 ft dl = 3.24 ft
i = 0.219 i(criticial) = 1.018
FSpiping = 4.65

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.3e-007	0.1	0.41
Sluiced Fly Ash	1.607e-005	0.02	0.46
Lean Clay (Alluvium)	4.593e-007	0.05	0.41
Fat Clay (Alluvium)	3.674e-008	0.05	0.41
Clayey Sand (Alluvium)	1.64e-006	0.02	0.39
Bottom Ash Base	6.5e-008	0.04	0.46
Sand (Alluvium)	5.35e-006	0.02	0.39
Rip Rap	0.01	1	0.4

Proposed Rip-Rap Buttress
Subsurface Profile and Boundary Conditions



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SEEP/W Analysis

Cross-Section O-O'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section O-O' buttress.gsz

Note:
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Piping Potential
Maximum Exit Gradient occurs at (214,770.29)
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Total Head = 795.71 ft
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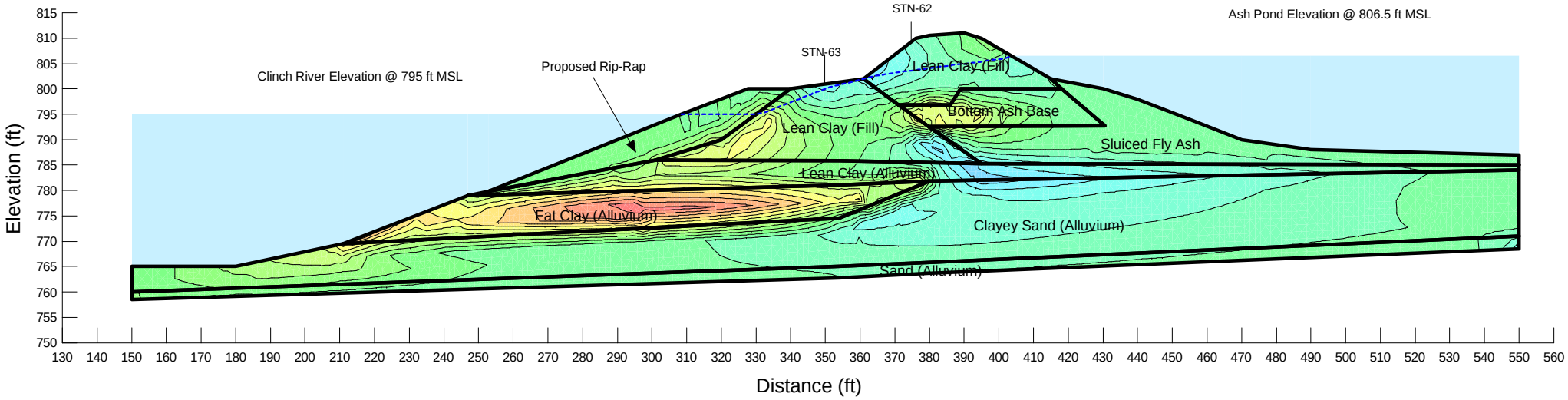
FSpiping = 4.65

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.3e-007	0.1	0.41
Sluiced Fly Ash	1.607e-005	0.02	0.46
Lean Clay (Alluvium)	4.593e-007	0.05	0.41
Fat Clay (Alluvium)	3.674e-008	0.05	0.41
Clayey Sand (Alluvium)	1.64e-006	0.02	0.39
Bottom Ash Base	6.5e-008	0.04	0.46
Sand (Alluvium)	5.35e-006	0.02	0.39
Rip Rap	0.01	1	0.4

Proposed Rip-Rap Buttress

Vertical Gradient Contours



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SEEP/W Analysis

Cross-Section O-O'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section O-O' buttress.gsz

Note:
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Piping Potential
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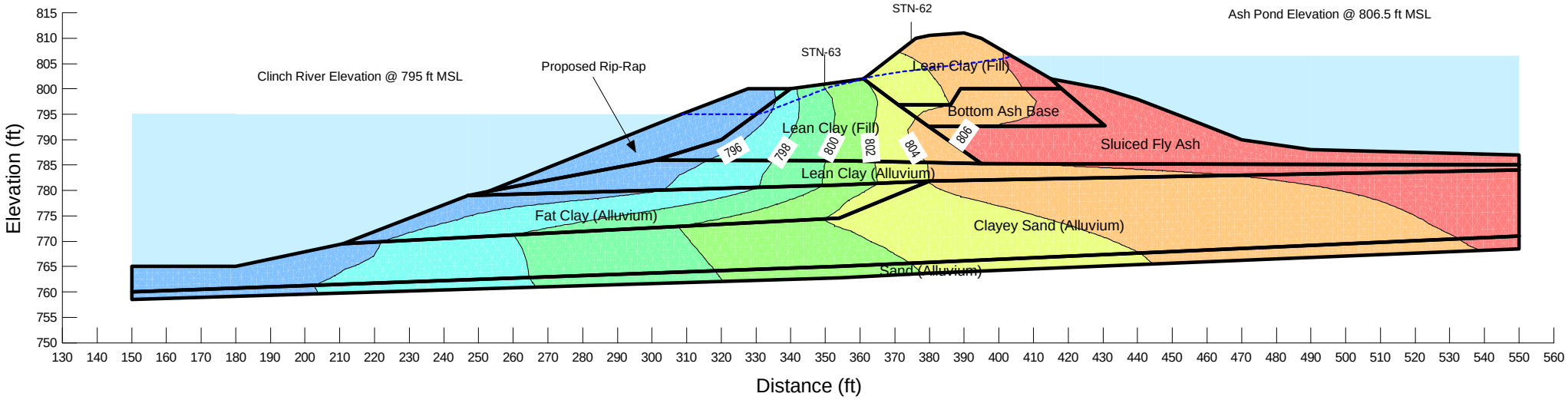
Total Head = 795 ft
At (213.74,767.05)
Total Head = 795.71 ft
dH = 0.71 ft dl = 3.24 ft
i = 0.219 i(criticial) = 1.018
FSpiping = 4.65

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.3e-007	0.1	0.41
Sluiced Fly Ash	1.607e-005	0.02	0.46
Lean Clay (Alluvium)	4.593e-007	0.05	0.41
Fat Clay (Alluvium)	3.674e-008	0.05	0.41
Clayey Sand (Alluvium)	1.64e-006	0.02	0.39
Bottom Ash Base	6.5e-008	0.04	0.46
Sand (Alluvium)	5.35e-006	0.02	0.39
Rip Rap	0.01	1	0.4

Proposed Rip-Rap Buttress
Total Head Contours



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SEEP/W Analysis

Cross-Section O-O'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section O-O' buttress.gsz

Note:
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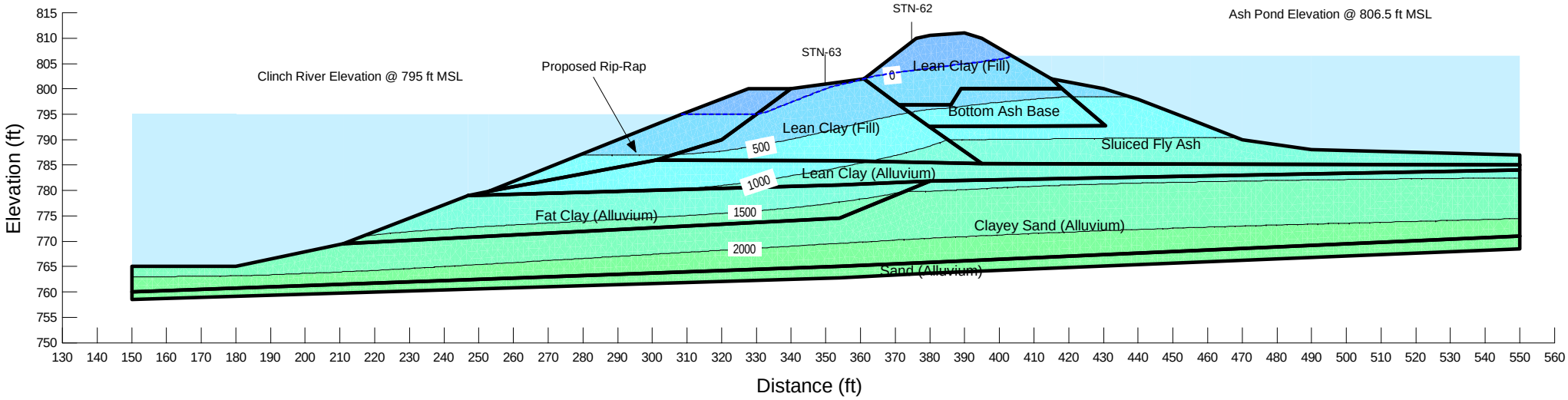
Piping Potential
Maximum Exit Gradient occurs at (214,770.29)
Total Head = 795 ft
At (213.74,767.05)
Total Head = 795.71 ft
dH = 0.71 ft dl = 3.24 ft
i = 0.219 i(criticial) = 1.018
FSpiping = 4.65

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.3e-007	0.1	0.41
Sluiced Fly Ash	1.607e-005	0.02	0.46
Lean Clay (Alluvium)	4.593e-007	0.05	0.41
Fat Clay (Alluvium)	3.674e-008	0.05	0.41
Clayey Sand (Alluvium)	1.64e-006	0.02	0.39
Bottom Ash Base	6.5e-008	0.04	0.46
Sand (Alluvium)	5.35e-006	0.02	0.39
Rip Rap	0.01	1	0.4

Proposed Rip-Rap Buttress
Pore Water Pressure Contours



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Slope Stability

Cross-Section O-O'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Modified Spencer
File Name: Slope W Section O-O' buttress.gsz

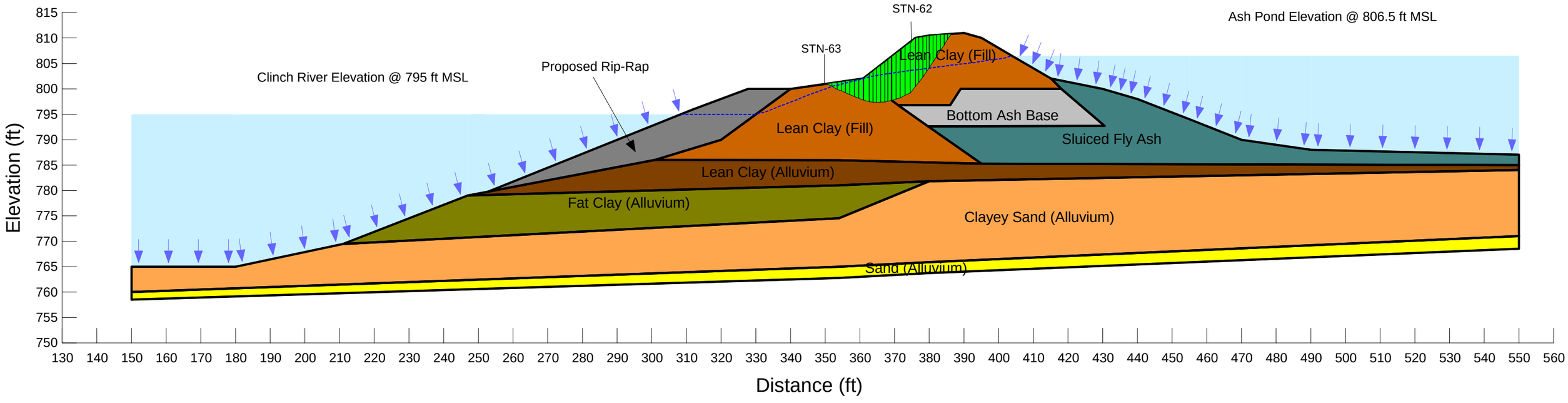
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Factor of Safety: 1.8
Center: (365, 821.5) ft
Radius: 18.63288 ft
Minimum Slip Surface Depth: 10 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Lean Clay (Fill)	125	126	0	33
Sluiced Fly Ash	100	105	0	25
Lean Clay (Alluvium)	123	123	0	31
Fat Clay (Alluvium)	117	121	0	30
Clayey Sand (Alluvium)	112	112	0	33
Bottom Ash Base	100	105	0	33
Sand (Alluvium)	120	120	0	33
Rip Rap	115	115	0	40

Proposed Rip-Rap Buttress

Global Failure



SEEP/W Analysis

Cross-Section O-O'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section O-O' existing conditions Pool 801.5.gsz

Piping Potential
Maximum Exit Gradient occurs at (214,770.29)
Total Head = 795 ft
At (213.74,767.05)
Total Head = 795.4 ft
dH = 0.4 ft dl = 3.24 ft
i = 0.123 i(criticial) = 1.018
FSpiping = 8.28

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.3e-007	0.1	0.41
Sluiced Fly Ash	1.607e-005	0.02	0.46
Lean Clay (Alluvium)	4.593e-007	0.05	0.41
Fat Clay (Alluvium)	3.674e-008	0.05	0.41
Clayey Sand (Alluvium)	1.64e-006	0.02	0.39
Bottom Ash Base	6.5e-008	0.04	0.46
Sand (Alluvium)	5.35e-006	0.02	0.39

Note:
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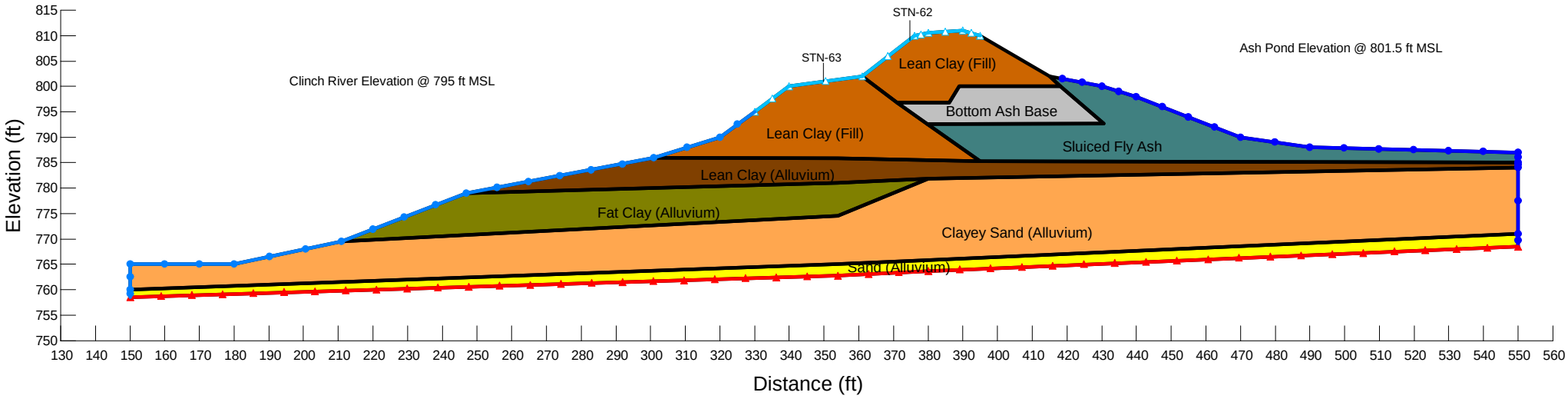
Ash Pond Pool Lowered to Elevation 801.5'

Subsurface Profile and Boundary Conditions



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SEEP/W Analysis

Cross-Section O-O'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

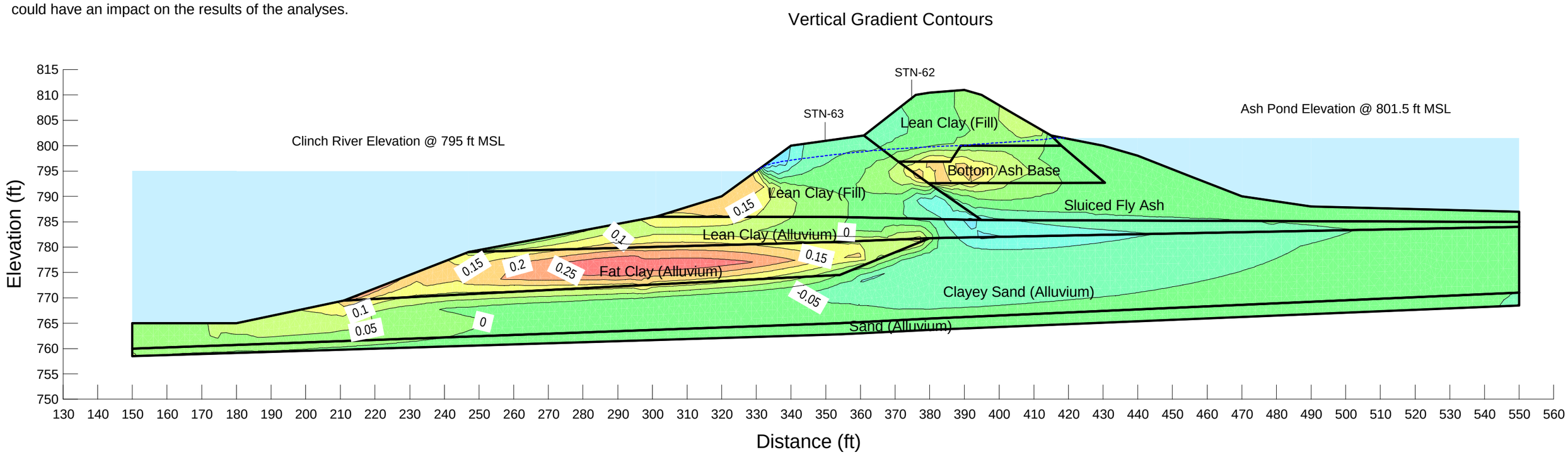
February 2010
Method: Steady-State Seepage
File Name: Slope W Section O-O' Ash Pond Pool 801.5 (Global).gsz

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (214,770.29)
Total Head = 795 ft
At (213.74,767.05)
Total Head = 795.4 ft
dH = 0.4 ft dl = 3.24 ft
i = 0.123 i(criticial) = 1.018
FSpiping = 8.3

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.3e-007	0.1	0.41
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Alluvium)	4.6e-007	0.05	0.41
Fat Clay (Alluvium)	3.7e-008	0.05	0.41
Clayey Sand (Alluvium)	1.6e-006	0.02	0.39
Bottom Ash Base	6.5e-008	0.04	0.46
Sand (Alluvium)	5.3e-006	0.02	0.39

Ash Pond Pool Lowered to Elevation 801.5'



SEEP/W Analysis

Cross-Section O-O'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section O-O' existing conditions Pool 801.5.gsz

Piping Potential
Maximum Exit Gradient occurs at (214,770.29)
Total Head = 795 ft
At (213.74,767.05)
Total Head = 795.4 ft
dH = 0.4 ft dl = 3.24 ft
i = 0.123 i(criticial) = 1.018
FSpiping = 8.28

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.3e-007	0.1	0.41
Sluiced Fly Ash	1.607e-005	0.02	0.46
Lean Clay (Alluvium)	4.593e-007	0.05	0.41
Fat Clay (Alluvium)	3.674e-008	0.05	0.41
Clayey Sand (Alluvium)	1.64e-006	0.02	0.39
Bottom Ash Base	6.5e-008	0.04	0.46
Sand (Alluvium)	5.35e-006	0.02	0.39

Note:
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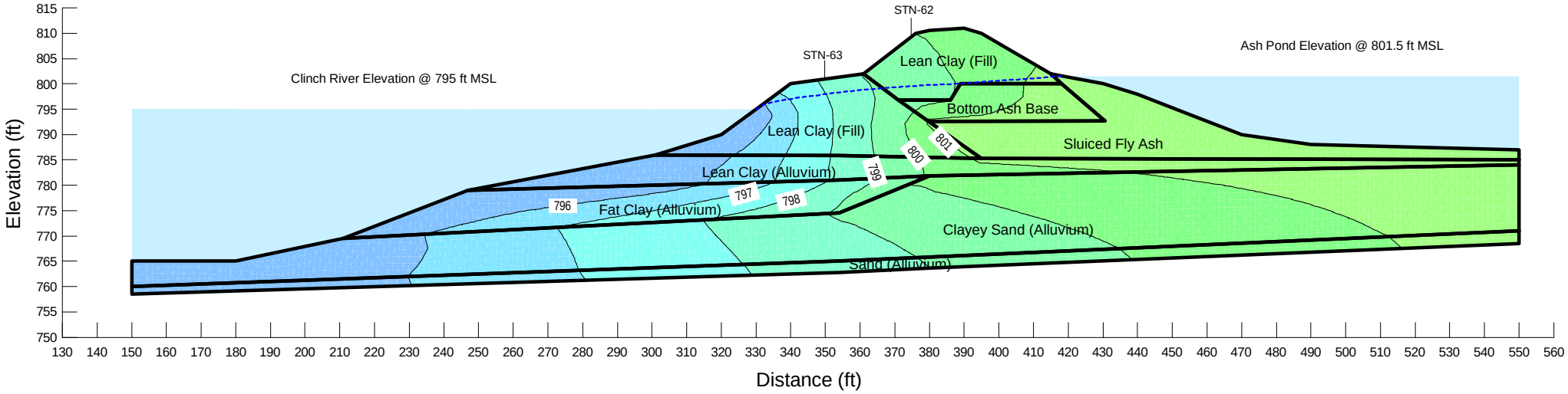
Ash Pond Pool Lowered to Elevation 801.5'

Total Head Contours



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SEEP/W Analysis

Cross-Section O-O'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section O-O' existing conditions Pool 801.5.gsz

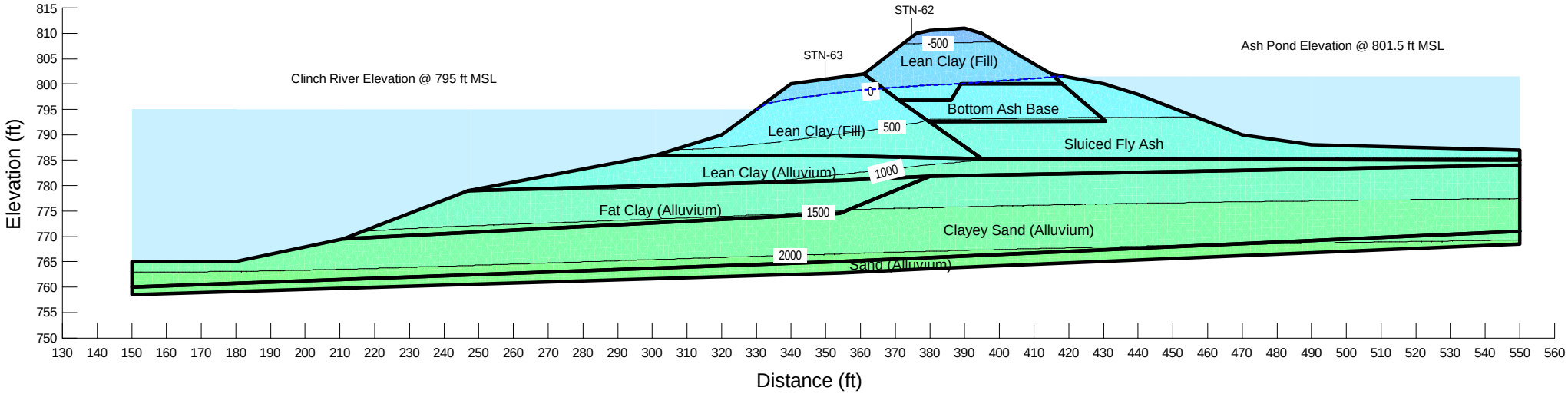
Piping Potential
Maximum Exit Gradient occurs at (214,770.29)
Total Head = 795 ft
At (213.74,767.05)
Total Head = 795.4 ft
dH = 0.4 ft dl = 3.24 ft
i = 0.123 i(criticial) = 1.018
FSpiping = 8.28

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.3e-007	0.1	0.41
Sluiced Fly Ash	1.607e-005	0.02	0.46
Lean Clay (Alluvium)	4.593e-007	0.05	0.41
Fat Clay (Alluvium)	3.674e-008	0.05	0.41
Clayey Sand (Alluvium)	1.64e-006	0.02	0.39
Bottom Ash Base	6.5e-008	0.04	0.46
Sand (Alluvium)	5.35e-006	0.02	0.39

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Ash Pond Pool Lowered to Elevation 801.5'

Pore Water Pressure Contours



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Slope Stability (Entry-Exit)

Cross-Section O-O'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Modified Spencer
File Name: Slope W Section O-O' Ash Pond Pool 801.5 (Global).gsz

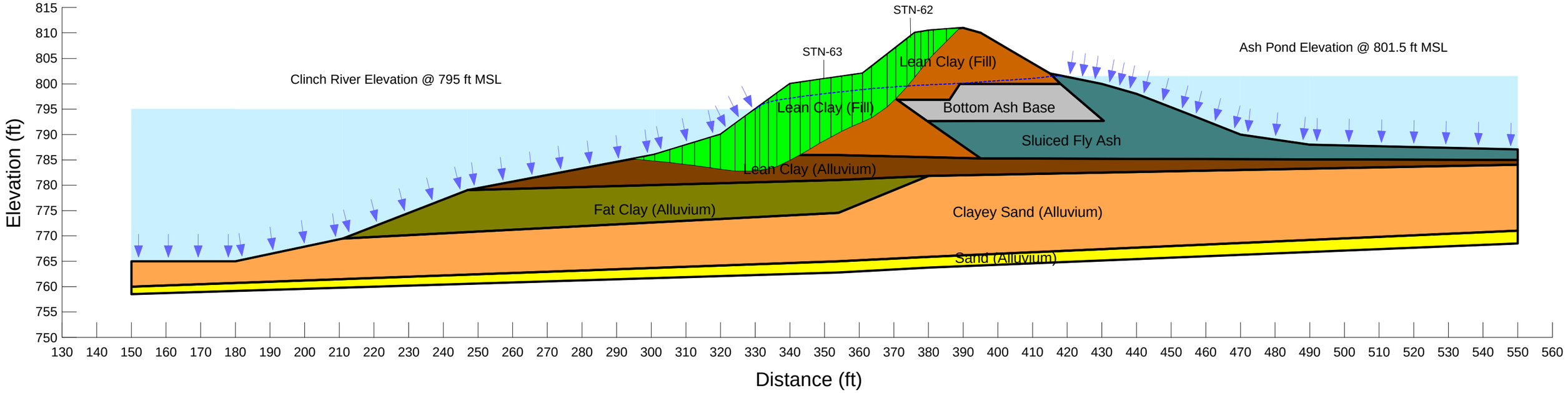
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Factor of Safety: 1.6
Center: (319.858, 881.623) ft
Radius: 45.778 ft
Minimum Slip Surface Depth: 15 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Lean Clay (Fill)	125	126	0	33
Sluiced Fly Ash	100	105	0	25
Lean Clay (Alluvium)	123	123	0	31
Fat Clay (Alluvium)	117	121	0	30
Clayey Sand (Alluvium)	112	112	0	33
Bottom Ash Base	100	105	0	33
Sand (Alluvium)	120	120	0	33

Ash Pond Pool Lowered to Elevation 801.5'

Global Failure



SEEP/W Analysis

Cross-Section R-R'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section R-R' existing conditions (Non-global).gsz

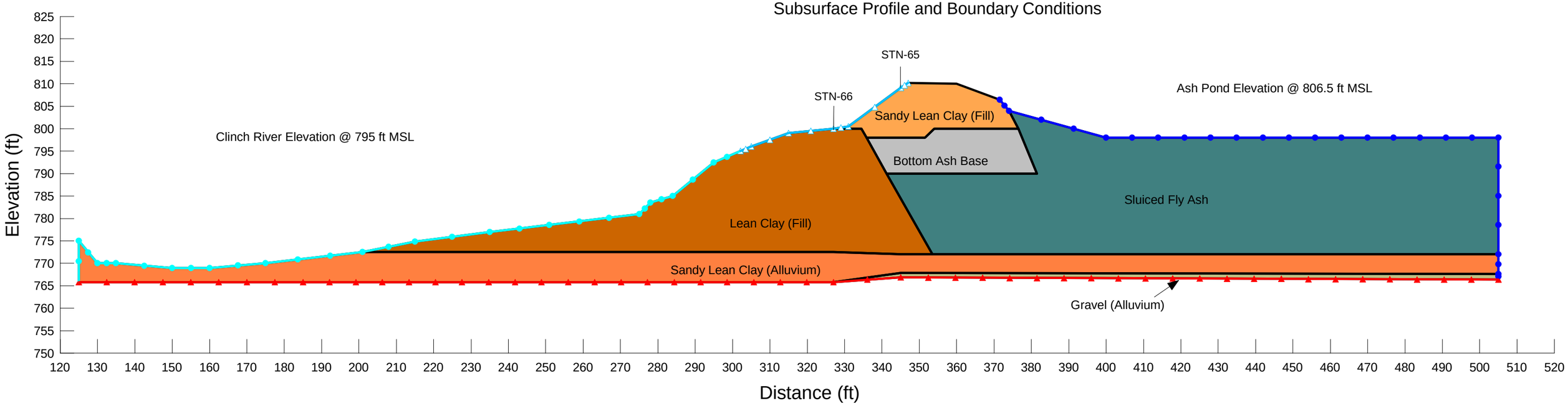
Piping Potential
Maximum Exit Gradient occurs at (299.76,794.17)
Total Head = 795 ft
At (298.51,790.68)
Total Head = 796.09 ft
dH = 1.09 ft dl = 3.49 ft
i = 0.312 i(criticial) = 1
FSpiping = 3.2

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.3e-007	0.1	0.41
Sandy Lean Clay (Fill)	2.8e-007	0.1	0.38
Sluiced Fly Ash	1.6e-005	0.02	0.46
Sandy Lean Clay (Alluvium)	2.8e-007	0.05	0.38
Gravel (Alluvium)	5.3e-006	0.02	0.23
Bottom Ash Base	6.5e-008	0.04	0.46

Existing Conditions

Subsurface Profile and Boundary Conditions



SEEP/W Analysis

Cross-Section R-R'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

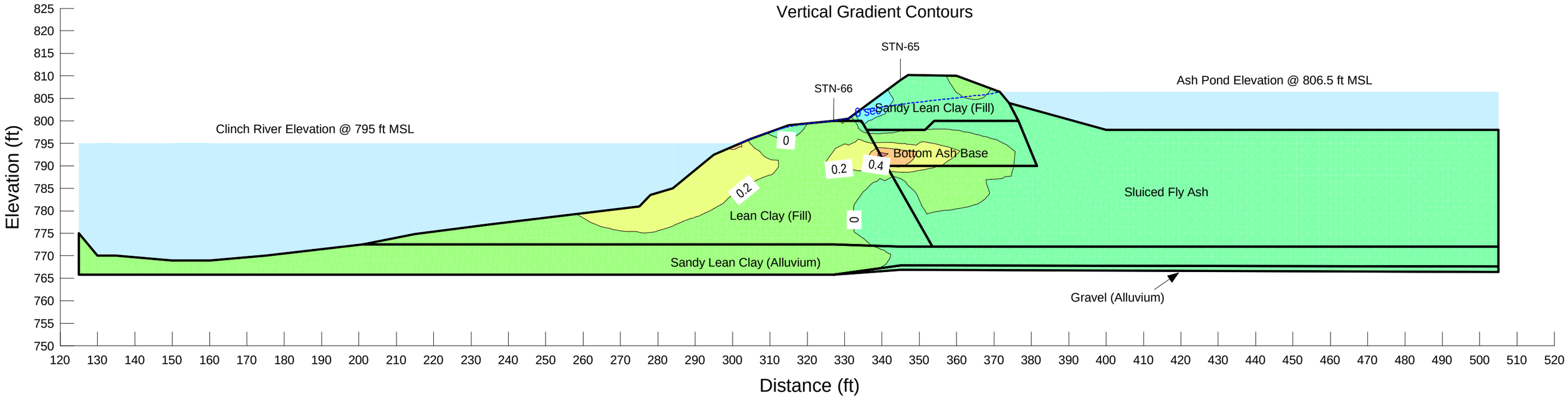
February 2010
Method: Steady-State Seepage
File Name: Slope W Section R-R' existing conditions (Non-global).gsz

Piping Potential
Maximum Exit Gradient occurs at (299.76,794.17)
Total Head = 795 ft
At (298.51,790.68)
Total Head = 796.09 ft
dH = 1.09 ft dl = 3.49 ft
i = 0.312 i(criticial) = 1
FSpiping = 3.2

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.3e-007	0.1	0.41
Sandy Lean Clay (Fill)	2.8e-007	0.1	0.38
Sluiced Fly Ash	1.6e-005	0.02	0.46
Sandy Lean Clay (Alluvium)	2.8e-007	0.05	0.38
Gravel (Alluvium)	5.3e-006	0.02	0.23
Bottom Ash Base	6.5e-008	0.04	0.46

Existing Conditions



SEEP/W Analysis

Cross-Section R-R'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section R-R' existing conditions (Non-global).gsz

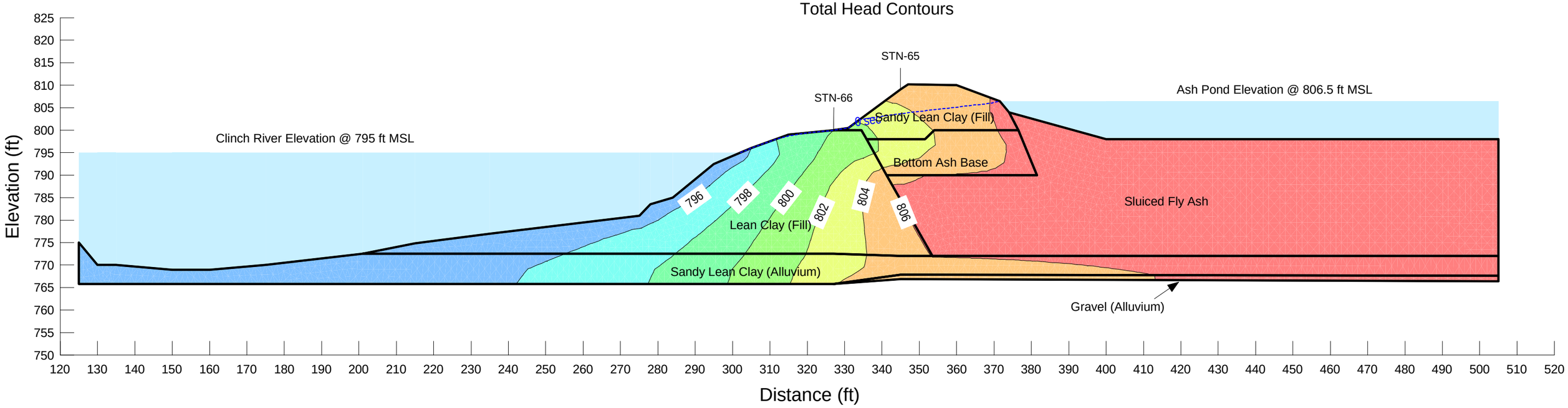
Piping Potential
Maximum Exit Gradient occurs at (299.76,794.17)
Total Head = 795 ft
At (298.51,790.68)
Total Head = 796.09 ft
dH = 1.09 ft dl = 3.49 ft
i = 0.312 i(criticial) = 1
FSpiping = 3.2

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.3e-007	0.1	0.41
Sandy Lean Clay (Fill)	2.8e-007	0.1	0.38
Sluiced Fly Ash	1.6e-005	0.02	0.46
Sandy Lean Clay (Alluvium)	2.8e-007	0.05	0.38
Gravel (Alluvium)	5.3e-006	0.02	0.23
Bottom Ash Base	6.5e-008	0.04	0.46

Existing Conditions

Total Head Contours



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SEEP/W Analysis

Cross-Section R-R'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section R-R' existing conditions (Non-global).gsz

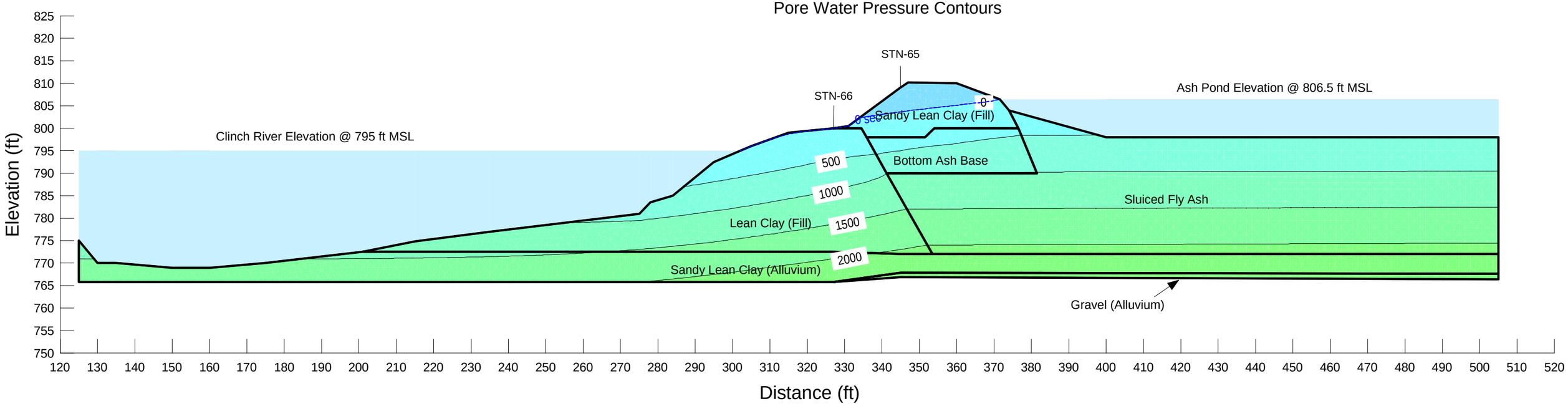
Piping Potential
Maximum Exit Gradient occurs at (299.76,794.17)
Total Head = 795 ft
At (298.51,790.68)
Total Head = 796.09 ft
dH = 1.09 ft dl = 3.49 ft
i = 0.312 i(criticial) = 1
FSpiping = 3.2

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.3e-007	0.1	0.41
Sandy Lean Clay (Fill)	2.8e-007	0.1	0.38
Sluiced Fly Ash	1.6e-005	0.02	0.46
Sandy Lean Clay (Alluvium)	2.8e-007	0.05	0.38
Gravel (Alluvium)	5.3e-006	0.02	0.23
Bottom Ash Base	6.5e-008	0.04	0.46

Existing Conditions

Pore Water Pressure Contours



Slope Stability

Cross-Section R-R'
Fly Ash Disposal Area 2

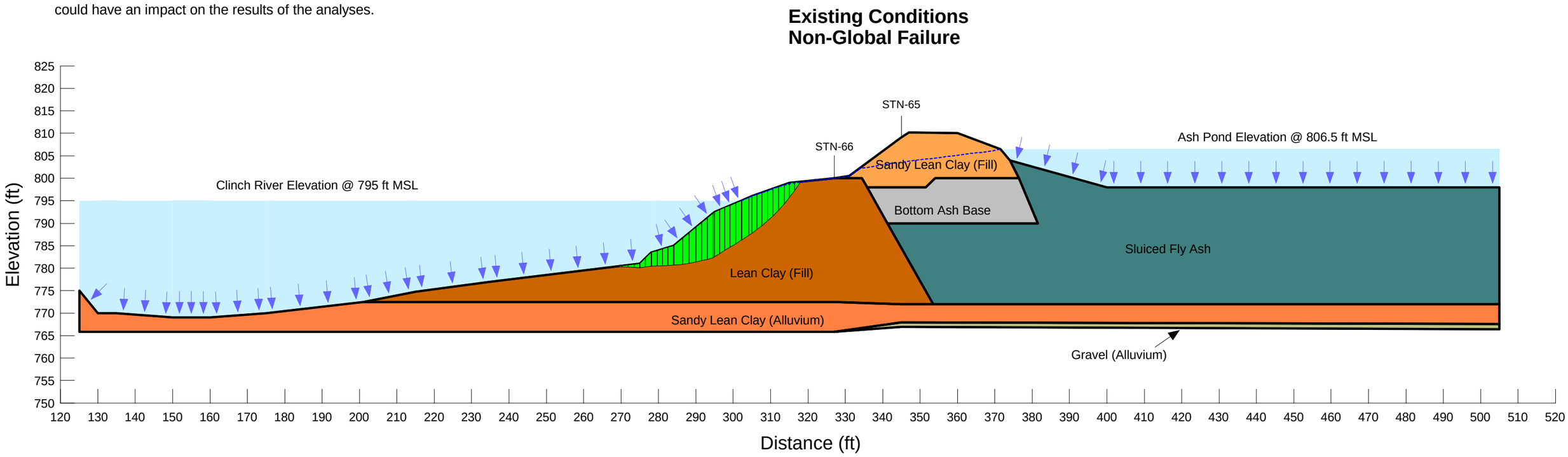
Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Modified Spencer
File Name: Slope W Section R-R' existing conditions (Non-global).gsz

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Factor of Safety: 1.0
Center: (280, 828) ft
Radius: 27.92882 ft
Minimum Slip Surface Depth: 10 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Lean Clay (Fill)	125	126	0	33
Sandy Lean Clay (Fill)	125	126	0	33
Sluiced Fly Ash	100	105	0	25
Sandy Lean Clay (Alluvium)	126	127	0	33
Gravel (Alluvium)	135	135	0	40
Bottom Ash Base	100	105	0	33



Slope Stability

Cross-Section R-R'
Fly Ash Disposal Area 2

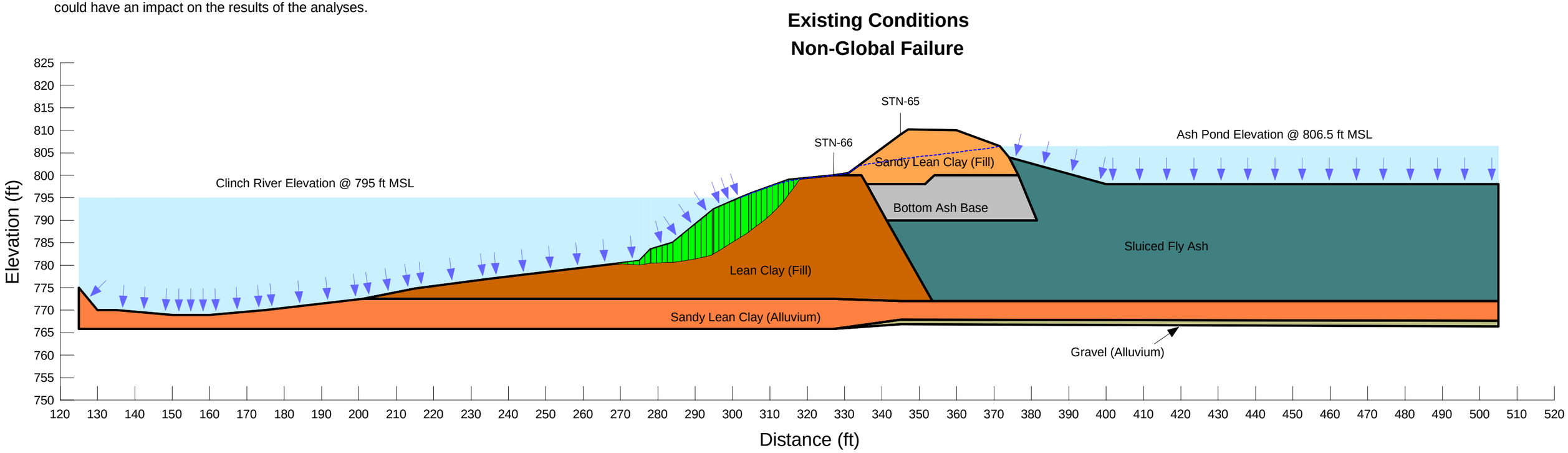
Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Modified Spencer
File Name: Slope W Section R-R' existing conditions (Non-global).gsz

Factor of Safety: 1.0
Center: (280, 828) ft
Radius: 27.92882 ft
Minimum Slip Surface Depth: 10 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Lean Clay (Fill)	125	126	0	33
Sandy Lean Clay (Fill)	125	126	0	33
Sluiced Fly Ash	100	105	0	25
Sandy Lean Clay (Alluvium)	126	127	0	33
Gravel (Alluvium)	135	135	0	40
Bottom Ash Base	100	105	0	33

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.



SEEP/W Analysis

Cross-Section R-R'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section R-R' buttress.gsz

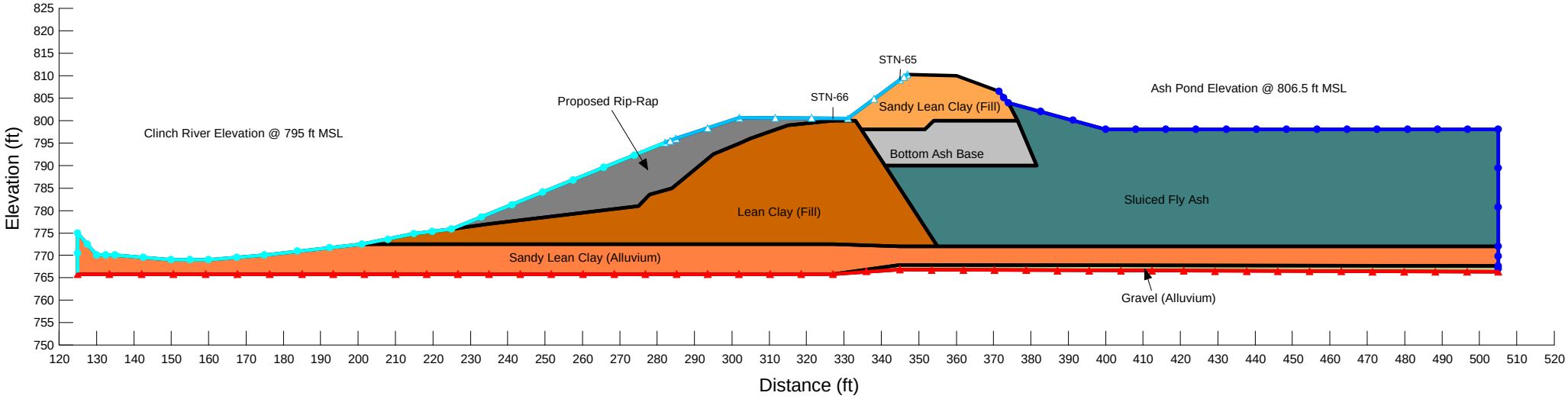
Piping Potential:
Maximum Exit Gradient occurs at (221.62,775.53)
Total Head = 795 ft
At (222,772.5)
Total Head = 795.17 ft
dH = 0.17 ft dl = 3.03 ft
i = 0.056 i(criticial) = 1
FSpiping = 17.86

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.297e-007	0.1	0.41
Sandy Lean Clay (Fill)	2.7887e-007	0.1	0.38
Sluiced Fly Ash	1.6076e-005	0.02	0.46
Sandy Lean Clay (Alluvium)	2.7887e-007	0.05	0.38
Gravel (Alluvium)	5.3477e-006	0.02	0.23
Rip Rap	0.01	1	0.4
Bottom Ash Base	6.5e-008	0.04	0.46

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Proposed Rip-Rap Buttress

Subsurface Profile and Boundary Conditions



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SEEP/W Analysis

Cross-Section R-R'
Fly Ash Disposal Area 2

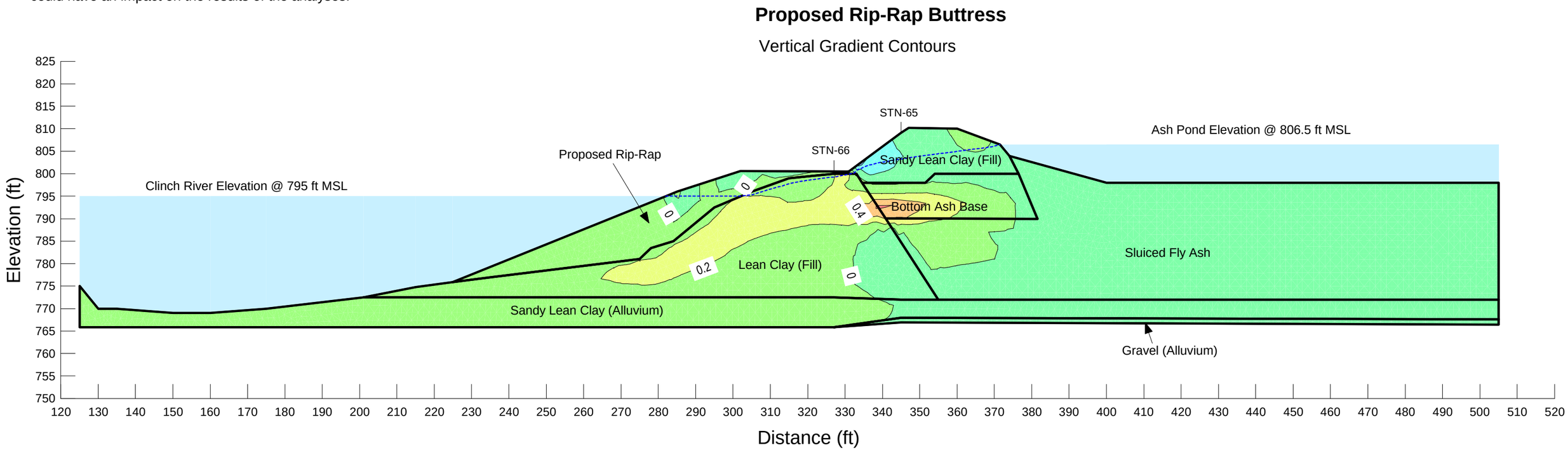
Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section R-R' buttress.gsz

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (221.62,775.53)
Total Head = 795 ft
At (222,772.5)
Total Head = 795.17 ft
dH = 0.17 ft dl = 3.03 ft
i = 0.056 i(criticial) = 1
FSpiping = 17.9

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.3e-007	0.1	0.41
Sandy Lean Clay (Fill)	2.8e-007	0.1	0.38
Sluiced Fly Ash	1.6e-005	0.02	0.46
Sandy Lean Clay (Alluvium)	2.8e-007	0.05	0.38
Gravel (Alluvium)	5.3e-006	0.02	0.23
Rip Rap	0.01	1	0.4
Bottom Ash Base	6.5e-008	0.04	0.46



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SEEP/W Analysis

Cross-Section R-R'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section R-R' buttress.gsz

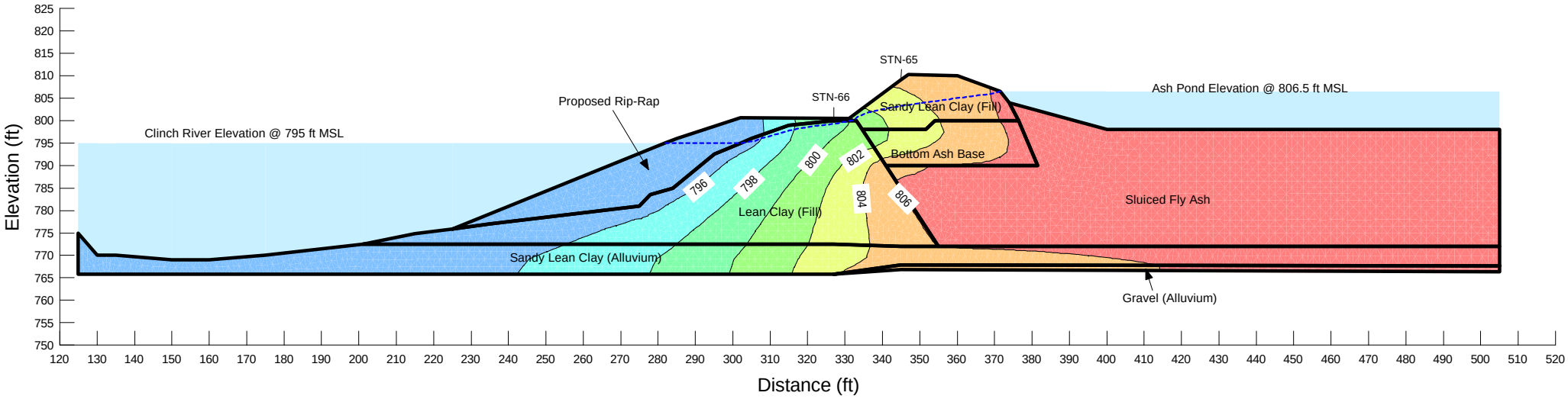
Piping Potential:
Maximum Exit Gradient occurs at (221.62,775.53)
Total Head = 795 ft
At (222,772.5)
Total Head = 795.17 ft
dH = 0.17 ft dl = 3.03 ft
i = 0.056 i(criticial) = 1
FSpiping = 17.86

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.297e-007	0.1	0.41
Sandy Lean Clay (Fill)	2.7887e-007	0.1	0.38
Sluiced Fly Ash	1.6076e-005	0.02	0.46
Sandy Lean Clay (Alluvium)	2.7887e-007	0.05	0.38
Gravel (Alluvium)	5.3477e-006	0.02	0.23
Rip Rap	0.01	1	0.4
Bottom Ash Base	6.5e-008	0.04	0.46

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Proposed Rip-Rap Buttress

Total Head Contours



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SEEP/W Analysis

Cross-Section R-R'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section R-R' buttress.gsz

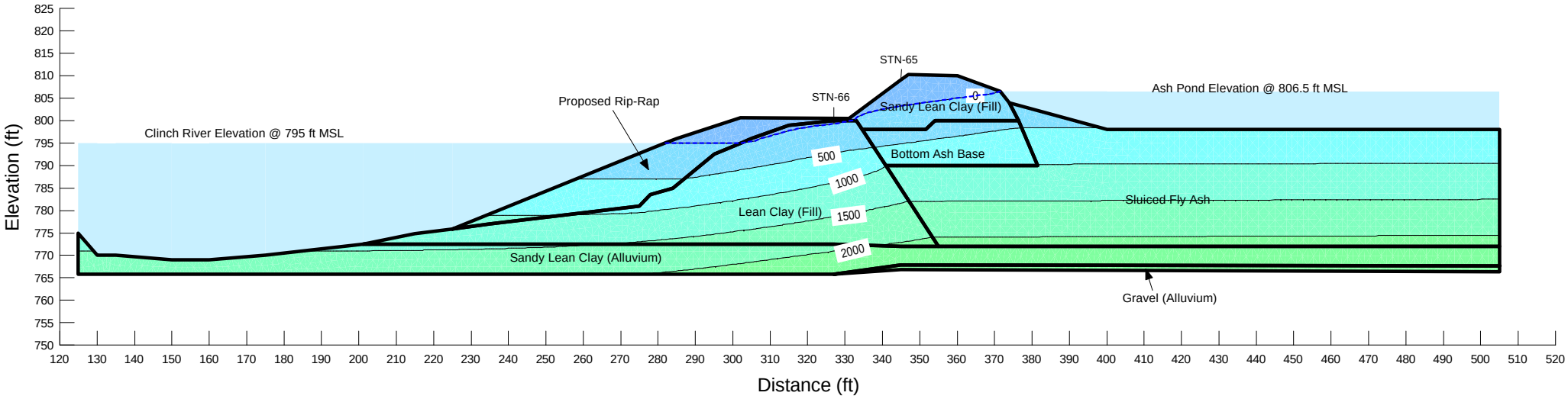
Piping Potential:
Maximum Exit Gradient occurs at (221.62,775.53)
Total Head = 795 ft
At (222,772.5)
Total Head = 795.17 ft
dH = 0.17 ft dl = 3.03 ft
i = 0.056 i(criticial) = 1
FSpiping = 17.86

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.297e-007	0.1	0.41
Sandy Lean Clay (Fill)	2.7887e-007	0.1	0.38
Sluiced Fly Ash	1.6076e-005	0.02	0.46
Sandy Lean Clay (Alluvium)	2.7887e-007	0.05	0.38
Gravel (Alluvium)	5.3477e-006	0.02	0.23
Rip Rap	0.01	1	0.4
Bottom Ash Base	6.5e-008	0.04	0.46

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Proposed Rip-Rap Buttress

Pore Water Pressure Contours



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Slope Stability

Cross-Section R-R'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Modified Spencer
File Name: Slope W Section R-R' buttress.gsz

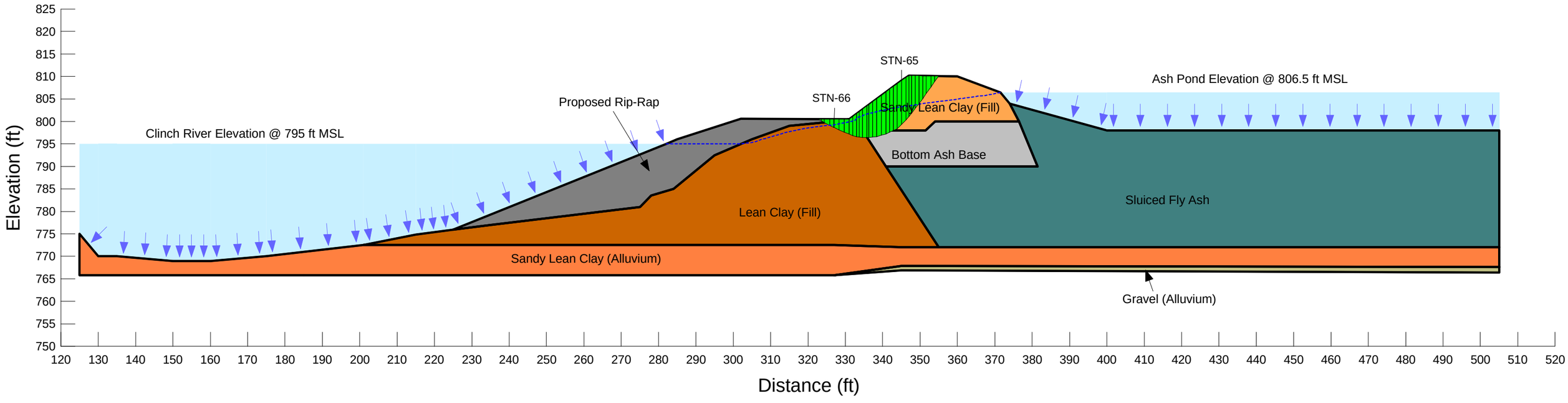
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Factor of Safety: 1.7
Center: (335, 821.5) ft
Radius: 17.56185 ft
Minimum Slip Surface Depth: 10 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Lean Clay (Fill)	125	126	0	33
Sandy Lean Clay (Fill)	125	126	0	33
Sluiced Fly Ash	100	105	0	25
Sandy Lean Clay (Alluvium)	126	127	0	33
Gravel (Alluvium)	135	135	0	40
Rip Rap	115	115	0	40
Bottom Ash Base	100	105	0	33

Proposed Rip-Rap Buttress

Global Failure



SEEP/W Analysis

Cross-Section R-R'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

Piping Potential
Maximum Exit Gradient occurs at (299.76,794.17)
Total Head = 795 ft
At (298.51,790.68)
Total Head = 795.66 ft
dH = 0.66 ft dl = 3.49 ft
i = 0.189 i(criticial) = 1
FSpiping = 5.29

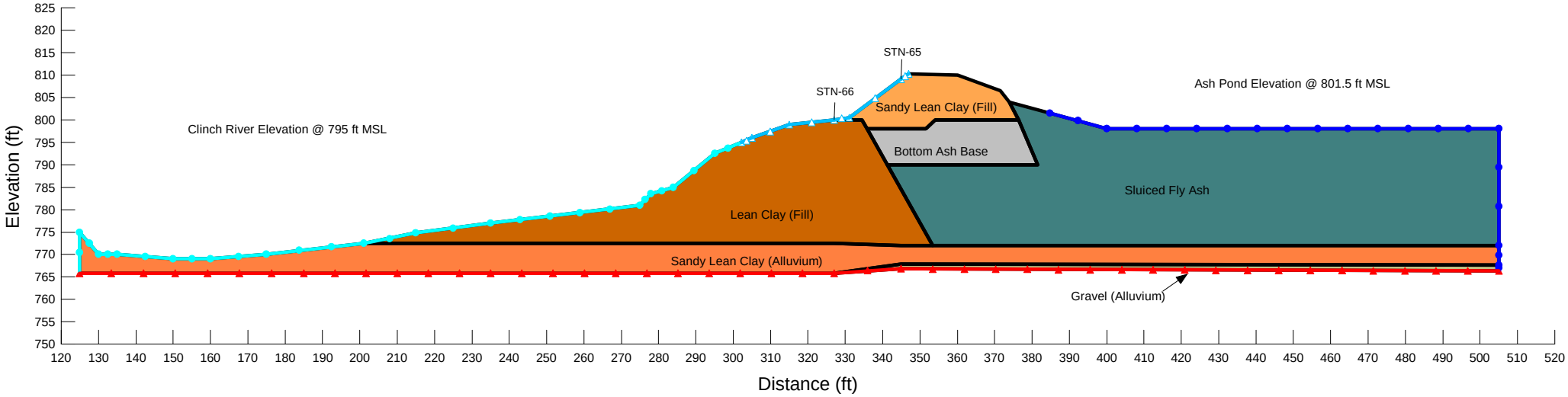
February 2010
Method: Steady-State Seepage
File Name: Slope W Section R-R' existing conditions Pool 801.5'.gsz

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.297e-007	0.1	0.41
Sandy Lean Clay (Fill)	2.7887e-007	0.1	0.38
Sluiced Fly Ash	1.6076e-005	0.02	0.46
Sandy Lean Clay (Alluvium)	2.7887e-007	0.05	0.38
Gravel (Alluvium)	5.3477e-006	0.02	0.23
Bottom Ash Base	6.5e-008	0.04	0.46

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Ash Pond Pool Lowered to Elevation 801.5'

Subsurface Profile and Boundary Conditions



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SEEP/W Analysis

Cross-Section R-R'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section R-R' Ash Pond Pool 801.5'.gsz

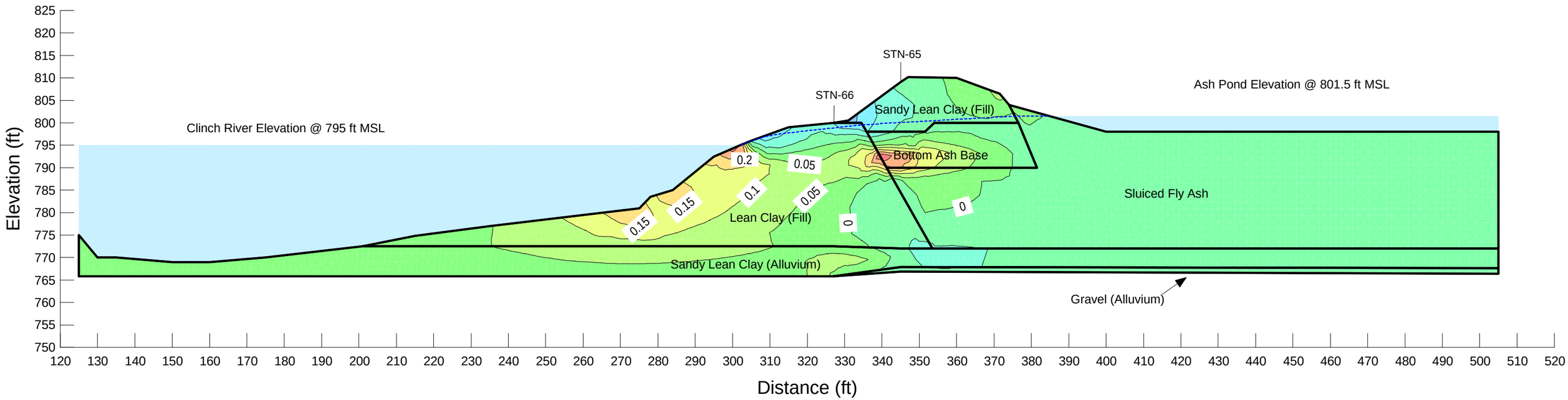
Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Piping Potential
Maximum Exit Gradient occurs at (299.76,794.17)
Total Head = 795 ft
At (298.51,790.68)
Total Head = 795.66 ft
dH = 0.66 ft dl = 3.49 ft
i = 0.189 i(criticial) = 1
FSpiping = 5.3

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.3e-007	0.1	0.41
Sandy Lean Clay (Fill)	2.8e-007	0.1	0.38
Sluiced Fly Ash	1.6e-005	0.02	0.46
Sandy Lean Clay (Alluvium)	2.8e-007	0.05	0.38
Gravel (Alluvium)	5.3e-006	0.02	0.23
Bottom Ash Base	6.5e-008	0.04	0.46

Ash Pond Pool Lowered to Elevation 801.5'

Vertical Gradient Contours



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SEEP/W Analysis

Cross-Section R-R'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

Piping Potential
Maximum Exit Gradient occurs at (299.76,794.17)
Total Head = 795 ft
At (298.51,790.68)
Total Head = 795.66 ft
dH = 0.66 ft dl = 3.49 ft
i = 0.189 i(criticial) = 1
FSpiping = 5.29

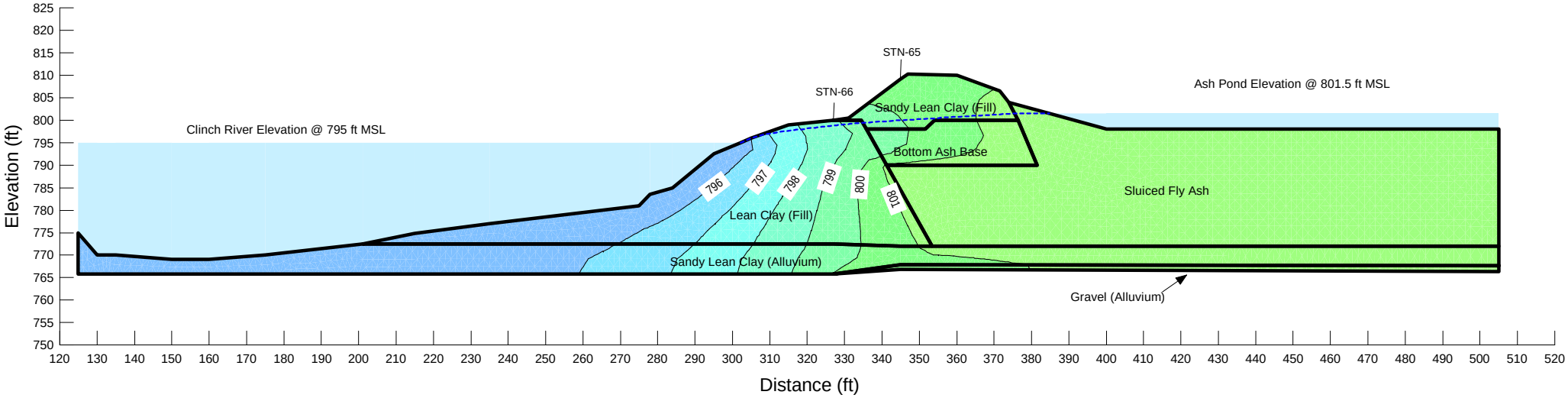
February 2010
Method: Steady-State Seepage
File Name: Slope W Section R-R' existing conditions Pool 801.5'.gsz

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.297e-007	0.1	0.41
Sandy Lean Clay (Fill)	2.7887e-007	0.1	0.38
Sluiced Fly Ash	1.6076e-005	0.02	0.46
Sandy Lean Clay (Alluvium)	2.7887e-007	0.05	0.38
Gravel (Alluvium)	5.3477e-006	0.02	0.23
Bottom Ash Base	6.5e-008	0.04	0.46

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Ash Pond Pool Lowered to Elevation 801.5'

Total Head Contours



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SEEP/W Analysis

Cross-Section R-R'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

Piping Potential
Maximum Exit Gradient occurs at (299.76,794.17)
Total Head = 795 ft
At (298.51,790.68)
Total Head = 795.66 ft
dH = 0.66 ft dl = 3.49 ft
i = 0.189 i(criticial) = 1
FSpiping = 5.29

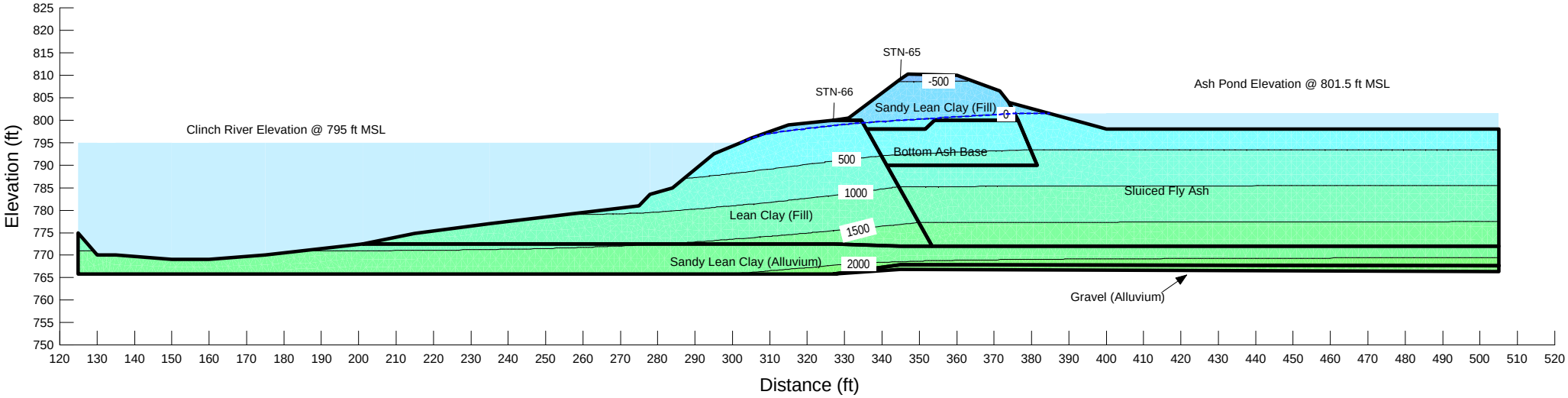
February 2010
Method: Steady-State Seepage
File Name: Slope W Section R-R' existing conditions Pool 801.5'.gsz

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Lean Clay (Fill)	2.297e-007	0.1	0.41
Sandy Lean Clay (Fill)	2.7887e-007	0.1	0.38
Sluiced Fly Ash	1.6076e-005	0.02	0.46
Sandy Lean Clay (Alluvium)	2.7887e-007	0.05	0.38
Gravel (Alluvium)	5.3477e-006	0.02	0.23
Bottom Ash Base	6.5e-008	0.04	0.46

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Ash Pond Pool Lowered to Elevation 801.5'

Pore Water Pressure Contours



V:\1714\active\171468118\environmental\Bull Run - 172679015\DRAFT Report\Engineering Analysis\Sect R-R'\Slope\Slope W Section R-R' existing conditions Pool 801.5'.gsz

Slope Stability dMin=20

Cross-Section R-R'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Modified Spencer
File Name: Slope W Section R-R' Ash Pond Pool 801.5'.gsz

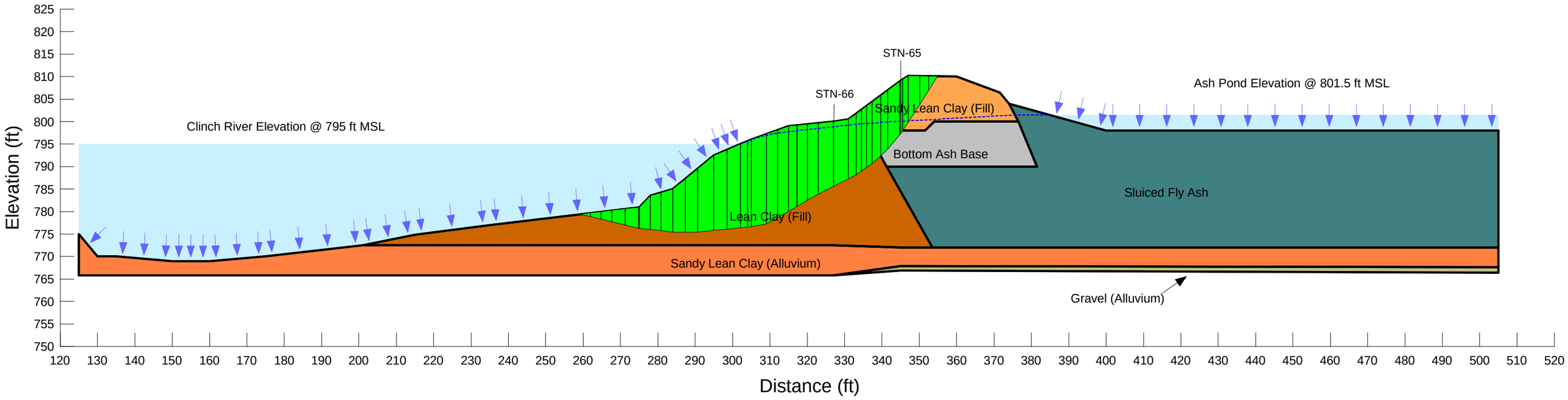
Factor of Safety: 1.5
Center: (290, 855) ft
Radius: 50.76405 ft
Minimum Slip Surface Depth: 20 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Lean Clay (Fill)	125	126	0	33
Sandy Lean Clay (Fill)	125	126	0	33
Sluiced Fly Ash	100	105	0	25
Sandy Lean Clay (Alluvium)	126	127	0	33
Gravel (Alluvium)	135	135	0	40
Bottom Ash Base	100	105	0	33

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Ash Pond Pool Lowered to Elevation 801.5'

Global Failure



V:\1714\active\171468118\environmental\Bull Run - 172679015\Report\Engineering Analysis\Sect R-R'\Slope\Slope W Section R-R' Ash Pond Pool 801.5'.gsz

SEEP/W Analysis

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

Piping Potential
Maximum Exit Gradient occurs at (313.17,793)
Total Head = 795 ft
At (316.37,789.16)
Total Head = 796.63ft
dH = 1.63 ft dl = 3.84 ft
i = 0.424 i(criticial) = 1
FSpiping = 2.4

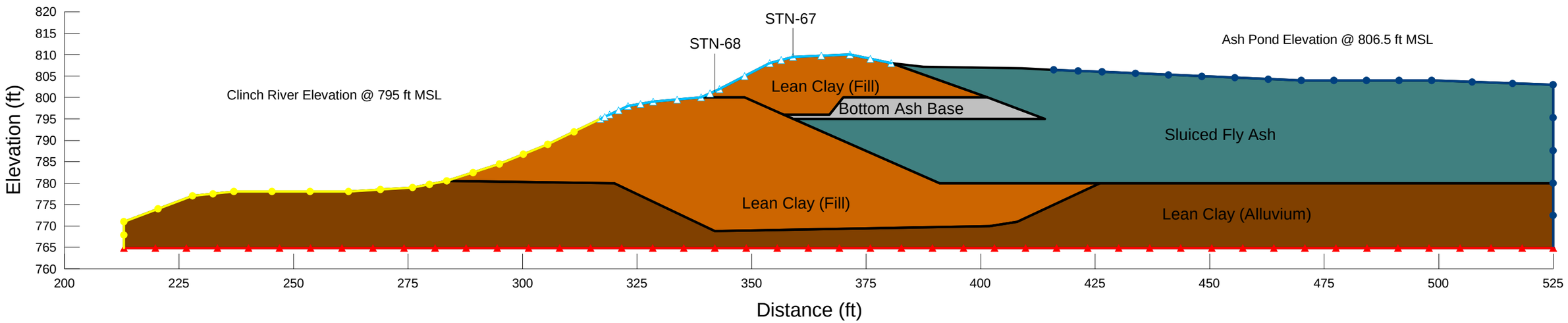
February 2010
Method: Steady-State Seepage
File Name: Slope W Section S-S' existing conditions (Global).gsz

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
Lean Clay (Alluvium)	2.3e-007	0.05	0.41
Bottom Ash Base	6.5e-008	0.04	0.46

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Existing Conditions

Subsurface Profile and Boundary Conditions



SEEP/W Analysis

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

Piping Potential
Maximum Exit Gradient occurs at (313.17,793)
Total Head = 795 ft
At (316.37,789.16)
Total Head = 796.63ft
dH = 1.63 ft dl = 3.84 ft
i = 0.424 i(criticial) = 1
FSpiping = 2.4

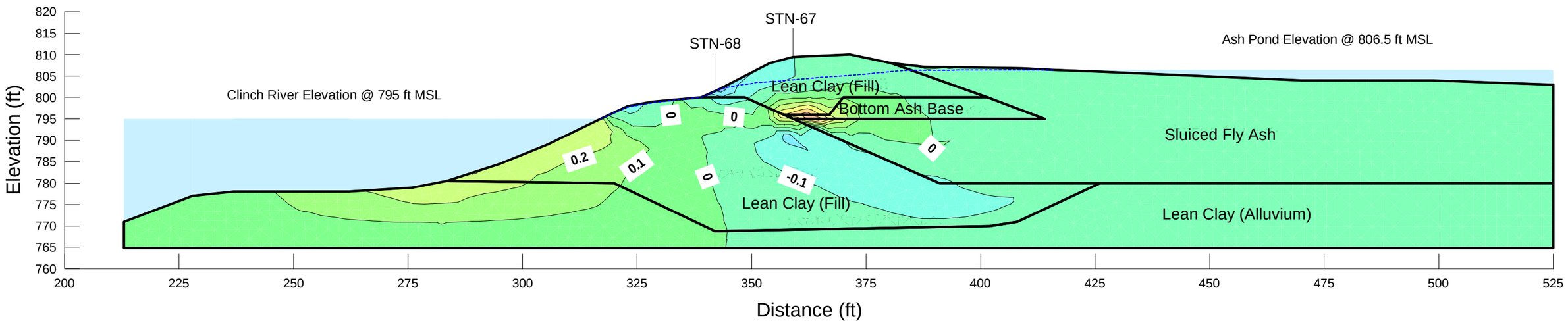
February 2010
Method: Steady-State Seepage
File Name: Slope W Section S-S' existing conditions (Global).gsz

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
Lean Clay (Alluvium)	2.3e-007	0.05	0.41
Bottom Ash Base	6.5e-008	0.04	0.46

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Existing Conditions

Vertical Gradient Contours



SEEP/W Analysis

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

Piping Potential
Maximum Exit Gradient occurs at (313.17,793)
Total Head = 795 ft
At (316.37,789.16)
Total Head = 796.63ft
dH = 1.63 ft dl = 3.84 ft
i = 0.424 i(criticial) = 1
FSpiping = 2.4

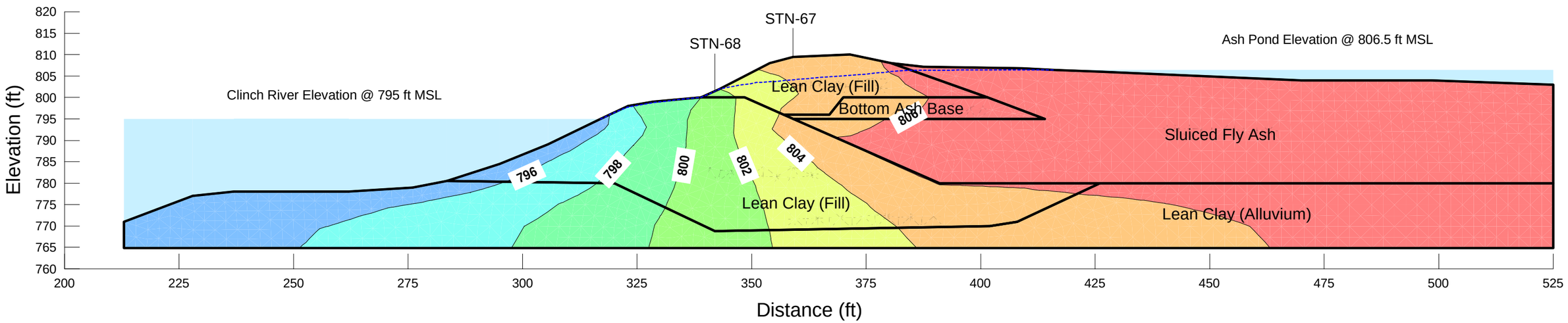
February 2010
Method: Steady-State Seepage
File Name: Slope W Section S-S' existing conditions (Global).gsz

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
Lean Clay (Alluvium)	2.3e-007	0.05	0.41
Bottom Ash Base	6.5e-008	0.04	0.46

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Existing Conditions

Total Head Contours



SEEP/W Analysis

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

Piping Potential
Maximum Exit Gradient occurs at (313.17,793)
Total Head = 795 ft
At (316.37,789.16)
Total Head = 796.63ft
dH = 1.63 ft dl = 3.84 ft
i = 0.424 i(criticial) = 1
FSpiping = 2.4

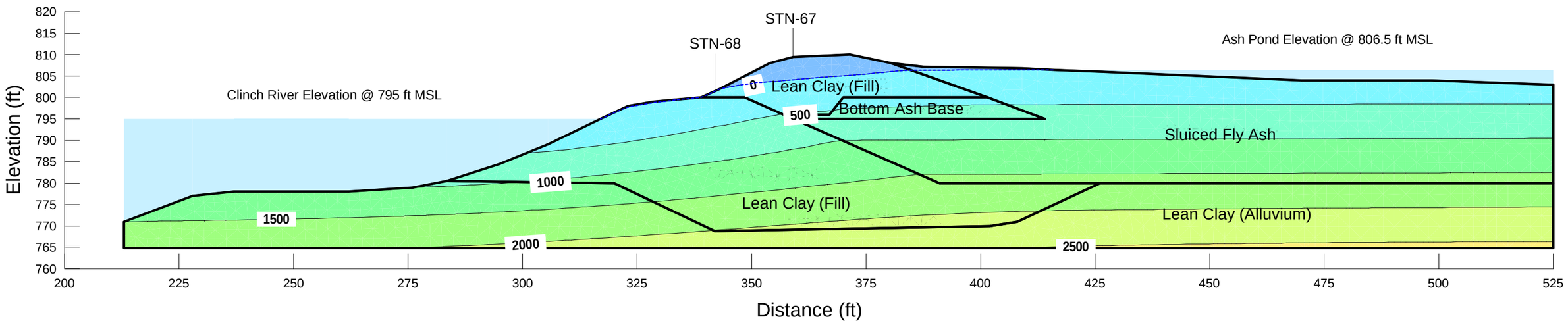
February 2010
Method: Steady-State Seepage
File Name: Slope W Section S-S' existing conditions (Global).gsz

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
Lean Clay (Alluvium)	2.3e-007	0.05	0.41
Bottom Ash Base	6.5e-008	0.04	0.46

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Existing Conditions

Pore Water Pressure Contours



Slope Stability (Entry-Exit)

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

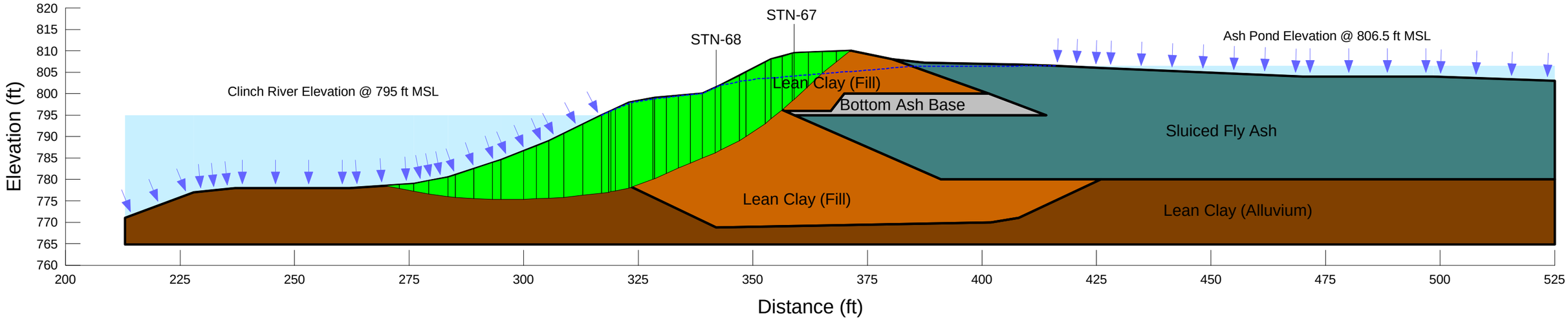
Factor of Safety: 1.2
Center: (296.129, 871.931) ft
Radius: 52.70431 ft
Minimum Slip Surface Depth: 20 ft

February 2010
Method: Modified Spencer
File Name: Slope W Section S-S' existing conditions (Global).gsz

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Sluiced Fly Ash	100	105	0	25
Lean Clay (Fill)	125	126	0	33
Lean Clay (Alluvium)	123	123	0	31
Bottom Ash Base	100	105	0	33

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Existing Conditions
Global Failure



Slope Stability

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

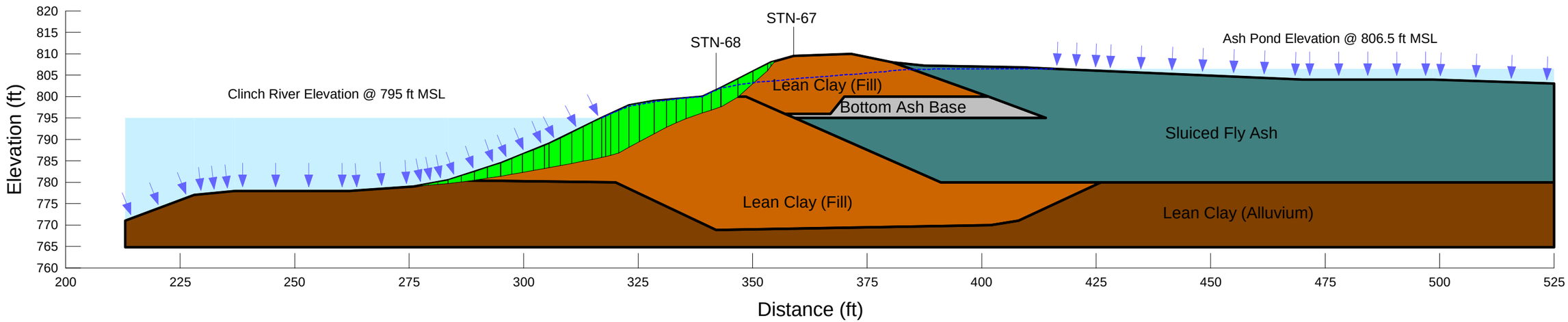
Factor of Safety: 1.1
Center: (281, 889.75) ft
Radius: 42.5393 ft
Minimum Slip Surface Depth: 10 ft

February 2010
Method: Modified Spencer
File Name: Slope W Section S-S' existing conditions (Non-global).gsz

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Sluiced Fly Ash	100	105	0	25
Lean Clay (Fill)	125	126	0	33
Lean Clay (Alluvium)	123	123	0	31
Bottom Ash Base	100	105	0	33

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Existing Conditions
Non-Global Failure



SEEP/W Analysis

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section S-S' buttress.gsz

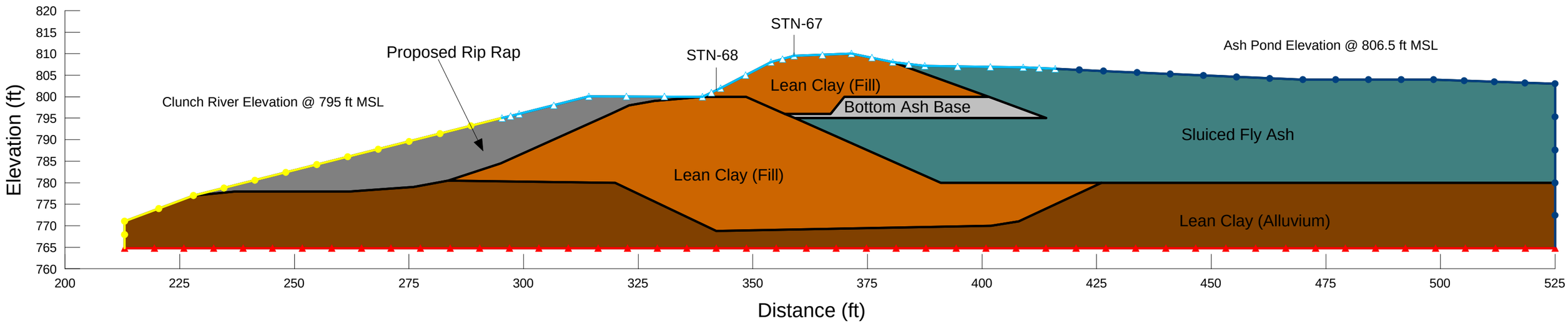
Piping Potential
Maximum Exit Gradient occurs at (213,771)
Total Head = 795 ft
At (213,764.8)
Total Head = 795.51 ft
dH = 0.51 ft dl = 6.2 ft
i = 0.082 i(criticial) = 1
FSpiping = 12.2

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
Lean Clay (Alluvium)	2.3e-007	0.05	0.41
Bottom Ash Base	6.5e-008	0.04	0.46
Rip Rap	0.01	1	0.4

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Proposed Rip-Rap Buttress

Subsurface Profile and Boundary Conditions



SEEP/W Analysis

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section S-S' buttress.gsz

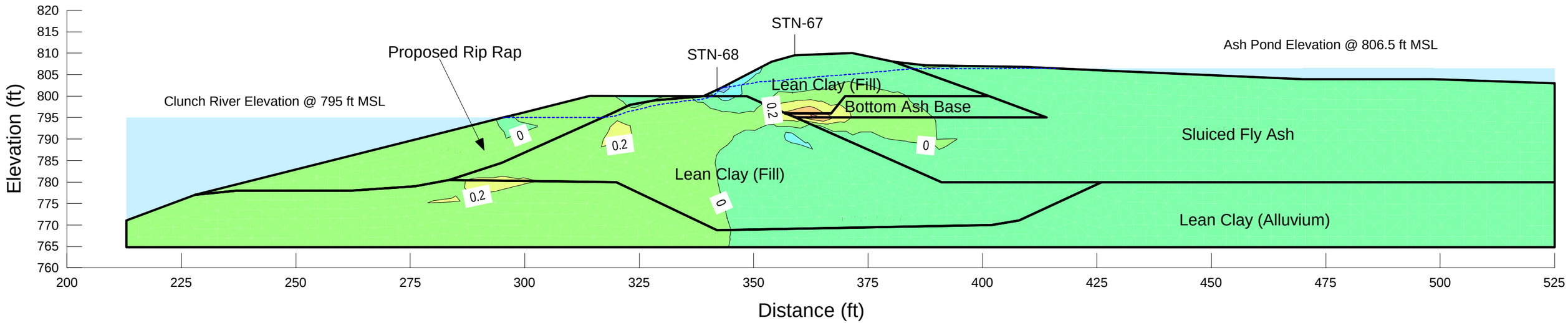
Piping Potential
Maximum Exit Gradient occurs at (213,771)
Total Head = 795 ft
At (213,764.8)
Total Head = 795.51 ft
dH = 0.51 ft dl = 6.2 ft
i = 0.082 i(criticial) = 1
FSpiping = 12.2

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
Lean Clay (Alluvium)	2.3e-007	0.05	0.41
Bottom Ash Base	6.5e-008	0.04	0.46
Rip Rap	0.01	1	0.4

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Proposed Rip-Rap Buttress

Vertical Gradient Contours



SEEP/W Analysis

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section S-S' buttress.gsz

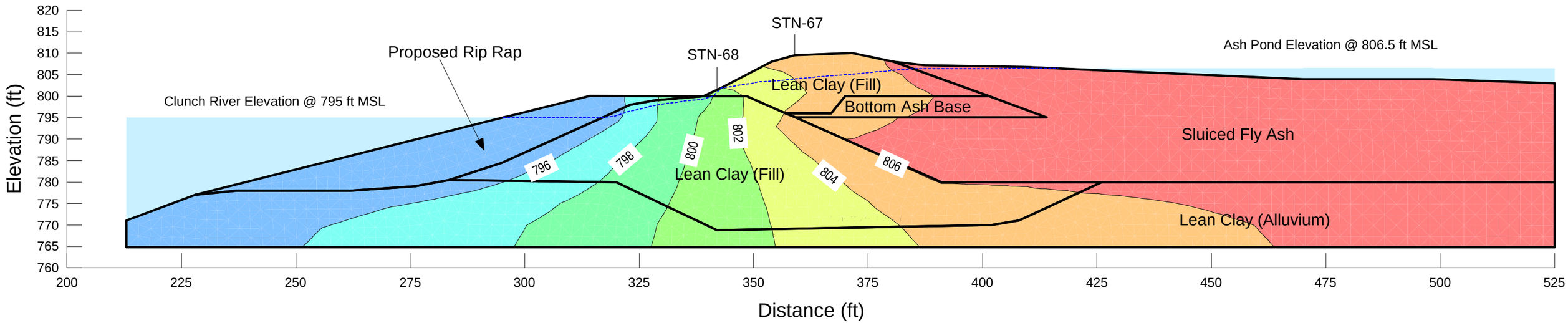
Piping Potential
Maximum Exit Gradient occurs at (213,771)
Total Head = 795 ft
At (213,764.8)
Total Head = 795.51 ft
dH = 0.51 ft dl = 6.2 ft
i = 0.082 i(criticial) = 1
FSpiping = 12.2

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
Lean Clay (Alluvium)	2.3e-007	0.05	0.41
Bottom Ash Base	6.5e-008	0.04	0.46
Rip Rap	0.01	1	0.4

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Proposed Rip-Rap Buttress

Total Head Contours



SEEP/W Analysis

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

February 2010
Method: Steady-State Seepage
File Name: Slope W Section S-S' buttress.gsz

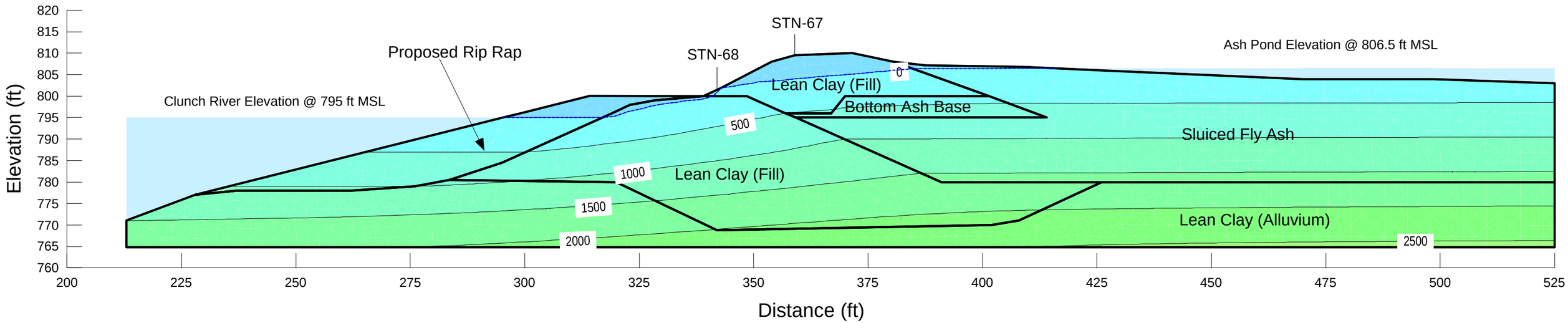
Piping Potential
Maximum Exit Gradient occurs at (213,771)
Total Head = 795 ft
At (213,764.8)
Total Head = 795.51 ft
dH = 0.51 ft dl = 6.2 ft
i = 0.082 i(criticial) = 1
FSpiping = 12.2

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
Lean Clay (Alluvium)	2.3e-007	0.05	0.41
Bottom Ash Base	6.5e-008	0.04	0.46
Rip Rap	0.01	1	0.4

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Proposed Rip-Rap Buttress

Pore Water Pressure Contours



Slope Stability

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

Factor of Safety: 1.7
Center: (347.725, 816.64) ft
Radius: 17.38605 ft
Minimum Slip Surface Depth: 10 ft

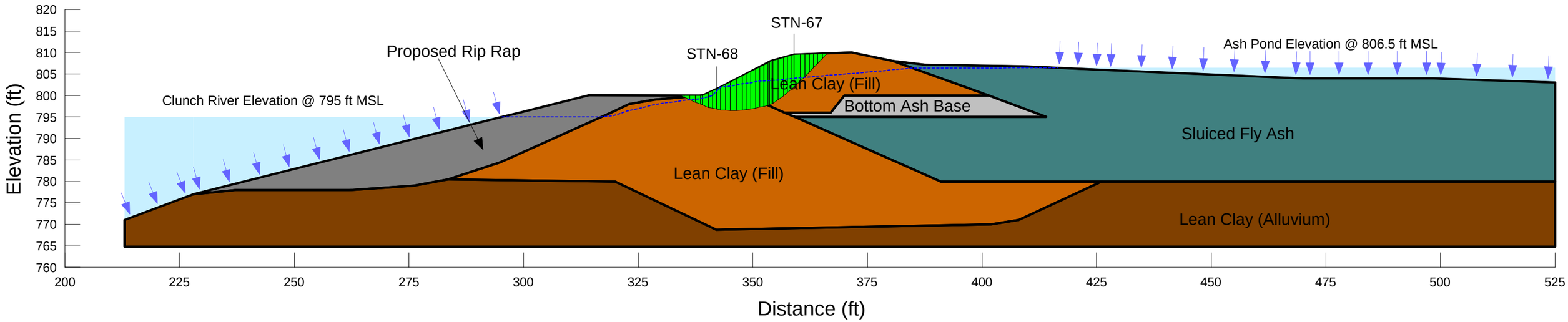
January 2010
Method: Modified Spencer
File Name: Slope W Section S-S' buttress.gsz

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Sluiced Fly Ash	100	105	0	25
Lean Clay (Fill)	125	126	0	33
Lean Clay (Alluvium)	123	123	0	31
Bottom Ash Base	100	105	0	33
Rip Rap	115	115	0	40

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Proposed Rip-Rap Buttress

Global Failure



SEEP/W Analysis

Cross-Section S-S'
Fly Ash Disposal Area 2

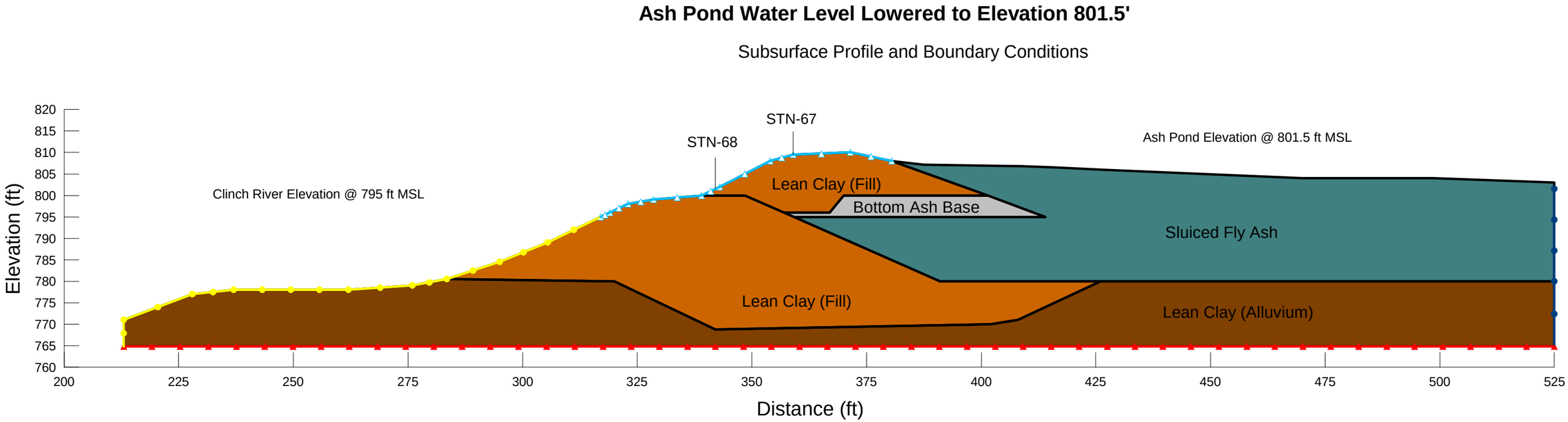
Bull Run Fossil Plant
Tennessee Valley Authority

Piping Potential
Maximum Exit Gradient occurs at (313.17,793)
Total Head = 795 ft
At (316.37,789.16)
Total Head = 795.97 ft
dH = 0.97 ft dl = 3.84 ft
i = 0.253 i(criticial) = 1
FSpiping = 4.0

February 2010
Method: Steady-State Seepage
File Name: Slope W Section S-S' Ash Pond Pool 801.5' (Global).gsz

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
Lean Clay (Alluvium)	2.3e-007	0.05	0.41
Bottom Ash Base	6.5e-008	0.04	0.46

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.



SEEP/W Analysis

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

Piping Potential
Maximum Exit Gradient occurs at (313.17,793)
Total Head = 795 ft
At (316.37,789.16)
Total Head = 795.97 ft
dH = 0.97 ft dl = 3.84 ft
i = 0.253 i(criticial) = 1
FSpiping = 4.0

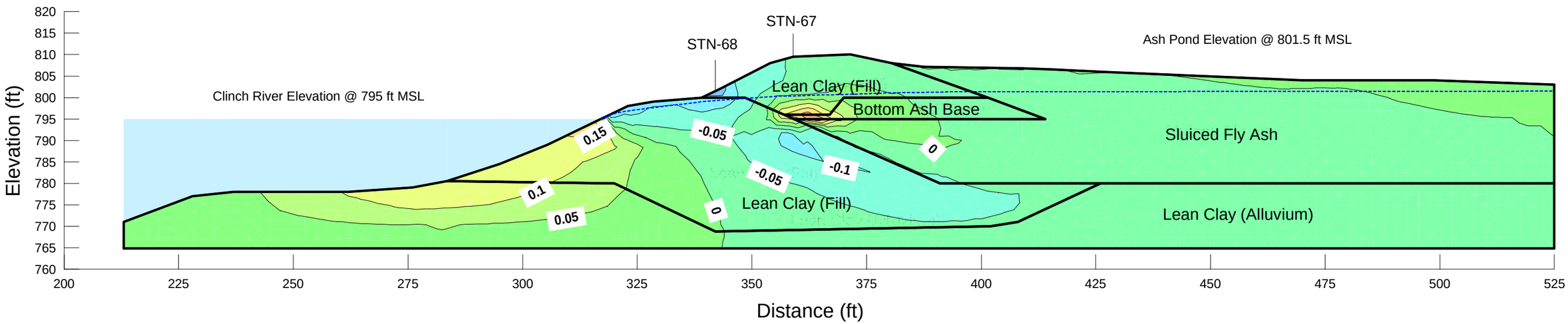
February 2010
Method: Steady-State Seepage
File Name: Slope W Section S-S' Ash Pond Pool 801.5' (Global).gsz

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
Lean Clay (Alluvium)	2.3e-007	0.05	0.41
Bottom Ash Base	6.5e-008	0.04	0.46

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Ash Pond Water Level Lowered to Elevation 801.5'

Vertical Gradient Contours



SEEP/W Analysis

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

Piping Potential
Maximum Exit Gradient occurs at (313.17,793)
Total Head = 795 ft
At (316.37,789.16)
Total Head = 795.97 ft
dH = 0.97 ft dl = 3.84 ft
i = 0.253 i(criticial) = 1
FSpiping = 4.0

February 2010
Method: Steady-State Seepage
File Name: Slope W Section S-S' Ash Pond Pool 801.5' (Global).gsz

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
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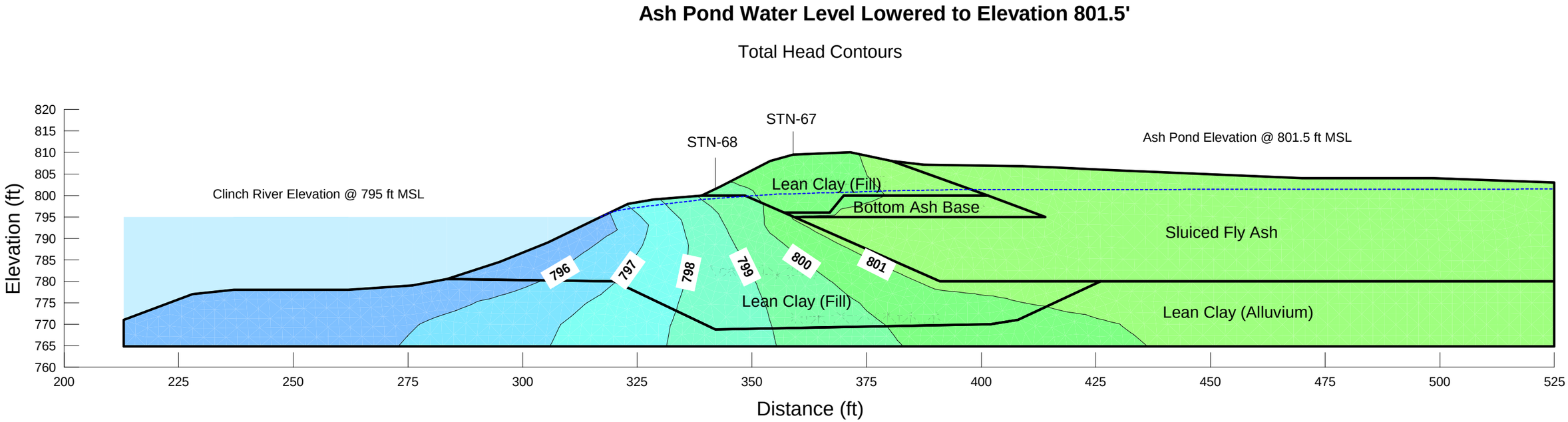

SEEP/W Analysis

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

Piping Potential
Maximum Exit Gradient occurs at (313.17,793)
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February 2010
Method: Steady-State Seepage
File Name: Slope W Section S-S' Ash Pond Pool 801.5' (Global).gsz

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
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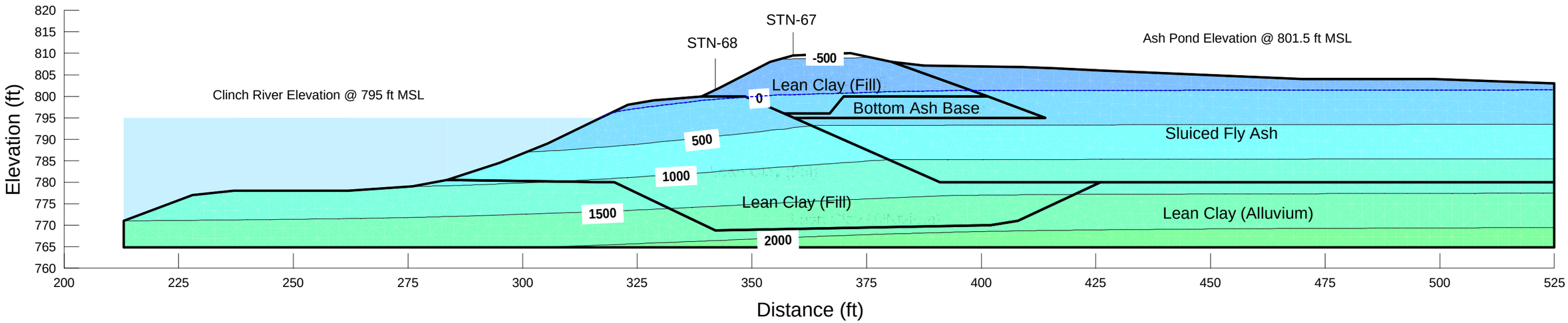
Ash Pond Water Level Lowered to Elevation 801.5'

Pore Water Pressure Contours



Slope Stability (Entry-Exit)

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

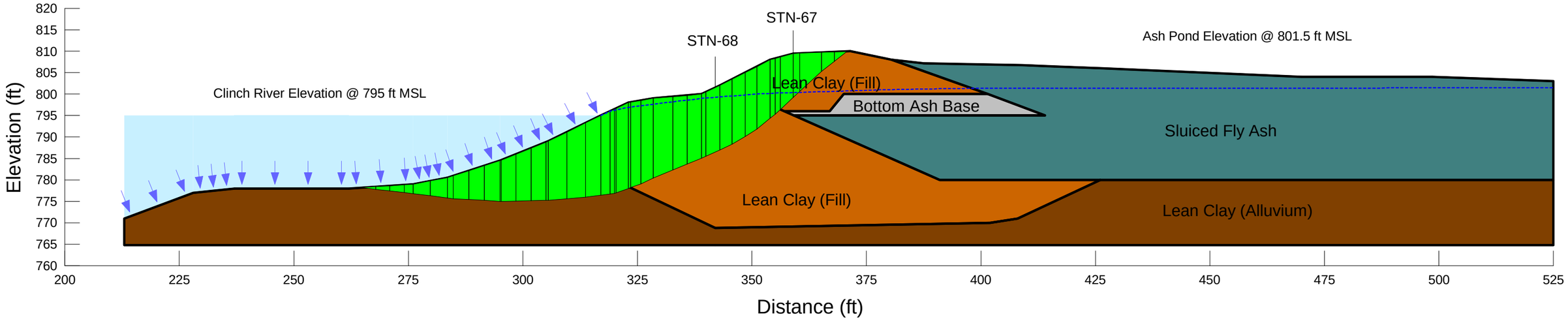
February 2010
Method: Modified Spencer
File Name: Slope W Section S-S' Ash Pond Pool 801.5' (Global).gsz

Factor of Safety: 1.4
Center: (294.972, 872.705) ft
Radius: 54.48379 ft
Minimum Slip Surface Depth: 20 ft

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Sluiced Fly Ash	100	105	0	25
Lean Clay (Fill)	125	126	0	33
Lean Clay (Alluvium)	123	123	0	31
Bottom Ash Base	100	105	0	33

Note:
The results of the analysis shown were developed based on available subsurface information from a limited number of exploratory locations, with the assumption that the materials exposed fairly represent the subsurface conditions within the areas explored. No guarantee can be made regarding the subsurface conditions between the explored locations; and such unknown conditions could have an impact on the results of the analyses.

Ash Pond Water Level Lowered to Elevation 801.5'
Global Failure



SEEP/W Analysis

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

Piping Potential
Maximum Exit Gradient occurs at (276,779)
Total Head = 795 ft
At (276.19,774.43)
Total Head = 795.98 ft
dH = 0.98 ft dl = 4.57 ft
i = 0.214 i(criticial) = 1
FSpiping = 4.7

February 2010
Method: Steady-State Seepage
File Name: Slope W Section S-S' 30' slurry wall (Global).gsz

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
Lean Clay (Alluvium)	2.3e-007	0.05	0.41
Bottom Ash Base	6.5e-008	0.04	0.46

Note:
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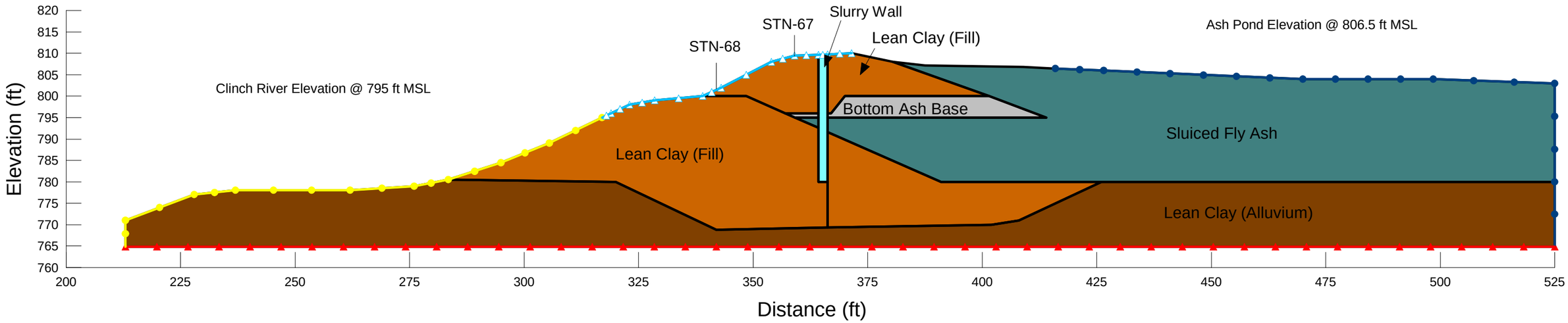
Proposed Slurry Wall

Subsurface Profile and Boundary Conditions



SEEP/W Analysis

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

Piping Potential
Maximum Exit Gradient occurs at (276,779)
Total Head = 795 ft
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February 2010
Method: Steady-State Seepage
File Name: Slope W Section S-S' 30' slurry wall (Global).gsz

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
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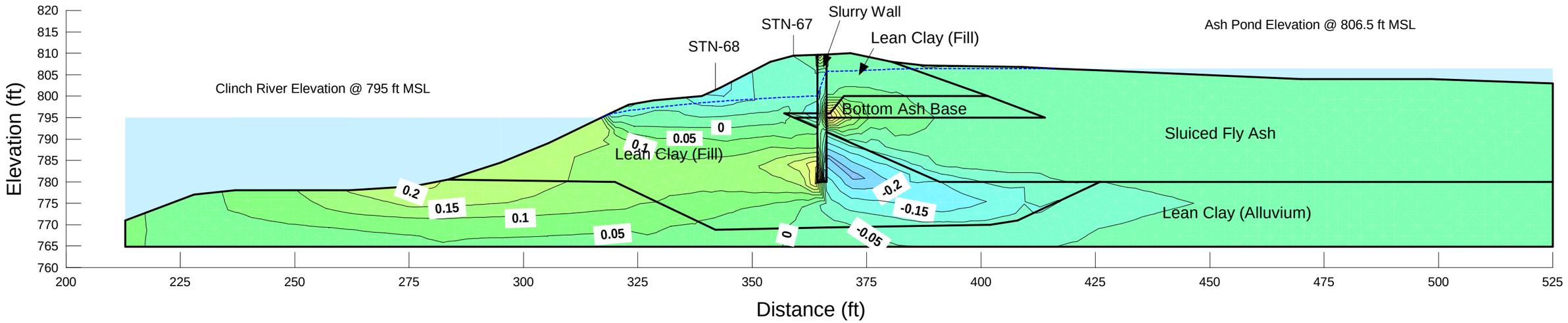
Proposed Slurry Wall

Vertical Gradient Contours



SEEP/W Analysis

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

Piping Potential
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February 2010
Method: Steady-State Seepage
File Name: Slope W Section S-S' 30' slurry wall (Global).gsz

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
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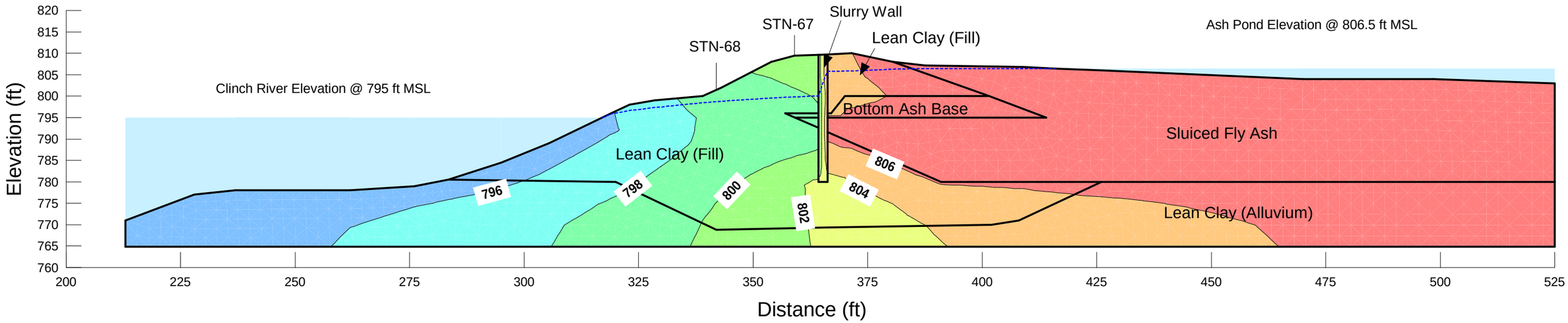
Proposed Slurry Wall

Total Head Contours



SEEP/W Analysis

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

Piping Potential
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February 2010
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File Name: Slope W Section S-S' 30' slurry wall (Global).gsz

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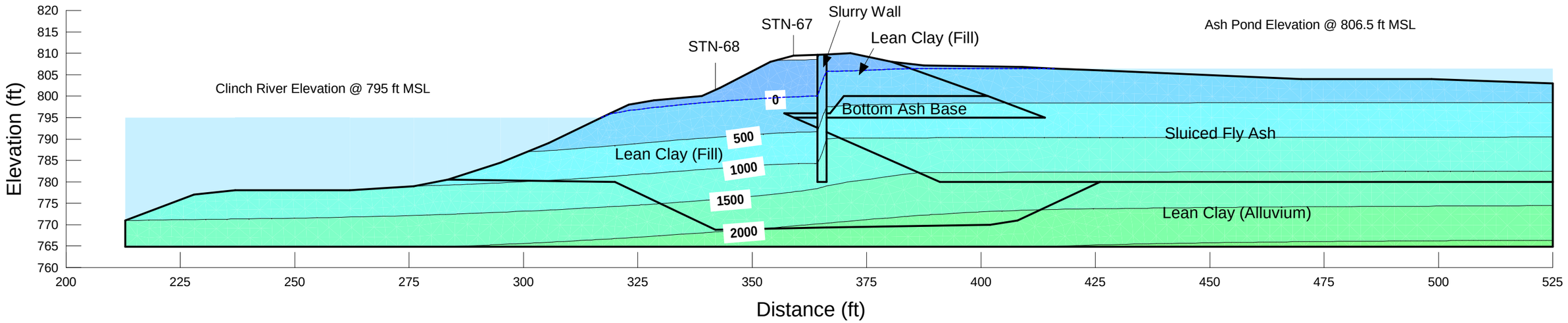
Proposed Slurry Wall

Pore Water Pressure Contours



Slope Stability (dMin=20)

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

Factor of Safety: 1.4
Center: (298.25, 849.5) ft
Radius: 52.25045 ft
Minimum Slip Surface Depth: 20 ft

January 2010
Method: Modified Spencer
File Name: Slope W Section S-S' 30' slurry wall (Global).gsz

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Sluiced Fly Ash	100	105	0	25
Lean Clay (Fill)	125	126	0	33
Lean Clay (Alluvium)	123	123	0	31
Bottom Ash Base	100	105	0	33

Note:
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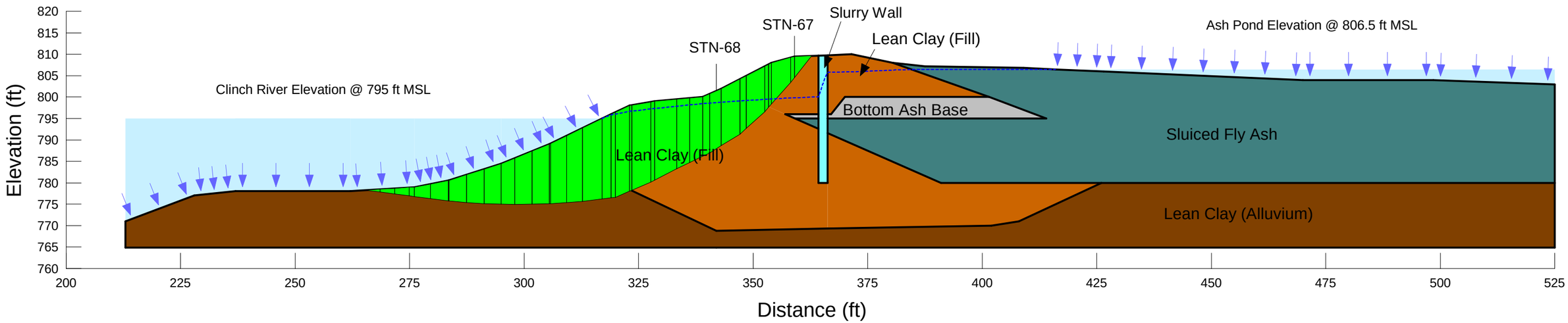
Proposed Slurry Wall

Global Failure



V:\1714\active\171468118\environmental\Bull Run - 172679015\Report\Engineering Analysis\Sect S-S'\Slope\Slope W Section S-S' 30' slurry wall (Global).gsz

SEEP/W Analysis

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

Piping Potential
Maximum Exit Gradient occurs at (276,779)
Total Head = 795 ft
At (276.19,774.43)
Total Head = 795.55 ft
dH = 0.55 ft dl = 4.57 ft
i = 0.12 i(criticial) = 1
FSpiping = 8.3

February 2010
Method: Steady-State Seepage
File Name: Slope W Section S-S' 30' slurry wall Pool 801.5' (Global).gsz

Material Type	Ksat (ft/s)	Kratio	Wsat (ft3/ft3)
Sluiced Fly Ash	1.6e-005	0.02	0.46
Lean Clay (Fill)	2.3e-007	0.1	0.41
Lean Clay (Alluvium)	2.3e-007	0.05	0.41
Bottom Ash Base	6.5e-008	0.04	0.46

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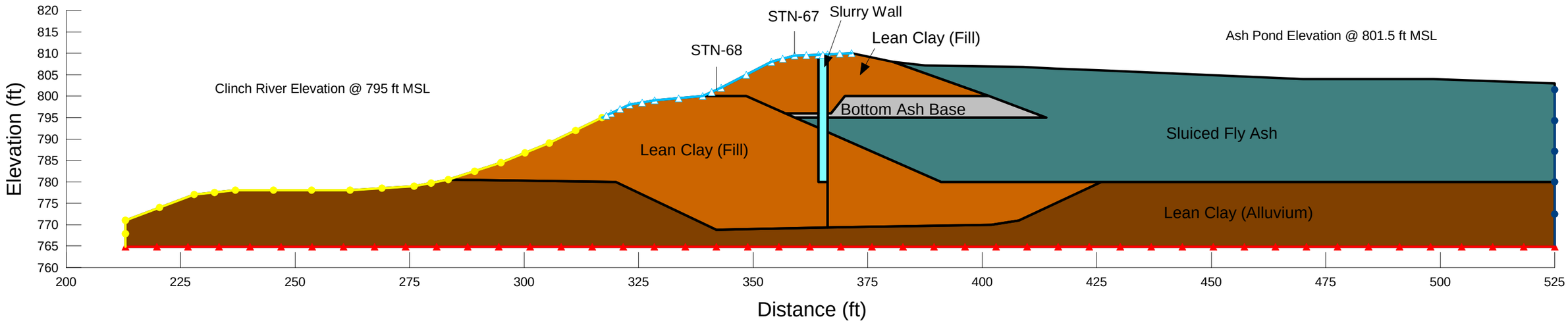
Proposed Slurry Wall and Ash Pond Pool Lowered to Elevation 801.5'

Subsurface Profile and Boundary Conditions



SEEP/W Analysis

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

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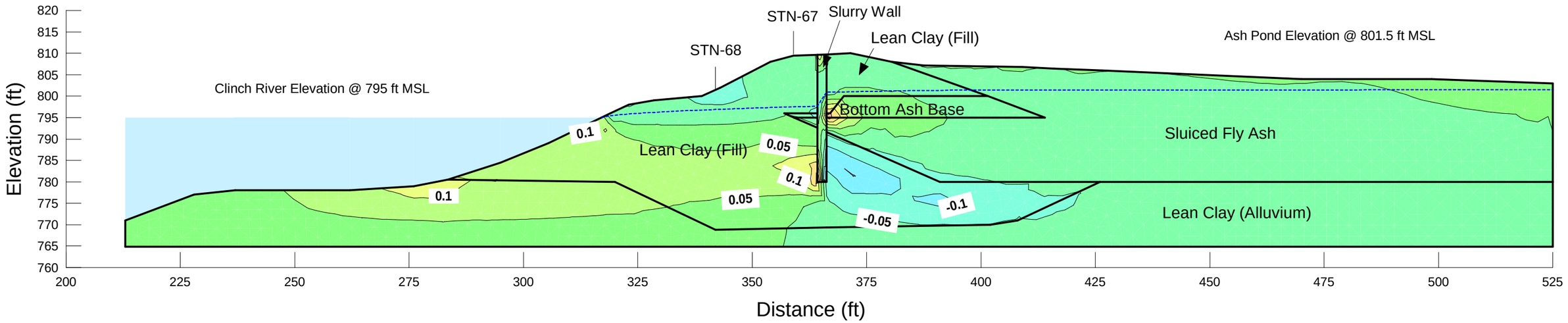
Proposed Slurry Wall and Ash Pond Pool Lowered to Elevation 801.5'

Vertical Gradient Contours



SEEP/W Analysis

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

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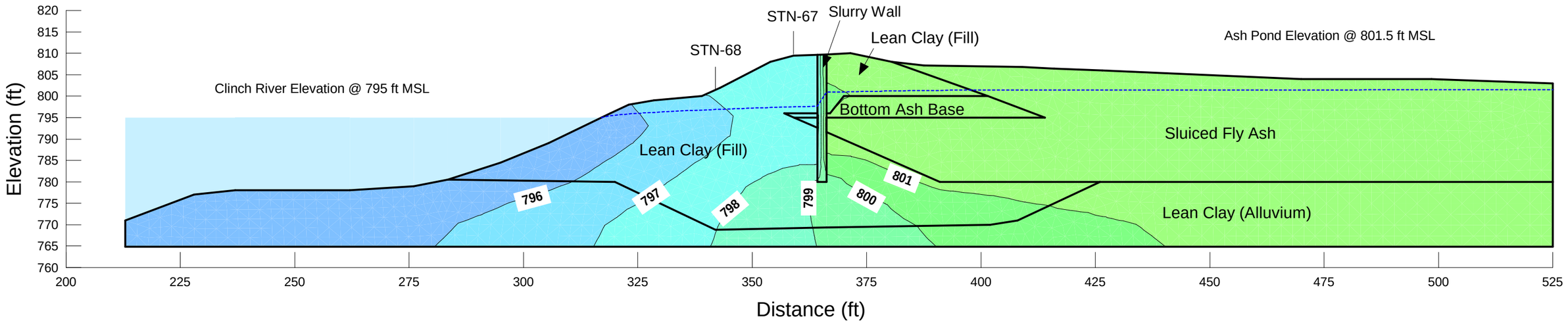
Proposed Slurry Wall and Ash Pond Pool Lowered to Elevation 801.5'

Total Head Contours



SEEP/W Analysis

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

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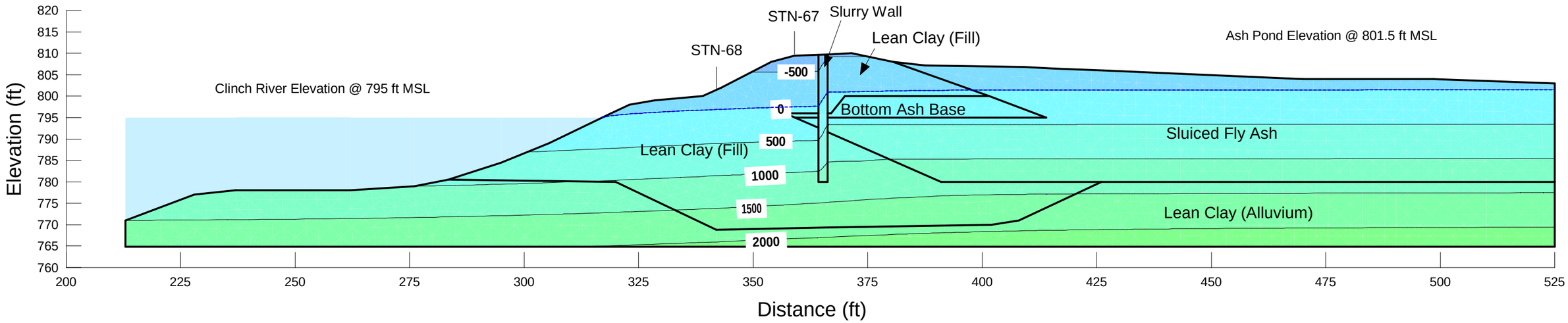
Proposed Slurry Wall and Ash Pond Pool Lowered to Elevation 801.5'

Pore Water Pressure Contours



Slope Stability (dMin=20)

Cross-Section S-S'
Fly Ash Disposal Area 2

Bull Run Fossil Plant
Tennessee Valley Authority

Factor of Safety: 1.5
Center: (298.25, 855.25) ft
Radius: 52.4 ft
Minimum Slip Surface Depth: 20 ft

February 2010
Method: Modified Spencer
File Name: Slope W Section S-S' 30' slurry wall Pool 801.5' (Global).gsz

Material Type	Moist Unit Weight	Saturated Unit Weight	Cohesion	Friction Angle
Sluiced Fly Ash	100	105	0	25
Lean Clay (Fill)	125	126	0	33
Lean Clay (Alluvium)	123	123	0	31
Bottom Ash Base	100	105	0	33

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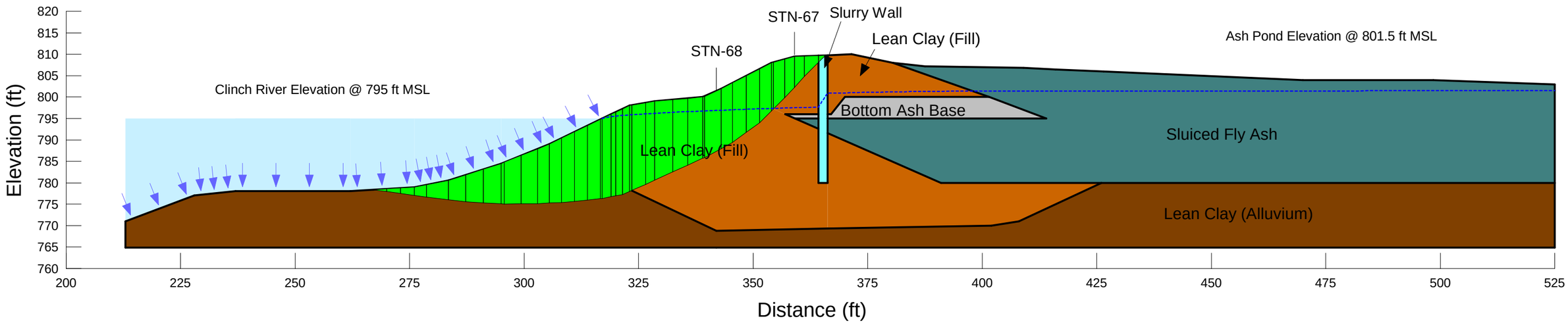
Proposed Slurry Wall and Ash Pond Pool Lowered to Elevation 801.5'

Global Failure