APPENDIX E HYDROGEOLOGIC INVESTIGATION REPORT OF FINDINGS

Hydrogeological Investigation
Report of Findings
Norborne, Missouri

For

Associated Electric Cooperative, Inc.

Collector Wells International, Inc.

6360 Huntley Road
Columbus, Ohio

August 24, 2006

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EXECUTIVE SUMMARY

Collector Wells International, Inc. (CWI) was contracted by Associated Electric Cooperative, Inc. (AEC), to conduct a hydrogeological evaluation of the feasibility of utilizing horizontal collector well technology and riverbank filtration (RBF) to provide a water supply for a proposed new generating facility. AEC has proposed construction of a new coal-powered generating facility to be located in the Missouri River Valley near Norborne, Missouri. Water requirements are estimated to average 5,600 gallons per minute (gpm), peaking to 7,400 gpm during the summer. The study for the plant's water supply was conducted on a site located about 7 miles south of the proposed plant and adjacent to the Missouri River (Figure 1).

The scope of this project consisted of three (3) tasks including: Task 1 – Exploratory Test Borings; Task 2 – Detailed Aquifer Testing; and Task 3 – Data Analyses, Conceptual Design and Reporting. Task 1 involved drilling three (3) test borings and conducting a hydraulic interval test in one of the borings. Task 2 included the installation of a test well capable of pumping at least 1,000 gpm and four (4) additional observation wells (Figure 2), and conducting a 72-hour constant rate aquifer test. Task 3 included the compilation and analysis of the data collected in Tasks 1 and 2 to determine the feasibility and preliminary design of a collector well or wells at the proposed site.

The test borings indicated that the project site is underlain by an unconsolidated aquifer that contains variable sequences of sand and gravel and is overlain by clay, silt and fine sand. The bedrock surface was encountered at depths of 71 to 75 feet below the ground surface in the borings, and the lower 30 feet of the borings above the bedrock was generally comprised of sand and gravel (Figure 3). The results of the Task 1 field activities indicated that the site had the potential for the development of a ground water supply, and the Task 2 activities were conducted to quantify the potential ground water yield.

The results of the Task 2 aquifer testing indicate that the aquifer in the vicinity of the test pumping well is permeable, having a transmissivity of approximately 129,000 gallons per day per foot (gpd/ft) under the test conditions. It also appears that the aquifer is in reasonably good hydraulic connection with the river, which provides a source of recharge. The aquifer properties and the proximity to the river allows for the potential development of a RBF system utilizing one or more collector wells.

Based on the testing results, it is estimated that a collector well located near the test pumping well location could yield in excess of the desired 7,400 gpm under average summer conditions. Under the assumed low river level, low water temperature conditions as would be expected in winter months, it is estimated that a collector well near the test pumping well could yield approximately 4,700 gpm.

An analytic element ground water flow model was used to estimate the effects on the aquifer when pumping the desired yield. A model simulation was run with a single collector well near the test pumping well pumping 7,400 gpm under assumed average summer conditions. This simulation shows that there would be approximately 2 feet or more drawdown extending approximately 1,200 feet north of the site property boundaries, and an area with a projected drawdown of approximately 0.5 feet or more would extend to approximately 1.5 miles north of the site. A simulation was run with two collector wells with each pumping 3,700 gpm for a total of 7,400 gpm under assumed winter low river conditions. This simulation shows that there would be approximately 5 feet or more drawdown extending nearly to the property boundaries of the project site, and an area that would have a projected drawdown of approximately 0.5 feet or more extending to approximately 2.2 miles north of the project site. An additional simulation was run with low river levels during the summer. This simulation produced results intermediate between the simulation for the summer average conditions and the winter low river conditions.

Because a single collector well at the test pumping well site is unlikely to be capable of yielding 7,400 under low river conditions, it would be necessary to install two collector wells at the site to ensure an adequate supply under the low flow conditions and to provide a backup supply under average conditions. If AEC determines that a single collector well located near the test pumping well is a viable option to meet the projected water supply requirements, the recommended location for the collector well caisson is approximately 25 feet to the east of the test pumping well. Alternatively, if it is determined that two collector wells are required to ensure that 7,400 gpm can be obtained on a year-round basis, then the recommended locations are approximately

200 feet east of the west property line and approximately 200 feet west of the east property line.

The preliminary design for the proposed collector well(s) includes a 16-foot diameter (ID) caisson to allow sufficient room for pumping equipment. The top of the caisson should extend to an elevation at or above the 500-year flood level. To ensure adequate mechanical capacity and low screen entrance velocities, the preliminary design also includes six (6) laterals with an approximate length of 200 feet each. The laterals would be comprised of 12-inch diameter stainless-steel well screen, and the six laterals would be installed in a radial pattern on a 175-degree arc on the river side of the caisson.

1.0 INTRODUCTION

Collector Wells International, Inc. (CWI) was contracted by Associated Electric Cooperative, Inc. (AEC), to conduct a hydrogeological evaluation of the feasibility of utilizing horizontal collector well technology to provide a water supply for a proposed new generating facility to be located near Norborne, Missouri. The project was conducted in accordance with AEC purchase order number HQ504633 dated March 15, 2006 as specified in the CWI proposal dated March 8, 2006.

1.1 PROJECT BACKGROUND AND SCOPE

AEC has proposed construction of a new coal-powered generating facility to be located in the Missouri River Valley near Norborne, Missouri. Water requirements are estimated to average 5,600 gallons per minute (gpm), peaking to 7,400 gpm during the summer. Preliminary investigations indicated that the desired yield could not be obtained from ground water near the proposed plant site. Consequently, AEC decided to direct the study for the plant's water supply to a site located about 7 miles south of the proposed plant and adjacent to the Missouri River (Figure 1). This investigation focused on riverbank filtration (RBF) using a horizontal collector well(s). The investigation is designed to meet the objectives of Specification A-7213, i.e., collect the necessary data to determine the quantity and anticipated quality of water available from the test site, develop a conceptual design of a RBF system to yield the desired quantity and evaluate potential impacts (if any) on other nearby ground water users.

The study area lies within the valley of the Missouri River. Available data indicate that the areas under consideration are underlain by an unconsolidated glacial-fluvial aquifer up to 100 feet thick that contains variable sequences of clays, silts, sand and gravel. However, detailed testing (the subject of this report) is required to confirm aquifer hydraulics and recharge and develop site-specific design components.

The scope of this project consisted of three (3) tasks including:

Task 1 – Exploratory Test Borings
Task 2 – Detailed Aquifer Testing
Task 3 – Data Analyses, Conceptual Design and Reporting

Task 1 involved drilling test borings and conducting hydraulic interval tests in selected borings. Based on the preliminary estimates of aquifer properties and logistical considerations, the TB-06-2 site (Figure 2) was selected for detailed aquifer testing.

The scope for Task 2 included the installation of a test well capable of pumping at least 1,000 gpm, and three additional observation wells. A fourth observation well was installed as part of Task 2 at AEC's request. Task 2 also included conducting a 72-hour constant rate aquifer test.

The scope for Task 3 included the compilation and analysis of the data collected in Tasks 1 and 2 to determine the feasibility and preliminary design of a collector well or wells at the proposed site. This report represents the results of the Task 1 and Task 2 activities and the Task 3 analysis.

1.2 REPORT ORGANIZATION

The material in the report is presented in the following sections:

Executive Summary
Section 1.0 – Introduction
Section 2.0 – Field Activities
Section 3.0 – Hydrogeological Setting and Testing Results
Section 4.0 – Horizontal Collector Well Feasibility
Section 5.0 – Conclusion and Recommendations
Section 6.0 – References
Section 7.0 – Glossary

1.3 LIMITATIONS

This report was prepared for the exclusive use of the Associated Electric Cooperative, Inc., for the specific application and purposes identified herein. Conclusions reached in this report are based on the objective data available at the time of performing the analysis and the accuracy of the report depends upon the accuracy of these data. Every effort has been made to evaluate the available information by the methods generally recognized to constitute accepted standard practices for water supply investigations at the time of rendering the report and the conclusions reached therein to represent our opinions. CWI cannot be responsible for actual conditions proved to be materially at variance with the data collected or supplied to us, upon which our opinions are based.

2.0 FIELD ACTIVITIES

The field activities conducted for this investigation were outlined as part of Tasks 1 and 2 of the proposal. Task 1 included drilling test borings, conducting hydraulic interval testing and converting selected borings to observation wells. Task 2 included drilling and installation of additional observation wells and a test pumping well and conducting aquifer testing.

2.1 TASK 1 TEST DRILLING

Three (3) test borings were drilled for Task 1 of this project at the locations along the north bank of the Missouri River as indicated on Figure 2. Test boring TB-06-1 was drilled approximately 200 feet east of the southwest corner of the property. Boring TB-06-2 was drilled at about the middle of the south side of the property, 400 feet east of TB-06-1; and boring TB-06-3 was drilled about 200 feet west of the east property line.

Task 1 drilling activities were initiated on April 18, 2006 and completed on April 20, 2006. The drilling activities were directed by a CWI hydrogeologist experienced in collector well evaluations who made the necessary decisions as to boring depth and hydraulic interval testing. Logs for the test borings are presented in Appendix A. A summary of information on the test borings is presented in Table 1.

The test borings were drilled by Bowser Morner of Dayton, Ohio with a truck-mounted drilling rig using rotasonic drilling methods. In the rotasonic drilling method, a drill casing is advanced into the ground using rotary/vibrasonic techniques. This method does not require the use of drilling mud, so there is no mud to dispose of, and disturbance of the ground surface is minimal. The rotasonic drilling method produces nearly continuous 4-inch diameter samples of the materials penetrated by the sample tube, and the method produces representative samples from unconsolidated, granular deposits.

The test borings were advanced until bedrock was encountered. Lithologic samples were obtained every five (5) feet and at each change in formation materials from the ground surface to the completion depth. Lithologic samples were placed in suitable containers, plainly identified as to date of collection, hole number, and depth of stratum. Upon completion of the drilling activities, the lithologic samples were turned over to AEC. Additional lithologic samples were selected from the lower portions of each boring for sieve analysis. The sieve analyses were performed to help characterize the aquifer materials and help evaluate the aquifer hydraulic conductivity. The sieve analysis results are presented in Appendix B and summarized in Table 2.

Upon completion of the drilling, borings TB-06-1, TB-06-2 and TB-06-3 were converted to observation wells to be utilized in the Task 2 aquifer testing. The observation wells were constructed with 2-inch diameter slotted PVC well screen attached to 2-inch diameter flush-threaded PVC casing. The PVC casing in the observation wells extends to approximately 3 feet above the ground surface. The top of the PVC casing on each of the observation wells was provided with a watertight plug and is covered with a 4-inch square steel tubing protective casing with a lockable lid. The formation materials around the well screens were allowed to collapse as the temporary steel drill casing was removed. The remaining open portion of the annulus was sealed with bentonite, and the protective casings were set in place in bentonite. Following installation, the observation wells were developed by air-lifting to assure openness of the well screen to the aquifer.

2.2 <u>TASK 1 HYDRAULIC INTERVAL TESTING</u>

Prior to conversion to an observation well, a hydraulic interval test was conducted in a temporary pumping well installed in the TB-06-2 test boring. The purpose of interval testing is to determine the hydraulic conductivity of the selected intervals and evaluate ground water quality. The data from the interval test are presented in Appendix C and summarized in Table 3.

The interval to be tested was selected by the Hydrogeologist on the basis of the drilling and sampling results. Upon reaching the total completion depth of the test borings, the 6-inch steel casing was pulled back to the bottom of the interval to be tested. A temporary test well was constructed in the boring by installing a nominal 4-inch diameter, wire-wrapped well screen in the selected interval using the pull back method. Development of the temporary test well was accomplished by airlifting and pumping until the water produced was visibly clear and contained little or no sediment. Development time was approximately two (2) hours. Response of the well to development pumping was noted so that pumping rates for the hydraulic interval testing could be estimated. The temporary test well was equipped with a submersible pump capable of pumping a minimum of 100 gpm. The pumping rates were determined using an in-line flow meter. The selected interval was pumped for a minimum of two (2) hours. The pumping period was divided into four (4) steps of at least thirty (30) minutes duration. During each step, the pumping was maintained at a constant rate. The pumping rate was varied between steps so that the steps were run at approximately 40%, 60%, 80% and 100% of the maximum achievable pumping rate. The pumping rate was adjusted and stabilized as quickly as possible between steps.

Depths to water were measured to the nearest 0.01 foot in the test boring prior to and during the pumping period. The elapsed time of pumping to the nearest minute associated with each water level measurement was recorded along with the pumping rates. During each step of the pumping period, water level measurements in the test boring were made on approximately the following schedule:

- Every 1 minute for 0 to 6 minutes from the start of the step;
- Every 2 minutes for 6 to 12 minutes from the start of the step;
- Every 5 minutes after 15 minutes from the start of the step.

At the end of the test pumping period, water levels in the test boring were monitored on the same schedule until the water level recovered to nearly the pre-pumping level. During the pumping period water quality was monitored in the field for pH, conductivity, iron and hardness. A water sample was collected near the end of the test for laboratory analysis of the general water quality parameters, selected metals and volatile organics.

2.3 TASK 2 TEST DRILLING AND PUMPING WELL INSTALLATION

At the completion of Task 1, a location for detailed aquifer testing was selected with the concurrence of AEC. The site selected for the test pumping well (PW) was adjacent to boring TB-06-2.

Task 2 included the drilling and installation of four (4) additional observation wells for sampling subsurface materials, monitoring water levels and for conducting detailed aquifer testing. The four additional observation wells (TB-06-4, TB-06-5, TB-06-6 and TB-06-7) were positioned in a pattern around the test pumping well at appropriate locations and distances selected to facilitate the data analysis. The Task 2 observation wells were installed between April 20 and April 22, 2006. The observation wells were drilled using the same rotasonic drilling and sampling methods as were used in the Task 1 borings. Selected formation samples from the lower portions of the borings were submitted for sieve analyses to determine optimum well screen design for the test pumping well and to help evaluate the hydraulic conductivity of the aquifer. Following completion of drilling, each of the borings was converted an observation well. The observation wells were constructed from 2-inch internal diameter (ID) PVC pipe well casing with a 20-foot length of slotted PVC well screen placed in the lower portion of the formation in each well. Following installation, the wells were developed by air lifting to assure openness to the aquifer.

Following installation of the observation wells, a 12-inch ID steel cased temporary production well (PW) was drilled using reverse rotary methods. The well was installed by Brotcke Well and Pump, Inc., of Fenton, Missouri. The well was equipped with approximately 20 feet of nominal 12-inch continuous-slot wire-wound well screen. The screen slot size (0.080-inch) was selected based on the grain size distribution of the lithologic samples from the adjacent observation wells. The screen was installed with a gravel pack in a nominal 24-inch diameter borehole. Following installation, the well was thoroughly developed using air-lift techniques and equipped with an electrical pump capable of producing a minimum of 1,000 gpm. A log for the test pumping well is included in Appendix A. A temporary water supply well was drilled to provide water during the drilling of the test pumping well. This well was located about 25 feet east of TB-06-4 and was equipped with 20 feet of 6-inch ID machine slotted PVC well screen set from 39 to 59 feet below the ground surface.

Following installation of the wells, the necessary piping and controls were installed at the test pumping well. Discharge from the pump was measured using a circular free-discharge pipe orifice weir with water conveyed to the Missouri River, with the necessary controls to minimize erosion.

To determine the elevation of the river water level at the site and to track changes in the river water level during the testing period, two temporary river staff gages were installed at the site (Figure 2). The staff gages consisted of 5-foot lengths of slotted 2-inch ID PVC pipe that were attached to metal fence posts driven into the riverbed.

Once the pumping and observation wells and river staff gages were installed, the measuring point elevations and horizontal coordinates for the wells and staff gages were surveyed by M & M Land Surveying Service, Inc., of Richmond, Missouri. M & M Land Surveying Service also determined measuring point elevations and horizontal coordinates for two offsite irrigation wells that were monitored during the testing period.

2.4 TASK 2 AQUIFER TESTING

The Task 2 aquifer testing included the following:

- A four-hour multiple rate step drawdown test
- A recovery/background period
- A constant-rate aquifer test.
- A recovery monitoring period.

During the testing period, water levels in the wells and river were monitored using computer assisted data acquisition units (e.g. In-Situ 3000 and In-Situ Trolls), which utilize pressure transducers. Prior to the start of the pumping tests, transducers were set in the test pumping well, the observation wells and the river. Water level measurements were measured to the nearest 0.01 foot, with the transducers programmed to collect data at least every ten (10) minutes. Manual measurements in the wells were also collected periodically throughout the testing to the nearest 0.01 foot using direct read electronic water level meters. These measurements were used to calibrate the transducers and confirm that the automated units were functioning correctly. Measurements collected using electronic water meters were recorded on standardized data forms.

The first portion of the test pumping involved a multiple-rate performance test. This consisted of a four (4) hour test conducted in one-hour steps at increasing rates of discharge to the maximum capacity of the pump. The test results were evaluated to determine the discharge rate for the subsequent constant-rate test, and confirm the operation of the test equipment. The multiple-rate test was a step drawdown type pumping test in which pumping rates were approximately as follows:

Step	Rate, gpm	Duration, hours
1	340	1
2	580	1
3	780	1
4	1100	1

During the multiple-rate test, water levels were measured at approximately the following frequencies (at a minimum) at the following monitoring points.

- Test pumping well
  Every 1 minute for the first 6 minutes from the start of each step;
  Every 2 minutes for 6 to 12 minutes from the start of the step;
  Every 5 minutes after 15 minutes from the start of the step;
- Observation Wells (with transducers) - Every 1 minute throughout the testing period.
- Missouri River – (with transducer) Every 5 minutes

Following the shut down of the pump, water level measurements were collected at the same frequency noted above for 1 hour. Additionally, water levels were measured periodically at two offsite irrigation wells: the Durham well, located about 2.6 miles northwest of the test site; and the Gibson well, located about 4.0 miles north-northwest of the test site (Figure 1).

Following the multiple-rate pumping test, the test pumping well was allowed to recover for approximately 12 hours, before the constant rate-pumping test was started. During this period, water levels were collected in the wells with transducers at least every 10 minutes.

The constant-rate test had a pumping period of approximately 72-hours in duration. During the test, discharge from the pumping well was maintained at a constant rate, with flow monitored by the orifice weir. Based upon the results from the multiple-rate pumping test, the pumping rate was set at approximately 1,000 gpm. At the conclusion of the test, the pump was shut off and the recovery of water levels was monitored for approximately 24-hours. During the constant rate test, water level measurements were collected at the following frequencies at the following monitoring points:

- Test pumping well
  - Every 1 minute for the first 6 minutes from the start of the test;
  - Every 2 minutes for 6 to 16 minutes from the start of the test;
  - Every 5 minutes for 20 to 30 minutes from the start of the test;
  - Every 10 minutes for 30 to 1 hour from the start of the test;
  - Every 15 minutes for 1 to 2 hours from the start of the test;
  - Every 30 minutes for 2 to 4 hours from the start of the test;
  - Every 60 minutes for 4 hours to the end of the pumping period;
- On-Site Observation Wells (with transducers)
  - At least every 10 minutes throughout the testing period;
  - At least 6 times a day with an electronic meter
- Missouri River – Every 5 minutes (with transducer)
  - At least 3 times a day with an electronic meter

In addition, the discharge rate was checked periodically and recorded on the data sheets. Temperature of the pumped discharge water and the Missouri River were periodically measured during the constant-rate test using a hand-held thermometer. Also, water levels were manually measured periodically at two offsite irrigation wells, the Durham well and the Gibson well, and transducers were placed in these wells to continuously monitor water levels during the testing period.

During the constant-rate test, water quality from the test pumping well and the river was monitored in the field for pH, conductivity, iron, hardness and temperature. The test pumping well discharge was monitored in the field three times per day and the river quality was monitored in the field twice per day during the constant-rate test pumping period. Additionally, water samples from the test pumping well were collected after approximately 24 hours and 72 hours from the start of the pumping period and submitted for laboratory analysis of the general water quality parameters, selected inorganic compounds and metals.

3.0 HYDROGEOLOGIC SETTING AND TESTING RESULTS

This section presents general background information on the hydrogeologic setting of the testing site along with the detailed findings of the Task 1 and Task 2 field activities.

3.1 AREA SETTING AND HYDROGEOLOGY

The project is located in Section 19 of Township 51 North, Range 25 West (T51N, R25W) of Carroll County, Missouri on the north side of the Missouri River. In the area of the test site, the Missouri River occupies a broad valley that is nearly eight miles wide. The test site is near the southern margin of the valley. The Missouri River Valley is filled with unconsolidated sediments that generally comprise a fining upward sequence. The unconsolidated deposits are underlain by Pennsylvanian-aged sedimentary rock. The bedrock typically consists of shale or sandstone and generally yields very limited quantities of poor quality water (MDNR, 1997). In the vicinity of the project site, the unconsolidated sediments typically consist of three zones including 1) a lower layer of coarse-grained sand and gravel, and in some cases boulders (rock fragments greater than 10 inches in diameter) overlying bedrock; 2) an intermediate layer of relatively fine sand or silty sand; and 3) a surficial layer of silt, fine sand and clay. Sand-sized to cobble-sized (2.5 to 10 inch) pieces of lignite coal are common in the sand and gravel deposits. A generalized geologic cross-section for the project site is depicted in Figure 3. It should be noted that because the unconsolidated materials were deposited by a meandering stream over long periods of time, the nature and sequence of the deposits could vary both horizontally and vertically over short distances.

In the Missouri Valley, the water levels in the sand and gravel aquifer are affected by the river levels, and consequently can show a substantial amount of variability. In areas where fine-grained materials with relatively low permeability overly the aquifer materials, the aquifer can be under confined conditions when the water levels are high and under unconfined conditions when the water levels are low. At the test site, the ground water levels were above the top of the of the more permeable sand and gravel deposits during the testing period, and consequently the aquifer was under confined or semi-confined conditions.

3.2 <u>TEST DRILLING RESULTS</u>

For the Task 1 drilling activities, three (3) test borings were installed, and for the Task 2 activities four (4) additional observation wells and a test pumping well were drilled at the locations indicated in Figure 2. Logs for the borings are presented in Appendix A, and a summary of information about the borings is presented in Table 1. The results of sieve analyses performed on selected samples from the borings are presented in Appendix B and summarized in Table 2.

3.2.1 <u>Boring TB-06-1 Drilling Results</u>

Boring TB-06-1 was drilled to a total depth of 79 feet below the ground surface on April 18, 2006 as part of the Task 1 test drilling. The lithologic materials encountered in TB-06-1 were as follows:

- 0 to 12 feet – Silt and Silty Sand
- 12 to 22 feet – Clay and Silty Clay
- 22 to 35 feet – Silty Sand
- 35 to 44 feet – Sand
- 44 to 45.5 feet – Silty Clay
- 45.5 to 59 feet – Sand and Gravel
- 59 to 67 feet – Sand
- 67 to 74.5 feet – Sand and Gravel
- 74.5 to 79 feet – Shale

Sieve analysis of the samples from 50 to 55 feet and 55 to 65 feet indicated these zones consisted of about 83% to 93% sand, 7% to 17% gravel, and less than 1% silt and/or clay. Sieve analysis of the sample from 65 to 75 feet indicated that this interval was substantially coarser and consisted of about 48% sand, 51% gravel, and less than 1% silt and/or clay.

After drilling, the boring was converted to a 2-inch diameter observation well with the well screen set at a depth of 55 to 75 feet.

3.2.2 <u>Borings TB-06-2</u>

Boring TB-06-2 was drilled to a total depth of 78 feet below the ground surface on April 18, 2006 as part of the Task 1 test drilling. The lithologic materials encountered in TB-06-2 were as follows:

- 0 to 12 feet – Silt and Silty Sand
- 12 to 14 feet – Clay and Silty Clay
- 14 to 43 feet – Silty Sand to Sand
- 43 to 73 feet – Sand and Gravel
- 73 to 78 feet – Shale

Sieve analysis of the samples from 49 to 54 feet, 54 to 59 feet, 64 to 69 feet and 69 to 73 feet indicated these zones were relatively coarse and consisted of about 50% to 68% sand, 30% to 49% gravel, and about 1% or less silt and/or clay. Sieve analysis of the sample from 59 to 64 feet indicated that this interval was finer grained and consisted of about 83% sand, 17% gravel, and less than 1% silt and/or clay.

After drilling, a temporary pumping well was installed in the TB-06-2 boring, and a hydraulic interval test was conducted. Following this, the boring was converted to a 2-inch diameter observation well with the well screen set at a depth of 50.2 to 70.2 feet.

3.2.3 Boring TB-06-3 Drilling Results

Boring TB-06-3 was drilled to a total depth of 76 feet below the ground surface on April 19, 2006 as part of the Task 1 test drilling. The lithologic materials encountered in TB-06-3 were as follows:

- 0 to 4 feet – Sandy Clayey Silt
- 4 to 10 feet – Sandy Silt
- 10 to 16 feet – Silty Clay to Clayey Silt
- 16 to 23 feet – Silty Sand
- 23 to 25 feet – Sand and Gravel
- 25 to 29 feet – Silty Sand
- 29 to 44 feet – Sand
- 44 to 74 feet – Sand and Gravel or Sand
- 74 to 76 feet – Shale

Sieve analysis of the samples from 54 to 59 feet, 65 to 69 feet and 69 to 74 feet indicated these zones were relatively coarse and consisted of about 59% to 82% sand, 18% to 42% gravel, and less than 1% silt and/or clay. Sieve analysis of the samples from 52 to 54 feet and 59 to 65 feet indicated that these intervals were finer grained and consisted of about 94% to 96% sand, about 4% gravel, and less than 1% to slightly more than 1% silt and/or clay.

After drilling, the boring was converted to a 2-inch diameter observation well with the well screen set at a depth of 50 to 70 feet.

3.2.4 Boring TB-06-4 Drilling Results

Boring TB-06-4 was drilled to a total depth of 79 feet below the ground surface on April 20, 2006 as part of the Task 2 test drilling. The lithologic materials encountered in TB-06-4 were as follows:

- 0 to 9 feet – Sandy Silt to Silty Sand
- 9 to 14 feet – Silty Clay to Clayey Silt
- 14 to 19 feet – Sandy Silt
- 19 to 43 feet – Silty Sand
- 43 to 46 feet – Sand and Gravel
- 46 to 52 feet – Silty Sand
- 52 to 73 feet – Sand and Gravel
- 73 to 79 feet – Shale

Sieve analysis of the samples from 52 to 59 feet, 59 to 64 feet and 64 to 69 feet indicated these zones were relatively coarse and consisted of about 58% to 75% sand, 25% to 41% gravel, and less than 1% silt and/or clay. The sieve analysis of the material from 69 to 73 feet indicated that this interval consisted of 15% sand, 84% gravel and 1% silt and/or clay. Sieve analysis of the sample from 49 to 52 feet indicated that this interval was finer grained and consisted of about 99% sand, and 1% silt and/or clay.

After drilling, the boring was converted to a 2-inch diameter observation well with the well screen set at a depth of 53 to 73 feet.

3.2.5 Boring TB-06-5 Drilling Results

Boring TB-06-5 was drilled to a total depth of 73 feet below the ground surface on April 20, 2006 as part of the Task 2 test drilling. The lithologic materials encountered in TB-06-5 were as follows:

- 0 to 9 feet – Sandy Silt
- 9 to 16 feet – Silty Clay to Clayey Silt
- 16 to 19 feet – Sandy Silt
- 19 to 46 feet – Silty Sand
- 46 to 71 feet – Sand and Gravel or Sand

- 71 to 73 feet – Sandstone

Sieve analysis of the samples from 46 to 49 feet, 57 to 59 feet and 59 to 64 feet indicated these zones were relatively coarse and consisted of about 67% to 77% sand, 23% to 33% gravel, and less than 1% silt and/or clay. The sieve analysis of the material from 67 to 69 feet indicated that this interval consisted of 44% sand, 56% gravel and less than 1% silt and/or clay. Sieve analysis of the samples from 53 to 57 and 64 to 67 feet indicated that these intervals were finer grained and consisted of about 92 to 99% sand, 0% to 6% gravel and less than 1% to 2% silt and/or clay.

After drilling, the boring was converted to a 2-inch diameter observation well with the well screen set at a depth of 50 to 70 feet.

3.2.6 Boring TB-06-6 Drilling Results

Boring TB-06-6 was drilled to a total depth of 79 feet below the ground surface on April 21, 2006 as part of the Task 2 test drilling. The lithologic materials encountered in TB-06-6 were as follows:

- 0 to 10 feet – Sandy Silt to Sandy Silt
- 10 to 21 feet – Silty Clay to Clayey Silt
- 21 to 39 feet – Silty Sand
- 39 to 49 feet – Interbedded Silty Clay, Sand and Gravel
- 49 to 53 feet – Silty Sand and Silty Clay
- 53 to 73 feet – Sand and Gravel
- 73 to 79 feet – Shale

Sieve analysis of the samples from 53 to 56 feet, 59 to 64 feet and 64 to 69 feet indicated these zones were relatively coarse and consisted of about 59% to 76% sand, 24% to 40% gravel, and less than 1% silt and/or clay. The sieve analysis of the material from 69 to 73 feet indicated that this interval consisted of 29% sand, 71% gravel and less than 1% silt and/or clay. Sieve analysis of the sample from 49 to 52 feet indicated that this interval was finer grained and consisted of about 97% sand, 1% gravel and 2% silt and/or clay.

After drilling, the boring was converted to a 2-inch diameter observation well with the well screen set at a depth of 53 to 73 feet.

3.2.7 <u>Boring TB-06-7 Drilling Results</u>

Boring TB-06-7 was drilled to a total depth of 75 feet below the ground surface on April 21, 2006 as part of the Task 2 activities. The lithologic materials encountered in TB-06-7 were as follows:

- 0 to 4 feet – Clayey Silt
- 4 to 9 feet – Sandy Silt to Silty Sand
- 9 to 19 feet – Silty Clay to Clayey Silt
- 19 to 29 feet – Silty Sand
- 29 to 32 feet – Sand
- 32 to 72 feet – Sand and Gravel or Sand
- 72 to 75 feet – Shale

Sieve analysis of the samples from 49 to 55 feet and 63 to 65 feet indicated these zones were relatively coarse and consisted of about 61% to 62% sand, 37% to 39% gravel, and less than 1% silt and/or clay. The sieve analysis of the material from 69 to 72 feet indicated that this interval consisted of 45% sand, 54% gravel and less than 1% silt and/or clay. Sieve analysis of the samples from 55 to 59 feet and 59 to 63 feet indicated that these intervals were finer grained and consisted of about 90% sand, 9% to 10% gravel and less than 1% silt and/or clay.

After drilling, the boring was converted to a 2-inch diameter observation well with the well screen set at a depth of 50 to 70 feet.

3.2.8 <u>Test Well PW Drilling Results</u>

Test well PW was drilled to a total depth of 72 feet below existing ground surface on May 19, 2006. The well was drilled with reverse rotary methods with a nominal 24-inch diameter drill bit. The lithologic materials encountered in the borehole included the following:

- 0 to 11 feet – Silt to Sandy Silt
- 11 to 14 feet – Silty Clay
- 14 to 29 feet – Silty Sand
- 29 to 43 feet – Sand
- 43 to 72 feet – Sand and Gravel

No bedrock material was recovered from the borehole, but the change in drilling indicated that the bedrock surface was at or just below the total drilled depth. Because of the different drilling method used, the lithologic samples collected may not be fully representative of the formation materials, and consequently, no sieve analyses were performed on the lithologic samples from the PW boring.

After drilling to the total depth, a 0.080-inch slot, wire-wrapped steel well screen was installed in the borehole. The annulus was back filled around the screen with graded filter pack material. The remaining annulus above the screen was sealed using granular bentonite. The well was developed for approximately 1.5 hours by air-lifting.

3.3 HYDRAULIC INTERVAL TESTING RESULTS

As indicated in Section 3.2, a hydraulic interval test was conducted in boring TB-06-2. The results of the hydraulic interval test are summarized in Table 3 and the data are included in Appendix C.

The hydraulic conductivity of the aquifer can be estimated from data collected during the interval tests. Transmissivity of an aquifer can be estimated from specific capacity using the following equation (Driscoll, 1986):

$$T = 2000 * Q/s$$

Where:	T	= transmissivity, gallons per day per foot (gpd/ft)
	Q/s	= specific capacity, gallons per minute per foot (gpm/ft)

Hydraulic conductivity is related to transmissivity by the following equation:

$$K = T/b$$

Where:	K	= hydraulic conductivity, gpd/ft^2
	b	= aquifer thickness, feet

The base of the alluvial aquifer at the boring locations is considered to be at the elevation where bedrock was encountered. Defining the top of the aquifer is somewhat arbitrary because at most of the boring locations there is a gradual transition from fine-grained to coarse-grained materials. The top of the aquifer at most of the boring locations was estimated to be at the shallowest depth where the drilling results indicated that the materials were predominantly sand. The static water levels in the borings were generally above the depths that were determined to be the top of the aquifer, and consequently, the aquifer was considered to be under semi-confined or confined conditions during the testing.

In order to estimate the transmissivity of the aquifer, the specific capacity data from the interval test was adjusted for well loss and the effects of partial penetration effects using an equation by Kozeny (1933), such that:

$$T = \frac{2000 \cdot Q/s}{X \cdot E}$$

$$X = L \cdot \left[1 + 7 \cdot \sqrt{\frac{r}{2 \cdot b \cdot L}} \cdot \cos\left(\frac{\pi \cdot L}{2}\right) \right]$$

Where:	r	= well radius, in feet
	b	= aquifer thickness, feet
	L	= well screen length as a fraction of aquifer thickness
	E	= efficiency, obtained from analysis of the step test

The TB-06-2 hydraulic interval test was conducted on April 19, 2006. A 0.040-inch slot screen was set in the temporary test well from 59.8 to 69.8 feet below the ground surface. The well was pumped at rates of approximately 35, 58, 82 and 120 gpm. The observed drawdown at the end of the last step was 6.1 feet giving an observed specific capacity of 19.5 gallons per minute per foot of drawdown (gpm/ft). Using the equations given above, the estimated aquifer transmissivity at this location is approximately 90,000 gallons per day per foot (gpd/ft). Assuming a saturated aquifer thickness at this location of 30 feet at the time of the testing gives an estimated hydraulic conductivity of 3000 gallons per day per square foot (gpd/ft^2).

The short interval test results should be considered only an estimate of aquifer hydraulics. It is possible that stratification, well inefficiencies and partial penetration may have resulted in estimated transmissivity and hydraulic conductivity values that differ significantly from the actual values.

3.4 AQUIFER TEST RESULTS AND ANALYSIS

3.4.1 Background Period Observations

The scope for the Task 2 activities did not include a formal background water level monitoring period. However, water level measurements were made in the observation wells prior to conducting the aquifer testing to establish background trends and evaluate the response of the aquifer to river level changes. Hydrographs depicting the water levels in selected wells during the background period are presented in Figure 4. River level readings were obtained from the river gages, which were installed on May 17, 2006. For comparison purposes, river level data were also obtained from the US Geological Survey (USGS) gage station at Waverly, Missouri, which is approximately 12 miles east (downstream) of the project site. The Waverly river gage data are also depicted in Figure 4.

The background monitoring confirms that water level changes in the aquifer generally correspond to water level changes in the river level. Under non-pumping conditions during the field activities, the water elevations in the onsite observation wells were slightly above the adjacent river water elevations, and the water elevations in the observation wells parallel to the riverbank generally decreased from west to east corresponding to the downstream direction of the river gradient. In wells located in a line roughly perpendicular to the riverbank (TB-06-2, TB-06-6, and TB-06-7), the water elevations decreased toward the river under non-pumping conditions during the field activities.

3.4.2 Multiple-Rate Step Drawdown Test

The multiple-rate step drawdown test using well PW at the Norborne site was conducted on May 22, 2006. The test data are presented in Appendix E, and the test results are summarized in Table 4. Hydrographs for the test pumping period are depicted in Figure 5, and a semi-log plot of the drawdown in PW with respect to the elapsed pumping time is presented in Figure 6. As indicated in Table 4, well PW was pumped in steps of approximately one-hour at rates of 340, 580, 780 and 1,100 gpm. At the end of each of the four steps the resulting observed drawdown in PW was 4.05, 7.46, 10.07 and 14.48 feet, respectively. The observed specific capacity at the end of the last pumping step was 76.2 gpm/ft. The step test results indicated that PW was acceptably efficient and that the observation wells were functioning correctly.

3.4.3 Constant-Rate Aquifer Test

The pumping period for the constant-rate aquifer test was started on May 23, 2006 at 8:21 AM and ended on May 26, 2006 at 8:33 AM. The pumping rate was held at a constant rate of approximately 1,010 gpm through the pumping period. The constant-rate test data are presented in Appendix F and summarized in Table 5. Hydrographs depicting the observed water level changes in the pumping well, observation wells and the river are presented in Figures 7 and 8. During the constant-rate test, water levels in the wells appeared to stabilize with respect to pumping of PW in about 24 hours from the start of the test. At the end of the constant-rate test pumping period, the observed water level changes in the observation wells ranging from a drop of 6.0 feet at TB-06-2 (34 feet from PW) to a drop of 1.3 feet at TB-06-3 (448 feet from PW). The observed water level change in PW at the end of the constant-rate test was a decline of 13.5 feet below the static level prior to the start of pumping. There were no observable water level changes in the offsite irrigation wells (Durham and Gibson) that were due to the PW constant-rate test pumping.

The ground water level changes observed in the pumping well and observation wells include the effects of the river level changes during the test pumping period. The river level showed a net drop of 0.4 feet over the constant-rate pumping period. In order to analyze the pumping effects, the water level data from the observation wells were adjusted to remove the effects of the river level changes. To adjust the data, river efficiency values (i.e. the ratio of water level change in the ground water corresponding to a given water level change of the river) were estimated for the observation wells adjacent to the pumping well. The river efficiency values that were used were 0.85 for well TB-06-7; 0.9 for wells TB-06-1 and TB-06-3; and 0.95 for the remaining wells. Hydrographs of the water levels adjusted to remove the river level changes apparent in observation wells during the constant-rate test pumping period are depicted in Figure 9.

The constant-rate test data were analyzed to determine the aquifer parameters of transmissivity, hydraulic conductivity and storativity. Transmissivity is the rate at which water is transmitted through a unit width of an aquifer under a unit hydraulic gradient and is expressed in units of gallons per day per foot (gpd/ft). Storativity is the volume of water entering or released from storage per unit surface area of the aquifer per unit change in head and is unitless. Hydraulic conductivity represents the rate that water will flow through a unit cross section of an aquifer under unit hydraulic gradient and is expressed as gallons per day per square foot (gpd/ft^2) or feet per day (ft/day). The aquifer test analyses were performed using the software package Aquifer Test for Windows, Version 2.5.7 from Waterloo Hydrogeologic, Inc (Waterloo Hydrogeologic, Inc., 1999). The aquifer test analysis plots for the Norborne site are included in Appendix G. Semi-log drawdown versus time plots for the observation wells with the observed drawdown and drawdown adjusted for the river level changes are presented in Figures 10 and 11, respectively. A semi-log drawdown versus distance plot of the observation well data at the end of the pumping period is depicted in Figure 12. A map depicting the observed drawdown at the end of the pumping period is depicted in Figure 13.

The time-drawdown data were analyzed using the Cooper-Jacob straight-line method and the curve-matching technique for developed by Theis (Lohman, 1972). The time-recovery data and distance-drawdown data were analyzed using the straight-line method of Jacob (Lohman, 1972) to check the values of transmissivity obtained from the time-drawdown analysis. The straight-line method uses the trend of semi-logarithmic time-drawdown plots. The Theis method matches a log-log time-drawdown plot against a standard type curve. The distance-drawdown data from the end of the pumping period were analyzed using the Cooper-Jacob straight-line method, and the method developed Rorabaugh to evaluate the recharge boundary represented by the river (Rorabaugh, 1956). The drawdown values adjusted for the river level changes were used for the time-drawdown and distance-drawdown analyses methods.

The results of the aquifer analysis are presented in Table 6. Because of the influence of the recharge boundary represented by the river, the time-drawdown and time-recovery analysis methods could only be applied to a few of the observation wells. The Cooper-Jacob method was applied to the portions of the semi-log time-drawdown curves at the beginning of the pumping period for observation well TB-06-2. The Cooper-Jacob time-drawdown analysis transmissivity result for TB-06-2 is 151,000 gpd/ft and the storativity result is 0.0002. The time-recovery method was applied to the data from wells PW, TB-06-2, and TB-06-6. The results of the time-recovery analysis for these wells range from 116,000 gpd/ft to 162,000 gpd/ft. The result of the Theis analysis for transmissivity from TB-06-2 is 129,000 gpd/ft and the storativity value is

0.0004. The Cooper-Jacob distance-drawdown analysis transmissivity result for the observation wells located parallel to the river bank using the adjusted drawdown values at the end of the pumping period is 128,000 gpd/ft.

Rorabaugh (1956) developed equations based on image well theory that can be used to estimate the effective distance to a line source of recharge and the aquifer transmissivity. When using this method, it is assumed that effects such as stream partial penetration and aquifer stratification are integrated into the estimate of the effective distance (Walton, 1987). The following equation is applicable to observation wells located on a line through the pumping well parallel to the recharge boundary after pumping has continued to the point that drawdowns have stabilized:

$$T = \frac{Q \cdot \ln\left(\frac{\sqrt{4 \cdot a^2 + r^2 - 4 \cdot a \cdot r \cdot \cos(\theta)}}{r}\right)}{2 \cdot \pi \cdot s}$$

Where:
T = transmissivity of the aquifer, gal/day/ft
Q = production well pumping rate, gal/day
r = distance from the pumping well to the observation well, feet
s = drawdown in the observation well at distance r, feet
θ = angle between pumping well and observation well and pumping well and image well, radians
a = effective distance to line source of recharge, feet

Using the graphical solution to the Rorabaugh equation presented by Schaefer and Kaser (1965) for wells located parallel to the river bank and using the adjusted drawdown at the end of the pumping period the transmissivity result is 129,000 gpd/ft and the effective distance to a line source of recharge (a-distance) result is 330 feet. This indicates that there is a reasonably good hydraulic connection between the aquifer and the river, which will allow the river to act as a source of induced infiltration.

Because the early time-drawdown response may be affected by factors such as fluctuations in the pumping rate, casing storage in the pumping well and the proximity to the recharge boundary, the distance-drawdown results are considered to give the more reliable estimates of the transmissivity. Based on the distance-drawdown analysis results, a transmissivity value of

129,000 gpd/ft is considered representative of the aquifer at the site for the purposes of estimating potential collector well yield. This value of transmissivity, which equates to an average hydraulic conductivity of 4,300 gpd/ft^2 with a saturated aquifer thickness of 30 feet and a ground water temperature of 58^o F, is applicable to the test conditions and will vary with changes in saturated thickness and water temperature in the aquifer.

3.5 WATER QUALITY RESULTS

Water quality was evaluated in the field during the hydraulic interval testing and the test pumping of well PW. Additionally, water quality samples were collected at the end of the interval test and during the constant-rate test and submitted for laboratory analysis. The field water quality results are presented in Table 7. The laboratory testing results are summarized in Table 8, and the laboratory reports are presented in Appendix H.

3.5.1 Field Water Quality

Field water quality parameters of pH, specific conductance, total hardness and iron content were measured during the hydraulic interval test, the multiple-rate step test and the constant-rate test, and water temperature was measured during the multiple-rate step test and the constant-rate test. The specific conductance values (which are roughly correlated with the total dissolved concentration of ionic constituents) from the TB-06-2 interval test had an average of about 540 microsiemens per centimeter (µS/cm). The field hardness values from the TB-06-2 interval test had an average of about 380 milligrams per liter (mg/l) as $CaCO_3$. The field measurements of pH from the interval test had an average of 7.4 standard units (S.U.) and the field determinations of the iron concentration in the water discharged during the interval test had and average of 6 mg/l.

The discharge temperature readings from PW during the multiple-rate and constant-rate tests averaged about 58^{o}F with no apparent trends in the temperature during the pumping periods. The specific conductance readings from the PW field samples had an average of 570 µS/cm. The field hardness values from the PW samples had an average of about 440 mg/l as $CaCO_3$. The field measurements of pH from the PW samples had and average of 7.7 S.U, and the field determinations of the iron concentration from the PW samples averaged of about 7 mg/l.

Additionally during the constant-rate test, water samples from the Missouri River water were monitored for field determinations of temperature, pH, conductivity, total hardness and iron content. The daytime river water temperature readings varied between about 70^o and 76^o F during the test period. The specific conductance readings from the river water samples had an average of about 670 µS/cm. The field hardness values from the river samples had and average of 340 mg/l as $CaCO_3$. The field measurements of pH from the river samples averaged about 8.1 S.U, and the field determinations of the iron concentration from the river samples averaged of about 0.5 mg/l.

3.5.2 <u>Laboratory Water Quality Results</u>

Water samples for laboratory analysis were collected at the end of the TB-06-2 hydraulic interval test, and were submitted to National Testing Laboratories, Inc., of Ypsilanti, Michigan. Water samples were also collected from test well PW during the constant-rate test pumping period. One set of samples collected from PW on the second day of the constant-rate test, and a second set was collected just before the end of the pumping period. Both sets of samples from PW were submitted to Blue Valley Laboratories, Inc., of Kansas City, Missouri. The results of the analyses from the interval tests and from the PW constant-rate test are summarized in Table 8.

The laboratory results indicate that the ground water quality at TB-06-2 and PW are generally similar. The laboratory result for total dissolved solids (TDS) from the TB-06-2 interval test sample was 320 mg/l, and the results from the two samples from PW were 291 and 292 mg/l. The sulfate concentration from TB-06-2 was 17 mg/l. The sulfate concentrations from the PW samples were 13 and 19 mg/l. The manganese result from TB-06-2 was 0.22 mg/l, while the manganese results for PW averaged 0.41 mg/l. The laboratory result for total hardness for TB-06-2 was 290 mg/l as $CaCO_3$. Hardness was not directly analyzed for the samples from PW, but hardness can be calculated from the reported calcium, magnesium, iron, and manganese results. The calculated hardness values for the PW samples were 371 and 354 mg/l.

The sodium concentration from TB-06-2 was 9 mg/l, while both samples from PW had sodium concentrations of 8.4 mg/l. The chloride concentration from TB-06-2 was 8 mg/l, and the chloride concentrations from PW were both 12 mg/l. The iron concentration was 6.8 mg/l from

TB-06-2. The iron concentration from the PW samples had an average of 8.2 mg/l.

There were no detections of the volatile organic compounds tested for in the samples from the PW-06-2 interval test. Nitrate was detected in the samples from PW at concentrations of 0.07 and 0.21 mg/l as Nitrogen. The total suspended solids (TSS) result had a result of 10 mg/l. The TSS analysis was run from an unpreserved sample and the results could have been affected by oxidized iron precipitating out of solution. This is also true of the turbidity results in the laboratory report for TB-06-2. The samples were visibly clear at the time of collection.

4.0 HORIZONTAL COLLECTOR WELL YIELD

The results of the detailed aquifer testing allow the estimation of potential collector well yield under conditions that vary from those of the test conditions. The testing results indicate that the site of the test pumping well PW is favorable for the installation of a collector well or wells. For planning purposes, yield estimates were made for a collector well located near the test pumping well location. Additionally, a ground water flow model was used to evaluate the effects that one collector well located near well PW under summer average conditions or two collector wells located near TB-06-1 and TB-06-3 under winter and summer low river conditions would have on the ground water levels.

4.1 POTENTIAL YIELD OF A COLLECTOR LOCATED NEAR WELL PW

Using the recent testing results, an estimate for the yield of a horizontal collector well located near the PW location can be calculated. The theoretical drawdown under steady-state pumping conditions in a collector well near a stream in a confined aquifer is calculated using the following equation developed by Hantush and Papadopulos (1962):

$$s_{cs} \geq \left(\frac{Q}{2\pi Kb}\right) \mathrm{Ln}\left(\frac{\Gamma^{\Gamma}}{\varepsilon^{\varepsilon}}\left(\frac{\left(\frac{b}{\pi r_w}\right)^2}{2\left(1 - \cos\frac{\pi}{b}\left(2z_i + r_w\right)\right)}\right)^{\frac{b}{4l}}\right)$$

where:

	s_{cs}	= Drawdown in collector well, ft
	Q	= Yield of collector, gal/day
	K	= Hydraulic Conductivity, gal/day/ft^2
	b	= Saturated thickness of aquifer, ft
	Γ	= (2 (a - r_c))/l
	a	= Effective distance to a line of recharge, ft
	l	= Average length of laterals, ft
	r_c	= Radius of collector caisson, ft
	ε	= (2a - r_c - l)/l
	r_w	= Effective radius of each lateral, ft
	z_i	= Depth of lateral below static water level, ft

Using a variation of the above equation, the potential yield of a collector well near test well PW was estimated using the following assumptions:

Grade Elevation	685 ft, msl
Top of Aquifer Elevation	642 ft, msl
Base of Aquifer	612 ft, msl
Centerline of Laterals	619 ft, msl
Inside Diameter of Caisson	16 ft
Static Water Level	668.4 ft, msl (test)
	669.4 ft, msl (average conditions)
	660.4 ft, msl (low river)
Hydraulic Conductivity	4313 gpd/ft^2 @ 58^o F (test, and average)
	3546 gpd/ft^2 @ 45^o F (winter)
	4777 gpd/ft^2 @ 65^o F (summer)
Saturated Aquifer Thickness	30 ft
Recommended Minimum Pumping Level	629 ft, msl
Radius of Laterals	0.5 ft
Design distance to line source of recharge	500 ft (average conditions)
	700 ft (low river conditions)
Average Lateral Length	200 ft
Number of Laterals	6

The preliminary collector design for the horizontal collector well consists of a total of six (6) laterals placed in one tier. In order to maintain adequate spacing the laterals should be installed 35° apart over a 175-degree arc oriented toward the river. The proposed average lateral length of 200 feet and design (12-inch ID stainless steel wire-wrapped continuous slot screen) will result in low entrance velocities. Based upon the sieve analyses, screen slot sizes for the laterals will probably vary between 0.020 inches and 0.080 inches. Assuming that the laterals will be constructed with ten feet of blank pipe at the caisson wall and an average slot size of 0.060 inches, the resulting average entrance velocity of the water entering the screens would be about 0.8 feet per minute (assuming no blockage) when pumping 7,400 gpm (10.6 million gallons per day (MGD)). At this pumping rate the approach velocity would be about 0.22 feet per minute. Average in-line velocity in the laterals would be 3.5 feet per second (ft/s) at the design maximum pumping rate of 7,400 gpm.

The static water level at the proposed collector well site will vary due to changes in the level of the Missouri River. To evaluate the potential changes in the river level, stream flow records were obtained from the USGS Missouri River stream gage station closest to the project site, which is the gage station at Waverly, Missouri (USGS, 2006). Daily statistical values for the stream flows were obtained from the beginning of the record period for the gage, October 1928, through September 2005. To compare the this historical data set with the more recent behavior of the river, daily stream flow statistics were also obtained for the ten-year period from October 1994 through September 2005. Selected daily stream flow statistics from the gage data are depicted in Figure 14. Shown on Figure 14 are the median daily flow values, i.e. the flow that is equaled or exceeded for 50% of the records for a given day of the year, and also shown are the flow values that are equaled or exceeded for 90% of the records for a given day of the year. These records indicate that the lowest stream flows on this stretch of the Missouri River typically occur during the winter months. For the purposes of estimating the potential collector well yield, the winter low flow conditions were assumed to be represented by the daily flows during the months of December and January that are equaled or exceeded for 90% of the records at the Waverly gage. For the purposes of estimating the potential collector well yield, the average late summer flow conditions were assumed to be represented by the median daily flows during the months of August and September at the Waverly gage.

The observed river water level at the project site at was approximately 668.4 feet at the end of the constant-rate test pumping period. Assuming that the river levels at the project site vary similarly with changes in flow as do the river levels at the Waverly gage, it is estimated that the river level during the assumed winter low flow conditions would be approximately 8 feet lower at the site than the river level was at the time of the aquifer test. Consequently, the static water level representing winter low flow conditions was assumed to be an elevation of 660.4 feet at the site. Also, based on the information from the USGS gage station, it estimated that the median summer river elevation at the site is approximately 1 foot higher than the conditions observed during the testing period. Consequently, under average late summer stream flow conditions, it is estimated that the river would be at an elevation of approximately 669.4 feet.

Due to the increase in water viscosity with temperature, a lower water temperature than observed during the testing would result in a lower hydraulic conductivity for the aquifer, and a higher ground water temperature would result in a higher hydraulic conductivity for the aquifer. Based on information on other sites along the Missouri River, it is estimated that the river water temperature varies from just above freezing in the winter to over 80^{o} F in the summer. Under the influence of induced filtration of river water, the ground water temperature near the proposed collector well could range from a low temperature of approximately 45^{o} F to a high temperature of about 70^{o} F. The ground water temperature of 58^{o} during the constant-rate test is probably close to average conditions. The least favorable water supply conditions would occur if extreme low river levels coincide with low winter water temperatures.

One of the most important factors that determines well yield for RBF applications is the amount of recharge that can be obtained from the river through induced infiltration. This is controlled by properties such as the permeability and thickness of the streambed deposits, the width and depth of the stream, the slope of the streambed and the distance from the well to the stream bank. To make the problem of estimating the recharge amenable to mathematical treatment, the recharge to a well from a stream can be simulated by an imaginary well or "image" well that adds recharge to the aquifer at the same rate as the real pumping well extracts water (Walton, 1987). Using this mathematical approach, all of the properties that affect the amount of recharge can be simulated by a single value that represents half of the distance between the real well and the image well. This value is the considered to be effective distance to a line source of recharge or recharge boundary. Because of the factors that affect the amount of recharge available other than the physical distance between a production well and a stream, the effective distance to a recharge boundary will always be greater that the actual distance from the well to the stream bank. For the purposes of estimating the potential collector well yield at the project site, the effective distance to the recharge boundary represented by the river was set at 500 feet under average conditions and 700 feet under low flow conditions. These values were chosen to give conservative estimates of the potential collector well yield. The effective distance to the source of recharge may vary seasonally with changes in river level, water temperature and streambed conditions.

To ensure that the full length of all of the laterals remains below the water level, the recommended minimum pumping level in the collector caisson is specified as 10 feet above the centerline of the laterals. Based on the assumed collector well design with the centerline of the laterals approximately seven (7) feet above the bottom of the aquifer (assumed to be at an elevation of 612 feet), the design centerline of the laterals is at an elevation of 619 feet, and the recommended minimum pumping level is at an elevation of 629 feet.

The potential collector well yield was estimated for three assumed conditions: 1) Summer with average river levels; 2) Winter with low river levels; and 3) Summer with low river levels. The estimated water levels in a collector well caisson at different pumping rates under the assumed conditions for the PW location are depicted in Figure 15. Using the above equation and assumptions, it is calculated that a horizontal collector well constructed near the PW location could yield up to 8,700 gpm (12.5 MGD) under average summer conditions with the river at an elevation of 669.4 feet and the ground water temperature at 58^{o} F. Under the assumed low river level (elevation 660.4 feet), low water temperature (45^{o} F) winter conditions, it is estimated that the proposed collector well could yield 4,700 gpm (6.7 MGD). Under the assumed low river level (elevation 660.4 feet) summer conditions with the ground water temperature at 65^{o} F, it is estimated that the proposed collector well could yield 6,300 gpm (9.1 MGD). Actual collector well yields will depend on how well the aquifer conditions match the assumed conditions, and will vary with changes in river level and ground water temperature. As indicated in Figure 14, with the current regulation of flows in the Missouri River it would be very unusual for very low river levels to occur during the summer. Based on the recent river data from the site and from the USGS gage at Waverly, it is estimated that the river level at the project site will rarely drop below an elevation of approximately 663 feet. At this river level a collector well at the PW site would be capable of yielding up to 6,300 gpm (10.3 MGD) with the ground water temperature at 58^{o} F.

4.3 <u>POTENTIAL PUMPING EFFECTS AND GROUND WATER QUALITY CHANGES</u>

In order to estimate the potential pumping effects from the proposed collector well, a ground water flow model was developed using the software package GFLOW Version 2.1.1. This is an analytic element ground water flow model that allows simulation of 2-dimensional ground water flow under steady-state conditions.

GFLOW simulations were conducted for the test conditions at the start of the PW constant-rate test in order to check the model input values. The aquifer parameters were assumed to be uniform throughout the modeled area. The model input parameters were based on the aquifer testing results with the following values used for the simulations:

Base of Aquifer	612 ft, msl
Static Water Level at PW location	668 ft, msl (test conditions)
	669 ft, msl (average conditions)
	660 ft, msl (low flow conditions)
Aquifer Hydraulic Conductivity	577 ft/day (test and average conditions)
	471 ft/day (winter conditions)
Aquifer Thickness	30 ft
Stream Width	1,000 ft
Streambed Vertical Hydraulic Conductivity	0.5 ft/day (test and average conditions)
Streambed thickness	1 ft
Stream depth	13 ft (test conditions)
	14 ft (average conditions)
	5 ft (low flow conditions)

Constant head boundaries were set in the model at upgradient and downgradient locations across the width of the aquifer to act as the limits of the model area. The limits of the aquifer along the margins of the river valley were simulated by no-flow boundaries. The constant head boundaries and stream heads were set to simulate the river gradient observed between the on-site stream gages and the USGS gage at Waverly at the time of the aquifer testing.

The simulation of the test conditions generated modeled drawdown values that were very close to the drawdown values in the observation wells at the end of the testing period adjusted for changes in the river levels. This result indicates that the model is a reasonable approximation of the aquifer conditions at least in the immediate vicinity of the PW location.

To simulate the potential effects that the proposed collector well(s) would have on the aquifer, model simulations were run under assumed average summer conditions, assumed low flow winter conditions, and assumed low flow summer conditions. The model run under assumed average summer conditions was performed to simulate the effects of one collector well near the PW location pumping at 7,400 gpm. Because the yield calculations indicated that a single collector well could not yield 7,400 gpm under the assumed low river conditions for winter or summer, the simulations for these conditions included two collector wells pumping at 3,700 gpm, each.

Figure 16 depicts the results of the simulation run with the collector well near the PW site pumping 7,400 gpm under assumed average summer conditions. This simulation shows that there would be approximately 2 feet or more drawdown extending approximately 1,200 feet to the north of the site property boundaries. An area that has a projected drawdown of approximately 0.5 feet or more extends to approximately 1.5 miles north of the site.

Figure 17 depicts the results of the simulation run with collector wells near TB-06-1 and TB-06-3 with each pumping 3,700 gpm for a total of 7,400 gpm under assumed winter low river conditions. This simulation shows that there would be approximately 2 feet of drawdown extending 2,200 feet to the north of the site and about 5 feet of drawdown extending nearly to the property boundaries of the project site. An area that has a projected drawdown of approximately 0.5 feet or more extends to approximately 2.1 miles to the north of the project site. This simulation probably over-estimates the drawdown on the landward side of the collector wells because the hydraulic conductivity of the aquifer is assigned a uniform low value in the model to account for the low temperature river water entering the aquifer near the collector wells. However, in reality, the infiltration of the river water would lower the ground water temperature only in the portion of the aquifer near the river. The ground water in the areas of the aquifer farther inland would have minimal temperature change and consequently the hydraulic conductivity of the aquifer would not be as low as the value used in the model.

Figure 18 depicts the model estimated drawdown with collector wells near TB-06-1 and TB-06-3 with each pumping 3,700 gpm under assumed summer low river conditions. This simulation shows that there would be approximately 2 feet of drawdown extending 1,400 feet to the north of the site and about 5 feet of drawdown extending nearly to the property boundaries of the project site. An area that has a projected drawdown of approximately 0.5 feet or more extends to approximately 1.6 miles to the north of the project site. Because this simulation uses the low river levels assumed for the winter low flow conditions, but the higher aquifer hydraulic conductivity assumed for the summer average conditions, the results are intermediate between the results for the summer average simulation and the winter low river simulation.

The flow model was used to estimate the induced recharge and its potential effect on the ground water quality. The estimates were made for the assumed average conditions for a collector well at the PW site pumping at 7,400 gpm. The flow model results indicate that after 30 days of pumping, water entering the aquifer from the stream would reach a collector well at the PW location from distances of approximately 1,200 feet upstream of and 1,200 feet downstream of the collector well under average conditions. It is estimated that approximately 70% of the discharge from the collector well would be derived from induced infiltration of the stream at this time. Parameters such as TDS and hardness tend to follow simple mixing relationships under the influence of induced infiltration. Based on the analytical results from the samples collected from well PW, it is estimated that the average ground water TDS at the PW site is about 290 mg/l, and the average hardness is about 350 mg/l. Based on USGS records for the Missouri River at St. Joseph, Missouri, the average TDS of the river water is about 300 mg/l and the average hardness is about 240 mg/l. Based on this, induced infiltration will cause minimal change in the TDS because the ground water and surface water TDS are nearly the same. For the hardness, simple mixing of 70% river water and 30% ground water would result in a hardness value of approximately 270 mg/l in the water from the well. Parameters such as iron, which typically has relatively low concentrations in surface water, would also show reductions in concentration in the water produced from the well due to the influence of induced infiltration. However, iron tends to be involved in biochemical and oxidation-reduction reactions within the riverbed and aquifer and consequently does not tend to show simple mixing relationships due to the influence of induced infiltration.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Collector Wells International, Inc. completed a test drilling and aquifer testing program to evaluate the feasibility of installing a horizontal collector well or wells for the water supply system for the proposed AEC power plant to be located near Norborne, Missouri. The test site is located on a property to the south of Norborne and situated along the north bank of the Missouri River. Three test borings were drilled, and a hydraulic interval test was performed in one of these borings as part of the Task 1 activities. An additional four borings were drilled for observation wells and a test pumping well was installed for the Task 2 activities. The test well was used to conduct a multiple-rate test and a constant-rate aquifer test. The results of the testing were used to predict the potential yields of a collector well located near the test pumping well.

5.1 CONCLUSIONS

The test borings conducted by CWI indicate that the aquifer conditions are favorable for the development of a ground water supply at the test site. The aquifer properties and the proximity to the river allows for the potential development of a riverbank filtration (RBF) system utilizing a collector well or wells.

At the location of the test borings, the favorable aquifer materials are up to 30 feet thick. The aquifer testing indicates that the aquifer in the vicinity of PW is permeable, having a transmissivity of approximately 129,000 gpd/ft under the test conditions. It also appears that the aquifer is in reasonably good hydraulic connection with the river, which provides a source of recharge.

The water quality testing indicates that the ground water in the vicinity of the test well PW is hard and has elevated concentrations of iron and manganese.

Based on the testing results, it is estimated that the proposed collector well located near the PW location could yield in excess of the desired 7,400 gpm under average summer conditions. Under the assumed low river level, low water temperature conditions, it is estimated that a collector well near PW could yield approximately 4,700 gpm.

As indicated from the yield estimates, a single collector well at the PW site is unlikely to be capable of yielding 7,400 under low river conditions. Also, it should be recognized that the capacity of any well will decrease with time as clogging of the well screens and aquifer materials adjacent to the well screens takes place. Consequently, it would be desirable to install a second collector well at the site to augment the supply under low river conditions and provide a backup supply under average river conditions.

5.2 RECOMMENDATIONS

If AEC determines that a collector well located near test well PW is a viable option to meet the projected water supply requirements, the recommended location for the collector well caisson is approximately 25 feet to the east of the test well PW. Alternatively, if it is determined that two collector wells are required to ensure that 7,400 gpm can be obtained on a year-round basis, then the recommended locations are approximately 25 feet east of TB-06-1 and approximately 25 feet west of TB-06-3 (Figure 17). If two collector wells are installed, the same general designs could be used for both.

The preliminary design for the proposed collector well(s) includes a 16-foot diameter (ID) caisson to allow sufficient room for pumping equipment. The top of the caisson should extend to an elevation at or above the 500-year flood level. To ensure adequate mechanical capacity and low screen entrance velocities, the preliminary design also includes six (6) laterals with an approximate length of 200 feet each. The laterals would be comprised of 12-inch diameter stainless-steel well screen, and the six laterals would be installed in a radial pattern on a 175-degree arc on the river side of the caisson.

The test pumping well PW should be left in place to serve as a water supply source during the collector well installation. The observation wells installed during the Tasks 1 and 2 activities should be left in place until completion of construction and testing of the collector well(s). After construction is completed selected observation wells should be converted to permanent monitoring wells by installing concrete pads around the protective surface casings. Observation wells that are deemed unnecessary for monitoring the collector well(s) should be properly abandoned once initial testing of the collector well(s) is completed.

6.0 REFERENCES

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7.0 GLOSSARY

Aquifer – a layer of earth materials that can yield a usable quantity of water to wells.

Alluvial – pertaining to sediments deposited by modern streams or rivers.

Collector Well – a well consisting of a hollow cylindrical concrete caisson that is sunk into the ground from which horizontal well screen laterals project into the surrounding aquifer that allow water to enter the well.

Drawdown – the change in ground water level that results from pumping. It is determined from the difference between the depth to the ground water surface at a given time after pumping has started and the depth to the ground water surface prior to the start of pumping.

Glacial-Fluvial Deposits – earth materials that have been deposited or formed by either by the action of glaciers or by streams or rivers, or sediments formed by glaciers and re-deposited by streams.

Hydraulic Conductivity – a measure of the permeability of a porous media. Specifically it is defined as the volume of water that can flow through a unit cross section of a media under a unit hydraulic gradient. It has units of a velocity and can be expressed in terms of feet per day (ft/day) or in gallons per day per square foot (gpd/ft^2).

Pressure Transducer – a device that generates an electrical signal that varies in proportion to the amount of pressure that the device is exposed to. The electrical signal can be converted to a digital signal that can be stored on a computer as a record of the pressures that the transducer is exposed to, such as head pressures (ground water levels) within a well.

Specific Capacity – a measure of the productivity of a well. It is determined by dividing the pumping rate of a well by the amount of drawdown. It is typically expressed in units of gallons per minute per foot of drawdown (gpm/ft).

Specific Conductance – a measure of the ability of water to conduct electricity. It roughly correlates to the total dissolved concentration of ionic constituents (chemicals that form charged particles when dissolved) in the water, and is thus a general indicator of water quality. Pure water has very low specific conductance. As the amount of ionic constituents dissolved in the water increases, the specific conductance increases. It is expressed in units of microsiemens per centimeter (µS/cm) or the equivalent unit micromhos per centimeter (µmhos/cm)

Storativity – a measure of an aquifer's ability to store water. Specifically it is the volume of water that an aquifer stores or releases per unit surface area of the aquifer per unit change in hydraulic head. Storativity is a unitless value.

Transmissivity – a measure of an aquifer's ability to transmit water. Specifically it is defined as the volume of water that can flow through a vertical cross section of an aquifer of unit width under a unit hydraulic gradient. It is the product of the hydraulic conductivity of an aquifer and the saturated thickness of the aquifer. It is expressed in terms of gallons per day per foot (gpd/ft).

Unconsolidated Materials – earth materials such as soil that are not cemented or compacted together. Rock would generally be considered a consolidated material.

Well Development – the process of removing fine-grained materials from around a well screen to ensure that the screen is open to the aquifer and to maximize the well's performance. Well development is typically accomplished by pumping or surging the well. Pumping for development can be accomplished by air-lifting, a method in which a pipe is installing into the well through which compressed air is injected. The air forces water up out of the well casing carrying the fine-grained materials that can pass through well screen along with it.

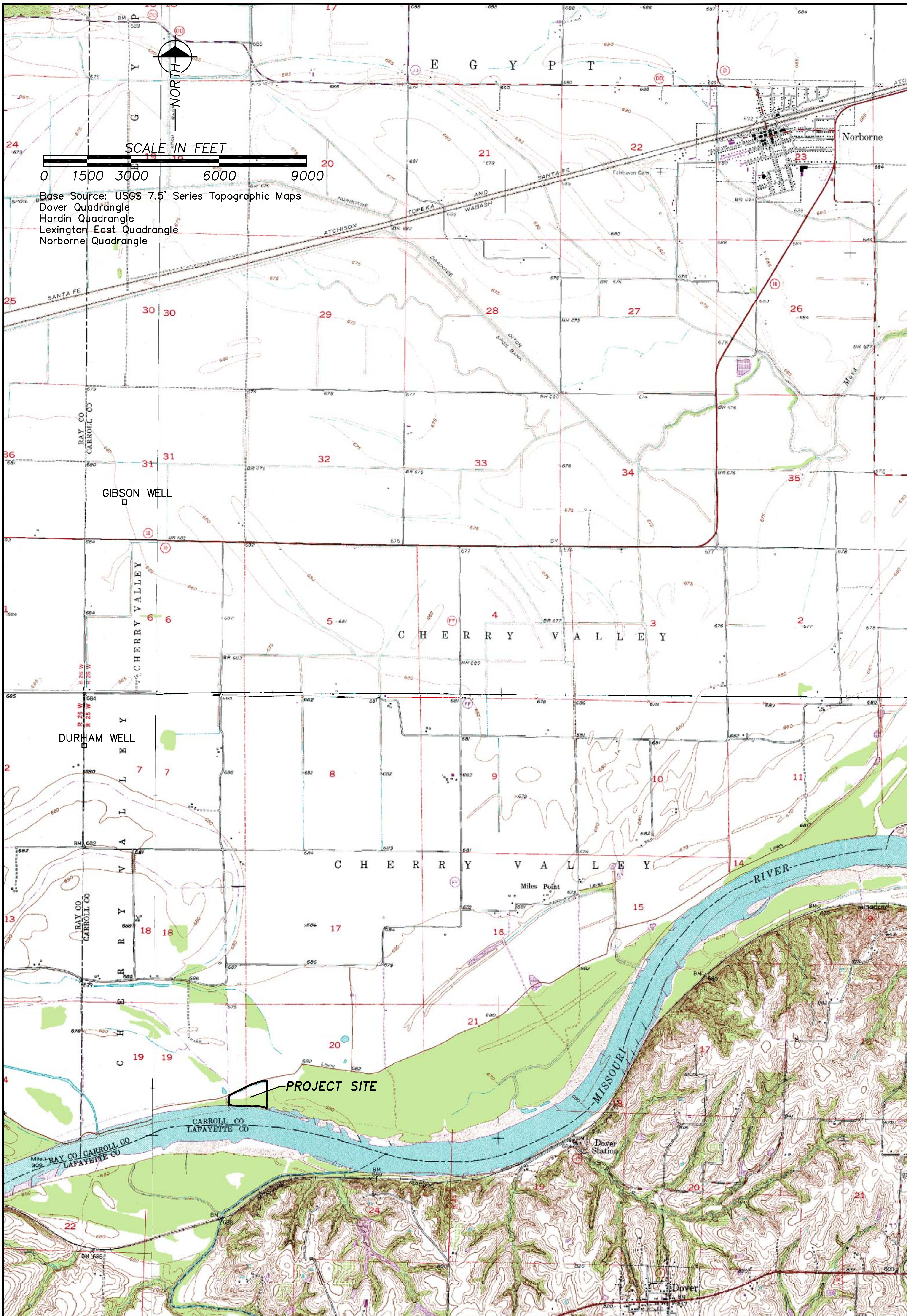
Well Screen – part of a well in an unconsolidated aquifer that is designed to maximize the amount of water that enters the well while minimizing the amount of sand or fine-grained materials that can enter the well. A well screen can be simply pipe with numerous slots cut through it. Wire-wrapped well screen provides the maximum amount of open area. It is constructed from a number of metal rods running the length of the screen around which a wire is wrapped and attached by welding. A gap is left between successive wraps of the wire to form a continuous slot that allows the entrance of water into the screen. For either cut slot or wire-wrapped well screen, the size of the slot opening is selected based on the grain-size distribution of the aquifer materials.

Grain Size Classifications

The grain size classifications used in this report follow the Wentworth Scale as indicated below (Source: *Manual of Field Geology*, by R. Compton, 1962):

Approximate Size in Inches:			Classification
Greater than 10			Boulders
2.5	to	10	Cobbles
1.2	to	2.5	Very Coarse Pebble Gravel
0.6	to	1.2	Coarse Pebble Gravel
0.3	to	0.6	Medium Pebble Gravel
0.15	to	0.3	Fine Pebble Gravel
0.08	to	0.15	Granule Gravel
0.04	to	0.08	Very Coarse Sand
0.02	to	0.04	Coarse Sand
0.01	to	0.02	Medium Sand
0.005	to	0.01	Fine Sand
0.002	to	0.005	Very Fine Sand
0.00015	to	0.002	Silt
Less than 0.00015			Clay (clay-sized materials)

FIGURES



GENERAL LOCATION MAP ASSOCIATED ELECTRIC COOPERATIVE, INC. NORBORNE, MISSOURI			FIGURE 1
PROJECT NUMBER 106-294	DATE 06/05/06	FILE NAME 106-294-02	SCALE 1" = 3000'

Collector Wells International, Inc.
6360 HUNTLEY RD
COLUMBUS, OHIO 43229
(614) 888-6263 / FAX (614) 888-9208

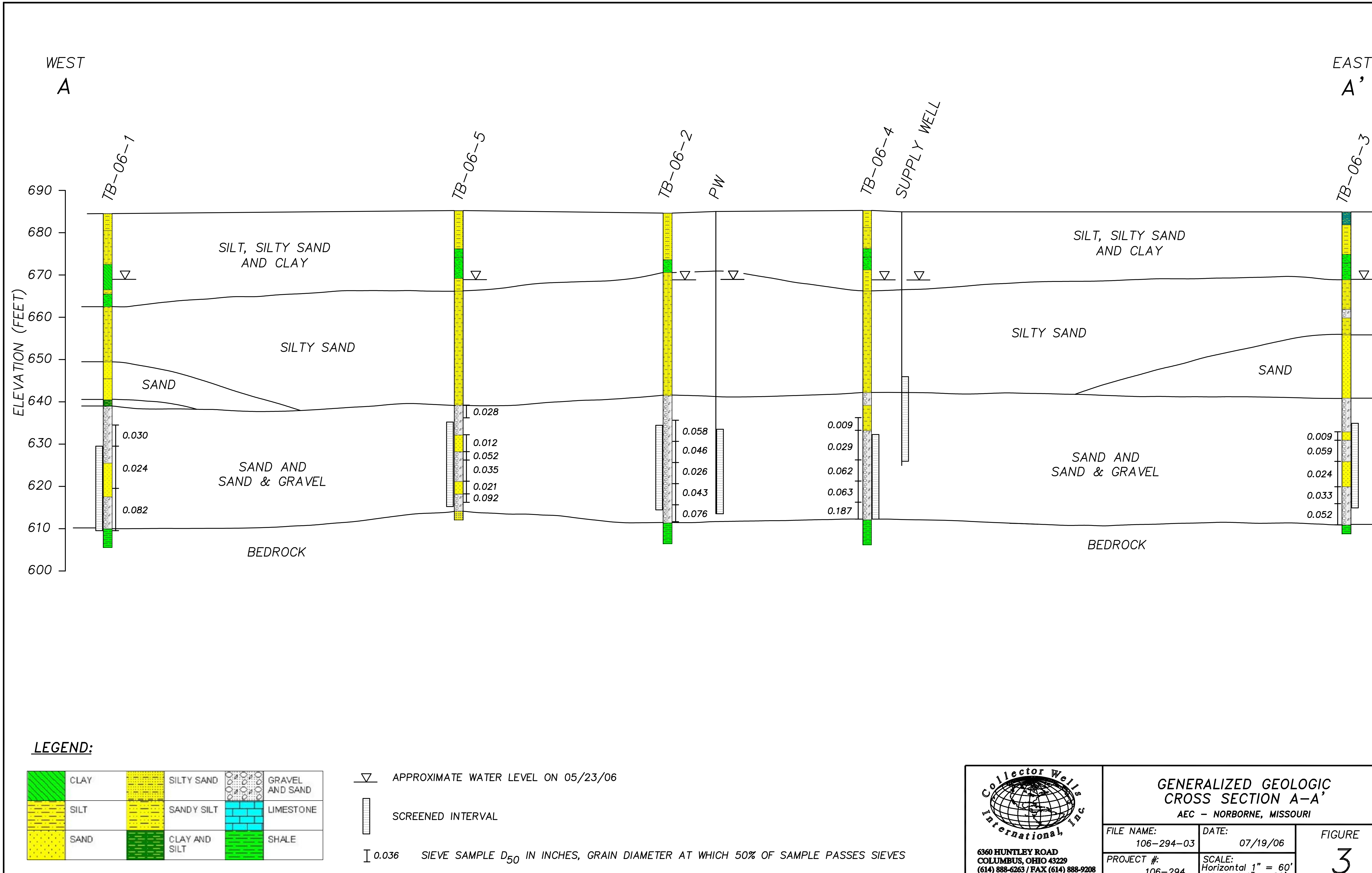
Collector Wells International, Inc.
6360 HUNTLEY RD
COLUMBUS, OHIO 43229
(614) 888-6263 / FAX (614) 888-9208

WELL LOCATION MAP

AEC PROJECT SITE
NORBORNE, MISSOURI

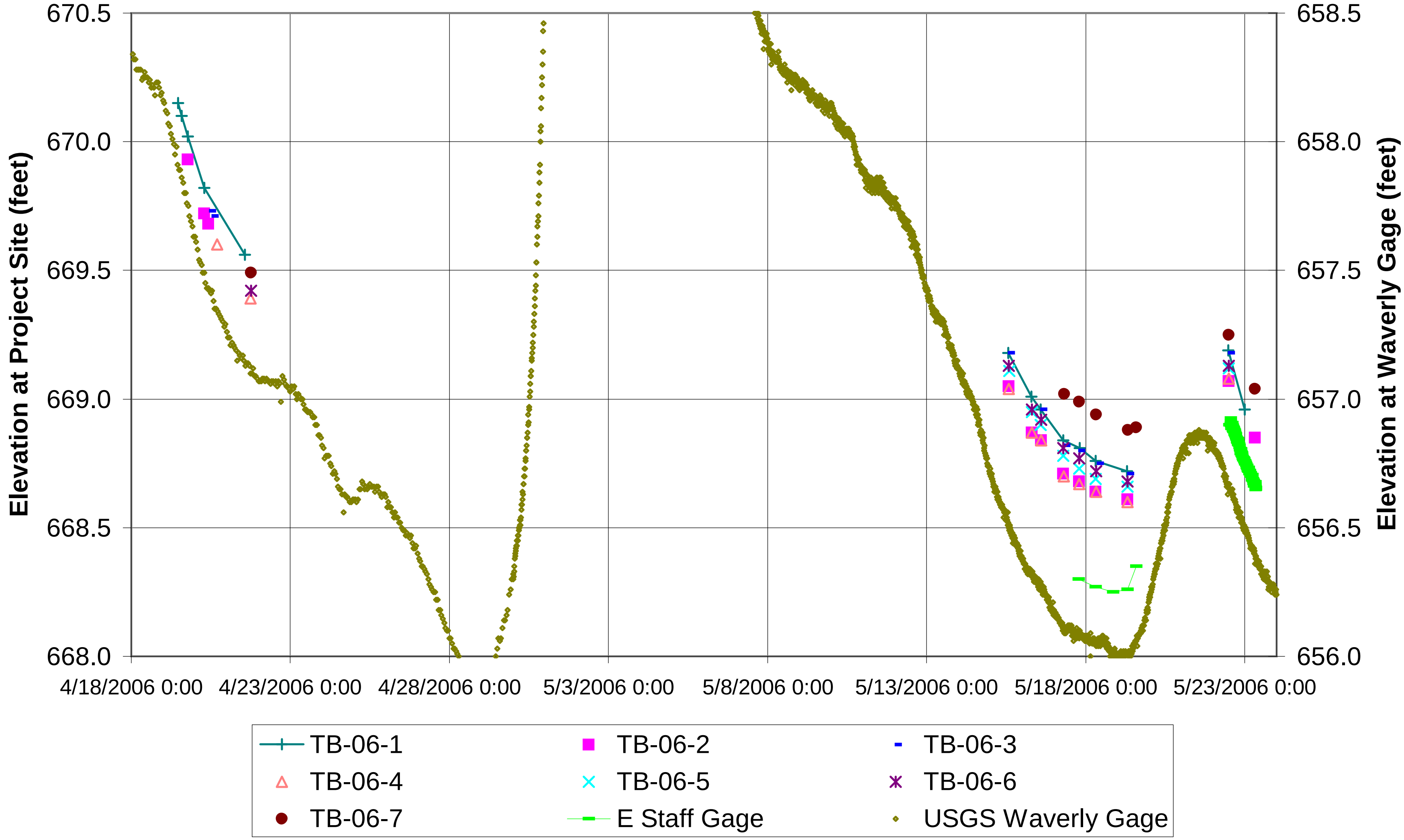
PROJECT NUMBER	DATE	FILE NAME	SCALE
106-294	06/01/06	106-294-01	1" = 200'

FIGURE 2



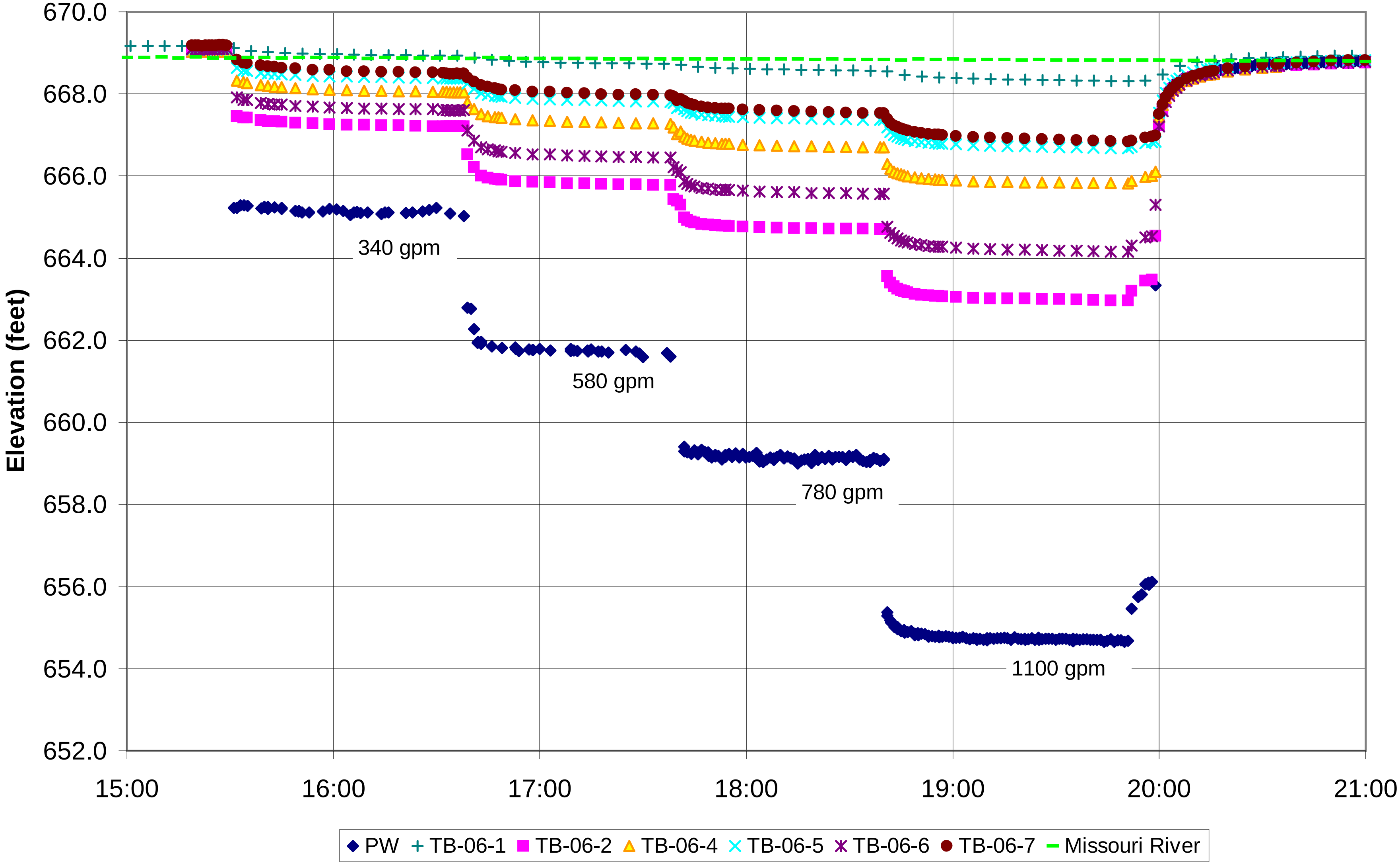
WEST
A
EAST
A'
TB-06-1
TB-06-5
TB-06-2
PW
TB-06-4
SUPPLY WELL
TB-06-3
ELEVATION (FEET)
690
680
670
660
650
640
630
620
610
600
SILT, SILTY SAND AND CLAY
SILTY SAND
SAND
SAND AND SAND & GRAVEL
BEDROCK
SILT, SILTY SAND AND CLAY
SILTY SAND
SAND
SAND AND SAND & GRAVEL
BEDROCK
0.030
0.024
0.082
0.028
0.012
0.052
0.035
0.021
0.092
0.058
0.046
0.026
0.043
0.076
0.009
0.029
0.062
0.063
0.187
0.009
0.059
0.024
0.033
0.052
LEGEND:
CLAY
SILTY SAND
GRAVEL AND SAND
SILT
SANDY SILT
LIMESTONE
SAND
CLAY AND SILT
SHALE
APPROXIMATE WATER LEVEL ON 05/23/06
SCREENED INTERVAL
0.036 SIEVE SAMPLE D50 IN INCHES, GRAIN DIAMETER AT WHICH 50% OF SAMPLE PASSES SIEVES
Collector Wells International, Inc.
6360 HUNTLEY ROAD
COLUMBUS, OHIO 43229
(614) 888-6263 / FAX (614) 888-9208
GENERALIZED GEOLOGIC CROSS SECTION A-A'
AEC - NORBORNE, MISSOURI
FILE NAME: 106-294-03
DATE: 07/19/06
FIGURE 3
PROJECT #: 106-294
SCALE: Horizontal 1" = 60' Vertical 1" = 20'

FIGURE 4
Background Period Hydrographs – Observed Water Elevations
AEC - Norborne, Missouri



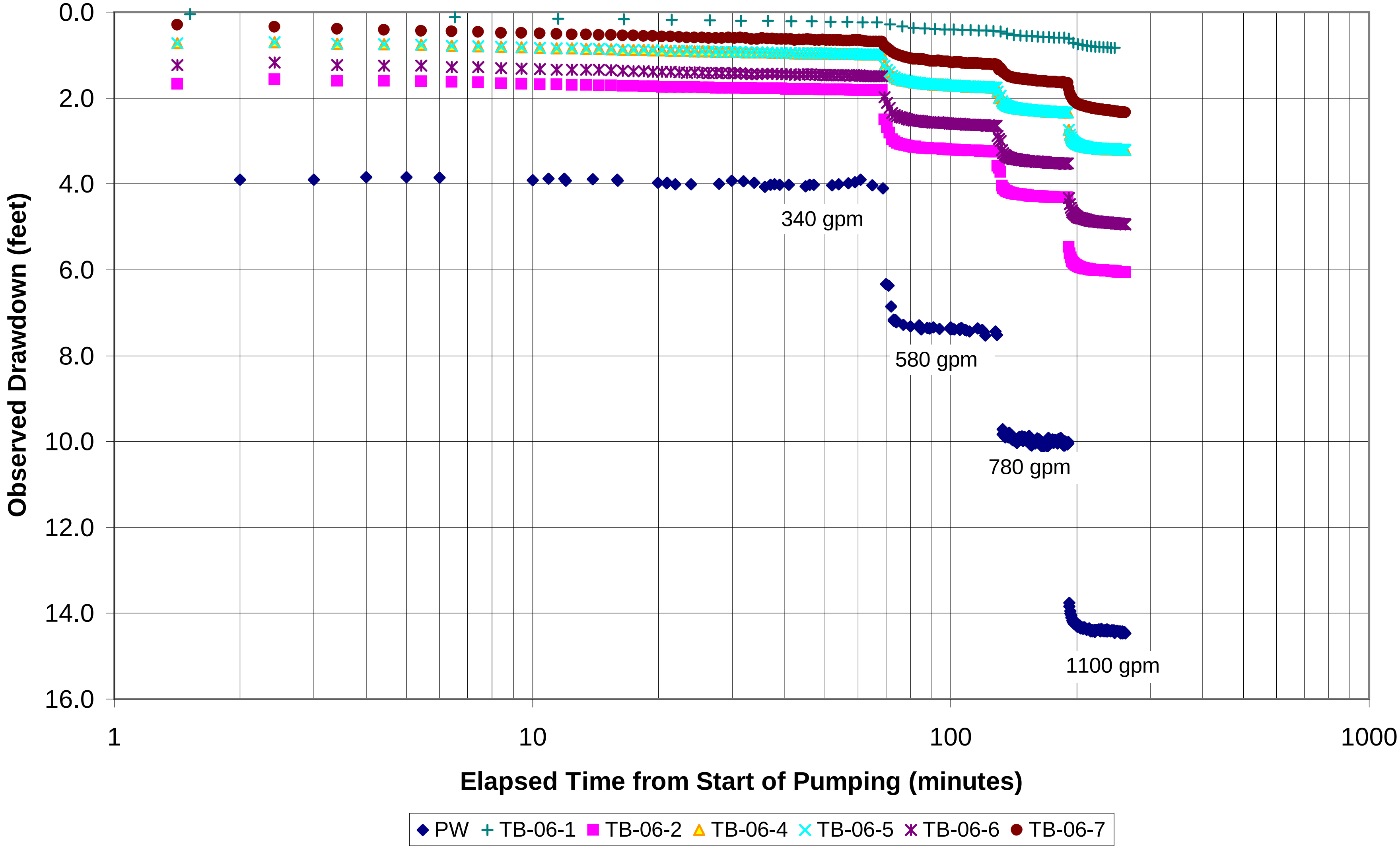
File: AEC Background Water Level Data.xls Print Date: 7/17/2006

FIGURE 5
PW Multiple-Rate Step Test Hydrographs
AEC - Norborne, Missouri



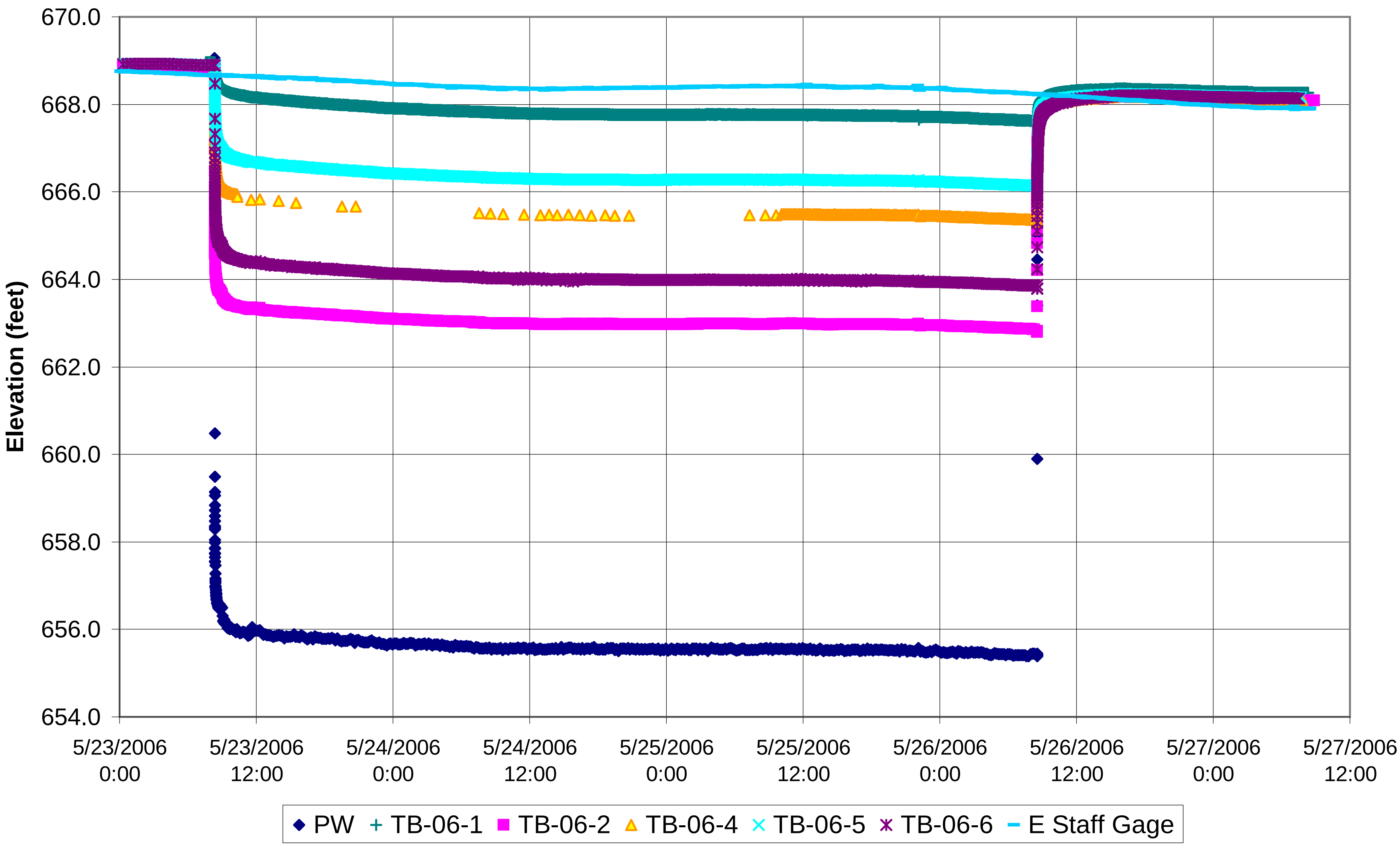
File: AEC Step Test.xls Print Date: 7/17/2006

FIGURE 6
PW Multiple-Rate Step Test Semi-Log Time-Drawdown Plots
AEC - Norborne, Missouri



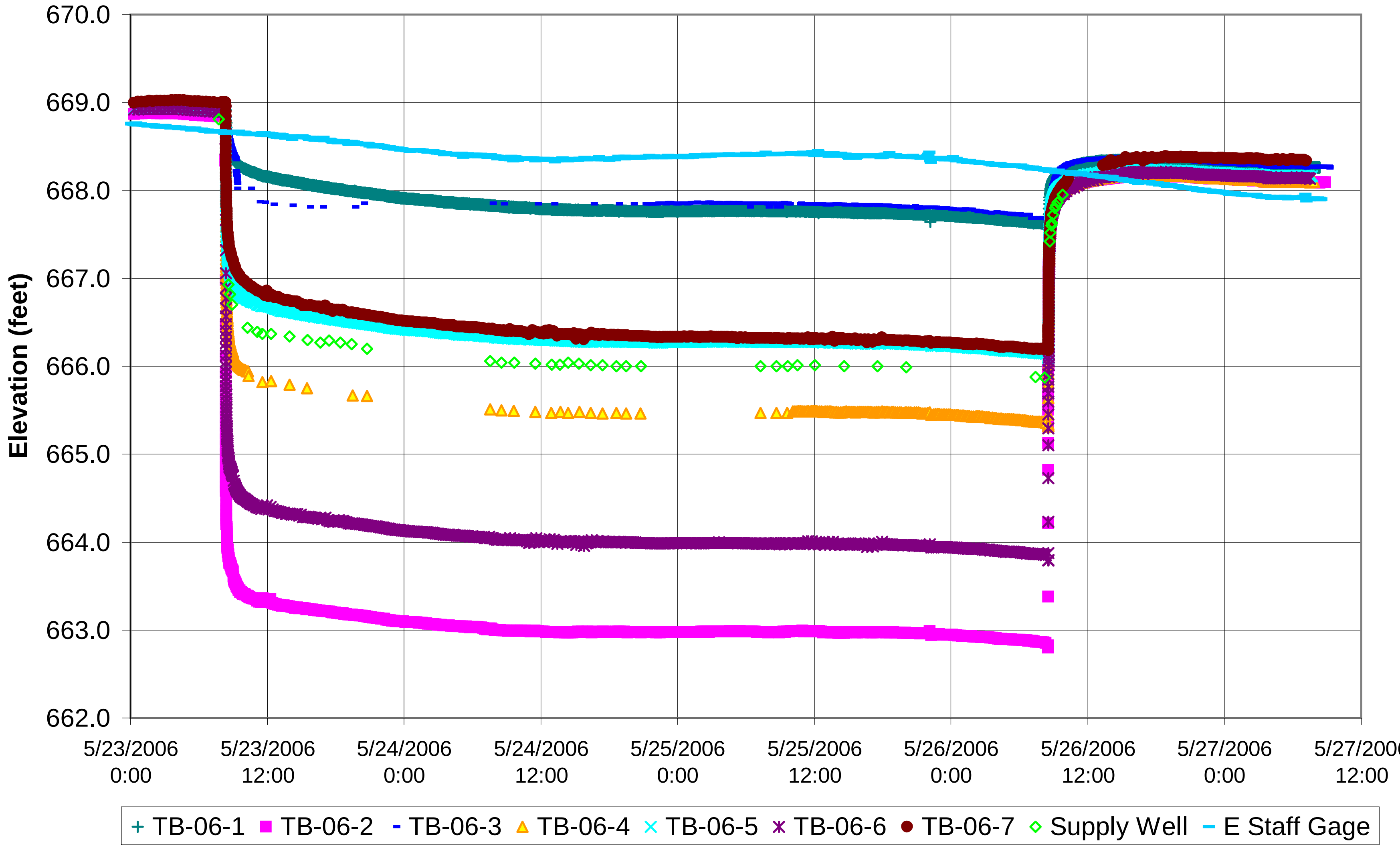
File: AEC Step Test.xls Print Date: 7/17/2006

FIGURE 7
Constant-Rate Aquifer Test Period Hydrographs – Observed Water Elevations
AEC - Norborne, Missouri



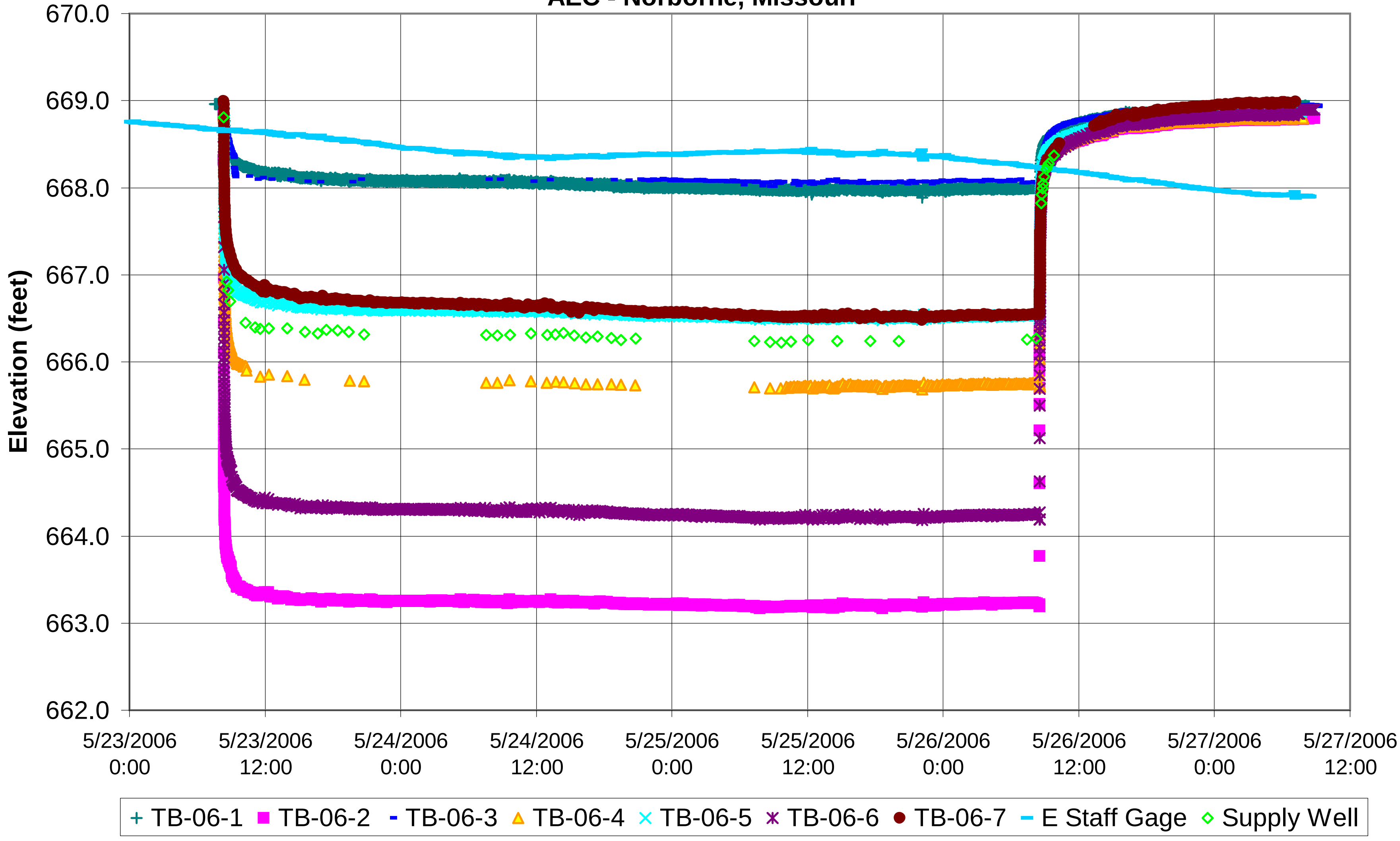
File: AEC Constant-Rate Test Data.xls Print Date: 7/17/2006

FIGURE 8
Constant-Rate Aquifer Test Period Hydrographs – Observed Water Elevations
AEC - Norborne, Missouri

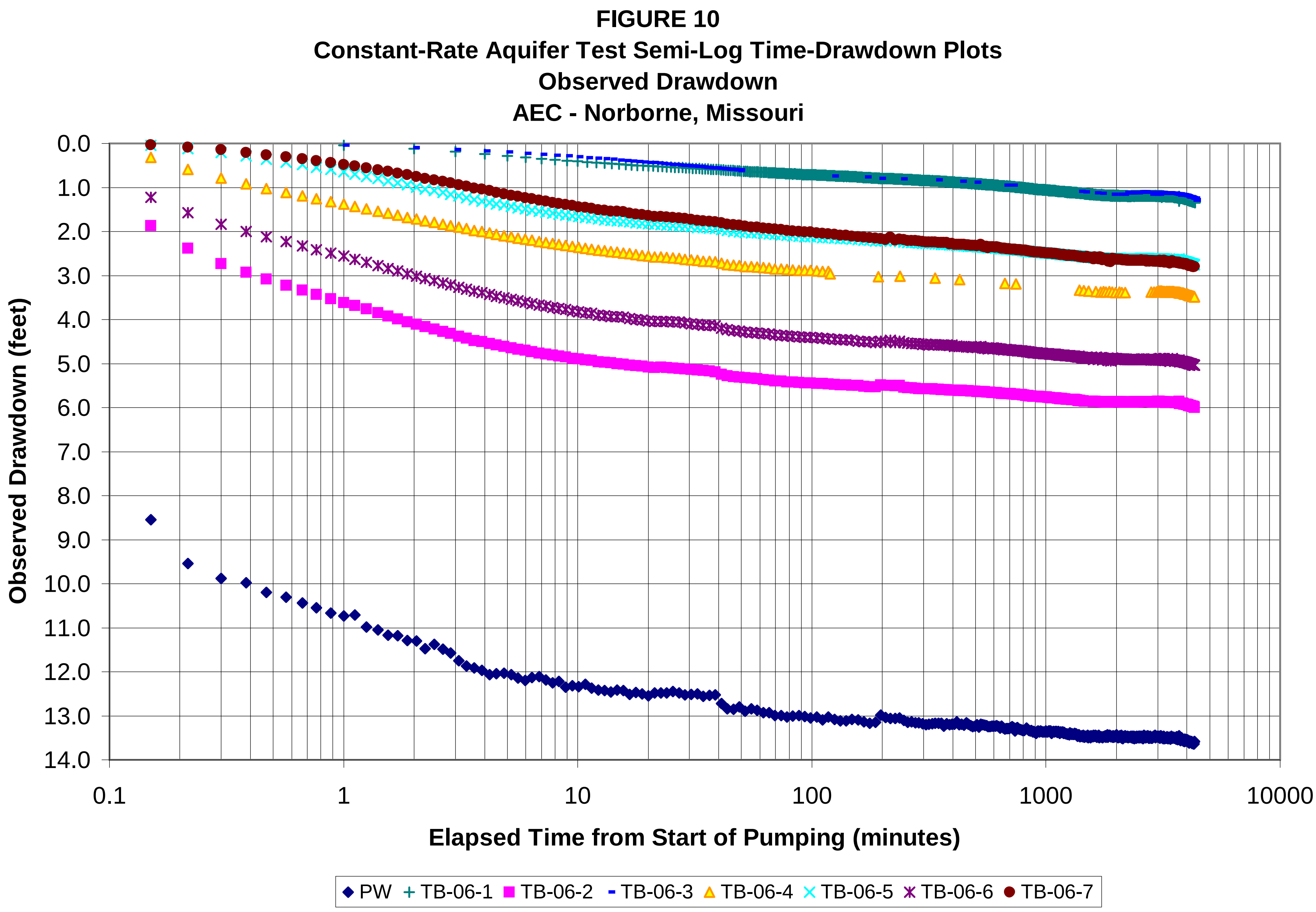


File: AEC Constant-Rate Test Data.xls Print Date: 7/17/2006

FIGURE 9
Constant-Rate Aquifer Test Period Hydrographs
Water Elevations Adjusted for River Level Changes
AEC - Norborne, Missouri

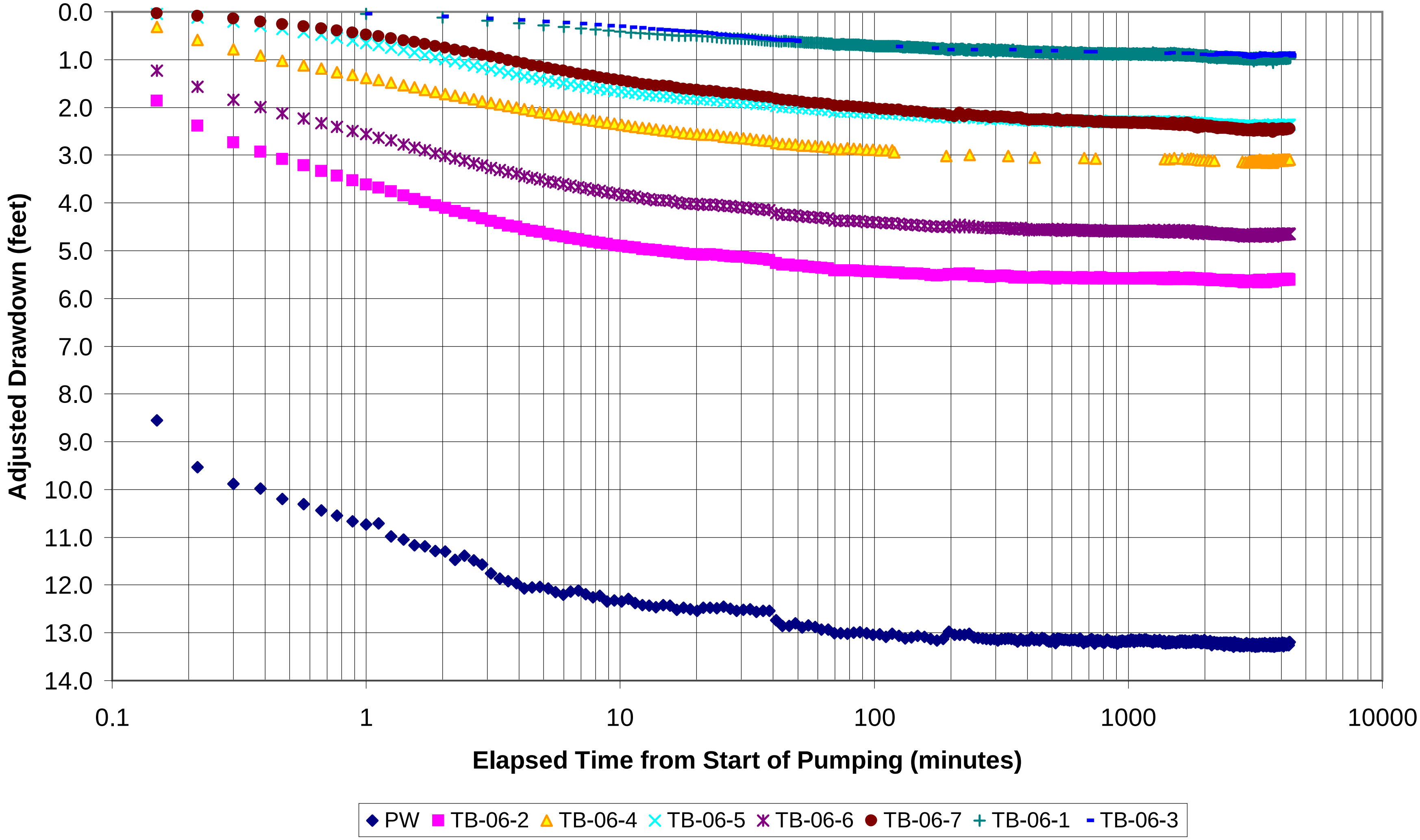


File: AEC Constant-Rate Test Data.xls Print Date: 7/17/2006



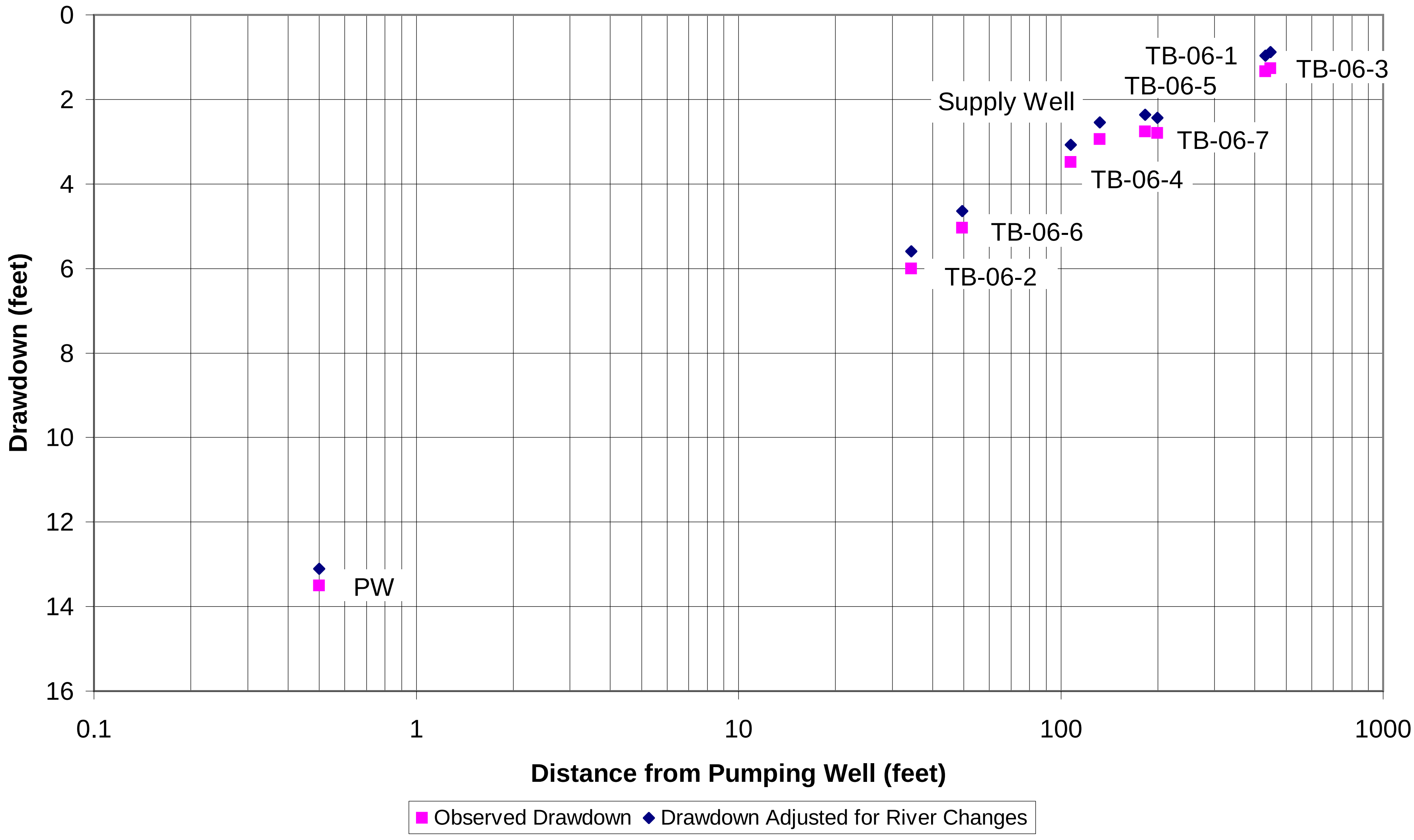
File: AEC Constant-Rate Test Data.xls Print Date: 7/17/2006

FIGURE 11
Constant-Rate Aquifer Test Semi-Log Time-Drawdown Plots
Drawdown Adjusted for River Level Changes
AEC - Norborne, Missouri



File: AEC Constant-Rate Test Data.xls Print Date: 7/17/2006

FIGURE 12
Constant-Rate Aquifer Test Semi-Log Distance-Drawdown Plots
AEC - Norborne, Missouri



File: AEC Distance Drawdown.xls Print Date: 7/17/2006

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6360 HUNTLEY RD
COLUMBUS, OHIO 43229
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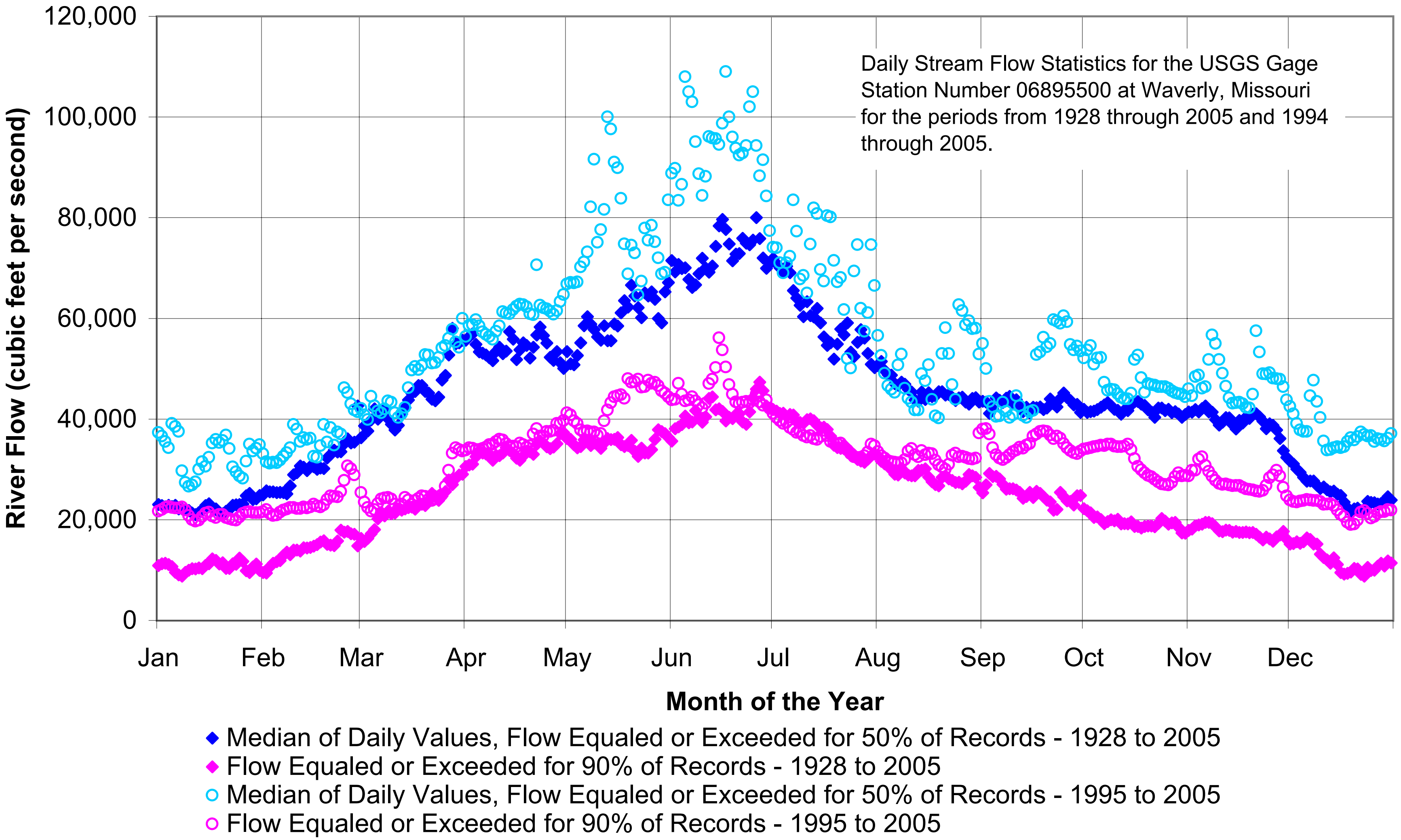
END OF CONSTANT-RATE AQUIFER TEST
OBSERVED DRAWDOWN MAP
AEC PROJECT SITE
NORBORNE, MISSOURI

PROJECT NUMBER	DATE	FILE NAME	SCALE
106-294	07/13/06	106-294-04	1" = 200'

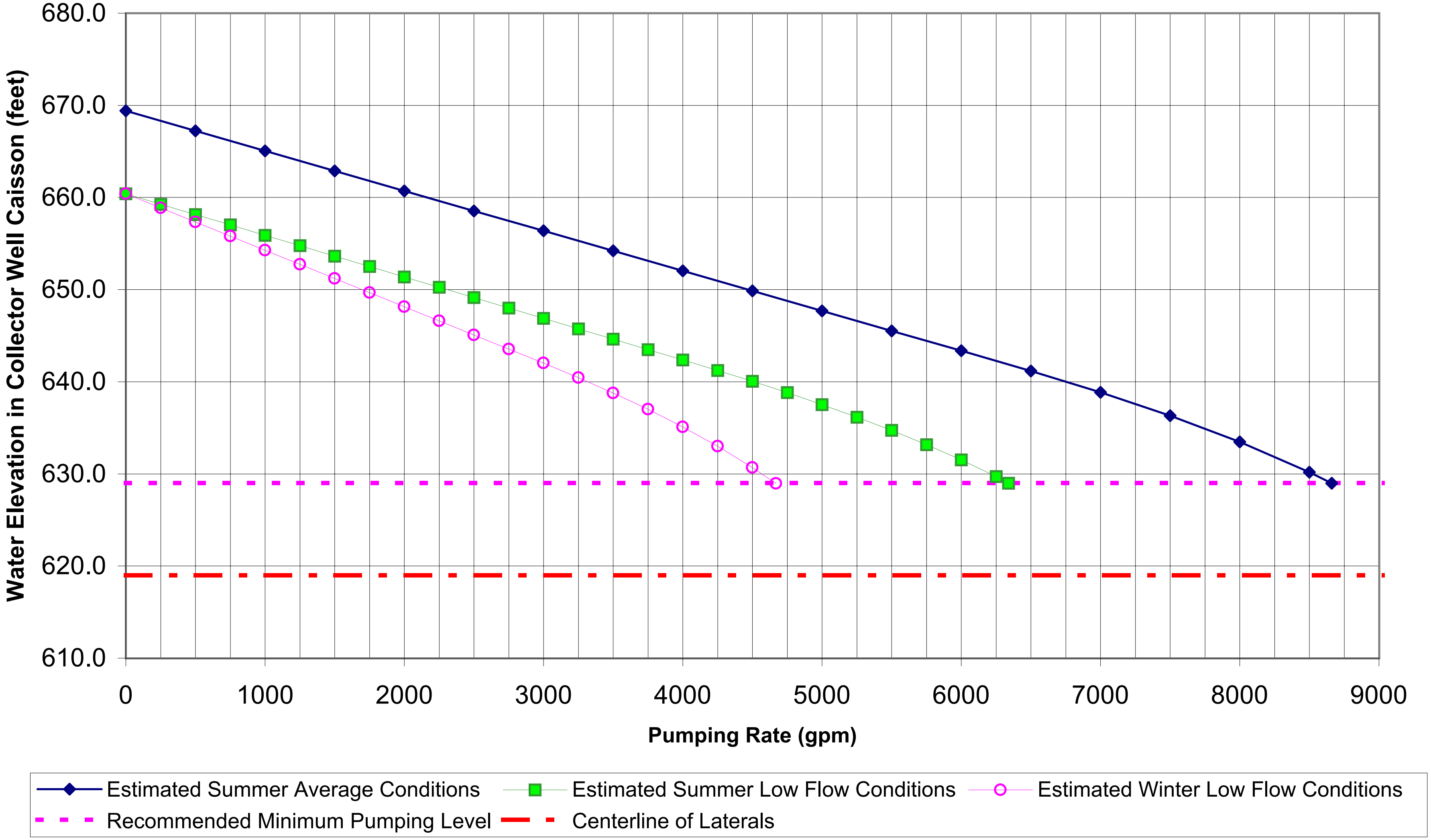
FIGURE 13

FIGURE 14
Missouri River Daily Stream Flow Statistics
for the US Geological Survey Gage Station at Waverly, Missouri
AEC - Norborne, Missouri

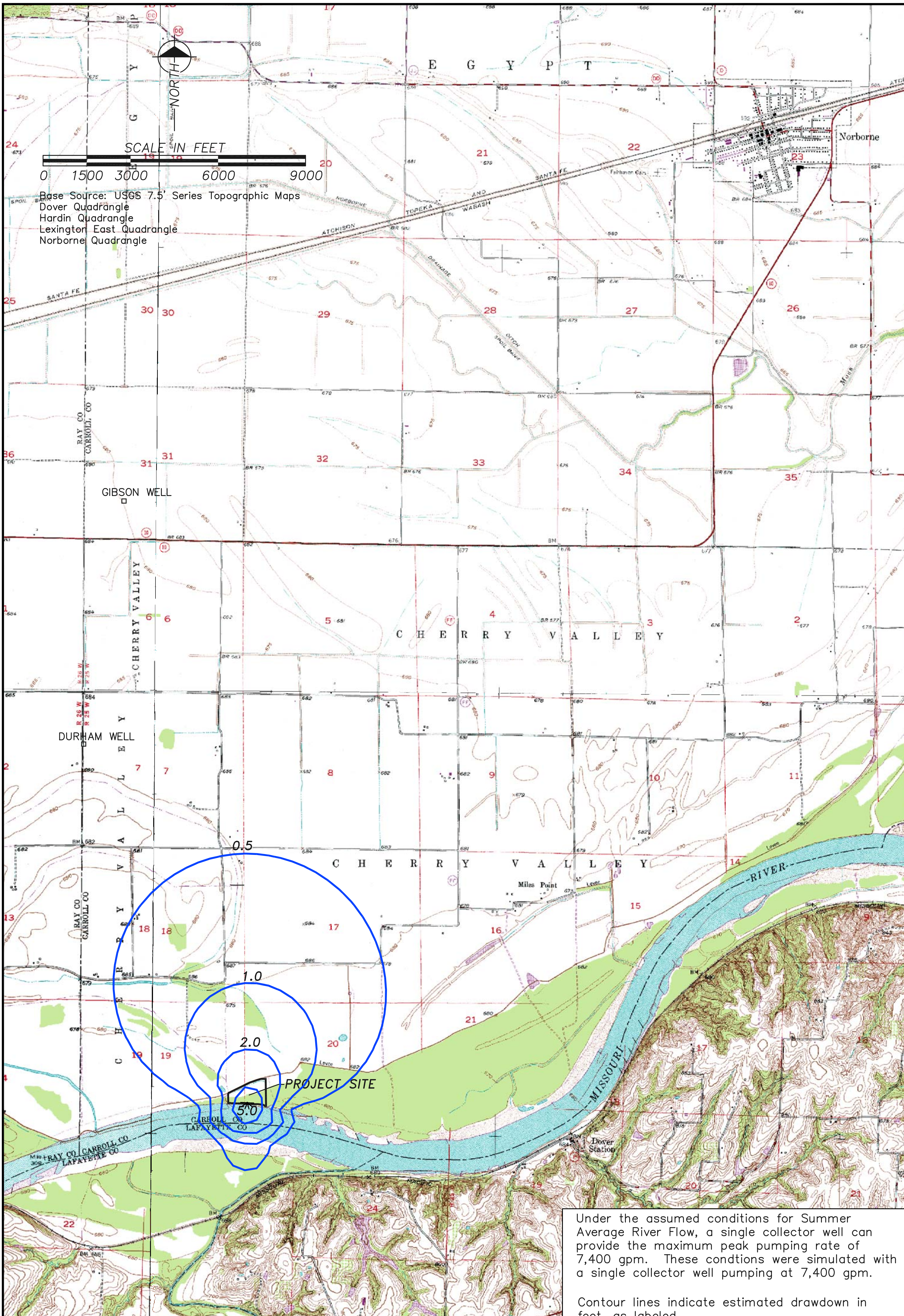


File: Missouri River at Waverly dvstat.xls Print Date: 08/21/06

FIGURE 15
Estimated Yield from Horizontal Collector Well at the PW Location
AEC - Norborne, Missouri



File: AEC PW Yield Calculations COLNSSS-SMS-8-17-06.XLS Print Date: 08/23/06



Under the assumed conditions for Summer Average River Flow, a single collector well can provide the maximum peak pumping rate of 7,400 gpm. These condtions were simulated with a single collector well pumping at 7,400 gpm.

Contour lines indicate estimated drawdown in feet, as labeled.

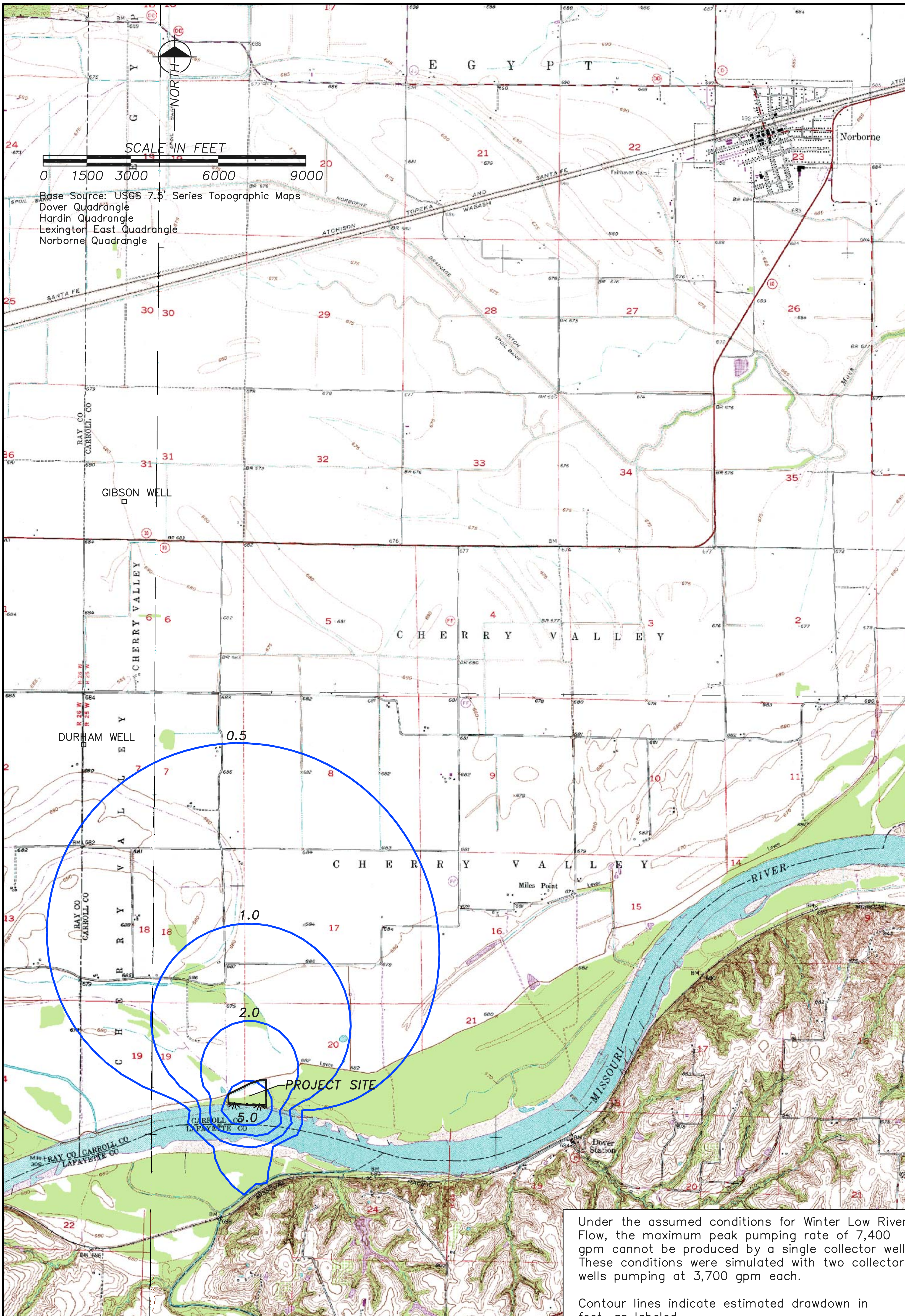
Collector Wells International, Inc.
6360 HUNTLEY RD
COLUMBUS, OHIO 43229
(614) 888-6263 / FAX (614) 888-9208

MODEL ESTIMATED DRAWDOWN FOR ONE COLLECTOR WELL PUMPING 7,400 GPM – SUMMER AVERAGE RIVER CONDITIONS

ASSOCIATED ELECTRIC COOPERATIVE, INC.
NORBORNE, MISSOURI

FIGURE 16

PROJECT NUMBER	DATE	FILE NAME	SCALE
106-294	08/13/08	106-294-06	1" = 3000'



Under the assumed conditions for Winter Low River Flow, the maximum peak pumping rate of 7,400 gpm cannot be produced by a single collector well. These conditions were simulated with two collector wells pumping at 3,700 gpm each.

Contour lines indicate estimated drawdown in feet, as labeled.

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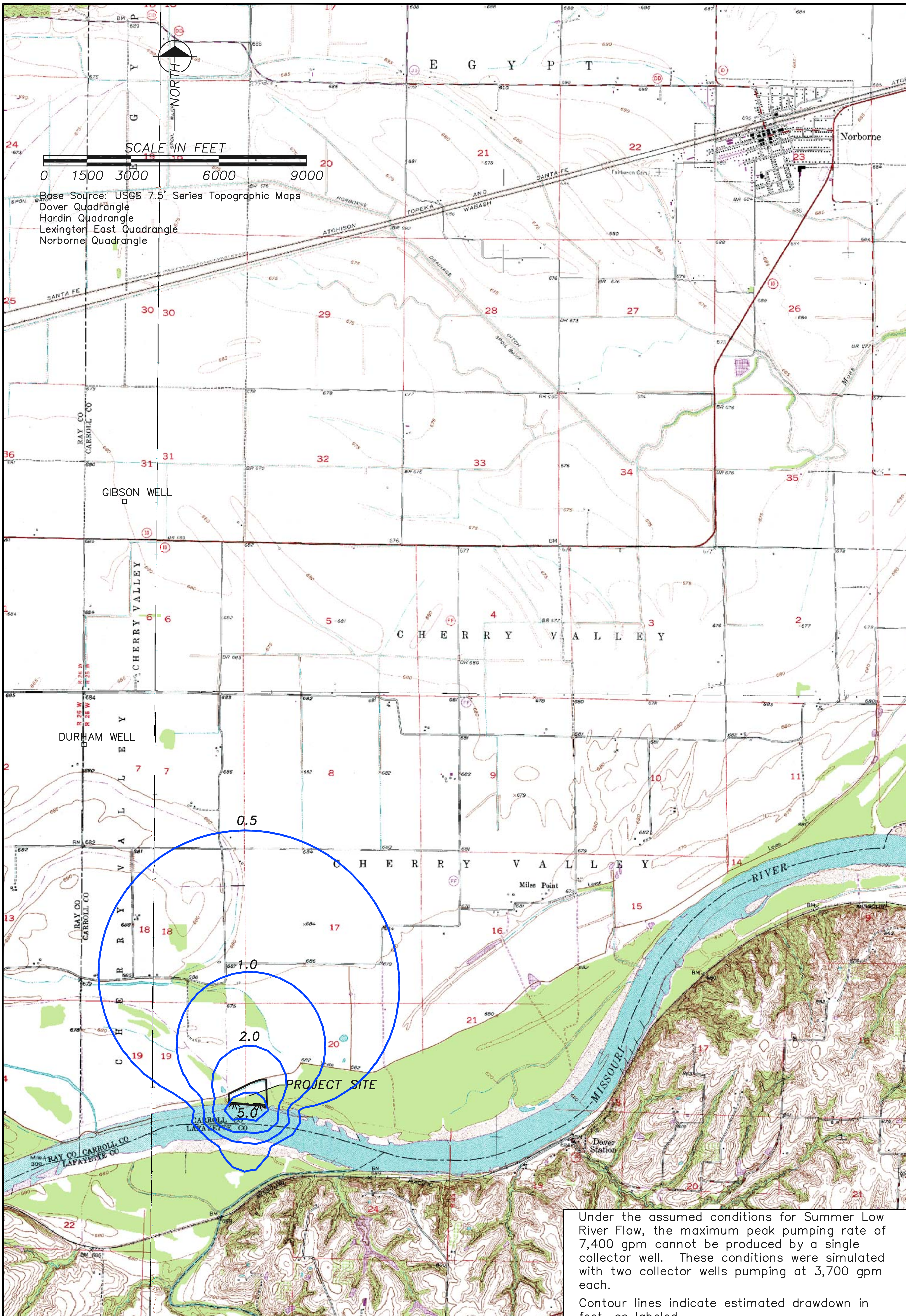
6360 HUNTLEY RD
COLUMBUS, OHIO 43229
(614) 888-6263 / FAX (614) 888-9208

MODEL ESTIMATED DRAWDOWN FOR TWO COLLECTOR WELLS PUMPING 3,700 GPM EACH, WINTER LOW RIVER CONDITIONS

ASSOCIATED ELECTRIC COOPERATIVE, INC.
NORBORNE, MISSOURI

FIGURE 17

PROJECT NUMBER	DATE	FILE NAME	SCALE
106-294	08/09/06	106-294-05	1" = 3000'



Under the assumed conditions for Summer Low River Flow, the maximum peak pumping rate of 7,400 gpm cannot be produced by a single collector well. These conditions were simulated with two collector wells pumping at 3,700 gpm each.

Contour lines indicate estimated drawdown in feet, as labeled.

Collector Wells International, Inc.
6360 HUNTLEY RD
COLUMBUS, OHIO 43229
(614) 888-6263 / FAX (614) 888-9208

MODEL ESTIMATED DRAWDOWN FOR TWO COLLECTOR WELLS PUMPING 3,700 GPM EACH, SUMMER LOW RIVER CONDITIONS

ASSOCIATED ELECTRIC COOPERATIVE, INC.
NORBORNE, MISSOURI

PROJECT NUMBER	DATE	FILE NAME	SCALE
106-294	08/13/06	106-294-07	1" = 3000'

FIGURE 18

TABLES

TABLE 1

Test Boring and Monitoring Point Information Summary
Hydrogeological Evaluation, AEC - Norborne, Missouri

Boring ID	Date Installed	Total Depth Drilled (feet)	Depth to Bedrock (feet)	Distance from PW (feet)	UTM Coordinates (1) Easting (meters)	UTM Coordinates (1) Northing (meters)	Site Coordinates (2) Easting (feet)	Site Coordinates (2) Northing (feet)	Ground Surface Elevation (3) (feet)	Measuring Point Elevation (3) (feet)	Approximate Bedrock Surface Elevation (feet)	Screened Interval Depths (feet)
TB-06-1	4/18/2006	79	74.5	432	436,088	4,340,493	55,242.45	45,760.86	684.5	687.37	610	55 - 75
TB-06-2	4/18/2006	78	73	34.3	436,206	4,340,484	55,639.42	45,741.03	684.6	686.78	612	50.2 - 70.2
TB-06-3	4/19/2006	76	74	448	436,361	4,340,480	56,121.31	45,728.68	684.9	687.71	611	50 - 70
TB-06-4	4/20/2006	79	73	107	436,253	4,340,486	55,780.79	45,732.32	685.3	688.27	612	53 - 73
TB-06-5	4/20/2006	73	71	183	436,163	4,340,494	55,491.28	45,752.11	685.2	688.33	614	50 - 70
TB-06-6	4/21/2006	79	73	49.5	436,225	4,340,504	55,691.97	45,786.73	685.5	688.41	613	53 - 73
TB-06-7	4/21/2006	75	72	199	436,227	4,340,548	55,699.58	45,938.29	684.3	687.30	612	50 - 70
Supply Well	5/16/2006	60		132	436,259	4,340,485	55,805.36	45,731.04	684.9	685.97		39 - 59
PW	5/19/2006	71.5		-	436,224	4,340,487	55,673.72	45,740.71	685.0	686.38		51.5 - 71.5
Upstream (West) Staff Gage	5/17/2006			524	436,063	4,340,472	55,152.10	45,687.48	665.6	670.61		
Downstream (East) Staff Gage	5/17/2006			89	436,211	4,340,464	55,637.18	45,660.09	666.2	671.21		
Durham Well				13,493			50,001.11	57,983.87	687.1	688.42		
Gibson Well				21,036			51,307.92	66,318.51	679.8	681.73		

1) Approximate coordinates, determined with hand-held GPS receiver, UTM NAD 1983 Zone 15.

2) Site coordinates provided by M&M Land Surveying Service, Inc. - Coordinate System assumed

3) Elevations provided by M&M Land Surveying Service, Inc. - Vertical Datum NGVD1929

TABLE 2
Sieve Analysis Results
Hydrogeological Evaluation, AEC - Norborne, Missouri

		Effective Grain Size (1)						Wentworth Size Fraction		
Boring ID	Depth Interval (feet)	D_{10} (mm)	D_{40} (mm)	D_{50} (mm)	D_{60} (mm)	D_{90} (mm)	Coefficient of Uniformity (C_u)	Gravel (percent)	Sand (percent)	Silt/Clay (percent)
TB-06-1	50-55	0.35	0.65	0.77	0.95	3.18	2.7	17.2%	82.5%	0.3%
	55-65	0.30	0.54	0.61	0.70	1.62	2.3	6.6%	93.0%	0.4%
	65-75	0.55	1.60	2.08	2.90	14.00	5.3	51.4%	48.3%	0.3%
TB-06-2	49-54	0.33	1.03	1.47	1.99	7.67	6.1	39.9%	59.4%	0.7%
	54-59	0.23	0.88	1.16	1.55	5.03	6.9	31.6%	67.8%	0.6%
	59-64	0.32	0.58	0.67	0.76	5.17	2.4	16.7%	82.9%	0.3%
	64-69	0.42	0.82	1.10	1.48	7.65	3.5	29.7%	69.9%	0.4%
	69-73	0.45	1.36	1.93	2.95	15.04	6.5	49.0%	49.9%	1.1%
TB-06-3	52-54	0.15	0.21	0.24	0.28	0.66	1.8	4.5%	94.2%	1.3%
	54-59	0.41	1.11	1.49	2.03	8.62	5.0	40.6%	59.1%	0.3%
	59-65	0.36	0.55	0.61	0.67	1.19	1.8	4.2%	95.6%	0.2%
	65-69	0.33	0.68	0.83	1.06	3.01	3.3	18.1%	81.5%	0.3%
	69-74	0.49	1.10	1.33	1.58	3.91	3.3	26.8%	73.0%	0.2%
TB-06-4	49-52	0.16	0.21	0.23	0.26	0.40	1.7	0.0%	99.2%	0.8%
	52-59	0.24	0.53	0.73	1.06	4.09	4.3	24.6%	74.8%	0.6%
	59-64	0.44	1.21	1.58	2.08	6.15	4.7	41.4%	58.1%	0.4%
	64-69	0.52	1.31	1.59	1.94	5.55	3.7	38.4%	61.2%	0.4%
	69-73	1.35	3.71	4.75	6.08	13.50	4.5	84.0%	15.1%	0.9%
TB-06-5	46-49	0.25	0.57	0.72	0.95	4.05	3.7	22.9%	76.8%	0.3%
	53-57	0.13	0.27	0.31	0.36	1.05	2.7	6.3%	91.6%	2.1%
	57-59	0.28	0.92	1.31	1.68	6.35	5.9	33.0%	66.7%	0.3%
	59-64	0.29	0.69	0.90	1.27	3.33	4.3	22.7%	77.0%	0.3%
	64-67	0.28	0.49	0.54	0.60	0.82	2.1	0.2%	99.5%	0.2%
	67-69	0.52	1.76	2.33	3.18	13.79	6.1	55.6%	44.0%	0.5%
TB-06-6	49-52	0.12	0.20	0.23	0.27	0.68	2.3	1.0%	96.9%	2.0%
	53-56	0.26	1.14	1.53	2.02	6.82	7.8	40.3%	59.4%	0.3%
	59-64	0.25	0.91	1.31	1.78	5.49	7.2	36.1%	63.4%	0.5%
	64-69	0.34	0.78	0.98	1.23	5.02	3.6	23.5%	76.2%	0.2%
	69-73	1.22	2.33	2.73	3.20	7.39	2.6	71.0%	28.7%	0.2%
TB-06-7	49-55	0.35	1.09	1.42	1.86	7.29	5.3	37.2%	62.5%	0.4%
	55-59	0.35	0.59	0.67	0.76	1.96	2.2	9.6%	89.9%	0.5%
	59-63	0.28	0.53	0.61	0.70	1.92	2.5	9.3%	90.1%	0.6%
	63-65	0.44	1.16	1.50	1.94	8.31	4.4	38.8%	61.0%	0.2%
	69-72	0.54	1.73	2.25	3.02	11.50	5.6	54.5%	44.7%	0.8%

1) Effective grain size values represent diameter at percent passing fraction, e.g. D_{10} = grain diameter at 10% passing size.

TABLE 3
Hydraulic Interval Test Summary
Hydrogeological Evaluation, AEC - Norborne, Missouri

Temporary Well ID	Approximate Aquifer Thickness (feet)	Screened Depth Interval (feet)	Screen Slot Size (inches)	Step No.	Pumping Rate (gpm)	Observed Drawdown at End of Pumping Step (feet)	Observed Specific Capacity at End of Step (gpm/ft)	Estimated Laminar Flow Loss (1) (%)	Estimated Hydraulic Conductivity (gpd/ft^2)	Estimated Transmissivity (gpd/ft)
TB-06-2	30	59.8-69.8	0.040	1	35	1.58	22.2	96%	3,000	89,400
				2	58	2.77	20.9	90%	3,000	89,900
				3	82	4.02	20.4	88%	3,000	89,900
				4	120	6.14	19.5	84%	3,000	89,900

1) Laminar Flow Loss estimated based on analysis using the methods of Bruin and Hudson, 1955.

TABLE 4
Multiple-Rate Step Test Results
Hydrogeological Evaluation, AEC - Norborne, Missouri

Step	Step Start Time	Step End Time	Step Duration	Pumping Rate	Depth to Water at End of Step (1)	Observed Drawdown at End of Step	Observed Specific Capacity
			(minutes)	(gpm)		(feet)	(gpm/feet)
Static	---	---	---		17.23	---	---
1	15:29	16:38	69	341	21.28	4.05	84.2
2	16:38	17:38	60	584	24.69	7.46	78.3
3	17:38	18:40	62	782	27.30	10.07	77.7
4	18:40	19:40	60	1,103	31.71	14.48	76.2

1) Well PW depth to water measuring point was top of 12-inch steel casing 1.4 feet above grade.

Well PW multiple-rate step pumping test conducted on May 22, 2006

TABLE 5
Constant-Rate Aquifer Test Results
Hydrogeological Evaluation, AEC - Norborne, Missouri

Well or Monitoring Point	Distance from Well PW	Reference Elevation (1)	Static Depth to Water (2) 05/23/06	Estimated River Efficiency	After 24 Hours of Pumping: Depth to Water (2) 05/24/06	After 24 Hours of Pumping: Observed Change from Static (3)	After 24 Hours of Pumping: Adjusted Change from Static (4)	After 72 Hours of Pumping: Depth to Water (2) 05/26/06	After 72 Hours of Pumping: Observed Change from Static (3)	After 72 Hours of Pumping: Adjusted Change from Static (4)	After 24 Hours of Recovery: Depth to Water (2) 05/27/06	After 24 Hours of Recovery: Observed Change from Static (3)	After 24 Hours of Recovery: Adjusted Change from Static (4)
	(feet)	(feet msl.)	(feet)	(%)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)
PW	-	686.38	17.43	95%	30.82	13.39	13.12	30.94	13.51	13.11	18.20	0.77	0.06
TB-06-1	432	687.37	18.41	90%	19.55	1.14	0.89	19.75	1.34	0.96	19.11	0.70	0.02
TB-06-2	34.3	686.78	17.93	95%	23.78	5.85	5.58	23.93	6.00	5.60	18.69	0.76	0.05
TB-06-3	448	687.71	18.74	90%	19.85	1.11	0.86	20.00	1.26	0.88	19.44	0.70	0.03
TB-06-4	107	688.27	19.43	95%	22.77	3.34	3.07	22.91	3.48	3.08	20.17	0.74	0.03
TB-06-5	183	688.33	19.43	95%	22.01	2.58	2.31	22.19	2.76	2.36	20.17	0.74	0.03
TB-06-6	49.5	688.41	19.52	95%	24.38	4.86	4.59	24.56	5.04	4.64	20.27	0.75	0.04
TB-06-7	199	687.30	18.31	85%	20.89	2.58	2.34	21.11	2.80	2.44	18.97	0.66	0.02
Supply Well	132	685.97	17.16	95%	19.93	2.77	2.50	20.10	2.94	2.54	Supply Well abandoned on 5/26/06		
Downstream (East) Staff Gage	89	671.21	2.56		2.84	0.28		2.98	0.42		3.31	0.75	
Upstream (West) Staff Gage	524	670.61	1.85		2.15	0.30		2.30	0.45		2.65	0.80	
Durham Well	13493	688.42	12.70	n/a	12.67	-0.03	n/a	12.73	0.03	n/a	12.75	0.05	n/a
Gibson Well	21036	681.73	7.35	n/a	7.34	-0.01	n/a	7.39	0.04	n/a	7.40	0.05	n/a

1) Reference Elevations provided by M&M Land Surveying Service, Inc. - Vertical Datum NGVD1929

2) Depths to water referenced from top of 2-inch casings in the observation wells, the top of the 12-inch steel casing in PW, and the tops of the 2-inch PVC pipe on the river staff gages.

3) Observed change values are positive depths to water greater than static (drawdown), and are negative for depths to water less than static.

4) Observed change values adjusted for changes in river level from start of pumping and estimated river efficiency values at the respective wells.

Average Discharge Rate from Well PW was 1010 gpm during the pumping period.
Pumping period started May 23, 2006 at 08:21 and ended May 26, 2006 at 08:33.

TABLE 6
Aquifer Test Analysis Results
Hydrogeological Evaluation, AEC - Norborne, Missouri

Cooper and Jacob Time-Drawdown Method (Semi-log straight-line matching)

Well	Transmissivity	Transmissivity	Storativity	Horizontal Hydraulic Conductivity (1)
	(ft^2/min)	(gal/day/ft)	(unitless)	(gal/day/ft^2)
TB-06-2	14.0	151,000	0.0002	5,030

Theis Method (Log-log plot curve matching)

Well	Transmissivity	Transmissivity	Storativity	Horizontal Hydraulic Conductivity (1)
	(ft^2/min)	(gal/day/ft)	(unitless)	(gal/day/ft^2)
TB-06-2	12.0	129,000	0.0004	4,300

Theis and Jacob Recovery Method (Semi-log straight-line matching)

Well	Transmissivity	Transmissivity	Storativity	Horizontal Hydraulic Conductivity (1)
	(ft^2/min)	(gal/day/ft)	(unitless)	(gal/day/ft^2)
PW	10.8	116,000	n/a	3,870
TB-06-2	11.8	127,000	n/a	4,230
TB-06-6	15.0	162,000	n/a	5,400
Mean of Results	12.5	135,000		4,500

Cooper and Jacob Distance-Drawdown Method (Semi-log straight-line matching)

Well	Transmissivity	Transmissivity	Storativity	Horizontal Hydraulic Conductivity (1)
	(ft^2/min)	(gal/day/ft)	(unitless)	(gal/day/ft^2)
Observed Drawdown after 4320				
minutes of pumping	11.9	128,000	n/a	4,270

Schaefer and Kaser Distance-Drawdown Method (Semi-log straight-line matching)

Well	Transmissivity	Transmissivity	Storativity	Horizontal Hydraulic Conductivity (1)
	(ft^2/min)	(gal/day/ft)	(unitless)	(gal/day/ft^2)
Observed Drawdown after 4320				
minutes of pumping	12.0	129,000	n/a	4,300

1) Assumes an aquifer thickness of 30 feet

TABLE 7
Field Water Quality Results
Hydrogeological Evaluation, AEC - Norborne, Missouri

Sample Location	Date	Comments	Time (hr:min)	Temperature (° Fahrenheit)	Temperature (° Celsius)	pH (Standard Units)	Conductivity (µS/cm)	Iron (mg/l)	Total Hardness (mg/l)
TB-06-2	04/19/06	Development Pumping	10:05	-	-	7.8	483	7.0	360
		Step 1	11:49	-	-	7.4	575	6.2	380
		Step 2	12:22	-	-	7.3	538	6.6	380
		Step 3	12:51	-	-	7.3	548	6.4	380
		Step 4	13:17	-	-	7.3	546	6.0	380
		Averages				7.4	538	6.44	376.00
TB-06-2	04/21/06	Dev.Pumping Obs Well	18:28	-	-	7.3	545	-	-
TB-06-3	04/21/06	Dev.Pumping Obs Well	17:10	-	-	7.8	592	8.0	420
TB-06-4	04/21/06	Dev.Pumping Obs Well	17:54	-	-	7.3	583	-	-
PW	05/22/06	Step 1	16:20	58.8	14.9	8.2	495	-	480
		Step 2	17:08	59.7	15.4	8.2	575	-	480
		Step 3	18:02	58.1	14.5	8.0	570	-	480
		Step 4	19:05	58.1	14.5	7.8	542	-	400
	05/23/06	Constant-Rate Test	11:44	58.1	14.5	7.3	533	-	400
		Constant-Rate Test	15:43	58.2	14.6	8.1	554	-	400
		Constant-Rate Test	20:57	58.1	14.5	7.6	592	7.4	400
	05/24/06	Constant-Rate Test	10:45	58.2	14.6	8.2	604	7.6	440
		Constant-Rate Test	16:57	58.2	14.6	7.2	596	7.6	440
		Constant-Rate Test	20:27	58.2	14.6	7.3	584	7.0	440
	05/25/06	Constant-Rate Test	8:00	57.9	14.4	7.2	586	7.1	440
		Constant-Rate Test	16:04	58.2	14.6	7.3	589	7.6	440
		Constant-Rate Test	20:16	57.9	14.4	7.4	583	7.0	440
	05/26/06	Constant-Rate Test	7:39	57.7	14.3	7.6	607	7.0	480
	Averages			58.2	14.6	7.7	572.1	7.3	440.0
River	05/23/06	Constant-Rate Test	12:00	69.9	21.1	7.8	649	-	360
		Constant-Rate Test	15:55	71.7	22.1	7.6	670	-	360
	05/24/06	Constant-Rate Test	17:16	73.9	23.3	8.3	657	0.2	360
	05/25/06	Constant-Rate Test	8:15	72.8	22.7	7.9	682	0.5	340

TABLE 7
Field Water Quality Results
Hydrogeological Evaluation, AEC - Norborne, Missouri

Sample Location	Date	Comments	Time (hr:min)	Temperature (° Fahrenheit)	Temperature (° Celsius)	pH (Standard Units)	Conductivity (μS/cm)	Iron (mg/l)	Total Hardness (mg/l)
River	05/25/06	Constant-Rate Test	16:23	75.2	24.0	8.3	678	0.6	340
		Constant-Rate Test	20:18	74.8	23.8		-	-	-
	05/26/06	Constant-Rate Test	7:47	73.7	23.2		-	-	-
		Constant-Rate Test	15:32	75.5	24.2	8.4	693	0.5	340
	Averages			73.4	23.0	8.1	671.5	0.5	350.0

TABLE 8
Laboratory Water Quality Analysis Results
Hydrogeological Evaluation, AEC Norborne, Missouri

Constituent	Units	MCL	National Testing Lab NTL Detection Limits	TB-06-2 Sample Results 04/19/06	Blue Valley Laboratories BVL Detection Limits	PW Sample Results 05/24/06	PW Sample Results 05/26/06
Aluminum	mg/l	0.2	0.1	ND	0.050	ND	ND
Antimony	mg/l			n/a	0.050	ND	ND
Arsenic	mg/l	0.05	0.005	ND	0.050	ND	ND
Barium	mg/l	2.00	0.30	**0.44**	0.005	**0.55**	ND
Beryllium	mg/l				0.005	ND	
Boron	mg/l			n/a	0.010	**0.08**	**0.068**
Cadmium	mg/l	0.005	0.002	ND	0.005	ND	ND
Calcium	mg/l		2.0	**83**	0.050	**98.6**	**95.8**
Chromium	mg/l	0.1	0.010	ND	0.010	ND	ND
Copper	mg/l	1.3	0.004	ND	0.010	ND	ND
Iron	mg/l	0.3	0.020	**6.8**	0.010	**8.15**	**8.22**
Lead	mg/l	0.015	0.002	ND	0.050	ND	ND
Magnesium	mg/l		0.10	**20**	0.050	**24.7**	**22.3**
Manganese	mg/l	0.05	0.004	**0.22**	0.050	**0.43**	**0.41**
Mercury	mg/l	0.002	0.001	ND	0.0002	ND	ND
Nickel	mg/l	0.1	0.02	ND	0.010	ND	ND
Potassium	mg/l			n/a	0.1	**1.8**	**1.6**
Selenium	mg/l	0.05	0.020	ND	0.08	ND	ND
Silica	mg/l			n/a	0.050	**2.49**	**2.4**
Silver	mg/l	0.1	0.002	ND	0.005	ND	ND
Sodium	mg/l		1	**9**	0.050	**8.4**	**8.4**
Strontium	mg/l			n/a	0.010	**0.56**	**0.55**
Thallium	mg/l				0.050	ND	**0.08**
Zinc	mg/l	5	0.004	**0.007**	0.005	ND	ND
Alkalinity, Total, as $CaCO_3$	mg/l		20	**290**	5	**308**	**416**
Biochemical Oxygen Demand (BOD)	mg/l			n/a	5.000	ND	ND
BOD, Carbonaceous	mg/l			n/a		ND	ND
Chemical Oxygen Demand (COD)	mg/l			n/a	10.0	ND	ND
Chloride	mg/l	250.0	5.0	**8**	5.0	**12**	**12**
Cyanide	mg/l		0.0	n/a	0.005	**0.006**	ND
Fluoride	mg/l	4	0.5	ND	0.1	**0.41**	**0.28**
Total Hardness as $CaCO_3$	mg/l		10	**290**		**371**^{cal}	**354**^{cal}
Ammonia as N	mg/l			n/a	0.050	ND	ND
Nitrate as N	mg/l	10	0.5	ND	0.05	**0.07**	**0.21**
Nitrite as N	mg/l	1	0.5	ND	0.5	n/a	n/a
Total Kjelhal Nitrogen as N	mg/l			n/a	0.05	ND	ND
Total Organic Nitrogen	mg/l			n/a	0.1	ND	ND
pH	S.U.	6.5-8.5		**6.7**		**6.87**	**6.85**
Ortho Phosphate	mg/l			n/a	0.05	**0.54**	**0.59**
Sulfate	mg/l	250	5.0	**17**	5.0	**13.1**	**18.7**
Sulfide	mg/l			n/a	0.050	ND	ND
Specific Conductance	µS/cm			n/a		**530**	**530**
Total Phenols	mg/l		0.001	n/a	0.04	ND	ND
Total Dissolved Solids (TDS)	mg/l	500	20	**320**	5	**291**	**292**
Total Suspended Solids (TSS)	mg/l		10	n/a	5	**10**	**10**
Total Organic Carbon (TOC)	mg/l		0.2	n/a	0.1	**2.60**	**2.4**
Trihalomethanes and VOCs							
See Appendix H for Parameter List				ND		n/a	n/a

* The MCL (Maximum Contaminant Level) or SMCL (Secondary Maximum Contaminant Level) has been exceeded for this parameter. SMCL values are based on aesthetic concerns and are not related to health affects.
ND - The contaminant was not detected at or above the stated detection limit.
n/a - Not Analyzed

APPENDIX A
Test Boring/Well Logs

COLLECTOR WELLS INTERNATIONAL, INC.
6360 HUNTLEY ROAD
COLUMBUS, OHIO 43229
614-888-6263

FIELD BOREHOLE LOG

BOREHOLE NO.: **TB-06-1**
TOTAL DEPTH: **79 feet**

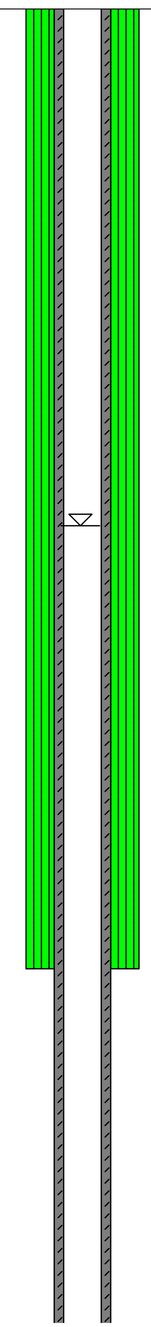
CLIENT: Associated Electric Cooperative, Inc. - Norborne, Missouri
SITE LOCATION: Approx. 200 feet east of the SW corner of the property. 432 feet west of PW
COORDINATES: N 4,340,493 m E 436,088 m UTM Zone 15 NAD83
TOP OF CASING ELEVATION: 687.37 Feet
GRADE ELEVATION: 684.5 Feet

JOB NO.: 106-294
DATE DRILLED: 4/18/2006
GEOLOGIST: Brad Gamble, CWI
DRILLER: Dave Schrecengost, Bowser-Morner
BORING DIAMETER: 6 inches
METHOD OF DRILLING: Rotasonic

NOTES: Coordinates Not Surveyed, approximately determined with handheld GPS receiver.
Elevations provided by M&M Land Surveying Service, Inc. - Vertical Datum NGVD1929
Water level 14 feet below grade at 18:13 on 04/18/06.

DEPTH (feet)	LITHOLOGY	RECOVERY	WELL DESCRIPTION
0	Silt to Sandy Silt, light brown, trace clay, dense to loose, dry, with roots and plant matter.	0 to 9 feet, 7 feet recovery	
5	Silty Sand, tan, mostly very fine to fine sand, loose, dry 10-20% silt, occasional layer of dark brown clayey silt.		6" borehole
10	Silty Sand, as above, becoming moist.	9 to 19 feet, 9 feet recovery	
	Clay, dark gray with some reddish brown mottling, firm, moist.		
15	Silty Sand, dark gray, mostly very fine to medium sand, trace to 20% silt, loose, moist to wet , thin clay layer at about 19 feet.		
20	Clay to Silty Clay, dark gray, soft, wet.	19 to 29 feet, 10 feet recovery	Bentonite seal placed in annulus
25	Silty Sand to Sandy Silt, dark gray to black, very fine to medium sand, trace to 30% silt, trace clay, dense, wet, numerous plant roots and some wood fragments.		
30	Silty Sand to Sandy Silt, as above, occasional layers of silty clay.	29 to 39 feet, 5 feet recovery	2" PVC Casing, threaded joints
35			

WELL CONSTRUCTION



COLLECTOR WELLS INTERNATIONAL, INC.
6360 HUNTLEY ROAD
COLUMBUS, OHIO 43229
614-888-6263

FIELD BOREHOLE LOG

BOREHOLE NO.: **TB-06-1**

TOTAL DEPTH: **79 feet**

DEPTH (feet)	LITHOLOGY	RECOVERY	WELL DESCRIPTION
	Sand, dark gray, very fine to medium, mostly fine, trace silt, occasional pebbles up to 1/2-inch, loose, wet.		
40	Sand interbedded with Sand and Gravel, layers up to 0.5 feet thick, Sand is brownish gray, mostly very fine to medium sand, trace silt, Sand and Gravel is brownish gray, fine to very coarse sand, mostly coarse, granules and pebbles up to 3/8-inch, loose, wet.	39 to 49 feet, 7 feet recovery	2" PVC Casing, threaded joints
45	Clay to Silty Clay, dark gray, firm, moist to wet.		
	Sand and Gravel, brownish gray, 40-60% fine to very coarse sand, mostly coarse, 40-60% granules, pebbles and cobbles up to 4-inches, subrounded to subangular, loose, wet.		
50, 55	Sand and Gravel, brownish gray, 50-70% fine to very coarse sand, mostly coarse, 30-50% granules, pebbles and cobbles up to 3-inches, rounded to subangular, loose, wet, 1 to 2-inch layer of rounded gravel-sized lignite at about 55 feet.	49 to 59 feet, 6 feet recovery	
60	Sand, gray, fine to very coarse, mostly coarse, trace to 10% granules and pebbles up to 1/2-inch, occasional cobble, loose, wet.	59 to 69 feet, 10 feet recovery	
65	Sand and Gravel, brownish gray, 40-60% medium to very coarse sand, mostly coarse, 40-60% granules and pebbles up to 2-inches, rounded to subangular, loose, wet, relatively well sorted.		2" PVC Screen, 0.020-inch slot set at 55-75 feet
70	Sand and Gravel, brownish gray, 30-50% medium to very coarse sand, mostly very coarse, 50-70% granules, pebbles and cobbles up to 3-inches, rounded to subangular, numerous cobbles from about 73.5 to 74.5 feet, loose, wet.	69 to 79 feet, 10 feet recovery	
75	Shale, light gray, clayey, very hard but friable, indistinct laminations, dry.		

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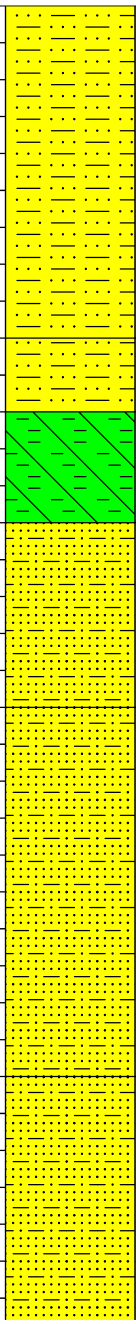
FIELD BOREHOLE LOG

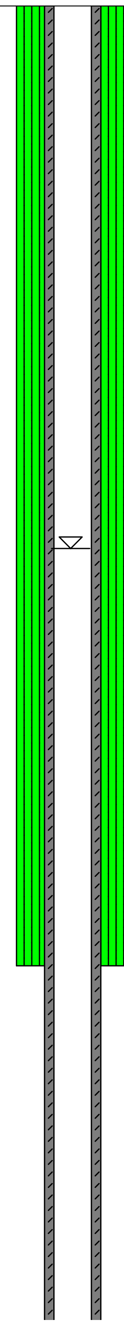
BOREHOLE NO.: **TB-06-2**
TOTAL DEPTH: **78 feet**

CLIENT: Associated Electric Cooperative, Inc. - Norborne, Missouri
SITE LOCATION: Approx. 400 feet east of TB-06-1, and 34.3 feet west of the PW location.
COORDINATES: N 4,340,484 m E 436,206 m UTM Zone 15 NAD83
TOP OF CASING ELEVATION: 686.78 Feet
GRADE ELEVATION: 684.6 Feet

JOB NO.: 106-294
DATE DRILLED: 4/18/2006
GEOLOGIST: Brad Gamble, CWI
DRILLER: Dave Schrecengost, Bowser-Morner
BORING DIAMETER: 6 inches
METHOD OF DRILLING: Rotasonic

NOTES: Coordinates Not Surveyed, approximately determined with handheld GPS receiver.
Elevations provided by M&M Land Surveying Service, Inc. - Vertical Datum NGVD1929
Water level 14.7 feet below grade at 18:36 on 04/19/06.





DEPTH (feet)	LITHOLOGY	RECOVERY	WELL DESCRIPTION
0–9	Silt to Sandy Silt, brown grading to light brown at about 3 feet, silt with very fine to fine sand, dense to loose, moist.	0 to 9 feet, 5 feet recovery	6" borehole
9–11	Sandy Silt, as above.	9 to 19 feet, 8 feet recovery	
11–14	Silty Clay, dark gray with tan laminations and reddish brown mottling, firm, moist to wet.		
14–19	Silty Sand, gray, mostly very fine to fine sand, trace medium, trace to 20% silt, dense, wet, with plant roots and decayed wood fragments.		
19–29	Silty Sand, gray, with brown layer from 19 to 20 feet, very fine to medium sand, mostly fine, trace to 15% silt, loose, wet, roots and plant fragments at 25 to 26 feet.	19 to 29 feet, 9 feet recovery	Bentonite seal placed in annulus
29–35	Silty Sand to Sand, as above, less silt, dense to loose, wet.	29 to 39 feet, 10 feet recovery	2" PVC Casing, threaded joints

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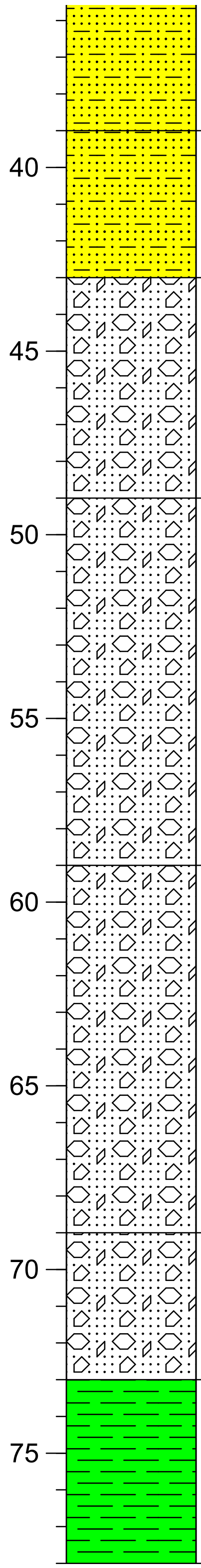
FIELD BOREHOLE LOG

BOREHOLE NO.: **TB-06-2**

TOTAL DEPTH: **78 feet**



DEPTH (feet)	LITHOLOGY	RECOVERY	WELL CONSTRUCTION	WELL DESCRIPTION
39–43	Silty Sand to Sand, as above, trace lignite.	39 to 49 feet, 6 feet recovery		2" PVC Casing, threaded joints
43–49	Sand and Gravel, gray, 50-70% fine to very coarse sand, 30-50% granules, pebbles and occasional cobbles up to 3-inches, rounded to subangular, loose, wet.			
49–59	Sand and Gravel, as above, 1 to 3 inch clay layer at about 54 feet.	49 to 59 feet, 8 feet recovery		
59–69	Sand and Gravel, light gray, 60-80% fine to very coarse sand, mostly coarse, 20-40% granules and pebbles up to 1/2-inch, rounded to subangular, occasional cobble up to 3-inches, loose, wet, trace lignite	59 to 69 feet, 10 feet recovery		2" PVC Screen, 0.020-inch slot set at 50.2-70.2 feet
69–73	Sand and Gravel, as above.	69 to 78 feet, 8 feet recovery		
73–78	Shale, gray, very hard but friable, upper 1 to 2 feet is clayey, moist, rest is dry, drilled to rubble.			

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FIELD BOREHOLE LOG

BOREHOLE NO.: **TB-06-3**
TOTAL DEPTH: **76 feet**

CLIENT: Associated Electric Cooperative, Inc. - Norborne, Missouri
SITE LOCATION: In woods approx. 220 feet east of east property line, 448 feet east of the PW location.
COORDINATES: N 4,340,480 m E 436,361 m UTM Zone 15 NAD83
TOP OF CASING ELEVATION: 687.71 Feet
GRADE ELEVATION: 684.9 Feet

JOB NO.: 106-294
DATE DRILLED: 4/19/2006
GEOLOGIST: Brad Gamble, CWI
DRILLER: Dave Schrecengost, Bowser-Morner
BORING DIAMETER: 6 inches
METHOD OF DRILLING: Rotasonic

NOTES: Coordinates Not Surveyed, approximately determined with handheld GPS receiver.
Elevations provided by M&M Land Surveying Service, Inc. - Vertical Datum NGVD1929
Water level 15.2 feet below grade at 11:28 on 04/20/06.

DEPTH (feet)	LITHOLOGY	RECOVERY	WELL CONSTRUCTION	WELL DESCRIPTION
0	Sandy Clayey Silt, dark brown to reddish brown, firm, moist, with roots and plant matter.	0 to 9 feet, 6 feet recovery		
5	Sandy Silt to Silty Sand, tan, silt with very fine to fine sand, loose, dry.			6" borehole
	Sandy Silt, as above.	9 to 19 feet, 8 feet recovery		
10	Silty Clay, dark gray, mottled reddish brown, firm, moist.			
	Clayey Silt, gray with olive tan laminations, trace very fine sand, soft, moist to wet.			
15				
	Silty Sand, tan, very fine to fine sand, trace to 15% silt, loose, wet.			
20	Silty Sand, as above.	19 to 29 feet, 10 feet recovery		Bentonite seal placed in annulus
	Sand and Gravel, brownish gray, 70-90% fine to very coarse sand, 10-30% granules and pebbles up to 1-inch, subrounded to angular, loose, wet.			
25	Silty Sand, dark gray, very fine to fine sand, trace to 15% silt, dense, wet.			
30	Sand, brown, fine to very coarse, mostly coarse, trance granules, loose, wet.	29 to 39 feet, 6 feet recovery		2" PVC Casing, threaded joints
	Sand, gray, very fine to coarse, mostly medium, trace silt, loose, wet.			
35				

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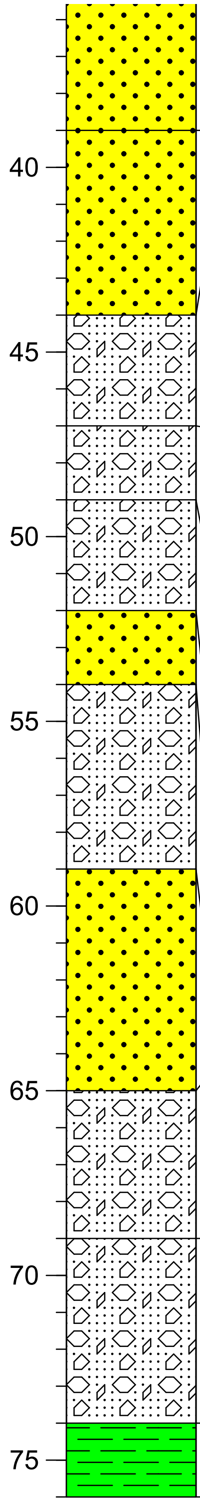
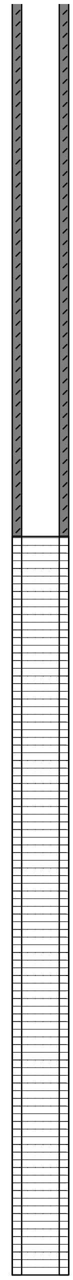
FIELD BOREHOLE LOG

BOREHOLE NO.: **TB-06-3**

TOTAL DEPTH: **76 feet**

DEPTH (feet)	LITHOLOGY	RECOVERY	WELL CONSTRUCTION	WELL DESCRIPTION





LITHOLOGY	RECOVERY	WELL DESCRIPTION
Sand, dark gray, very fine to medium, mostly medium, trace silt, loose, wet, with wood fragments.	39 to 49 feet, 10 feet recovery	2" PVC Casing, threaded joints
Sand and Gravel, dark gray to black, 70-90% fine to very coarse sand, mostly medium, 10-30% granules and pebbles up to 3/4-inch, loose, wet, 1-inch layer of mostly gravel-sized lignite at 44 feet, and decayed wood at 47 feet.		
Sand and Gravel, dark gray, 50-70% medium to very coarse sand, mostly coarse, 30-50% granules and pebbles up to 2-inches, subangular to subrounded, loose, wet.	49 to 59 feet, 7 feet recovery	
Sand and Gravel, brownish gray, 60-80% fine to very coarse sand, mostly coarse, 20-40% granules and pebbles up to 1-inch, subrounded to subangular, loose, wet, mostly gravel at about 52 feet.		
Sand, gray, very fine to medium, mostly medium, trace silt, loose, wet, 3-inch clayey silt layer at about 54 feet.		
Sand and Gravel, gray, 50-70% fine to very coarse sand, mostly coarse, 30-50% granules, pebbles and cobbles, up to 3-inches, subrounded to subangular, loose, wet.	59 to 69 feet, 10 feet recovery	2" PVC Screen, 0.020-inch slot set at 50-70 feet
Sand, brownish gray, fine to very coarse, mostly coarse, trance granules, loose, wet.		
Sand and Gravel, brownish gray, 70-90% fine to very coarse sand, mostly coarse, 10-30% granules and pebbles up to 3/4-inch, subrounded to subangular, loose, wet, 1-inch clay layer at about 69 feet.		
Sand and Gravel, as above, with cobbles at about 73 to 74 feet.	69 to 76 feet, 7 feet recovery	
Shale, gray, very hard but friable, dry to moist.		

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FIELD BOREHOLE LOG

BOREHOLE NO.: **TB-06-4**
TOTAL DEPTH: **79 feet**

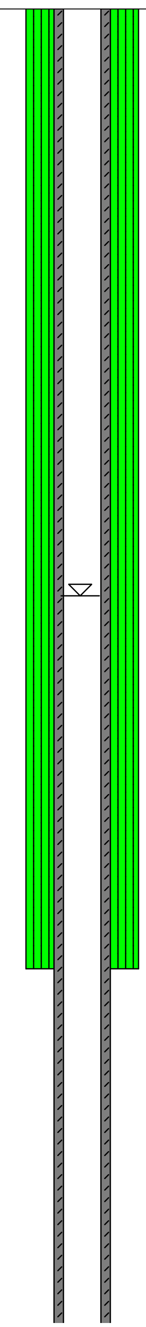
CLIENT: Associated Electric Cooperative, Inc. - Norborne, Missouri
SITE LOCATION: At the southeast corner of the field, 107 feet east of the PW location.
COORDINATES: N 4,340,486 m E 436,253 m UTM Zone 15 NAD83
TOP OF CASING ELEVATION: 688.27 Feet
GRADE ELEVATION: 685.3 Feet

JOB NO.: 106-294
DATE DRILLED: 4/20/2006
GEOLOGIST: Brad Gamble, CWI
DRILLER: Dave Schrecengost, Bowser-Morner
BORING DIAMETER: 6 inches
METHOD OF DRILLING: Rotasonic

NOTES: Coordinates Not Surveyed, approximately determined with handheld GPS receiver.
Elevations provided by M&M Land Surveying Service, Inc. - Vertical Datum NGVD1929
Water level 15.9 feet below grade at 18:02 on 04/21/06.

DEPTH (feet)	LITHOLOGY	RECOVERY	WELL DESCRIPTION
0	Sandy Silt, brown, firm, moist.	0 to 9 feet, 7 feet recovery	
4	Silty Sand to Sandy Silt, tan, very fine to fine sand with silt, dense, dry.		6" borehole
9	Clayey Silt, brown with dark laminations and reddish brown mottling, soft, wet.	9 to 19 feet, 9 feet recovery	
11	Silty Clay, gray, mottled reddish brown, firm, moist.		
14	Sandy Silt, brownish gray with darker laminations, mostly silt with very fine to fine sand, trace clay, very soft, wet.		
19	Silty Sand, dark gray, very fine to fine sand, trace to 15% silt, loose, wet.	19 to 29 feet, 10 feet recovery	Bentonite seal placed in annulus
29	Silty Sand, as above, some black laminations, probably lignite grains, decayed wood at about 35 feet.	29 to 39 feet, 6 feet recovery	2" PVC Casing, threaded joints

WELL CONSTRUCTION



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FIELD BOREHOLE LOG

BOREHOLE NO.: **TB-06-4**

TOTAL DEPTH: **79 feet**

DEPTH (feet)	LITHOLOGY	RECOVERY	WELL CONSTRUCTION	WELL DESCRIPTION
40	Silty Sand, as above, with decayed wood from 41 to 43 feet.	39 to 49 feet, 10 feet recovery		2" PVC Casing, threaded joints
45	Sand and Gravel, brownish gray, 70-90% very fine to coarse sand, mostly medium, 10-30% granules and pebbles up to 1-inch, loose, wet, with thin layers of fine sand.			
	Silty Sand, light brownish gray, very fine to vine sand, trace to 10% silt, loose, wet.			
50	Silty Sand, as above.	49 to 59 feet, 7 feet recovery		
55	Sand and Gravel, brownish gray, 60-80% fine to very coarse sand, mostly medium to coarse, 20-40% granules and pebbles up to 1-1/2-inch, subangular to subrounded, occasional cobbles, loose, wet, with thin clay layers between 52 and 53 feet.			
60	Sand and Gravel, brownish gray, 40-60% fine to very coarse sand, mostly coarse, 40-60% granules and pebbles up to 2-inches, subrounded to subangular, loose, wet.	59 to 69 feet, 6 feet recovery		
65				2" PVC Screen, 0.020-inch slot set at 53-73 feet
	Sand and Gravel, as above.	69 to 79 feet, 10 feet recovery		
70	Sand and Gravel, 30-50% coarse to very coarse sand, 50-70% granules and pebbles up to 2-inches, rounded to subangular, loose, wet.			
75	Shale, gray with light gray laminations, hard but friable, upper few feet moist, clayey.			

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FIELD BOREHOLE LOG

BOREHOLE NO.: **TB-06-5**

TOTAL DEPTH: **73 feet**

CLIENT: Associated Electric Cooperative, Inc. - Norborne, Missouri

SITE LOCATION: About middle of south side of field, 183 feet west of the PW location.

COORDINATES: N 4,340,494 m E 436,163 m UTM Zone 15 NAD83

TOP OF CASING ELEVATION: 688.33 Feet

GRADE ELEVATION: 685.2 Feet

JOB NO.: 106-294

DATE DRILLED: 4/20/2006

GEOLOGIST: Brad Gamble, CWI

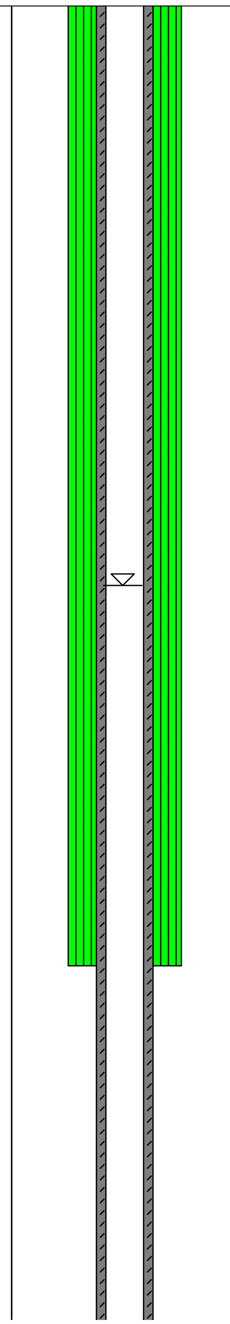
DRILLER: Dave Schrecengost, Bowser-Morner

BORING DIAMETER: 6 inches

METHOD OF DRILLING: Rotasonic

NOTES: Coordinates Not Surveyed, approximately determined with handheld GPS receiver.
Elevations provided by M&M Land Surveying Service, Inc. - Vertical Datum NGVD1929
Water level 15.7 feet below grade at 08:35 on 04/21/06.

DEPTH (feet)	LITHOLOGY	RECOVERY	WELL CONSTRUCTION	WELL DESCRIPTION
0	Sandy Silt, brown grading to tan, silt with very fine to fine sand, trace clay, dense, dry.	0 to 9 feet, 8 feet recovery		
5				6" borehole
10	Clayey Silt, brown mottled reddish brown, trace fine sand, soft, wet.	9 to 19 feet, 9 feet recovery		
	Clay to Silty Clay, dark gray mottled reddish brown, firm, moist.			
15	Sandy Silt, dark gray, silt with very fine to fine sand, very soft, wet.			
20	Silty Sand, dark brownish gray, very fine to fine sand, trace to 15% silt, dense, wet.	19 to 29 feet, 10 feet recovery		Bentonite seal placed in annulus
25				
30	Silty Sand to Sand, dark brownish gray, very fine to medium sand, mostly fine, trace to 10% silt, loose, wet.	29 to 39 feet, 9 feet recovery		2" PVC Casing, threaded joints
35				



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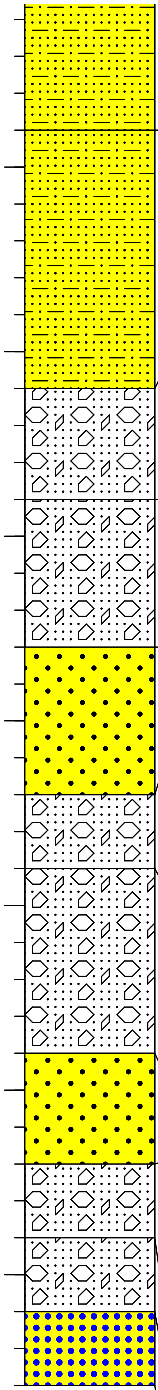
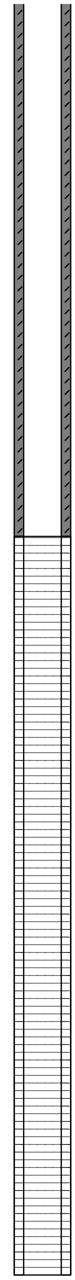
FIELD BOREHOLE LOG

BOREHOLE NO.: **TB-06-5**

TOTAL DEPTH: **73 feet**





DEPTH (feet)	LITHOLOGY	RECOVERY	WELL CONSTRUCTION	WELL DESCRIPTION
40	Silty Sand to Sand, as above, occasional lignite cobble.	39 to 49 feet, 9 feet recovery		2" PVC Casing, threaded joints
45	Sand and Gravel, brownish gray, 70-90% fine to very coarse sand, mostly medium to coarse, 10-30% granules and pebbles up to 1-inch, subrounded to subangular, loose, wet.			
50	Sand and Gravel, as above, 3 inch layer of clayey silt and lignite at 49 feet.	49 to 59 feet, 9 feet recovery		
55	Sand, brownish gray, very fine to medium, mostly fine, loose, wet, occasional cobble and thin layers of coarse sand.			
	Sand and Gravel, brownish gray, 60-80% fine to very coarse sand, mostly coarse, 20-40% granules and pebbles up to 1-1/2-inch, subangular to subrounded, loose, wet.			
60	Sand and Gravel, brownish gray, 70-90% fine to very coarse sand, mostly coarse, 10-30% granules and pebbles up to 1/2-inch, subangular to subrounded, occasional cobbles, loose, wet, numerous pebbles and cobbles up to 4-inches up to 64 feet.	59 to 69 feet, 10 feet recovery		2" PVC Screen, 0.020-inch slot set at 50-70 feet
65	Sand, brownish gray, very fine to coarse, mostly medium, loose, wet.			
70	Sand and Gravel, brownish gray, 50-70% fine to very coarse sand, mostly coarse, 30-50% granules and pebbles up to 1-inch, subangular to subrounded, loose, wet, 2-inch silty clay layer at about 69 feet.	69 to 73 feet, 4 feet recovery		
	Sand and Gravel, as above.			
	Silty Sandstone, bluish gray, fine-grained, weathered, friable, moist.			

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FIELD BOREHOLE LOG

BOREHOLE NO.: **TB-06-6**
TOTAL DEPTH: **79 feet**

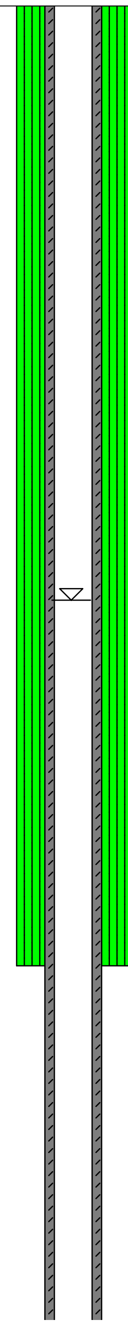
CLIENT: Associated Electric Cooperative, Inc. - Norborne, Missouri
SITE LOCATION: In the southeast part of the field, 49.5 north of the PW location.
COORDINATES: N 4,340,504 m E 436,225 m UTM Zone 15 NAD83
TOP OF CASING ELEVATION: 688.41 Feet
GRADE ELEVATION: 685.5 Feet

JOB NO.: 106-294
DATE DRILLED: 4/21/2006
GEOLOGIST: Brad Gamble, CWI
DRILLER: Dave Schrecengost, Bowser-Morner
BORING DIAMETER: 6 inches
METHOD OF DRILLING: Rotasonic

NOTES: Coordinates Not Surveyed, approximately determined with handheld GPS receiver.
Elevations provided by M&M Land Surveying Service, Inc. - Vertical Datum NGVD1929
Water level 16.1 feet below grade at 18:22 on 04/21/06.

DEPTH (feet)	LITHOLOGY	RECOVERY	WELL DESCRIPTION
0	Silty Sand to Sandy Silt, brown to tan, trace clay, dry, loose, with roots and plant matter in the upper 3 feet.	0 to 9 feet, 5 feet recovery	6" borehole
9	Silty Sand, as above.	9 to 19 feet, 9 feet recovery	
10	Clayey Silt, gray, mottled reddish brown, trace very fine sand, very soft, wet.		
13	Clay to Silty Clay, dark gray with some reddish brown mottling, firm, moist, traces of decayed wood.		
16	Clayey Sandy Silt, dark brownish gray, mostly silt with clay and very fine sand, soft, wet.		
19	Clayey Sandy Silt, as above.	19 to 29 feet, 9 feet recovery	Bentonite seal placed in annulus
21	Silty Sand, dark gray, very fine to medium sand, mostly fine, trace to 20% silt, trace clay, loose, wet.		
29	Silty Sand, as above.	29 to 39 feet, 6 feet recovery	2" PVC Casing, threaded joints

WELL CONSTRUCTION



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FIELD BOREHOLE LOG

BOREHOLE NO.: **TB-06-6**

TOTAL DEPTH: **79 feet**

DEPTH (feet)	LITHOLOGY	RECOVERY	WELL CONSTRUCTION	WELL DESCRIPTION
40, 45	Interbedded Silty Clay and Sand and Gravel in 1 to 2-inch layers, dark gray, Clay is soft, wet, Sand and Gravel mostly coarse sand, wet, wood fragment at 39 feet.	39 to 49 feet, 7 feet recovery		2" PVC Casing, threaded joints
50	Silty Sand, dark gray, very fine to medium sand, mostly fine, trace to 10% silt, loose, wet.	49 to 59 feet, 7 feet recovery		
	Silty Clay, dark gray, very soft, moist to wet.			
55	Sand and Gravel, dark brownish gray, 60-80% fine to very coarse sand, 20-40% granules and pebbles up to 1-1/2-inches, subangular to subrounded, loose, wet.			
60, 65	Sand and Gravel, dark brownish gray, 70-90% fine to very coarse sand, mostly medium, 10-30% granules and pebbles up to 1/2-inch, subangular to subrounded, loose, wet, numerous lignite grains.	59 to 69 feet, 8 feet recovery		2" PVC Screen, 0.020-inch slot set at 53-73 feet
70	Sand and Gravel, brownish gray, 30-50% medium to very coarse sand, mostly coarse, 50-70% granules and pebbles up to 1/2-inch, rounded to subangular, loose, wet, relatively well sorted, cobbles at about 73 feet.	69 to 79 feet, 9 feet recovery		
75	Shale, light gray, very hard but friable, moist, clayey.			

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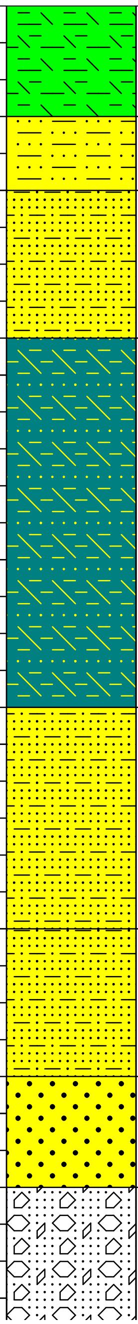
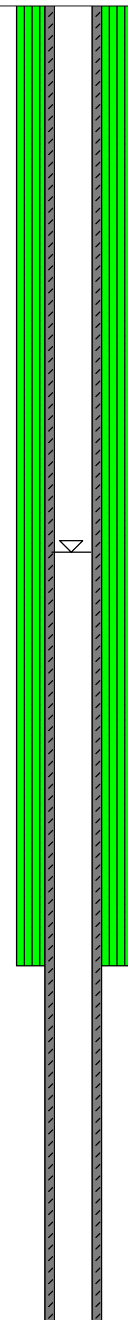
FIELD BOREHOLE LOG

BOREHOLE NO.: **TB-06-7**
TOTAL DEPTH: **75 feet**

CLIENT: Associated Electric Cooperative, Inc. - Norborne, Missouri
JOB NO.: 106-294
SITE LOCATION: In the field about 70 feet west of trees, 199 feet north of the PW location.
DATE DRILLED: 4/21/2006
GEOLOGIST: Brad Gamble, CWI
COORDINATES: N 4,340,548 m E 436,227 m UTM Zone 15 NAD83
DRILLER: Dave Schrecengost, Bowser-Morner
TOP OF CASING ELEVATION: 687.3 Feet
BORING DIAMETER: 6 inches
GRADE ELEVATION: 684.3 Feet
METHOD OF DRILLING: Rotasonic

NOTES: Coordinates Not Surveyed, approximately determined with handheld GPS receiver.
Elevations provided by M&M Land Surveying Service, Inc. - Vertical Datum NGVD1929
Water level 14.8 feet below grade at 18:20 on 04/21/06.





DEPTH (feet)	LITHOLOGY	RECOVERY	WELL CONSTRUCTION	WELL DESCRIPTION
0	Sandy Clayey Silt, brown to dark brown, firm, moist, with roots and plant matter.	0 to 9 feet, 6 feet recovery		
	Sandy Silt, brown, trace clay, soft, moist.			
5	Silty Sand, tan, mostly very fine to fine sand with silt, trace clay, loose, dry.			6" borehole
10	Interbedded Sandy Clayey Silt and Sandy Silty Clay, brown mottled reddish brown, some layers laminated, soft, wet.	9 to 19 feet, 9 feet recovery		
15				
20	Silty Sand, dark gray, very fine to fine sand, trace to 15% silt, loose, wet.	19 to 29 feet, 9 feet recovery		Bentonite seal placed in annulus
25	Silty Sand, dark brownish gray, very fine to medium sand, trace coarse sand granules and pebbles, loose, wet, with decayed plant matter.			
30	Sand, brownish gray, very fine to coarse, mostly medium, trace granules, loose, wet.	29 to 39 feet, 5 feet recovery		2" PVC Casing, threaded joints
35	Sand and Gravel, brownish gray, 70-90% fine to very coarse sand, mostly medium, 10-30% granules and pebbles up to 1/4 inch, loose, wet.			

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FIELD BOREHOLE LOG

BOREHOLE NO.: **TB-06-7**

TOTAL DEPTH: **75 feet**

DEPTH (feet)	LITHOLOGY	RECOVERY	WELL CONSTRUCTION	WELL DESCRIPTION
40	Sand, brownish gray, very fine to coarse, mostly coarse, trace granules and pebbles up to 1/4-inch, loose, wet.	39 to 49 feet, 10 feet recovery		2" PVC Casing, threaded joints
45	Grades to Sand and Gravel, brownish gray, 70-90% fine to very coarse sand, mostly coarse, 10-30% granules and pebbles up to 2 inches, subangular to subrounded, loose, wet, occasional lumps of silty clay.			
50	Sand and Gravel, brownish gray, 60-80% fine to very coarse sand, mostly coarse, 20-40% granules and pebbles up to 1/2 inch, subangular to subrounded, trace silt, loose, wet, 2 to 4-inch layers of silty clay at 53 and 54 feet.	49 to 59 feet, 9 feet recovery		
55	Sand and Gravel, brownish gray, 70-90% fine to very coarse sand, mostly medium, 10-30% granules and pebbles up to 2-inches, loose, wet.			
60	Sand, brownish gray, fine to very coarse, mostly coarse, trace granules, loose, wet, occasional 1 to 2-inch clay balls at 59 feet.	59 to 69 feet, 6 feet recovery		2" PVC Screen, 0.020-inch slot set at 50-70 feet
65	Sand and Gravel, brownish gray, 50-70% fine to very coarse sand, mostly coarse, 30-50% granules, pebbles and occasional cobbles, subangular to subrounded, loose, wet.			
70	Sand and Gravel, 30-50% medium to very coarse sand, mostly coarse, 50-70% granules and pebbles up to 1-inch, rounded to subangular, loose, wet, relatively well sorted.	69 to 75 feet, 6 feet recovery		
75	Shale, light gray with dark laminations, hard but friable, dry to moist.			

COLLECTOR WELLS INTERNATIONAL, INC.
6360 HUNTLEY ROAD
COLUMBUS, OHIO 43229
614-888-6263

FIELD BOREHOLE LOG

BOREHOLE NO.: **PW**

TOTAL DEPTH: **72 feet**

CLIENT: Associated Electric Cooperative, Inc. - Norborne, Missouri

SITE LOCATION: About the middle of the south side of the property

COORDINATES: N 4,340,487 m   E 436,224 m   UTM Zone 15 NAD83

TOP OF CASING ELEVATION: 686.38 Feet

GRADE ELEVATION: 685.0 Feet

JOB NO.: 106-294

DATE DRILLED: 5/19/2006

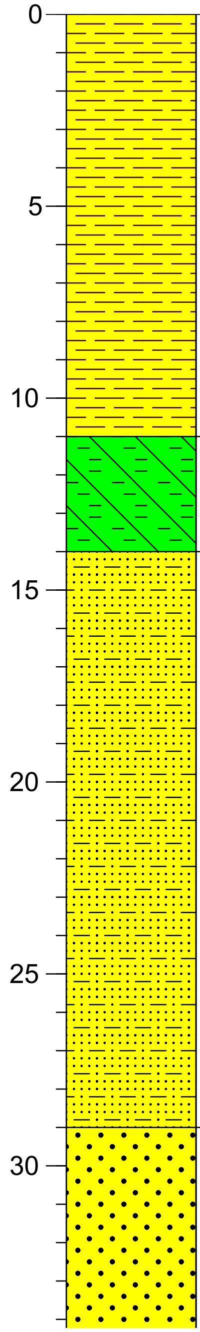
GEOLOGIST: Brad Gamble, CWI

DRILLER: John Layton, Brotcke Well&Pump

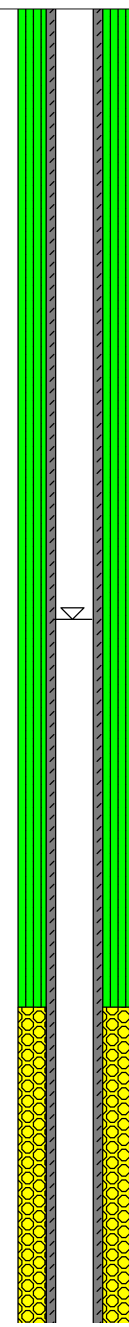
BORING DIAMETER: 24 inches

METHOD OF DRILLING: Reverse Rotary

NOTES: Coordinates Not Surveyed, approximately determined with handheld GPS receiver.
Elevations provided by M&M Land Surveying Service, Inc. - Vertical Datum NGVD1929
Water level 15.9 feet below grade at 11:49 on 05/22/06.



DEPTH (feet)	LITHOLOGY	RECOVERY	WELL CONSTRUCTION	WELL DESCRIPTION
0	Silt to Sandy Silt, brown.			24" borehole
	Silty Clay, dark gray.			
	Silty Sand, gray.			Bentonite seal placed in annulus
	Silty Sand to Sand, gray, trace gravel.			12" Steel Casing, welded joints



COLLECTOR WELLS INTERNATIONAL, INC.
6360 HUNTLEY ROAD
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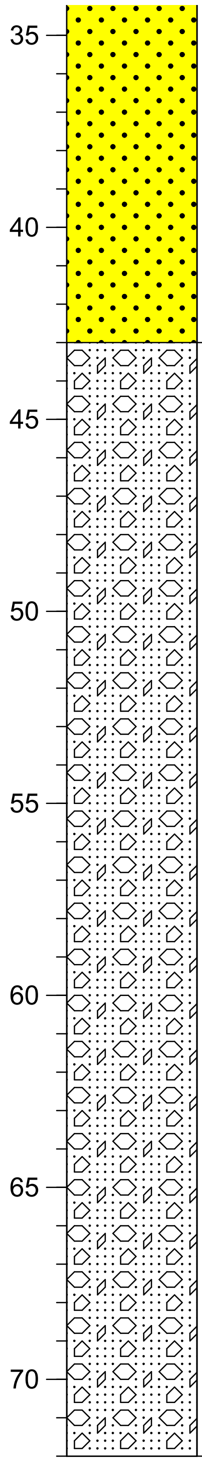
614-888-6263

FIELD BOREHOLE LOG

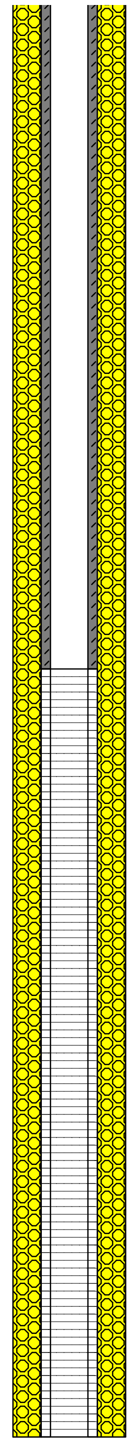
BOREHOLE NO.: **PW**

TOTAL DEPTH: **72 feet**

DEPTH (feet)	LITHOLOGY	RECOVERY	WELL CONSTRUCTION	WELL DESCRIPTION



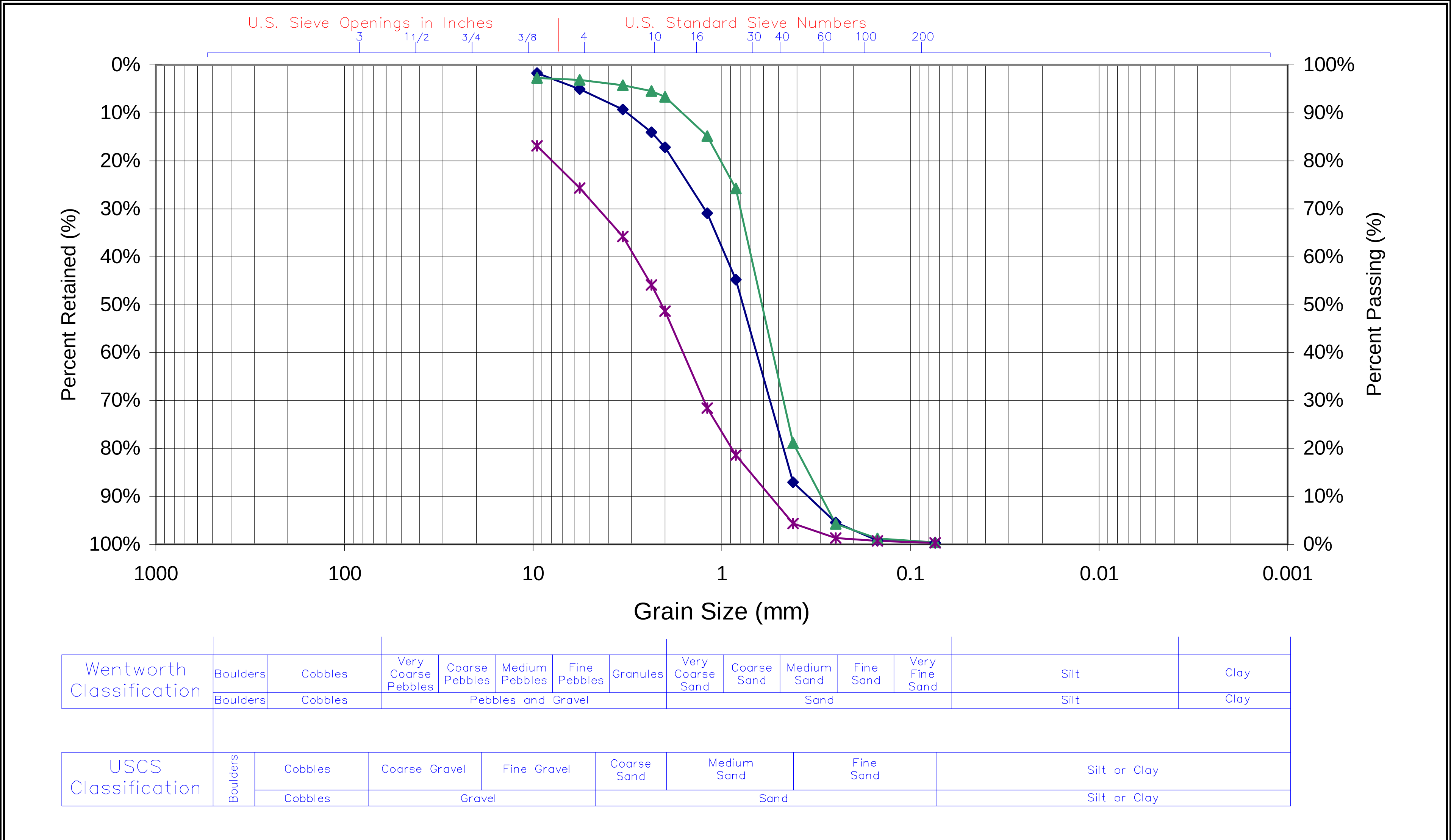
Sand and Gravel, gray, numerous cobbles up to 8-inches from 55 to 66 feet and below 70 feet.



12" Steel Casing, welded joints

12" Steel Screen, 0.080-inch slot set at 51.5 - 71.5 feet

APPENDIX B
Sieve Analysis Data



GRAIN SIZE ANALYSIS

Collector Wells International, Inc.

Project: AEC - Norborne, Missouri
Test Boring TB-06-1

Job Number: 106-294

SIEVE ANALYSIS RESULTS

Client: AEC - Norborne, Missouri
Job No. 106-294

Boring ID: TB-06-1
Depth Interval: 50-55

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	12	12	1.7%	98.3%
3.5	5.664	0.223	24	36	5.1%	94.9%
6	3.353	0.132	30	66	9.3%	90.7%
8	2.360	0.093	34	100	14.1%	85.9%
10	1.999	0.079	22	122	17.2%	82.8%
16	1.191	0.047	98	220	31.0%	69.0%
20	0.841	0.033	98	318	44.8%	55.2%
40	0.419	0.016	300	618	87.0%	13.0%
60	0.249	0.010	60	678	95.5%	4.5%
100	0.150	0.006	26	704	99.2%	0.8%
200	0.074	0.003	4	708	99.7%	0.3%
Pan			2	710	100.0%	0.0%

Total	710			
Initial Weight	704	Gravel	Sand	Silt/Clay
Difference	-0.9%	17.2%	82.5%	0.3%

	D10	D40	D50	D60	D90	Cu
(mm)	0.349	0.654	0.772	0.949	3.184	2.7
(inches)	0.014	0.026	0.030	0.037	0.125	

Boring ID: TB-06-1
Depth Interval: 55-65

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	14	14	2.7%	97.3%
3.5	5.664	0.223	2	16	3.1%	96.9%
6	3.353	0.132	6	22	4.3%	95.7%
8	2.360	0.093	6	28	5.5%	94.5%
10	1.999	0.079	6	34	6.6%	93.4%
16	1.191	0.047	42	76	14.8%	85.2%
20	0.841	0.033	56	132	25.8%	74.2%
40	0.419	0.016	272	404	78.9%	21.1%
60	0.249	0.010	86	490	95.7%	4.3%
100	0.150	0.006	16	506	98.8%	1.2%
200	0.074	0.003	4	510	99.6%	0.4%
Pan			2	512	100.0%	0.0%

Total	512			
Initial Weight	508	Gravel	Sand	Silt/Clay
Difference	-0.8%	6.6%	93.0%	0.4%

	D10	D40	D50	D60	D90	Cu
(mm)	0.297	0.537	0.612	0.698	1.617	2.3
(inches)	0.012	0.021	0.024	0.027	0.064	

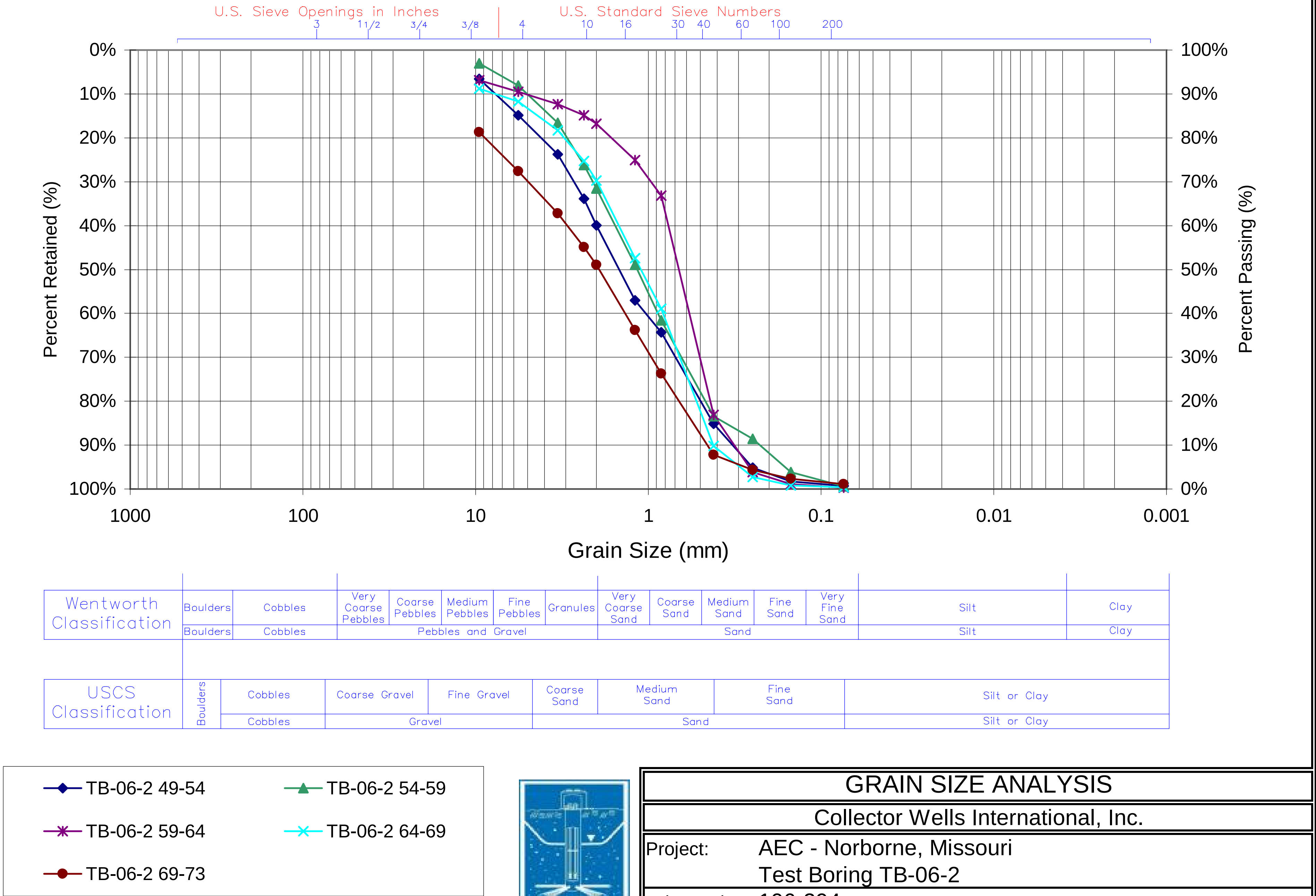
SIEVE ANALYSIS RESULTS

Client: AEC - Norborne, Missouri
Job No. 106-294

Boring ID: TB-06-1
Depth Interval: 65-75

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	100	100	16.9%	83.1%
3.5	5.664	0.223	52	152	25.7%	74.3%
6	3.353	0.132	60	212	35.8%	64.2%
8	2.360	0.093	60	272	45.9%	54.1%
10	1.999	0.079	32	304	51.4%	48.6%
16	1.191	0.047	120	424	71.6%	28.4%
20	0.841	0.033	58	482	81.4%	18.6%
40	0.419	0.016	84	566	95.6%	4.4%
60	0.249	0.010	18	584	98.6%	1.4%
100	0.150	0.006	4	588	99.3%	0.7%
200	0.074	0.003	2	590	99.7%	0.3%
Pan			2	592	100.0%	0.0%
		Total	592			
		Initial Weight	588	Gravel	Sand	Silt/Clay
		Difference	-0.7%	51.4%	48.3%	0.3%

	D10	D40	D50	D60	D90	Cu
(mm)	0.552	1.603	2.084	2.900	14.005	5.3
(inches)	0.022	0.063	0.082	0.114	0.551	



GRAIN SIZE ANALYSIS

Collector Wells International, Inc.

Project: AEC - Norborne, Missouri
Test Boring TB-06-2

Job Number: 106-294

SIEVE ANALYSIS RESULTS

Client: AEC - Norborne, Missouri
Job No. 106-294

Boring ID: TB-06-2
Depth Interval: 49-54

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	98	98	6.5%	93.5%
3.5	5.664	0.223	124	222	14.8%	85.2%
6	3.353	0.132	134	356	23.8%	76.2%
8	2.360	0.093	152	508	33.9%	66.1%
10	1.999	0.079	90	598	39.9%	60.1%
16	1.191	0.047	256	854	57.0%	43.0%
20	0.841	0.033	110	964	64.4%	35.6%
40	0.419	0.016	312	1276	85.2%	14.8%
60	0.249	0.010	150	1426	95.2%	4.8%
100	0.150	0.006	46	1472	98.3%	1.7%
200	0.074	0.003	16	1488	99.3%	0.7%
Pan			10	1498	100.0%	0.0%

Total	1498			
Initial Weight	1506	Gravel	Sand	Silt/Clay
Difference	0.5%	39.9%	59.4%	0.7%

	D10	D40	D50	D60	D90	Cu
(mm)	0.326	1.034	1.473	1.994	7.666	6.1
(inches)	0.013	0.041	0.058	0.079	0.302	

Boring ID: TB-06-2
Depth Interval: 54-59

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	40	40	3.0%	97.0%
3.5	5.664	0.223	66	106	8.1%	91.9%
6	3.353	0.132	112	218	16.6%	83.4%
8	2.360	0.093	126	344	26.2%	73.8%
10	1.999	0.079	70	414	31.6%	68.4%
16	1.191	0.047	228	642	48.9%	51.1%
20	0.841	0.033	166	808	61.6%	38.4%
40	0.419	0.016	286	1094	83.4%	16.6%
60	0.249	0.010	68	1162	88.6%	11.4%
100	0.150	0.006	100	1262	96.2%	3.8%
200	0.074	0.003	42	1304	99.4%	0.6%
Pan			8	1312	100.0%	0.0%

Total	1312			
Initial Weight	1318	Gravel	Sand	Silt/Clay
Difference	0.5%	31.6%	67.8%	0.6%

	D10	D40	D50	D60	D90	Cu
(mm)	0.226	0.878	1.157	1.554	5.034	6.9
(inches)	0.009	0.035	0.046	0.061	0.198	

SIEVE ANALYSIS RESULTS

Client: AEC - Norborne, Missouri
Job No. 106-294

Boring ID: TB-06-2
Depth Interval: 59-64

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	90	90	6.9%	93.1%
3.5	5.664	0.223	34	124	9.5%	90.5%
6	3.353	0.132	36	160	12.3%	87.7%
8	2.360	0.093	34	194	14.9%	85.1%
10	1.999	0.079	24	218	16.7%	83.3%
16	1.191	0.047	108	326	25.0%	75.0%
20	0.841	0.033	106	432	33.2%	66.8%
40	0.419	0.016	650	1082	83.1%	16.9%
60	0.249	0.010	170	1252	96.2%	3.8%
100	0.150	0.006	36	1288	98.9%	1.1%
200	0.074	0.003	10	1298	99.7%	0.3%
Pan			4	1302	100.0%	0.0%

Total	1302			
Initial Weight	1308	Gravel	Sand	Silt/Clay
Difference	0.5%	16.7%	82.9%	0.3%

	D10	D40	D50	D60	D90	Cu
(mm)	0.318	0.578	0.665	0.765	5.175	2.4
(inches)	0.013	0.023	0.026	0.030	0.204	

Boring ID: TB-06-2
Depth Interval: 64-69

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	130	130	8.7%	91.3%
3.5	5.664	0.223	44	174	11.7%	88.3%
6	3.353	0.132	98	272	18.3%	81.7%
8	2.360	0.093	104	376	25.3%	74.7%
10	1.999	0.079	66	442	29.7%	70.3%
16	1.191	0.047	262	704	47.4%	52.6%
20	0.841	0.033	172	876	59.0%	41.0%
40	0.419	0.016	464	1340	90.2%	9.8%
60	0.249	0.010	106	1446	97.3%	2.7%
100	0.150	0.006	28	1474	99.2%	0.8%
200	0.074	0.003	6	1480	99.6%	0.4%
Pan			6	1486	100.0%	0.0%

Total	1486			
Initial Weight	1490	Gravel	Sand	Silt/Clay
Difference	0.3%	29.7%	69.9%	0.4%

	D10	D40	D50	D60	D90	Cu
(mm)	0.421	0.822	1.101	1.479	7.646	3.5
(inches)	0.017	0.032	0.043	0.058	0.301	

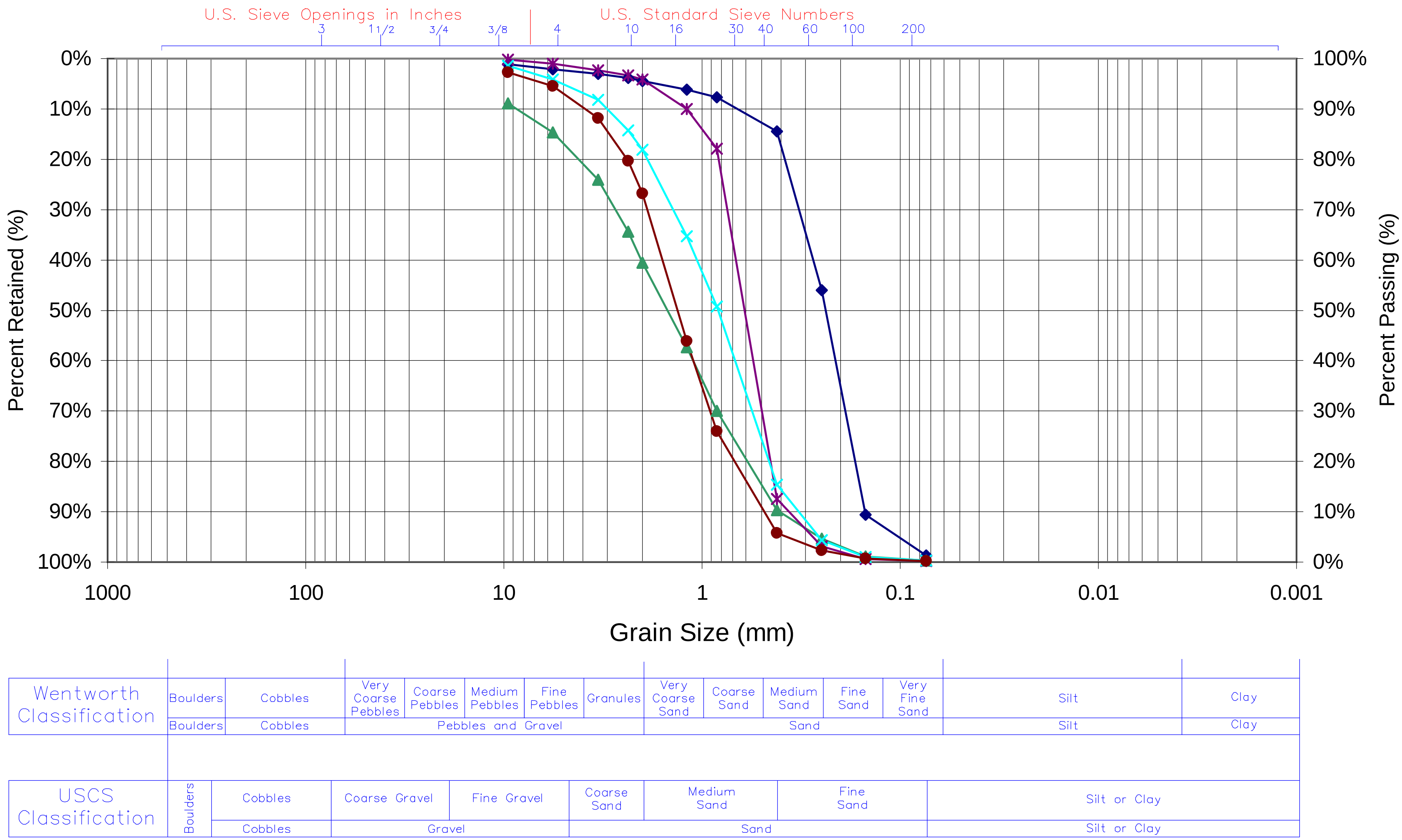
SIEVE ANALYSIS RESULTS

Client: AEC - Norborne, Missouri
Job No. 106-294

Boring ID: TB-06-2
Depth Interval: 69-73

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	272	272	18.7%	81.3%
3.5	5.664	0.223	130	402	27.6%	72.4%
6	3.353	0.132	140	542	37.2%	62.8%
8	2.360	0.093	112	654	44.9%	55.1%
10	1.999	0.079	60	714	49.0%	51.0%
16	1.191	0.047	216	930	63.8%	36.2%
20	0.841	0.033	144	1074	73.7%	26.3%
40	0.419	0.016	270	1344	92.2%	7.8%
60	0.249	0.010	50	1394	95.6%	4.4%
100	0.150	0.006	30	1424	97.7%	2.3%
200	0.074	0.003	18	1442	98.9%	1.1%
Pan			16	1458	100.0%	0.0%
		Total	1458			
		Initial Weight	1460	Gravel	Sand	Silt/Clay
		Difference	0.1%	49.0%	49.9%	1.1%

	D10	D40	D50	D60	D90	Cu
(mm)	0.455	1.360	1.928	2.947	15.042	6.5
(inches)	0.018	0.054	0.076	0.116	0.592	



TB-06-3 52-54
TB-06-3 54-59
TB-06-3 59-65
TB-06-3 65-69
TB-06-3 69-74

GRAIN SIZE ANALYSIS

Collector Wells International, Inc.

Project: AEC - Norborne, Missouri
Test Boring TB-06-3

Job Number: 106-294

SIEVE ANALYSIS RESULTS

Client: AEC - Norborne, Missouri
Job No. 106-294

Boring ID: TB-06-3
Depth Interval: 52-54

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	10	10	1.1%	98.9%
3.5	5.664	0.223	10	20	2.1%	97.9%
6	3.353	0.132	8	28	3.0%	97.0%
8	2.360	0.093	8	36	3.8%	96.2%
10	1.999	0.079	6	42	4.5%	95.5%
16	1.191	0.047	16	58	6.2%	93.8%
20	0.841	0.033	14	72	7.7%	92.3%
40	0.419	0.016	64	136	14.5%	85.5%
60	0.249	0.010	296	432	46.1%	53.9%
100	0.150	0.006	418	850	90.6%	9.4%
200	0.074	0.003	76	926	98.7%	1.3%
Pan			12	938	100.0%	0.0%
		Total	938			
		Initial Weight	942	Gravel	Sand	Silt/Clay
		Difference	0.4%	4.5%	94.2%	1.3%

	D10	D40	D50	D60	D90	Cu
(mm)	0.151	0.212	0.238	0.275	0.663	1.8
(inches)	0.006	0.008	0.009	0.011	0.026	

Boring ID: TB-06-3
Depth Interval: 54-59

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	170	170	8.9%	91.1%
3.5	5.664	0.223	110	280	14.6%	85.4%
6	3.353	0.132	180	460	24.1%	75.9%
8	2.360	0.093	198	658	34.4%	65.6%
10	1.999	0.079	118	776	40.6%	59.4%
16	1.191	0.047	320	1096	57.3%	42.7%
20	0.841	0.033	242	1338	70.0%	30.0%
40	0.419	0.016	376	1714	89.6%	10.4%
60	0.249	0.010	110	1824	95.4%	4.6%
100	0.150	0.006	66	1890	98.8%	1.2%
200	0.074	0.003	16	1906	99.7%	0.3%
Pan			6	1912	100.0%	0.0%
		Total	1912			
		Initial Weight	1914	Gravel	Sand	Silt/Clay
		Difference	0.1%	40.6%	59.1%	0.3%

	D10	D40	D50	D60	D90	Cu
(mm)	0.406	1.106	1.494	2.031	8.617	5.0
(inches)	0.016	0.044	0.059	0.080	0.339	

SIEVE ANALYSIS RESULTS

Client: AEC - Norborne, Missouri
Job No. 106-294

Boring ID: TB-06-3
Depth Interval: 59-65

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	2	2	0.2%	99.8%
3.5	5.664	0.223	8	10	1.0%	99.0%
6	3.353	0.132	12	22	2.3%	97.7%
8	2.360	0.093	10	32	3.3%	96.7%
10	1.999	0.079	8	40	4.2%	95.8%
16	1.191	0.047	56	96	10.0%	90.0%
20	0.841	0.033	76	172	17.9%	82.1%
40	0.419	0.016	668	840	87.5%	12.5%
60	0.249	0.010	90	930	96.9%	3.1%
100	0.150	0.006	24	954	99.4%	0.6%
200	0.074	0.003	4	958	99.8%	0.2%
Pan			2	960	100.0%	0.0%
		Total	960			
		Initial Weight	966	Gravel	Sand	Silt/Clay
		Difference	0.6%	4.2%	95.6%	0.2%

	D10	D40	D50	D60	D90	Cu
(mm)	0.365	0.552	0.610	0.674	1.191	1.8
(inches)	0.014	0.022	0.024	0.027	0.047	

Boring ID: TB-06-3
Depth Interval: 65-69

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	24	24	1.4%	98.6%
3.5	5.664	0.223	48	72	4.1%	95.9%
6	3.353	0.132	70	142	8.1%	91.9%
8	2.360	0.093	106	248	14.2%	85.8%
10	1.999	0.079	68	316	18.1%	81.9%
16	1.191	0.047	300	616	35.3%	64.7%
20	0.841	0.033	242	858	49.2%	50.8%
40	0.419	0.016	618	1476	84.6%	15.4%
60	0.249	0.010	192	1668	95.6%	4.4%
100	0.150	0.006	58	1726	99.0%	1.0%
200	0.074	0.003	12	1738	99.7%	0.3%
Pan			6	1744	100.0%	0.0%
		Total	1744			
		Initial Weight	1746	Gravel	Sand	Silt/Clay
		Difference	0.1%	18.1%	81.5%	0.3%

	D10	D40	D50	D60	D90	Cu
(mm)	0.325	0.680	0.828	1.059	3.012	3.3
(inches)	0.013	0.027	0.033	0.042	0.119	

SIEVE ANALYSIS RESULTS

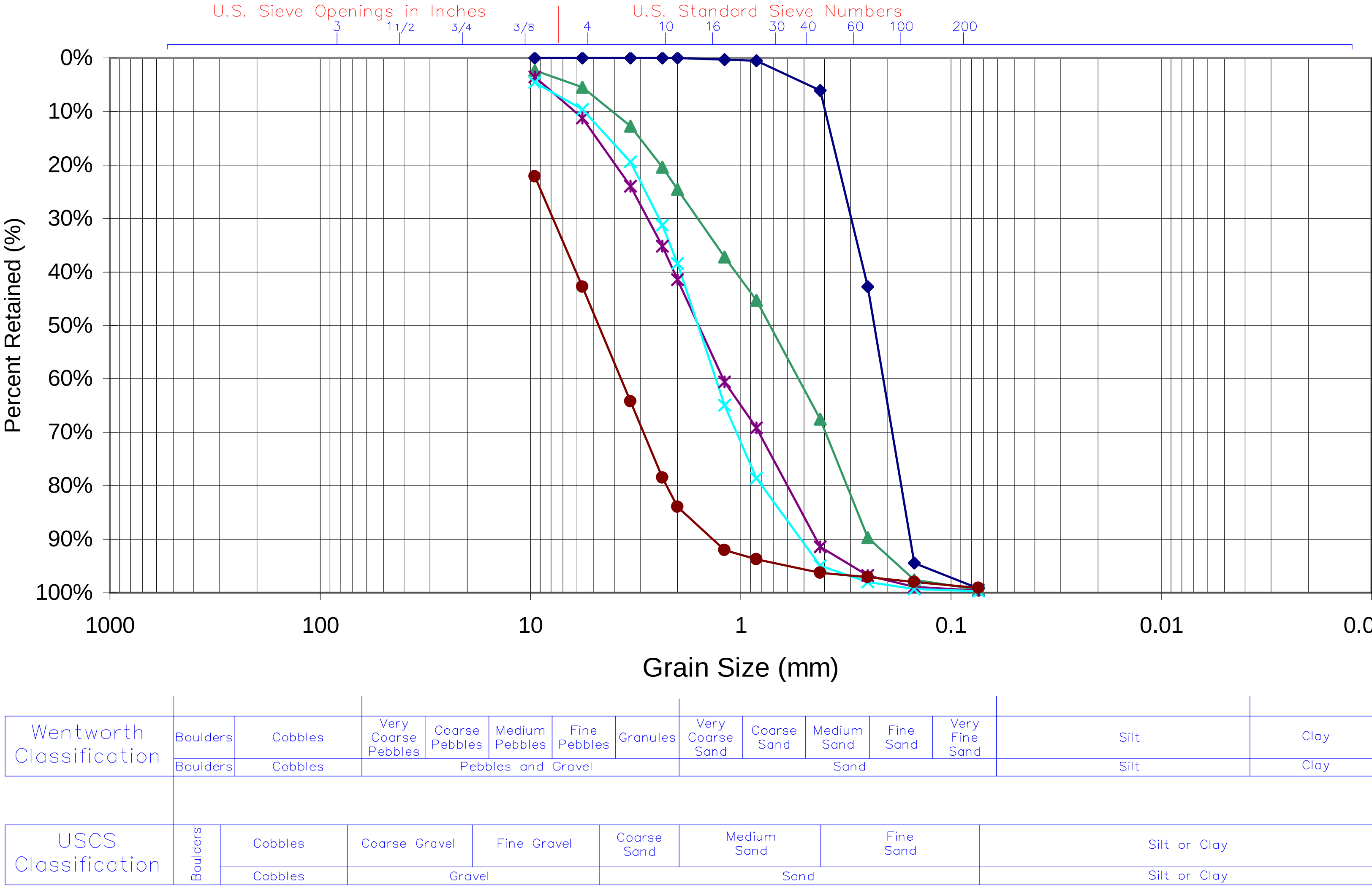
Client: AEC - Norborne, Missouri
Job No. 106-294

Boring ID: TB-06-3
Depth Interval: 69-74

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	52	52	2.8%	97.2%
3.5	5.664	0.223	52	104	5.5%	94.5%
6	3.353	0.132	120	224	11.9%	88.1%
8	2.360	0.093	160	384	20.3%	79.7%
10	1.999	0.079	122	506	26.8%	73.2%
16	1.191	0.047	554	1060	56.1%	43.9%
20	0.841	0.033	338	1398	74.0%	26.0%
40	0.419	0.016	384	1782	94.3%	5.7%
60	0.249	0.010	64	1846	97.7%	2.3%
100	0.150	0.006	30	1876	99.3%	0.7%
200	0.074	0.003	10	1886	99.8%	0.2%
Pan			4	1890	100.0%	0.0%

Total	1890			
Initial Weight	1894	Gravel	Sand	Silt/Clay
Difference	0.2%	26.8%	73.0%	0.2%

	D10	D40	D50	D60	D90	Cu
(mm)	0.485	1.104	1.326	1.582	3.907	3.3
(inches)	0.019	0.043	0.052	0.062	0.154	



TB-06-4 49-52
TB-06-4 52-59
TB-06-4 59-64
TB-06-4 64-69
TB-06-4 69-73

GRAIN SIZE ANALYSIS

Collector Wells International, Inc.

Project: AEC - Norborne, Missouri
Test Boring TB-06-4

Job Number: 106-294

SIEVE ANALYSIS RESULTS

Client: AEC - Norborne, Missouri
Job No. 106-294

Boring ID: TB-06-4
Depth Interval: 49-52

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	0	0	0.0%	100.0%
3.5	5.664	0.223	0	0	0.0%	100.0%
6	3.353	0.132	0	0	0.0%	100.0%
8	2.360	0.093	0	0	0.0%	100.0%
10	1.999	0.079	0	0	0.0%	100.0%
16	1.191	0.047	2	2	0.3%	99.7%
20	0.841	0.033	2	4	0.5%	99.5%
40	0.419	0.016	42	46	6.1%	93.9%
60	0.249	0.010	278	324	42.7%	57.3%
100	0.150	0.006	392	716	94.5%	5.5%
200	0.074	0.003	36	752	99.2%	0.8%
Pan			6	758	100.0%	0.0%

Total	758			
Initial Weight	760	Gravel	Sand	Silt/Clay
Difference	0.3%	0.0%	99.2%	0.8%

	D10	D40	D50	D60	D90	Cu
(mm)	0.157	0.210	0.232	0.259	0.396	1.7
(inches)	0.006	0.008	0.009	0.010	0.016	

Boring ID: TB-06-4
Depth Interval: 52-59

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	38	38	2.3%	97.7%
3.5	5.664	0.223	52	90	5.5%	94.5%
6	3.353	0.132	118	208	12.7%	87.3%
8	2.360	0.093	126	334	20.4%	79.6%
10	1.999	0.079	68	402	24.6%	75.4%
16	1.191	0.047	206	608	37.2%	62.8%
20	0.841	0.033	132	740	45.3%	54.7%
40	0.419	0.016	364	1104	67.6%	32.4%
60	0.249	0.010	362	1466	89.7%	10.3%
100	0.150	0.006	128	1594	97.6%	2.4%
200	0.074	0.003	30	1624	99.4%	0.6%
Pan			10	1634	100.0%	0.0%

Total	1634			
Initial Weight	1640	Gravel	Sand	Silt/Clay
Difference	0.4%	24.6%	74.8%	0.6%

	D10	D40	D50	D60	D90	Cu
(mm)	0.245	0.531	0.726	1.056	4.088	4.3
(inches)	0.010	0.021	0.029	0.042	0.161	

SIEVE ANALYSIS RESULTS

Client: AEC - Norborne, Missouri
Job No. 106-294

Boring ID: TB-06-4
Depth Interval: 59-64

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	64	64	3.5%	96.5%
3.5	5.664	0.223	140	204	11.2%	88.8%
6	3.353	0.132	232	436	24.0%	76.0%
8	2.360	0.093	204	640	35.2%	64.8%
10	1.999	0.079	114	754	41.4%	58.6%
16	1.191	0.047	348	1102	60.5%	39.5%
20	0.841	0.033	156	1258	69.1%	30.9%
40	0.419	0.016	406	1664	91.4%	8.6%
60	0.249	0.010	98	1762	96.8%	3.2%
100	0.150	0.006	38	1800	98.9%	1.1%
200	0.074	0.003	12	1812	99.6%	0.4%
Pan			8	1820	100.0%	0.0%

Total	1820			
Initial Weight	1824	Gravel	Sand	Silt/Clay
Difference	0.2%	41.4%	58.1%	0.4%

	D10	D40	D50	D60	D90	Cu
(mm)	0.438	1.209	1.585	2.076	6.146	4.7
(inches)	0.017	0.048	0.062	0.082	0.242	

Boring ID: TB-06-4
Depth Interval: 64-69

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	78	78	4.6%	95.4%
3.5	5.664	0.223	86	164	9.6%	90.4%
6	3.353	0.132	166	330	19.4%	80.6%
8	2.360	0.093	202	532	31.3%	68.7%
10	1.999	0.079	122	654	38.4%	61.6%
16	1.191	0.047	450	1104	64.9%	35.1%
20	0.841	0.033	234	1338	78.6%	21.4%
40	0.419	0.016	278	1616	94.9%	5.1%
60	0.249	0.010	52	1668	98.0%	2.0%
100	0.150	0.006	22	1690	99.3%	0.7%
200	0.074	0.003	6	1696	99.6%	0.4%
Pan			6	1702	100.0%	0.0%

Total	1702			
Initial Weight	1710	Gravel	Sand	Silt/Clay
Difference	0.5%	38.4%	61.2%	0.4%

	D10	D40	D50	D60	D90	Cu
(mm)	0.517	1.310	1.594	1.938	5.554	3.7
(inches)	0.020	0.052	0.063	0.076	0.219	

SIEVE ANALYSIS RESULTS

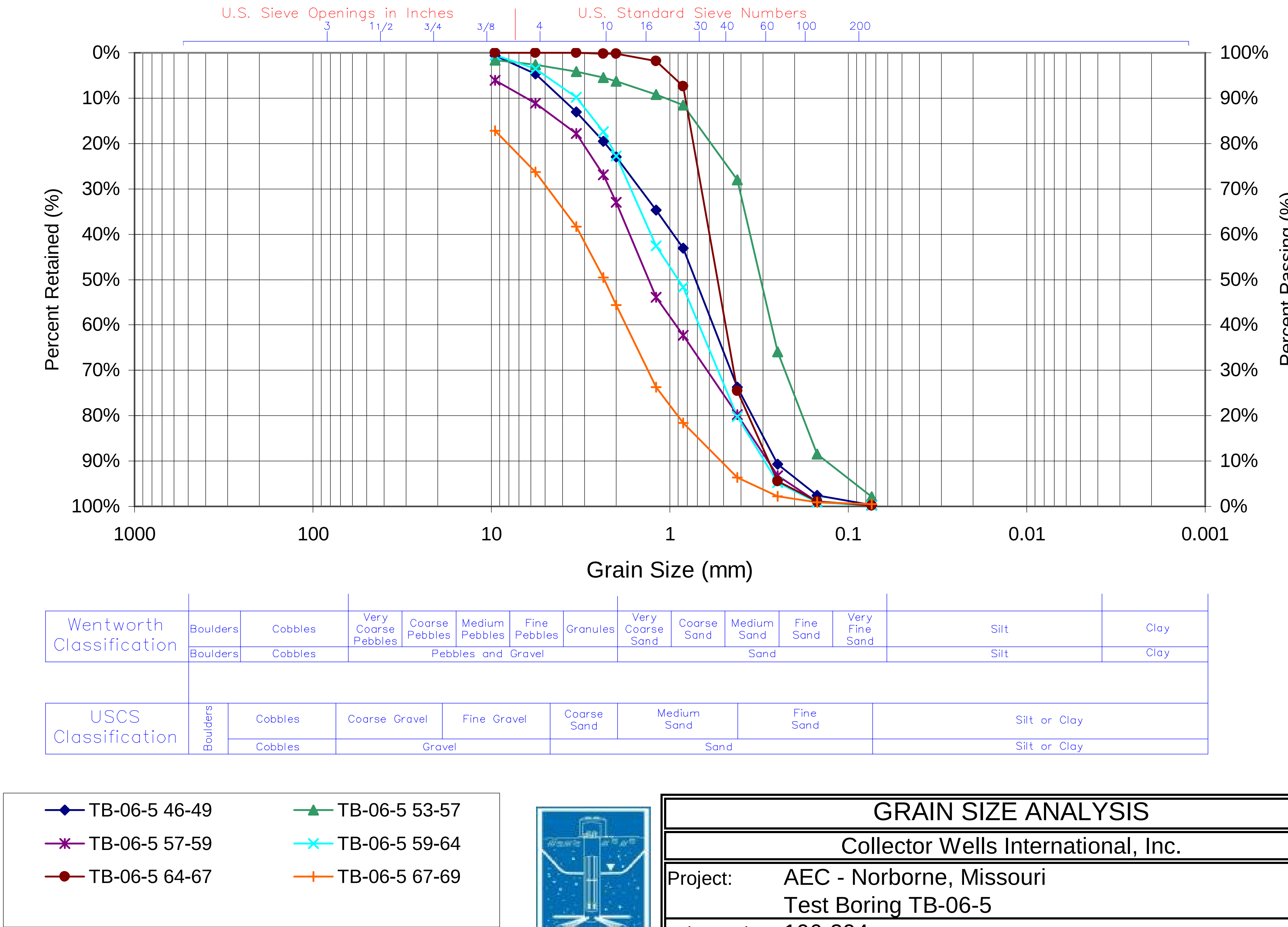
Client: AEC - Norborne, Missouri
Job No. 106-294

Boring ID: TB-06-4
Depth Interval: 69-73

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	426	426	22.2%	77.8%
3.5	5.664	0.223	396	822	42.8%	57.2%
6	3.353	0.132	410	1232	64.2%	35.8%
8	2.360	0.093	274	1506	78.4%	21.6%
10	1.999	0.079	106	1612	84.0%	16.0%
16	1.191	0.047	154	1766	92.0%	8.0%
20	0.841	0.033	34	1800	93.8%	6.3%
40	0.419	0.016	48	1848	96.3%	3.8%
60	0.249	0.010	16	1864	97.1%	2.9%
100	0.150	0.006	18	1882	98.0%	2.0%
200	0.074	0.003	20	1902	99.1%	0.9%
Pan			18	1920	100.0%	0.0%

Total	1920			
Initial Weight	1920	Gravel	Sand	Silt/Clay
Difference	0.0%	84.0%	15.1%	0.9%

	D10	D40	D50	D60	D90	Cu
(mm)	1.353	3.714	4.748	6.080	13.500	4.5
(inches)	0.053	0.146	0.187	0.239	0.531	



GRAIN SIZE ANALYSIS

Collector Wells International, Inc.

Project: AEC - Norborne, Missouri
Test Boring TB-06-5

Job Number: 106-294

SIEVE ANALYSIS RESULTS

Client: AEC - Norborne, Missouri
Job No. 106-294

Boring ID: TB-06-5
Depth Interval: 46-49

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	4	4	0.6%	99.4%
3.5	5.664	0.223	26	30	4.6%	95.4%
6	3.353	0.132	54	84	13.0%	87.0%
8	2.360	0.093	42	126	19.5%	80.5%
10	1.999	0.079	22	148	22.9%	77.1%
16	1.191	0.047	76	224	34.7%	65.3%
20	0.841	0.033	54	278	43.0%	57.0%
40	0.419	0.016	198	476	73.7%	26.3%
60	0.249	0.010	110	586	90.7%	9.3%
100	0.150	0.006	44	630	97.5%	2.5%
200	0.074	0.003	14	644	99.7%	0.3%
Pan			2	646	100.0%	0.0%

Total	646			
Initial Weight	650	Gravel	Sand	Silt/Clay
Difference	0.6%	22.9%	76.8%	0.3%

	D10	D40	D50	D60	D90	Cu
(mm)	0.254	0.572	0.718	0.954	4.048	3.7
(inches)	0.010	0.023	0.028	0.038	0.159	

Boring ID: TB-06-5
Depth Interval: 53-57

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	12	12	1.6%	98.4%
3.5	5.664	0.223	8	20	2.6%	97.4%
6	3.353	0.132	12	32	4.2%	95.8%
8	2.360	0.093	10	42	5.5%	94.5%
10	1.999	0.079	6	48	6.3%	93.7%
16	1.191	0.047	22	70	9.2%	90.8%
20	0.841	0.033	18	88	11.5%	88.5%
40	0.419	0.016	126	214	28.0%	72.0%
60	0.249	0.010	290	504	66.0%	34.0%
100	0.150	0.006	172	676	88.5%	11.5%
200	0.074	0.003	72	748	97.9%	2.1%
Pan			16	764	100.0%	0.0%

Total	764			
Initial Weight	766	Gravel	Sand	Silt/Clay
Difference	0.3%	6.3%	91.6%	2.1%

	D10	D40	D50	D60	D90	Cu
(mm)	0.134	0.270	0.310	0.355	1.052	2.7
(inches)	0.005	0.011	0.012	0.014	0.041	

SIEVE ANALYSIS RESULTS

Client: AEC - Norborne, Missouri
Job No. 106-294

Boring ID: TB-06-5
Depth Interval: 57-59

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	36	36	6.1%	93.9%
3.5	5.664	0.223	30	66	11.1%	88.9%
6	3.353	0.132	40	106	17.8%	82.2%
8	2.360	0.093	54	160	26.9%	73.1%
10	1.999	0.079	36	196	33.0%	67.0%
16	1.191	0.047	124	320	53.9%	46.1%
20	0.841	0.033	50	370	62.3%	37.7%
40	0.419	0.016	104	474	79.8%	20.2%
60	0.249	0.010	80	554	93.3%	6.7%
100	0.150	0.006	34	588	99.0%	1.0%
200	0.074	0.003	4	592	99.7%	0.3%
Pan			2	594	100.0%	0.0%
		Total	594			
		Initial Weight	602	Gravel	Sand	Silt/Clay
		Difference	1.3%	33.0%	66.7%	0.3%

	D10	D40	D50	D60	D90	Cu
(mm)	0.282	0.924	1.311	1.680	6.350	5.9
(inches)	0.011	0.036	0.052	0.066	0.250	

Boring ID: TB-06-5
Depth Interval: 59-64

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	8	8	0.5%	99.5%
3.5	5.664	0.223	48	56	3.5%	96.5%
6	3.353	0.132	100	156	9.8%	90.2%
8	2.360	0.093	120	276	17.4%	82.6%
10	1.999	0.079	84	360	22.7%	77.3%
16	1.191	0.047	314	674	42.6%	57.4%
20	0.841	0.033	144	818	51.6%	48.4%
40	0.419	0.016	452	1270	80.2%	19.8%
60	0.249	0.010	230	1500	94.7%	5.3%
100	0.150	0.006	70	1570	99.1%	0.9%
200	0.074	0.003	10	1580	99.7%	0.3%
Pan			4	1584	100.0%	0.0%
		Total	1584			
		Initial Weight	1588	Gravel	Sand	Silt/Clay
		Difference	0.3%	22.7%	77.0%	0.3%

	D10	D40	D50	D60	D90	Cu
(mm)	0.295	0.686	0.896	1.273	3.330	4.3
(inches)	0.012	0.027	0.035	0.050	0.131	

SIEVE ANALYSIS RESULTS

Client: AEC - Norborne, Missouri
Job No. 106-294

Boring ID: TB-06-5
Depth Interval: 64-67

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	0	0	0.0%	100.0%
3.5	5.664	0.223	0	0	0.0%	100.0%
6	3.353	0.132	0	0	0.0%	100.0%
8	2.360	0.093	2	2	0.2%	99.8%
10	1.999	0.079	0	2	0.2%	99.8%
16	1.191	0.047	14	16	1.8%	98.2%
20	0.841	0.033	48	64	7.4%	92.6%
40	0.419	0.016	584	648	74.5%	25.5%
60	0.249	0.010	174	822	94.5%	5.5%
100	0.150	0.006	38	860	98.9%	1.1%
200	0.074	0.003	8	868	99.8%	0.2%
Pan			2	870	100.0%	0.0%

Total	870			
Initial Weight	874	Gravel	Sand	Silt/Clay
Difference	0.5%	0.2%	99.5%	0.2%

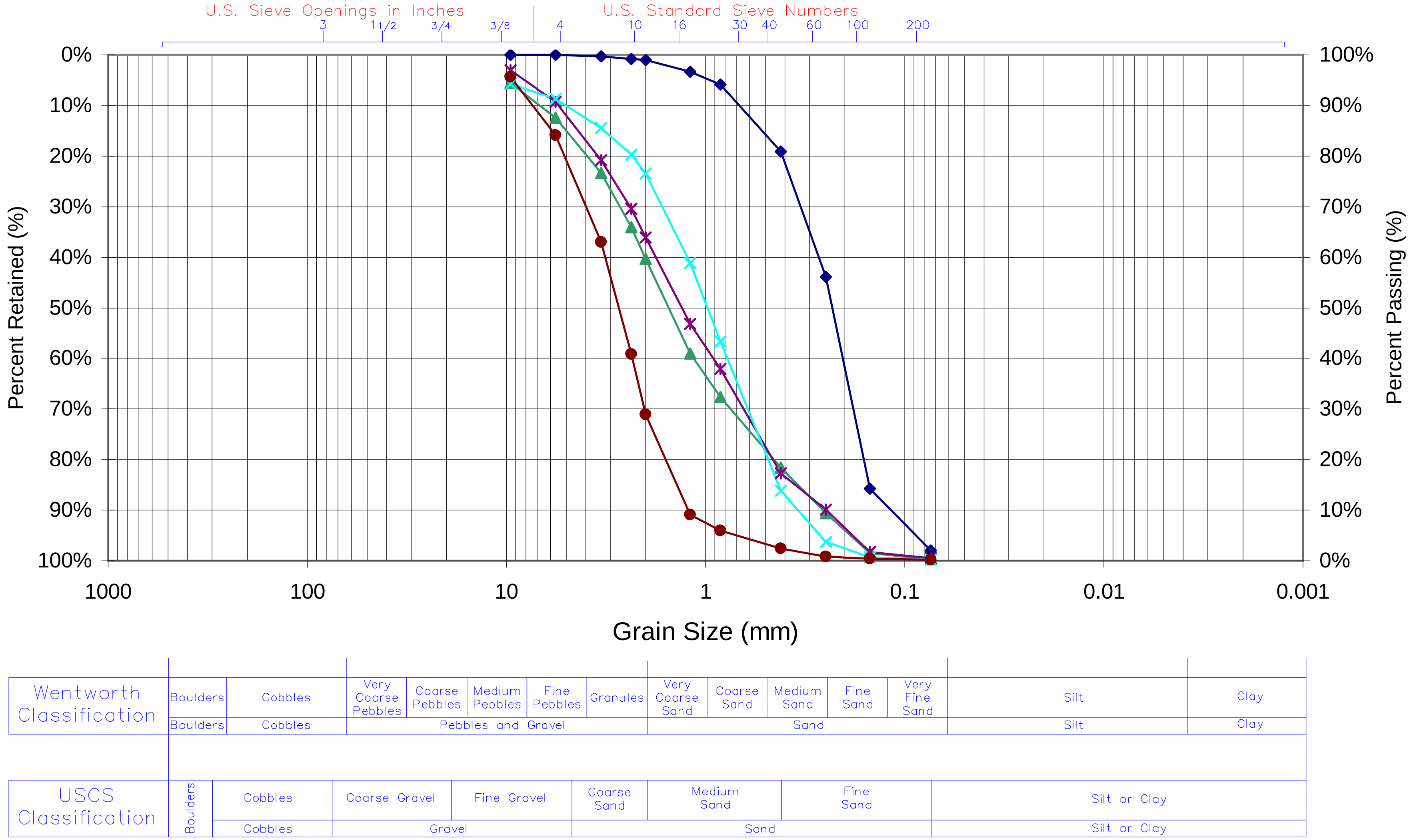
	D10	D40	D50	D60	D90	Cu
(mm)	0.280	0.487	0.540	0.599	0.818	2.1
(inches)	0.011	0.019	0.021	0.024	0.032	

Boring ID: TB-06-5
Depth Interval: 67-69

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	294	294	17.2%	82.8%
3.5	5.664	0.223	154	448	26.3%	73.7%
6	3.353	0.132	206	654	38.3%	61.7%
8	2.360	0.093	192	846	49.6%	50.4%
10	1.999	0.079	102	948	55.6%	44.4%
16	1.191	0.047	310	1258	73.7%	26.3%
20	0.841	0.033	134	1392	81.6%	18.4%
40	0.419	0.016	206	1598	93.7%	6.3%
60	0.249	0.010	70	1668	97.8%	2.2%
100	0.150	0.006	22	1690	99.1%	0.9%
200	0.074	0.003	8	1698	99.5%	0.5%
Pan			8	1706	100.0%	0.0%

Total	1706			
Initial Weight	1708	Gravel	Sand	Silt/Clay
Difference	0.1%	55.6%	44.0%	0.5%

	D10	D40	D50	D60	D90	Cu
(mm)	0.518	1.762	2.333	3.183	13.790	6.1
(inches)	0.020	0.069	0.092	0.125	0.543	



TB-06-6 49-52
TB-06-6 53-56
TB-06-6 59-64
TB-06-6 64-69
TB-06-6 69-73

GRAIN SIZE ANALYSIS

Collector Wells International, Inc.

Project: AEC - Norborne, Missouri
Test Boring TB-06-6

Job Number: 106-294

SIEVE ANALYSIS RESULTS

Client: AEC - Norborne, Missouri
Job No. 106-294

Boring ID: TB-06-6
Depth Interval: 49-52

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	0	0	0.0%	100.0%
3.5	5.664	0.223	0	0	0.0%	100.0%
6	3.353	0.132	2	2	0.3%	99.7%
8	2.360	0.093	4	6	0.8%	99.2%
10	1.999	0.079	2	8	1.0%	99.0%
16	1.191	0.047	18	26	3.3%	96.7%
20	0.841	0.033	20	46	5.9%	94.1%
40	0.419	0.016	104	150	19.1%	80.9%
60	0.249	0.010	194	344	43.9%	56.1%
100	0.150	0.006	328	672	85.7%	14.3%
200	0.074	0.003	96	768	98.0%	2.0%
Pan			16	784	100.0%	0.0%
		Total	784			
		Initial Weight	788	Gravel	Sand	Silt/Clay
		Difference	0.5%	1.0%	96.9%	2.0%

	D10	D40	D50	D60	D90	Cu
(mm)	0.117	0.205	0.231	0.270	0.677	2.3
(inches)	0.005	0.008	0.009	0.011	0.027	

Boring ID: TB-06-6
Depth Interval: 53-56

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	100	100	5.6%	94.4%
3.5	5.664	0.223	124	224	12.5%	87.5%
6	3.353	0.132	196	420	23.4%	76.6%
8	2.360	0.093	192	612	34.1%	65.9%
10	1.999	0.079	112	724	40.3%	59.7%
16	1.191	0.047	336	1060	59.0%	41.0%
20	0.841	0.033	154	1214	67.6%	32.4%
40	0.419	0.016	252	1466	81.6%	18.4%
60	0.249	0.010	162	1628	90.6%	9.4%
100	0.150	0.006	140	1768	98.4%	1.6%
200	0.074	0.003	22	1790	99.7%	0.3%
Pan			6	1796	100.0%	0.0%
		Total	1796			
		Initial Weight	1804	Gravel	Sand	Silt/Clay
		Difference	0.4%	40.3%	59.4%	0.3%

	D10	D40	D50	D60	D90	Cu
(mm)	0.258	1.145	1.529	2.016	6.823	7.8
(inches)	0.010	0.045	0.060	0.079	0.269	

SIEVE ANALYSIS RESULTS

Client: AEC - Norborne, Missouri
Job No. 106-294

Boring ID: TB-06-6
Depth Interval: 59-64

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	48	48	3.0%	97.0%
3.5	5.664	0.223	100	148	9.3%	90.7%
6	3.353	0.132	182	330	20.8%	79.2%
8	2.360	0.093	154	484	30.5%	69.5%
10	1.999	0.079	90	574	36.1%	63.9%
16	1.191	0.047	270	844	53.1%	46.9%
20	0.841	0.033	142	986	62.1%	37.9%
40	0.419	0.016	328	1314	82.7%	17.3%
60	0.249	0.010	114	1428	89.9%	10.1%
100	0.150	0.006	132	1560	98.2%	1.8%
200	0.074	0.003	20	1580	99.5%	0.5%
Pan			8	1588	100.0%	0.0%
		Total	1588			
		Initial Weight	1596	Gravel	Sand	Silt/Clay
		Difference	0.5%	36.1%	63.4%	0.5%

	D10	D40	D50	D60	D90	Cu
(mm)	0.248	0.912	1.311	1.778	5.491	7.2
(inches)	0.010	0.036	0.052	0.070	0.216	

Boring ID: TB-06-6
Depth Interval: 64-69

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	94	94	5.7%	94.3%
3.5	5.664	0.223	48	142	8.6%	91.4%
6	3.353	0.132	96	238	14.5%	85.5%
8	2.360	0.093	86	324	19.7%	80.3%
10	1.999	0.079	62	386	23.5%	76.5%
16	1.191	0.047	290	676	41.2%	58.8%
20	0.841	0.033	254	930	56.6%	43.4%
40	0.419	0.016	484	1414	86.1%	13.9%
60	0.249	0.010	166	1580	96.2%	3.8%
100	0.150	0.006	50	1630	99.3%	0.7%
200	0.074	0.003	8	1638	99.8%	0.2%
Pan			4	1642	100.0%	0.0%
		Total	1642			
		Initial Weight	1646	Gravel	Sand	Silt/Clay
		Difference	0.2%	23.5%	76.2%	0.2%

	D10	D40	D50	D60	D90	Cu
(mm)	0.343	0.777	0.976	1.233	5.017	3.6
(inches)	0.014	0.031	0.038	0.049	0.198	

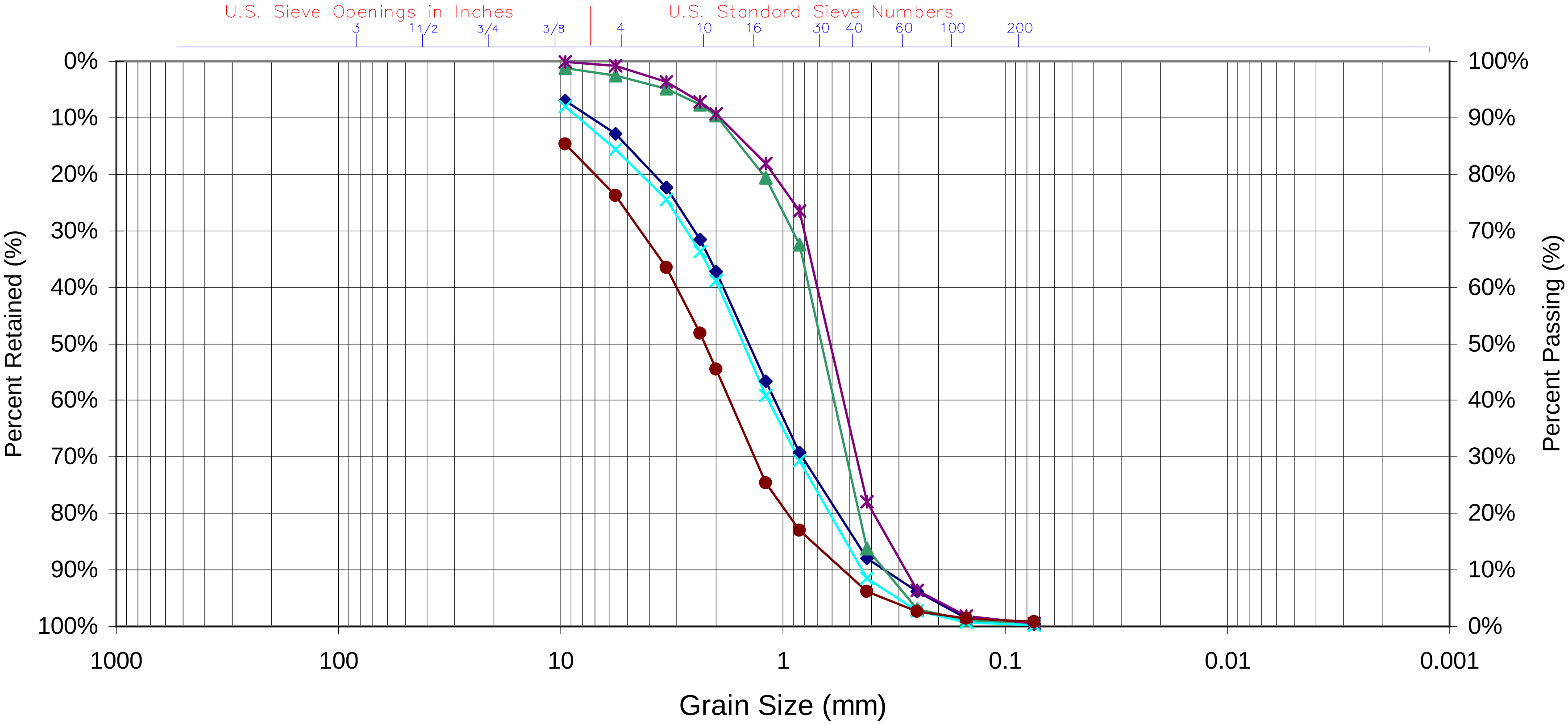
SIEVE ANALYSIS RESULTS

Client: AEC - Norborne, Missouri
Job No. 106-294

Boring ID: TB-06-6
Depth Interval: 69-73

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	78	78	4.3%	95.7%
3.5	5.664	0.223	208	286	15.9%	84.1%
6	3.353	0.132	378	664	37.0%	63.0%
8	2.360	0.093	398	1062	59.1%	40.9%
10	1.999	0.079	214	1276	71.0%	29.0%
16	1.191	0.047	356	1632	90.9%	9.1%
20	0.841	0.033	56	1688	94.0%	6.0%
40	0.419	0.016	64	1752	97.6%	2.4%
60	0.249	0.010	30	1782	99.2%	0.8%
100	0.150	0.006	6	1788	99.6%	0.4%
200	0.074	0.003	4	1792	99.8%	0.2%
Pan			4	1796	100.0%	0.0%
		Total	1796			
		Initial Weight	1802	Gravel	Sand	Silt/Clay
		Difference	0.3%	71.0%	28.7%	0.2%

	D10	D40	D50	D60	D90	Cu
(mm)	1.218	2.332	2.727	3.196	7.389	2.6
(inches)	0.048	0.092	0.107	0.126	0.291	



Wentworth Classification	Boulders	Cobbles	Very Coarse Pebbles	Coarse Pebbles	Medium Pebbles	Fine Pebbles	Granules	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt	Clay
	Boulders	Cobbles	Pebbles and Gravel					Sand					Silt	Clay

USCS Classification	Boulders	Cobbles	Coarse Gravel	Fine Gravel	Coarse Sand	Medium Sand	Fine Sand	Silt or Clay
		Cobbles	Gravel		Sand			Silt or Clay

- TB-06-7 49-55
- TB-06-7 55-59
- TB-06-7 59-63
- TB-06-7 63-65
- TB-06-7 69-72

GRAIN SIZE ANALYSIS

Collector Wells International, Inc.

Project: AEC - Norborne, Missouri
Test Boring TB-06-7

Job Number: 106-294

SIEVE ANALYSIS RESULTS

Client: AEC - Norborne, Missouri
Job No. 106-294

Boring ID: TB-06-7
Depth Interval: 49-55

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	118	118	7.0%	93.0%
3.5	5.664	0.223	100	218	12.9%	87.1%
6	3.353	0.132	160	378	22.3%	77.7%
8	2.360	0.093	156	534	31.5%	68.5%
10	1.999	0.079	96	630	37.2%	62.8%
16	1.191	0.047	330	960	56.7%	43.3%
20	0.841	0.033	214	1174	69.3%	30.7%
40	0.419	0.016	316	1490	88.0%	12.0%
60	0.249	0.010	100	1590	93.9%	6.1%
100	0.150	0.006	80	1670	98.6%	1.4%
200	0.074	0.003	18	1688	99.6%	0.4%
Pan			6	1694	100.0%	0.0%

Total	1694			
Initial Weight	1698	Gravel	Sand	Silt/Clay
Difference	0.2%	37.2%	62.5%	0.4%

	D10	D40	D50	D60	D90	Cu
(mm)	0.350	1.087	1.422	1.855	7.292	5.3
(inches)	0.014	0.043	0.056	0.073	0.287	

Boring ID: TB-06-7
Depth Interval: 55-59

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	16	16	1.3%	98.7%
3.5	5.664	0.223	16	32	2.5%	97.5%
6	3.353	0.132	30	62	4.9%	95.1%
8	2.360	0.093	36	98	7.7%	92.3%
10	1.999	0.079	24	122	9.6%	90.4%
16	1.191	0.047	140	262	20.6%	79.4%
20	0.841	0.033	150	412	32.4%	67.6%
40	0.419	0.016	684	1096	86.3%	13.7%
60	0.249	0.010	136	1232	97.0%	3.0%
100	0.150	0.006	24	1256	98.9%	1.1%
200	0.074	0.003	8	1264	99.5%	0.5%
Pan			6	1270	100.0%	0.0%

Total	1270			
Initial Weight	1272	Gravel	Sand	Silt/Clay
Difference	0.2%	9.6%	89.9%	0.5%

	D10	D40	D50	D60	D90	Cu
(mm)	0.350	0.589	0.670	0.763	1.962	2.2
(inches)	0.014	0.023	0.026	0.030	0.077	

SIEVE ANALYSIS RESULTS

Client: AEC - Norborne, Missouri
Job No. 106-294

Boring ID: TB-06-7
Depth Interval: 59-63

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	2	2	0.1%	99.9%
3.5	5.664	0.223	10	12	0.8%	99.2%
6	3.353	0.132	40	52	3.6%	96.4%
8	2.360	0.093	52	104	7.2%	92.8%
10	1.999	0.079	30	134	9.3%	90.7%
16	1.191	0.047	126	260	18.1%	81.9%
20	0.841	0.033	122	382	26.5%	73.5%
40	0.419	0.016	740	1122	77.9%	22.1%
60	0.249	0.010	226	1348	93.6%	6.4%
100	0.150	0.006	66	1414	98.2%	1.8%
200	0.074	0.003	18	1432	99.4%	0.6%
Pan			8	1440	100.0%	0.0%

Total	1440			
Initial Weight	1444	Gravel	Sand	Silt/Clay
Difference	0.3%	9.3%	90.1%	0.6%

	D10	D40	D50	D60	D90	Cu
(mm)	0.281	0.534	0.612	0.701	1.919	2.5
(inches)	0.011	0.021	0.024	0.028	0.076	

Boring ID: TB-06-7
Depth Interval: 63-65

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	140	140	8.0%	92.0%
3.5	5.664	0.223	132	272	15.6%	84.4%
6	3.353	0.132	156	428	24.5%	75.5%
8	2.360	0.093	160	588	33.6%	66.4%
10	1.999	0.079	90	678	38.8%	61.2%
16	1.191	0.047	356	1034	59.2%	40.8%
20	0.841	0.033	202	1236	70.7%	29.3%
40	0.419	0.016	364	1600	91.5%	8.5%
60	0.249	0.010	100	1700	97.3%	2.7%
100	0.150	0.006	36	1736	99.3%	0.7%
200	0.074	0.003	8	1744	99.8%	0.2%
Pan			4	1748	100.0%	0.0%

Total	1748			
Initial Weight	1752	Gravel	Sand	Silt/Clay
Difference	0.2%	38.8%	61.0%	0.2%

	D10	D40	D50	D60	D90	Cu
(mm)	0.441	1.161	1.503	1.938	8.305	4.4
(inches)	0.017	0.046	0.059	0.076	0.327	

SIEVE ANALYSIS RESULTS

Client: AEC - Norborne, Missouri
Job No. 106-294

Boring ID: TB-06-7
Depth Interval: 69-72

Sieve No.	Sieve Size (mm)	Sieve Size (inches)	Weight Retained (grams)	Cumulative Weight (grams)	Cumulative % Retained	Cumulative % Passing
3/8	9.525	0.375	300	300	14.6%	85.4%
3.5	5.664	0.223	186	486	23.7%	76.3%
6	3.353	0.132	262	748	36.5%	63.5%
8	2.360	0.093	238	986	48.1%	51.9%
10	1.999	0.079	130	1116	54.5%	45.5%
16	1.191	0.047	412	1528	74.6%	25.4%
20	0.841	0.033	172	1700	83.0%	17.0%
40	0.419	0.016	222	1922	93.8%	6.2%
60	0.249	0.010	72	1994	97.4%	2.6%
100	0.150	0.006	24	2018	98.5%	1.5%
200	0.074	0.003	14	2032	99.2%	0.8%
Pan			16	2048	100.0%	0.0%
		Total	2048			
		Initial Weight	2056	Gravel	Sand	Silt/Clay
		Difference	0.4%	54.5%	44.7%	0.8%

	D10	D40	D50	D60	D90	Cu
(mm)	0.537	1.735	2.248	3.019	11.500	5.6
(inches)	0.021	0.068	0.089	0.119	0.453	

APPENDIX C
Hydraulic Interval Test Data

Well ID: TB-06-2

Date: 4/19/2006
Job No.: 105-278

Client: AEC - Norborne, Missouri
Location: Approximately 400 feet east of TB-06-1 and 600 feet east of the SW property corner.
Well Information: Temporary 0.040-inch slot wire-wrapped screen set from 59.8 to 69.8 feet below grade
Test Information: Multiple-rate Hydraulic Interval Step Test with 30 minute steps
Measuring Point: Top of temporary 6-inch casing, approximately 1.2 feet above grade.

Time	Elapsed Time from Start of Test	Elapsed Time from Start of Step	Depth to Water	Observed Drawdown	Totalizer Reading	Pumping Rate	Comments
(hr:min)	(minutes)	(minutes)	(feet)	(feet)	(gallons)	(gpm)	
11:16			15.98				
11:24			15.98				
11:27	0	0		0.00			Start Step 1
11:28	1	1	20.27	4.29			
11:29	2	2	17.81	1.83			
11:30	3	3	17.70	1.72			
11:31	4	4	17.67	1.69			
11:32	5	5	17.65	1.67	338		
11:33	6	6	17.64	1.66	360	25.9	
11:35	8	8	17.63	1.65	418	35.0	
11:37	10	10	17.62	1.64	488	34.9	
11:39	12	12	17.60	1.62	568	34.8	
11:41	14	14	17.60	1.62	648	34.8	
11:43	16	16	17.59	1.61	698	34.7	
11:48	21	21	17.58	1.60	868	34.6	
11:54	27	27	17.56	1.58	1088	34.5	
11:57	30	30	17.55	1.57	1178	34.4	
12:00	33	0					Start Step 2
12:01	34	1	18.62	2.64	1360		
12:02	35	2	18.75	2.77	1410	58.8	
12:03	36	3	18.75	2.77	1470	58.4	
12:04	37	4	18.75	2.77	1530	58.3	
12:05	38	5	18.75	2.77	1590	58.2	
12:06	39	6	18.75	2.77	1640	58.1	
12:08	41	8	18.75	2.77	1740	58.0	
12:10	43	10	18.75	2.77	1860	58.0	
12:12	45	12	18.75	2.77	1990	58.0	
12:14	47	14	18.75	2.77	2100	57.9	
12:16	49	16	18.75	2.77	2200	57.9	
12:20	53	20	18.75	2.77	2450	57.9	
12:25	58	25	18.74	2.76	2730	57.8	
12:30	63	0	18.74		2960	57.8	Start Step 3
12:31	64	1	19.58	3.60	3100		
12:32	65	2	19.98	4.00	3180	82.8	
12:33	66	3	19.99	4.01	3270	82.3	
12:34	67	4	20.00	4.02	3340	82.3	
12:35	68	5	20.01	4.03	3420	82.1	
12:36	69	6	20.01	4.03	3500	82.2	
12:38	71	8	20.01	4.03	3680	82.1	
12:40	73	10	20.01	4.03	3830	82.2	
12:42	75	12	20.01	4.03	4020	79.4	
12:44	77	14	20.01	4.03			
12:46	79	16	20.01	4.03	4330	82.0	
12:50	83	20	20.00	4.02	4660	82.0	
12:55	88	25	20.00	4.02	5130	82.0	
13:00	93	0					Start Step 4
13:01	94	1	22.03	6.05	5610		
13:02	95	2	22.05	6.07	5720	122.2	
13:03	96	3	22.07	6.09	5860	120.0	
13:04	97	4	22.08	6.10	5980	120.0	
13:05	98	5	22.08	6.10	6080	120.0	
13:06	99	6	22.09	6.11	6220	120.0	
13:07	100	7	22.09	6.11	6330	120.0	

Well ID: TB-06-2

Date: 4/19/2006
Job No.: 105-278

Client: AEC - Norborne, Missouri
Location: Approximately 400 feet east of TB-06-1 and 600 feet east of the SW property corner.
Well Information: Temporary 0.040-inch slot wire-wrapped screen set from 59.8 to 69.8 feet below grade
Test Information: Multiple-rate Hydraulic Interval Step Test with 30 minute steps
Measuring Point: Top of temporary 6-inch casing, approximately 1.2 feet above grade.

Time	Elapsed Time from Start of Test	Elapsed Time from Start of Step	Depth to Water	Observed Drawdown	Totalizer Reading	Pumping Rate	Comments
(hr:min)	(minutes)	(minutes)	(feet)	(feet)	(gallons)	(gpm)	
13:08	101	8	22.10	6.12	6440	120.0	
13:10	103	10	22.10	6.12	6670	120.0	
13:13	106	13	22.10	6.12	7040	119.8	
13:15	108	15	22.11	6.13	7330	119.9	
13:20	113	20	22.11	6.13	7870	119.9	
13:26	119	26	22.11	6.13	8580	119.9	
13:30	123	30	22.12	6.14	9140	119.7	
13:32	125	0				0	Pump off, Start Recovery
13:33	126	1	16.23	0.25			
13:34	127	2	16.17	0.19			
13:35	128	3	16.13	0.15			
13:36	129	4	16.12	0.14			
13:37	130	5	16.10	0.12			
13:38	131	6	16.09	0.11			
13:39	132	7	16.08	0.10			
13:41	134	9	16.07	0.09			
13:45	138	13	16.06	0.08			
13:52	145	20	16.05	0.07			

APPENDIX D
Background Water Level Data

Background Water Level Measurements

Client: Associated Electric Coop **Job No.:** 106-294
Location: Norborne, Missouri Site

Well	Date/Time (hr:min)	Measuring Point Elevation (feet)	Depth to Water (feet)	Water Elevation (feet)	Comments
TB-06-1	4/19/2006 11:22	687.37	17.22	670.15	
	4/19/2006 14:00		17.27	670.10	
	4/19/2006 18:51		17.35	670.02	
	4/20/2006 7:07		17.55	669.82	
	4/21/2006 13:42		17.81	669.56	
	5/15/2006 13:42		18.19	669.18	
	5/16/2006 7:12		18.36	669.01	
	5/16/2006 14:05		18.41	668.96	
	5/17/2006 7:02		18.53	668.84	
	5/17/2006 19:20		18.56	668.81	
	5/18/2006 7:29		18.61	668.76	
	5/18/2006 11:19		18.70	668.67	Pumping Supply Well
	5/18/2006 20:38		18.63	668.74	
	5/19/2006 7:19		18.65	668.72	
TB-06-2	4/19/2006 18:36	686.78	16.85	669.93	
	4/20/2006 7:15		17.06	669.72	
	4/20/2006 10:17		17.10	669.68	
	5/15/2006 13:47		17.73	669.05	
	5/16/2006 7:21		17.91	668.87	
	5/16/2006 14:12		17.94	668.84	
	5/17/2006 7:09		18.07	668.71	
	5/17/2006 8:18		18.41	668.37	Pumping Supply Well
	5/17/2006 9:26		18.53	668.25	Pumping Supply Well
	5/17/2006 19:14		18.10	668.68	
	5/18/2006 7:40		18.14	668.64	
	5/18/2006 11:24		18.57	668.21	Pumping Supply Well
	5/18/2006 20:16		18.09	668.69	
	5/19/2006 7:27		18.17	668.61	
	5/19/2006 10:53		18.62	668.16	Developing PW
	5/19/2006 10:54		19.16	667.62	Developing PW
	5/19/2006 10:55		19.31	667.47	Developing PW
	5/19/2006 10:56		19.39	667.39	Developing PW
	5/19/2006 10:57		19.42	667.36	Developing PW
	5/19/2006 10:58		19.31	667.47	Developing PW
	5/19/2006 11:08		19.28	667.50	Developing PW
	5/19/2006 11:30		19.20	667.58	Developing PW
	5/19/2006 12:37		18.24	668.54	
	5/19/2006 14:06		18.14	668.64	
TB-06-3	4/20/2006 11:25	687.71	17.98	669.73	
	4/20/2006 13:18		18.00	669.71	
	5/15/2006 13:51		18.53	669.18	
	5/16/2006 14:26		18.75	668.96	
	5/17/2006 7:53		18.89	668.82	
	5/17/2006 8:48		19.10	668.61	Pumping Supply Well
	5/17/2006 9:36		19.16	668.55	Pumping Supply Well
	5/17/2006 19:00		18.91	668.80	
	5/18/2006 8:56		18.96	668.75	
	5/18/2006 20:06		18.96	668.75	
	5/19/2006 7:54		19.00	668.71	

Background Water Level Measurements

Client: Associated Electric Coop **Job No.:** 106-294
Location: Norborne, Missouri Site

Well	Date/Time (hr:min)	Measuring Point Elevation (feet)	Depth to Water (feet)	Water Elevation (feet)	Comments
TB-06-3	5/19/2006 13:57		18.97	668.74	
TB-06-4	4/20/2006 16:35	688.27	18.67	669.60	
	4/21/2006 18:02		18.88	669.39	
	5/15/2006 13:57		19.23	669.04	
	5/16/2006 7:24		19.40	668.87	
	5/16/2006 14:18		19.43	668.84	
	5/17/2006 7:26		19.57	668.70	
	5/17/2006 8:02		20.34	667.93	Pumping Supply Well
	5/17/2006 8:12		20.47	667.80	Pumping Supply Well
	5/17/2006 8:27		20.51	667.76	Pumping Supply Well
	5/17/2006 8:44		20.56	667.71	Pumping Supply Well
	5/17/2006 9:22		20.71	667.56	Pumping Supply Well
	5/17/2006 10:09		20.73	667.54	Pumping Supply Well
	5/17/2006 19:03		19.60	668.67	
	5/18/2006 7:48		19.63	668.64	
	5/18/2006 11:34		20.73	667.54	Pumping Supply Well
	5/19/2006 7:35		19.67	668.60	
	5/19/2006 13:55		19.65	668.62	
TB-06-5	5/15/2006 14:10	688.33	19.22	669.11	
	5/16/2006 7:18		19.38	668.95	
	5/16/2006 14:09		19.43	668.90	
	5/17/2006 7:06		19.55	668.78	
	5/17/2006 8:21		19.73	668.60	Pumping Supply Well
	5/17/2006 9:27		19.81	668.52	Pumping Supply Well
	5/17/2006 19:16		19.6	668.73	
	5/18/2006 7:26		19.64	668.69	
	5/18/2006 11:22		19.86	668.47	Pumping Supply Well
	5/18/2006 20:34		19.64	668.69	
	5/19/2006 7:25		19.67	668.66	
TB-06-6	4/21/2006 18:22	688.41	18.99	669.42	
	5/15/2006 14:00		19.28	669.13	
	5/16/2006 7:32		19.45	668.96	
	5/16/2006 14:16		19.49	668.92	
	5/17/2006 7:12		19.6	668.81	
	5/17/2006 8:16		20.03	668.38	Pumping Supply Well
	5/17/2006 9:24		20.18	668.23	Pumping Supply Well
	5/17/2006 19:11		19.64	668.77	
	5/18/2006 7:43		19.69	668.72	
	5/18/2006 11:31		20.23	668.18	Pumping Supply Well
	5/18/2006 20:11		19.63	668.78	
	5/19/2006 7:32		19.73	668.68	
	5/19/2006 14:04		19.71	668.70	
TB-06-7	4/21/2006 18:20	687.3	17.81	669.49	
	5/17/2006 7:57		18.28	669.02	
	5/17/2006 8:24		18.53	668.77	Pumping Supply Well
	5/17/2006 9:33		18.84	668.46	Pumping Supply Well
	5/17/2006 19:06		18.31	668.99	
	5/18/2006 7:45		18.36	668.94	

Background Water Level Measurements

Client: Associated Electric Coop **Job No.:** 106-294
Location: Norborne, Missouri Site

Well	Date/Time (hr:min)	Measuring Point Elevation (feet)	Depth to Water (feet)	Water Elevation (feet)	Comments
TB-06-7	5/18/2006 20:13		18.35	668.95	
	5/19/2006 7:45		18.42	668.88	
	5/19/2006 14:02		18.41	668.89	
PW	5/19/2006 10:20	686.38	17.75	668.63	
	5/19/2006 11:32		20.60	665.78	Developing PW
	5/19/2006 13:00		17.75	668.63	
Supply Well	5/17/2006 19:04	685.97	17.31	668.66	
	5/18/2006 8:50		17.36	668.61	
	5/18/2006 20:09		17.31	668.66	
	5/19/2006 13:53		17.37	668.60	
Downstream (East) Staff Gage	5/17/2006 18:50	671.21	2.91	668.30	
	5/18/06 7:38		2.94	668.27	
	5/18/2006 20:31		2.96	668.25	
	5/19/2006 7:37		2.95	668.26	
	5/19/2006 14:09		2.86	668.35	
Upstream (West) Staff Gage	5/17/06 18:41	670.61	2.23	668.38	

APPENDIX E
Multiple-Rate Step Test Data

Well ID: PW **Job No.:** 106-294
Client: Associated Electric Coop
Location:
Well Information: Test pumping well with 0.080-inch slot wire-wrapped screen set from 51.5 to 71.5 feet below grade
Test Information: Multiple-rate Step Drawdown Test with 1-hour steps
Measuring Point: Top of 12-inch steel casing, approx. 2.0 feet above grade. 686.38 Measuring Point Elevation

Orifice Pipe Diameter: 6 **Orifice Dia.:** 5 **Orifice Constant:** 0.791

Date/Time (hr:min)	Elapsed Time from Start of Test (minutes)	Elapsed Time from Start of Step (minutes)	Depth to Water (feet)	Observed Drawdown (feet)	Water Elevation (feet)	Manometer Reading (inches)	Pumping Rate (gpm)	Comments
05/22/06 11:49			17.21		669.17			
05/22/06 14:25			17.25		669.13			
05/22/06 15:21			17.23		669.15			
05/22/06 15:29	0	0	17.23	0	669.15			Start of Step 1
05/22/06 15:31	2	2	21.15	3.92	665.23			
05/22/06 15:32	3	3	21.16	3.93	665.22	8	352	
05/22/06 15:33	4	4	21.10	3.87	665.28			
05/22/06 15:34	5	5	21.10	3.87	665.28			
05/22/06 15:35	6	6	21.11	3.88	665.27	7 1/2	341	
05/22/06 15:39	10	10	21.17	3.94	665.21			
05/22/06 15:41	12	12	21.18	3.95	665.20	7 1/2	341	
05/22/06 15:45	16	16	21.18	3.95	665.20			
05/22/06 15:50	21	21	21.23	4.00	665.15			
05/22/06 16:06	37	37	21.27	4.04	665.11	7 1/2	341	
05/22/06 16:10	41	41	21.27	4.04	665.11	7 1/2	341	
05/22/06 16:16	47	47	21.27	4.04	665.11			
05/22/06 16:21	52	52	21.28	4.05	665.10			
05/22/06 16:38	69	0						Start of Step 2
05/22/06 16:42	73	4	24.42		661.96	20	557	
05/22/06 16:43	74	5	24.47	7.24	661.91			
05/22/06 16:46	77	8	24.53	7.30	661.85	22	584	
05/22/06 16:49	80	11	24.57	7.34	661.81	22	584	
05/22/06 16:53	84	15	24.59	7.36	661.79			
05/22/06 16:58	89	20	24.62	7.39	661.76	22	584	
05/22/06 17:03	94	25	24.63	7.40	661.75	22	584	
05/22/06 17:09	100	31	24.64	7.41	661.74			
05/22/06 17:14	105	36	24.65	7.42	661.73	22	584	
05/22/06 17:18	109	40	24.66	7.43	661.72			
05/22/06 17:37	128	59	24.69	7.46	661.69			
05/22/06 17:38	129	0						Start of Step 3
05/22/06 17:42	133	4	27.08	9.85	659.30			
05/22/06 17:44	135	6	27.15	9.92	659.23	40	787	
05/22/06 17:46	137	8	27.16	9.93	659.22	40	787	
05/22/06 17:49	140	11	27.20	9.97	659.18			
05/22/06 17:51	142	13	27.21	9.98	659.17	40	787	
05/22/06 17:54	145	16	27.22	9.99	659.16			
05/22/06 17:58	149	20	27.22	9.99	659.16	40	787	
05/22/06 18:04	155	26	27.25	10.02	659.13			
05/22/06 18:08	159	30	27.26	10.03	659.12	39 3/4	785	
05/22/06 18:13	164	35	27.26	10.03	659.12	39 3/4	785	
05/22/06 18:21	172	43	27.29	10.06	659.09			
05/22/06 18:25	176	47	27.29	10.06	659.09			
05/22/06 18:36	187	58	27.30	10.07	659.08	39 1/2	783	
05/22/06 18:40	191	0	27.30	10.07	659.08			Start of Step 4
05/22/06 18:41	192	1	31.09	13.86	655.29			
05/22/06 18:42	193	2	31.26	14.03	655.12			
05/22/06 18:43	194	3	31.36	14.13	655.02	78	1100	
05/22/06 18:44	195	4	31.42	14.19	654.96			
05/22/06 18:45	196	5	31.46	14.23	654.92			
05/22/06 18:46	197	6	31.50	14.27	654.88			
05/22/06 18:49	200	9	31.56	14.33	654.82			
05/22/06 18:50	201	10	31.57	14.34	654.81			

Well ID: PW **Job No.:** 106-294
Client: Associated Electric Coop
Location:
Well Information: Test pumping well with 0.080-inch slot wire-wrapped screen set from 51.5 to 71.5 feet below grade
Test Information: Multiple-rate Step Drawdown Test with 1-hour steps
Measuring Point: Top of 12-inch steel casing, approx. 2.0 feet above grade. 686.38 Measuring Point Elevation

Orifice Pipe Diameter: 6 **Orifice Dia.:** 5 **Orifice Constant:** 0.791

Date/Time (hr:min)	Elapsed Time from Start of Test (minutes)	Elapsed Time from Start of Step (minutes)	Depth to Water (feet)	Observed Drawdown (feet)	Water Elevation (feet)	Manometer Reading (inches)	Pumping Rate (gpm)	Comments
05/22/06 18:53	204	13	31.60	14.37	654.78	78	1100	
05/22/06 18:56	207	16	31.61	14.38	654.77			
05/22/06 19:00	211	20	31.64	14.41	654.74	79 1/2	1110	
05/22/06 19:07	218	27	31.68	14.45	654.70			
05/22/06 19:10	221	30	31.69	14.46	654.69			
05/22/06 19:21	232	41	31.68	14.45	654.70	78 1/2	1103	
05/22/06 19:25	236	45	31.68	14.45	654.70			
05/22/06 19:35	246	55	31.71	14.48	654.67	78 1/2	1103	
05/22/06 19:57	268	77	30.34	13.11	656.04	65	1004	
05/22/06 19:59	270	0				0	0	Pump Off Start Recovery
05/22/06 20:00	271	1	18.91	1.68	667.47			
05/22/06 20:02	273	3	18.46	1.23	667.92			
05/22/06 20:03	274	4	18.25	1.02	668.13			
05/22/06 20:04	275	5	18.16	0.93	668.22			
05/22/06 20:06	277	7	18.05	0.82	668.33			
05/22/06 20:07:00	278	8	17.98	0.75	668.40			
05/22/06 20:17:00	288	18	17.75	0.52	668.63			
05/22/06 20:36:00	307	37	17.61	0.38	668.77			

In-Situ Inc.	Hermit 3000	
Report generated:	05/26/06	17:40:04
Report from file:	C:\Win-Situ\Data\SN45692 2006-05-22 151855 AEC Step Test.bin	
DataMgr Version	3.71	
Serial number:	45692	
Firmware Version	7.1	
Unit name:	Hermit 3000	
Test name:	AEC Step Test	
Test defined on:	05/22/06	7:47:38
Test started on:	05/22/06	15:18:55
Test stopped on:	05/23/06	8:14:13
Test extracted on:	05/23/06	21:31:34
Data gathered using Linear testing		
Time between data points:	Minutes.	
Number of data samples:	1016	
TOTAL DATA SAMPLES	1016	
Channel number [1]		
Measurement type:	Pressure	
Channel name:	PW	
Linearity:	0.1254	
Scale:		19.8458
Offset:		-0.0609
Warmup:		50
Specific gravity:	1	
Mode:	TOC	
User-defined reference:	17.21	Feet H2O
Referenced on:	channel definition.	
Pressure head at reference:	27.228	Feet H2O
Channel number [2]		
Measurement type:	Pressure	
Channel name:	TB-06-2	
Linearity:	0.1185	
Scale:		20.0059
Offset:		0.0508
Warmup:		50
Specific gravity:	1	
Mode:	TOC	
User-defined reference:	17.73	Feet H2O
Referenced on:	channel definition.	
Pressure head at reference:	22.812	Feet H2O
Channel number [3]		
Measurement type:	Pressure	
Channel name:	TB-06-4	
Linearity:	0.0239	
Scale:		10.0987
Offset:		0.9336
Warmup:		50
Specific gravity:	1	
Mode:	TOC	
User-defined reference:	19.23	Feet H2O
Referenced on:	channel definition.	
Pressure head at reference:	16.264	Feet H2O

Channel number [4]

Measurement type:	Pressure	
Channel name:	TB-06-5	
Linearity:	0.0174	
Scale:		10.0857
Offset:		-0.0818
Warmup:		50
Specific gravity:	1	
Mode:	TOC	
User-defined reference:	19.24 Feet H2O	
Referenced on:	channel definition.	
Pressure head at reference:	17.445 Feet H2O	

Channel number [5]

Measurement type:	Pressure	
Channel name:	TB-06-6	
Linearity:	0.0453	
Scale:		9.9843
Offset:		0.0068
Warmup:		50
Specific gravity:	1	
Mode:	TOC	
User-defined reference:	19.31 Feet H2O	
Referenced on:	channel definition.	
Pressure head at reference:	17.392 Feet H2O	

Channel number [6]

Measurement type:	Pressure	
Channel name:	TB-06-7	
Linearity:	0.1437	
Scale:		20.0812
Offset:		0.0342
Warmup:		50
Specific gravity:	1	
Mode:	TOC	
User-defined reference:	18.07 Feet H2O	
Referenced on:	channel definition.	
Pressure head at reference:	23.669 Feet H2O	

Channel number [0]

Measurement type:	Barometric Pressure	
Channel name:	Barometric	
Linearity:	0	
Scale:		0
Offset:		0
Warmup:		50

Date	Time	Logger ET (min)	PW Chan[1] Feet H2O	TB-06-2 Chan[2] Feet H2O	TB-06-4 Chan[3] Feet H2O	TB-06-5 Chan[4] Feet H2O	TB-06-6 Chan[5] Feet H2O	TB-06-7 Chan[6] Feet H2O	Barometer Chan[0] Inches Hg
05/22/06	15:18	0	17.218	17.759	19.239	19.250	19.319	18.123	29.408
05/22/06	15:19	1	17.215	17.759	19.240	19.251	19.316	18.120	29.410
05/22/06	15:20	2	17.212	17.765	19.239	19.251	19.329	18.123	29.408
05/22/06	15:21	3	17.218	17.753	19.239	19.247	19.323	18.132	29.402
05/22/06	15:22	4	17.229	17.753	19.239	19.246	19.312	18.123	29.400
05/22/06	15:23	5	17.244	17.753	19.239	19.246	19.325	18.123	29.400
05/22/06	15:24	6	17.244	17.753	19.240	19.246	19.325	18.120	29.398
05/22/06	15:25	7	17.244	17.753	19.237	19.246	19.319	18.120	29.398
05/22/06	15:26	8	17.249	17.756	19.240	19.244	19.320	18.111	29.396
05/22/06	15:27	9	17.249	17.753	19.236	19.246	19.319	18.111	29.394

Date	Time	Logger ET (min)	PW Chan[1] Feet H2O	TB-06-2 Chan[2] Feet H2O	TB-06-4 Chan[3] Feet H2O	TB-06-5 Chan[4] Feet H2O	TB-06-6 Chan[5] Feet H2O	TB-06-7 Chan[6] Feet H2O	Barometer Chan[0] Inches Hg
05/22/06	15:28	10	17.252	17.753	19.239	19.244	19.317	18.120	29.394
05/22/06	15:31	13	20.978	19.322	19.940	19.690	20.497	18.464	29.390
05/22/06	15:33	15	21.053	19.360	19.985	19.751	20.558	18.540	29.392
05/22/06	15:34	16	21.096	19.366	20.001	19.766	20.562	18.554	29.392
05/22/06	15:38	20	21.064	19.424	20.058	19.820	20.634	18.601	29.390
05/22/06	15:40	22	21.127	19.441	20.077	19.836	20.652	18.630	29.388
05/22/06	15:42	24	21.145	19.453	20.093	19.848	20.663	18.639	29.386
05/22/06	15:44	26	21.153	19.461	20.103	19.859	20.671	18.659	29.386
05/22/06	15:48	30	21.228	19.490	20.131	19.872	20.704	18.677	29.384
05/22/06	15:53	35	21.179	19.496	20.150	19.888	20.718	18.715	29.382
05/22/06	15:58	40	21.176	19.519	20.163	19.900	20.740	18.718	29.382
05/22/06	16:03	45	21.142	19.528	20.176	19.910	20.760	18.750	29.382
05/22/06	16:08	50	21.168	19.534	20.188	19.918	20.763	18.753	29.384
05/22/06	16:13	55	21.309	19.543	20.194	19.923	20.768	18.758	29.386
05/22/06	16:18	60	21.312	19.551	20.204	19.932	20.774	18.764	29.386
05/22/06	16:23	65	21.182	19.560	20.210	19.939	20.785	18.773	29.388
05/22/06	16:28	70	21.487	19.566	20.217	19.945	20.782	18.776	29.388
05/22/06	16:31	73	21.127	19.569	20.221	19.950	20.807	18.793	29.388
05/22/06	16:32	74	21.355	19.569	20.223	19.951	20.810	18.802	29.388
05/22/06	16:33	75	21.289	19.574	20.226	19.953	20.814	18.811	29.386
05/22/06	16:34	76	21.188	19.572	20.227	19.954	20.817	18.811	29.386
05/22/06	16:35	77	21.447	19.572	20.226	19.953	20.808	18.802	29.386
05/22/06	16:36	78	21.047	19.572	20.226	19.953	20.814	18.811	29.386
05/22/06	16:37	79	21.355	19.572	20.226	19.953	20.807	18.802	29.384
05/22/06	16:38	80	23.586	20.253	20.481	20.075	21.298	18.898	29.384
05/22/06	16:40	82	24.104	20.569	20.639	20.206	21.550	19.003	29.382
05/22/06	16:42	84	24.423	20.769	20.760	20.310	21.713	19.085	29.384
05/22/06	16:44	86	24.682	20.824	20.807	20.352	21.757	19.123	29.382
05/22/06	16:46	88	24.458	20.847	20.833	20.380	21.789	19.158	29.384
05/22/06	16:47	89	24.688	20.859	20.843	20.393	21.812	19.181	29.382
05/22/06	16:48	90	24.607	20.873	20.855	20.403	21.825	19.193	29.382
05/22/06	16:52	94	24.550	20.905	20.884	20.426	21.847	19.213	29.379
05/22/06	16:57	99	24.622	20.925	20.910	20.451	21.884	19.248	29.390
05/22/06	17:02	104	24.521	20.937	20.926	20.461	21.883	19.245	29.375
05/22/06	17:07	109	24.443	20.957	20.944	20.473	21.907	19.274	29.373
05/22/06	17:12	114	24.599	20.963	20.953	20.482	21.916	19.283	29.371
05/22/06	17:17	119	24.889	20.972	20.966	20.490	21.935	19.309	29.371
05/22/06	17:22	124	24.483	20.980	20.975	20.502	21.944	19.318	29.369
05/22/06	17:27	129	24.656	20.989	20.983	20.512	21.946	19.315	29.365
05/22/06	17:32	134	24.604	21.001	20.988	20.518	21.955	19.327	29.363
05/22/06	17:37	139	24.774	21.001	20.994	20.522	21.964	19.336	29.363
05/22/06	17:38	140	25.991	21.340	21.090	20.549	22.197	19.359	29.363
05/22/06	17:39	141	25.082	21.386	21.249	20.677	22.271	19.455	29.361
05/22/06	17:40	142	25.988	21.476	21.183	20.633	22.313	19.426	29.361
05/22/06	17:41	143	26.971	21.795	21.310	20.703	22.537	19.476	29.363
05/22/06	17:42	144	27.112	21.859	21.361	20.753	22.598	19.516	29.361
05/22/06	17:43	145	27.032	21.896	21.389	20.783	22.638	19.545	29.361
05/22/06	17:44	146	27.063	21.917	21.408	20.804	22.662	19.569	29.359
05/22/06	17:46	148	27.049	21.948	21.434	20.833	22.701	19.610	29.359
05/22/06	17:48	150	27.109	21.969	21.455	20.852	22.714	19.630	29.359
05/22/06	17:50	152	27.170	21.977	21.468	20.864	22.735	19.645	29.359
05/22/06	17:52	154	27.287	21.992	21.481	20.874	22.748	19.656	29.361
05/22/06	17:53	155	27.170	21.995	21.485	20.880	22.745	19.656	29.357
05/22/06	17:54	156	27.144	21.998	21.488	20.881	22.753	19.662	29.359
05/22/06	17:58	160	27.147	22.009	21.503	20.894	22.766	19.680	29.357
05/22/06	18:03	165	27.333	22.030	21.519	20.907	22.793	19.700	29.357
05/22/06	18:08	170	27.227	22.038	21.531	20.919	22.799	19.712	29.357
05/22/06	18:13	175	27.259	22.047	21.541	20.926	22.805	19.723	29.357

Date	Time	Logger ET (min)	PW Chan[1] Feet H2O	TB-06-2 Chan[2] Feet H2O	TB-06-4 Chan[3] Feet H2O	TB-06-5 Chan[4] Feet H2O	TB-06-6 Chan[5] Feet H2O	TB-06-7 Chan[6] Feet H2O	Barometer Chan[0] Inches Hg
05/22/06	18:18	180	27.371	22.053	21.550	20.936	22.821	19.735	29.355
05/22/06	18:23	185	27.198	22.061	21.560	20.947	22.828	19.747	29.355
05/22/06	18:28	190	27.296	22.067	21.561	20.948	22.832	19.752	29.351
05/22/06	18:33	195	27.325	22.070	21.569	20.955	22.840	19.764	29.351
05/22/06	18:38	200	27.322	22.076	21.574	20.958	22.845	19.770	29.349
05/22/06	18:39	201	27.267	22.073	21.574	20.960	22.842	19.770	29.349
05/22/06	18:40	202	31.011	23.218	21.983	21.146	23.641	19.904	29.347
05/22/06	18:41	203	31.204	23.380	22.095	21.257	23.789	20.000	29.349
05/22/06	18:42	204	31.301	23.472	22.161	21.327	23.874	20.061	29.349
05/22/06	18:43	205	31.364	23.525	22.202	21.374	23.929	20.105	29.349
05/22/06	18:44	206	31.448	23.565	22.233	21.409	23.975	20.140	29.349
05/22/06	18:45	207	31.436	23.594	22.257	21.432	24.004	20.166	29.349
05/22/06	18:46	208	31.485	23.617	22.276	21.452	24.030	20.192	29.349
05/22/06	18:48	210	31.522	23.652	22.305	21.484	24.065	20.227	29.349
05/22/06	18:50	212	31.528	23.675	22.324	21.505	24.091	20.251	29.349
05/22/06	18:52	214	31.577	23.690	22.343	21.522	24.111	20.274	29.349
05/22/06	18:54	216	31.603	23.704	22.354	21.534	24.123	20.289	29.349
05/22/06	18:55	217	31.574	23.707	22.358	21.538	24.123	20.292	29.349
05/22/06	18:56	218	31.603	23.713	22.359	21.543	24.130	20.300	29.347
05/22/06	19:00	222	31.629	23.730	22.380	21.560	24.155	20.321	29.349
05/22/06	19:05	227	31.643	23.751	22.396	21.578	24.178	20.347	29.349
05/22/06	19:10	232	31.643	23.762	22.411	21.592	24.194	20.364	29.351
05/22/06	19:15	237	31.640	23.765	22.419	21.604	24.205	20.382	29.351
05/22/06	19:20	242	31.649	23.768	22.422	21.610	24.208	20.394	29.351
05/22/06	19:25	247	31.669	23.774	22.428	21.617	24.216	20.405	29.351
05/22/06	19:30	252	31.654	23.782	22.431	21.626	24.226	20.417	29.347
05/22/06	19:35	257	31.669	23.791	22.432	21.633	24.233	20.429	29.347
05/22/06	19:40	262	31.680	23.797	22.438	21.643	24.242	20.440	29.347
05/22/06	19:45	267	31.669	23.808	22.444	21.649	24.252	20.449	29.347
05/22/06	19:50	272	31.703	23.811	22.448	21.656	24.259	20.458	29.345
05/22/06	19:51	273	30.913	23.583	22.394	21.621	24.100	20.434	29.347
05/22/06	19:55	277	30.319	23.336	22.287	21.530	23.906	20.359	29.347
05/22/06	19:57	279	30.259	23.310	22.263	21.506	23.880	20.338	29.347
05/22/06	19:58	280	23.045	22.235	22.165	21.490	23.109	20.318	29.347
05/22/06	19:59	281	19.074	19.551	20.830	20.788	21.205	19.799	29.347
05/22/06	20:00	282	18.685	19.148	20.545	20.487	20.834	19.557	29.347
05/22/06	20:01	283	18.463	18.919	20.372	20.299	20.604	19.385	29.345
05/22/06	20:02	284	18.330	18.774	20.252	20.173	20.452	19.257	29.345
05/22/06	20:03	285	18.232	18.667	20.164	20.076	20.339	19.161	29.347
05/22/06	20:04	286	18.154	18.588	20.096	20.005	20.255	19.082	29.347
05/22/06	20:05	287	18.094	18.525	20.042	19.951	20.188	19.024	29.347
05/22/06	20:07	289	18.002	18.432	19.957	19.868	20.088	18.927	29.347
05/22/06	20:09	291	17.938	18.374	19.896	19.807	20.019	18.860	29.349
05/22/06	20:11	293	17.889	18.325	19.846	19.766	19.964	18.811	29.349
05/22/06	20:13	295	17.855	18.287	19.808	19.734	19.922	18.767	29.349
05/22/06	20:14	296	17.835	18.269	19.792	19.718	19.906	18.750	29.349
05/22/06	20:15	297	17.820	18.258	19.778	19.708	19.888	18.735	29.349
05/22/06	20:19	301	17.771	18.211	19.725	19.665	19.838	18.680	29.349
05/22/06	20:24	306	17.725	18.168	19.674	19.626	19.786	18.636	29.349
05/22/06	20:29	311	17.656	18.139	19.636	19.598	19.751	18.595	29.367
05/22/06	20:33	315	17.624	18.124	19.611	19.587	19.728	18.572	29.371
05/22/06	20:34	316	17.641	18.107		19.576	19.719	18.566	29.357
05/22/06	20:39	321	17.641	18.087		19.562	19.693	18.537	29.351
05/22/06	20:44	326	17.621	18.066		19.544	19.671	18.513	29.353
05/22/06	20:49	331	17.604	18.049		19.530	19.655	18.493	29.351
05/22/06	20:54	336	17.592	18.037		19.521	19.646	18.484	29.351
05/22/06	20:59	341	17.575	18.026		19.512	19.629	18.473	29.353
05/22/06	21:19	361	17.535	17.988		19.480	19.588	18.420	29.355

Date Time	Logger ET (min)	PW Chan[1] Feet H2O	TB-06-2 Chan[2] Feet H2O	TB-06-4 Chan[3] Feet H2O	TB-06-5 Chan[4] Feet H2O	TB-06-6 Chan[5] Feet H2O	TB-06-7 Chan[6] Feet H2O	Barometer Chan[0] Inches Hg
05/22/06 21:39	381	17.509	17.962		19.458	19.559	18.394	29.353
05/22/06 21:59	401	17.494	17.950		19.444	19.541	18.368	29.347
05/22/06 22:19	421	17.483	17.939		19.434	19.528	18.350	29.345
05/22/06 22:39	441	17.474	17.930		19.425	19.516	18.339	29.343
05/22/06 22:59	461	17.469	17.924		19.419	19.507	18.327	29.345
05/22/06 23:19	481	17.460	17.918		19.412	19.502	18.318	29.337
05/22/06 23:39	501	17.460	17.916		19.409	19.499	18.312	29.341
05/22/06 23:59	521	17.457	17.913		19.407	19.496	18.309	29.347
05/23/06 0:19	541	17.454	17.910		19.404	19.491	18.304	29.345
05/23/06 0:39	561	17.451	17.907		19.402	19.488	18.295	29.339
05/23/06 0:59	581	17.448	17.907		19.402	19.487	18.292	29.339
05/23/06 1:19	601	17.451	17.904		19.400	19.486	18.292	29.337
05/23/06 1:39	621	17.448	17.904		19.400	19.484	18.283	29.333
05/23/06 1:59	641	17.451	17.904		19.400	19.484	18.286	29.335
05/23/06 2:19	661	17.451	17.907		19.402	19.484	18.280	29.331
05/23/06 2:39	681	17.451	17.907		19.400	19.486	18.283	29.325
05/23/06 2:59	701	17.448	17.907		19.400	19.483	18.280	29.320
05/23/06 3:19	721	17.448	17.904		19.400	19.484	18.280	29.314
05/23/06 3:39	741	17.451	17.907		19.400	19.483	18.277	29.310
05/23/06 3:59	761	17.451	17.907		19.400	19.486	18.274	29.308
05/23/06 4:19	781	17.454	17.907		19.402	19.487	18.277	29.310
05/23/06 4:39	801	17.457	17.910		19.404	19.490	18.277	29.316
05/23/06 4:59	821	17.463	17.918		19.409	19.494	18.280	29.322
05/23/06 5:19	841	17.466	17.921		19.412	19.497	18.286	29.335
05/23/06 5:39	861	17.471	17.924		19.418	19.502	18.289	29.341
05/23/06 5:59	881	17.474	17.927		19.419	19.502	18.289	29.343
05/23/06 6:19	901	17.474	17.930		19.420	19.504	18.292	29.349
05/23/06 6:39	921	17.477	17.930		19.423	19.507	18.295	29.355
05/23/06 6:59	941	17.483	17.936		19.429	19.512	18.298	29.367
05/23/06 7:19	961	17.483	17.936		19.428	19.512	18.298	29.367
05/23/06 7:39	981	17.489	17.942		19.434	19.520	18.306	29.379
05/23/06 7:59	1001	17.489	17.942		19.431	19.510	18.301	29.390
05/23/06 8:11	1013	17.445	17.930		19.431	19.506	18.298	29.422
05/23/06 8:13	1015	17.405	17.930	19.451	19.431	19.513	18.304	29.424

In-Situ Inc. MiniTroll Pro

Report generated: 05/27/06 8:23:46
Report from file: C:\Win-Situ\Data\SN00860 2006-05-22 133101 AEC TB-06-1.bin
DataMgr Version 3.71

Serial number: 860
Firmware Version 3.09
Unit name: B14958B

Test name: AEC TB-06-1

Test defined on: 05/22/06 8:12:15
Test started on: 05/22/06 13:31:01
Test stopped on: 05/23/06 7:32:54
Test extracted on: N/A

Data gathered using Linear testing
Time between data points: Minutes.
Number of data samples: 217

TOTAL DATA SAMPLES 217

Channel number [1]
Measurement type: Temperature
Channel name:

Channel number [2]
Measurement type: Pressure
Channel name: Troll B14958B
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: TOC
User-defined reference: 18.19 Feet H2O
Referenced on: channel definition.
Pressure head at reference: 16.177 Feet H2O

Date	Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
05/22/06	13:31	0	57.71	18.192
05/22/06	13:36	5	57.71	18.190
05/22/06	13:41	10	57.71	18.194
05/22/06	13:46	15	57.71	18.192
05/22/06	13:51	20	57.68	18.191
05/22/06	13:56	25	57.68	18.191
05/22/06	14:01	30	57.68	18.193
05/22/06	14:06	35	57.71	18.194
05/22/06	14:11	40	57.71	18.196
05/22/06	14:16	45	57.71	18.198
05/22/06	14:21	50	57.71	18.196
05/22/06	14:26	55	57.71	18.198
05/22/06	14:31	60	57.71	18.198
05/22/06	14:36	65	57.71	18.196
05/22/06	14:41	70	57.71	18.198
05/22/06	14:46	75	57.71	18.199
05/22/06	14:51	80	57.71	18.199
05/22/06	14:56	85	57.71	18.203
05/22/06	15:01	90	57.71	18.203
05/22/06	15:06	95	57.71	18.203

Date	Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
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05/22/06	15:11	100	57.71	18.203
05/22/06	15:16	105	57.71	18.203
05/22/06	15:21	110	57.71	18.205
05/22/06	15:26	115	57.71	18.205
05/22/06	15:31	120	57.68	18.250
05/22/06	15:36	125	57.68	18.326
05/22/06	15:41	130	57.68	18.356
05/22/06	15:46	135	57.68	18.375
05/22/06	15:51	140	57.68	18.388
05/22/06	15:56	145	57.66	18.399
05/22/06	16:01	150	57.66	18.404
05/22/06	16:06	155	57.66	18.410
05/22/06	16:11	160	57.66	18.420
05/22/06	16:16	165	57.66	18.421
05/22/06	16:21	170	57.66	18.427
05/22/06	16:26	175	57.66	18.433
05/22/06	16:31	180	57.66	18.437
05/22/06	16:36	185	57.66	18.440
05/22/06	16:41	190	57.66	18.484
05/22/06	16:46	195	57.66	18.540
05/22/06	16:51	200	57.66	18.567
05/22/06	16:56	205	57.66	18.582
05/22/06	17:01	210	57.66	18.593
05/22/06	17:06	215	57.66	18.605
05/22/06	17:11	220	57.66	18.610
05/22/06	17:16	225	57.66	18.618
05/22/06	17:21	230	57.66	18.624
05/22/06	17:26	235	57.66	18.629
05/22/06	17:31	240	57.66	18.635
05/22/06	17:36	245	57.66	18.641
05/22/06	17:41	250	57.66	18.661
05/22/06	17:46	255	57.66	18.709
05/22/06	17:51	260	57.66	18.735
05/22/06	17:56	265	57.66	18.748
05/22/06	18:01	270	57.66	18.758
05/22/06	18:06	275	57.66	18.767
05/22/06	18:11	280	57.66	18.775
05/22/06	18:16	285	57.66	18.782
05/22/06	18:21	290	57.66	18.788
05/22/06	18:26	295	57.66	18.794
05/22/06	18:31	300	57.66	18.797
05/22/06	18:36	305	57.66	18.803
05/22/06	18:41	310	57.66	18.820
05/22/06	18:46	315	57.66	18.911
05/22/06	18:51	320	57.66	18.947
05/22/06	18:56	325	57.66	18.969
05/22/06	19:01	330	57.64	18.982
05/22/06	19:06	335	57.64	18.995
05/22/06	19:11	340	57.64	19.007
05/22/06	19:16	345	57.64	19.014
05/22/06	19:21	350	57.64	19.022
05/22/06	19:26	355	57.64	19.029
05/22/06	19:31	360	57.64	19.033
05/22/06	19:36	365	57.64	19.041
05/22/06	19:41	370	57.64	19.048
05/22/06	19:46	375	57.64	19.054
05/22/06	19:51	380	57.64	19.059
05/22/06	19:56	385	57.64	19.042

Date	Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
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05/22/06	20:01	390	57.64	18.893
05/22/06	20:06	395	57.66	18.688
05/22/06	20:11	400	57.66	18.603
05/22/06	20:16	405	57.66	18.556
05/22/06	20:21	410	57.66	18.525
05/22/06	20:26	415	57.66	18.501
05/22/06	20:31	420	57.64	18.485
05/22/06	20:36	425	57.66	18.471
05/22/06	20:41	430	57.66	18.459
05/22/06	20:46	435	57.66	18.450
05/22/06	20:51	440	57.66	18.442
05/22/06	20:56	445	57.66	18.442
05/22/06	21:01	450	57.66	18.437
05/22/06	21:06	455	57.66	18.431
05/22/06	21:11	460	57.66	18.425
05/22/06	21:16	465	57.66	18.420
05/22/06	21:21	470	57.66	18.416
05/22/06	21:26	475	57.66	18.410
05/22/06	21:31	480	57.66	18.408
05/22/06	21:36	485	57.66	18.404
05/22/06	21:41	490	57.64	18.400
05/22/06	21:46	495	57.64	18.398
05/22/06	21:51	500	57.64	18.395
05/22/06	21:56	505	57.64	18.393
05/22/06	22:01	510	57.64	18.391
05/22/06	22:06	515	57.64	18.391
05/22/06	22:11	520	57.64	18.387
05/22/06	22:16	525	57.64	18.387
05/22/06	22:21	530	57.64	18.383
05/22/06	22:26	535	57.64	18.381
05/22/06	22:31	540	57.66	18.380
05/22/06	22:36	545	57.64	18.380
05/22/06	22:41	550	57.64	18.380
05/22/06	22:46	555	57.64	18.380
05/22/06	22:51	560	57.62	18.377
05/22/06	22:56	565	57.62	18.375
05/22/06	23:01	570	57.64	18.374
05/22/06	23:06	575	57.64	18.374
05/22/06	23:11	580	57.64	18.374
05/22/06	23:16	585	57.64	18.370
05/22/06	23:21	590	57.64	18.368
05/22/06	23:26	595	57.62	18.366
05/22/06	23:31	600	57.62	18.368
05/22/06	23:36	605	57.62	18.368
05/22/06	23:41	610	57.62	18.368
05/22/06	23:46	615	57.62	18.368
05/22/06	23:51	620	57.62	18.368
05/22/06	23:56	625	57.62	18.366
05/23/06	0:01	630	57.62	18.366
05/23/06	0:06	635	57.62	18.366
05/23/06	0:11	640	57.62	18.364
05/23/06	0:16	645	57.62	18.366
05/23/06	0:21	650	57.62	18.364
05/23/06	0:26	655	57.59	18.365
05/23/06	0:31	660	57.59	18.364
05/23/06	0:36	665	57.59	18.362
05/23/06	0:41	670	57.59	18.364
05/23/06	0:46	675	57.62	18.362

Date	Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
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05/23/06	0:51	680	57.62	18.362
05/23/06	0:56	685	57.62	18.362
05/23/06	1:01	690	57.62	18.364
05/23/06	1:06	695	57.62	18.362
05/23/06	1:11	700	57.62	18.362
05/23/06	1:16	705	57.62	18.362
05/23/06	1:21	710	57.59	18.362
05/23/06	1:26	715	57.59	18.362
05/23/06	1:31	720	57.59	18.364
05/23/06	1:36	725	57.59	18.362
05/23/06	1:41	730	57.59	18.364
05/23/06	1:46	735	57.62	18.364
05/23/06	1:51	740	57.64	18.364
05/23/06	1:56	745	57.64	18.364
05/23/06	2:01	750	57.64	18.363
05/23/06	2:06	755	57.62	18.366
05/23/06	2:11	760	57.64	18.364
05/23/06	2:16	765	57.64	18.364
05/23/06	2:21	770	57.64	18.364
05/23/06	2:26	775	57.64	18.363
05/23/06	2:31	780	57.64	18.364
05/23/06	2:36	785	57.62	18.364
05/23/06	2:41	790	57.62	18.366
05/23/06	2:46	795	57.62	18.364
05/23/06	2:51	800	57.64	18.364
05/23/06	2:56	805	57.64	18.363
05/23/06	3:01	810	57.64	18.363
05/23/06	3:06	815	57.64	18.364
05/23/06	3:11	820	57.62	18.366
05/23/06	3:16	825	57.62	18.364
05/23/06	3:21	830	57.62	18.364
05/23/06	3:26	835	57.64	18.364
05/23/06	3:31	840	57.62	18.362
05/23/06	3:36	845	57.64	18.363
05/23/06	3:41	850	57.64	18.363
05/23/06	3:46	855	57.64	18.364
05/23/06	3:51	860	57.64	18.363
05/23/06	3:56	865	57.64	18.363
05/23/06	4:01	870	57.64	18.363
05/23/06	4:06	875	57.64	18.363
05/23/06	4:11	880	57.64	18.364
05/23/06	4:16	885	57.64	18.364
05/23/06	4:21	890	57.62	18.366
05/23/06	4:26	895	57.64	18.366
05/23/06	4:31	900	57.62	18.368
05/23/06	4:36	905	57.62	18.368
05/23/06	4:41	910	57.62	18.370
05/23/06	4:46	915	57.64	18.372
05/23/06	4:51	920	57.62	18.372
05/23/06	4:56	925	57.64	18.372
05/23/06	5:01	930	57.64	18.372
05/23/06	5:06	935	57.64	18.372
05/23/06	5:11	940	57.62	18.372
05/23/06	5:16	945	57.62	18.375
05/23/06	5:21	950	57.62	18.375
05/23/06	5:26	955	57.62	18.379
05/23/06	5:31	960	57.59	18.379
05/23/06	5:36	965	57.59	18.379

Date	Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
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05/23/06	5:41	970	57.59	18.381
05/23/06	5:46	975	57.59	18.381
05/23/06	5:51	980	57.59	18.381
05/23/06	5:56	985	57.59	18.381
05/23/06	6:01	990	57.59	18.382
05/23/06	6:06	995	57.59	18.384
05/23/06	6:11	1000	57.59	18.382
05/23/06	6:16	1005	57.59	18.384
05/23/06	6:21	1010	57.62	18.383
05/23/06	6:26	1015	57.62	18.383
05/23/06	6:31	1020	57.62	18.387
05/23/06	6:36	1025	57.62	18.387
05/23/06	6:41	1030	57.62	18.389
05/23/06	6:46	1035	57.62	18.390
05/23/06	6:51	1040	57.62	18.389
05/23/06	6:56	1045	57.62	18.390
05/23/06	7:01	1050	57.62	18.390
05/23/06	7:06	1055	57.62	18.389
05/23/06	7:11	1060	57.62	18.389
05/23/06	7:16	1065	57.62	18.390
05/23/06	7:21	1070	57.62	18.392
05/23/06	7:26	1075	57.62	18.392
05/23/06	7:31	1080	57.62	18.383

In-Situ Inc. MiniTroll Pro

Report generated: 05/27/06 8:32:10
Report from file: C:\Win-Situ\Data\SN01114 2006-05-22 132000 AEC River Gage.bin
DataMgr Version 3.71

Serial number: 1114
Firmware Version 3.09
Unit name: B14989B

Test name: AEC River Gage

Test defined on: 05/22/06 9:21:35
Test started on: 05/22/06 13:20:00
Test stopped on: 05/27/06 8:31:55
Test extracted on: N/A

Data gathered using Linear testing
Time between data points: 5.0000 Minutes.
Number of data samples: 1383

TOTAL DATA SAMPLES 1383

Channel number [1]
Measurement type: Temperature
Channel name: temperature

Channel number [2]
Measurement type: Pressure
Channel name: Pressure
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: TOC
User-defined reference: 2.31 Feet H2O
Referenced on: channel definition.
Pressure head at reference: 2.198 Feet H2O

Date	Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
05/22/06	13:20	0	69.18	2.306
05/22/06	13:25	5	69.21	2.312
05/22/06	13:30	10	69.25	2.284
05/22/06	13:35	15	69.27	2.296
05/22/06	13:40	20	69.30	2.305
05/22/06	13:45	25	69.32	2.325
05/22/06	13:50	30	69.32	2.317
05/22/06	13:55	35	69.34	2.308
05/22/06	14:00	40	69.36	2.322
05/22/06	14:05	45	69.41	2.324
05/22/06	14:10	50	69.43	2.313
05/22/06	14:15	55	69.48	2.313
05/22/06	14:20	60	69.52	2.316
05/22/06	14:25	65	69.54	2.302
05/22/06	14:30	70	69.57	2.308
05/22/06	14:35	75	69.61	2.303
05/22/06	14:40	80	69.63	2.315
05/22/06	14:45	85	69.66	2.319
05/22/06	14:50	90	69.68	2.323
05/22/06	14:55	95	69.72	2.333

Date	Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
05/22/06	15:00	100	69.75	2.330
05/22/06	15:05	105	69.77	2.326
05/22/06	15:10	110	69.79	2.313
05/22/06	15:15	115	69.79	2.334
05/22/06	15:20	120	69.84	2.319
05/22/06	15:25	125	69.86	2.333
05/22/06	15:30	130	69.88	2.337
05/22/06	15:35	135	69.91	2.325
05/22/06	15:40	140	69.93	2.322
05/22/06	15:45	145	69.95	2.336
05/22/06	15:50	150	69.95	2.326
05/22/06	15:55	155	69.95	2.330
05/22/06	16:00	160	69.97	2.326
05/22/06	16:05	165	70.00	2.328
05/22/06	16:10	170	70.02	2.346
05/22/06	16:15	175	70.02	2.331
05/22/06	16:20	180	70.04	2.338
05/22/06	16:25	185	70.06	2.341
05/22/06	16:30	190	70.06	2.339
05/22/06	16:35	195	70.06	2.339
05/22/06	16:40	200	70.09	2.351
05/22/06	16:45	205	70.11	2.332
05/22/06	16:50	210	70.13	2.343
05/22/06	16:55	215	70.13	2.353
05/22/06	17:00	220	70.15	2.355
05/22/06	17:05	225	70.15	2.349
05/22/06	17:10	230	70.15	2.349
05/22/06	17:15	235	70.15	2.347
05/22/06	17:20	240	70.18	2.359
05/22/06	17:25	245	70.18	2.361
05/22/06	17:30	250	70.18	2.348
05/22/06	17:35	255	70.20	2.358
05/22/06	17:40	260	70.20	2.365
05/22/06	17:45	265	70.20	2.363
05/22/06	17:50	270	70.20	2.361
05/22/06	17:55	275	70.22	2.367
05/22/06	18:00	280	70.22	2.365
05/22/06	18:05	285	70.22	2.362
05/22/06	18:10	290	70.22	2.364
05/22/06	18:15	295	70.22	2.365
05/22/06	18:20	300	70.22	2.377
05/22/06	18:25	305	70.22	2.365
05/22/06	18:30	310	70.24	2.371
05/22/06	18:35	315	70.24	2.375
05/22/06	18:40	320	70.24	2.379
05/22/06	18:45	325	70.24	2.387
05/22/06	18:50	330	70.24	2.368
05/22/06	18:55	335	70.24	2.371
05/22/06	19:00	340	70.24	2.364
05/22/06	19:05	345	70.27	2.383
05/22/06	19:10	350	70.27	2.381
05/22/06	19:15	355	70.27	2.374
05/22/06	19:20	360	70.29	2.389
05/22/06	19:25	365	70.27	2.379
05/22/06	19:30	370	70.29	2.389
05/22/06	19:35	375	70.29	2.384
05/22/06	19:40	380	70.29	2.389
05/22/06	19:45	385	70.29	2.384
05/22/06	19:50	390	70.29	2.387

Date	Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
05/22/06	19:55	395	70.29	2.393
05/22/06	20:00	400	70.29	2.391
05/22/06	20:05	405	70.29	2.399
05/22/06	20:10	410	70.29	2.397
05/22/06	20:15	415	70.29	2.399
05/22/06	20:20	420	70.29	2.405
05/22/06	20:25	425	70.29	2.409
05/22/06	20:30	430	70.27	2.406
05/22/06	20:35	435	70.27	2.403
05/22/06	20:40	440	70.27	2.406
05/22/06	20:45	445	70.24	2.404
05/22/06	20:50	450	70.24	2.404
05/22/06	20:55	455	70.24	2.414
05/22/06	21:00	460	70.24	2.423
05/22/06	21:05	465	70.22	2.404
05/22/06	21:10	470	70.22	2.406
05/22/06	21:15	475	70.22	2.419
05/22/06	21:20	480	70.22	2.417
05/22/06	21:25	485	70.20	2.421
05/22/06	21:30	490	70.20	2.425
05/22/06	21:35	495	70.20	2.429
05/22/06	21:40	500	70.18	2.428
05/22/06	21:45	505	70.18	2.417
05/22/06	21:50	510	70.18	2.427
05/22/06	21:55	515	70.18	2.421
05/22/06	22:00	520	70.15	2.432
05/22/06	22:05	525	70.15	2.430
05/22/06	22:10	530	70.15	2.430
05/22/06	22:15	535	70.13	2.438
05/22/06	22:20	540	70.13	2.436
05/22/06	22:25	545	70.13	2.436
05/22/06	22:30	550	70.13	2.434
05/22/06	22:35	555	70.13	2.440
05/22/06	22:40	560	70.13	2.440
05/22/06	22:45	565	70.13	2.445
05/22/06	22:50	570	70.11	2.441
05/22/06	22:55	575	70.11	2.447
05/22/06	23:00	580	70.11	2.445
05/22/06	23:05	585	70.11	2.439
05/22/06	23:10	590	70.11	2.445
05/22/06	23:15	595	70.11	2.445
05/22/06	23:20	600	70.09	2.447
05/22/06	23:25	605	70.09	2.447
05/22/06	23:30	610	70.09	2.443
05/22/06	23:35	615	70.09	2.443
05/22/06	23:40	620	70.06	2.450
05/22/06	23:45	625	70.06	2.452
05/22/06	23:50	630	70.06	2.452
05/22/06	23:55	635	70.06	2.456
05/23/06	0:00	640	70.04	2.454
05/23/06	0:05	645	70.04	2.456
05/23/06	0:10	650	70.04	2.454
05/23/06	0:15	655	70.04	2.462
05/23/06	0:20	660	70.02	2.461
05/23/06	0:25	665	70.02	2.463
05/23/06	0:30	670	70.02	2.450
05/23/06	0:35	675	70.02	2.463
05/23/06	0:40	680	70.02	2.463
05/23/06	0:45	685	70.00	2.459

Date Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
05/23/06 0:50	690	70.00	2.459
05/23/06 0:55	695	70.00	2.457
05/23/06 1:00	700	70.00	2.463
05/23/06 1:05	705	69.97	2.467
05/23/06 1:10	710	69.97	2.463
05/23/06 1:15	715	69.97	2.469
05/23/06 1:20	720	69.95	2.470
05/23/06 1:25	725	69.95	2.470
05/23/06 1:30	730	69.95	2.476
05/23/06 1:35	735	69.95	2.476
05/23/06 1:40	740	69.93	2.470
05/23/06 1:45	745	69.93	2.480
05/23/06 1:50	750	69.93	2.468
05/23/06 1:55	755	69.91	2.476
05/23/06 2:00	760	69.91	2.476
05/23/06 2:05	765	69.91	2.474
05/23/06 2:10	770	69.91	2.483
05/23/06 2:15	775	69.88	2.489
05/23/06 2:20	780	69.88	2.487
05/23/06 2:25	785	69.86	2.481
05/23/06 2:30	790	69.86	2.481
05/23/06 2:35	795	69.86	2.490
05/23/06 2:40	800	69.84	2.490
05/23/06 2:45	805	69.84	2.486
05/23/06 2:50	810	69.84	2.479
05/23/06 2:55	815	69.82	2.482
05/23/06 3:00	820	69.82	2.490
05/23/06 3:05	825	69.82	2.477
05/23/06 3:10	830	69.79	2.486
05/23/06 3:15	835	69.79	2.488
05/23/06 3:20	840	69.79	2.492
05/23/06 3:25	845	69.77	2.491
05/23/06 3:30	850	69.77	2.501
05/23/06 3:35	855	69.75	2.493
05/23/06 3:40	860	69.75	2.491
05/23/06 3:45	865	69.75	2.497
05/23/06 3:50	870	69.72	2.497
05/23/06 3:55	875	69.72	2.489
05/23/06 4:00	880	69.72	2.499
05/23/06 4:05	885	69.70	2.498
05/23/06 4:10	890	69.70	2.508
05/23/06 4:15	895	69.70	2.504
05/23/06 4:20	900	69.68	2.496
05/23/06 4:25	905	69.68	2.502
05/23/06 4:30	910	69.66	2.498
05/23/06 4:35	915	69.66	2.509
05/23/06 4:40	920	69.66	2.506
05/23/06 4:45	925	69.66	2.506
05/23/06 4:50	930	69.63	2.505
05/23/06 4:55	935	69.63	2.511
05/23/06 5:00	940	69.63	2.509
05/23/06 5:05	945	69.61	2.509
05/23/06 5:10	950	69.61	2.509
05/23/06 5:15	955	69.61	2.515
05/23/06 5:20	960	69.59	2.522
05/23/06 5:25	965	69.59	2.524
05/23/06 5:30	970	69.59	2.520
05/23/06 5:35	975	69.59	2.524
05/23/06 5:40	980	69.57	2.505

Date	Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
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05/23/06	5:45	985	69.57	2.522
05/23/06	5:50	990	69.57	2.518
05/23/06	5:55	995	69.57	2.518
05/23/06	6:00	1000	69.57	2.522

APPENDIX F
Constant-Rate Aquifer Test Data

Well ID: PW **Job No.:** 106-294
Client: Associated Electric Coop
Location: Norborne, Missouri Site
Well Information: Test pumping well with 0.080-inch slot wire-wrapped screen set from 51.5 to 71.5 feet below grade
Test Information: 72-Hour Constant-rate aquifer test
Measuring Point: Top of 12-inch steel casing, approx. 2.0 feet above grade. 686.38 Measuring Point Elevation

Orifice Pipe Diameter: 6 **Orifice Dia.:** 5 **Orifice Constant:** 0.791

Date/Time	Elapsed Time from Start of Test	Elapsed Time from Start of Step	Depth to Water	Observed Drawdown	Water Elevation	Manometer Reading	Pumping Rate	Comments
(hr:min)	(minutes)	(minutes)	(feet)	(feet)	(feet)	(inches)	(gpm)	
05/23/06 7:42			17.44		668.94			
05/23/06 7:59			17.43		668.95			
05/23/06 8:18			17.43		668.95			
05/23/06 8:21	0			0				Start of constant-rate test
05/23/06 8:22	1		28.51	11.08	657.87	63 1/2	992	
05/23/06 8:23	2		28.94	11.51	657.44			
05/23/06 8:24	3		29.21	11.78	657.17			
05/23/06 8:25	4		29.36	11.93	657.02			
05/23/06 8:26	5		29.47	12.04	656.91			
05/23/06 8:27	6		29.56	12.13	656.82	64	996	
05/23/06 8:29	8		29.66	12.23	656.72			
05/23/06 8:31	10		29.71	12.28	656.67	64	996	
05/23/06 8:33	12		29.76	12.33	656.62			
05/23/06 8:35	14		29.81	12.38	656.57			
05/23/06 8:38	17		29.85	12.42	656.53	64	996	
05/23/06 8:41	20		29.90	12.47	656.48			
05/23/06 8:46	25		29.85	12.42	656.53	63	988	
05/23/06 8:51	30		29.90	12.47	656.48	63	988	
05/23/06 8:57	36		29.94	12.51	656.44	63	988	
05/23/06 9:04	43		30.20	12.77	656.18	65	1004	Adjusted rate up
05/23/06 9:19	58		30.39	12.96	655.99	65	1004	
05/23/06 9:36	75		30.40	12.97	655.98	65 1/2	1008	
05/23/06 9:51	90		30.42	12.99	655.96	65 1/2	1008	
05/23/06 10:14	113		30.45	13.02	655.93	65 1/2	1008	
05/23/06 10:26	125		30.47	13.04	655.91	65 3/4	1010	
05/23/06 10:44	143		30.49	13.06	655.89	65 3/4	1010	
05/23/06 11:06	165		30.51	13.08	655.87	66	1011	
05/23/06 11:31	190		30.55	13.12	655.83	65 3/4	1010	
05/23/06 12:14	233		30.43	13.00	655.95	65 3/4	1010	
05/23/06 12:33	252		30.51	13.08	655.87	66 1/4	1013	
05/23/06 13:43	322		30.56	13.13	655.82	66 1/4	1013	
05/23/06 14:14	353		30.56	13.13	655.82	66 1/4	1013	
05/23/06 14:52	391		30.53	13.10	655.85	66 1/4	1013	
05/23/06 15:20	419		30.57	13.14	655.81	66 1/4	1013	
05/23/06 16:34	493		30.60	13.17	655.78	66	1011	
05/23/06 17:20	539		30.60	13.17	655.78	66 1/4	1013	
05/23/06 18:21	600		30.62	13.19	655.76	66 1/2	1015	
05/23/06 19:21	660		30.66	13.23	655.72	66	1011	
05/23/06 20:34	733		30.66	13.23	655.72	66	1011	
05/23/06 21:01	760		30.67	13.24	655.71	66	1011	
05/23/06 22:21	840		30.67	13.24	655.71	66	1011	
05/24/06 7:23	1382		30.82	13.39	655.56	66	1011	
05/24/06 8:30	1449		30.83	13.40	655.55			
05/24/06 9:35	1514		30.83	13.40	655.55	66	1011	
05/24/06 10:13	1552		30.84	13.41	655.54	66 1/2	1015	
05/24/06 11:23	1622		30.84	13.41	655.54	66 1/2	1015	
05/24/06 12:40	1699		30.85	13.42	655.53	66	1011	
05/24/06 13:39	1758		30.95	13.52	655.43			
05/24/06 14:21	1800		30.84	13.41	655.54	66	1011	
05/24/06 15:20	1859		30.84	13.41	655.54	66	1011	
05/24/06 16:17	1916		30.84	13.41	655.54	66	1011	
05/24/06 17:22	1981		30.83	13.40	655.55	66	1011	

Well ID: PW **Job No.:** 106-294
Client: Associated Electric Coop
Location: Norborne, Missouri Site
Well Information: Test pumping well with 0.080-inch slot wire-wrapped screen set from 51.5 to 71.5 feet below grade
Test Information: 72-Hour Constant-rate aquifer test
Measuring Point: Top of 12-inch steel casing, approx. 2.0 feet above grade. 686.38 Measuring Point Elevation

Orifice Pipe Diameter: 6 **Orifice Dia.:** 5 **Orifice Constant:** 0.791

Date/Time	Elapsed Time from Start of Test	Elapsed Time from Start of Step	Depth to Water	Observed Drawdown	Water Elevation	Manometer Reading	Pumping Rate	Comments
(hr:min)	(minutes)	(minutes)	(feet)	(feet)	(feet)	(inches)	(gpm)	
05/24/06 18:30	2049		30.83	13.40	655.55	66	1011	
05/24/06 19:27	2106		30.84	13.41	655.54	66	1011	
05/24/06 20:24	2163		30.84	13.41	655.54	66	1011	
05/25/06 7:07	2806		30.84	13.41	655.54	66	1011	
05/25/06 8:21	2880		30.83	13.40	655.55	66	1011	
05/25/06 10:23	3002		30.82	13.39	655.56	66	1011	
05/25/06 11:58	3097		30.81	13.38	655.57	66	1011	
05/25/06 14:29	3248		30.84	13.41	655.54	66	1011	
05/25/06 16:31	3370		30.84	13.41	655.54	66	1011	
05/25/06 17:25	3424		30.84	13.41	655.54	66	1011	
05/25/06 19:58	3577		30.85	13.42	655.53	66	1011	
05/26/06 7:22	4261		30.95	13.52	655.43	66	1011	
05/26/06 8:30	4329		30.96	13.53	655.42			
05/26/06 8:33	4332	0						Pump Off Start Recovery
05/26/06 8:34	4333	1	19.77	2.34	666.61			
05/26/06 8:35	4334	2	19.36	1.93	667.02			
05/26/06 8:36	4335	3	19.11	1.68	667.27			
05/26/06 8:37	4336	4	18.88	1.45	667.50			
05/26/06 8:38	4337	5	18.88	1.45	667.50			
05/26/06 8:39	4338	6	18.80	1.37	667.58			
05/26/06 8:42	4341	9	18.67	1.24	667.71			
05/26/06 8:43	4342	10	18.83	1.40	667.55			
05/26/06 8:46	4345	13	18.57	1.14	667.81			
05/26/06 8:48	4347	15	18.52	1.09	667.86			
05/26/06 8:59	4358	26	18.46	1.03	667.92			
05/26/06 9:00	4359	27	18.42	0.99	667.96			
05/26/06 9:05	4364	32	18.38	0.95	668.00			
05/26/06 9:15	4374	42	18.35	0.92	668.03			
05/26/06 9:20	4379	47	18.33	0.90	668.05			
05/26/06 9:41	4400	68	18.29	0.86	668.09			
05/26/06 14:23	4682	350	18.11	0.68	668.27			
05/26/06 15:55	4774	442	18.08	0.65	668.30			
05/26/06 17:49	4888	556	18.09	0.66	668.29			
05/27/06 6:58	5677	1345	18.16	0.73	668.22			

In-Situ Inc.	Hermit 3000	
Report generated:	05/26/06	17:41:28
Report from file:	C:\Win-Situ\Data\SN45692 2006-05-23 081947 AEC Con-Rate.bin	
DataMgr Version	3.71	
Serial number:	45692	
Firmware Version	7.1	
Unit name:	Hermit 3000	
Test name:		AEC Con-Rate
Test defined on:	05/22/06	7:48:28
Test started on:	05/23/06	8:19:47
Test stopped on:	N/A	N/A
Test extracted on:	05/23/06	21:30:48
Data gathered using Logarithmic testing		
Maximum time between data points:		10 Minutes
Number of data samples:	532	
TOTAL DATA SAMPLES	532	
Channel number [1]		
Measurement type:	Pressure	
Channel name:	PW	
Linearity:	0.1254	
Scale:		19.8458
Offset:		-0.0609
Warmup:		50
Specific gravity:	1	
Mode:	TOC	
User-defined reference:	17.21	Feet H2O
Referenced on:	channel definition.	
Pressure head at reference:	27.228	Feet H2O
Channel number [2]		
Measurement type:	Pressure	
Channel name:	TB-06-2	
Linearity:	0.1185	
Scale:		20.0059
Offset:		0.0508
Warmup:		50
Specific gravity:	1	
Mode:	TOC	
User-defined reference:	17.73	Feet H2O
Referenced on:	channel definition.	
Pressure head at reference:	22.812	Feet H2O
Channel number [3]		
Measurement type:	Pressure	
Channel name:	TB-06-4	
Linearity:	0.0239	
Scale:		10.0987
Offset:		0.9336
Warmup:		50
Specific gravity:	1	
Mode:	TOC	
User-defined reference:	19.43	Feet H2O
Referenced on:	channel definition.	
Pressure head at reference:	16.042	Feet H2O

Channel number [4]

Measurement type:	Pressure
Channel name:	TB-06-5
Linearity:	0.0174
Scale:	10.0857
Offset:	-0.0818
Warmup:	50
Specific gravity:	1
Mode:	TOC
User-defined reference:	19.24 Feet H2O
Referenced on:	channel definition.
Pressure head at reference:	17.445 Feet H2O

Channel number [5]

Measurement type:	Pressure
Channel name:	TB-06-6
Linearity:	0.0453
Scale:	9.9843
Offset:	0.0068
Warmup:	50
Specific gravity:	1
Mode:	TOC
User-defined reference:	19.31 Feet H2O
Referenced on:	channel definition.
Pressure head at reference:	17.392 Feet H2O

Channel number [6]

Measurement type:	Pressure
Channel name:	TB-06-7
Linearity:	0.1437
Scale:	20.0812
Offset:	0.0342
Warmup:	50
Specific gravity:	1
Mode:	TOC
User-defined reference:	18.3 Feet H2O
Referenced on:	channel definition.
Pressure head at reference:	23.435 Feet H2O

Channel number [0]

Measurement type:	Barometric Pressure
Channel name:	Barometric
Linearity:	0
Scale:	0
Offset:	0
Warmup:	50

Date	Time	ET (min)	PW Chan[1] Feet H2O	TB-06-2 Chan[2] Feet H2O	TB-06-4 Chan[3] Feet H2O	TB-06-5 Chan[4] Feet H2O	TB-06-6 Chan[5] Feet H2O	TB-06-7 Chan[6] Feet H2O	Barometric Chan[0] Inches Hg
05/23/06	8:19	0	17.443	17.930	19.427	19.432	19.515	18.299	29.428
05/23/06	8:20	1.0943	17.477	17.947	19.428	19.431	19.516	18.307	29.430
05/23/06	8:20	1.1535	17.324	17.930	19.422	19.435	19.516	18.307	29.430
05/23/06	8:20	1.2162	17.353	17.930	19.422	19.432	19.516	18.310	29.430
05/23/06	8:21	1.2825	20.672	18.446	19.449	19.437	19.939	18.319	29.430
05/23/06	8:21	1.3528	25.901	19.798	19.736	19.474	20.743	18.348	29.428
05/23/06	8:21	1.4273	26.891	20.314	20.009	19.556	21.088	18.401	29.430
05/23/06	8:21	1.5063	27.236	20.665	20.205	19.641	21.354	18.456	29.428
05/23/06	8:21	1.59	27.328	20.859	20.338	19.721	21.514	18.514	29.428
05/23/06	8:21	1.6785	27.549	21.012	20.449	19.789	21.640	18.570	29.430

Date	Time	ET (min)	PW Chan[1] Feet H2O	TB-06-2 Chan[2] Feet H2O	TB-06-4 Chan[3] Feet H2O	TB-06-5 Chan[4] Feet H2O	TB-06-6 Chan[5] Feet H2O	TB-06-7 Chan[6] Feet H2O	Barometric Chan[0] Inches Hg
05/23/06	8:21	1.7723	27.655	21.149	20.539	19.855	21.750	18.614	29.428
05/23/06	8:21	1.8717	27.793	21.262	20.612	19.915	21.845	18.663	29.430
05/23/06	8:21	1.977	27.903	21.363	20.681	19.973	21.929	18.704	29.430
05/23/06	8:21	2.0885	28.017	21.459	20.742	20.027	22.009	18.748	29.430
05/23/06	8:21	2.2067	28.089	21.543	20.801	20.081	22.078	18.786	29.432
05/23/06	8:22	2.3318	28.058	21.615	20.853	20.132	22.149	18.826	29.430
05/23/06	8:22	2.4643	28.334	21.691	20.906	20.183	22.211	18.867	29.432
05/23/06	8:22	2.6048	28.400	21.780	20.958	20.231	22.290	18.908	29.432
05/23/06	8:22	2.7537	28.523	21.856	21.006	20.283	22.356	18.946	29.432
05/23/06	8:22	2.9112	28.538	21.922	21.053	20.332	22.417	18.990	29.432
05/23/06	8:22	3.078	28.644	21.983	21.100	20.377	22.475	19.025	29.434
05/23/06	8:23	3.2548	28.655	22.041	21.139	20.422	22.531	19.065	29.432
05/23/06	8:23	3.4422	28.825	22.099	21.180	20.466	22.583	19.103	29.436
05/23/06	8:23	3.6405	28.733	22.151	21.219	20.508	22.635	19.138	29.434
05/23/06	8:23	3.8507	28.839	22.198	21.256	20.550	22.683	19.176	29.434
05/23/06	8:23	4.0733	28.923	22.250	21.295	20.591	22.731	19.211	29.434
05/23/06	8:24	4.3092	29.104	22.311	21.326	20.627	22.782	19.249	29.420
05/23/06	8:24	4.559	29.219	22.354	21.361	20.665	22.827	19.284	29.418
05/23/06	8:24	4.8237	29.270	22.406	21.396	20.709	22.869	19.322	29.416
05/23/06	8:24	5.104	29.319	22.432	21.427	20.741	22.909	19.351	29.418
05/23/06	8:25	5.4008	29.420	22.476	21.459	20.776	22.950	19.386	29.414
05/23/06	8:25	5.7153	29.394	22.514	21.489	20.805	22.987	19.424	29.414
05/23/06	8:25	6.0485	29.385	22.540	21.516	20.836	23.023	19.456	29.416
05/23/06	8:26	6.4013	29.420	22.577	21.545	20.866	23.060	19.485	29.414
05/23/06	8:26	6.7752	29.495	22.606	21.573	20.893	23.091	19.514	29.414
05/23/06	8:26	7.1712	29.552	22.632	21.602	20.922	23.122	19.541	29.414
05/23/06	8:27	7.5905	29.486	22.664	21.624	20.947	23.154	19.570	29.414
05/23/06	8:27	8.0348	29.466	22.690	21.650	20.971	23.184	19.599	29.414
05/23/06	8:28	8.5055	29.538	22.719	21.673	20.995	23.211	19.622	29.414
05/23/06	8:28	9.004	29.609	22.742	21.698	21.017	23.239	19.651	29.412
05/23/06	8:29	9.532	29.572	22.763	21.720	21.038	23.265	19.675	29.414
05/23/06	8:29	10.0913	29.698	22.783	21.742	21.057	23.290	19.698	29.416
05/23/06	8:34	15.053	29.813	22.919	21.879	21.180	23.449	19.847	29.414
05/23/06	8:39	20.0428	29.856	22.994	21.964	21.244	23.528	19.931	29.414
05/23/06	8:44	25.2087	29.839	23.023	22.012	21.289	23.565	19.981	29.418
05/23/06	8:49	29.9433	29.882	23.052	22.053	21.312	23.588	20.013	29.422
05/23/06	8:59	39.8997	29.882	23.116	22.115	21.369	23.660	20.094	29.430
05/23/06	9:02	42.2585	30.075	23.174	22.148	21.390	23.711	20.118	29.430
05/23/06	9:04	44.7572	30.193	23.212	22.174	21.413	23.748	20.141	29.432
05/23/06	9:09	50.2073	30.155	23.241	22.200	21.438	23.777	20.170	29.432
05/23/06	9:19	59.6547	30.224	23.278	22.235	21.470	23.821	20.217	29.434
05/23/06	9:39	79.521	30.379	23.348	22.283	21.524	23.887	20.287	29.441
05/23/06	9:59	100.0878	30.402	23.374	22.311	21.550	23.918	20.325	29.424
05/23/06	10:49	149.7107	30.431	23.426	22.359	21.608	23.991	20.415	29.371
05/23/06	11:17	177.9148	30.526	23.458	22.387	21.634	24.020	20.447	29.367
05/23/06	11:27	187.9148	30.506	23.464	22.397	21.646	24.036	20.462	29.373
05/23/06	11:37	197.9148	30.333	23.417	22.390	21.649	24.006	20.473	29.392
05/23/06	11:47	207.9148	30.394	23.429	22.394	21.645	24.030	20.494	29.396
05/23/06	11:57	217.9148	30.414	23.429	22.384	21.646	23.990	20.441	29.396
05/23/06	12:07	227.9148	30.408	23.438	22.396	21.652	24.040	20.508	29.384
05/23/06	12:17	237.9148	30.397	23.432	22.391	21.658	24.012	20.482	29.379
05/23/06	12:27	247.9148	30.460	23.475	22.407	21.672	24.040	20.494	29.379
05/23/06	12:37	257.9148	30.500	23.484	22.413	21.678	24.055	20.517	29.377
05/23/06	12:47	267.9148	30.494	23.487	22.415	21.684	24.058	20.517	29.369
05/23/06	12:57	277.9148	30.514	23.493	22.418	21.688	24.064	20.514	29.375
05/23/06	13:07	287.9148	30.511	23.501	22.422	21.697	24.067	20.531	29.377
05/23/06	13:17	297.9148	30.532	23.507	22.425	21.704	24.080	20.537	29.377

Date	Time	ET (min)	PW Chan[1] Feet H2O	TB-06-2 Chan[2] Feet H2O	TB-06-4 Chan[3] Feet H2O	TB-06-5 Chan[4] Feet H2O	TB-06-6 Chan[5] Feet H2O	TB-06-7 Chan[6] Feet H2O	Barometric Chan[0] Inches Hg
05/23/06	13:27	307.9148	30.552	23.504	22.425	21.704	24.075	20.546	29.373
05/23/06	13:37	317.9148	30.540	23.507	22.426	21.707	24.093	20.552	29.369
05/23/06	13:47	327.9148	30.529	23.507	22.419	21.710	24.084	20.549	29.361
05/23/06	13:57	337.9148	30.517	23.510	22.416	21.712	24.088	20.555	29.357
05/23/06	14:07	347.9148	30.523	23.516	22.420	21.718	24.097	20.566	29.359
05/23/06	14:17	357.9148	30.526	23.527	22.422	21.723	24.098	20.564	29.361
05/23/06	14:27	367.9148	30.586	23.530	22.419	21.729	24.094	20.566	29.361
05/23/06	14:37	377.9148	30.534	23.525	22.413	21.729	24.091	20.564	29.361
05/23/06	14:47	387.9148	30.554	23.536	22.418	21.734	24.111	20.590	29.365
05/23/06	15:07	407.9148	30.543	23.533	22.416	21.741	24.126	20.610	29.365
05/23/06	15:27	427.9148	30.554	23.545	22.412	21.750	24.124	20.610	29.355
05/23/06	15:47	447.9148	30.563	23.545	22.406	21.755	24.127	20.607	29.347
05/23/06	16:07	467.9148	30.540	23.551	22.401	21.767	24.135	20.616	29.341
05/23/06	16:27	487.9148	30.603	23.559	22.394	21.770	24.146	20.625	29.333
05/23/06	16:47	507.9148	30.560	23.565	22.387	21.779	24.153	20.642	29.322
05/23/06	17:07	527.9148	30.543	23.568	22.372	21.777	24.132	20.610	29.314
05/23/06	17:27	547.9148	30.569	23.574	22.369	21.793	24.171	20.660	29.306
05/23/06	17:47	567.9148	30.595	23.583	22.365	21.799	24.181	20.677	29.300
05/23/06	18:07	587.9148	30.592	23.588	22.350	21.801	24.165	20.660	29.288
05/23/06	18:27	607.9148	30.592	23.594	22.350	21.811	24.175	20.668	29.286
05/23/06	18:47	627.9148	30.600	23.600	22.349	21.814	24.179	20.671	29.286
05/23/06	19:07	647.9148	30.583	23.609	22.350	21.827	24.195	20.692	29.286
05/23/06	19:27	667.9148	30.655	23.609	22.355	21.827	24.195	20.689	29.286
05/23/06	19:47	687.9148	30.644	23.614	22.355	21.834	24.201	20.698	29.282
05/23/06	20:07	707.9148	30.623	23.617	22.356	21.840	24.207	20.709	29.282
05/23/06	20:27	727.9148	30.623	23.626	22.353	21.846	24.214	20.712	29.276
05/23/06	20:47	747.9148	30.632	23.632	22.349	21.852	24.218	20.721	29.270
05/23/06	21:07	767.9148	30.652	23.638	22.349	21.859	24.227	20.730	29.263
05/23/06	21:27	787.9148	30.675	23.640	22.342	21.863	24.230	20.735	29.253
05/23/06	21:47	807.9148	30.684	23.646	22.342	21.871	24.236	20.738	29.253
05/23/06	22:07	827.9148	30.632	23.655	22.345	21.878	24.246	20.747	29.255
05/23/06	22:27	847.9148	30.689	23.667	22.355	21.885	24.253	20.753	29.259
05/23/06	22:47	867.9148	30.684	23.672	22.362	21.892	24.260	20.765	29.263
05/23/06	23:07	887.9148	30.710	23.675	22.365	21.897	24.268	20.770	29.263
05/23/06	23:27	907.9148	30.750	23.681	22.371	21.903	24.272	20.779	29.268
05/23/06	23:47	927.9148	30.698	23.684	22.377	21.907	24.278	20.782	29.272
05/24/06	0:07	947.9148	30.701	23.693	22.372	21.913	24.282	20.785	29.268
05/24/06	0:27	967.9148	30.724	23.695	22.375	21.917	24.286	20.791	29.268
05/24/06	0:47	987.9148	30.715	23.695	22.361	21.919	24.288	20.794	29.253
05/24/06	1:07	1007.915	30.718	23.695	22.349	21.920	24.289	20.797	29.243
05/24/06	1:27	1027.915	30.692	23.701	22.358	21.927	24.297	20.805	29.247
05/24/06	1:47	1047.915	30.701	23.707	22.343	21.930	24.299	20.805	29.235
05/24/06	2:07	1067.915	30.721	23.710	22.327	21.935	24.301	20.808	29.219
05/24/06	2:27	1087.915	30.724	23.710	22.308	21.935	24.302	20.808	29.200
05/24/06	2:47	1107.915	30.707	23.716	22.323	21.942	24.311	20.817	29.213
05/24/06	3:07	1127.915	30.707	23.722	22.333	21.948	24.317	20.826	29.223
05/24/06	3:27	1147.915	30.750	23.730	22.346	21.955	24.324	20.832	29.233
05/24/06	3:47	1167.915	30.727	23.727	22.340	21.955	24.323	20.835	29.227
05/24/06	4:07	1187.915	30.756	23.736	22.330	21.959	24.330	20.840	29.217
05/24/06	4:27	1207.915	30.747	23.736	22.334	21.964	24.333	20.846	29.221
05/24/06	4:47	1227.915	30.761	23.742	22.346	21.971	24.338	20.852	29.233
05/24/06	5:07	1247.915	30.773	23.742	22.336	21.973	24.338	20.852	29.223
05/24/06	5:27	1267.915	30.741	23.742	22.340	21.974	24.341	20.858	29.231
05/24/06	5:47	1287.915	30.770	23.751	22.350	21.978	24.347	20.861	29.239
05/24/06	6:07	1307.915	30.773	23.748	22.326	21.978	24.346	20.861	29.217
05/24/06	6:27	1327.915	30.756	23.748	22.314	21.978	24.347	20.861	29.202
05/24/06	6:47	1347.915	30.767	23.753	22.315	21.984	24.354	20.867	29.204

Date Time	ET (min)	PW Chan[1] Feet H2O	TB-06-2 Chan[2] Feet H2O	TB-06-4 Chan[3] Feet H2O	TB-06-5 Chan[4] Feet H2O	TB-06-6 Chan[5] Feet H2O	TB-06-7 Chan[6] Feet H2O	Barometric Chan[0] Inches Hg
05/24/06 7:07	1367.915	30.816	23.771	22.320	21.992	24.367	20.872	29.204
05/24/06 7:27	1387.915	30.790	23.765	22.320	21.992	24.347	20.875	29.204
05/24/06 7:47	1407.915	30.819	23.774	22.312	21.993	24.364	20.875	29.200
05/24/06 8:07	1427.915	30.810	23.782	22.321	22.005	24.382	20.890	29.217
05/24/06 8:27	1447.915	30.799	23.779	22.320	22.005	24.380	20.890	29.225
05/24/06 8:47	1467.915	30.822	23.785	22.320	22.009	24.385	20.893	29.235
05/24/06 9:07	1487.915	30.833	23.791	22.327	22.015	24.392	20.902	29.251
05/24/06 9:27	1507.915	30.801	23.788	22.317	22.013	24.391	20.902	29.249
05/24/06 9:47	1527.915	30.816	23.791	22.323	22.016	24.392	20.904	29.257
05/24/06 10:07	1547.915	30.847	23.791	22.314	22.019	24.392	20.904	29.249
05/24/06 10:27	1567.915	30.816	23.788	22.314	22.019	24.389	20.907	29.245
05/24/06 10:47	1587.915	30.824	23.791	22.315	22.022	24.401	20.919	29.247
05/24/06 11:07	1607.915	30.813	23.797	22.311	22.029	24.411	20.931	29.243
05/24/06 11:27	1627.915	30.796	23.788	22.296	22.025	24.383	20.902	29.239
05/24/06 11:47	1647.915	30.839	23.794	22.305	22.029	24.393	20.913	29.245
05/24/06 12:07	1667.915	30.816	23.800	22.299	22.034	24.399	20.916	29.239
05/24/06 12:27	1687.915	30.850	23.803	22.299	22.034	24.391	20.899	29.237
05/24/06 12:47	1707.915	30.830	23.803	22.295	22.034	24.380	20.893	29.237
05/24/06 13:07	1727.915	30.839	23.803	22.283	22.035	24.383	20.902	29.233
05/24/06 13:27	1747.915	30.847	23.806	22.285	22.038	24.431	20.954	29.227
05/24/06 13:47	1767.915	30.833	23.803	22.270	22.037	24.408	20.931	29.219
05/24/06 14:07	1787.915	30.827	23.808	22.264	22.041	24.411	20.939	29.210
05/24/06 14:27	1807.915	30.839	23.808	22.256	22.044	24.409	20.936	29.206
05/24/06 14:47	1827.915	30.781	23.811	22.250	22.045	24.417	20.951	29.202
05/24/06 15:07	1847.915	30.822	23.806	22.245	22.048	24.445	20.989	29.200
05/24/06 15:27	1867.915	30.796	23.806	22.237	22.050	24.409	20.939	29.196
05/24/06 15:47	1887.915	30.833	23.806	22.229	22.053	24.453	20.998	29.192
05/24/06 16:07	1907.915	30.827	23.800	22.222	22.050	24.421	20.945	29.188
05/24/06 16:27	1927.915	30.842	23.808	22.218	22.048	24.391	20.919	29.182
05/24/06 16:47	1947.915	30.842	23.803	22.213	22.047	24.412	20.942	29.174
05/24/06 17:07	1967.915	30.822	23.803	22.209	22.047	24.408	20.948	29.170
05/24/06 17:27	1987.915	30.807	23.800	22.194	22.047	24.404	20.934	29.156
05/24/06 17:47	2007.915	30.830	23.803	22.190	22.048	24.408	20.942	29.149
05/24/06 18:07	2027.915	30.845	23.803	22.187	22.047	24.414	20.945	29.143
05/24/06 18:27	2047.915	30.842	23.803	22.183	22.048	24.408	20.942	29.141
05/24/06 18:47	2067.915	30.810	23.800	22.177	22.048	24.408	20.942	29.135
05/24/06 19:07	2087.915	30.804	23.803	22.174	22.048	24.412	20.948	29.133
05/24/06 19:27	2107.915	30.856	23.806	22.174	22.053	24.417	20.948	29.133
05/24/06 19:47	2127.915	30.873	23.806	22.172	22.051	24.415	20.954	29.133
05/24/06 20:07	2147.915	30.824	23.806	22.172	22.053	24.415	20.954	29.135
05/24/06 20:27	2167.915	30.830	23.806	22.174	22.054	24.419	20.957	29.133
05/24/06 20:47	2187.915	30.839	23.808	22.175	22.054	24.421	20.957	29.133
05/24/06 21:07	2207.915	30.833	23.806	22.181	22.054	24.421	20.963	29.131
05/24/06 21:27	2227.915	30.822	23.806	22.183	22.057	24.419	20.960	29.127
05/24/06 21:47	2247.915	30.827	23.806	22.187	22.056	24.422	20.966	29.123
05/24/06 22:07	2267.915	30.827	23.808	22.190	22.059	24.425	20.969	29.121
05/24/06 22:27	2287.915	30.830	23.808	22.200	22.059	24.425	20.969	29.125
05/24/06 22:47	2307.915	30.813	23.803	22.202	22.054	24.424	20.969	29.121
05/24/06 23:07	2327.915	30.842	23.803	22.200	22.054	24.422	20.966	29.119
05/24/06 23:27	2347.915	30.862	23.806	22.196	22.053	24.421	20.966	29.111
05/24/06 23:47	2367.915	30.859	23.806	22.193	22.054	24.421	20.969	29.107
05/25/06 0:07	2387.915	30.868	23.803	22.190	22.053	24.419	20.966	29.105
05/25/06 0:27	2407.915	30.824	23.803	22.186	22.053	24.421	20.966	29.094
05/25/06 0:47	2427.915	30.856	23.806	22.180	22.053	24.422	20.969	29.092
05/25/06 1:07	2447.915	30.827	23.803	22.171	22.051	24.419	20.963	29.084
05/25/06 1:27	2467.915	30.827	23.803	22.177	22.053	24.421	20.969	29.088
05/25/06 1:47	2487.915	30.816	23.803	22.177	22.053	24.419	20.969	29.084

Date	Time	ET (min)	PW Chan[1] Feet H2O	TB-06-2 Chan[2] Feet H2O	TB-06-4 Chan[3] Feet H2O	TB-06-5 Chan[4] Feet H2O	TB-06-6 Chan[5] Feet H2O	TB-06-7 Chan[6] Feet H2O	Barometric Chan[0] Inches Hg
05/25/06	2:07	2507.915	30.850	23.800	22.174	22.051	24.422	20.966	29.080
05/25/06	2:27	2527.915	30.813	23.800	22.162	22.048	24.418	20.966	29.066
05/25/06	2:47	2547.915	30.853	23.803	22.155	22.048	24.418	20.969	29.060
05/25/06	3:07	2567.915	30.845	23.800	22.155	22.048	24.419	20.969	29.058
05/25/06	3:27	2587.915	30.833	23.797	22.149	22.048	24.418	20.969	29.052
05/25/06	3:47	2607.915	30.833	23.797	22.143	22.045	24.417	20.966	29.044
05/25/06	4:07	2627.915	30.813	23.797	22.145	22.047	24.417	20.969	29.044
05/25/06	4:27	2647.915	30.819	23.797	22.146	22.048	24.419	20.969	29.044
05/25/06	4:47	2667.915	30.836	23.797	22.150	22.050	24.419	20.969	29.042
05/25/06	5:07	2687.915	30.816	23.797	22.152	22.048	24.419	20.971	29.042
05/25/06	5:27	2707.915	30.816	23.794	22.150	22.048	24.419	20.971	29.033
05/25/06	5:47	2727.915	30.822	23.800	22.153	22.050	24.419	20.977	29.039
05/25/06	6:07	2747.915	30.865	23.800	22.155	22.048	24.422	20.980	29.039
05/25/06	6:27	2767.915	30.839	23.800	22.158	22.053	24.424	20.980	29.042
05/25/06	6:47	2787.915	30.819	23.800	22.165	22.051	24.424	20.980	29.048
05/25/06	7:07	2807.915	30.853	23.803	22.171	22.053	24.428	20.980	29.052
05/25/06	7:27	2827.915	30.847	23.803	22.175	22.053	24.430	20.980	29.068
05/25/06	7:47	2847.915	30.839	23.806	22.174	22.053	24.427	20.977	29.080
05/25/06	8:07	2867.915	30.827	23.806	22.181	22.054	24.425	20.980	29.105
05/25/06	8:27	2887.915	30.827	23.806	22.187	22.056	24.431	20.983	29.127
05/25/06	8:47	2907.915	30.804	23.803	22.183	22.051	24.427	20.977	29.133
05/25/06	9:07	2927.915	30.801	23.806	22.190	22.053	24.428	20.986	29.145
05/25/06	9:27	2947.915	30.833	23.806	22.191	22.054	24.437	20.989	29.149
05/25/06	9:47	2967.915	30.833	23.797	22.187	22.053	24.419	20.980	29.149
05/25/06	10:07	2987.915	30.813	23.794	22.784	22.053	24.422	20.983	29.147
05/25/06	10:27	3007.915	30.836	23.794	22.784	22.051	24.431	20.986	29.139
05/25/06	10:47	3027.915	30.833	23.794	22.779	22.050	24.424	20.989	29.131
05/25/06	11:07	3047.915	30.833	23.797	22.785	22.051	24.430	20.992	29.127
05/25/06	11:27	3067.915	30.856	23.791	22.778	22.053	24.404	20.971	29.123
05/25/06	11:47	3087.915	30.839	23.794	22.776	22.053	24.401	20.977	29.119
05/25/06	12:07	3107.915	30.827	23.794	22.779	22.057	24.409	20.977	29.111
05/25/06	12:27	3127.915	30.845	23.794	22.782	22.050	24.427	20.989	29.109
05/25/06	12:47	3147.915	30.850	23.808	22.787	22.059	24.425	20.986	29.107
05/25/06	13:07	3167.915	30.870	23.803	22.784	22.056	24.422	20.989	29.096
05/25/06	13:27	3187.915	30.822	23.808	22.785	22.060	24.431	20.998	29.094
05/25/06	13:47	3207.915	30.876	23.808	22.794	22.063	24.441	21.012	29.096
05/25/06	14:07	3227.915	30.859	23.814	22.795	22.066	24.428	20.977	29.092
05/25/06	14:27	3247.915	30.850	23.811	22.795	22.069	24.435	20.980	29.090
05/25/06	14:47	3267.915	30.862	23.811	22.785	22.060	24.431	20.995	29.086
05/25/06	15:07	3287.915	30.850	23.806	22.790	22.069	24.435	20.992	29.088
05/25/06	15:27	3307.915	30.847	23.806	22.790	22.070	24.437	20.998	29.080
05/25/06	15:47	3327.915	30.870	23.808	22.791	22.073	24.443	21.009	29.076
05/25/06	16:07	3347.915	30.862	23.806	22.792	22.075	24.428	20.995	29.072
05/25/06	16:27	3367.915	30.839	23.806	22.792	22.069	24.430	20.995	29.066
05/25/06	16:47	3387.915	30.847	23.806	22.792	22.072	24.424	20.995	29.064
05/25/06	17:07	3407.915	30.868	23.808	22.797	22.073	24.457	21.024	29.062
05/25/06	17:27	3427.915	30.865	23.808	22.791	22.070	24.441	21.006	29.058
05/25/06	17:47	3447.915	30.856	23.806	22.794	22.073	24.438	21.004	29.062
05/25/06	18:07	3467.915	30.862	23.806	22.788	22.069	24.430	20.995	29.056
05/25/06	18:27	3487.915	30.839	23.808	22.792	22.069	24.438	21.004	29.056
05/25/06	18:47	3507.915	30.845	23.806	22.792	22.070	24.438	21.001	29.054
05/25/06	19:07	3527.915	30.859	23.808	22.794	22.075	24.440	21.006	29.052
05/25/06	19:27	3547.915	30.865	23.811	22.797	22.075	24.441	21.009	29.054
05/25/06	19:47	3567.915	30.856	23.817	22.801	22.077	24.447	21.012	29.056
05/25/06	20:07	3587.915	30.868	23.817	22.797	22.076	24.443	21.009	29.060
05/25/06	20:27	3607.915	30.888	23.814	22.798	22.077	24.444	21.012	29.056
05/25/06	20:47	3627.915	30.850	23.817	22.798	22.082	24.451	21.012	29.060

Date	Time	ET (min)	PW Chan[1] Feet H2O	TB-06-2 Chan[2] Feet H2O	TB-06-4 Chan[3] Feet H2O	TB-06-5 Chan[4] Feet H2O	TB-06-6 Chan[5] Feet H2O	TB-06-7 Chan[6] Feet H2O	Barometric Chan[0] Inches Hg
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05/25/06	21:07	3647.915	30.891	23.817	22.798	22.082	24.450	21.018	29.062
05/25/06	21:27	3667.915	30.862	23.820	22.806	22.086	24.456	21.024	29.062
05/25/06	21:47	3687.915	30.888	23.820	22.806	22.085	24.456	21.021	29.068
05/25/06	22:07	3707.915	30.807	23.791	22.795	22.060	24.435	21.012	29.068
05/25/06	22:27	3727.915	30.873	23.835	22.820	22.099	24.470	21.033	29.070
05/25/06	22:47	3747.915	30.913	23.829	22.813	22.094	24.464	21.027	29.066
05/25/06	23:07	3767.915	30.873	23.832	22.817	22.095	24.466	21.030	29.060
05/25/06	23:27	3787.915	30.862	23.832	22.817	22.096	24.464	21.033	29.056
05/25/06	23:47	3807.915	30.868	23.832	22.820	22.098	24.469	21.033	29.052
05/26/06	0:07	3827.915	30.908	23.835	22.822	22.101	24.472	21.036	29.052
05/26/06	0:27	3847.915	30.916	23.840	22.826	22.108	24.474	21.038	29.050
05/26/06	0:47	3867.915	30.913	23.846	22.830	22.110	24.480	21.041	29.048
05/26/06	1:07	3887.915	30.893	23.849	22.833	22.114	24.483	21.047	29.050
05/26/06	1:27	3907.915	30.934	23.852	22.838	22.120	24.486	21.050	29.052
05/26/06	1:47	3927.915	30.891	23.852	22.841	22.120	24.486	21.050	29.046
05/26/06	2:07	3947.915	30.928	23.858	22.844	22.123	24.490	21.050	29.042
05/26/06	2:27	3967.915	30.925	23.855	22.839	22.121	24.485	21.047	29.017
05/26/06	2:47	3987.915	30.893	23.861	22.845	22.127	24.493	21.050	29.011
05/26/06	3:07	4007.915	30.916	23.863	22.848	22.130	24.495	21.056	29.017
05/26/06	3:27	4027.915	30.908	23.869	22.857	22.137	24.505	21.065	29.033
05/26/06	3:47	4047.915	30.913	23.875	22.860	22.142	24.509	21.068	29.035
05/26/06	4:07	4067.915	30.934	23.878	22.865	22.143	24.511	21.073	29.048
05/26/06	4:27	4087.915	30.974	23.881	22.868	22.147	24.515	21.079	29.050
05/26/06	4:47	4107.915	30.928	23.887	22.873	22.153	24.521	21.079	29.058
05/26/06	5:07	4127.915	30.942	23.887	22.871	22.152	24.519	21.079	29.048
05/26/06	5:27	4147.915	30.942	23.890	22.874	22.156	24.519	21.079	29.050
05/26/06	5:47	4167.915	30.965	23.892	22.879	22.161	24.525	21.085	29.052
05/26/06	6:07	4187.915	30.942	23.895	22.883	22.163	24.529	21.088	29.054
05/26/06	6:27	4207.915	30.980	23.901	22.886	22.166	24.534	21.091	29.058
05/26/06	6:47	4227.915	30.965	23.904	22.893	22.171	24.538	21.103	29.068
05/26/06	7:07	4247.915	30.965	23.907	22.896	22.174	24.541	21.100	29.072
05/26/06	7:27	4267.915	30.968	23.913	22.902	22.179	24.547	21.103	29.080
05/26/06	7:47	4287.915	30.994	23.916	22.902	22.182	24.550	21.105	29.076
05/26/06	8:07	4307.915	30.939	23.919	22.905	22.185	24.553	21.108	29.084
05/26/06	8:17	4317.915	30.936	23.927	22.911	22.191	24.557	21.108	29.117

In-Situ Inc.	Hermit 3000	
Report generated:	05/26/06	17:43:51
Report from file:	C:\Win-Situ\Data\SN45692 2006-05-26 083252 AEC Con-Rate Rec.bin	
DataMgr Version	3.71	
Serial number:	45692	
Firmware Version	7.1	
Unit name:	Hermit 3000	
Test name:		AEC Con-Rate Rec
Test defined on:	05/22/06	7:55:53
Test started on:	05/26/06	8:32:52
Test stopped on:	N/A	N/A
Test extracted on:	05/26/06	17:43:06
Data gathered using Logarithmic testing		
Maximum time between data points:		10 Minutes
Number of data samples:	155	
TOTAL DATA SAMPLES	155	
Channel number [1]		
Measurement type:	Pressure	
Channel name:	PW	
Linearity:	0.1254	
Scale:		19.8458
Offset:		-0.0609
Warmup:		50
Specific gravity:	1	
Mode:	TOC	
User-defined reference:	17.21	Feet H2O
Referenced on:	channel definition.	
Pressure head at reference:	27.228	Feet H2O
Channel number [2]		
Measurement type:	Pressure	
Channel name:	TB-06-2	
Linearity:	0.1185	
Scale:		20.0059
Offset:		0.0508
Warmup:		50
Specific gravity:	1	
Mode:	TOC	
User-defined reference:	23.95	Feet H2O
Referenced on:	channel definition.	
Pressure head at reference:	16.642	Feet H2O
Channel number [3]		
Measurement type:	Pressure	
Channel name:	TB-06-4	
Linearity:	0.0239	
Scale:		10.0987
Offset:		0.9336
Warmup:		50
Specific gravity:	1	
Mode:	TOC	
User-defined reference:	22.94	Feet H2O
Referenced on:	channel definition.	
Pressure head at reference:	12.572	Feet H2O

Channel number [4]

Measurement type:	Pressure
Channel name:	TB-06-5
Linearity:	0.0174
Scale:	10.0857
Offset:	-0.0818
Warmup:	50
Specific gravity:	1
Mode:	TOC
User-defined reference:	22.23 Feet H2O
Referenced on:	channel definition.
Pressure head at reference:	14.495 Feet H2O

Channel number [5]

Measurement type:	Pressure
Channel name:	TB-06-6
Linearity:	0.0453
Scale:	9.9843
Offset:	0.0068
Warmup:	50
Specific gravity:	1
Mode:	TOC
User-defined reference:	24.61 Feet H2O
Referenced on:	channel definition.
Pressure head at reference:	12.148 Feet H2O

Channel number [6]

Measurement type:	Pressure
Channel name:	TB-06-7
Linearity:	0.1437
Scale:	20.0812
Offset:	0.0342
Warmup:	50
Specific gravity:	1
Mode:	TOC
User-defined reference:	18.3 Feet H2O
Referenced on:	channel definition.
Pressure head at reference:	23.435 Feet H2O

Channel number [0]

Measurement type:	Barometric Pressure
Channel name:	Barometric
Linearity:	0
Scale:	0
Offset:	0
Warmup:	50

Date	Time	ET (min)	PW Chan[1] Feet H2O	TB-06-2 Chan[2] Feet H2O	TB-06-4 Chan[3] Feet H2O	TB-06-5 Chan[4] Feet H2O	TB-06-6 Chan[5] Feet H2O	TB-06-7 Chan[6] Feet H2O	Barometric Chan[0] Inches Hg
05/26/06	8:32	0	30.936	23.980	22.956	22.234	24.620	21.117	29.129
05/26/06	8:32	0.0382	30.974	23.980	22.956	22.233	24.618	21.114	29.131
05/26/06	8:32	0.0763	30.974	23.980	22.956	22.233	24.618	21.117	29.131
05/26/06	8:32	0.1145	30.968	23.977	22.956	22.233	24.618	21.114	29.131
05/26/06	8:33	0.1527	30.968	23.980	22.956	22.233	24.618	21.114	29.131
05/26/06	8:33	0.1908	30.997	23.980	22.956	22.233	24.618	21.117	29.131
05/26/06	8:33	0.229	30.977	23.980	22.956	22.231	24.618	21.117	29.133
05/26/06	8:33	0.2672	30.965	23.980	22.956	22.233	24.618	21.117	29.133
05/26/06	8:33	0.3053	30.982	23.980	22.956	22.231	24.618	21.114	29.131
05/26/06	8:33	0.3435	30.977	23.954	22.956	22.231	24.535	21.114	29.133

Date	Time	ET (min)	PW Chan[1] Feet H2O	TB-06-2 Chan[2] Feet H2O	TB-06-4 Chan[3] Feet H2O	TB-06-5 Chan[4] Feet H2O	TB-06-6 Chan[5] Feet H2O	TB-06-7 Chan[6] Feet H2O	Barometric Chan[0] Inches Hg
05/26/06	8:33	0.3817	26.485	23.401	22.931	22.227	24.177	21.108	29.131
05/26/06	8:33	0.4198	22.976	22.566	22.819	22.211	23.681	21.094	29.133
05/26/06	8:33	0.458	21.931	21.958	22.632	22.179	23.308	21.071	29.133
05/26/06	8:33	0.4962	21.346	21.653	22.464	22.134	23.115	21.036	29.133
05/26/06	8:33	0.5343	21.064	21.468	22.353	22.086	22.961	21.006	29.133
05/26/06	8:33	0.5725	20.837	21.274	22.255	22.042	22.814	20.974	29.133
05/26/06	8:33	0.6107	20.713	21.149	22.165	22.000	22.717	20.945	29.131
05/26/06	8:33	0.6488	20.554	21.056	22.099	21.962	22.642	20.916	29.131
05/26/06	8:33	0.687	20.488	20.964	22.044	21.925	22.564	20.893	29.133
05/26/06	8:33	0.7252	20.387	20.885	21.990	21.892	22.502	20.867	29.133
05/26/06	8:33	0.7633	20.330	20.830	21.943	21.861	22.451	20.843	29.135
05/26/06	8:33	0.8028	20.255	20.764	21.904	21.832	22.398	20.823	29.133
05/26/06	8:33	0.8447	20.200	20.709	21.867	21.803	22.353	20.802	29.133
05/26/06	8:33	0.889	20.148	20.659	21.829	21.775	22.311	20.782	29.133
05/26/06	8:33	0.936	20.099	20.607	21.796	21.749	22.267	20.759	29.133
05/26/06	8:33	0.9858	20.047	20.561	21.764	21.720	22.227	20.741	29.135
05/26/06	8:33	1.0385	19.998	20.514	21.732	21.691	22.188	20.715	29.133
05/26/06	8:33	1.0943	19.978	20.480	21.707	21.667	22.162	20.700	29.135
05/26/06	8:34	1.1535	19.875	20.430	21.666	21.629	22.111	20.674	29.133
05/26/06	8:34	1.2162	19.837	20.384	21.635	21.597	22.072	20.654	29.135
05/26/06	8:34	1.2825	19.791	20.340	21.603	21.568	22.034	20.628	29.135
05/26/06	8:34	1.3528	19.742	20.297	21.572	21.542	21.994	20.607	29.135
05/26/06	8:34	1.4273	19.690	20.251	21.542	21.510	21.955	20.584	29.133
05/26/06	8:34	1.5063	19.661	20.204	21.514	21.479	21.917	20.564	29.135
05/26/06	8:34	1.59	19.621	20.164	21.485	21.453	21.876	20.534	29.135
05/26/06	8:34	1.6785	19.589	20.117	21.456	21.420	21.837	20.514	29.133
05/26/06	8:34	1.7723	19.535	20.074	21.429	21.390	21.803	20.491	29.135
05/26/06	8:34	1.8717	19.466	20.030	21.400	21.361	21.765	20.462	29.137
05/26/06	8:34	1.977	19.454	19.993	21.372	21.329	21.730	20.438	29.137
05/26/06	8:34	2.0885	19.431	19.949	21.345	21.299	21.694	20.415	29.137
05/26/06	8:35	2.2067	19.370	19.911	21.317	21.268	21.656	20.389	29.137
05/26/06	8:35	2.3318	19.345	19.871	21.289	21.239	21.619	20.362	29.137
05/26/06	8:35	2.4643	19.278	19.836	21.263	21.207	21.582	20.336	29.139
05/26/06	8:35	2.6048	19.272	19.795	21.234	21.178	21.546	20.310	29.135
05/26/06	8:35	2.7537	19.224	19.761	21.206	21.147	21.511	20.284	29.137
05/26/06	8:35	2.9112	19.212	19.720	21.181	21.118	21.477	20.258	29.137
05/26/06	8:35	3.078	19.131	19.694	21.154	21.089	21.443	20.228	29.139
05/26/06	8:36	3.2548	19.111	19.653	21.127	21.060	21.407	20.202	29.137
05/26/06	8:36	3.4422	19.094	19.621	21.101	21.032	21.372	20.179	29.137
05/26/06	8:36	3.6405	19.068	19.589	21.075	21.003	21.341	20.150	29.139
05/26/06	8:36	3.8507	19.025	19.558	21.051	20.974	21.307	20.124	29.137
05/26/06	8:36	4.0733	18.947	19.526	21.025	20.947	21.274	20.097	29.137
05/26/06	8:37	4.3092	19.039	19.514	20.999	20.918	21.246	20.068	29.125
05/26/06	8:37	4.559	19.022	19.479	20.976	20.896	21.215	20.042	29.123
05/26/06	8:37	4.8237	18.990	19.453	20.951	20.872	21.184	20.016	29.123
05/26/06	8:37	5.104	18.964	19.424	20.929	20.845	21.155	19.987	29.123
05/26/06	8:38	5.4008	18.938	19.395	20.904	20.821	21.128	19.963	29.125
05/26/06	8:38	5.7153	18.912	19.369	20.882	20.796	21.099	19.940	29.125
05/26/06	8:38	6.0485	18.889	19.346	20.860	20.772	21.068	19.911	29.125
05/26/06	8:39	6.4013	18.863	19.317	20.837	20.749	21.042	19.887	29.125
05/26/06	8:39	6.7752	18.837	19.294	20.816	20.727	21.013	19.864	29.127
05/26/06	8:40	7.1712	18.817	19.273	20.795	20.707	20.986	19.838	29.125
05/26/06	8:40	7.5905	18.797	19.247	20.777	20.686	20.964	19.815	29.127
05/26/06	8:40	8.0348	18.780	19.230	20.758	20.668	20.938	19.794	29.129
05/26/06	8:41	8.5055	18.760	19.213	20.742	20.647	20.916	19.774	29.127
05/26/06	8:41	9.004	18.751	19.192	20.724	20.631	20.895	19.750	29.129
05/26/06	8:42	9.532	18.734	19.172	20.705	20.612	20.874	19.733	29.129

Date	Time	ET (min)	PW Chan[1] Feet H2O	TB-06-2 Chan[2] Feet H2O	TB-06-4 Chan[3] Feet H2O	TB-06-5 Chan[4] Feet H2O	TB-06-6 Chan[5] Feet H2O	TB-06-7 Chan[6] Feet H2O	Barometric Chan[0] Inches Hg
05/26/06	8:42	10.0913	18.708	19.152	20.688	20.596	20.853	19.713	29.129
05/26/06	8:43	10.6838	18.679	19.134	20.672	20.580	20.837	19.692	29.129
05/26/06	8:44	11.3113	18.693	19.120	20.656	20.564	20.815	19.675	29.129
05/26/06	8:44	11.9762	18.676	19.105	20.653	20.549	20.799	19.657	29.131
05/26/06	8:45	12.6803	18.630	19.088	20.625	20.536	20.783	19.643	29.133
05/26/06	8:46	13.4262	18.647	19.073	20.612	20.522	20.766	19.622	29.133
05/26/06	8:47	14.2162	18.639	19.062	20.600	20.510	20.753	19.608	29.135
05/26/06	8:47	15.053	18.627	19.050	20.584	20.498	20.738	19.593	29.137
05/26/06	8:48	15.9395	18.572	19.036	20.571	20.485	20.719	19.579	29.137
05/26/06	8:49	16.8785	18.598	19.021	20.557	20.474	20.705	19.558	29.137
05/26/06	8:50	17.8732	18.549	19.010	20.545	20.462	20.693	19.546	29.139
05/26/06	8:51	18.9268	18.569	18.998	20.532	20.450	20.682	19.535	29.139
05/26/06	8:52	20.0428	18.561	18.989	20.522	20.440	20.669	19.523	29.139
05/26/06	8:54	21.225	18.544	18.981	20.508	20.431	20.658	19.503	29.141
05/26/06	8:55	22.4772	18.512	18.963	20.497	20.420	20.643	19.494	29.143
05/26/06	8:56	23.8037	18.520	18.957	20.487	20.412	20.634	19.482	29.145
05/26/06	8:58	25.2087	18.512	18.946	20.476	20.404	20.627	19.471	29.147
05/26/06	8:59	26.697	18.503	18.940	20.468	20.396	20.618	19.465	29.147
05/26/06	9:01	28.2735	18.489	18.925	20.456	20.386	20.611	19.450	29.145
05/26/06	9:02	29.9433	18.486	18.923	20.446	20.377	20.595	19.439	29.147
05/26/06	9:04	31.7122	18.477	18.911	20.433	20.369	20.582	19.424	29.149
05/26/06	9:06	33.5858	18.469	18.899	20.424	20.361	20.572	19.415	29.149
05/26/06	9:08	35.5705	18.460	18.894	20.412	20.351	20.563	19.401	29.149
05/26/06	9:10	37.6728	18.448	18.885	20.400	20.343	20.543	19.380	29.147
05/26/06	9:12	39.8997	18.454	18.879	20.395	20.338	20.544	19.374	29.149
05/26/06	9:15	42.2585	18.443	18.870	20.380	20.329	20.530	19.360	29.147
05/26/06	9:17	44.7572	18.422	18.862	20.373	20.324	20.524	19.351	29.149
05/26/06	9:20	47.4038	18.417	18.859	20.365	20.312	20.515	19.337	29.151
05/26/06	9:23	50.2073	18.420	18.847	20.360	20.309	20.506	19.334	29.156
05/26/06	9:26	53.177	18.399	18.838	20.345	20.302	20.498	19.316	29.158
05/26/06	9:29	56.3227	18.405	18.833	20.342	20.294	20.488	19.307	29.162
05/26/06	9:32	59.6547	18.397	18.824	20.330	20.287	20.479	19.302	29.158
05/26/06	9:36	63.1842	18.382	18.818	20.320	20.281	20.460	19.281	29.162
05/26/06	9:39	66.9227	18.376	18.809	20.313	20.275	20.456	19.278	29.162
05/26/06	9:43	70.8828		18.804	20.306	20.270	20.451	19.264	29.160
05/26/06	9:47	75.0777		18.792	20.297	20.264	20.444	19.252	29.164
05/26/06	9:52	79.521		18.804	20.298	20.262	20.454	19.258	29.160
05/26/06	9:57	84.2277		18.780	20.278	20.249	20.425	19.229	29.158
05/26/06	10:02	89.2132		18.775	20.273	20.242	20.418	19.226	29.160
05/26/06	10:07	94.494		18.769	20.269	20.238	20.418	19.217	29.162
05/26/06	10:12	100.0878		18.757	20.252	20.227	20.389	19.191	29.162
05/26/06	10:18	106.0132		18.751	20.243	20.219	20.376	19.170	29.160
05/26/06	10:25	112.2895		18.746	20.243	20.216	20.392		29.162
05/26/06	10:31	118.9378		18.740	20.230	20.200	20.372		29.162
05/26/06	10:38	125.98		18.734	20.222	20.201	20.357		29.160
05/26/06	10:46	133.4395		18.725	20.221	20.200	20.375		29.158
05/26/06	10:54	141.341		18.717	20.206	20.188	20.340		29.156
05/26/06	11:02	149.7107		18.714	20.203	20.188	20.356		29.158
05/26/06	11:20	167.9673		18.702	20.187	20.172	20.321		29.166
05/26/06	11:30	177.9148		18.696	20.183	20.168	20.318		29.162
05/26/06	11:40	187.9148		18.693	20.176	20.160	20.309		29.158
05/26/06	11:50	197.9148		18.688	20.168	20.156	20.305		29.153
05/26/06	12:00	207.9148		18.685	20.161	20.144	20.291		29.151
05/26/06	12:10	217.9148		18.679	20.160	20.149	20.296		29.158
05/26/06	12:20	227.9148		18.676	20.152	20.143	20.275		29.162
05/26/06	12:30	237.9148		18.670	20.154	20.144	20.298		29.158
05/26/06	12:40	247.9148		18.664	20.141	20.134	20.264		29.162

Date	Time	ET (min)	PW Chan[1] Feet H2O	TB-06-2 Chan[2] Feet H2O	TB-06-4 Chan[3] Feet H2O	TB-06-5 Chan[4] Feet H2O	TB-06-6 Chan[5] Feet H2O	TB-06-7 Chan[6] Feet H2O	Barometric Chan[0] Inches Hg
05/26/06	12:50	257.9148		18.662	20.148	20.138	20.291		29.160
05/26/06	13:00	267.9148		18.656	20.136	20.133	20.260		29.160
05/26/06	13:10	277.9148		18.659	20.132	20.125	20.259		29.158
05/26/06	13:20	287.9148		18.653	20.130	20.122	20.259	19.016	29.156
05/26/06	13:30	297.9148		18.653	20.129	20.125	20.259	19.013	29.158
05/26/06	13:40	307.9148		18.653	20.125	20.117	20.246	18.993	29.158
05/26/06	13:50	317.9148		18.647	20.125	20.122	20.254	19.007	29.158
05/26/06	14:00	327.9148		18.644	20.114	20.118	20.233	18.961	29.156
05/26/06	14:10	337.9148		18.641	20.114	20.115	20.241	18.990	29.153
05/26/06	14:20	347.9148	18.108	18.641	20.113	20.115	20.253	18.993	29.145
05/26/06	14:30	357.9148	18.137	18.635	20.116	20.109	20.244	18.975	29.145
05/26/06	14:40	367.9148	18.131	18.635	20.108	20.108	20.235	18.978	29.141
05/26/06	14:50	377.9148	18.131	18.633	20.108	20.109	20.227	18.963	29.135
05/26/06	15:00	387.9148	18.129	18.627	20.103	20.108	20.231	18.969	29.131
05/26/06	15:10	397.9148	18.120	18.621	20.095	20.101	20.224	18.961	29.119
05/26/06	15:20	407.9148	18.126	18.618	20.091	20.101	20.206	18.926	29.109
05/26/06	15:30	417.9148	18.117	18.612	20.088	20.096	20.211	18.949	29.086
05/26/06	15:40	427.9148	18.111	18.609	20.082	20.093	20.211	18.949	29.068
05/26/06	15:50	437.9148	18.114	18.612	20.085	20.096	20.220	18.949	29.074
05/26/06	16:00	447.9148	18.108	18.606	20.079	20.092	20.204	18.934	29.056
05/26/06	16:10	457.9148	18.111	18.612	20.085	20.095	20.205	18.934	29.056
05/26/06	16:20	467.9148	18.114	18.609	20.087	20.095	20.201	18.926	29.058
05/26/06	16:30	477.9148	18.117	18.612	20.091	20.096	20.205	18.934	29.062
05/26/06	16:40	487.9148	18.117	18.618	20.091	20.099	20.217	18.940	29.062
05/26/06	16:50	497.9148	18.126	18.621	20.098	20.102	20.227	18.963	29.070
05/26/06	17:00	507.9148	18.120	18.615	20.091	20.096	20.208	18.926	29.066
05/26/06	17:10	517.9148	18.123	18.618	20.091	20.098	20.211	18.946	29.070
05/26/06	17:20	527.9148	18.123	18.618	20.095	20.101	20.206	18.928	29.072
05/26/06	17:30	537.9148	18.126	18.618	20.094	20.098	20.208	18.928	29.074
05/26/06	17:40	547.9148	18.123	18.618	20.097	20.101	20.209	18.926	29.070
05/26/06	17:50	557.9148	18.123	18.618	20.095	20.102	20.215	18.931	29.080
05/26/06	18:00	567.9148	18.126	18.621	20.100	20.102	20.215	18.934	29.078
05/26/06	18:10	577.9148	18.126	18.618	20.095	20.101	20.209	18.928	29.078
05/26/06	18:20	587.9148	18.126	18.621	20.098	20.102	20.212	18.928	29.074
05/26/06	18:30	597.9148	18.129	18.621	20.100	20.106	20.214	18.926	29.074
05/26/06	18:40	607.9148	18.126	18.621	20.098	20.103	20.209	18.923	29.070
05/26/06	18:50	617.9148	18.123	18.621	20.095	20.099	20.196	18.911	29.072
05/26/06	19:00	627.9148	18.129	18.621	20.100	20.105	20.208	18.920	29.072
05/26/06	19:10	637.9148	18.131	18.624	20.103	20.108	20.215	18.931	29.074
05/26/06	19:20	647.9148	18.129	18.624	20.101	20.105	20.211	18.923	29.070
05/26/06	19:30	657.9148	18.131	18.624	20.101	20.108	20.212	18.926	29.068
05/26/06	19:40	667.9148	18.129	18.624	20.100	20.106	20.209	18.923	29.066
05/26/06	19:50	677.9148	18.131	18.627	20.104	20.109	20.214	18.926	29.068
05/26/06	20:00	687.9148	18.131	18.624	20.103	20.109	20.212	18.923	29.068
05/26/06	20:10	697.9148	18.131	18.621	20.100	20.106	20.211	18.920	29.064
05/26/06	20:20	707.9148	18.134	18.624	20.104	20.109	20.214	18.923	29.062
05/26/06	20:30	717.9148	18.137	18.627	20.104	20.111	20.215	18.923	29.064
05/26/06	20:40	727.9148	18.137	18.627	20.107	20.111	20.217	18.923	29.062
05/26/06	20:50	737.9148	18.137	18.627	20.107	20.111	20.218	18.926	29.060
05/26/06	21:00	747.9148	18.140	18.630	20.108	20.112	20.220	18.923	29.058
05/26/06	21:10	757.9148	18.140	18.630	20.113	20.115	20.221	18.926	29.060
05/26/06	21:20	767.9148	18.146	18.633	20.114	20.115	20.222	18.928	29.058
05/26/06	21:30	777.9148	18.149	18.635	20.117	20.118	20.224	18.926	29.060
05/26/06	21:40	787.9148	18.149	18.638	20.119	20.119	20.225	18.931	29.062
05/26/06	21:50	797.9148	18.152	18.641	20.122	20.124	20.230	18.934	29.070
05/26/06	22:00	807.9148	18.152	18.641	20.123	20.125	20.230	18.931	29.070
05/26/06	22:10	817.9148	18.154	18.644	20.126	20.127	20.231	18.931	29.072

Date	Time	ET (min)	PW Chan[1] Feet H2O	TB-06-2 Chan[2] Feet H2O	TB-06-4 Chan[3] Feet H2O	TB-06-5 Chan[4] Feet H2O	TB-06-6 Chan[5] Feet H2O	TB-06-7 Chan[6] Feet H2O	Barometric Chan[0] Inches Hg
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05/26/06	22:20	827.9148	18.154	18.644	20.126	20.125	20.230	18.928	29.070
05/26/06	22:30	837.9148	18.154	18.644	20.126	20.128	20.230	18.928	29.070
05/26/06	22:40	847.9148	18.157	18.647	20.127	20.130	20.234	18.931	29.072
05/26/06	22:50	857.9148	18.157	18.647	20.129	20.130	20.231	18.928	29.078
05/26/06	23:00	867.9148	18.160	18.650	20.130	20.131	20.234	18.934	29.082
05/26/06	23:10	877.9148	18.160	18.650	20.133	20.134	20.235	18.934	29.084
05/26/06	23:20	887.9148	18.160	18.650	20.133	20.133	20.237	18.934	29.076
05/26/06	23:30	897.9148	18.160	18.650	20.133	20.133	20.235	18.931	29.074
05/26/06	23:40	907.9148	18.160	18.650	20.133	20.134	20.237	18.931	29.076
05/26/06	23:50	917.9148	18.163	18.650	20.133	20.134	20.238	18.928	29.072
05/27/06	0:00	927.9148	18.163	18.653	20.136	20.136	20.235	18.934	29.074
05/27/06	0:20	947.9148	18.163	18.653	20.138	20.137	20.241	18.934	29.066
05/27/06	0:40	967.9148	18.166	18.656	20.139	20.138	20.244	18.934	29.072
05/27/06	1:00	987.9148	18.169	18.656	20.139	20.141	20.243	18.934	29.064
05/27/06	1:20	1007.915	18.178	18.667	20.148	20.149	20.251	18.943	29.080
05/27/06	1:40	1027.915	18.178	18.664	20.148	20.147	20.248	18.940	29.072
05/27/06	2:00	1047.915	18.175	18.664	20.145	20.146	20.247	18.934	29.054
05/27/06	2:20	1067.915	18.178	18.667	20.148	20.147	20.248	18.934	29.054
05/27/06	2:40	1087.915	18.178	18.667	20.149	20.149	20.251	18.940	29.054
05/27/06	3:00	1107.915	18.180	18.670	20.151	20.150	20.251	18.940	29.052
05/27/06	3:20	1127.915	18.189	18.676	20.161	20.157	20.259	18.946	29.072
05/27/06	3:40	1147.915	18.195	18.682	20.167	20.163	20.264	18.952	29.090
05/27/06	4:00	1167.915	18.198	18.688	20.171	20.168	20.270	18.958	29.105
05/27/06	4:20	1187.915	18.195	18.685	20.167	20.165	20.267	18.952	29.099
05/27/06	4:40	1207.915	18.192	18.685	20.165	20.163	20.266	18.949	29.088
05/27/06	5:00	1227.915	18.198	18.688	20.170	20.168	20.269	18.952	29.105
05/27/06	5:20	1247.915	18.198	18.685	20.170	20.168	20.270	18.955	29.099
05/27/06	5:40	1267.915	18.195	18.682	20.168	20.165	20.267	18.955	29.094
05/27/06	6:00	1287.915	18.195	18.682	20.167	20.165	20.266	18.946	29.088
05/27/06	6:20	1307.915	18.192	18.685	20.167	20.165	20.264	18.952	29.086
05/27/06	6:40	1327.915	18.198	18.688	20.171	20.168	20.269	18.955	29.094
05/27/06	7:00	1347.915	18.195	18.682	20.167	20.163	20.267	18.952	29.099
05/27/06	7:20	1367.915	18.198	18.685	20.171	20.166	20.269		29.099
05/27/06	7:40	1387.915	18.198	18.688	20.173	20.169			29.101
05/27/06	8:00	1407.915	18.198	18.691					29.096
05/27/06	8:20	1427.915	18.201	18.693					29.094
05/27/06	8:40	1447.915	18.198	18.691					29.099
05/27/06	8:50	1457.915	18.198	18.691					29.101

In-Situ Inc. MiniTroll Pro

Report generated: 06/01/06 12:05:27
Report from file: C:\Win-Situ\Data\SN00860 2006-05-23 073501 AEC TB-06-1 CR.bin
DataMgr Version 3.71

Serial number: 860
Firmware Version 3.09
Unit name: B14958B

Test name: AEC TB-06-1 CR

Test defined on: 05/23/06 7:34:24
Test started on: 05/23/06 7:35:01
Test stopped on: 05/27/06 8:20:23
Test extracted on: N/A

Data gathered using Linear testing
Time between data points: Minutes.
Number of data samples: 5806

TOTAL DATA SAMPLES 5806

Channel number [1]
Measurement type: Temperature
Channel name:

Channel number [2]
Measurement type: Pressure
Channel name: Troll B14958B
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: TOC
User-defined reference: 18.41 Feet H2O
Referenced on: channel definition.
Pressure head at reference: 15.982 Feet H2O

Date	Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
05/23/06	7:35	0	57.62	18.410
05/23/06	7:45	10	57.62	18.412
05/23/06	7:55	20	57.62	18.410
05/23/06	8:05	30	57.62	18.412
05/23/06	8:15	40	57.62	18.414
05/23/06	8:20	45	57.62	18.412
05/23/06	8:21	46	57.62	18.412
05/23/06	8:22	47	57.62	18.459
05/23/06	8:23	48	57.62	18.535
05/23/06	8:24	49	57.62	18.601
05/23/06	8:25	50	57.59	18.653
05/23/06	8:26	51	57.59	18.693
05/23/06	8:27	52	57.59	18.729
05/23/06	8:28	53	57.59	18.757
05/23/06	8:29	54	57.59	18.784
05/23/06	8:30	55	57.59	18.802
05/23/06	8:31	56	57.59	18.819
05/23/06	8:32	57	57.59	18.838
05/23/06	8:33	58	57.59	18.850
05/23/06	8:34	59	57.59	18.859

Date Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
05/23/06 8:35	60	57.59	18.872
05/23/06 8:36	61	57.59	18.882
05/23/06 8:41	66	57.62	18.924
05/23/06 8:46	71	57.62	18.948
05/23/06 8:51	76	57.59	18.972
05/23/06 8:56	81	57.59	18.989
05/23/06 9:01	86	57.59	19.005
05/23/06 9:06	91	57.59	19.025
05/23/06 9:11	96	57.62	19.041
05/23/06 9:16	101	57.62	19.052
05/23/06 9:21	106	57.62	19.063
05/23/06 9:36	121	57.62	19.090
05/23/06 9:51	136	57.64	19.115
05/23/06 10:06	151	57.64	19.128
05/23/06 10:21	166	57.64	19.143
05/23/06 10:51	196	57.64	19.166
05/23/06 11:21	226	57.71	19.194
05/23/06 11:51	256	57.66	19.210
05/23/06 12:21	286	57.64	19.224
05/23/06 13:21	346	57.64	19.253
05/23/06 14:21	406	57.66	19.276
05/23/06 15:21	466	57.64	19.296
05/23/06 16:21	526	57.71	19.318
05/23/06 17:21	586	57.66	19.340
05/23/06 18:21	646	57.62	19.358
05/23/06 19:21	706	57.62	19.379
05/23/06 20:21	766	57.62	19.394
05/23/06 21:21	826	57.62	19.413
05/23/06 22:21	886	57.64	19.430
05/23/06 23:21	946	57.64	19.453
05/24/06 0:21	1006	57.64	19.464
05/24/06 1:21	1066	57.64	19.476
05/24/06 2:21	1126	57.64	19.483
05/24/06 3:21	1186	57.71	19.503
05/24/06 4:21	1246	57.62	19.509
05/24/06 5:21	1306	57.62	19.522
05/24/06 6:21	1366	57.62	19.528
05/24/06 7:21	1426	57.62	19.539
05/24/06 8:21	1486	57.64	19.549
05/24/06 9:21	1546	57.64	19.561
05/24/06 10:21	1606	57.64	19.566
05/24/06 11:21	1666	57.64	19.574
05/24/06 12:21	1726	57.66	19.586
05/24/06 13:21	1786	57.66	19.587
05/24/06 14:21	1846	57.66	19.593
05/24/06 15:21	1906	57.64	19.595
05/24/06 16:21	1966	57.66	19.597
05/24/06 17:21	2026	57.68	19.599
05/24/06 18:21	2086	57.66	19.599
05/24/06 19:21	2146	57.64	19.604
05/24/06 20:21	2206	57.64	19.608
05/24/06 21:21	2266	57.64	19.608
05/24/06 22:21	2326	57.64	19.610
05/24/06 23:21	2386	57.64	19.608
05/25/06 0:21	2446	57.64	19.606
05/25/06 1:21	2506	57.64	19.606
05/25/06 2:21	2566	57.64	19.602
05/25/06 3:21	2626	57.64	19.602

Date Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
05/25/06 4:21	2686	57.64	19.602
05/25/06 5:21	2746	57.64	19.600
05/25/06 6:21	2806	57.64	19.602
05/25/06 7:21	2866	57.66	19.603
05/25/06 8:21	2926	57.66	19.606
05/25/06 9:21	2986	57.66	19.593
05/25/06 10:21	3046	57.66	19.608
05/25/06 11:21	3106	57.64	19.606
05/25/06 12:21	3166	57.64	19.632
05/25/06 13:21	3226	57.66	19.610
05/25/06 14:21	3286	57.66	19.616
05/25/06 15:21	3346	57.68	19.622
05/25/06 16:21	3406	57.68	19.626
05/25/06 17:21	3466	57.68	19.626
05/25/06 18:21	3526	57.73	19.626
05/25/06 19:21	3586	57.75	19.633
05/25/06 20:21	3646	57.75	19.636
05/25/06 21:21	3706	57.75	19.642
05/25/06 22:08	3753	57.75	19.621
05/25/06 22:09	3754	57.75	19.682
05/25/06 22:10	3755	57.75	19.727
05/25/06 22:21	3766	57.75	19.655
05/25/06 23:21	3826	57.75	19.655
05/26/06 0:21	3886	57.75	19.663
05/26/06 1:21	3946	57.75	19.674
05/26/06 2:21	4006	57.75	19.678
05/26/06 3:21	4066	57.75	19.691
05/26/06 4:21	4126	57.75	19.708
05/26/06 5:21	4186	57.75	19.714
05/26/06 6:21	4246	57.75	19.725
05/26/06 7:21	4306	57.75	19.738
05/26/06 8:21	4366	57.75	19.748
05/26/06 8:27	4372	57.75	19.750
05/26/06 8:32	4377	57.75	19.752
05/26/06 8:33	4378	57.75	19.750
05/26/06 8:34	4379	57.75	19.716
05/26/06 8:35	4380	57.75	19.640
05/26/06 8:36	4381	57.75	19.576
05/26/06 8:37	4382	57.75	19.525
05/26/06 8:38	4383	57.75	19.483
05/26/06 8:39	4384	57.75	19.449
05/26/06 8:40	4385	57.75	19.421
05/26/06 8:41	4386	57.75	19.400
05/26/06 8:42	4387	57.75	19.381
05/26/06 8:43	4388	57.75	19.364
05/26/06 8:44	4389	57.75	19.349
05/26/06 8:45	4390	57.75	19.336
05/26/06 8:46	4391	57.75	19.325
05/26/06 8:47	4392	57.75	19.313
05/26/06 8:51	4396	57.75	19.283
05/26/06 8:56	4401	57.75	19.253
05/26/06 9:01	4406	57.75	19.232
05/26/06 9:06	4411	57.75	19.215
05/26/06 9:11	4416	57.75	19.202
05/26/06 9:16	4421	57.75	19.187
05/26/06 9:21	4426	57.75	19.179
05/26/06 9:36	4441	57.75	19.155
05/26/06 9:51	4456	57.75	19.134

Date	Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
05/26/06	10:06	4471	57.73	19.118
05/26/06	10:21	4486	57.75	19.104
05/26/06	10:51	4516	57.75	19.083
05/26/06	11:21	4546	57.73	19.071
05/26/06	11:51	4576	57.73	19.056
05/26/06	12:21	4606	57.73	19.049
05/26/06	13:21	4666	57.73	19.035
05/26/06	14:21	4726	57.71	19.029
05/26/06	15:21	4786	57.71	19.020
05/26/06	16:21	4846	57.71	19.016
05/26/06	17:21	4906	57.71	19.024
05/26/06	18:21	4966	57.71	19.029
05/26/06	19:21	5026	57.71	19.037
05/26/06	20:21	5086	57.73	19.041
05/26/06	21:21	5146	57.73	19.050
05/26/06	22:21	5206	57.73	19.060
05/26/06	23:21	5266	57.71	19.069
05/27/06	0:21	5326	57.68	19.074
05/27/06	1:21	5386	57.71	19.084
05/27/06	2:21	5446	57.66	19.087
05/27/06	3:21	5506	57.62	19.096
05/27/06	4:21	5566	57.66	19.104
05/27/06	5:21	5626	57.66	19.108
05/27/06	6:21	5686	57.68	19.106
05/27/06	7:21	5746	57.66	19.106
05/27/06	7:51	5776	57.64	19.109
05/27/06	8:19	5804	57.64	19.107
05/27/06	8:20	5805	57.64	19.109

In-Situ Inc. MiniTroll Pro

Report generated: 05/23/06 13:18:14
Report from file: C:\Win-Situ\Data\SN01118 2006-05-23 080500 AEC TB-06-3 CR.bin
DataMgr Version 3.71

Serial number: 1118
Firmware Version 3.09
Unit name: B14996b

Test name: AEC TB-06-3 CR

Test defined on: 05/23/06 7:56:07
Test scheduled for: 05/23/06 8:05:00
Test started on: 05/23/06 8:05:00
Test stopped on: 05/27/06 9:10:00
Test extracted on: N/A

Data gathered using Linear testing
Time between data points: Minutes.
Number of data samples: 1797

TOTAL DATA SAMPLES 1797

Channel number [1]
Measurement type: Temperature
Channel name:

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: TOC
User-defined reference: 18.76 Feet H2O
Referenced on: test start
Pressure head at reference: 12.144 Feet H2O

Date	Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
05/23/06	8:05	0	57.93	18.760
05/23/06	8:15	10	56.82	18.746
05/23/06	8:20	15	56.80	18.742
05/23/06	8:21	16	56.80	18.744
05/23/06	8:22	17	56.78	18.786
05/23/06	8:23	18	56.80	18.840
05/23/06	8:24	19	56.78	18.880
05/23/06	8:25	20	56.80	18.915
05/23/06	8:26	21	56.78	18.943
05/23/06	8:27	22	56.78	18.967
05/23/06	8:28	23	56.78	18.991
05/23/06	8:29	24	56.78	19.013
05/23/06	8:30	25	56.78	19.027
05/23/06	8:31	26	56.78	19.047
05/23/06	8:32	27	56.78	19.065
05/23/06	8:33	28	56.78	19.079
05/23/06	8:34	29	56.78	19.093
05/23/06	8:35	30	56.78	19.106
05/23/06	8:36	31	56.78	19.120

Date Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
05/23/06 8:41	36	56.76	19.174
05/23/06 8:46	41	56.73	19.218
05/23/06 8:51	46	56.73	19.254
05/23/06 8:56	51	56.71	19.286
05/23/06 9:01	56	56.69	19.310
05/23/06 9:06	61	56.66	19.333
5/23/06 9:10			19.36
5/23/06 11:11			19.51
5/23/06 16:42			19.63
5/23/06 20:18			19.69
5/24/06 8:36			19.85
5/24/06 18:41			19.90
5/24/06 20:00			19.90
5/24/06 21:30		56.47	19.864
5/24/06 22:30		56.47	19.866
5/24/06 23:30		56.48	19.857
5/25/06 0:30		56.48	19.855
5/25/06 1:30		56.48	19.860
5/25/06 2:30		56.48	19.853
5/25/06 3:30		56.48	19.851
5/25/06 4:30		56.47	19.851
5/25/06 5:30		56.47	19.854
5/25/06 6:30		56.47	19.854
5/25/06 7:20		56.47	19.856
5/25/06 7:21			19.90
5/25/06 7:30		56.47	19.858
5/25/06 8:30		56.48	19.861
5/25/06 9:30		56.49	19.864
5/25/06 9:34			19.90
5/25/06 9:40		56.49	19.858
5/25/06 10:35			19.90
5/25/06 11:30	141000	56.50	19.864
5/25/06 12:30	144600	56.51	19.865
5/25/06 13:30	148200	56.51	19.867
5/25/06 14:30	151800	56.51	19.875
5/25/06 15:30	155400	56.51	19.870
5/25/06 16:30	159000	56.51	19.877
5/25/06 17:30	162600	56.50	19.879
5/25/06 18:30	166200	56.50	19.879
5/25/06 19:30	169800	56.49	19.885
5/25/06 20:30	173400	56.49	19.889
5/25/06 21:30	177000	56.49	19.898
5/25/06 22:30	180600	56.49	19.910
5/25/06 23:30	184200	56.49	19.908
5/26/06 0:30	187800	56.49	19.917
5/26/06 1:30	191400	56.48	19.927
5/26/06 2:30	195000	56.48	19.928
5/26/06 3:30	198600	56.47	19.950
5/26/06 4:30	202200	56.47	19.966
5/26/06 5:30	205800	56.48	19.965
5/26/06 6:30	209400	56.47	19.978
5/26/06 7:30	213000	56.48	19.992
5/26/06 8:00	214800	56.47	19.987
5/26/06 8:29	1320.001	56.48	20.031
5/26/06 8:33	1560.001	56.48	19.999
5/26/06 8:34	1620.001	56.48	19.943
5/26/06 8:35	1680.001	56.48	19.908
5/26/06 8:36	1740.001	56.48	19.873

Date	Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
5/26/06	8:37	1800.001	56.49	19.846
5/26/06	8:38	1860.001	56.49	19.825
5/26/06	8:39	1920.001	56.49	19.804
5/26/06	8:40	1980.001	56.49	19.785
5/26/06	8:41	2040.001	56.49	19.771
5/26/06	8:42	2100.001	56.49	19.750
5/26/06	8:43	2160.001	56.49	19.742
5/26/06	8:44	2220.001	56.49	19.722
5/26/06	8:45	2280.001	56.49	19.713
5/26/06	8:46	2340.001	56.49	19.698
5/26/06	8:47	2400.001	56.49	19.692
5/26/06	8:48	2460.001	56.49	19.680
5/26/06	8:49	2520.001	56.50	19.666
5/26/06	8:50	2580.001	56.49	19.659
5/26/06	8:51	2640.001	56.50	19.650
5/26/06	8:52	2700.001	56.50	19.641
5/26/06	8:53	2760.001	56.49	19.634
5/26/06	8:54	2820.001	56.49	19.624
5/26/06	8:55	2880.001	56.49	19.617
5/26/06	9:00	3180.001	56.49	19.585
5/26/06	9:05	3480.001	56.50	19.556
5/26/06	9:10	3780.001	56.49	19.536
5/26/06	9:15	4080.001	56.50	19.512
5/26/06	9:20	4380.001	56.49	19.498
5/26/06	9:25	4680.001	56.50	19.479
5/26/06	9:30	4980.001	56.49	19.480
5/26/06	9:40	5580.001	56.49	19.460
5/26/06	10:00	6780.001	56.48	19.425
5/26/06	10:20	7980.001	56.49	19.403
5/26/06	11:20	11580	56.48	19.377
5/26/06	12:20	15180	56.49	19.355
5/26/06	13:20	18780	56.48	19.351
5/26/06	14:20	22380	56.49	19.343
5/26/06	15:20	25980	56.48	19.337
5/26/06	16:20	29580	56.47	19.341
5/26/06	17:20	33180	56.48	19.350
5/26/06	18:20	36780	56.47	19.354
5/26/06	19:20	40380	56.47	19.362
5/26/06	20:20	43980	56.47	19.373
5/26/06	21:20	47580	56.47	19.378
5/26/06	22:20	51180	56.48	19.394
5/26/06	23:20	54780	56.48	19.403
5/27/06	0:20	58380	56.48	19.404
5/27/06	1:20	61980	56.47	19.421
5/27/06	2:20	65580	56.48	19.414
5/27/06	3:20	69180	56.47	19.432
5/27/06	4:20	72780	56.48	19.440
5/27/06	5:20	76380	56.48	19.440
5/27/06	6:20	79980	56.48	19.438
5/27/06	7:20	83580	56.48	19.443
5/27/06	8:20	87180	56.48	19.444
5/27/06	8:50	88980	56.47	19.439
5/27/06	9:10	90180	56.47	19.455

Well ID: Supply Well **Job No.:** 106-294
Client: Associated Electric Coop
Location: Norborne, Missouri site
Well Information: 6-inch temporary supply well with 0.020-inch slotted PVC screen set from 39 to 59 feet below grade
Test Information: 72-Hour Constant-rate aquifer test
Measuring Point: Top of 6-inch PVC casing, approx. 1.0 feet above grade. 685.97 Measuring Point Elevation

Date/Time	Elapsed Time from Start of Test	Elapsed Time from Start of Step	Depth to Water	Observed Drawdown	Water Elevation	Comments
(hr:min)	(minutes)	(minutes)	(feet)	(feet)	(feet)	
05/22/06 11:52			16.92		669.05	
05/22/06 14:51			16.95		669.02	
05/22/06 16:32			17.76		668.21	
05/22/06 17:28			18.37		667.60	
05/22/06 18:28			19.58		666.39	
05/22/06 19:38			19.58		666.39	
05/22/06 20:10			17.73		668.24	
05/22/06 20:15			17.60		668.37	
05/22/06 20:40			17.50		668.47	
05/23/06 7:45			17.16		668.81	
05/23/06 8:21	0			0		Start of constant-rate test
05/23/06 8:37	16		19.04	1.88	666.93	
05/23/06 8:43	22		19.15	1.99	666.82	
05/23/06 8:56	35		19.27	2.11	666.70	
05/23/06 10:16	115		19.53	2.37	666.44	
05/23/06 11:08	167		19.58	2.42	666.39	
05/23/06 11:34	193		19.60	2.44	666.37	
05/23/06 12:20	239		19.60	2.44	666.37	
05/23/06 13:58	337		19.63	2.47	666.34	
05/23/06 15:31	430		19.67	2.51	666.30	
05/23/06 16:39	498		19.70	2.54	666.27	
05/23/06 17:24	543		19.68	2.52	666.29	
05/23/06 18:25	604		19.70	2.54	666.27	
05/23/06 19:24	663		19.72	2.56	666.25	
05/23/06 20:46	745		19.77	2.61	666.20	
05/24/06 7:34	1393		19.91	2.75	666.06	
05/24/06 8:34	1453		19.93	2.77	666.04	
05/24/06 9:40	1519		19.93	2.77	666.04	
05/24/06 11:31	1630		19.94	2.78	666.03	
05/24/06 12:57	1716		19.95	2.79	666.02	
05/24/06 13:41	1760		19.95	2.79	666.02	
05/24/06 14:23	1802		19.93	2.77	666.04	
05/24/06 15:22	1861		19.94	2.78	666.03	
05/24/06 16:24	1923		19.96	2.80	666.01	
05/24/06 17:25	1984		19.96	2.80	666.01	
05/24/06 18:37	2056		19.97	2.81	666.00	
05/24/06 19:30	2109		19.97	2.81	666.00	
05/24/06 20:48	2187		19.97	2.81	666.00	
05/25/06 7:18	2817		19.97	2.81	666.00	
05/25/06 8:41	2900		19.97	2.81	666.00	
05/25/06 9:39	2958		19.97	2.81	666.00	
05/25/06 10:32	3011		19.96	2.80	666.01	
05/25/06 12:04	3103		19.96	2.80	666.01	
05/25/06 14:37	3256		19.97	2.81	666.00	
05/25/06 17:33	3432		19.97	2.81	666.00	
05/25/06 20:03	3582		19.98	2.82	665.99	
05/26/06 7:25	4264		20.09	2.93	665.88	
05/26/06 8:14	4313		20.10	2.94	665.87	
05/26/06 8:33	4332	0				Pump Off Start Recovery
05/26/06 8:41	4340	8	18.55	1.39	667.42	
05/26/06 8:44	4343	11	18.45	1.29	667.52	
05/26/06 8:48	4347	15	18.37	1.21	667.60	
05/26/06 8:50	4349	17	18.34	1.18	667.63	
05/26/06 8:57	4356	24	18.25	1.09	667.72	
05/26/06 9:08	4367	35	18.17	1.01	667.80	

Well ID: Supply Well **Job No.:** 106-294
Client: Associated Electric Coop
Location: Norborne, Missouri site
Well Information: 6-inch temporary supply well with 0.020-inch slotted PVC screen set from 39 to 59 feet below grade
Test Information: 72-Hour Constant-rate aquifer test
Measuring Point: Top of 6-inch PVC casing, approx. 1.0 feet above grade. 685.97 Measuring Point Elevation

Date/Time	Elapsed Time from Start of Test	Elapsed Time from Start of Step	Depth to Water	Observed Drawdown	Water Elevation	Comments
(hr:min)	(minutes)	(minutes)	(feet)	(feet)	(feet)	
05/26/06 9:13	4372	40	18.14	0.98	667.83	
05/26/06 9:21	4380	48	18.11	0.95	667.86	
05/26/06 9:49	4408	76	18.02	0.86	667.95	

In-Situ Inc. MiniTroll Pro

Report generated: 05/27/06 8:32:10
Report from file: C:\Win-Situ\Data\SN01114 2006-05-22 132000 AEC River Gage.bin
DataMgr Version 3.71

Serial number: 1114
Firmware Version 3.09
Unit name: B14989B

Test name: AEC River Gage

Test defined on: 05/22/06 9:21:35
Test started on: 05/22/06 13:20:00
Test stopped on: 05/27/06 8:31:55
Test extracted on: N/A

Data gathered using Linear testing
Time between data points: 5.0000 Minutes.
Number of data samples: 1383

TOTAL DATA SAMPLES 1383

Channel number [1]
Measurement type: Temperature
Channel name: temperature

Channel number [2]
Measurement type: Pressure
Channel name: Pressure
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: TOC
User-defined reference: 2.31 Feet H2O
Referenced on: channel definition.
Pressure head at reference: 2.198 Feet H2O

Date	Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
05/23/06	6:00	1000	69.57	2.522
05/23/06	6:20	1020	69.52	2.529
05/23/06	6:40	1040	69.52	2.533
05/23/06	7:00	1060	69.50	2.548
05/23/06	7:20	1080	69.50	2.533
05/23/06	7:40	1100	69.48	2.540
05/23/06	8:00	1120	69.48	2.550
05/23/06	8:20	1140	69.50	2.560
05/23/06	8:40	1160	69.54	2.566
05/23/06	9:00	1180	69.57	2.543
05/23/06	9:20	1200	69.57	2.564
05/23/06	9:40	1220	69.59	2.566
05/23/06	10:00	1240	69.59	2.555
05/23/06	10:20	1260	69.59	2.574
05/23/06	10:40	1280	69.57	2.572
05/23/06	11:00	1300	69.66	2.577
05/23/06	11:20	1320	69.84	2.575
05/23/06	11:40	1340	69.95	2.584
05/23/06	12:00	1360	70.06	2.591
05/23/06	12:20	1380	70.15	2.574

Date Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
05/23/06 12:40	1400	70.36	2.582
05/23/06 13:00	1420	70.54	2.600
05/23/06 13:20	1440	70.67	2.582
05/23/06 13:40	1460	70.81	2.599
05/23/06 14:00	1480	70.92	2.598
05/23/06 14:20	1500	71.06	2.601
05/23/06 14:40	1520	71.17	2.603
05/23/06 15:00	1540	71.26	2.602
05/23/06 15:20	1560	71.39	2.613
05/23/06 15:40	1580	71.48	2.627
05/23/06 16:00	1600	71.57	2.613
05/23/06 16:20	1620	71.67	2.633
05/23/06 16:40	1640	71.73	2.642
05/23/06 17:00	1660	71.82	2.644
05/23/06 17:20	1680	71.82	2.642
05/23/06 17:40	1700	71.89	2.651
05/23/06 18:00	1720	71.91	2.645
05/23/06 18:20	1740	71.94	2.657
05/23/06 18:40	1760	71.96	2.648
05/23/06 19:00	1780	72.00	2.660
05/23/06 19:20	1800	71.98	2.662
05/23/06 19:40	1820	71.98	2.677
05/23/06 20:00	1840	71.98	2.681
05/23/06 20:20	1860	71.98	2.683
05/23/06 20:40	1880	71.96	2.692
05/23/06 21:00	1900	71.96	2.704
05/23/06 21:20	1920	71.96	2.696
05/23/06 21:40	1940	71.94	2.707
05/23/06 22:00	1960	71.94	2.705
05/23/06 22:20	1980	71.94	2.721
05/23/06 22:40	2000	71.94	2.734
05/23/06 23:00	2020	71.91	2.726
05/23/06 23:20	2040	71.91	2.736
05/23/06 23:40	2060	71.89	2.749
05/24/06 0:00	2080	71.89	2.749
05/24/06 0:20	2100	71.87	2.753
05/24/06 0:40	2120	71.87	2.755
05/24/06 1:00	2140	71.87	2.756
05/24/06 1:20	2160	71.85	2.750
05/24/06 1:40	2180	71.85	2.760
05/24/06 2:00	2200	71.82	2.769
05/24/06 2:20	2220	71.82	2.777
05/24/06 2:40	2240	71.80	2.769
05/24/06 3:00	2260	71.80	2.779
05/24/06 3:20	2280	71.78	2.794
05/24/06 3:40	2300	71.78	2.784
05/24/06 4:00	2320	71.78	2.796
05/24/06 4:20	2340	71.76	2.801
05/24/06 4:40	2360	71.76	2.803
05/24/06 5:00	2380	71.73	2.813
05/24/06 5:20	2400	71.71	2.811
05/24/06 5:40	2420	71.71	2.820
05/24/06 6:00	2440	71.69	2.812
05/24/06 6:20	2460	71.67	2.806
05/24/06 6:40	2480	71.64	2.818
05/24/06 7:00	2500	71.64	2.829
05/24/06 7:20	2520	71.62	2.831
05/24/06 7:40	2540	71.62	2.815
05/24/06 8:00	2560	71.62	2.823

Date Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
05/24/06 8:20	2580	71.64	2.843
05/24/06 8:40	2600	71.69	2.833
05/24/06 9:00	2620	71.76	2.859
05/24/06 9:20	2640	71.82	2.864
05/24/06 9:40	2660	71.89	2.841
05/24/06 10:00	2680	72.00	2.866
05/24/06 10:20	2700	72.12	2.850
05/24/06 10:40	2720	72.23	2.858
05/24/06 11:00	2740	72.30	2.850
05/24/06 11:20	2760	72.39	2.845
05/24/06 11:40	2780	72.36	2.850
05/24/06 12:00	2800	72.34	2.867
05/24/06 12:20	2820	72.36	2.862
05/24/06 12:40	2840	72.43	2.849
05/24/06 13:00	2860	72.50	2.859
05/24/06 13:20	2880	72.50	2.859
05/24/06 13:40	2900	72.77	2.868
05/24/06 14:00	2920	72.95	2.866
05/24/06 14:20	2940	73.04	2.869
05/24/06 14:40	2960	73.22	2.871
05/24/06 15:00	2980	73.38	2.869
05/24/06 15:20	3000	73.49	2.851
05/24/06 15:40	3020	73.54	2.857
05/24/06 16:00	3040	73.58	2.863
05/24/06 16:20	3060	73.67	2.847
05/24/06 16:40	3080	73.74	2.848
05/24/06 17:00	3100	73.76	2.846
05/24/06 17:20	3120	73.76	2.860
05/24/06 17:40	3140	73.76	2.864
05/24/06 18:00	3160	73.79	2.868
05/24/06 18:20	3180	73.79	2.854
05/24/06 18:40	3200	73.79	2.846
05/24/06 19:00	3220	73.79	2.843
05/24/06 19:20	3240	73.81	2.829
05/24/06 19:40	3260	73.81	2.843
05/24/06 20:00	3280	73.81	2.845
05/24/06 20:20	3300	73.81	2.845
05/24/06 20:40	3320	73.79	2.841
05/24/06 21:00	3340	73.76	2.837
05/24/06 21:20	3360	73.74	2.836
05/24/06 21:40	3380	73.72	2.832
05/24/06 22:00	3400	73.67	2.832
05/24/06 22:20	3420	73.65	2.837
05/24/06 22:40	3440	73.63	2.827
05/24/06 23:00	3460	73.60	2.837
05/24/06 23:20	3480	73.58	2.821
05/24/06 23:40	3500	73.58	2.821
05/25/06 0:00	3520	73.56	2.829
05/25/06 0:20	3540	73.54	2.832
05/25/06 0:40	3560	73.54	2.825
05/25/06 1:00	3580	73.51	2.820
05/25/06 1:20	3600	73.49	2.832
05/25/06 1:40	3620	73.49	2.826
05/25/06 2:00	3640	73.47	2.814
05/25/06 2:20	3660	73.45	2.814
05/25/06 2:40	3680	73.40	2.808
05/25/06 3:00	3700	73.36	2.811
05/25/06 3:20	3720	73.33	2.815
05/25/06 3:40	3740	73.29	2.806

Date Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
05/25/06 4:00	3760	73.27	2.812
05/25/06 4:20	3780	73.24	2.810
05/25/06 4:40	3800	73.22	2.804
05/25/06 5:00	3820	73.20	2.809
05/25/06 5:20	3840	73.18	2.813
05/25/06 5:40	3860	73.15	2.811
05/25/06 6:00	3880	73.13	2.793
05/25/06 6:20	3900	73.09	2.806
05/25/06 6:40	3920	73.06	2.800
05/25/06 7:00	3940	73.02	2.796
05/25/06 7:20	3960	73.02	2.805
05/25/06 7:40	3980	73.00	2.803
05/25/06 8:00	4000	73.00	2.798
05/25/06 8:20	4020	73.00	2.796
05/25/06 8:40	4040	73.04	2.798
05/25/06 9:00	4060	73.06	2.802
05/25/06 9:20	4080	73.13	2.793
05/25/06 9:40	4100	73.22	2.800
05/25/06 10:00	4120	73.31	2.801
05/25/06 10:20	4140	73.40	2.796
05/25/06 10:40	4160	73.49	2.786
05/25/06 11:00	4180	73.60	2.783
05/25/06 11:20	4200	73.72	2.794
05/25/06 11:40	4220	73.81	2.802
05/25/06 12:00	4240	73.88	2.813
05/25/06 12:20	4260	73.99	2.764
05/25/06 12:40	4280	74.12	2.806
05/25/06 13:00	4300	74.21	2.803
05/25/06 13:20	4320	74.26	2.784
05/25/06 13:40	4340	74.37	2.785
05/25/06 14:00	4360	74.46	2.802
05/25/06 14:20	4380	74.55	2.793
05/25/06 14:40	4400	74.64	2.804
05/25/06 15:00	4420	74.66	2.833
05/25/06 15:20	4440	74.73	2.830
05/25/06 15:40	4460	74.82	2.846
05/25/06 16:00	4480	74.87	2.816
05/25/06 16:20	4500	74.91	2.824
05/25/06 16:40	4520	74.93	2.815
05/25/06 17:00	4540	74.96	2.809
05/25/06 17:20	4560	74.96	2.819
05/25/06 17:40	4580	74.96	2.809
05/25/06 18:00	4600	74.98	2.834
05/25/06 18:20	4620	74.98	2.804
05/25/06 18:40	4640	74.98	2.811
05/25/06 19:00	4660	74.98	2.827
05/25/06 19:20	4680	74.98	2.821
05/25/06 19:40	4700	74.98	2.821
05/25/06 20:00	4720	74.96	2.825
05/25/06 20:20	4740	74.93	2.834
05/25/06 20:40	4760	74.89	2.818
05/25/06 21:00	4780	74.87	2.841
05/25/06 21:20	4800	74.84	2.846
05/25/06 21:40	4820	74.80	2.832
05/25/06 22:00	4840	74.78	2.805
05/25/06 22:20	4860	74.75	2.857
05/25/06 22:40	4880	74.71	2.837
05/25/06 23:00	4900	74.69	2.852
05/25/06 23:20	4920	74.66	2.854

Date	Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
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05/25/06	23:40	4940	74.64	2.850
05/26/06	0:00	4960	74.60	2.857
05/26/06	0:20	4980	74.57	2.863
05/26/06	0:40	5000	74.55	2.868
05/26/06	1:00	5020	74.51	2.883
05/26/06	1:20	5040	74.48	2.881
05/26/06	1:40	5060	74.44	2.873
05/26/06	2:00	5080	74.42	2.888
05/26/06	2:20	5100	74.39	2.890
05/26/06	2:40	5120	74.35	2.897
05/26/06	3:00	5140	74.33	2.900
05/26/06	3:20	5160	74.30	2.908
05/26/06	3:40	5180	74.28	2.913
05/26/06	4:00	5200	74.21	2.922
05/26/06	4:20	5220	74.19	2.928
05/26/06	4:40	5240	74.15	2.933
05/26/06	5:00	5260	74.10	2.936
05/26/06	5:20	5280	74.08	2.940
05/26/06	5:40	5300	74.03	2.938
05/26/06	6:00	5320	73.99	2.939
05/26/06	6:20	5340	73.94	2.940
05/26/06	6:40	5360	73.94	2.946
05/26/06	7:00	5380	73.90	2.965
05/26/06	7:20	5400	73.90	2.957
05/26/06	7:40	5420	73.88	2.971
05/26/06	8:00	5440	73.88	2.976
05/26/06	8:20	5460	73.88	2.976
05/26/06	8:40	5480	73.90	2.984
05/26/06	9:00	5500	73.92	2.990
05/26/06	9:20	5520	73.97	2.997
05/26/06	9:40	5540	74.03	3.001
05/26/06	10:00	5560	74.12	3.004
05/26/06	10:20	5580	74.17	3.014
05/26/06	10:40	5600	74.21	3.016
05/26/06	11:00	5620	74.30	3.025
05/26/06	11:20	5640	74.44	3.021
05/26/06	11:40	5660	74.51	3.031
05/26/06	12:00	5680	74.48	3.033
05/26/06	12:20	5700	74.60	3.036
05/26/06	12:40	5720	74.69	3.043
05/26/06	13:00	5740	74.69	3.058
05/26/06	13:20	5760	74.78	3.055
05/26/06	13:40	5780	75.03	3.066
05/26/06	14:00	5800	75.03	3.058
05/26/06	14:20	5820	75.21	3.083
05/26/06	14:40	5840	75.39	3.083
05/26/06	15:00	5860	75.43	3.082
05/26/06	15:20	5880	75.50	3.100
05/26/06	15:40	5900	75.45	3.105
05/26/06	16:00	5920	75.54	3.106
05/26/06	16:20	5940	75.54	3.112
05/26/06	16:40	5960	75.48	3.113
05/26/06	17:00	5980	75.57	3.127
05/26/06	17:20	6000	75.57	3.120
05/26/06	17:40	6020	75.54	3.135
05/26/06	18:00	6040	75.57	3.131
05/26/06	18:20	6060	75.54	3.141
05/26/06	18:40	6080	75.54	3.137
05/26/06	19:00	6100	75.54	3.162

Date	Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
05/26/06	19:20	6120	75.54	3.156
05/26/06	19:40	6140	75.54	3.160
05/26/06	20:00	6160	75.54	3.173
05/26/06	20:20	6180	75.52	3.181
05/26/06	20:40	6200	75.52	3.186
05/26/06	21:00	6220	75.50	3.186
05/26/06	21:20	6240	75.50	3.198
05/26/06	21:40	6260	75.48	3.197
05/26/06	22:00	6280	75.48	3.209
05/26/06	22:20	6300	75.45	3.209
05/26/06	22:40	6320	75.43	3.212
05/26/06	23:00	6340	75.43	3.228
05/26/06	23:20	6360	75.43	3.228
05/26/06	23:40	6380	75.41	3.228
05/27/06	0:00	6400	75.41	3.235
05/27/06	0:20	6420	75.39	3.247
05/27/06	0:40	6440	75.36	3.242
05/27/06	1:00	6460	75.34	3.256
05/27/06	1:20	6480	75.32	3.259
05/27/06	1:40	6500	75.30	3.257
05/27/06	2:00	6520	75.27	3.270
05/27/06	2:20	6540	75.23	3.266
05/27/06	2:40	6560	75.23	3.272
05/27/06	3:00	6580	75.18	3.275
05/27/06	3:20	6600	75.16	3.281
05/27/06	3:40	6620	75.14	3.294
05/27/06	4:00	6640	75.09	3.284
05/27/06	4:20	6660	75.07	3.293
05/27/06	4:40	6680	75.05	3.291
05/27/06	5:00	6700	75.03	3.289
05/27/06	5:20	6720	75.00	3.283
05/27/06	5:40	6740	75.00	3.292
05/27/06	6:00	6760	74.98	3.300
05/27/06	6:20	6780	74.96	3.290
05/27/06	6:40	6800	74.93	3.297
05/27/06	7:00	6820	74.93	3.288
05/27/06	7:20	6840	74.91	3.307
05/27/06	7:40	6860	74.93	3.311
05/27/06	8:00	6880	74.93	3.315
05/27/06	8:20	6900	74.98	3.309
05/27/06	8:30	6910	75.00	3.312

AQUIFER TEST DATA SHEET
OBSERVATION WELL

Sheet 1 of 2

Client AEC

Job Number 106-294 Location 432 ft west of PW

Well No. TB-06-1 Well Depth ______ Screen Stetting ______

Well Information ______

Test Information PW Step Test and Constant-Rate Test

Measuring Point Top of 2-inch PVC

Date	Time	Elapsed Time, min	Depth to Water, feet	Observed Drawdown, feet	Comments
5/22/06	1136		18.18		
	1327		18.19		
	1419		18.20		
	1929		19.05		Step 4
	2053		18.46		
5/23	0730		18.41		XD = 18.38
	0821	0	—		Start of Con-Rate Test
	1038		19.17	0.76	
	1253		19.25		
	1512		19.30		
	2138		19.42	1.01	
5/24	0744		19.55	>0.13 1.14	
	1145		19.58		
	1312		19.60		
	1636		19.60		
	1852		19.61		
5/25/06	0734		19.60		
	0921		19.61		
	1045		19.61		
	1221		19.61		
	1453		19.62		
	1752		19.63		
5/26/06	0715		19.75		

TB-06-1

AQUIFER TEST DATA SHEET
OBSERVATION WELL

Sheet 2 of 2

Client AEC

Job Number 106-294 Location

Well No. TB-06-1 Well Depth Screen Stetting

Well Information

Test Information PW Constant - Rate Test
SWL= 18.41 Reading 5/26/06 @ 0715 = 19.75

Measuring Point Top of 2" PVC

Date	Time	Elapsed Time, min	Depth to Water, feet	Observed Drawdown, feet	Comments
5/26/06	1003		19.13		Start Rec @ 0833
	1441		19.04		
	1610		19.03		
	1753		19.04		
5/27/06	0652		19.11		
	0818		19.12		

TB-06-1

AQUIFER TEST DATA SHEET
OBSERVATION WELL

Sheet 1 of 3

Client AEC

Job Number 106-294 Location 34 feet West of PW

Well No. TB-06-2 Well Depth ______ Screen Stetting ______

Well Information ______

Test Information PW Step Test and Constant-Rate Test

Measuring Point Top of 2-inch PVC

Date	Time	Elapsed Time, min	Depth to Water, feet	Observed Drawdown, feet	Comments
5/22/06	1147		17.71		
	1444		17.73		
	1539	0	—		Start Step 1
	1609		19.52		
	1625		19.56		Step 1
	1724		20.97		Step 2
	1752		21.98		Step 3
	1757		22.00		
	1822		22.06		
	1859		23.72	5.99	
	1924		23.78		XD=23.77
	2001		19.17		
	2008		18.42		
	2018		18.23		XD=18.24
5/23	0740		17.93		XD=17.95
	0817		17.93		
	0821	0	—		
	0823		22.18		
	0824		22.40		
	0825		22.53		
	0827		22.63		
	0828	7	22.70		
	0830		22.81		
	0833		22.90	4.97	

TB-06-2

AQUIFER TEST DATA SHEET
OBSERVATION WELL

Sheet 2 of 3

Client AEC

Job Number 106-294 Location 34 feet west of PW

Well No. TB-06-2 Well Depth ______ Screen Stetting ______

Well Information ______

Test Information PW Constant-Rate Test
SWL = 17.93

Measuring Point Top 2" PVC

Date	Time	Elapsed Time, min	Depth to Water, feet	Observed Drawdown, feet	Comments
5/23/06	0849		23,05		
	0859		23,11		
	1013		23,41		
	1030		23,42		XD = 23,41
	1213		23,45	5,52	
	1353		23,52		
	1519		23.55		
	1633		23.56		
	1924		23,61		
	2035		23,64	5,71	
5/24	0724		23.79	0,15 5,86	XD = 23.77
	0829		23.79		
	0945		23,79		
	1127		23.80		
	1239		23,82		
	1829		23,82		XD = 23.80
5/25/06	0711		23,82		
	0837		23,80		
	0917		23,81		XD = 23.81
	1022		23,81		
	1217		23,81		
	1448		23,82		
	1629		23,82		
	1730		23.82		
	2000		23.84		

TB-06-2

AQUIFER TEST DATA SHEET
OBSERVATION WELL

Sheet 3 of 3

Client AEC

Job Number 106-294 Location

Well No. TB-06-2 Well Depth Screen Stetting

Well Information

Test Information PW Constant-Rate Test

SWL = 17.93

Measuring Point Top 2" PVC

Date	Time	Elapsed Time, min	Depth to Water, feet	Observed Drawdown, feet	Comments
5/26/06	0720		23.94		XD=23.91
	0823		23.95		
	0833		—		Start Recovery
	0836		19.71		
	0837		19.55		
	0838		19.43		
	0839		19.32		
	0840		19.25		
	0853		18.94		
	0855		18.94		
	0901		18.89		
	0924		18.80		
	1424		18.60		XD = 18.64
	1554		18.58		
5/27/06	0657		18.66		

TB-06-2

AQUIFER TEST DATA SHEET
OBSERVATION WELL

Sheet 1 of 2

Client AEC

Job Number 106-294 Location 448 feet east of PW

Well No. TB-06-3 Well Depth ______ Screen Stetting ______

Well Information ______

Test Information PW Step Test and Constant-Rate Test

Measuring Point Top of 2-inch PVC

Date	Time	Elapsed Time, min	Depth to Water, feet	Observed Drawdown, feet	Comments
5/22/06	~~1454~~ 1155		18.53		
	1454		18.56		
	1635		18.80		Step 1
	1731		18.99		Step 2
	1830		19.15		Step 3
	1940		19.39		Step 4
	2013		19.04		
	2043		18.85		
5/23	0748		18.76		
	0803		18.76		
	0821	0	—		Start of Con Rate
	0910		19.36		
	1024		19.49		
	1111		19.51		
	1137		19.54		
	1223		19.55	0.79	
	1404		19.57		
	1534		19.61		
	1642		19.63		
	1933		19.69		
	2018		19.69	0.93	
5/24	0737		19.84	>0.15 1.08	
	0836		19.85		
	1135		19.87		

TB-06-3

IWC - 4/99

AQUIFER TEST DATA SHEET
OBSERVATION WELL

Client AEC

Job Number 106-294 Location

Well No. TB-06-3 Well Depth Screen Stetting

Well Information

Test Information PW Constant Rate Test

SWL= 18.76

Measuring Point Top of 2" PVC

Date	Time	Elapsed Time, min	Depth to Water, feet	Observed Drawdown, feet	Comments
5/24/06	1300		19.88		
	1627		19.90		
	1841		19.90		
	2000		19.90		
5/25/06	0721		19.90		
	0910		19.90		
	0934		19.90		
	1035		19.90		
	1209		19.90		
	1441		19.90		
	1736		19.92		
	2006		19.94		
5/26/06	0728		20.04		
	0759		20.04		
	0833	0	–		Start Recovery
	~~08~~0911		19.55		
	0952		19.44		
	1430		19.35		
	1600		19.34		
	1721		19.36		
5/27/06	0705		19.48		

TB-06-3

AQUIFER TEST DATA SHEET
OBSERVATION WELL

Sheet 1 of 3

Client AEC

Job Number 106-294 Location 107 feet east of PW

Well No. TB-06-4 Well Depth ______ Screen Stetting ______

Well Information ______

Test Information PW Step Test and Constant-Rate Test

Measuring Point Top of 2-inch PVC

Date	Time	Elapsed Time, min	Depth to Water, feet	Observed Drawdown, feet	Comments
5/22/06	1151		19.19		
	1450		19.23		
	1631		20.24		Step 1
	1726		21.00		Step 2
	1826		21.59		Step 3
	1936		22.50		Step 4 XD=22.43
	20.38		19.60		XD=19.61
	~~20:40~~		~~17.35~~		
5/23	0744		19.43		XD=19.45
	0821	0	–		Start Con-Rate Test
	0845		22.04		
	0855		22.12		
	0922		22.27		
	0938		22.31		
	0953		22.34		
	1021		22.38		XD=22.33
	1133		22.45		
	1219		22.44	3.01	
	1357		22.48		
	1529		22.52		
	1930		22.60		
	2045		22.61	0.15	
5/24	0733		22.76	3.33	XD=22.32

TB-06-4

AQUIFER TEST DATA SHEET
OBSERVATION WELL

Sheet 2 of 3

Client AEC

Job Number 106-294 Location 107 feet east of PW

Well No. TB-06-4 Well Depth ______ Screen Stetting ______

Well Information ______

Test Information PW Constant Rate Test

SWL= 19.43

Measuring Point Top of 2" PVC

Date	Time	Elapsed Time, min	Depth to Water, feet	Observed Drawdown, feet	Comments
5/24	0832		22.77	3.34	
	0939		22.78		
	1130		22.79		
	1256		22.80		
	1343		22.79		
	1424		22.80		
	1524		22.79		
	1623		22.80		
	1724		22.81		
	1838		22.80		XD=22.18
	1929		22.81		
	2045		22.81		
5/25	0717		22.80		
	0840		22.80		XD=22.18
	0938		22.80		
	1030		22.80		
	1206		22.80		
	1436		22.81		
	1732		22.81		
	2001		22.83		
5/26/06	0723		22.93		
	0815		22.94		XD=22.90
	0833	0	—		
	0846		20.62		
	0847		20.57		

TB-06-4

AQUIFER TEST DATA SHEET
OBSERVATION WELL

Sheet 3 of 3

Client AEC

Job Number 106-294 Location

Well No. TB-06-4 Well Depth Screen Stetting

Well Information

Test Information PW Constant Rate Test
SWL = 19.43

Measuring Point Top of 2" PVC

Date	Time	Elapsed Time, min	Depth to Water, feet	Observed Drawdown, feet	Comments
5/26/06	0851		20.51		
	0859		20.44		
	0907		20.39		
	0922		20.32		
	0948		20.26		
	1427		20.08		XD = 20.11
	1557		20.05		
5/27/06	0702		20.14		

TB-06-4

AQUIFER TEST DATA SHEET
OBSERVATION WELL

Sheet 1 of 2

Client AEC

Job Number 106-294 Location 183 ft west of PW

Well No. TB-06-5 Well Depth ____ Screen Stetting ____

Well Information ____

Test Information PW Step Test and Constant Rate Test

Measuring Point Top of 2-inch PVC

Date	Time	Elapsed Time, min	Depth to Water, feet	Observed Drawdown, feet	Comments
5/22/06	1145		19.21		
	1501		19.24		
	1627		19.96		Step 1
	1723		20.51		Step 2
	1824		20.96		Step 3
	1927		21.64		Step 4 XD=21.62
	2024		19.65		XD=19.64
5/23	0738		19.43		XD=19.43
	0821	0	—		Start Con-Rate Test
	1036		21.62		XD=21.60
	1241		21.71	2.28	
	1409		21.75		
	1516		21.78		
	1922		21.85		
	2039		21.88		
5/24	0741		22.03	0.15 2.60	XD=21.99
	0855		22.04		
	0944		22.05		
	1143		22.06	2.63	
	1308		22.07		
	1634		22.08		
	1850		22.08		XD=22.05
5/25/06	0729		22.08		XD=22.05
	0919		22.08		

TB-06-5

IWC - 4/99

AQUIFER TEST DATA SHEET
OBSERVATION WELL

Sheet 2 of 2

Client AEC

Job Number 106-294 Location 183 ft west of PW

Well No. TB-06-5 Well Depth ______ Screen Stetting ______

Well Information ______

Test Information PW Constant-Rate Test

SWL = 19.43 Reading 5/25/06 @ 0919 = 22.08

Measuring Point Top of 2" PVC

Date	Time	Elapsed Time, min	Depth to Water, feet	Observed Drawdown, feet	Comments
5/25/06	1043		22.08		
	1219		22.08		
	1450		22.09		
	1747		22.10		
	2038		22.11		
5/26/06	0717		22.22		XD=22.18
	0829		22.23		
	0833	0	–		Start Con-Rate Test
	0903		20.36		
	0926		20.29		
	1001		20.23		
	1439		20.10		XD=20.12
	1607		20.08		
5/27/06	0654		20.~~25~~.15		

TB-06-5

AQUIFER TEST DATA SHEET
OBSERVATION WELL

Sheet 1 of 2

Client AEC

Job Number 106-294 Location 49.5 feet north of PW

Well No. TB-06-6 Well Depth ______ Screen Stetting ______

Well Information

Test Information PW Step Test and Constant-Rate Test

Measuring Point Top of 2-inch PVC

Date	Time	Elapsed Time, min	Depth to Water, feet	Observed Drawdown, feet	Comments
5/22/06	1158		19.28		
	1446		19.31		
	1628		20.81		Step 1
	1734		21.99		Step 2
	1833		22.87		Step 3
	1943		24.29		Step 4 XD=24.25
	2019		19.85		XD=19.85
5/23	0750		19.51		XD=19.50
	0821	0	–		Start Con-Rate Test
	0834		23.46		
	0836		23.49		
	1031		24.03		XD=23.97
	1226		24.10	4.59	
	1355		24.14		
	1525		24.17		
	1646		24.19		
	1926		24.24		
	2041		24.28		
5/24	0728		24.42	0.14 4.91	XD=24.37
	0841		24.43		
	0942		24.45		
	1138		24.45		
	1304		24.46		
	1632		24.46		

TB-06-6

AQUIFER TEST DATA SHEET
OBSERVATION WELL

Client AEC

Job Number 106-294 Location

Well No. TB-06-6 Well Depth Screen Stetting

Well Information

Test Information PW Constant-Rate Test

SWL = 19.51 ft 5/24 @ 1632 Reading 24.46

Measuring Point Top 2" PVC

Date	Time	Elapsed Time, min	Depth to Water, feet	Observed Drawdown, feet	Comments
5/24/06	1845		24.46		XD=24.41
5/25/06	0713		24.48		
	0913		24.48		XD=24.42
	1038		24.47		
	1213		24.47		
	1444		24.48		
	1742		24.49		
	2009		24.50		
5/26/06	0731		24.60		XD=24.55
	0825		24.61		
	0833	0	–		Start Recovery
	0852		20.64		
	0856		20.60		
	0915		20.49		
	0916		20.48		
	1436		20.19		XD=20.24
5/27/06	0709		20.23		

TB-06-6

AQUIFER TEST DATA SHEET
OBSERVATION WELL

Client AEC

Job Number 106-294 Location 199 ft north of PW

Well No. TB-06-7 Well Depth ______ Screen Stetting ______

Well Information ______

Test Information PW Step Test and Constant Rate Test

Measuring Point Top of 2-inch PVC

Date	Time	Elapsed Time, min	Depth to Water, feet	Observed Drawdown, feet	Comments
5/22/06	1207		18.05		
	1448		18,07		
	1630		18,74		Step 1
	~~16~~1735		19,30		Step 2
	1835		19,73		Step 3
	1942		20,42		Step 4 XD=20.44
	2021		18,65		XD=18,67
5/23	0752		18,26		XD=18,30
	0821	0	–		Start Con-Rate Test
	1033		20.38		XD=20.39
	1231		20.48	2,22	
	1406		20.53		
	1527		20.58		
	1648		20,61		
	1928		20.67		
	2043		20,70		
5/24	0730		20.85	0.15 2.59	XD=20.88
	0852		20.88		
	1139		20.90		
	1306		20,91		
	1630		20,93		
	1847		20.93		XD=20.94
5/25/06	0715		20.96		

0915 20.95 XD=20.98

TB-06-7

AQUIFER TEST DATA SHEET
OBSERVATION WELL

Sheet 2 of 2

Client AEC

Job Number 106-294 Location 199 feet North of PW

Well No. TB-06-7 Well Depth ______ Screen Stetting ______

Well Information ______

Test Information PW Constant-Rate Test

SWL = 18.26 ft, Readinging 5/25 @ 0910 = 20.95

Measuring Point Top of 2" PVC

Date	Time	Elapsed Time, min	Depth to Water, feet	Observed Drawdown, feet	Comments
5/25/06	1040		20.96		
	1215		20.97		
	1446		20.97		
	1744		20.99		
	2011		21.00		
5/26/06	0733		21.09		XD = 21.10
	0827		21.09		
	0833	0	–		Start Recovery
	0918		19.32		
	0956		19.20		
	1434		18.95		XD = 18.98
	1605		18.91		
5/27/06	0711		18.94		

TB-06-7

AQUIFER TEST DATA SHEET
OBSERVATION WELL

Sheet 1 of 1

Client AEC

Job Number 106-294 Location

Well No. Staff Gage 1 Well Depth Screen Stetting

Well Information Up steam staff gage, slotted 2-inch PVC set in riverbed

Test Information

Measuring Point Top of 2-inch PVC

Date	Time	Elapsed Time, min	Depth to Water, feet	Observed Drawdown, feet	Comments
5/22/06	1131		3.35		
	1931		3.25		
5/23/06	0727		3.1		
	1040		3.05		
	1501		1.95/3.0		
5/24	0746		2.8		
	1147		2.8		
	1314		2.75		
5/25	0736		2.8		
	0923		2.8		
	1223		2.8		
	1758		2.15/2.8		
5/26/06	0712		2.65		
	1443		2.55		
5/27/06	0806		2.65/2.3		

DTW/Gage Height   Upstream Staff Gage

AQUIFER TEST DATA SHEET
OBSERVATION WELL

Client AEC

Job Number 106-294 Location In river near PW

Well No. Staff Gage 2 Well Depth n/a Screen Stetting

Well Information Downstream Staff Gage, Slotted 2-inch PVC set in riverbed

Test Information PW Step Test and Consant Rate Test

Measuring Point Top of 2-inch PVC

Date	Time	Elapsed Time, min	Depth to Water, feet	Observed Drawdown, feet	Comments
5/22/06	1214		2.31 / 2.6		
	1605		2.55		
	1651		2.55		
	1820		2.5		
	1855		2.5		
	1906		2.5		
	1948		2.5		
	2049		2.5		
5/23	0808		2.35		
	0853		2.35		
	1028		2.35		
	1116		2.35		
	1217		2.3		
	1350		2.3		
	1443		2.63/2.3		XD Reads 2.60
	1555		2.3		
	1636		2.25		
	2037		2.25		
	2058		2.2		
5/24	0726		2.1		River dropped 0.26 ft from 5/23 @ 0820
	0937		2.05		
	1015		2.05		
	1125		2.05		
	1242		2.05		

DTW / Stage Reading

Downstream Staff Gage

AQUIFER TEST DATA SHEET
OBSERVATION WELL

Sheet 2 of 2

Client AEC

Job Number 106-294 Location

Well No. Staff Gage 2 Well Depth Screen Stetting

Well Information Downstream Staff gage (east)

Test Information

Measuring Point top of 2" PVC

Date	Time	Elapsed Time, min	Depth to Water, feet	Observed Drawdown, feet	Comments
5/24/06	1620		2.05		
	1718		2.88/2.05		
	1834		2.88/2.05		
	1943		2.88/2.05		
	2028		2.05		
5/25/06	0709		2.84/2.1		
	0816		2.84/2.1		
	1027		2.84/2.1		
	1200		2.84/2.1		
	1433		2.85/2.1		
	1625		2.85/2.1		
	1727		2.1		
	1810		2.85/2.1		
	2019		2.86/2.1		
5/26/06	0746		2.99/1.95		
	1455		3.11/1.85		
	1530		3.13/1.8		
	1702		3.16/1.8		
5/27/06	0700		3.33/1.6		
	0834		3.35/1.6		

DTW/Stage

Downstream Staff Gage

In-Situ Inc. MiniTroll Pro

Report generated: 5/27/2006 6:35:51
Report from file: C:\Win-Situ\Data\SN00454 2006-05-22 135001 AEC Durham Well.bin
DataMgr Version 3.71

Serial number: 454
Firmware Version 3.09
Unit name: B14951B

Test name: AEC Durham Well

Test defined on: 5/22/2006 8:21:52
Test started on: 5/22/2006 13:50:01
Test stopped on: 5/27/2006 6:35:38
Test extracted on: N/A

Data gathered using Linear testing
Time between data points: 10 minutes
Number of data samples: 677

TOTAL DATA SAMPLES 677

Channel number [1]
Measurement type: Temperature
Channel name:

Channel number [2]
Measurement type: Pressure
Channel name: Pressure
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: TOC
User-defined reference: 12.67 Feet H2O
Referenced on: channel definition.
Pressure head at reference: 12.373 Feet H2O

Date	Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O	Depth to Water Adjusted Based on Manual Measurements Feet H2O
5/22/2006	13:50	0	57.33	12.663	12.67
5/22/2006	14:00	10	56.31	12.695	
5/22/2006	14:10	20	56.31	12.716	
5/22/2006	14:20	30	56.29	12.739	
5/22/2006	14:30	40	56.29	12.760	
5/22/2006	14:40	50	56.29	12.774	
5/22/2006	14:50	60	56.29	12.791	
5/22/2006	15:00	70	56.25	12.806	
5/22/2006	15:10	80	56.27	12.815	
5/22/2006	15:20	90	56.29	12.827	
5/22/2006	15:30	100	56.25	12.836	
5/22/2006	15:40	110	56.27	12.842	
5/22/2006	15:50	120	56.22	12.844	
5/22/2006	16:00	130	56.29	12.845	12.66
5/22/2006	16:50	180	56.31	12.851	12.66
5/22/2006	17:50	240	56.25	12.850	12.66
5/22/2006	18:50	300	56.22	12.851	12.66
5/22/2006	19:50	360	56.27	12.856	12.67
5/22/2006	20:50	420	56.22	12.863	12.67
5/22/2006	21:50	480	56.25	12.867	12.68

Date Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O	Depth to Water Adjusted Based on Manual Measurements Feet H2O
5/22/2006 22:50	540	56.27	12.869	12.68
5/22/2006 23:50	600	56.25	12.871	12.68
5/23/2006 0:50	660	56.25	12.871	12.68
5/23/2006 1:50	720	56.27	12.869	12.68
5/23/2006 2:50	780	56.25	12.869	12.68
5/23/2006 3:50	840	56.25	12.865	12.68
5/23/2006 4:50	900	56.31	12.870	12.68
5/23/2006 5:50	960	56.27	12.879	12.69
5/23/2006 6:50	1020	56.25	12.882	12.69
5/23/2006 7:50	1080	56.31	12.885	12.70
5/23/2006 8:50	1140	56.27	12.888	12.70
5/23/2006 9:50	1200	56.29	12.885	12.70
5/23/2006 10:50	1260	56.25	12.869	12.68
5/23/2006 11:50	1320	56.29	12.875	12.69
5/23/2006 12:50	1380	56.25	12.867	12.68
5/23/2006 13:50	1440	56.27	12.860	12.67
5/23/2006 14:50	1500	56.27	12.854	12.66
5/23/2006 15:50	1560	56.27	12.854	12.66
5/23/2006 16:50	1620	56.27	12.850	12.66
5/23/2006 17:50	1680	56.29	12.846	12.66
5/23/2006 18:50	1740	56.25	12.846	12.66
5/23/2006 19:50	1800	56.27	12.850	12.66
5/23/2006 20:50	1860	56.25	12.852	12.66
5/23/2006 21:50	1920	56.29	12.852	12.66
5/23/2006 22:50	1980	56.31	12.860	12.67
5/23/2006 23:50	2040	56.29	12.866	12.68
5/24/2006 0:50	2100	56.29	12.862	12.67
5/24/2006 1:50	2160	56.27	12.858	12.67
5/24/2006 2:50	2220	56.29	12.852	12.66
5/24/2006 3:50	2280	56.27	12.862	12.67
5/24/2006 4:50	2340	56.27	12.863	12.67
5/24/2006 5:50	2400	56.27	12.860	12.67
5/24/2006 6:50	2460	56.31	12.858	12.67
5/24/2006 7:50	2520	56.31	12.860	12.67
5/24/2006 8:50	2580	56.25	12.865	12.68
5/24/2006 9:50	2640	56.27	12.863	12.67
5/24/2006 10:50	2700	56.34	12.862	12.67
5/24/2006 11:50	2760	56.22	12.865	12.68
5/24/2006 12:50	2820	56.29	12.862	12.67
5/24/2006 13:50	2880	56.25	12.859	12.67
5/24/2006 14:50	2940	56.29	12.854	12.66
5/24/2006 15:50	3000	56.27	12.854	12.66
5/24/2006 16:50	3060	56.29	12.854	12.66
5/24/2006 17:50	3120	56.29	12.850	12.66
5/24/2006 18:50	3180	56.29	12.850	12.66
5/24/2006 19:50	3240	56.27	12.854	12.66
5/24/2006 20:50	3300	56.27	12.860	12.67
5/24/2006 21:50	3360	56.27	12.867	12.68
5/24/2006 22:50	3420	56.27	12.871	12.68
5/24/2006 23:50	3480	56.27	12.871	12.68
5/25/2006 0:50	3540	56.31	12.868	12.68
5/25/2006 1:50	3600	56.25	12.871	12.68
5/25/2006 2:50	3660	56.34	12.864	12.67
5/25/2006 3:50	3720	56.25	12.863	12.67
5/25/2006 4:50	3780	56.29	12.866	12.68
5/25/2006 5:50	3840	56.27	12.869	12.68
5/25/2006 6:50	3900	56.27	12.875	12.69

Date Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O	Depth to Water Adjusted Based on Manual Measurements Feet H2O
5/25/2006 7:50	3960	56.31	12.876	12.69
5/25/2006 8:50	4020	56.27	12.881	12.69
5/25/2006 9:50	4080	56.34	12.882	12.69
5/25/2006 10:50	4140	56.25	12.880	12.69
5/25/2006 11:50	4200	56.31	12.881	12.69
5/25/2006 12:50	4260	56.29	12.877	12.69
5/25/2006 13:50	4320	56.25	12.873	12.68
5/25/2006 14:50	4380	56.31	12.874	12.68
5/25/2006 15:50	4440	56.27	12.871	12.68
5/25/2006 16:50	4500	56.31	12.874	12.68
5/25/2006 17:50	4560	56.34	12.876	12.69
5/25/2006 18:50	4620	56.31	12.876	12.69
5/25/2006 19:50	4680	56.31	12.883	12.69
5/25/2006 20:50	4740	56.31	12.889	12.70
5/25/2006 21:50	4800	56.27	12.896	12.71
5/25/2006 22:50	4860	56.27	12.900	12.71
5/25/2006 23:50	4920	56.25	12.900	12.71
5/26/2006 0:50	4980	56.27	12.902	12.71
5/26/2006 1:50	5040	56.31	12.902	12.71
5/26/2006 2:50	5100	56.29	12.893	12.70
5/26/2006 3:50	5160	56.29	12.902	12.71
5/26/2006 4:50	5220	56.29	12.910	12.72
5/26/2006 5:50	5280	56.29	12.910	12.72
5/26/2006 6:50	5340	56.29	12.914	12.72
5/26/2006 7:50	5400	56.34	12.916	12.73
5/26/2006 8:50	5460	56.34	12.916	12.73
5/26/2006 9:50	5520	56.34	12.916	12.73
5/26/2006 10:50	5580	56.34	12.918	12.73
5/26/2006 11:50	5640	56.31	12.920	12.73
5/26/2006 12:50	5700	56.31	12.920	12.73
5/26/2006 13:50	5760	56.29	12.921	12.73
5/26/2006 14:50	5820	56.34	12.914	12.72
5/26/2006 15:50	5880	56.31	12.893	12.70
5/26/2006 16:50	5940	56.29	12.900	12.71
5/26/2006 17:50	6000	56.29	12.910	12.72
5/26/2006 18:50	6060	56.31	12.910	12.72
5/26/2006 19:50	6120	56.34	12.910	12.72
5/26/2006 20:50	6180	56.29	12.912	12.72
5/26/2006 21:50	6240	56.36	12.918	12.73
5/26/2006 22:50	6300	56.36	12.924	12.73
5/26/2006 23:50	6360	56.34	12.928	12.74
5/27/2006 0:50	6420	56.29	12.927	12.74
5/27/2006 1:50	6480	56.27	12.927	12.74
5/27/2006 2:50	6540	56.34	12.922	12.73
5/27/2006 3:50	6600	56.31	12.937	12.75
5/27/2006 4:50	6660	56.31	12.937	12.75
5/27/2006 5:50	6720	56.31	12.935	12.75

AQUIFER TEST DATA SHEET
OBSERVATION WELL

Sheet 1 of 1

Client AEC

Job Number 106-294 Location On S County Line Road, 2.6 miles NW of Test Site

Well No. Durham Well Depth 75 ft. Screen Stetting

Well Information 18-inch diameter PVC casing, 20 feet of Screen

Test Information PW Step & Constant-Rate Test.

Measuring Point Top of PVC casing, 1.1 feet above ground

Date	Time	Elapsed Time, min	Depth to Water, feet	Observed Drawdown, feet	Comments
5/22/06	1344		12.67		
	2103		12.68		
5/23/06	0711		12.69		
	0940		12.69		
	1205		12.68		
	1905		12.65		
5/24/06	1552		12.67		
5/25/06	0655		12.67		
	1354		12.69		
	2050		12.70		
5/26/06	0702		12.73		
	1406		12.73		
	1803		12.73		
5/27/06	0631		12.74		

Durham

In-Situ Inc. MiniTroll Pro

Report generated: 5/27/2006 6:07:02
Report from file: C:\Win-Situ\Data\SN01118 2006-05-23 093219 Gibson Well.bin
DataMgr Version 3.71

Serial number: 1118
Firmware Version 3.09
Unit name: B14996b

Test name: Gibson Well

Test defined on: 5/23/2006 9:31:52
Test started on: 5/23/2006 9:32:19
Test stopped on: 5/27/2006 6:06:42
Test extracted on: N/A

Data gathered using Linear testing
Time between data points: 10 minutes
Number of data samples: 556

TOTAL DATA SAMPLES 556

Channel number [1]
Measurement type: Temperature
Channel name:

Channel number [2]
Measurement type: Pressure
Channel name:
Sensor Range: 30 PSI.
Specific gravity: 1
Mode: TOC
User-defined reference: 7.35 Feet H2O
Referenced on: test start
Pressure head at reference: 6.433 Feet H2O

Date Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
5/23/2006 9:32	0	56.06	7.350
5/23/2006 10:32	60	55.85	7.343
5/23/2006 11:32	120	55.83	7.345
5/23/2006 12:32	180	55.85	7.350
5/23/2006 13:32	240	55.85	7.346
5/23/2006 14:32	300	55.78	7.335
5/23/2006 15:32	360	55.81	7.335
5/23/2006 16:32	420	55.78	7.331
5/23/2006 17:32	480	55.81	7.325
5/23/2006 18:32	540	55.78	7.323
5/23/2006 19:32	600	55.74	7.326
5/23/2006 20:32	660	55.76	7.328
5/23/2006 21:32	720	55.74	7.328
5/23/2006 22:32	780	55.74	7.332
5/23/2006 23:32	840	55.76	7.336
5/24/2006 0:32	900	55.74	7.338
5/24/2006 1:32	960	55.74	7.336
5/24/2006 2:32	1020	55.76	7.328
5/24/2006 3:32	1080	55.74	7.334
5/24/2006 4:32	1140	55.72	7.334

Date Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
-------- --------	------------	------------------------------	
5/24/2006 5:32	1200	55.72	7.338
5/24/2006 6:32	1260	55.74	7.336
5/24/2006 7:32	1320	55.74	7.338
5/24/2006 8:32	1380	55.76	7.338
5/24/2006 9:32	1440	55.74	7.340
5/24/2006 10:32	1500	55.78	7.343
5/24/2006 11:32	1560	55.72	7.340
5/24/2006 12:32	1620	55.74	7.340
5/24/2006 13:32	1680	55.74	7.338
5/24/2006 14:32	1740	55.76	7.330
5/24/2006 15:32	1800	55.72	7.330
5/24/2006 16:32	1860	55.74	7.328
5/24/2006 17:32	1920	55.74	7.324
5/24/2006 18:32	1980	55.72	7.324
5/24/2006 19:32	2040	55.74	7.322
5/24/2006 20:32	2100	55.72	7.326
5/24/2006 21:32	2160	55.72	7.330
5/24/2006 22:32	2220	55.74	7.336
5/24/2006 23:32	2280	55.76	7.338
5/25/2006 0:32	2340	55.74	7.336
5/25/2006 1:32	2400	55.74	7.336
5/25/2006 2:32	2460	55.72	7.334
5/25/2006 3:32	2520	55.72	7.332
5/25/2006 4:32	2580	55.72	7.334
5/25/2006 5:32	2640	55.74	7.336
5/25/2006 6:32	2700	55.72	7.338
5/25/2006 7:32	2760	55.72	7.348
5/25/2006 8:32	2820	55.74	7.352
5/25/2006 9:32	2880	55.72	7.350
5/25/2006 10:32	2940	55.74	7.352
5/25/2006 11:32	3000	55.72	7.350
5/25/2006 12:32	3060	55.72	7.350
5/25/2006 13:32	3120	55.74	7.348
5/25/2006 14:32	3180	55.74	7.342
5/25/2006 15:32	3240	55.74	7.344
5/25/2006 16:32	3300	55.74	7.338
5/25/2006 17:32	3360	55.74	7.342
5/25/2006 18:32	3420	55.72	7.344
5/25/2006 19:32	3480	55.74	7.344
5/25/2006 20:32	3540	55.74	7.348
5/25/2006 21:32	3600	55.74	7.358
5/25/2006 22:32	3660	55.72	7.366
5/25/2006 23:32	3720	55.74	7.368
5/26/2006 0:32	3780	55.74	7.370
5/26/2006 1:32	3840	55.72	7.372
5/26/2006 2:32	3900	55.72	7.370
5/26/2006 3:32	3960	55.74	7.368
5/26/2006 4:32	4020	55.74	7.378
5/26/2006 5:32	4080	55.74	7.380
5/26/2006 6:32	4140	55.74	7.384
5/26/2006 7:32	4200	55.74	7.394
5/26/2006 8:32	4260	55.74	7.394
5/26/2006 9:32	4320	55.74	7.394
5/26/2006 10:32	4380	55.74	7.396
5/26/2006 11:32	4440	55.74	7.398
5/26/2006 12:32	4500	55.74	7.398
5/26/2006 13:32	4560	55.74	7.398
5/26/2006 14:32	4620	55.76	7.399

Date	Time	ET (min)	Chan[1] Fahrenheit	Chan[2] Feet H2O
5/26/2006	15:32	4680	55.76	7.385
5/26/2006	16:32	4740	55.76	7.375
5/26/2006	17:32	4800	55.76	7.381
5/26/2006	18:32	4860	55.74	7.376
5/26/2006	19:32	4920	55.74	7.378
5/26/2006	20:32	4980	55.74	7.378
5/26/2006	21:32	5040	55.76	7.383
5/26/2006	22:32	5100	55.74	7.388
5/26/2006	23:32	5160	55.74	7.394
5/27/2006	0:32	5220	55.74	7.394
5/27/2006	1:32	5280	55.74	7.398
5/27/2006	2:32	5340	55.74	7.394
5/27/2006	3:32	5400	55.74	7.398
5/27/2006	4:32	5460	55.74	7.407
5/27/2006	5:32	5520	55.76	7.407
5/27/2006	6:02	5550	55.76	7.405

AQUIFER TEST DATA SHEET
OBSERVATION WELL

Sheet 1 of 1

Client AEC

Job Number 106-294 Location 1/4-mile N of Rt. 10 & 1/4-mile east of County Line

Well No. Gibson Well Depth ______ Screen Stetting ______

Well Information Gibson irrigation well

Test Information PW Step & Constan-Rate Test

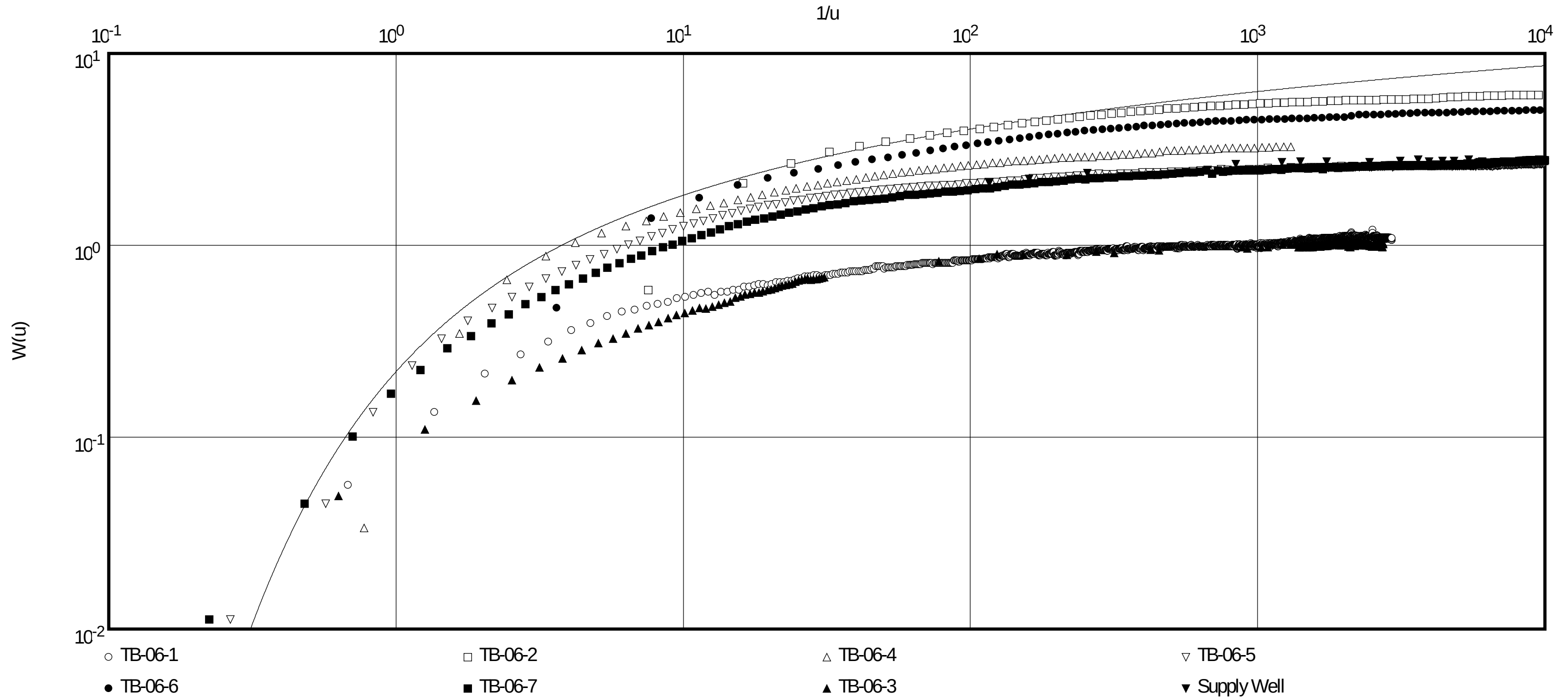
Measuring Point Hole in base of pump frame, 1.7 feet above ground

Date	Time	Elapsed Time, min	Depth to Water, feet	Observed Drawdown, feet	Comments
5/22/06	10:35	-	7.34		
	14:02		7.34		
5/23/06	07:04		7.35		
	09:26		7.35		
	12:22		7.34		
	18:53		7.31		
5/24/06	15:19		7.31		
5/25/06	06:43		7.33		
	13:43		7.33		
	21:02		7.33		
5/26/06	06:57		7.36		
	13:54		7.37		
	18:18		7.36		
5/27/06	06:16		7.39		

APPENDIX G
Constant-Rate Aquifer Test Analysis

Collector Wells International, Inc. 6360 Huntley Road Columbus, Ohio 43229 ph.(614) 888-6263	Pumping test analysis Theis analysis method Confined aquifer	Date: 10.07.2006	Page 1
		Project: AEC Norborne, MO	
		Evaluated by: BfG	

Pumping Test No.	Test conducted on: 5/23/06
PW	
Discharge 1010.00 U.S.gal/min	

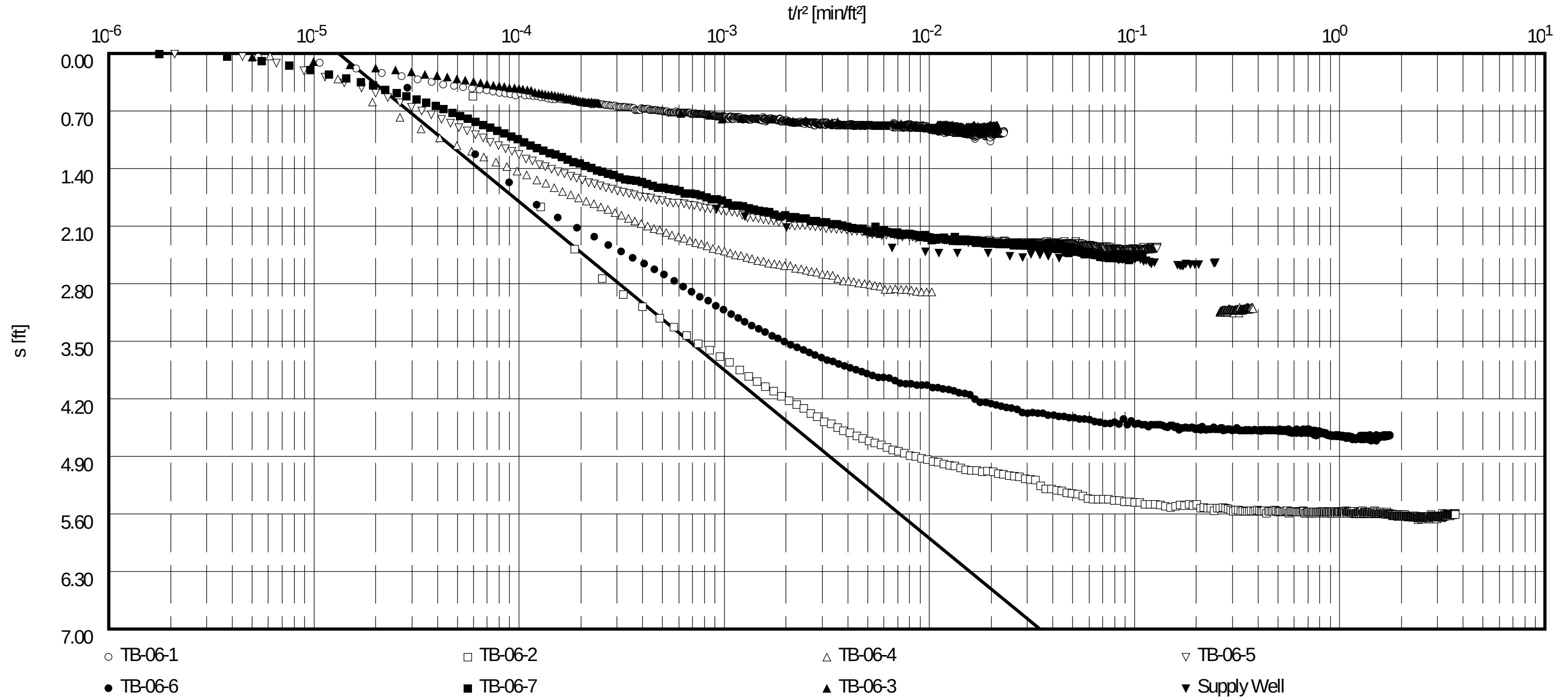


Transmissivity [ft²/min]: 1.20×10^{1}

Storativity: 3.80×10^{-4}

Collector Wells International, Inc. 6360 Huntley Road Columbus, Ohio 43229 ph.(614) 888-6263	Pumping test analysis Distance-Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date: 10.07.2006	Page 1
		Project: AEC Norborne, MO	
		Evaluated by: BfG	

Pumping Test No.	Test conducted on: 5/23/06
PW	
Discharge 1010.00 U.S.gal/min	

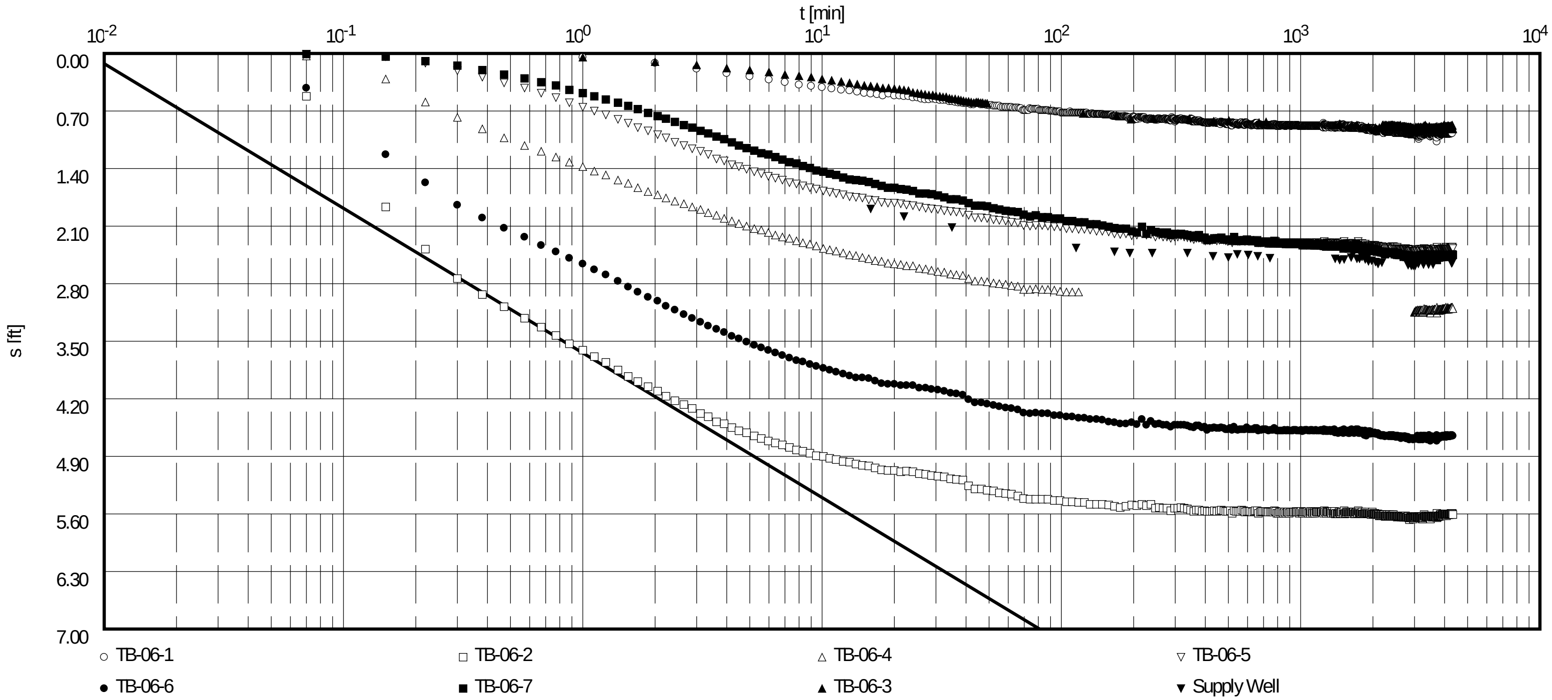


Transmissivity [ft²/min]: 1.20×10^{1}

Storativity: 3.57×10^{-4}

Collector Wells International, Inc. 6360 Huntley Road Columbus, Ohio 43229 ph.(614) 888-6263	Pumping test analysis Time-Drawdown-method after COOPER & JACOB Confined aquifer	Date: 10.07.2006	Page 1
		Project: AEC Norborne, MO	
		Evaluated by: BfG	

Pumping Test No.	Test conducted on: 5/23/06
PW	
Discharge 1010.00 U.S.gal/min	

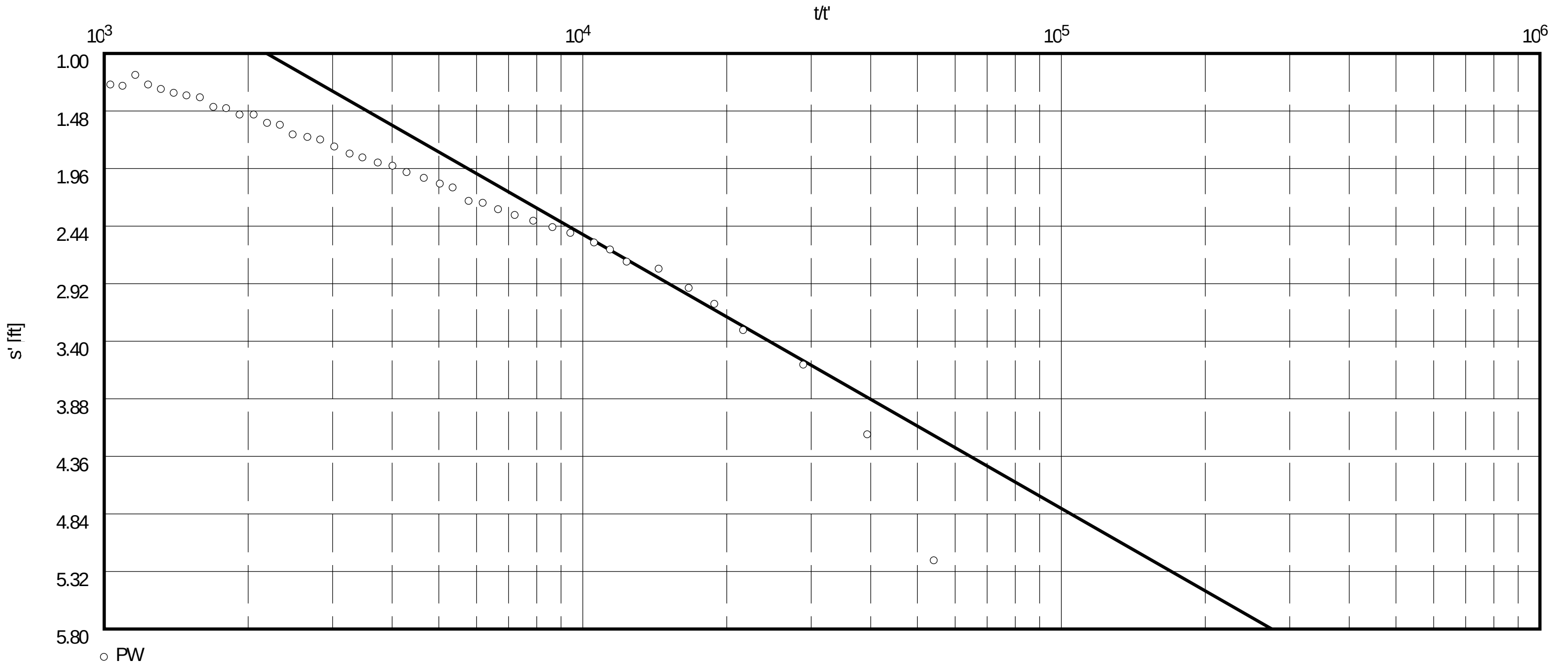


Transmissivity [ft²/min]: 1.40×10^{1}

Storativity: 2.27×10^{-4}

Collector Wells International, Inc. 6360 Huntley Road Columbus, Ohio 43229 ph.(614) 888-6263	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Date: 12.07.2006	Page 1
		Project: AEC Norborne, MO	
		Evaluated by: BfG	

Pumping Test No.	Test conducted on: 5/23/06
PW	
Discharge 1010.00 U.S.gal/min	
	Pumping test duration: 4332.22 min



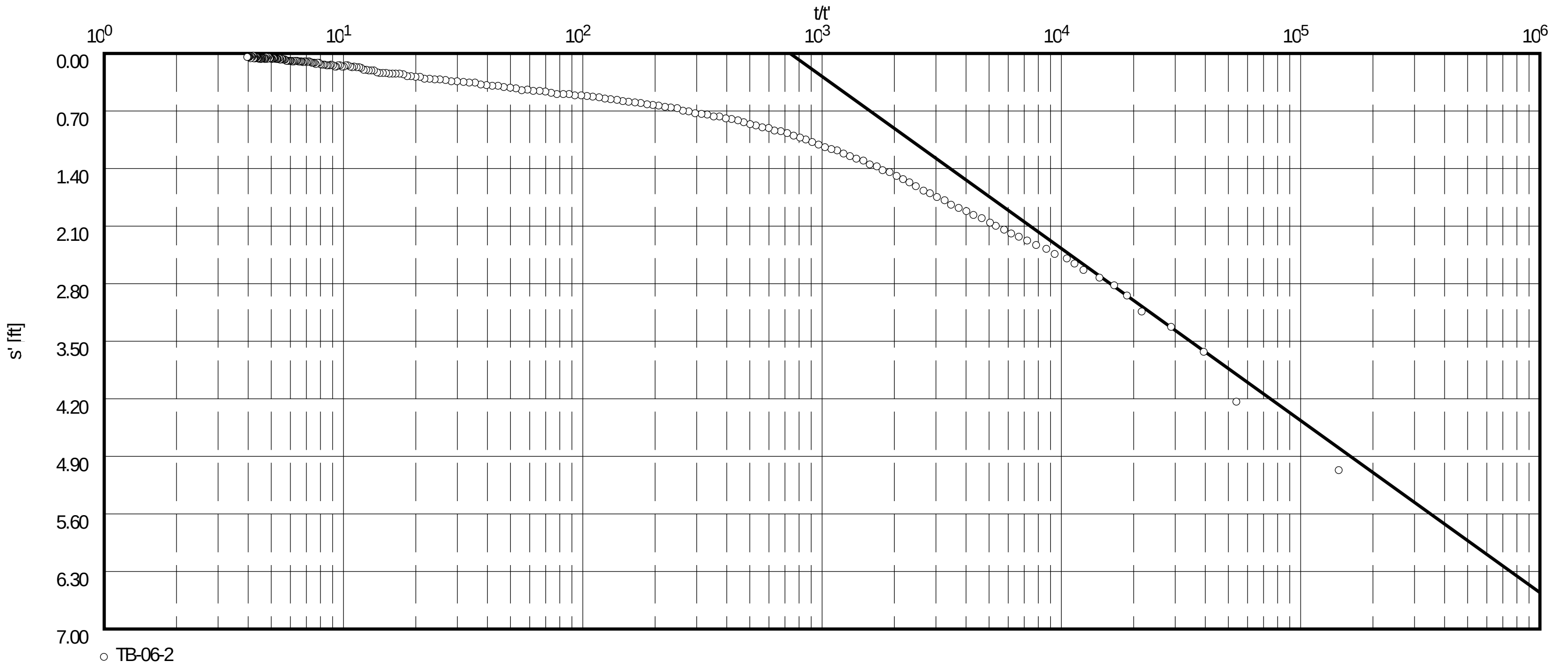
Transmissivity [ft²/min]: 1.08×10^{1}

Hydraulic conductivity [ft/min]: 3.60×10^{-1}

Aquifer thickness [ft]: 30.00

Collector Wells International, Inc. 6360 Huntley Road Columbus, Ohio 43229 ph.(614) 888-6263	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Date: 12.07.2006	Page 1
		Project: AEC Norborne, MO	
		Evaluated by: BfG	

Pumping Test No.	Test conducted on: 5/23/06
PW	
Discharge 1010.00 U.S.gal/min	
	Pumping test duration: 4332.22 min



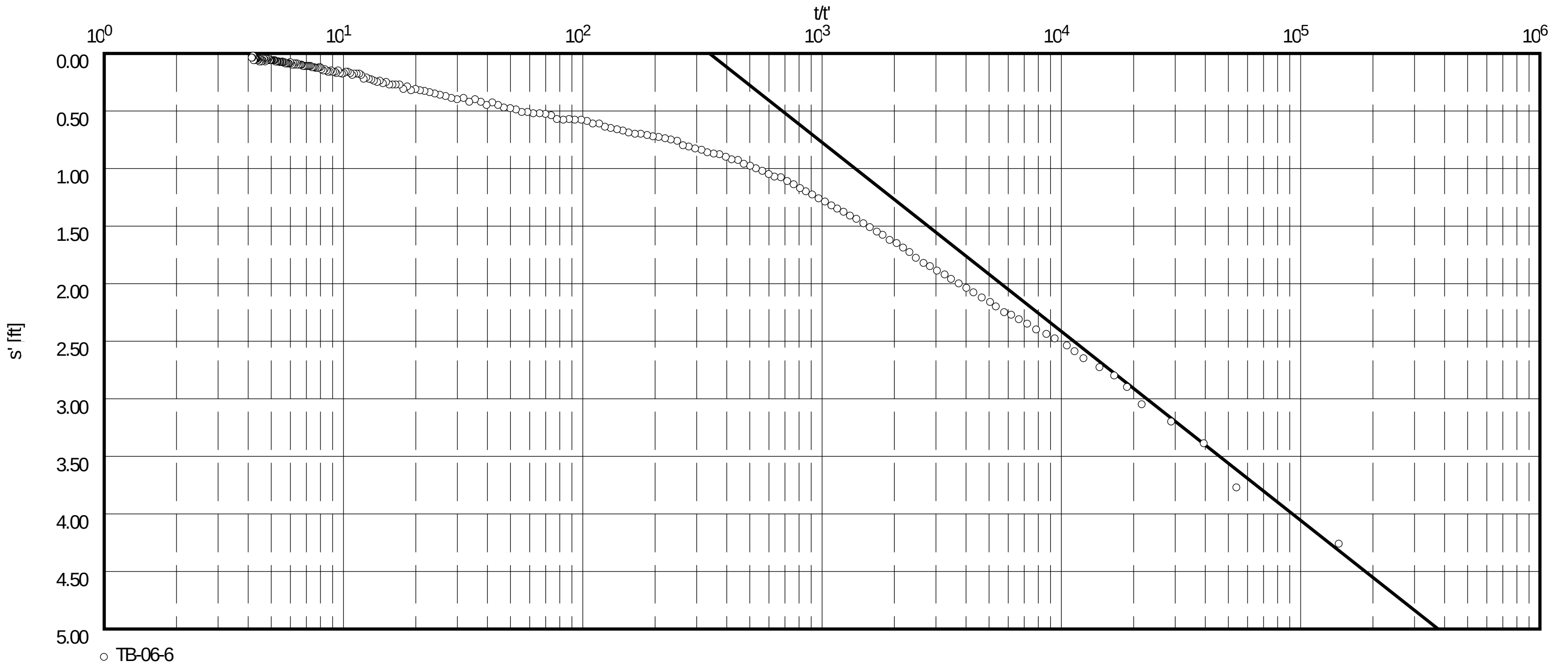
Transmissivity [ft²/min]: 1.18×10^{1}

Hydraulic conductivity [ft/min]: 3.94×10^{-1}

Aquifer thickness [ft]: 30.00

Collector Wells International, Inc. 6360 Huntley Road Columbus, Ohio 43229 ph.(614) 888-6263	Pumping test analysis Recovery method after THEIS & JACOB Confined aquifer	Date: 12.07.2006	Page 1
		Project: AEC Norborne, MO	
		Evaluated by: BfG	

Pumping Test No.	Test conducted on: 5/23/06
PW	
Discharge 1010.00 U.S.gal/min	
	Pumping test duration: 4332.22 min



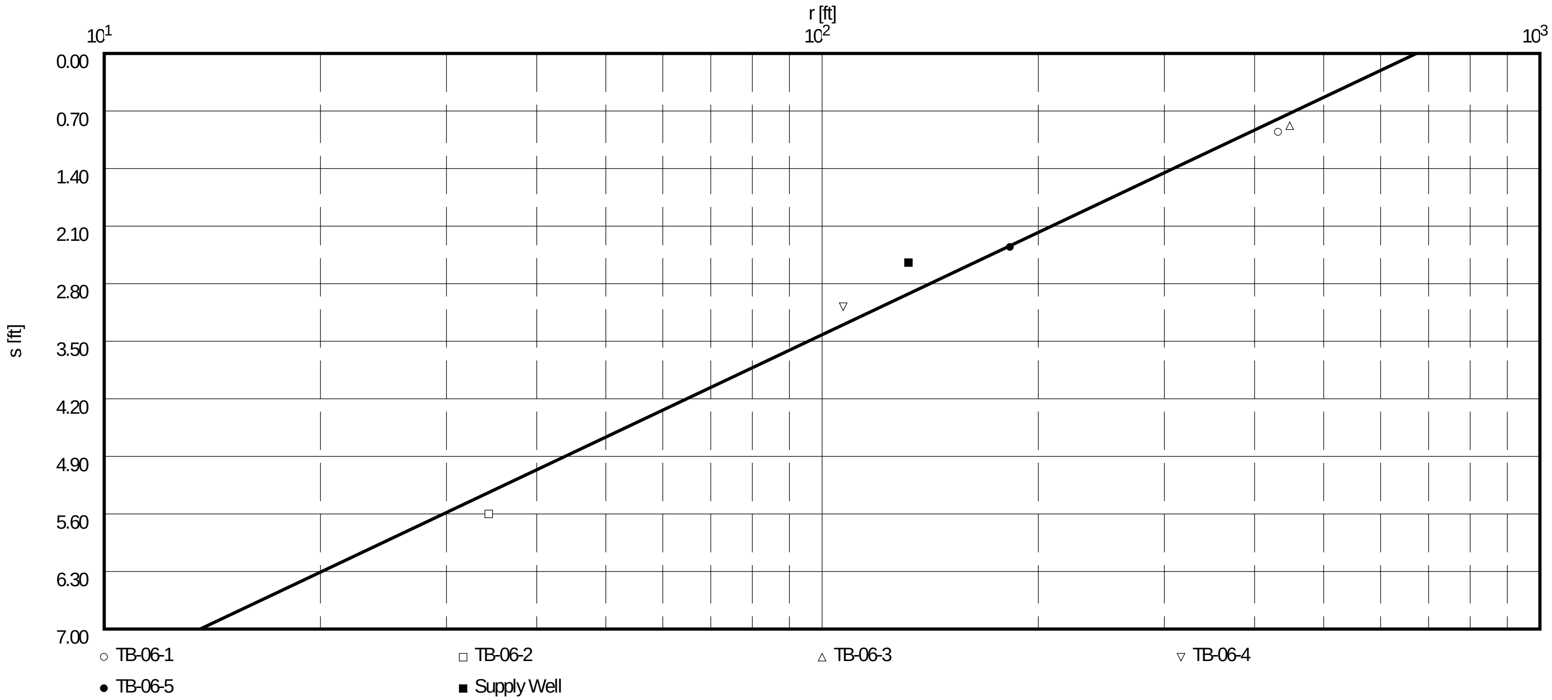
Transmissivity [ft²/min]: 1.50×10^{1}

Hydraulic conductivity [ft/min]: 5.01×10^{-1}

Aquifer thickness [ft]: 30.00

Collector Wells International, Inc. 6360 Huntley Road Columbus, Ohio 43229 ph.(614) 888-6263	Pumping test analysis Distance-Drawdown-method after COOPER & JACOB Confined aquifer	Date: 17.07.2006 / Page 1 Project: Evaluated by:

Pumping Test No.	Test conducted on:
Discharge 1010.00 U.S.gal/min	Analysis at time (t) 4320.00 min



Transmissivity [ft²/min]: 1.19×10^{1}

Storativity: 2.57×10^{-1}

APPENDIX H
Laboratory Water Quality Results

DATE COLLECTED	DATE RECEIVED	DATE COMPLETED	SAMPLE CODE
04/19/06	04/20/06	04/27/06	652359

CUSTOMER ADDRESS

AEC
NORBORNE, MO

DEALER ADDRESS

COLLECTOR WELLS INTL
6360 HUNTLEY RD
COLUMBUS, OH 43229-

NATIONAL TESTING LABORATORIES LTD.
6571 Wilson Mills Road
Cleveland, OH 44143
(440) 449-2525

DRINKING WATER ANALYSIS RESULTS

ID: WELL WATER
TB-06-2

NOTE: "*" The MCL (Maximum Contaminant Level) or an established guideline has been exceeded for this contaminant.
"**" Bacteria results may be invalid due to lack of collection information or because the sample has exceeded the 30-hour holding time.
"ND" This contaminant was not detected at or above our stated detection level.
"NBS" No bacteria submitted.
"NBR" No Bacteria Required.
"P" = PRESENCE
"A" = ABSENCE
"EP" = E. COLI PRESENCE
"EA" = E. COLI ABSENCE
"NA" Not Analyzed

Analysis Performed	MCL (mg/l)	Det. Level	Level Detected
Total coliform	P	P	NBR
Inorganic chemicals - metals:			
Aluminum	0.2	0.1	ND
Arsenic	0.010	0.005	ND
Barium	2	0.30	0.44
Cadmium	0.005	0.002	ND
Calcium	---	2.0	83
Chromium	0.1	0.010	ND
Copper	1.3	0.004	ND
Iron	0.3	0.020	6.8*
Lead	0.015	0.002	ND
Magnesium	---	0.10	20
Manganese	0.05	0.004	0.22*
Mercury	0.002	0.001	ND
Nickel	---	0.02	ND
Selenium	0.05	0.020	ND
Silver	0.1	0.002	ND
Sodium	---	1	9
Zinc	5	0.004	0.007
Inorganic chemicals - other, and physical factors:			
Alkalinity (Total as CaCO3)	---	20	290
Chloride	250	5.0	8
Fluoride	4	0.5	ND
Hardness (suggested limit = 100)		10	290*
Nitrate as N	10	0.5	ND
Nitrite as N	1	0.5	ND
pH (Standard Units)	6.5-8.5	---	6.7
Sulfate	250	5.0	17
Total Dissolved Solids	500	20	320
Turbidity (Turbidity Units)	1.0	0.1	32*
Organic chemicals - trihalomethanes:			
Bromodichloromethane	---	0.002	ND
Bromoform	---	0.004	ND
Chloroform	---	0.002	ND
Dibromochloromethane	---	0.004	ND
Total THMs	0.080	0.002	ND

page 2. Sample code: 652359

Analysis performed	MCL (mg/l)	Detection Level	Level Detected
1,1,1,2-Tetrachloroethane	---	0.002	ND
1,1,1-Trichloroethane	0.2	0.001	ND
1,1,2,2-Tetrachloroethane	---	0.002	ND
1,1,2-Trichloroethane	0.005	0.002	ND
1,1-Dichloroethane	---	0.002	ND
1,1-Dichloroethene	0.007	0.001	ND
1,1-Dichloropropene	---	0.002	ND
1,2,3-Trichlorobenzene	---	0.002	ND
1,2,3-Trichloropropane	---	0.002	ND
1,2,4-Trichlorobenzene	0.07	0.002	ND
1,2-Dichlorobenzene	0.6	0.001	ND
1,2-Dichloroethane	0.005	0.001	ND
1,2-Dichloropropane	0.005	0.002	ND
1,3-Dichlorobenzene	---	0.001	ND
1,3-Dichloropropane	---	0.002	ND
1,4-Dichlorobenzene	0.075	0.001	ND
2,2-Dichloropropane	---	0.002	ND
2-Chlorotoluene	---	0.001	ND
4-Chlorotoluene	---	0.001	ND
Benzene	0.005	0.001	ND
Bromobenzene	---	0.002	ND
Bromomethane	---	0.002	ND
Carbon Tetrachloride	0.005	0.001	ND
Chlorobenzene	0.1	0.001	ND
Chloroethane	---	0.002	ND
Chloromethane	---	0.002	ND
cis-1,2-Dichloroethene	0.07	0.002	ND
cis-1,3-Dichloropropene	---	0.002	ND
Dibromochloropropane (DBCP)	---	0.001	ND
Dibromomethane	---	0.002	ND
Dichlorodifluoromethane	---	0.002	ND
Dichloromethane	0.005	0.002	ND
Ethylbenzene	0.7	0.001	ND
Ethylenedibromide (EDB)	---	0.001	ND
Methyl-Tert-Butyl-Ether	---	0.004	ND
Styrene	0.1	0.001	ND
Tetrachloroethene (PCE)	0.005	0.002	ND
Toluene	1	0.001	ND
Trans-1,2-Dichloroethene	0.1	0.002	ND
trans-1,3-Dichloropropene	---	0.002	ND
Trichloroethene (TCE)	0.005	0.001	ND
Trichlorofluoromethane	---	0.002	ND
Vinyl Chloride	0.002	0.001	ND
Xylene	10	0.001	ND

We certify that the analyses performed for this report are accurate, and that the laboratory tests were conducted by methods approved by the U.S. Environmental Protection Agency or variations of these EPA methods.

These test results are intended to be used for informational purposes only and may not be used for regulatory compliance.

Blue Valley Laboratories, Inc.
Water Treatment Professionals Since 1973
814 East 16th Street Kansas City, MO 64108
Phone (816) 471-4719 Fax (816) 471-0268

Report of Analysis

Collector Wells Int.

Collector Wells Int.
Brad Gamble
6360 Huntley Rd.
Columbus OH 43229

BVL ID No: BVL10270
Collected_By Client
Contact Fax (614) 888-9208

Sample Matrix	Date Collected	Date In Lab
Well water	5/24/2006	5/25/2006

Analysis	Date Analyzed	Test_Method	Detection Limit	Result
Aluminum **Sample Site:** Well PW #1	5/24/06	EPA 200.8	0.050	**0.05 mg/L**
Ammonia as N **Sample Site:** Well PW #1	5/31/06	SM4500 NH3 F	0.050 mg/L	**<0.05 mg/L**
Antimony **Sample Site:** Well PW #1	5/24/06	EPA 200.8	0.050 mg/L	**<0.05 mg/L**
Arsenic **Sample Site:** Well PW #1	5/24/06	EPA 200.8	0.050 mg/L	**<0.05 mg/L**
Barium **Sample Site:** Well PW #1	5/24/06	EPA 200.8	0.005 mg/L	**0.55 mg/L**
Beryllium **Sample Site:** Well PW #1	5/24/06	EPA 6010C	0.005 mg/L	**<0.005 mg/L**
Biochemical Oxygen Demand (BOD) **Sample Site:** Well PW #1	5/26/06	SM 5210 B	5.000 mg/l	**<5.0 mg/L**
BOD, Carbonacious **Sample Site:** Well PW #1	5/26/06	SM 5210 B	0.000 mg/L	**<5.0 mg/L**

Corrected Report 7/18/06. Result for Fluoride was corrected.

Submitted by: Paul Myers, Laboratory Director Paul Myers

The reported analytical results relate only to the sample submitted.
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Blue Valley Laboratories, Inc. **Report of Analysis**

Collector Wells Int. **BVL ID No BVL10270**

Analysis	Date Analyzed	Test_Method	Detection Limit	Result
Boron **Sample Site:** Well PW #1	5/24/06	EPA 200.8	0.010 mg/L	**0.08 mg/L**
Cadmium **Sample Site:** Well PW #1	5/24/06	EPA 200.8	0.005 mg/L	**<0.005 mg/L**
Calcium **Sample Site:** Well PW #1	4/24/06	EPA 200.8	0.050 mg/L	**98.6 mg/L**
Chemical Oxygen Demand, EPA **Sample Site:** Well PW #1	6/1/06	HACH 8000	10.000 mg/L	**<10 mg/L**
Chloride **Sample Site:** Well PW #1	5/31/06	SM4500 Cl	5.000 mg/L	**12.0 mg/L**
Chromium **Sample Site:** Well PW #1	5/24/06	EPA 200.8	0.010 mg/L	**<0.01 mg/L**
Conductivity **Sample Site:** Well PW #1	5/30/06	SM2510	0.000 umho/cm	**530 uMHOS**
Copper **Sample Site:** Well PW #1	5/24/06	EPA 200.8	0.010 mg/L	**<0.01 mg/L**
Cyanide, Total **Sample Site:** Well PW #1	6/7/06	SM4500 CN	0.000 mg/L	**0.006 mg/L**
Fluoride **Sample Site:** Well PW #1	5/31/06	HACH 8029	0.100 mg/L	**0.41 mg/L**
Iron **Sample Site:** Well PW #1	5/24/06	EPA 200.8	0.010 mg/L	**8.15 mg/L**
Lead **Sample Site:** Well PW #1	5/24/06	EPA 200.8	0.050 mg/L	**<0.05 mg/L**
Magnesium **Sample Site:** Well PW #1	5/24/06	SM3120B	0.050 mg/L	**24.7 mg/L**
Manganese **Sample Site:** Well PW #1	5/24/06	EPA 200.8	0.050 mg/L	**0.43 mg/L**
Mercury **Sample Site:** Well PW #1	6/5/06	EPA 200.8	0.000 mg/L	**<0.0002 mg/L**
Nickel **Sample Site:** Well PW #1	5/24/06	EPA 200.8	0.010 mg/L	**<0.01 mg/L**
Nitrate - Nitrogen (NO3-N) Analysis **Sample Site:** Well PW #1	6/6/06	SM4500 E	0.050 mg/L	**0.07 mg/L**

Blue Valley Laboratories, Inc. **Report of Analysis**

Collector Wells Int. **BVL ID No BVL10270**

Analysis	Date Analyzed	Test_Method	Detection Limit	Result
pH determination **Sample Site:** Well PW #1	5/26/06	SM4500 H B	0.000 S.U.	6.87
Phenol **Sample Site:** Well PW #1	6/5/06	EPA 9066	0.000 mg/L	<0.04 mg/L
Phosphate, Ortho as P **Sample Site:** Well PW #1	5/30/06	SM4500 P E	0.050 mg/L	0.54 mg/L
Potassium **Sample Site:** Well PW #1	5/24/06	EPA 200.8	0.100 mg/L	1.8 mg/L
Selenium **Sample Site:** Well PW #1	5/24/06	EPA 200.8	0.080 mg/L	<0.08mg/L
Silica **Sample Site:** Well PW #1	5/24/06	EPA 200.8	0.050 mg/L	2.49 mg/L
Silver **Sample Site:** Well PW #1	5/24/06	EPA 200.8	0.005 mg/L	<0.005 mg/L
Sodium **Sample Site:** Well PW #1	5/24/06	EPA 200.8	0.050 mg/L	8.4 mg/L
Solids, Suspended **Sample Site:** Well PW #1	6/2/06	SM2540 B	5.000 mg/L	10 mg/L
Solids, Total Dissolved **Sample Site:** Well PW #1	5/30/06	SM2540 C	5.000 mg/L	291 mg/L
Strontium **Sample Site:** Well PW #1	5/10/06	EPA 200.8	0.010 mg/L	0.56 mg/L
Sulfate **Sample Site:** Well PW #1	5/31/06	Hach 8051	5.000 mg/L	13.1 mg/L
Sulfide **Sample Site:** Well PW #1	6/2/06	SM4500-S2	0.050 mg/L	<0.05 mg/L
Thallium **Sample Site:** Well PW #1	5/24/06	EPA 200.8	0.050 mg/L	<0.05 mg/L
Total Alkalinity as CaCO3 **Sample Site:** Well PW #1	5/30/06	SM2320 B	5.000 mg/L	308 mg/L
Total Kjelhal Nitrogen as N **Sample Site:** Well PW #1	5/31/06	SM4500 N C	0.050 mg/L	<0.05 mg/L
Total Organic Carbon **Sample Site:** Well PW #1	6/6/06	9060	0.100 mg/L	2.60mg/L

Collector Wells Int. **BVL ID No BVL10270**

Analysis	Date Analyzed	Test_Method	Detection Limit	Result
Total Organic Nitrogen **Sample Site:** Well PW #1	5/31/06	SM 4500-Norg	0.050 mg/L	**<0.05 mg/L**
Zinc **Sample Site:** Well PW #1	5/24/06	EPA 200.8	0.005 mg/L	**<0.005 mg/L**

Blue Valley Laboratories, Inc.
Water Treatment Professionals Since 1973
814 East 16th Street Kansas City, MO 64108
Phone (816) 471-4719 Fax (816) 471 0268

Report of Analysis

Collector Wells Int.

Collector Wells Int.
Brad Gamble
6360 Huntley Rd.
Columbus OH 43229

BVL ID No: BVL10275
Collected_By Client
Contact Fax (614) 888-9208

Sample Matrix	Date Collected	Date in Lab
Well water	5/26/2006	5/26/2006

Analysis	Date Analyzed	Test_Method	Detection Limit	Result
Nitrate - Nitrogen (NO3-N) Analysis **Sample Site:** PW #2	6/6/06	SM4500 E	0.050 mg/L	**0.21 mg/L**
Aluminum **Sample Site:** Well PW#2	5/26/06	EPA 200.8	0.050	**<0.05 mg/L**
Ammonia as N **Sample Site:** Well PW #2	5/31/06	SM4500 NH3 F	0.050 mg/L	**<0.05 mg/L**
Antimony **Sample Site:** Well PW#2	5/26/06	SM3120B	0.050 mg/L	**<0.05 mg/L**
Arsenic **Sample Site:** Well PW#2	5/26/06	SM3120B	0.050 mg/L	**<0.05 mg/L**
Barium **Sample Site:** Well PW#2	5/26/06	SM3120B	0.005 mg/L	**0.55 mg/L**
Beryllium **Sample Site:** Well PW #2	5/26/06	EPA 6010C	0.005 mg/L	**<0.005 mg/L**
Biochemical Oxygen Demand (BOD) **Sample Site:** Well PW#2	5/26/06	SM 5210 B	5.000 mg/l	**<5.0 mg/L**

Corrected Report 7/18/06. The results for Barium and Chloride were corrected.

Submitted by: Paul Myers, Laboratory Director Paul Myers

The reported analytical results relate only to the sample submitted.

7/18/06

Blue Valley Laboratories, Inc. **Report of Analysis**

Collector Wells Int. **BVL ID No BVL10275**

Analysis	Date Analyzed	Test_Method	Detection Limit	Result
BOD, Carbonacious **Sample Site:** Well PW#2	5/26/06	SM 5210 B	0.000 mg/L	**<5.0 mg/L**
Boron **Sample Site:** Well PW#2	5/26/06	SM3120B	0.010 mg/L	**0.068 mg/L**
Cadmium **Sample Site:** Well PW #2	5/26/06	EPA 200.8	0.005 mg/L	**<0.005 mg/L**
Calcium **Sample Site:** Well PW#2	5/26/06	EPA 200.8	0.050 mg/L	**95.8 mg/L**
Chemical Oxygen Demand, EPA **Sample Site:** Well PW #2	6/7/06	HACH 8000	10.000 mg/L	**<10.0 mg/L**
Chloride **Sample Site:** Well PW #2	5/31/06	SM4500 Cl	5.000 mg/L	**12.0 mg/L**
Chromium **Sample Site:** Well PW #2	5/26/06	EPA 200.8	0.010 mg/L	**<0.010 mg/L**
Conductivity **Sample Site:** Well PW#2	6/30/06	SM2510	0.000 umho/cm	**530 uohms**
Copper **Sample Site:** Well PW#2	5/19/06	EPA 200.8	0.010 mg/L	**<0.01 mg/L**
Cyanide, Total **Sample Site:** Well PW#2	5/26/06	SM4500 CN	0.000 mg/L	**<0.005 mg/L**
Fluoride **Sample Site:** Well PW#2	5/31/06	HACH 8029	0.100 mg/L	**0.45 mg/L**
Iron **Sample Site:** Well PW#2	5/26/06	EPA 200.8	0.010 mg/L	**8.22 mg/L**
Lead **Sample Site:** Well PW#2	5/26/06	EPA 200.8	0.050 mg/L	**<0.05 mg/L**
Magnesium **Sample Site:** Well PW#2	5/26/06	SM3120B	0.050 mg/L	**22.3 mg/L**
Manganese **Sample Site:** Well PW#2	5/26/06	EPA 200.8	0.050 mg/L	**0.41 mg/L**
Mercury **Sample Site:** Well PW#2	6/5/06	EPA 7470A	0.000 mg/L	**<0.0002**
Nickel **Sample Site:** Well PW#2	5/26/06	EPA 200.8	0.010 mg/L	**<0.01 mg/L**

Blue Valley Laboratories, Inc. **Report of Analysis**

Collector Wells Int. **BVL ID No BVL10275**

Analysis	Date Analyzed	Test_Method	Detection Limit	Result
Organic Nitrogen as N **Sample Site:** Well PW#2	6/30/06	SM 4500-Norg	0.050 mg/L	**<0.05 mg/L**
pH determination **Sample Site:** Well PW #2	5/26/06	SM4500 H B	0.000 S.U.	**6.85**
Phenol **Sample Site:** Well PW#2	6/5/06	EPA 9066	0.000 mg/L	**<0.04 mgL**
Phosphate, Orth as P **Sample Site:** Well PW#2	6/30/06	SM4500 P	0.050 mg/L	**0.59 mg/L**
Potassium **Sample Site:** Well PW#2	5/26/06	SM3120B	0.100 mg/L	**1.6 mg/L**
Selenium **Sample Site:** Well PW#2	5/26/06	SM3120B	0.080 mg/L	**<0.08**
Silica **Sample Site:** Well PW #2	5/26/06	EPA 200.8	0.050 mg/L	**2.40 mg/L**
Silver **Sample Site:** Well PW#2	5/26/06	SM3120B	0.005 mg/L	**<0.005 mg/L**
Sodium **Sample Site:** Well PW#2	5/24/06	EPA 200.8	0.050 mg/L	**8.4 mg/L**
Solids, Suspended **Sample Site:** Well PW#2	6/2/06	SM2540 B	5.000 mg/L	**10.0 mg/L**
Solids, Total Dissolved **Sample Site:** Well PW#2	5/25/06	SM2540 C	5.000 mg/L	**292 mg/L**
Strontium **Sample Site:** Well PW#2	6/6/06	EPA 6010 B	0.010 mg/L	**0.55 mg/L**
Sulfate **Sample Site:** Well PW#2	5/30/06	Hach 8051	5.000 mg/L	**18.7 mg/L**
Sulfide **Sample Site:** Well PW#2	5/26/06	SM4500-S2	0.050 mg/L	**<0.05 mg/L**
Thallium **Sample Site:** Well PW #2	5/26/06	SM3120B	0.050 mg/L	**0.08 mg/L**
Total Alkalinity as CaCO3 **Sample Site:** Well PW#2	5/30/06	SM2320 B	5.000 mg/L	**416 mg/L**
Total Kjelhal Nitrogen as N **Sample Site:** Well	5/31/06	SM4500 N C	0.050 mg/L	**<0.05 mg/L**

APPENDIX I
Project Photographs

Rotasonic drilling rig set up at the first test boring TB-06-1

Rotasonic drilling rig set up at the first test boring TB-06-1

Drillers extracting soil samples from the rotasonic core barrel.

Drillers laying out extracted soil samples.

Hydrogeologist logging soil samples from the test boring.

Soil samples from boring TB-06-1

Conducting hydraulic interval pumping test at boring TB-06-2

Top of temporary well for the hydraulic interval test and water level meter.

Temporary supply well for water to drill the test pumping well.

Setting up the reverse rotary drilling rig at the test pumping site.

Reverse rotary drilling rig set up to drill the test pumping well.

Drill bit for reverse rotary drilling rig.

Lowering the drill bit assembly into the borehole.

Hydrogeologist collecting drill cutting samples from test pumping well boring.

Rocks from the test pumping well drill cuttings.

Well screen being installed in the test pumping well.

Protective casing on top of one of the observation wells.

Temporary river staff gage.

Test pumping well set up with temporary generator to power pump.

Top of the test pumping well.

Top of observation well showing the top of the PVC well casing and the cable from the pressure transducer set in the well to measure the water levels.

Water level data recorder that is connected to the cables from the pressure transducers installed in the pumping well and observation wells.

Orifice weir used to measure the pumping rate for the aquifer pumping test.

One of the irrigation wells in which water levels were monitoring during the aquifer test.

Missouri River at the project site.

ADDENDUM 1
Hydrogeological Investigation Report of Findings - Norborne, Missouri
Associated Electric Cooperative, Inc.

September 27, 2006

Potential Pumping Impacts on Off-Site Wells

As presented in the Section 4.3 of the report, a ground water flow model was used to simulate the amount of drawdown that could be expected due to the operation of one or two collector wells under different conditions. Figure 16 depicts the model-estimated drawdown for one collector well operated at 7,400 gallons per minute (gpm) under average summer conditions. Figure 17 depicts the model-estimated drawdown for two collector wells operated at 3,700 gpm each under winter, low flow conditions. Figure 18 depicts the model-estimated drawdown for two collector wells operated at 3,700 gpm each under summer, low river flow conditions.

The water level in any well that is pumped will drop in response to the pumping. Drawdown between wells is additive, so that the net drawdown due to more than one well pumping will be the direct sum of the drawdown caused by the individual wells pumping alone. Consequently, the simulated drawdown values predicted by the ground water flow model represents the amount of additional drawdown that would occur in an offsite well located within the radius of influence of the proposed collector well(s). For example, a well located in the area between the 1 foot and 2 foot drawdown contours lines depicted in Figures 16-18, would be expected to have an increase of 1 to 2 feet of drawdown in addition to the amount of drawdown caused by its own pumping.

The amount of impact to off-site wells resulting from pumping of collector well(s) at the project site would be dependent on the depth, construction, ground water levels, pumping equipment and capacity of the of the off-site wells. Several feet of additional drawdown could be detrimental to a shallow well equipped with a suction pump that is operating near the limits of its capacity. Conversely, several feet of additional drawdown might go unnoticed in a deep high capacity well equipped with a submersible pump.

The aquifer conditions in the vicinity of the project site are generally favorable, and it is likely that the aquifer properties improve to the north of the project site. Domestic wells in the area probably have low amounts of drawdown under normal use. The natural variation in the ground water levels seasonally and with changes in the river level and recharge are likely to be larger than the amount of drawdown resulting from pumping of collector well(s) at the project site except in the area less than ½ mile from the proposed collector well(s). As such, the existing wells in the vicinity of the project site have probably experienced larger changes in water level under normal conditions, than would be caused by the proposed collector well(s).

Typically, a suction pump can lift water no more than about 25 feet. Consequently, if the water level in a well using a suction pump drops to more than a depth of about 25 feet below the pump, the pump will not be able to produce water. The depth from which submersible pumps can raise water is dependent on the pump capacity and power rating of the pump motor. In general, increasing the depth to water by a few feet in a well equipped with a submersible pump will not appreciably change the amount of water the pump can yield.

Lowering the water level in the vicinity of a well would decrease its maximum yield by decreasing the amount of available drawdown, i.e. the amount that that the water level can drop in the well due to its own pumping before the water level reaches the pump intake. Well capacity is generally expressed in terms of its specific capacity, which is the ratio of the pumping rate of the well to the amount of drawdown in the well due to the pumping. Lowering the water level at a well with a low specific capacity will cause more decrease in the potential yield than would lowering the water level by the same amount at a well with a high specific capacity.

In general, off-site wells located in the areas depicted in Figures 16-18 as having an estimated drawdown from the collector well(s) of 0.5 to 1.0 feet would probably have negligible impact from the collector well pumping. Wells in the areas depicted in Figures 16-18 as having an estimated drawdown from the collector well(s) of 1.0 to 2.0 feet would probably have slight decreases in capacity due to the collector well pumping. Wells in the areas depicted in Figures 16-18 as having an estimated drawdown from the collector well(s) in excess of 2.0 feet would probably have some decrease in yield due to the collector well pumping, and shallow low capacity wells would have the potential for the most impact. Decreases in yield would generally not be substantial in areas that did not have at least 3 feet of additional drawdown due to the pumping of the proposed collector well(s). At present, there are no houses or existing off-site wells in the areas where the ground water models predict 2 feet or more of drawdown from the proposed collector well(s).