

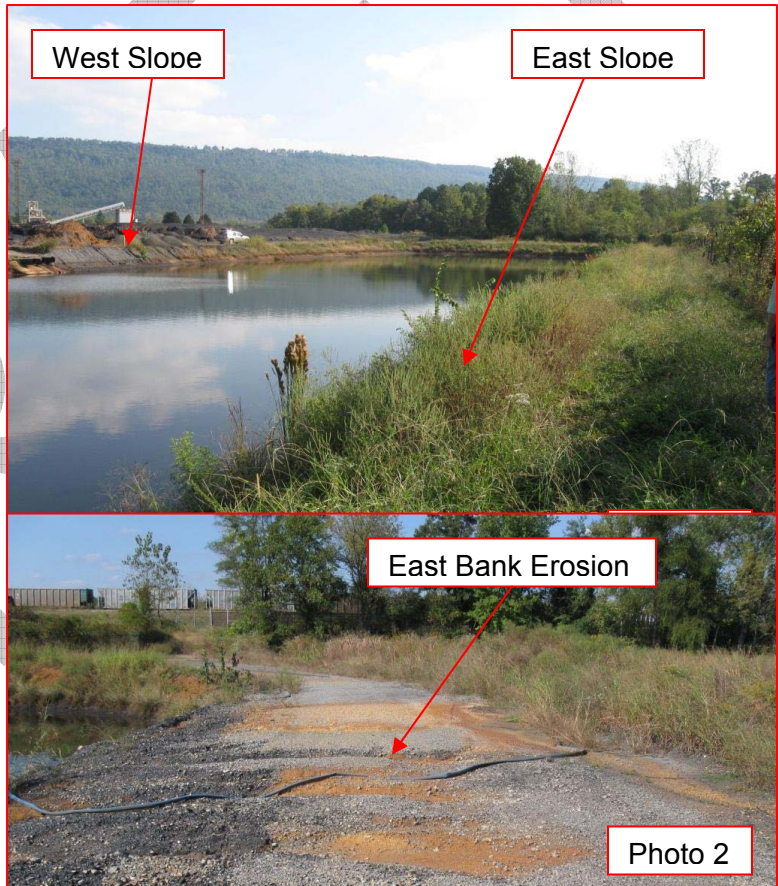
**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
FY 2009**

The waste disposal areas at Widows Creek Fossil Plant (WCF) were inspected for dike structural stability on October 15 and 16, 2008 by Kelly Evans of TVA Fossil Engineering Design Services (EDS) and Jamie Dotson of TVA Fuel By-products. The previous annual inspection was performed on December 5 and 6, 2007. The results of the inspection of the Coal Yard Drainage Basin, Coal Yard Perimeter Ditch, Limestone Pile Drainage Basin, Wet Gypsum Stacking Area, Stilling Pond for the Wet Gypsum Stacking Area, Active Ash Pond, Stilling Pond for Active Ash Pond, Dredge Cell, Perimeter Dikes, Red Water Pond, Chemical Treatment Pond, and the Abandoned Ash Disposal Area are listed below. A summary of recommendations is also provided. Estimated costs are based on the 2009 RSMEANS Building Construction Cost Data (quotes are advised for more accurate estimate).

During the writing of this report there was a failure in the Gypsum Stack. An abandoned weir (which was covered by sediment) drained the gypsum stack pond adjacent to the gypsum stilling pond. Water from the gypsum pond drained into the gypsum stilling pond overflowing into Widows Creek. This allowed gypsum with some trace amounts of ash to flow into the Tennessee River causing a Recordable Environmental Event (REE)

COAL YARD DRAINAGE BASIN

- **Location** - West of Powerhouse and Coal Pile.
- **Effluent** - Pumped to Active Ash Pond.
- **Observations (see sketch API08-1 for photo locations)**
 - Interior Slopes - Fair; Vegetation heavy on west slope, sparse on east slope (Photo 1)
 - ◆ Erosion observed on east slope. (Photos 2 and 3).
 - ◆ Open excavation at discharge pipes on east slope (Photo 4).
 - Sediment Level in Pond - Good - Pond was cleaned in 2007
 - ◆ Small retention basin before pond inlet is full of coal fines (Photo 5).
 - ◆ Pond inlet pipes (3) not covered. Two pipes inlets are raised (Photo 4).



**WIDOWS CREEK FOSSIL PLANT
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COAL YARD DRAINAGE BASIN (continued)

- **Observations - continued (see sketch API08-1 for photo locations)**

- Pump
 - ◆ Platform needs painting and repair to handrail. This is a future potential safety issue (Photo 6).
 - ◆ Operation of pump system was not part of the inspection.
 - ◆ Vegetation encroaching in access walkway (Photo 7).

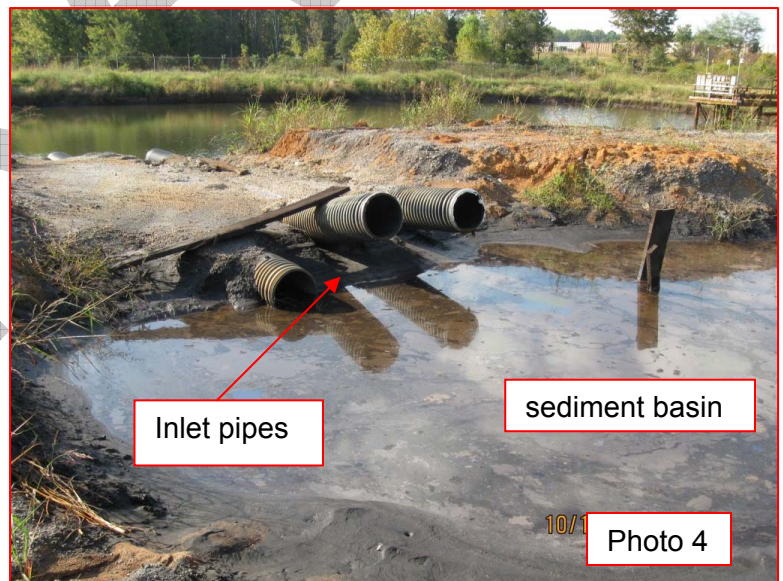


- **Actions Since Previous Inspection**

- Some work done at pond inlet pipes. Not complete.

- **Recommendations**

- Cut vegetation on the east, south and north interior slopes.
- Clean-out sediment basin in front of inlet pipes ~ 60' by 30' by 3' deep. \$1000.00.
- Reset inlet pipes, cover (w/gravel or clay) - \$2,500.00.
- Construct weir to prevent sediment from clogging inlet pipes or install prefabricated weir boxes (3 Agri Drains) - \$5,000.00. Place riprap filter ring in front of inlet weirs.
- Repair erosion and re-grade roadway along east slope. Stabilize surface with 3 inches of crushed stone - 1500 sq. ft. - \$14,000.00.
- Repair erosion on east slopes and place geo-textile fabric and rip-rap - \$78,000.00. As a minimum repair erosion re-grade road and repair erosion to prevent sediment from filling pond.
- Repair pump platform handrail - \$300.00. Paint platform within next two to three years.



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COAL YARD DRAINAGE BASIN - photos continued



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COAL YARD DRAINAGE BASIN - photos continued



COAL YARD PERIMETER DITCH

- **Location** - Perimeter of Coal Yard West of the Powerhouse.
- **Effluent** - Drains to the coal yard drainage basin.
- **Observations (see sketch API08-1 for photo locations)**
 - Sediment and coal fines fill the majority of the ditches. Clogging of the ditches has forced water over the access road into the coal yard drainage basin causing erosion in the east basin slopes. (Photos 8-14).

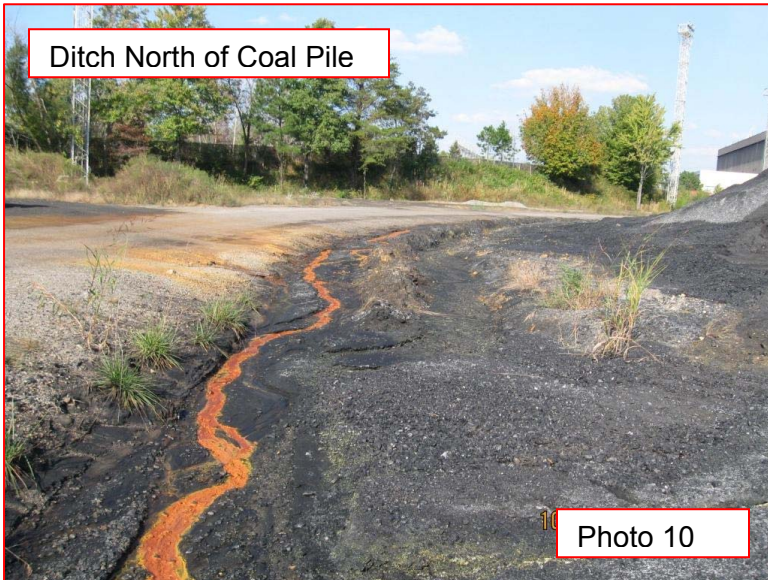


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COAL YARD PERIMETER DITCH - continued

- **Actions Since Previous Inspection**
 - None that inspector could identify

- **Recommendation**
 - Clean the perimeter ditches to allow run-off to be channeled into the coal yard drainage basin.



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COAL YARD PERIMETER DITCH - photos continued



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COAL YARD PERIMETER DITCH - photos continued



LIMESTONE PILE DRAINAGE BASIN (TVA Ref, drawings 10N8221 & 10N8224-1)

- **Location** - East of Powerhouse.
- **Effluent**
 - Discharges to a series of stilling ponds.
 - Final stilling pool discharges to Outfall 005 into Gunter'sville Reservoir.
- **Observations (see sketch API08-1 for photo locations)**
 - Interior Slopes - Satisfactory condition some erosion on interior slopes (Photo 17).
 - Sediment Level - Pond appears to be filling up again (Photos 15-16). Pond cleaned in November of 2006.
 - Discharge - submerged



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LIMESTONE PILE DRAINAGE BASIN - continued

- **Observations - continued**

- Surge Basin run-off pond
 - ◆ Heavily overgrown around pond (Photo 18)
 - ◆ Trees growing in and around pond
- Final Stilling Pond
 - ◆ Was not assessable due fencing.
 - ◆ Discharge empties into drainage channel to the river.
 - ◆ Inspected seepage into this channel near the limestone surge basin (Photo 92).
 - ◆ Source of seepage not determined.
 - ◆ Seepage did not appear to pose threat to embankment.

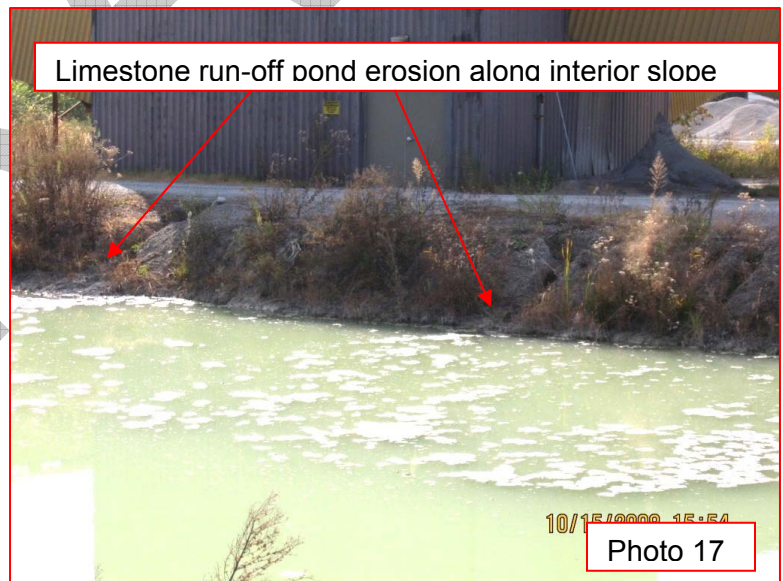


- **Actions Since Previous Inspection**

- None.

- **Recommendations**

- Continue good management practices utilized in maintaining the Limestone Pile Drainage Basin.
- Clean sediment around inlet. Monitor and clean-out pond as required.
- Perform isolated repairs at erosion locations along interior slopes. Pull slopes back to 3:1 smooth, seed and place seed mat ~250' of bank. Estimated ~2,500 sq. ft. - \$1200.00
- Remove vegetation around the surge basin. Pull trees up and fill holes with compacted material - \$3,000.00.
- Remove debris from surge basin. Repair Seep. Procedure to be developed by Engineering.
- Perform a dye test to see if observed seepage is coming from limestone surge basin.



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LIMESTONE PILE DRAINAGE BASIN - photos continued



WET GYPSUM STACKING AREA

- **Location** - East side of Widows Creek which borders the East side of the Active Ash Pond.
- **Effluent** - Discharges into Gypsum Stilling Pond.
- **Observations (see sketch API08-2 & 3 for photo locations)**
 - The development of the dry stack area appears to be in general accordance with the stacking plan. Deviations observed are noted later in the report. See TVA drawings 10W235-1 thru 16 for details. (Photos 19-29).
 - Rim ditch operations are approximately at 680.0 to 685.0 elevations.



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WET GYPSUM STACKING AREA - continued

• **Observations - continued**

- Operations are not fully functioning per the design drawings. The divider rim ditch has not been constructed, nor the west rim ditch on the southern end of the gypsum stack.
- The weir structure installed in 2007 has been abandoned and a new structure has been installed close to it. The reason for this is unclear. (Photos 25 - 26)
- Another weir structure had been installed near the southwest corner. The discharge for this weir was tied in to an existing discharge. (Photo 28)
- Lower perimeter dikes (top elevation ~630.0) were generally in good condition.
 - ◆ General terrain at base of lower perimeter dike is low lying and drains poorly. This is worse on the South and East dikes.
 - ◆ Saturated area along ~ 80' of the southern perimeter dike noted last inspection was not as noticeable. (see note on attached drawing API09-2).
 - ◆ Bare spots (4) noted on the previous inspection at the base of the northwest perimeter dike were not visible.
 - ◆ Woody growth was noted on the south, southwest, and north slope (see note on attached sketch API09-2 photos 30 and 31).
 - ◆ Bare spots were noted near the top of the northwest slope. Some erosion was present (Photo 32).
 - ◆ Overall, the slopes were heavily vegetated and required mowing.

Gypsum Stack -southeast side - looking west



Photo 20

Slurry Pipes near northwest corner



Photo 21

**WIDOWS CREEK FOSSIL PLANT
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WET GYPSUM STACKING AREA - continued

• **Observations - continued**

- Perimeter Ditch
 - ◆ Vegetation inhibiting flow in areas. Worst areas on the west and southeast sides of the gypsum stack (Photo 33).
 - ◆ Some toe drain outlets were covered with either sediment or vegetation (Photo 34).
 - ◆ Perimeter ditch discharge pipe on the north end of the final stilling pond was partially filled with sediment.
- Upper slopes - perimeter ditch to 350.0/355.0 bench.
 - ◆ Vegetative cover generally good but grass appears dead. Result of dry summer.
 - ◆ Areas of erosion were present and identified with pink flagging (Photos 35-37).
 - ◆ Worst area of erosion was on the west slope at the north end of the stilling pond (Photo 36).
 - ◆ Toe drains installed at base of this slope (~620.0) and at the 650.0/655.0 bench.
 - ◆ Some toe drain outlets were covered with sediment (Photo 34).
 - ◆ Observations of toe-drains that were flowing are on sketch API09-2
 - ◆ Several bench drain outlets were covered (Photo 38).
 - ◆ Toe-drains 1 and 2 have not been installed on the west slope next to the stilling pond. Interview with personnel involved in the past operation of the gypsum stack, revealed that slope was too saturated to install these drains. The designer (Ardaman & Associates) was contacted approved delaying the installation of these drains until the bench could be widened enough at the top. This would reduce the saturation enough to install the drains. Planned installation was for 2009.



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WET GYPSUM STACKING AREA - continued

- **Observations - continued**
 - Upper slopes - perimeter ditch to 350.0/355.0 bench-continued.
 - ◆ The damaged east PVC drain inspection well of no.12 toe drain outlets noted during the last inspection could not be observed due to vegetation.
 - ◆ The 650.0/655.0 bench was not graded to slope drains according to the design drawings. This allowed storm water run-off to erode the slope at several locations (Photo 39).
 - ◆ Interview with personnel involved in the past operation of the gypsum stack, revealed that the slope drains were installed and are covered. Inlets are protected to prevent sediment from filling the pipes. The construction plan was to wait until adequate vegetation had started on the slopes above this bench and then to re-grade and uncover slope drain inlets per the design drawings.
 - ◆ Weir outlets were in satisfactory condition. The southeast outlet discharge pipe does have erosion around the outlet but has not worsened from the previous inspection. (Photos 40 and 41).
 - ◆ Slurry line block supports have shifted making it difficult to operate transfer valves (Photo 42).



**WIDOWS CREEK FOSSIL PLANT
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WET GYPSUM STACKING AREA - continued

• **Observations - continued**

- Upper slopes - First bench (350.0/355.0) up to ~380.0.
 - ◆ Upper slope is not present on west side next to the lower stilling pond. The stack dips down in this area to ~650.0 (Elevation not verified).
 - ◆ The exact elevation at the top of this slope was not verified. Appeared to be close to 380.0.
 - ◆ Slopes have earth cover and grass seeding.
 - ◆ Grass was just beginning to germinate.
 - ◆ Several areas of slope erosion were observed. Gypsum was exposed at some of these locations.
 - ◆ Toe drains installed at bench elevation 650.



• **Actions Since Previous Inspection**

- Trans-Ash (Material Handling Contractor) began operation of the gypsum stack in June of 2008.
- Soil cover placed and seeded on slopes above first bench (650.0/655.0) to ~380.0.
- Weir installed in 2007 on west side at north end of final stilling pond abandoned.
- New weir and discharge pipe installed by Transash on west side at north end of final stilling pond near abandoned weir.
- Weir installed on west side near southwest corner and tied to existing weir discharge pipe.
- Sloughs and erosion noted from last inspection repaired.



**WIDOWS CREEK FOSSIL PLANT
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WET GYPSUM STACKING AREA (continued)

• **Actions Since Previous Inspection - continued**

- Slurry delivery pipes at the base of the stack near the southwest corner have been replaced with HDPE piping.
- Access ramp at the northeast corner of the final stilling pond has been re-worked.
- Could not verify if pumping of the inspections wells for toe drains 11, 12, and 13 as recommended from the previous inspection was done.
- Continued operations in general accordance with existing permit.



• **Recommendations**

- Review with Operator the current operations manual and drawings produced by Ardaman & Associates. This will insure that operations continue in accordance to the stacking plan.
- Monitor wet area along the Southern lower perimeter dike.
- Mow the lower perimeter dike. Regular mowing will eliminate woody growth. See tree removal procedure ~50 acres ~\$26,000.00
- Place vegetative cover and seed and mulch bare areas at the top of the perimeter dike on the northwest side. ~2000 square feet ~\$1,000.00.
- Clean vegetation and sedimentation from perimeter ditch. Remove sediment from all toe-drain outlets and verify that there are no obstructions in the lines. Insure that all discharge pipes into the final stilling pond are clear. Care must be taken to maintain the .23% slope ~\$13,000.00. Ditch length ~14,600' and assumed excavation of 1' deep by 3' wide.



**WIDOWS CREEK FOSSIL PLANT
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WET GYPSUM STACKING AREA (continued)

• **Recommendations - continued**

- Repair erosion and bare spots along gypsum slopes starting at the perimeter ditch up to the bench at 350.0/3.55.0 elevation. Estimated 8,800 square yards of repair with an average of 6" of earth cover required - \$29,000.00. Spot repairs must be done on a continuous basis until vegetation is established.

- Rework a portion of the West slope next to the Stilling Pond. Install toe drains on the west slope adjacent to the Gypsum, Stilling Pond as soon as the construction sequencing will allow. This will reduce saturation of the slope toe and will reduce sloughing in this area. Installation of these drains was previously done by a trenching machine. Cost of the installation of these drains will require a quote.

- Uncover slope drains at the 350.0/355.0 bench and grade per design drawings once vegetation covers the slope above this bench. Concrete aprons around the inlets of slope drains shall be installed as well. Estimated as 22,200 square yards of grading and 100 cubic yards of concrete - \$40,000.00.

- Re-work support blocks at the slurry lines transfer valves to allow easier operation ~ \$500.00.

- Repair erosion and bare spots along gypsum slopes starting at the bench at 350.0/355.0 elevation to top of gypsum stack ~ 380.0. Estimated 3,800 square yards of repair with an average of 6" of earth cover required - \$13,000.00. Spot repairs must be done on a continuous basis until vegetation is established.



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WET GYPSUM STACKING AREA - photos continued



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WET GYPSUM STACKING AREA - photos continued



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WET GYPSUM STACKING AREA - photos continued



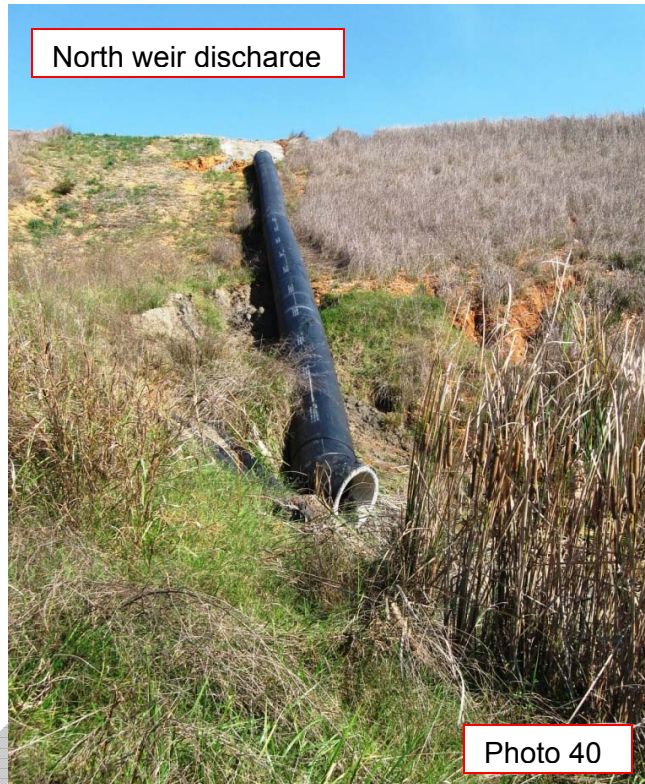
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WET GYPSUM STACKING AREA - photos continued



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WET GYPSUM STACKING AREA - photos continued



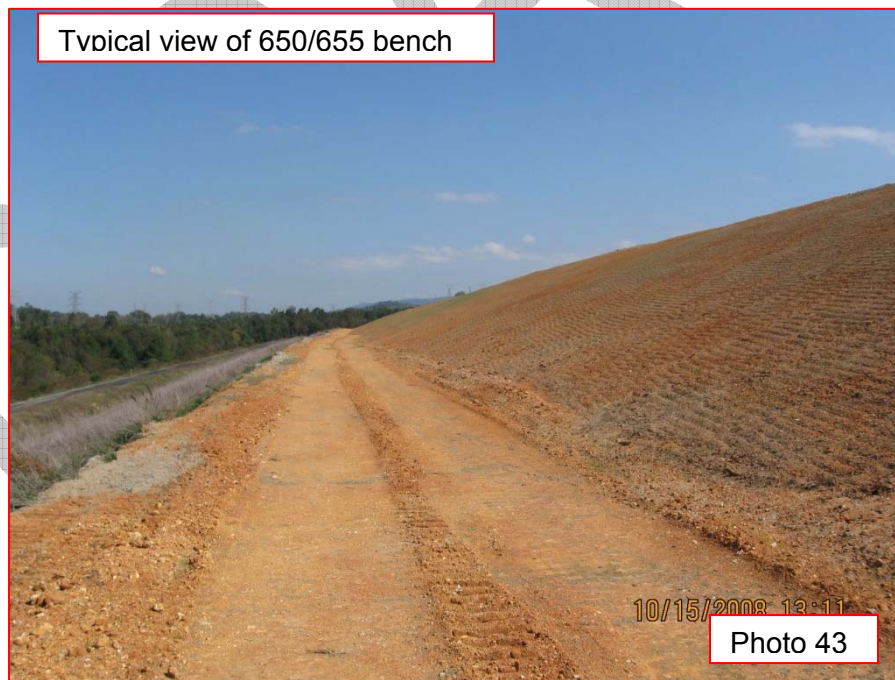
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WET GYPSUM STACKING AREA - photos continued



Slurry pipe valves

Photo 42



Typical view of 650/655 bench

Photo 43

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WET GYPSUM STACKING AREA - photos continued



STILLING POND FOR WET GYPSUM STACKING AREA

- **Location** - West of Wet Gypsum Stacking Area
- **Effluent** - Gravity Drains to Outfall 008 into Guntersville Reservoir.
- **Observations**
 - Pond Surface - good - some floating ash but contained with a skimmer boom (Photo 45)
 - Discharge pipes into Pond from Gypsum Wet Stack are in good condition.
 - ◆ Southern Discharge is the existing concrete pipe for old gypsum discharge weir. Hole has been knocked through top of pipe wall so water from perimeter ditch can enter.
 - Wooden Discharge Structure - satisfactory condition (Photos 46-47).
 - ◆ Access walkway very unstable - no handrails
 - Interior Slopes - heavy vegetation woody growth present (Photo 48).
 - Exterior Slopes - heavy vegetation w/ some woody growth (Photo 49).
- **Actions Since Previous Inspection**
 - None observed

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STILLING POND FOR WET GYPSUM STACKING AREA (continued)

- **Recommendations**

- Continue maintenance of the dike slopes by mowing annually. This will also inhibit woody growth.
- Remove trees - see tree removal procedure at the end of report recommendation summary.
- Consider alternate skimmer design available on TVA drawing 10W235-19. This design was completed in 2007. Quote required for cost. Reason: preventive maintenance.
- Provide an adequate access walkway if operations requires access to this skimmer. Will need a design and a quote for cost.



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STILLING POND FOR WET GYPSUM STACKING AREA - photos continued



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STILLING POND FOR WET GYPSUM STACKING AREA - photos continued



ACTIVE ASH POND

- **Location** - Northeast of Powerhouse
- **Effluent** - Discharges to Active Ash Pond Stilling Pond
- **Observations (Photos 50-55)**
 - Interior Slopes - Satisfactory.
 - Pond Surface - some floating ash observed near discharge structures (Photo 50 & 55)
 - Discharge Structures - Good condition (Photo 55)
 - ◆ Only one of five structures could be inspected.
- **Actions Since Last Inspection**
 - Trans-Ash (Material Handling Contractor) began operation of the gypsum stack in June of 2008.
 - Plant excavating trench to re-route gypsum slurry piping.
- **Recommendations**
 - Utilize Best Management Practices (BMP's) to prevent erosion on top exterior slopes.
 - Continue good maintenance and BMP's for Active Ash Pond Operations.
 - Remove floating ash near weirs.

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ACTIVE ASH POND - photos



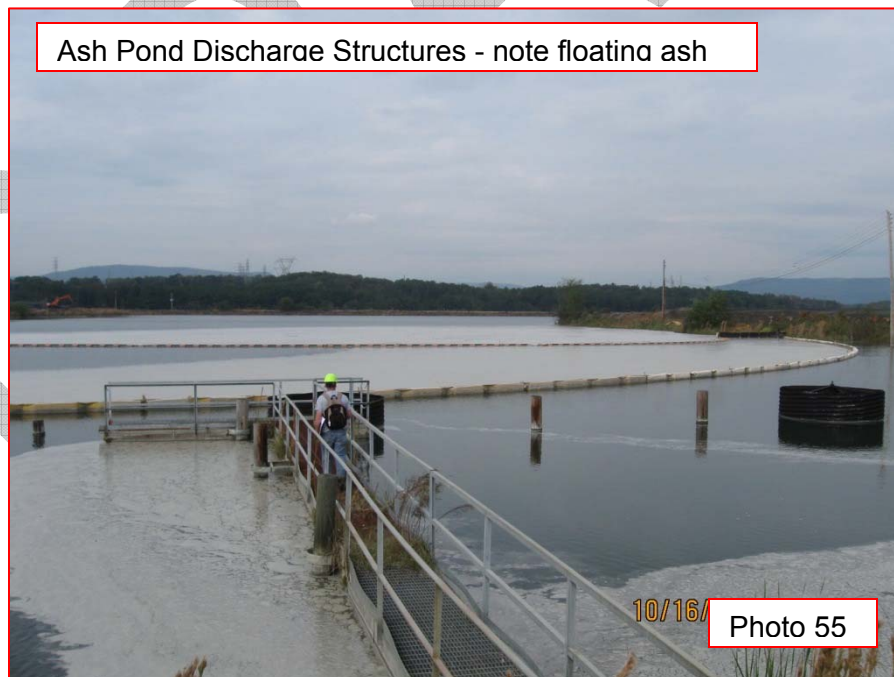
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ACTIVE ASH POND - photos continued



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ACTIVE ASH POND - photos continued



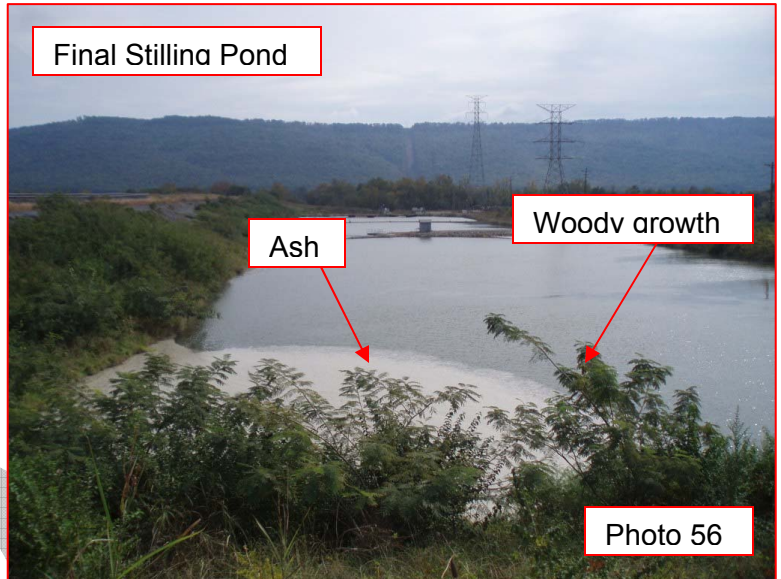
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Active Ash Pond Stilling Pond and Pumping Station Pond

- **Location** - Southeast of Active Ash Pond

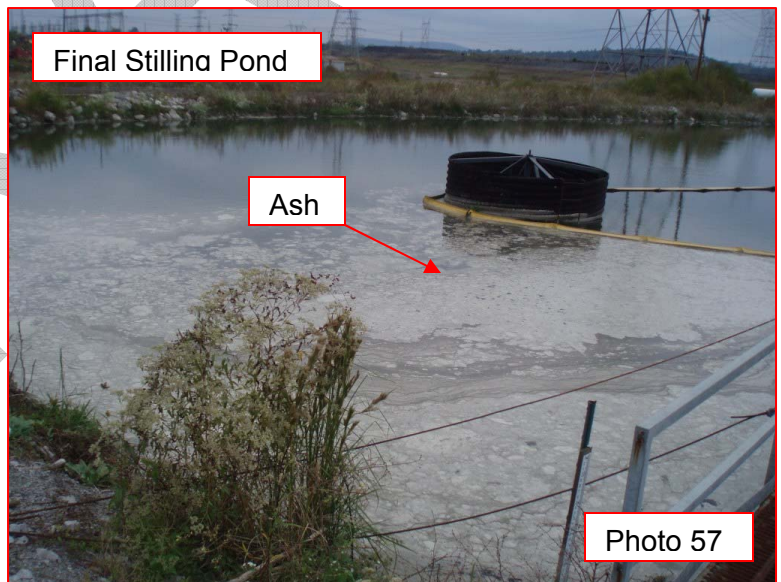
- **Effluent**

- Stilling Pond discharges to Pumping Station Pond
- Pumping Station Pond - pumped to Condenser Cooling Water (CCW) Intake with a portion pumped to wet gypsum system or overflows into outfall 001 into Guntersville Reservoir.



- **Observations**

- Stilling Pond surface had ash accumulation at northwest end and at discharge structures (Photos 56 & 57).
- Interior Slopes - Heavily vegetated with some woody growth.
 - ◆ Pumping Station Pump just has Riprap.
- Stilling pond discharge Structures - Good condition (Photo 58)
 - ◆ Only one structure was accessible.
- Pump Station Pond (Photo 59).
 - ◆ Water level higher than last inspection.
 - ◆ Seepage observed in FY2007 inspection at the Pumping Station Pond interior slope was not observed. This primarily due to the higher water level in the pumping station pond



- **Actions Since Last Inspection**

- None observed

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Active Ash Pond Stilling Pond and Pumping Station Pond (continued)

• **Recommendations**

- Continue good maintenance and BMP's for Active Ash Stilling Pond operations.
- Monitor seep in dike between Stilling Pond and Pumping Station Pond. This can only be done when the water level in the Pumping Station Pond is lower.
- Remove ash in the stilling pond and around discharge structures.
- Mow interior slopes. This will inhibit woody growth.



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ASH DREDGE CELL

- **Location** - Northeast corner of ash pond.
- **Effluent** - Surface runoff drains to active ash pond through prefabricated weirs.

- **Observations**

- This cell is full and dredging activities has stopped since the last inspection (Photo 60).
- Interior slopes - no vegetation with numerous ruts and eroded areas (Photo 61).
 - ◆ Caution must be taken driving around the perimeter of cell due to erosion noted.
- Exterior slopes - very sparse vegetation.
 - ◆ Slopes have been seeded numerous times. Material limits vegetative growth.
 - ◆ Despite sparse growth there are clumps of dense vegetation that exists.
 - ◆ No significant erosion observed.
- Perimeter ditch (Slope on ditch is very flat - cannot locate drawings that define slope)
 - ◆ Heavy vegetation observed in ditch.



- **Actions Since Last Inspection**

- This cell is full and dredging activities has stopped since the last inspection.
- Design to raise the dredge cell was near completion in 2008 but delayed. Tran-Ash proposed alternate ash management operation that would delay the need for dredging the ash pond.

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ASH DREDGE CELL (continued)

• **Recommendations**

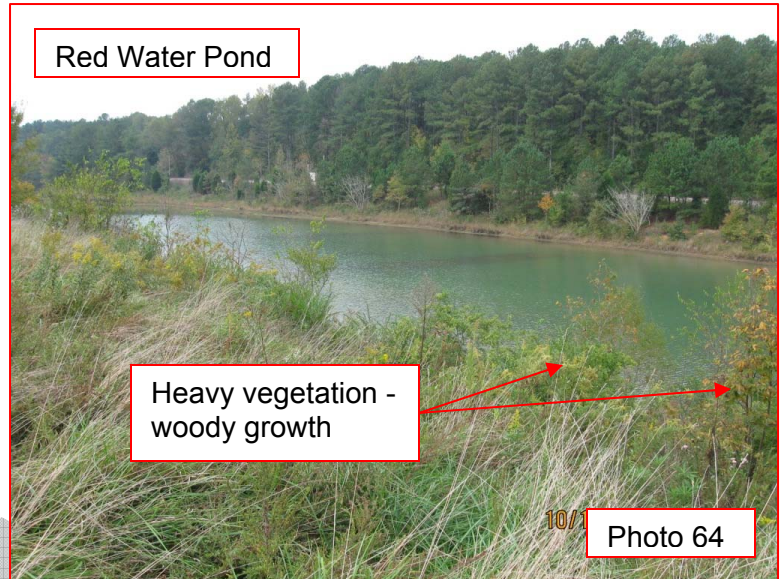
- Repair interior slope ruts and undercuts. Blade interior slopes to eliminate rutting and undercuts at interior edges. Inside perimeter is ~8,200 ft.
- Remove vegetation in the perimeter ditch to allow better flow.
- Cut-back areas of dense vegetation on exterior slopes to inhibit woody growth.
- Seed and mulch exterior slope. Jamey Dotson of TVA Fuel By-Products group is currently looking at aerial seeding of the dredge cell to reduce dusting. Expand seeding to include the exterior slopes if possible.



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ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND

- **Location**
 - **Perimeter Dikes** - Borders all sides of the Active Ash Pond and encloses the Chemical Ponds. Runs parallel to Widows Creek on along the North and East side.
 - **Red Water Pond** - Located between the railroad tracks and West Active Ash Pond Perimeter Dike.



- **Effluent** - Surface runoff drains to various locations.

- A portion of the South dike (starting at the Units 7 and 8 ash trench) and the entire Western dike drain into the Red Water Pond. A perimeter ditch receives run-off from the portion of the South dike and diverts water to the Red Water Pond.
- Dike surface runoff drains into Widows Creek starting near the North corner of the Active Ash Disposal Area and extending to the South corner of the Ash Pond Area. This is essentially the entire Eastern half of the disposal area and a portion of the Southern side.
- Surface runoff from the perimeter dike that borders the Stilling Pond flows into the Stilling Pond.
- Surface runoff of the remaining portion of the South dike, starting at the units 7 and 8 ash trench and ending at the Stilling Pond, drain to constructed wetlands and then to a stilling pond before exiting outfall 005. This is accomplished via a perimeter ditch starting at the units 7 and 8 ash trench.



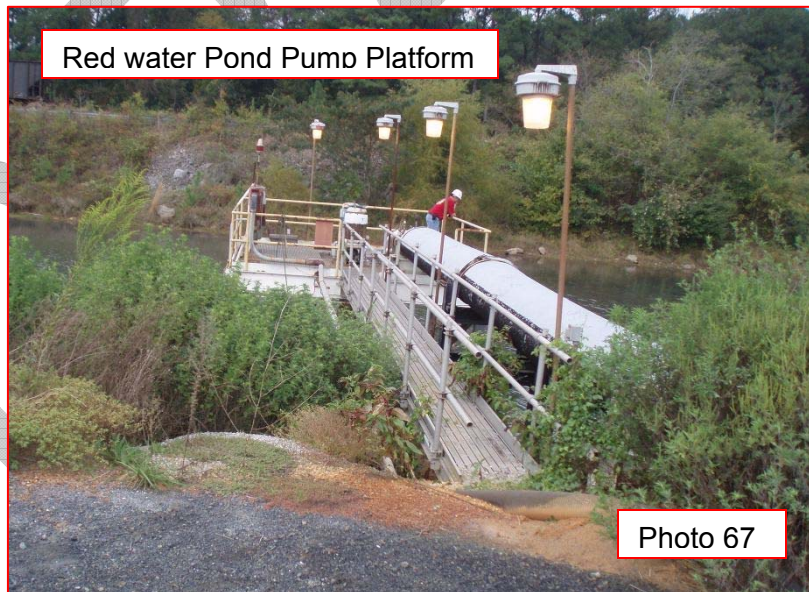
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ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)

• **Observations**

▪ Red Water Pond

- ◆ Interior Slopes - heavily vegetated w/ some woody growth (Photos 65 & 66).
- ◆ Interior Slopes - Riprap and vegetation covers west slope next to railroad track.
- ◆ Interior Slopes - area of erosion noted in previous inspections on west slope was still present but had not worsened.
- ◆ Dike on North end (Riprap surface) - Tree growth on the dike (Photo 66)
- ◆ Pump platform was in satisfactory condition (Photo 67).
- ◆ Project in 2008 lowered pump operating levels - etched on electrical cabinet.



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ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)

- Perimeter Dikes generally have heavy vegetative cover in most areas. Some areas of deficiencies were observed.
 - ◆ Heavy vegetation on slopes with some small woody growth starting.
 - ◆ Erosion observed on Northeast Dike between the bridge over Widows Creek and the southeast corner. This was noted last inspection but has not worsened. This area is approximately 70 feet along the dike extending an average of 50 feet down the slope from the top. (Photo 68).
 - ◆ Erosion noted last inspection on the northeast dike near southeast corner has some vegetation. Slope is bare near the top. (Photo 69).
 - ◆ Damaged manhole for the gypsum stilling pond drain line observed at base of the northeast dike is still present. Heavy vegetation covers the manhole so flagging was placed at manhole.
 - ◆ Old silt fencing is present along the base of the northeast slope. Fencing starts at the bridge and extends southeast around the base of the southeast slope (~3,500 ft.).
 - ◆ The wet areas and (equipment) rutting at the Northeast perimeter dike base just south of the bridge accessing the Gypsum disposal area were not visible due to heavy vegetation. The area was damp but no seepage was visible (Photo 70).



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
FY 2009**

ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)

• **Observations**

Perimeter Dikes continued

- ◆ Ruts forming on bench access road on the northwest dike. This serves as the access road to the red water pumping station. Standing water was observed (Photo 71).
- ◆ Two erosion areas noted at bench next to the red water pond system (northwest slope). These areas are on a bench bordered by trees between the red water pond and the scrubber access road (Photo 73).
- ◆ Mature trees observed on the northwest lower dike to the north and south of the red water pond (Photo 72 and 74).
- ◆ Drainage ditch cut through to the red water pond for the new Scrubber Road storm water discharge (Photo 75).
- ◆ Storm drainage discharge pipe needs grout between the pipe and outlet structure (Photo 76).
- ◆ Red water ditch cleaned out starting at the Units 1-6 sluice piping north to drainage channel cut to the red water pond.
- ◆ Settlement around some of the new storm water catch basins along the Scrubber Road was observed (Photo 77).
- ◆ Erosion observed at southwest corner next to the units 1-6 ash pipes. It appears that this was where previous ash pipes were located. Vegetation is present and area is stable. Erosion above this area was noted at road near the top of dike (Photo 83).

Location where equipment ruts and standing water noted last inspection.



Photo 70

Ruts in access road to red water pond - northwest dike



Photo 71

**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
FY 2009**

ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)

- **Observations**

- Perimeter Dikes continued
 - ◆ Erosion noted starting at access road from the Stilling Pond and extending approximately 1400 feet west. Starts at the top of the dike and extends down the slope. The paved plant perimeter access road runs parallel to this area (Photos 78 and 79).
 - ◆ Some erosion was noted at the top of the perimeter dike next to the Stilling Pond (Photo 80).
 - ◆ Woody growth observed on perimeter dike slopes bordering the stilling pond.
 - ◆ The red water seepage along the southern dike parallel to the paved plant perimeter access road is still present. Rip-rap installed in this area and along the drainage ditch next to the road has slid into the ditch and is restricting flow. This occurs on approximately 700 feet of ditch. This ditch drains to the red water pond (Photos 81 and 82).
 - ◆ Water accumulation noted on the ash pond side of area mentioned above. This area does not contain sluiced ash but is a basin where the two chemical ponds are contained. A drain pipe running the dike to discharge storm water to the ditch is plugged (Photos 84 and 85).



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
FY 2009**

ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)

• **Actions Since Last Inspection**

- Red Water Pump operating levels change for the Scrubber Road Drainage Project (see TVA drawings 15W7835-36 and 17W7835-36)
- New catch basins and drainage pipe installed along the Scrubber Road Access road next to the load rail road yard. This was to improve drainage of the storm water system along this road (see TVA drawings 10W8742-5 thru 9).
- Ditching to the Red Water Pond from the red water drainage ditch discharge point. Spoil placed and smooth along lower bench next to red water pond system. This was part of the Scrubber Road Drainage Project.
- Clearing of red water drainage ditch from the Units 1-6 ash sluice pipes north toward the red water pond. This was part of the Scrubber Road Drainage Project.



Large trees on lower slope of northwest perimeter dike - north of red water pond

Photo 74

• **Recommendations**

- Cutback vegetation on all slopes. Maintenance of the dike slopes by mowing annually will inhibit woody growth.
- Remove trees along slopes. See tree removal procedure. Note: trees on the bottom slopes on the west side of the ash ponds have many mature trees. Tree removal here may cause damage to the dike if removed. At this time the recommendation is to leave these trees in-place.



Drainage channel cut to red water pond from scrubber road discharge pipe

Photo 75

**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
FY 2009**

ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)

Recommendations - continued

- Repair erosion observed on Northeast dike between the bridge over Widows Creek and the southeast corner. Place suitable earth material atop of the existing earth material that is not supporting vegetative cover. This material shall then be seeded and mulched so that vegetative cover can be established. Some type of grass matting is recommended for this area. Estimated area to be covered, graded, and seeded - 300 yd² (Photos 68 & 69).



- Repair damaged manhole for the gypsum stilling pond gravity drain. This is located at the base of the northeast perimeter dike and shown on drawing API08-1.

- Remove existing silt fencing except at the two areas of erosion noted in the first bullet. Repair silt fencing in areas of erosion. Once these areas are properly vegetated then silt fencing can be removed.



- Address area along base of northeast dike where equipment ruts and water was observed during the last inspection. This will start at the bridge accessing the gypsum area and extend to where the gypsum stilling pond gravity drain line discharges to the 008 outfall ditch. Expose the area, fill

- ruts re-grade if required to prevent accumulation of water and then seed and mulch. Estimated area to be covered is 30,000 square feet (3,333 square yards) (Photo 70).
- Place labels identifying pump level operations on the red water pump electrical cabinet.
- Monitor erosion at the Red Water Pond interior slope. Notify EDS if erosion worsens. Placement of riprap is the recommended repair but not warranted at this time.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
FY 2009**

ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)

Recommendations - continued

- Remove woody growth along the northwest perimeter dike next to the red water pond.
- Ruts forming on bench access road on the northwest dike. This serves as the access road to the red water pumping station. Gravel and re-grade to prevent standing water. This is needed on approximately 2000 feet of the access road (Photo 71).
- Repair two areas of erosion on bottom bench of the northwest slope adjacent to the red water pond drainage system. Fill areas, re-grade, seed and mulch (100 square yards - 60 cubic yards of material required) (Photo 73)
- Repair erosion observed at the southwest corner at access road (Photo 83). Re-grade, seed, and mulch approximately 2,000 square feet (~225 square yards).
- Place suitable earth material atop of the existing earth material that is not supporting vegetative cover on the South perimeter dike. This material shall then be seeded and mulched so that vegetative cover can be established (Photos 78 and 79). Some type of grass matting is recommended for this area. Estimated area to be covered, graded, and seeded - 6500 yd². If dirt access road is used in this area surface and gravel. Estimated area is 800 yd².



Erosion along southeast perimeter dike slope adjacent to plant access road (scrubber road)

Photo 78



Erosion along access ramp to southeast perimeter dike

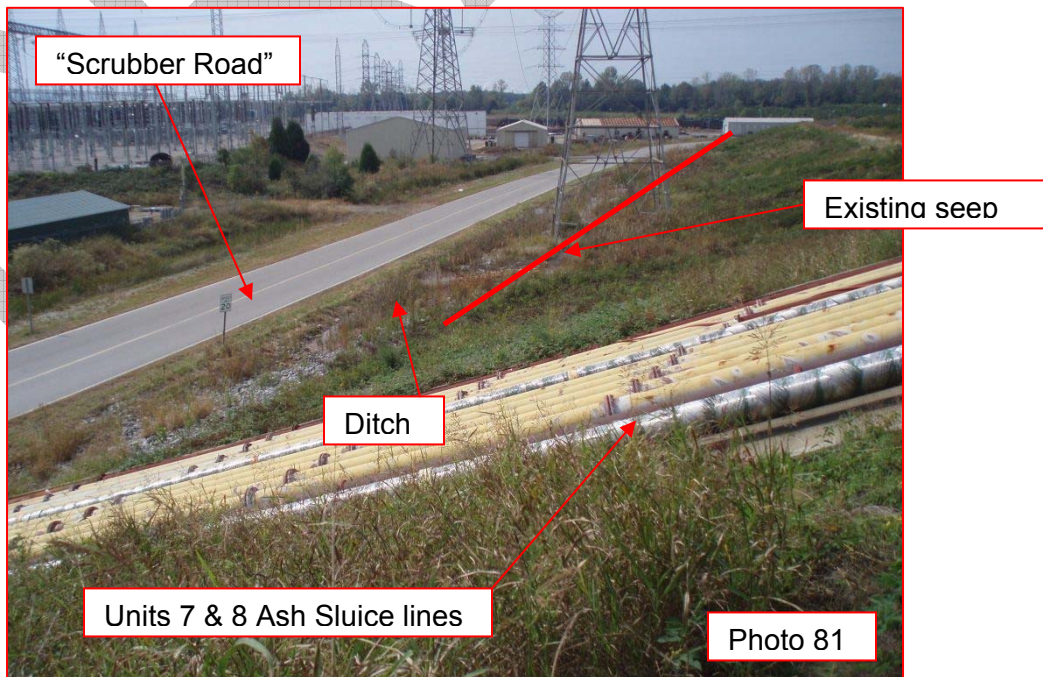
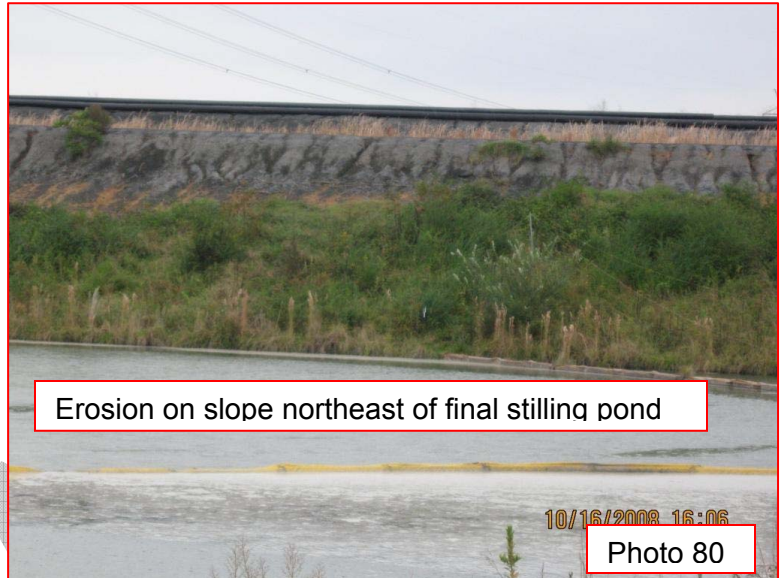
Photo 79

**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
FY 2009**

ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)

Recommendations - continued

- Repair erosion near top of south perimeter dike adjacent to the final stilling pond. Place suitable earth material atop of the existing earth material that is not supporting vegetative cover. This material shall then be seeded and mulched so that vegetative cover can be established (Photo 80). Some type of grass matting is recommended for this area. Estimated area to be covered, graded, and seeded - 6500 yd².
- Monitor the seepage along the South perimeter dike next to the Plant perimeter road. Notify EDS of any changes (Photo 81).
- Remove woody growth along the perimeter dike next to the stilling pond.
- Clean-out drain pipes that discharge storm water from chemical pond basin (Photos 84 and 85).
- Remove rip-rap from ditch along scrubber road to allow flow (Photo 82). Engineering to develop long term repair to prevent material from sliding into ditch.



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
FY 2009**

ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND - photos continued



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
FY 2009**

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WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
FY 2009

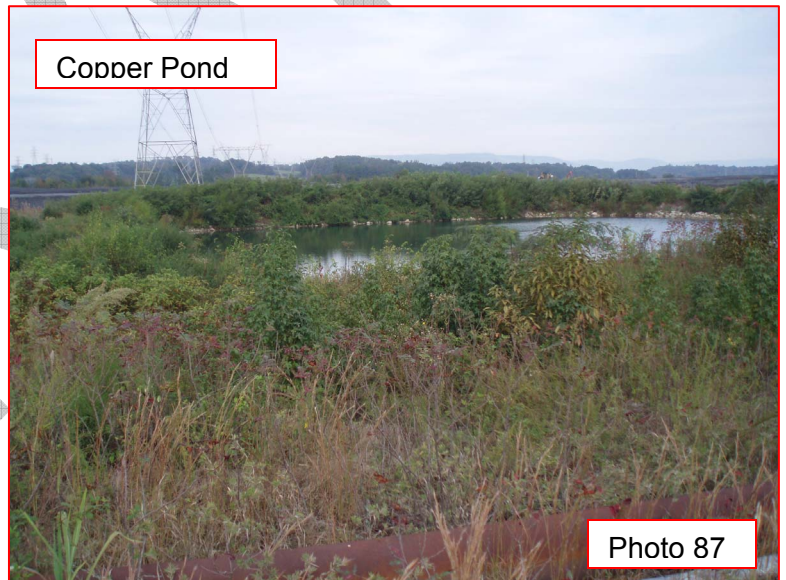
ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
FY 2009**

CHEMICAL PONDS

- **Location** - Inside the Ash Pond Perimeter Dikes Northwest of Powerhouse
- **Effluent** - Discharged into Active Ash Pond
- **Observations**
 - Interior slopes - Satisfactory - heavy vegetation with small trees and brush present along the edges of the Copper Pond (Photo 87).
 - ◆ Riprap cover in good condition in Iron Pond (Photo 86).
 - Platforms
 - ◆ Copper Pond - poor - appears structurally sound but needs paint. Access blocked by vegetation (Photo 88).
 - ◆ Iron Pond - satisfactory (Photo 89)
 - Ponds are enclosed by perimeter dikes forming a basin
 - ◆ Runoff from this area flows through two drainage pipes which penetrate the outside perimeter dike and runs down the slope to the perimeter ditch.
 - ◆ Inlet to these two pipes is partially clogged. (Photos 84 and 85).

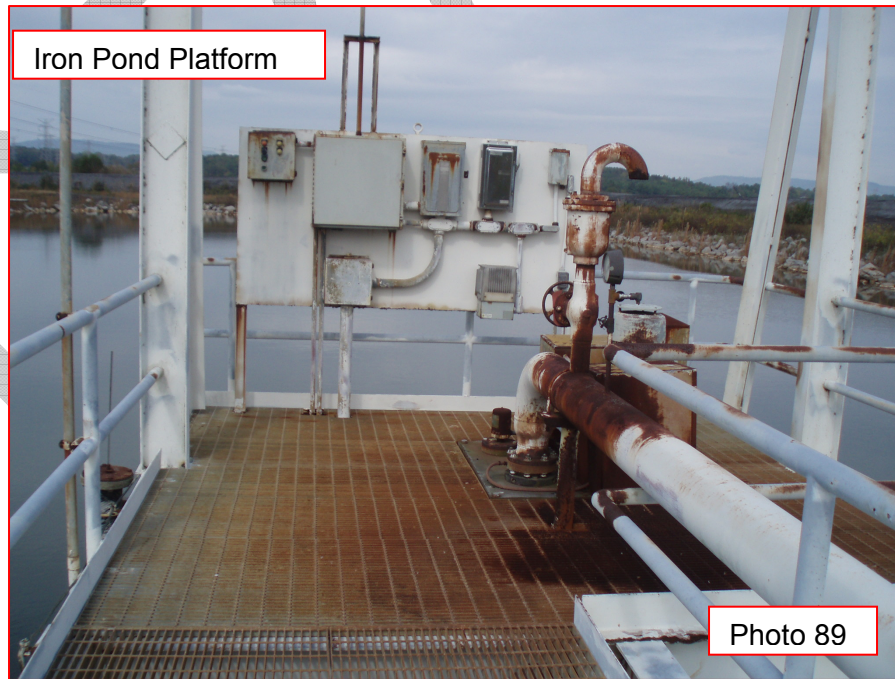


**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
FY 2009**

CHEMICAL PONDS (continued)

- **Actions Since Previous Inspection**
 - None that inspector is aware of.

- **Recommendations**
 - Unclog drainage pipes and place filter fabric and riprap check dam at entrance point to catch sediment (2 yd³).
 - Close ponds if they are not used and fill in basin area with bottom ash.
 - Remove brush and vegetation along the interior slope of the copper pond.



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
FY 2009**

ABANDONED ASH DISPOSAL AREA

- **Location** - Inside the Railroad Loop Northwest of Powerhouse
- **Effluent** - Majority of runoff goes to the Red Water Pond
- **Observations**
 - Heavily wooded in areas with vegetation throughout area (Photo 90).
 - Old discharge structures still present (Photo 91)
- **Actions Since Previous Inspection**
 - None that inspector is aware of.
- **Recommendations**
 - None



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
FY 2009**



DRAFT

**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
FY 2009**

SUMMARY OF RECOMMENDATIONS

COAL YARD DRAINAGE BASIN

- Cut vegetation on the east, south and north interior slopes.
- Clean-out sediment basin in front of inlet pipes ~ 60' by 30' by 3' deep. \$1000.00.
- Reset inlet pipes, cover (w/gravel or clay) - \$2,500.00.
- Construct weir to prevent sediment from clogging inlet pipes or install prefabricated weir boxes (3 Agri Drains) - \$5,000.00. Place riprap filter ring in front of inlet weirs.
- Repair erosion and re-grade roadway along east slope. Stabilize surface with 3 inches of crushed stone - 1500 sq. ft. - \$14,000.00.
- Repair erosion on east slopes and place geo-textile fabric and rip-rap - \$78,000.00. As a minimum repair erosion re-grade road and repair erosion to prevent sediment from filling pond.
- Repair pump platform handrail - \$300.00. Paint platform within next two to three years.

COAL YARD PERIMETER DITCH

- Clean the perimeter ditches to allow run-off to be channeled into the coal yard drainage basin.

LIMESTONE PILE DRAINAGE BASIN

- Continue good management practices utilized in maintaining the Limestone Pile Drainage Basin.
- Clean sediment around inlet. Monitor and clean-out pond as required.
- Perform isolate repairs at erosion locations along interior slopes. Pull slopes back to 3:1 smooth, seed and place seed mat ~250' of bank. Estimated ~2,500 sq. ft. - \$1200.00
- Remove vegetation around the surge basin. Pull trees up and fill holes with compacted material - \$3,000.00.
- Remove debris from surge basin. Repair Seep. Procedure to be developed by Engineering.
- Perform a dye test to see if observed seepage is coming from limestone surge basin. \$1,000.00. This was completed and the source is from the limestone pond surge basin.

WET GYPSUM STACKING AREA

- Review with Constructor the current operations manual and drawings produced by Ardaman & Associates. This will insure that operations continue in accordance to the stacking plan.
- Monitor wet area along the Southern lower perimeter dike.
- Mow the lower perimeter dike. Regular mowing will eliminate woody growth. See tree removal procedure ~50 acres ~\$26,000.00
- Place vegetative cover and seed and mulch bare areas at the top of the perimeter dike on the northwest side. ~2000 square feet ~ \$1,000.00.
- Clean vegetation and sedimentation from perimeter ditch. Remove sediment from all toe-drain outlets and verify that there are no obstructions in the lines. Insure that all discharge pipes into the final stilling pond are clear. Care must be taken to maintain the .23% slope ~\$13,000.00. Ditch length ~14,600' and assumed excavation of 1' deep by 3' wide.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
FY 2009
SUMMARY OF RECOMMENDATIONS - continued**

WET GYPSUM STACKING AREA - continued

- Repair erosion and bare spots along gypsum slopes starting at the perimeter ditch up to the bench at 350.0/3.55.0 elevation. Estimated 8,800 square yards of repair with an average of 6" of earth cover required - \$29,000.00. Spot repairs must be done on a continuous basis until vegetation is established.
- Rework a portion of the West slope next to the Stilling Pond. Install toe drains on the west slope adjacent to the Gypsum, Stilling Pond as soon as the construction sequencing will allow. This will reduce saturation of the slope toe and will reduce sloughing in this area. Installation of these drains was previously done by a trenching machine. Cost of the installation of these drains will require a quote.
- Uncover slope drains at the 350.0/355.0 bench and grade per design drawings once vegetation covers the slope above this bench. Concrete aprons around the inlets of slope drains shall be installed as well. Estimated as 22,200 square yards of grading and 100 cubic yards of concrete - \$40,000.00.
- Re-work support blocks at the slurry lines transfer valves to allow easier operation ~ \$500.00.
- Repair erosion and bare spots along gypsum slopes starting at the bench at 350.0/3.55.0 elevation to top of gypsum stack ~ 380.0. Estimated 3,800 square yards of repair with an average of 6" of earth cover required - \$13,000.00. Spot repairs must be done on a continuous basis until vegetation is established.
- Continue maintenance of the dike slopes by mowing annually. This will also inhibit woody growth.

WET GYPSUM STACKING STILLING POND

- Continue maintenance of the dike slopes by mowing annually. This will also inhibit woody growth.
- Remove trees - see tree removal procedure at the end of report recommendation summary.
- Consider alternate skimmer design available on TVA drawing 10W235-19. This design was completed in 2007. Existing skimmer appears to be functioning. Quote required for cost.
- Provide an adequate access walkway if operations requires access to this skimmer. Will need a design and a quote for cost.

ACTIVE ASH POND

- Utilize Best Management Practices (BMP's) to prevent erosion on top exterior slopes.
- Continue good maintenance and BMP's for Active Ash Pond Operations.
- Remove floating ash near weirs.

ACTIVE ASH POND STILLING POND AND PUMPING STATION POND

- Continue good maintenance and BMP's for Active Ash Stilling Pond operations.
- Monitor seep in dike between Stilling Pond and Pumping Station Pond. This can only be done when the water level in the Pumping Station Pond is lower.
- Remove ash in the stilling pond and around discharge structures.
- Mow interior slopes. This will inhibit woody growth.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
FY 2009
SUMMARY OF RECOMMENDATIONS - continued**

ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND - continued

- Cutback vegetation on all slopes. Maintenance of the dike slopes by mowing annually will inhibit woody growth.
- Remove trees along slopes. See tree removal procedure. Note: trees on the bottom slopes on the west side of the ash ponds have many mature trees. Tree removal here may cause damage to the dike if removed. At this time the recommendation is to leave these trees in-place.
- Repair erosion observed on Northeast dike between the bridge over Widows Creek and the southeast corner. Place suitable earth material atop of the existing earth material that is not supporting vegetative cover. This material shall then be seeded and mulched so that vegetative cover can be established. Some type of grass matting is recommended for this area. Estimated area to be covered, graded, and seeded - 300 yd² (Photos 68 and 69).
- Repair damaged manhole for the gypsum stilling pond gravity drain. This is located at the base of the northeast perimeter dike and shown on drawing API08-1.
- Remove existing silt fencing except at the two areas of erosion noted in the first bullet. Repair silt fencing in areas of erosion. Once these areas are properly vegetated then silt fencing can be removed.
- Address area along base of northeast dike where equipment ruts and water was observed during the last inspection. This will start at the bridge accessing the gypsum area and extend to where the gypsum stilling pond gravity drain line discharges to the 008 outfall ditch. Expose the area, fill ruts re-grade if required to prevent accumulation of water and then seed and mulch. Estimated area to be covered is 30,000 square feet (3,333 square yards) (Photo 70).
- Place labels identifying pump level operations on the red water pump electrical cabinet.
- Monitor erosion at the Red Water Pond interior slope. Notify EDS if erosion worsens. Placement of riprap is the recommended repair but not warranted at this time.
- Remove woody growth along the northwest perimeter dike next to the red water pond.
- Ruts forming on bench access road on the northwest dike. This serves as the access road to the red water pumping station. Gravel and re-grade to prevent standing water. This is needed on approximately 2000 feet of the access road (Photo 71).
- Repair two areas of erosion on bottom bench of the northwest slope adjacent to the red water pond drainage system. Fill areas, re-grade, seed and mulch (100 square yards - 60 cubic yards of material required) (Photo 73)
- Repair erosion observed at the southwest corner at access road (Photo 83). Re-grade, seed, and mulch approximately 2,000 square feet (~225 square yards).
- Place suitable earth material atop of the existing earth material that is not supporting vegetative cover on the South perimeter dike. This material shall then be seeded and mulched so that vegetative cover can be established (Photos 78 and 79). Some type of grass matting is recommended for this area. Estimated area to be covered, graded, and seeded - 6500 yd². If dirt access road is used in this area surface and gravel. Estimated area is 800 yd².

**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
FY 2009**

ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND - continued

- Repair erosion near top of south perimeter dike adjacent to the final stilling pond. Place suitable earth material atop of the existing earth material that is not supporting vegetative cover. This material shall then be seeded and mulched so that vegetative cover can be established (Photo 80). Some type of grass matting is recommended for this area. Estimated area to be covered, graded, and seeded - 6500 yd².
- Monitor the seepage along the South perimeter dike next to the Plant perimeter road. Notify EDS of any changes (Photo 81).
- Remove woody growth along the perimeter dike next to the stilling pond.
- Clean-out drain pipes that discharge storm water from chemical pond basin (Photos 84 and 85).
- Remove rip-rap from ditch along scrubber road to allow flow (Photo 82). Engineering to develop long term repair to prevent material from sliding into ditch.

CHEMICAL PONDS

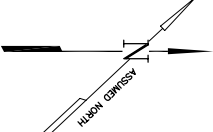
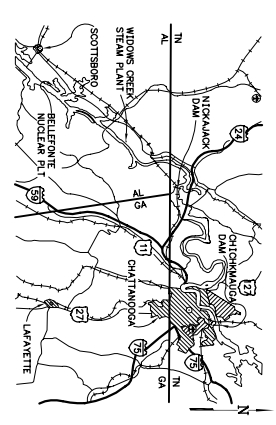
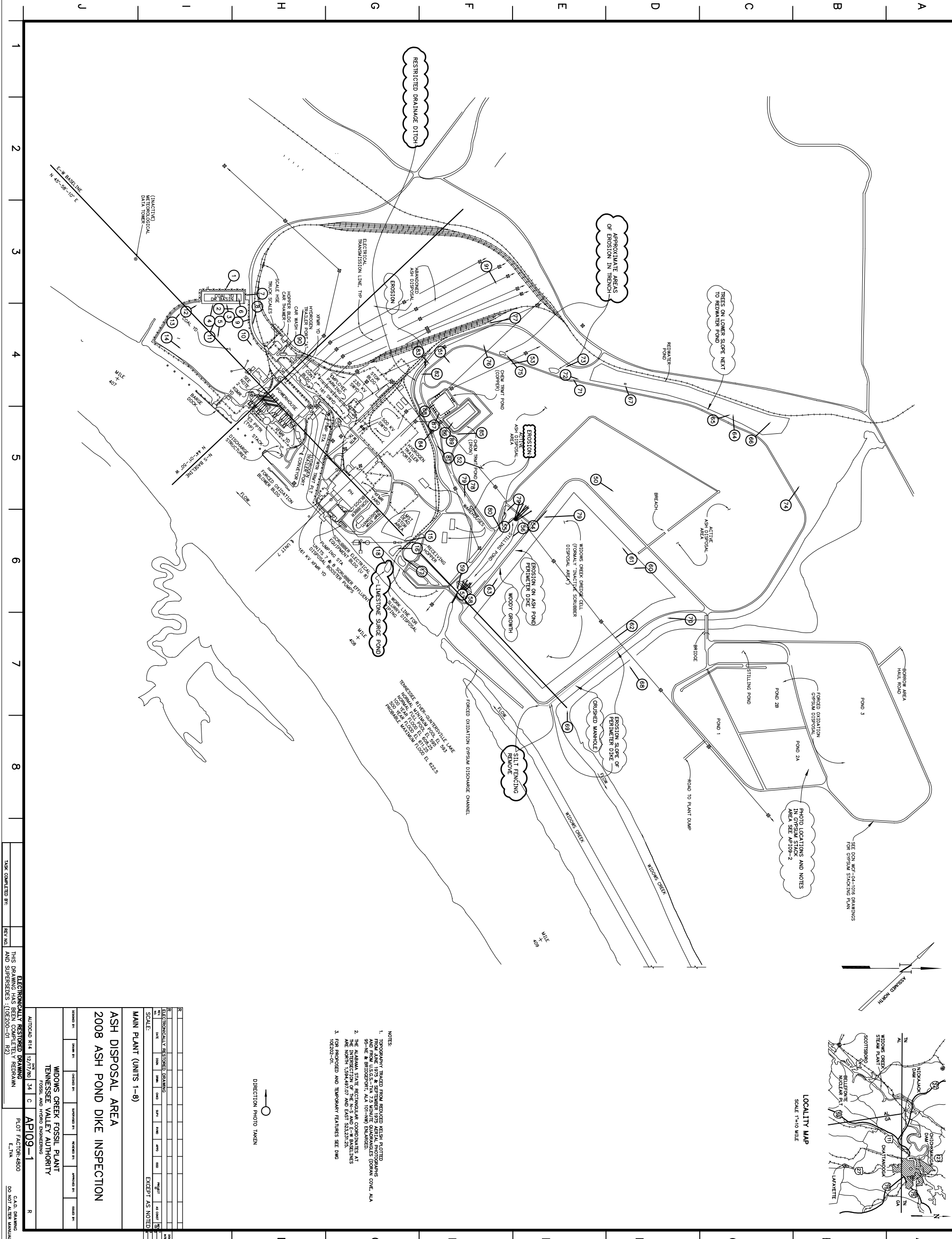
- Unclog drainage pipes and place filter fabric and riprap check dam at entrance point to catch sediment (2 yd³).
- Close ponds if they are not used and fill in basin area with bottom ash.
- Remove brush and vegetation along the interior slope of the copper pond.

ABANDONED ASH DISPOSAL AREA

- None

TREE REMOVAL PROCEDURE

- Trees growing in the dike should be pulled out by their roots with a chain and a backhoe and the damaged area compacted back in place to repair it. All trees above the toe of the dike should be removed this way. Removing the roots removes a path for water to erode a tunnel through the dike and cause a failure. Cutting trees should be avoided because this leaves the roots in place and will leave a tunnel after the root rots. Trees larger than 3" in diameter at the base should be left in place unless they are in a place critical to dike stability (the toe of the dike and the toe of any slope at a berm). Some species of trees this large have such large root systems removing them would cause more damage than leaving them would. Mowing very small trees while mowing the dikes will not cause future problems and is the best way to control tree growth.



NOTES:
 1. TOPOGRAPHY TRACED FROM REVISED KESHU PLOTTED FROM JUNE 1975 & SEPTEMBER 1975 AERIAL PHOTOGRAPHS CORRECTED 90°-E-W BRIDGEPOINT A-2 (DOWNS) ENLARGED.
 2. THE ALABAMA STATE RECTANGULAR COORDINATES AT THE INTERSECTION OF THE N-S AND E-W BASELINES ARE NORTH 1,394,497.07 AND EAST 523,231.25.
 3. FOR PROPOSED AND TEMPORARY FEATURES SEE DWG 102202-01.

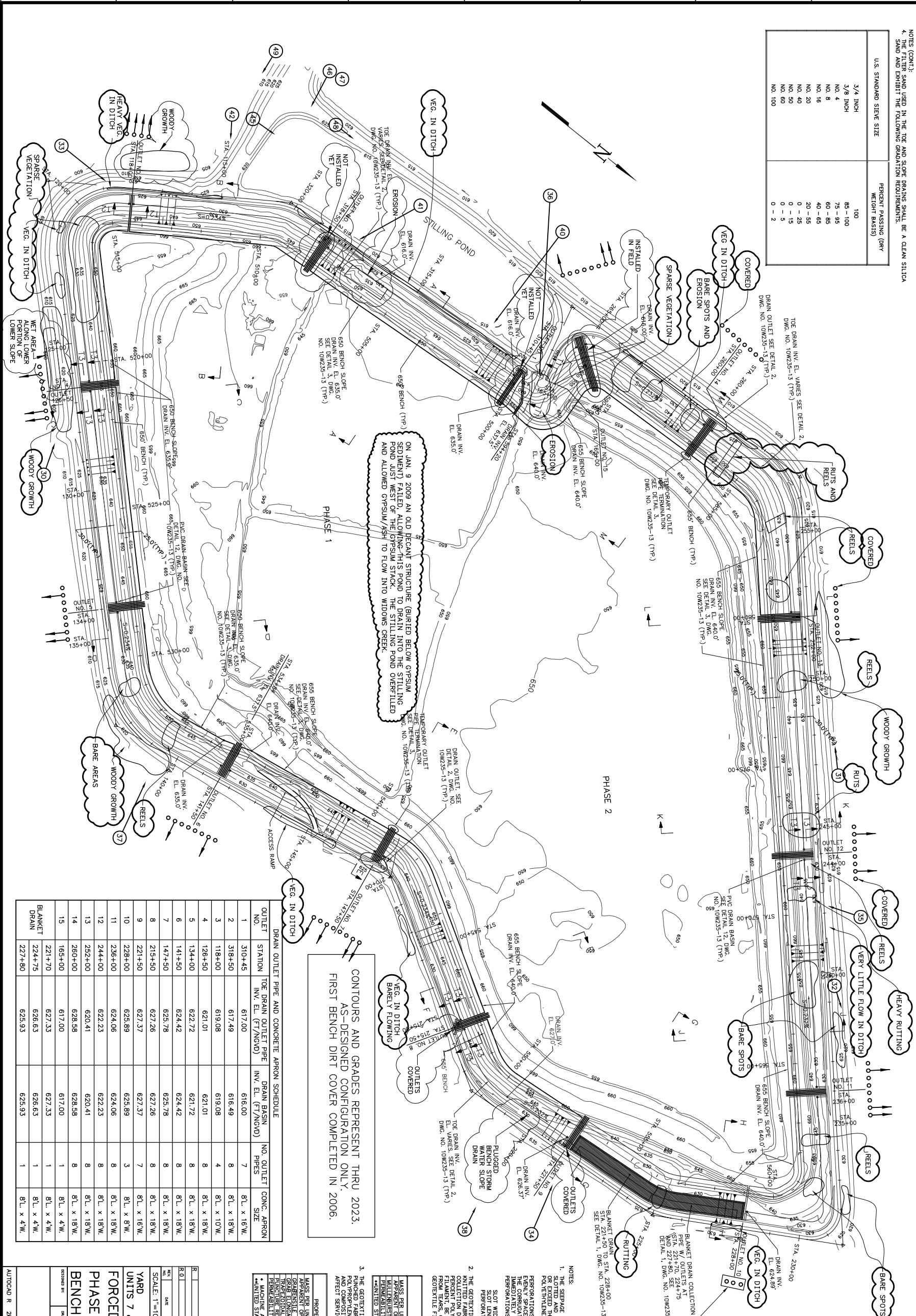


NO. 1	DATE	BY	CHKD	APP'D	DESC
1	12/17/90	SA	C	API09-1	R
ASH DISPOSAL AREA					
2008 ASH POND DIKE INSPECTION					
WIDOWS CREEK FOSSIL PLANT					
TENNESSEE VALLEY AUTHORITY					
FOSSIL AND HYDRO ENGINEERING					
DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY	DATE	SCALE
AUTOCAD R14 12/17/90 34 C API09-1					
PLOT FACTOR: 4800 E.TVA					
C.A.D. DRAWING DO NOT ALTER MANUALLY					

ELECTRONICALLY RESTORED DRAWING
 THIS DRAWING HAS BEEN ELECTRONICALLY RESTORED AND SUPERSEDES THE ORIGINAL DRAWING.
 TASK COMPLETED BY: []
 REV/NO: []

NOTES (CONT.):
 4. THE FILTER SAND USED IN THE TOE AND SLOPE DRAINS SHALL BE A CLEAN SILICA SAND AND EXHIBIT THE FOLLOWING GRADATION REQUIREMENTS.

U.S. STANDARD SIEVE SIZE	PERCENT PASSING (BY WEIGHT BASIS)
3/4 INCH	100
3/8 INCH	85 - 100
NO. 4	75 - 95
NO. 8	60 - 85
NO. 16	40 - 65
NO. 20	20 - 55
NO. 40	0 - 25
NO. 60	0 - 15
NO. 80	0 - 5
NO. 100	0 - 2



CONTOURS AND GRADES REPRESENT THRU 2023. AS-DESIGNED CONFIGURATION ONLY. FIRST BENCH DIRT COVER COMPLETED IN 2006.

OUTLET NO.	STATION	TOE DRAIN OUTLET PIPE INV. EL. (FT/NGVD)	DRAIN BASIN INV. EL. (FT/NGVD)	NO. OUTLET PIPES	CONC.	APRON SIZE
1	310+45	617.00	616.00	7	8" L x 16" W	
2	318+50	617.49	616.49	8	8" L x 18" W	
3	118+00	619.08	619.08	4	8" L x 10" W	
4	128+50	621.01	621.01	8	8" L x 18" W	
5	134+00	622.72	621.72	8	8" L x 18" W	
6	141+50	624.42	624.42	8	8" L x 18" W	
7	147+50	625.78	625.78	8	8" L x 18" W	
8	215+50	627.26	627.26	8	8" L x 18" W	
9	221+50	627.37	627.37	7	8" L x 16" W	
10	228+00	625.89	625.89	3	8" L x 8" W	
11	236+00	624.06	624.06	8	8" L x 18" W	
12	244+00	622.23	622.23	8	8" L x 18" W	
13	252+00	620.41	620.41	8	8" L x 18" W	
14	260+00	628.58	628.58	8	8" L x 18" W	
15	165+00	617.00	617.00	1	8" L x 4" W	
	221+70	627.33	627.33	1	8" L x 4" W	
	224+75	626.63	626.63	1	8" L x 4" W	
	227+80	625.93	625.93	1	8" L x 4" W	

NOTE: THE DRAINS INSTALLED IN TOE AND FIRST BENCH AT TIME OF INSPECTION ONLY OUTSIDE TWO PIPES SHOULD BE FLOWING.

OBSERVATIONS OF THE DRAIN OUTLETS 10/8/2008

↑ OUTLET FLOWING

○ ○ ○ ○ ○ ○ ○ ○ THE DRAIN OUTLETS

DIRECTION PHOTO TAKEN IN

F709 INSPECTION NOTES FOR F72009 ASH POND INSPECTION

○ ○ ○ ○ ○ ○ ○ ○ ONLY SLIGHT SEEPAGE FROM OUTLETS

- NOTES:
- THE SEEPAGE COLLECTION DRAIN AND OUTLET PIPE SHALL CONSIST OF EACH DIAMETER SLOTTED AND NON-SLOTTED CORRUGATED HOPE PIPE. THE PIPE AND FITTINGS SHALL MEET PERCENT POLYESTER OR POLYPROPYLENE WITH A MINIMUM FIBER SIZE OF 100 DENIER POLYETHYLENE DRAINAGE TUBING ASHFO SPECIFICATION # 252 CORRUGATED.
 - PREPARATIONS IN THE CORRUGATED HOPE PIPE SHALL CONSIST OF SLOTS CLEANLY CUT AND EVENLY SPACED ALONG 4 LINES AROUND THE PIPE CIRCUMFERENCE AND CENTERED WITHIN THE ADJACENT VALLETS ALONG THE LENGTH OF THE PIPE. PERFORATIONS LOCATED IN PERFORATIONS SHALL SATISFY THE FOLLOWING CRITERIA:
 - SLOT WIDTH (INCHES) # 4.0
 - SLOT WIDTH (INCHES) # 0.125
 - PERFORATED AREA (IN/100) # 4.0
 - THE GEOTEXTILE FILTER SOAKING USED FOR A TYPICAL (96" W) SHALL BE A MACHINE PINCHED FABRIC MANUFACTURED FROM 100 PERCENT POLYESTER OR 100 PERCENT POLYPROPYLENE. THE GEOTEXTILE SHALL BE UNIFORM AND HOMOGENEOUS IN APPEARANCE AND SERVICEABILITY. THE GEOTEXTILE SHALL MEET THE FOLLOWING CRITERIA:

PROPERTY	UNITS	TEST METHOD	CRITERION
MASS PER UNIT AREA	g/2.70'	ASTM D 5951	> 10
GRAB TENSILE STRENGTH	lb	ASTM D 4632	> 245
GRAB TENSILE STRENGTH	lb	ASTM D 4632	> 50
GRAB TENSILE STRENGTH	lb	ASTM D 4632	> 20
PERMEABILITY TO WATER	cm/sec	ASTM D 4491	> 0.2

 - * MACHINE AND TRANSVERSE DIRECTIONS.
 - * UNTESTED STATES STANDARD SIEVE SIZE.

3. THE GEOTEXTILE INDICATED ON THE DRAWINGS SHALL CONSIST OF A NONWoven, WEAVE PINCHED FABRIC MANUFACTURED FROM 100 PERCENT POLYESTER OR 100 PERCENT POLYPROPYLENE. THE GEOTEXTILE SHALL BE UNIFORM AND HOMOGENEOUS IN APPEARANCE AND SERVICEABILITY. THE GEOTEXTILE SHALL MEET THE FOLLOWING CRITERIA:

PROPERTY	UNITS	TEST METHOD	CRITERION
MASS PER UNIT AREA	g/2.70'	ASTM D 5951	> 10
GRAB TENSILE STRENGTH	lb	ASTM D 4632	> 245
GRAB TENSILE STRENGTH	lb	ASTM D 4632	> 50
GRAB TENSILE STRENGTH	lb	ASTM D 4632	> 20
PERMEABILITY TO WATER	cm/sec	ASTM D 4491	> 0.2

* MACHINE AND TRANSVERSE DIRECTIONS.
 * UNTESTED STATES STANDARD SIEVE SIZE.

YARD UNITS 7 & 8

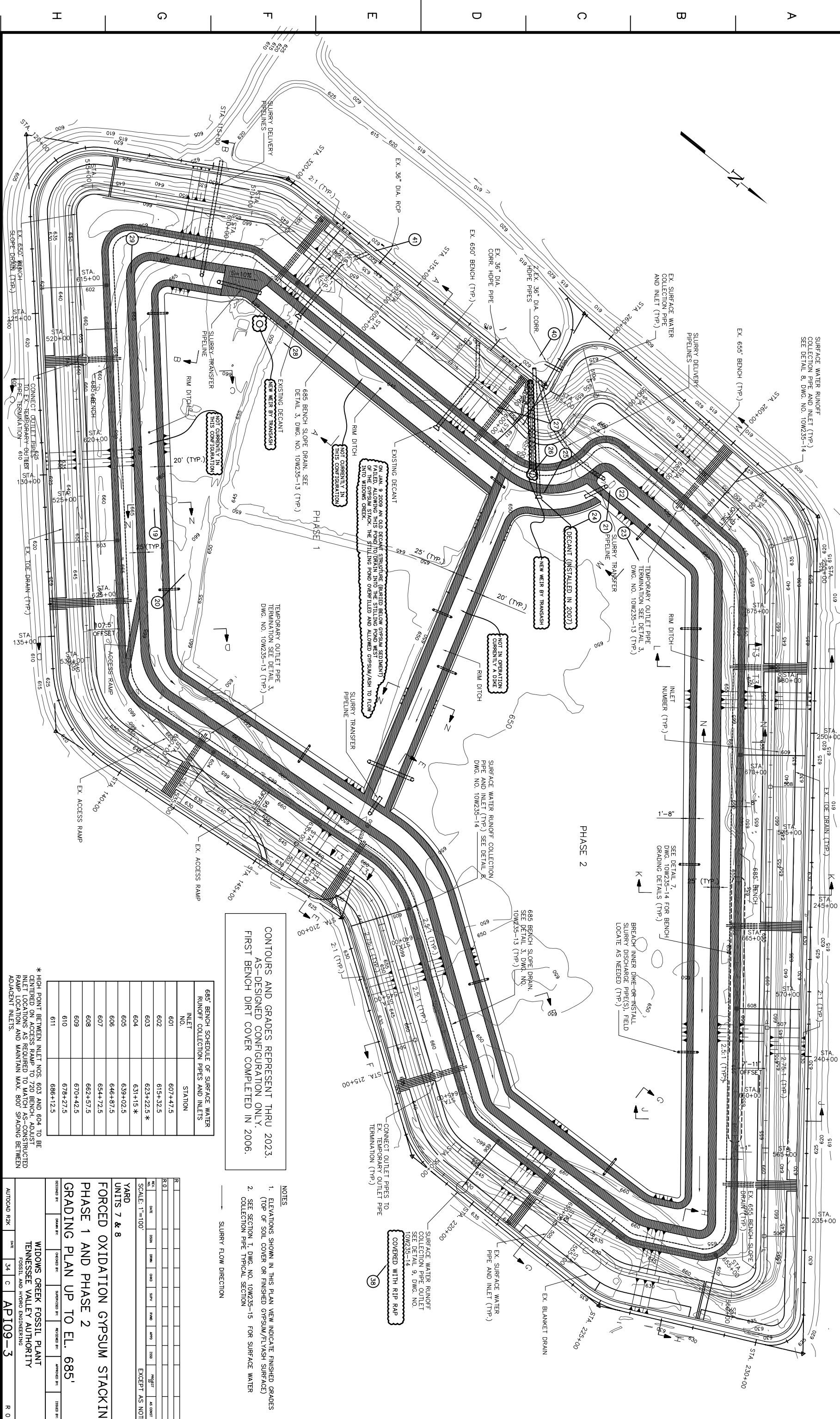
FORCED OXIDATION GYPSUM STACKING PHASE 1 & 2 - TOP DRAIN, 650/655 BENCH DRAIN AND OUTLET PIPES

REV.	DATE	BY	CHKD	DESCRIPTION	APPROVED BY	DATE
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

SCALE: 1"=100'

EXCEPT AS NOTED

WIDOWS CREEK FOSSIL PLANT
 TENNESSEE VALLEY AUTHORITY
 FOSSIL AND HYDRO ENGINEERING



CONTOURS AND GRADES REPRESENT THRU 2023.
AS-DESIGNED CONFIGURATION ONLY.
FIRST BENCH DIRT COVER COMPLETED IN 2006.

685' BENCH SCHEDULE OF SURFACE WATER RUNOFF COLLECTION PIPES AND INLETS	
INLET NO.	STATION
601	607+47.5
602	615+32.5
603	623+22.5*
604	631+15*
605	639+02.5
606	646+87.5
607	654+72.5
608	662+57.5
609	670+42.5
610	678+27.5
611	686+12.5

* HIGH POINT BETWEEN INLET NOS. 603 AND 604 TO BE CENTERED ON ACCESS RAMP TO 20' BENCH. ADJUST RAMP LOCATION AND MAINTAIN MAX. 800' SPACING BETWEEN ADJACENT INLETS.

- NOTES
- ELEVATIONS SHOWN IN THIS PLAN VIEW INDICATE FINISHED GRADES (TOP OF SOIL COVER OR FINISHED GYPSUM/FLYASH SURFACE)
 - SEE SECTION 1, DWG. NO. 10W235-15 FOR SURFACE WATER COLLECTION PIPE TYPICAL SECTION

SLURRY FLOW DIRECTION

YARD UNITS 7 & 8

FORCED OXIDATION GYPSUM STACKING

PHASE 1 AND PHASE 2

GRADING PLAN UP TO EL. 685'

DESIGNED BY	CHECKED BY	APPROVED BY	DATE
DRAWN BY	SCALE	DATE	

WIDOWS CREEK FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

PILOT FACTOR: 120
M_L7VA

C.A.D. DRAWING
DO NOT ALTER MANUALLY

August 1, 2000

Victor Davis, LP 2T-C

WIDOWS CREEK FOSSIL PLANT (WCF) - ANNUAL STABILITY INSPECTION OF
THE WASTE DISPOSAL AREA DIKES

Attached is a report from Ron Powell concerning the inspection of Widows Creek Fossil Plant's waste disposal area dikes. The report includes recommendations for corrective action.

Please make necessary copies and return the originals to Ron for filing with the previous inspection reports.



R. E. Purkey
Manager, Civil Engineering
LP 2G-C

REP:RDP

**TENNESSEE VALLEY AUTHORITY
WIDOWS CREEK FOSSIL PLANT**

*ANNUAL STABILITY INSPECTION OF
WASTE DISPOSAL AREA DIKES*

Prepared By: Ronald D. Powell
Date: August 1, 2000

WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE INSPECTION
2000

INTRODUCTION

The waste disposal areas at Widows Creek Fossil Plant were inspected for dike structural stability on May 2, 2000. This inspection was conducted by Ron Powell of TVA's Fossil Engineering Services and John Albright of TVA's Yard Systems. They were accompanied by Morgan Thomas of the Widows Creek Fossil Plant staff. The previous annual inspection was performed on March 23, 1999.

The results of the annual stability inspection are listed below according to location within the waste disposal area.

ACTIVE ASH POND AREA AND RELATED DIKES

All bottom ash and fly ash continues to be sluiced into the southwest corner of this area. The bottom ash drops out near the outfall of the pipes and is periodically worked with bulldozers. The fly ash flows northeast into the active ash pond, around the deflector dikes, and southeast through a breach in the interior divider dike, and into the inactive scrubber pond adjacent to the active ash pond. Water is discharged from the inactive scrubber pond back into the active ash pond through another breach in the interior divider dike southwest of the previously mentioned breach. Water is then discharged through five standard spillways with skimmers into the stilling pool area. Water is discharged from the stilling pool through another five standard spillways with skimmers into the pumping station pond. From the pumping station pond, water is either discharged into Gunter'sville Reservoir through three overflow pipes or it is pumped primarily to the CCW intake, with a portion going into the wet gypsum system as make up water.

The exterior and interior dike slopes of the active ash pond generally appear to be in good condition with no signs of instability. They have an excellent vegetative cover, however, patches of undesirable trees are present over some areas of these slopes. The previously noted seeps at the toe of the exterior slope of the east dike, both north and south of the bridge over Widows Creek, are still present, but do not appear to have increased in intensity from previous observations.

In accordance with the recommendation of Fossil Engineering, riprap was placed over the surface slip on the exterior dike slope in the southwest corner of this area. The slip was first observed and reported in March, 1997 after a period of heavy rainfall. There were no signs of any recent movement of earth material in this area and the seepage flow does not appear to have changed from previous observations. The tree growth on the dike slope west of the slip area should be removed and the riprap cover extended west to include all potential seepage points.

WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE INSPECTION
2000

The ditch along the toe of the exterior dike slope that drains surface runoff and seepage from the southern and western portions of this area to the containment basin to the north is clogged with vegetative growth and not flowing adequately. This is a long ditch with a relatively flat slope and it will require periodic maintenance to keep it functioning properly. Water in the containment basin is pumped across the dike into the active ash pond.

The bottom of the pumping station pond in the south end of the stilling pond was excavated and covered with riprap in the Fall of 1998 as shown on the design drawings for this area. No water was being discharged through the overflow pipes from the pumping station pond into Guntersville Reservoir at the time of this inspection.

INACTIVE SCRUBBER POND WEST OF WIDOWS CREEK

This area has been incorporated into the active ash pond system by breaching the divider dike between them at two locations and constructing interior deflector dikes to direct the flow of sluice water as described in the previous section of this report. Fly ash is presently being deposited in the northeast portion of this area. One of the floater attachments to the skimmer in the southwest breach in the divider dike has broken loose and needs to be repaired.

The riprap cover on the interior slope of the eastern dike is in good condition and there were no signs of additional erosion in that area. However, vegetative cover is generally sparse on the remainder of the interior dike slopes and some other areas are showing signs of damage due to erosion, particularly in the northwest corner.

The exterior dike slopes appear to be in good condition with no signs of instability. They have a thick vegetative cover, however, some areas have a heavy growth of undesirable trees.

FORCED OXIDATION GYPSUM STACKING AREA EAST OF WIDOWS CREEK

The development of this area is being managed by TVA's Heavy Equipment Division (HED). The gypsum material is sluiced into this area alternately at two locations: (1) The southwest corner of Pond 3, from which it flows north and east around an interior deflector dike, constructed of gypsum material, which extends into the northeast portion of Pond 3. It can be turned into Pond 3 at any point along the deflector dike. (2) The west end of Pond 1, from which it flows east and is discharged into the east end of Pond 2A. Pond 2A can be discharged either into Pond 2B or into Pond 3. The sluice water is discharged from Pond 3 into Pond 2B and from Pond 2B into the Stilling Pool. Water is discharged from the Stilling Pool by gravity through a long pipe and into a channel southeast of the Inactive Scrubber Pond and flows into Guntersville Reservoir.

WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE INSPECTION
2000

The slopes of the gypsum stack in Pond 1 and the northern and western sides of Pond 3 have had an earth cover placed over them and have a good stand of vegetation. The lower slope of the gypsum stack on the west side of Pond 2B has been covered with earth and seeded, however, that area of the stack has been raised to a level that the upper slope needs to be flattened, covered with earth, and seeded. Also, the slope of the gypsum stack along the east side of Pond 3 needs to be flattened, covered with earth and seeded.

The perimeter dikes surrounding the gypsum stacking area appear to be in good condition with no signs of instability. The exterior slopes of these dikes generally have an excellent vegetative cover, however, some areas had small trees growing on the slope that should be removed before they grow any larger. The interior slopes of the Stilling Pool dikes are in good condition and have a good vegetative cover. An area of sediment buildup with vegetative growth has developed at the outlet of the pipe which discharges the perimeter ditches into the Stilling Pool.

INACTIVE ASH POND AREA WITHIN THE RAILROAD LOOP

This disposal site is no longer in use. The area is covered in trees and vegetation. The slopes that were visible appeared to be stable and in good condition.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE INSPECTION
2000**

**OTHER AREAS INSPECTED, ACTIONS ON PREVIOUS RECOMMENDATIONS,
AND RECOMMENDATIONS FOR CORRECTIVE ACTION**

COAL YARD DRAINAGE BASIN

The Coal Yard Drainage Basin is located west of the plant adjacent to the northwest side of the coal yard area. It receives rainfall runoff from the coal pile and yard equipment areas. Both the exterior and interior dike slopes of this area are in good condition with a good vegetative cover. The discharge from this pond is pumped into the active ash pond area.

CHEMICAL TREATMENT PONDS

Both the iron and copper chemical treatment ponds are located within the active ash disposal area in its southwest corner. Effluent from plant chemical cleaning processes is discharged into these ponds and treated before it is pumped into the active ash pond.

Both ponds were excavated below grade and have only interior slopes. All interior slopes of these ponds are covered with riprap and are in good condition.

ACTIONS SINCE LAST INSPECTION

- Plant personnel have continued to make periodic observations of the dikes of the waste disposal areas for surface sloughs, animal burrows, wave erosion damage, new seepage areas, etc.
- Plant personnel have continued to monitor the seepage areas along the bank of Widows Creek for any signs of material movement or changes in seepage flow.

RECOMMENDATIONS

- Plant personnel should continue to make periodic observations of the dikes of the waste disposal areas for surface sloughs, animal burrows, wave erosion damage, new seepage areas, etc. and make repairs as needed and/or notify Fossil Engineering Services.
- Establish a schedule for periodic mowing of the exterior slopes of all dikes to the lower berm at a minimum. This will eliminate many of the small trees that can become a problem if they are allowed to grow larger.
- Continue to monitor the seepage areas along the bank of Widows Creek for any signs of

WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE INSPECTION
2000

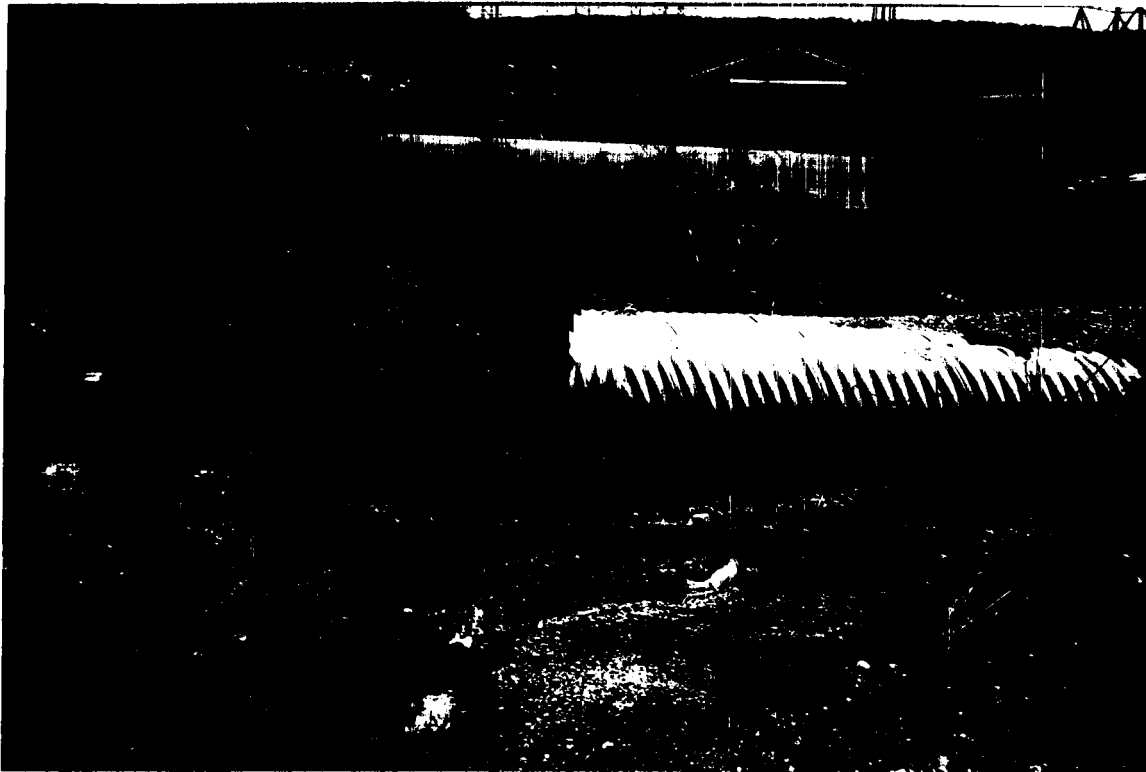
**OTHER AREAS INSPECTED, ACTIONS ON PREVIOUS RECOMMENDATIONS,
AND RECOMMENDATIONS FOR CORRECTIVE ACTION**

material movement or changes in seepage flow. Please notify Fossil Engineering Services immediately if any change is noted.

- Bottom ash should be stacked in accordance with the stacking plan shown on drawings 10W7463-1 and -2 or used to extend the deflector dike into the Inactive Scrubber Pond Area as shown on drawings 10W7420 and 10W7420-1.
- Remove the tree growth west of the slip area on the exterior slope of the southwest dike of the Active Ash Disposal Area and extend the riprap cover approximately 500 feet west to include all potential seepage points.
- Clear the vegetative growth, sediment, and riprap from the redwater ditch along the toe of the exterior slope of the south and west dikes of the Active Ash Disposal Area and regrade it as needed to provide a clear flow channel.
- Construct a compacted clay cover over the ends of the abandoned pipe sleeves for the units 1-6 ash sluice lines under the access road to prevent seepage through them from the redwater ditch.
- Repair the broken floater attachment to the skimmer in the southwest breach in the divider dike between the Active Ash Disposal Area and the Inactive Scrubber Pond Area.
- Remove the area of sediment buildup that has developed at the outlet of the pipe which discharges the perimeter ditches of the Active Gypsum Stacking Area into the Stilling Pool.
- Cover the slopes of the gypsum stack as it is raised and seed all covered areas. At the time of this inspection, the slope along the east dike of Pond 3 and the upper slope along the west dike of Pond 2B needed to be flattened to a 2.5:1 slope, covered with earth, and seeded.



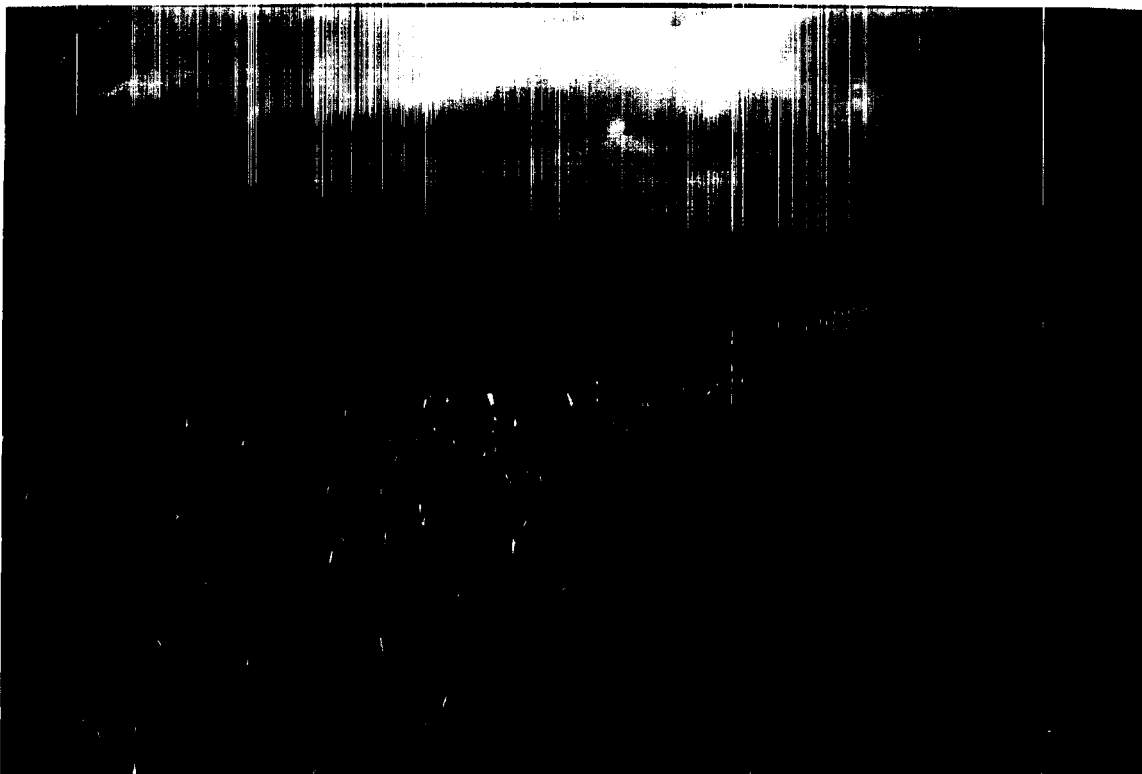
Picture 1. Vicinity of slip on exterior dike slope in southwest corner of active ash pond. Note vegetative growth blocking ditch.



Picture 2. Units 1-6 ash sluice pipes and pipe sleeves beneath access road.



Picture 3. Skimmer in the southwest breach in the divider dike between the Active Ash Disposal Area and the Inactive Scrubber Pond.



Picture 4. East Dike of Active Gypsum Stacking Area. Note steep wall of stacked gypsum.



Picture 5. Sediment buildup at the outlet of the pipe which discharges the perimeter ditches of the Active Gypsum Stacking Area into the Stilling Pool.

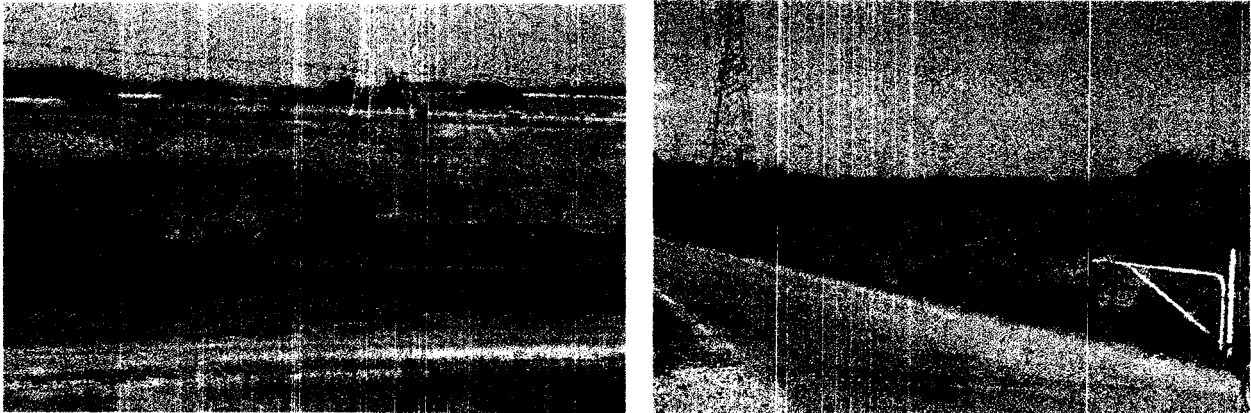
October 25, 2000

Kenny R. Lowery, Mgr., Reg. Yard Ops, MF 1B-M
Horace Wayne Parker, Supv., Plt Prod, WCF 1A-STA

WIDOWS CREEK FOSSIL PLANT (WCF) - WASTE DISPOSAL PONDS - PERIODIC INSPECTION

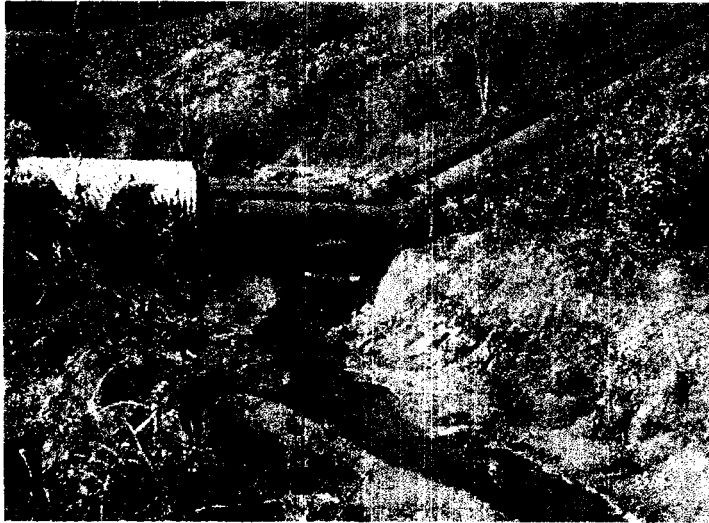
On October 18, I came to WCF at the request of Rodney Grandberry to look at the waste disposal ponds and met with Rodney, Horace Wayne Parker and Morgan Thomas. This memo is being written to transmit some sketches that would be difficult to send by E-mail.

First, Mr. Parker and his crew has done an excellent job mowing, cleaning off the dikes and removing trees. Here are a few shots of the dikes' current condition.



The work has left parts of the dikes without vegetation. These areas should be reseeded and fertilized following the T-1 Specs (attached). This is an excellent time of year to do that. The picture on the left shows an area just above the ditch that has a steep slope. This should be graded to match the slope of the dike. It is probably the result of ditch maintenance.

Here is a picture of the ash lines crossing the drainage ditch to the red water pond. It has been cleaned out and is now operating correctly.



This picture shows the west dike of Scrubber Pond 3.



It shows raw sludge at the top of the dike with severe erosion. In the foreground, sludge can be seen covering the soil and grass that had been growing on the dike. This area should be recovered with soil (or you can try to remove the sludge) and reseeded. The outer slope should be set to 2.5:1 and a mound (berm) of soil placed at the outer corner of the dike to ensure storm water runs into the pond rather than over the outer slope of the dike. The sludge making the outer slopes should always be covered with soil and grassed to prevent erosion. The slope of the sludge at the top of

the dike is too steep. The sludge should be cleaned out of the storm water ditch and it should be contoured to drain to the stilling pool.

Rodney Grandberry had some concern about the bottom ash building up to the bottom of the sluice pipes. When we inspected this part of the pond, the ash was right at the bottom of the U1-6 pipes, but U7-8 had about 3 feet of clearance. In this case, the operator had not finished cleaning out bottom ash from the U7-8 trench, so he had not gotten to the U1-6 side. Still the ash has built up in the discharge end of the pond and there is little freeboard along the southwest corner of the dike. There is a project to engineer a dike raising in FY02 and raise the dike in FY03. To ensure we don't have a storm event that overtops the dike in this area Attachments 2 and 3 give details for you to build a berm out of bottom ash on the inside of the dike. This has been cleared with Civil Engineering. It will become the base of the new dike when it is raised and Civil Engineering will likely specify a bottom ash base like this all around the pond for the new dike.

Attachment 3 and 4 show the preferred location and a detail of how to cut a breach in the old scrubber pond deflector dike. This breach will promote circulation in the back of the old scrubber pond and help the pond fill more evenly. This should be done as soon as practical, before the ash builds up too high to push into the area behind the old deflector dike.

If you have additional questions, please call me at (423) 751-3981, or Victor Davis at (423) 751-6846.



John G. Albright
System Engineer, Yard Systems

attachments

cc (w/attachments):

V. W. Davis, LP 2T-C

Rodney Grandberry, WCF 1A-STA

R. E. Purkey, LP 2G-C

Morgan Thomas, WCF 1A-STA

FOSSIL POWER GROUP	LOCATION ALL FOSSIL PLANTS	FPG - T-1		
	TITLE - GENERAL CONSTRUCTION	REV.		
	SPECIFICATION No. T-1	ISSUE		
	SITE DEVELOPMENT, HIGHWAY, R/R, AND	DATE		
	BRIDGE CONSTRUCTION	PAGE	1	OF	5

VEGETATION SPECIFICATIONS

NATIVE GRASSES - SEEDING AND MULCHING

(SPECIAL FOR WASTE AREAS)

SECTION 582 - Mulching

Refer to FP-96 Section 625. FP-96 Standard Specification for Construction of Roads and Bridges on Federal Highway Projects (US DOT - FHWA)

SECTION 583 - Native Grasses Seeding

583.1 - Description

This specification consists of furnishing and placing native warm season grass seed on waste disposal areas when specified by the plans or the Engineer. The use of these grasses for landfill cover crops is being encouraged by the Tennessee Department of Environment and Conservation Division of Solid Waste Management.

583.2 - Materials

1. Seeds

Seeds shall meet the requirements of applicable seed laws and shall be tested in accordance with the most current edition of the U.S. Department of Agriculture Handbook No. 30, Testing Agricultural and Vegetable Seed. Seeds shall be from the last preceding crop and comply with the requirements outlined below for purity and germination. Each variety of seed shall be furnished in separate, strong bags with each bag being fully tagged or labeled to show the variety, weight, purity, germination, and test data prescribed by law. All test

FOSSIL POWER GROUP	LOCATION ALL FOSSIL PLANTS	FPG - T-1		
	TITLE - GENERAL CONSTRUCTION SPECIFICATION No. T-1	REV.		
	SITE DEVELOPMENT, HIGHWAY, R/R, AND BRIDGE CONSTRUCTION	ISSUE		
		DATE		
		PAGE	2	OF	5

results shall be fully certified by the vendor or by a recognized seed testing agency. TVA reserves the right to require that samples be furnished, and to inspect and test the seeds after delivery. Seeds found not to comply with specification requirements shall be subject to rejection.

When mixing or forming seed mixtures, the seeds shall be carefully and uniformly mixed. Seeds shall not be mixed until each variety of seed to be used in the mix has been inspected and/or tested separately and approved.

583.2 - Materials (Continued)

<u>Seed Varieties</u>	<u>Purity, Minimum %</u>	<u>Germination Minimum %</u>
Sideoasts Gramma (<i>Bouteloua curtipendula</i>)	95	85
Little Bluestem (<i>Schizachyrium scoparium</i>)	95	85
Sand Lovegrass (<i>Eragrostis trichodes</i>)	95	85
Annual Rye (<i>loium multiflorum</i>)	90	90

Seeding materials shall be free from seeds or bulbets of Wild Onion (*Allium vineale*), Canada Thistle (*Cirsium arvense*), and Johnson Grass (*Sorghum halepense*).

Continued next page.....

Attachment 1

FOSSIL POWER GROUP	LOCATION ALL FOSSIL PLANTS	FPG - T-1		
	TITLE - GENERAL CONSTRUCTION SPECIFICATION No. T-1 SITE DEVELOPMENT, HIGHWAY, R/R, AND BRIDGE CONSTRUCTION	REV.		
		ISSUE		
		DATE		
	PAGE		3	OF	5

Seed species shall not contain more than six seeds per ounce of the seed of any of the following noxious weeds or the seeds of any other weed specifically listed as noxious:

Bindweed (<i>Convolvulus arvensis</i>)	Oxeyedaisy (<i>Chrysanthemum leucanthemum</i>)
Buckthorn (<i>Plantago lanceolata</i>)	Quackgrass (<i>Agropyron repens</i>)
Corncockle (<i>Agrostemmo githago</i>)	Sorrel (<i>Rumex acetosella</i>)
Dodder (<i>Cuscuta species</i>)	

Seed species shall not contain an excess of 2 percent by weight of weed seeds, noxious or otherwise.

2. Seed or seed mixtures, rates, and seasons

Seeding mixtures, rates, and seasons shall be those specified herein. The types to be used for each area or project will be specified by the drawing or by memorandum. Mixtures or rates of application other than those specified shall be used only when specified by the plans or the Engineer. Seeding shall be planted during the season and between the dates specified. Note that the pound rates are PLS (pure live seed).

Type 1: Winter seeding ((Plant between November 1 and December 31)

(1) Sideoats Grama	4 pounds per acre
(2) Little Bluestem	5 pounds per acre
(3) Sand Lovegrass	1 pounds per acre
(4) Annual Rye	<u>60 pounds per acre</u>
	70 pounds per acre

Type 2: Spring seeding (Plant between April 15 and July 1).

Mixture:

(1) Sideoats Grama	4 pounds per acre
(2) Little Bluestem	5 pounds per acre
(3) Sand Lovegrass	<u>1 pounds per acre</u>
	10 pounds per acres

Note: All slopes 3:1 or greater shall be seeded with the winter mixture

<i>FOSSIL POWER GROUP</i>	LOCATION	FPG - T-1			
	ALL FOSSIL PLANTS				
	TITLE - GENERAL CONSTRUCTION	REV.			
	SPECIFICATION No. T-1	ISSUE			
	SITE DEVELOPMENT, HIGHWAY, R/R, AND BRIDGE CONSTRUCTION	DATE			
		PAGE	4	OF	5

e. Temporary Cover

Type 3: Temporary winter seeding (Plant between October 15 and March 15).

Annual Ryegrass

80 pounds per acre

583.3- Soil Chemistry Requirements

Soil pH range: 5.0 - 7.8 S.U.

Soil Fertility: Low-Medium for phosphorous and potassium.

583.4 -- Soil Preparation

Areas to be seeded shall have approved cross sections and grades. Objects such as large roots, stones, stumps, coarse vegetation, debris, or any other items that might impede mechanical mowing shall be removed and disposed of satisfactorily.

Seedbeds shall be plowed, disked, harrowed, scarified, or cultivated to the approved depth. In areas where it is practical, this work shall be done with farm-type equipment. On steep slopes, preparation of seedbeds shall be done with the tools and methods specified by the Engineer. It is strongly recommended that scarifying and preparation on cut and fill slopes be accomplished with tools or equipment specially designed for this purpose. Small furrows or grooves formed in the slopes shall be horizontal or as nearly horizontal as practical. The work shall be performed only when the ground is in a workable and tillable condition as determined by good farming practices.

583.5 -- Special Hydroseeding Equipment

Equipment to be used for the hydraulic application of planting materials shall be a Finn Hydro-Seeder, Bowie Hydro Mulcher, Toro Environmental Control Unit, or an approved equal. The equipment shall have mixing tanks with built-in agitators having operating capacities sufficient to agitate, suspend, and homogeneously mix slurries of water and planting materials. The slurry distribution lines shall be large enough to prevent clogging or stoppage. Discharge lines shall be equipped with sets of different sized hydraulic spray nozzles capable of providing for even distribution of varying slurry mixtures on areas to be seeded.

<i>FOSSIL POWER GROUP</i>	LOCATION ALL FOSSIL PLANTS	FPG - T-1			
	TITLE - GENERAL CONSTRUCTION SPECIFICATION No. T-1 SITE DEVELOPMENT, HIGHWAY, R/R, AND BRIDGE CONSTRUCTION	REV.			
		ISSUE			
		DATE			
		PAGE	5	OF	5

583.6 -- Seeding Methods

Seeds shall be sown with approved hydroseeding equipment. Rates specified in Section 583.2 shall be maintained in a manner that will guarantee uniform coverage. Seeding operations shall not be performed when drought, high winds, and excessive moisture or other factors may defer satisfactory results. The carrier mix shall be 0-13-13. The area shall be cultipacked immediately after seeding.

583.7 -- Maintenance

Seeded areas shall be maintained until a satisfactory cover of plant material is secured, unless stipulated otherwise. All areas shall be preserved, repaired, and protected as specified for this purpose. Areas having poor stands of plant material shall be seeded again and fertilized at the proper rates.

Watering shall be accomplished during the maintenance period to the extent necessary.

583.8 -- Method of Measurement

Seeded areas will be measured in square yard units and include the seeded areas along slopes.



580.2 -- Materials (Continued)

e. Temporary Cover

Type 9: Temporary winter seeding (Plant between October 15 and March 15).

Annual Ryegrass	80 pounds per acre
White Clover	<u>10 pounds per acre</u>
Total mixture	90 pounds per acre

Type 10: Temporary summer seeding (Plant between May 1 and August 15).

Mixture:

(1) Korean Lespedeza (scarified)	20 pounds per acre
Foxtail Millet	<u>20 pounds per acre</u>
Total mixture	40 pounds per acre
(2) Red Clover	20 pounds per acre
Weeping Lovegrass	<u>10 pounds per acre</u>
Total mixture	30 pounds per acre

3. Fertilizer

Fertilizers shall be those readily available commercially. The application of fertilizer shall be at a rate of 200 pounds Ureaform (38-0-0) per acre with either 400 pounds of 15-15-15 per acre or 600 pounds of 6-12-12, unless specified otherwise by the drawings or memorandum.

Ammonium nitrate (NH₄NO₃) may be used for supplemental fertilization when specified by the Engineer.

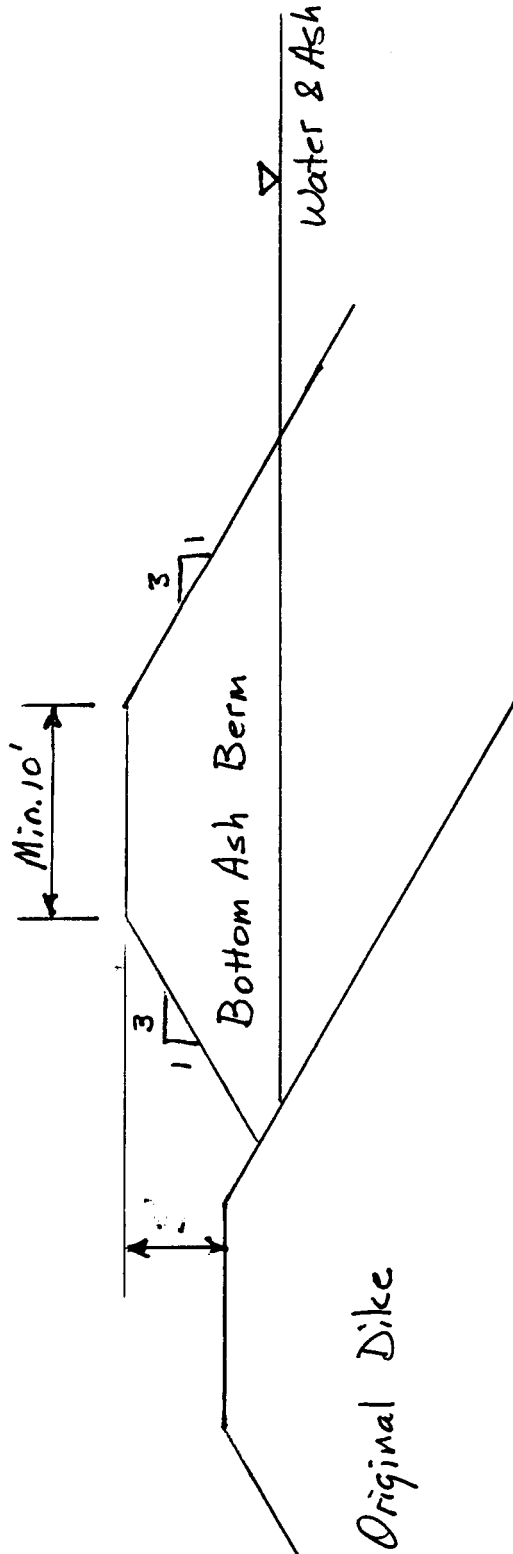
4. Agricultural Limestone

Limestone shall contain no less than 85 percent calcium carbonate by weight. It shall be crushed so that at least 85 percent will pass a No. 10 sieve. The application of limestone shall be at the rate of 2 tons per acre unless specified otherwise by the drawings or memorandum. Hydrated lime may be substituted at a rate of 1 ton per acre.

580.3 -- Topsoil

All lawn areas to be seeded shall have a 2-inch minimum depth of topsoil immediately below finish grade. Topsoil requirements for other areas, if any, will be determined by field inspection and shall comply with Section 581.3.

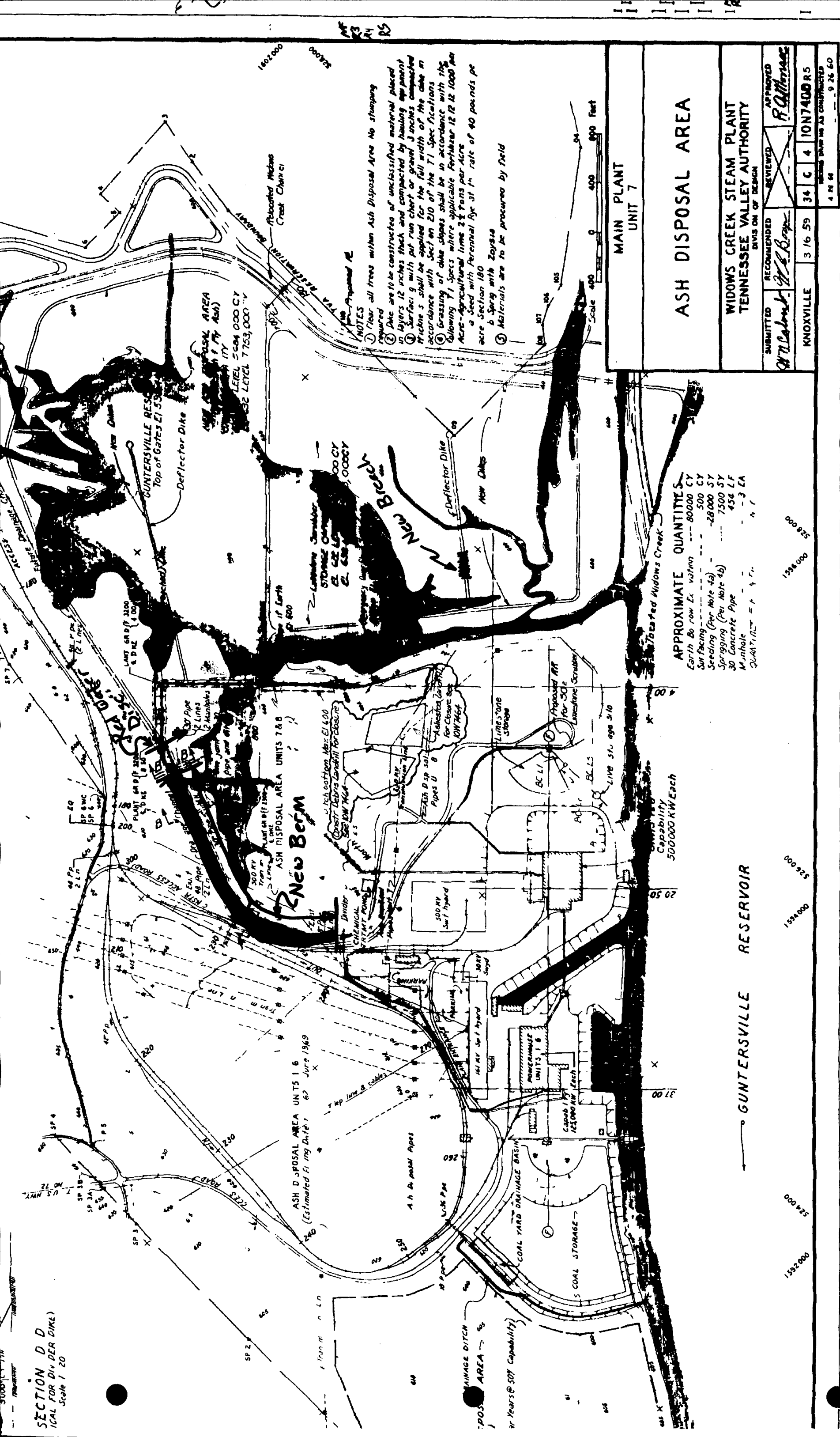
VA 11030 (WM-7-75)



Estimated length = 2750'

Estimated Volume = 17,100 yds³

SECTION D D
 TYPICAL FOR DIVIDER DIKE
 Scale 1/20



- NOTES
1. Clear all trees within Ash Disposal Area No stumping required
 2. Dike are to be constructed of unclassified material placed in layers 12 inches thick and compacted by hauling equipment
 3. Surface 9 with pit run chert or gravel 3 inches compacted
 4. Friction shall be applied for the full width of the dike in accordance with Section 210 of the T1 Specifications
 5. Grassing of dike slopes shall be in accordance with the following T1 Specs where applicable: Fertilizer 12 12 12 1000 per Acre - Agricultural lime 2 1/2 tons per Acre a. Seed with Perennial Ryegrass at 1/4 rate of 40 pounds per acre Section 180 b. Sprig with Zoysia
 6. Materials are to be procured by field

MAIN PLANT
 UNIT 7

ASH DISPOSAL AREA

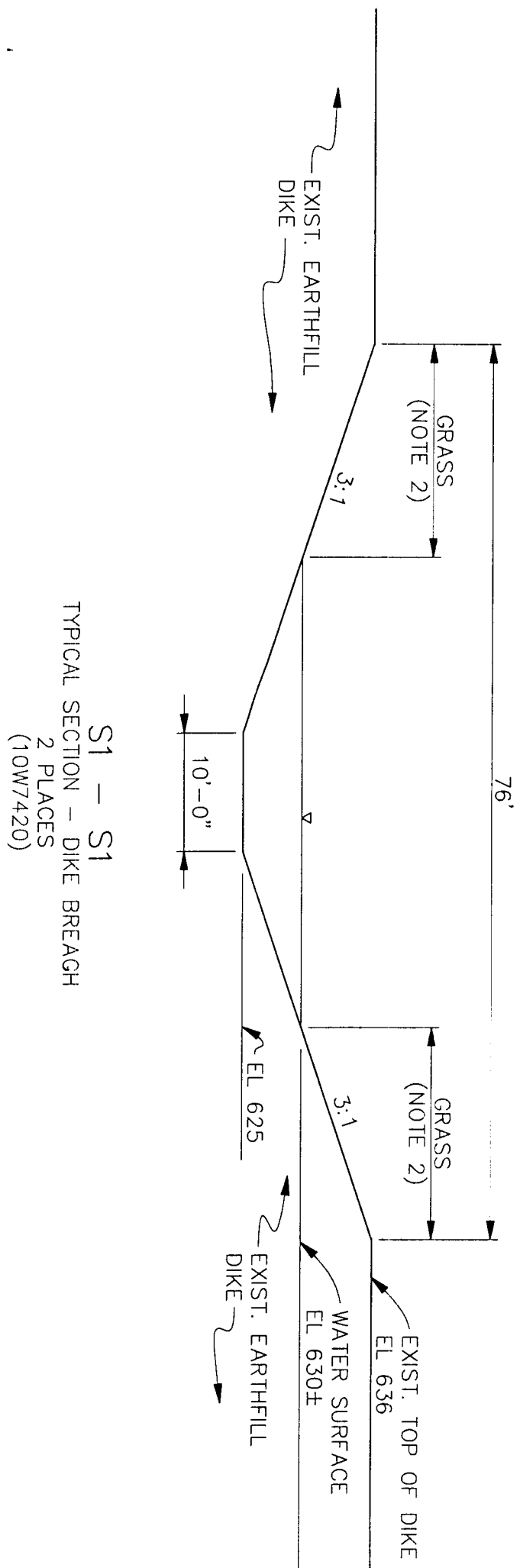
WIDOWS CREEK STEAM PLANT
 TENNESSEE VALLEY AUTHORITY

SUBMITTED	RECOMMENDED	REVIEWED	APPROVED
<i>W. C. ...</i>	<i>W. C. ...</i>	<i>W. C. ...</i>	<i>F. ...</i>
DIVISION OF DESIGN			
KNOXVILLE	3/6/59	34 C 4	10N7400 RS
ISSUES DRAWING AS CONSTRUCTED 4 28 64			

APPROXIMATE QUANTITIES

Earth Borrow Ex. volume	80000 CY
Surfacing	500 CY
Seeding (Per Note 4a)	28000 SY
Sprigging (Per Note 4b)	7500 SY
30 Concrete Pipe	454 LF
Manhole	3 EA
QUANTITY	N/A

GUNTERVILLE RESERVOIR



S1 - S1
 TYPICAL SECTION - DIKE BREACH
 2 PLACES
 (10W7420)

March 8, 2001

Randall E. Johnson, LP 5H-C

WIDOWS CREEK FOSSIL PLANT (WCF) - ANNUAL DIKE STABILITY INSPECTION
OF THE WASTE DISPOSAL AREAS

Attached is a report from Ron Powell concerning the inspection of Widows Creek Fossil Plant's waste disposal area dikes. The report includes recommendations for corrective action.

Please make necessary copies, forward one copy to HED, and return the originals to Ron Powell, LP 2G-C, for filing with the previous inspection reports.



R. E. Purkey
Manager, Civil Engineering
LP 2G-C

REP:RDP

**TENNESSEE VALLEY AUTHORITY
WIDOWS CREEK FOSSIL PLANT**

*ANNUAL STABILITY INSPECTION OF
WASTE DISPOSAL AREA DIKES*

Prepared By: Ronald D. Powell
Date: March 8, 2001

**WIDOWS CREEK FOSSIL PLANT
NPDES PERMIT NO. AL0003875
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2001**

INTRODUCTION

The waste disposal areas at Widows Creek Fossil Plant were inspected for dike structural stability on February 20, 2001. This inspection was conducted by Ron Powell of TVA's Fossil Engineering Services and John Albright of TVA's Yard Systems. They were accompanied by Morgan Thomas of the Widows Creek Fossil Plant staff. The previous annual inspection was performed on May 2, 2000.

The results of the annual dike stability inspection are listed below according to location.

ACTIVE ASH DISPOSAL AREA

All bottom ash and fly ash continues to be sluiced into the southwest corner of this area. The bottom ash drops out near the outfall of the pipes and is periodically worked with bulldozers. The fly ash flows northeast into the active ash pond, around the deflector dikes, and southeast through a breach in the interior divider dike, and into the inactive scrubber pond adjacent to the active ash pond. Water is discharged from the inactive scrubber pond back into the active ash pond through another breach in the interior divider dike southwest of the previously mentioned breach. Water is then discharged through five standard spillways with skimmers into the stilling pond. Water is discharged from the stilling pond through another five standard spillways with skimmers into the pumping station pond. From the pumping station pond, water is either discharged into Guntersville Reservoir through three overflow pipes or it is pumped primarily to the CCW intake, with a portion going into the wet gypsum system as make up water.

The pumps were not operating at the time of this inspection and water was discharging through the three overflow pipes into Guntersville Reservoir. When the system is operating under this condition, the water levels in the stilling pool and the pumping station pond are higher than when the pumps are operating due to the inlet elevation of the overflow pipes. Both of these ponds had only about two feet of freeboard remaining. The skimmers on the standard spillway standpipes, discharging from the stilling pool to the pumping station pond, were completely submerged. The floating skimmer just north of these standard spillways has broken loose and needs to be repaired. Floating ash was observed around the standard spillways.

The five standard spillways with skimmers discharging from the active ash pond to the stilling pond appeared to be in good condition and operating properly. The long floating skimmer north of these spillways had some of the floater attachments broken loose on the western end and needs to be repaired.

The exterior and interior dike slopes of the active ash pond generally appear to be in good condition with no signs of instability. They have an excellent vegetative cover, however, patches of undesirable trees are present over some areas of these slopes. Animal burrows were observed in the interior dike slope just above the water level in some areas along the northwestern dike of this area. These burrows could cause surface sluffs in the dike slope if not repaired. The previously noted seeps at the toe of the exterior slope of the east dike, both north

**WIDOWS CREEK FOSSIL PLANT
NPDES PERMIT NO. AL0003875
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2001**

and south of the bridge over Widows Creek, could not be observed during this inspection because of the high water level in Widows creek.

In accordance with the recommendation of Fossil Engineering, the heavy tree growth on the exterior slopes of both the south and west dikes of this area was removed. Also, the ditch along the exterior toe of these dikes, that drains surface runoff and seepage to the containment basin, was cleared. This is a long ditch with a relatively flat slope and it will require periodic maintenance to keep it functioning properly. Water in the containment basin is pumped across the dike into the active ash pond. When the ditch was cleared, a compacted clay cover was constructed over the ends of the abandoned pipe sleeves for the units 1-6 ash sluice lines, under the access road, to prevent seepage through them from the ditch. As a result, the area identified as Seep 2C has dried up and should no longer be considered a seepage point.

The previously noted surface slip on the exterior dike slope in the southwest corner of this area, and the seepage flow from this vicinity, does not appear to have changed from previous observations. Riprap was placed in this area after the slip occurred in March, 1997, however, the western portion of the slip face remains very steep. There were no signs of any recent movement of earth material in this area.

INACTIVE SCRUBBER POND AREA WEST OF WIDOWS CREEK

This area has been incorporated into the active ash pond system by breaching the divider dike between them at two locations and constructing interior deflector dikes of bottom ash to direct the flow of sluice water as described in the previous section of this report. Fly ash is presently being deposited in the east portion of this area.

It was observed that a small amount of gypsum material is being deposited in the southwest corner of this area due to some of the cutoff valves at the end of the sluice pipes to this area leaking. All of the cutoff valves for these sluice pipes should be inspected and repaired or replaced as needed.

The riprap cover on the interior slope of the eastern dike is in good condition and there were no signs of additional erosion in that area. However, vegetative cover is generally sparse on the remainder of the interior dike slopes and some other areas are showing signs of damage due to erosion, particularly in the northwest corner and along the divider dike.

The exterior dike slopes appear to be in good condition with no signs of instability. They have a thick vegetative cover, however, some areas of the east dike have patches of undesirable trees.

FORCED OXIDATION GYPSUM STACKING AREA EAST OF WIDOWS CREEK

The development of this area is being managed by TVA's Heavy Equipment Division (HED). The gypsum material is sluiced into this area alternately at two locations: (1) The southwest corner of Pond 3, from which it flows north and east around an interior deflector dike, constructed of gypsum material, which extends into the northeast portion of Pond 3. It can be turned into

**WIDOWS CREEK FOSSIL PLANT
NPDES PERMIT NO. AL0003875
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2001**

Pond 3 at any point along the deflector dike. (2) The west end of Pond 1, from which it flows east and is discharged into the east end of Pond 2A. Pond 2A can be discharged either into Pond 2B or into Pond 3. The sluice water is discharged from Pond 3 into Pond 2B and from the northwest corner of Pond 2B into the perimeter ditch, which discharges into the northeast corner of the Stilling Pool. Water is discharged from the Stilling Pool by gravity through a long pipe and into a channel south of the Inactive Scrubber Pond and flows into Gunter'sville Reservoir. Since the last annual inspection, an additional pipe discharging from the southwest corner of Pond 2B into the perimeter ditch has been constructed. In order to discharge this pipe into the Stilling Pool, the perimeter ditch was excavated down to the top of the abandoned concrete pipe, which discharged the original Pond 2 area into the Stilling Pool, and broke through its top.

The slopes of the gypsum stack in Pond 1, the lower slope on the west side of Pond 2B, and the lower slopes of the northern and western sides of Pond 3 have been covered with earth and seeded, and have a good cover of vegetation. However, in some areas, gypsum material is being eroded from the uncovered stack slopes above onto the previously covered slopes below. At the time of this inspection, all of the east slope and the upper slopes of the northern and western sides of Pond 3, and the upper slope of the west side of Pond 2B needed to be flattened to a 2.5:1 slope, covered with earth, and seeded.

The perimeter dikes surrounding the gypsum stacking area appear to be in good condition with no signs of instability. The exterior slopes of these dikes generally have an excellent vegetative cover, however, some areas had small trees growing on the slope that should be removed before they grow any larger. The interior slopes of the Stilling Pool dikes are in good condition and have a good vegetative cover.

INACTIVE ASH POND AREA WITHIN THE RAILROAD LOOP

This disposal site is no longer in use. The area is covered in trees and vegetation.

COAL YARD DRAINAGE BASIN

The Coal Yard Drainage Basin is located west of the plant adjacent to the northwest side of the coal yard area. It receives rainfall runoff from the coal pile and yard equipment areas. Both the exterior and interior dike slopes of this area are in good condition with a good vegetative cover. The discharge from this pond is pumped into the active ash pond area.

CHEMICAL TREATMENT PONDS

Both the iron and copper chemical treatment ponds are located within the active ash disposal area in its southwest corner. Effluent from plant chemical cleaning processes is discharged into these ponds and treated before it is pumped into the active ash pond.

Both ponds were excavated below grade and have only interior slopes. All interior slopes of these ponds are covered with riprap and are in good condition.

**WIDOWS CREEK FOSSIL PLANT
NPDES PERMIT NO. AL0003875
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2001**

ACTIONS SINCE LAST INSPECTION

- Plant personnel have continued to make periodic observations of the dikes of the waste disposal areas for surface sloughs, wave erosion damage, new seepage areas, etc.
- Plant personnel have continued to monitor the seepage areas along the bank of Widows Creek for any signs of material movement or changes in seepage flow.
- Plant Personnel have removed the heavy tree growth on the exterior slopes of both the south and west dikes of the Active Ash Disposal Area
- Plant personnel have cleared the ditch along the toe of the exterior slope of the south and west dikes of the Active Ash Disposal Area and regraded it to provide a clear channel to the containment basin.
- Plant personnel have constructed a compacted clay cover over the ends of the abandoned pipe sleeves for the units 1-6 ash sluice lines under the access road to prevent seepage through them from the redwater ditch.
- Plant personnel have repaired the broken floater attachment to the skimmer in the southwest breach in the divider dike between the Active Ash Disposal Area and the Inactive Scrubber Pond Area.

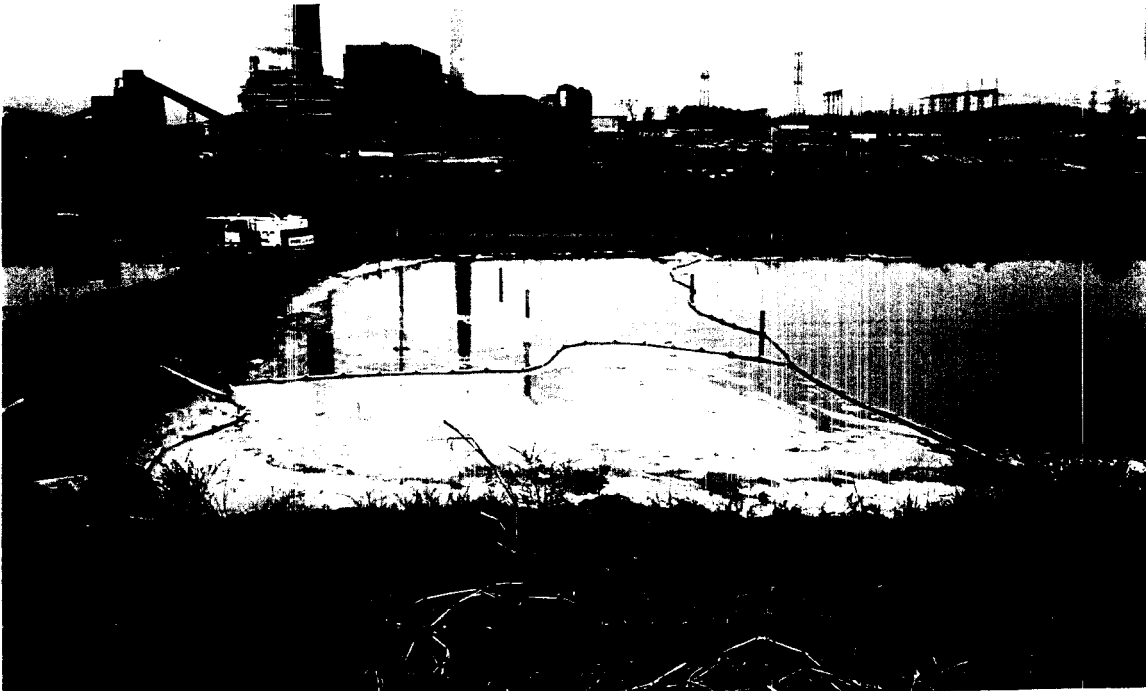
RECOMMENDATIONS

- Plant personnel should continue to make periodic observations of the dikes of the waste disposal areas for surface sloughs, wave erosion damage, new seepage areas, etc. and make repairs as needed and/or notify Fossil Engineering Services.
- Establish a schedule for periodic mowing of the exterior slopes of all dikes to the lower berm at a minimum. This will eliminate many of the small trees that can become a problem if they are allowed to grow larger.
- Continue to monitor the seepage areas along the bank of Widows Creek for any signs of material movement or changes in seepage flow. Please notify Fossil Engineering Services immediately if any change is noted.
- Bottom ash should be stacked in accordance with the stacking plan shown on drawings 10W7463-1 and -2 or used to extend the deflector dike into the Inactive Scrubber Pond Area as shown on drawings 10W7420 and 10W7420-1.
- Repair the broken floater attachments to the western end of the floating skimmer in the Active Ash Disposal Area.
- Repair the floating skimmer in the Stilling Pool Area.

**WIDOWS CREEK FOSSIL PLANT
NPDES PERMIT NO. AL0003875
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2001**

- Remove floating ash from the Active Ash Disposal Area and the Stilling Pool Area.
- Extend the riprap cover placed over the surface slip on the exterior dike slope in the southwest corner of the Active Ash Disposal Area approximately 200 feet west to cover the remaining steep area in dike slope.
- Inspect and repair or replace the cutoff valves at the end of the gypsum sluice pipes to the Inactive Scrubber Pond Area West of Widows Creek.
- Remove the area of sediment buildup that has developed at the outlets of the pipes which discharge the perimeter ditches of the Active Gypsum Stacking Area into the Stilling Pool.
- Remove the additional pipe discharging from the southwest corner of Pond 2B into the perimeter ditch of the Active Gypsum Stacking Area and repair the abandoned concrete pipe, which discharged the original Pond 2 area into the Stilling Pool. Construct a new spillway and pipe which discharges from Pond 3 to the perimeter ditch at the north end of the Stilling Pool. The location of the new spillway and pipe should be coordinated with Air, Gas, and Water Systems personnel.
- Flatten and cover the exterior slopes of the gypsum stack as it is raised and seed all covered areas. At the time of this inspection, all of the east slope and the upper slopes of the northern and western sides of Pond 3, and the upper slope of the west side of Pond 2B, for a total length of approximately 6,500 feet, needed to be flattened to a 2.5:1 slope, covered with earth, and seeded. As the gypsum stack is raised, the tops of the dikes must always be maintained sloped to the inside with an earth berm along their exterior edge to prevent erosion of the gypsum material onto the previously covered slopes.
- Pond 2B and Pond 3 of the Active Gypsum Stacking Area have been raised above the elevation at which underdrain systems should have been placed. Construct underdrain systems in these areas as closely as possible in accordance with drawings 10E7416-1, 10E7416-2, and 10W7416-3. If underdrain systems are not placed at these locations, the factors of safety for the stack slopes developed by Ardaman & Associates, Inc., which are the design basis for the stack configuration, will not be applicable.

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2001



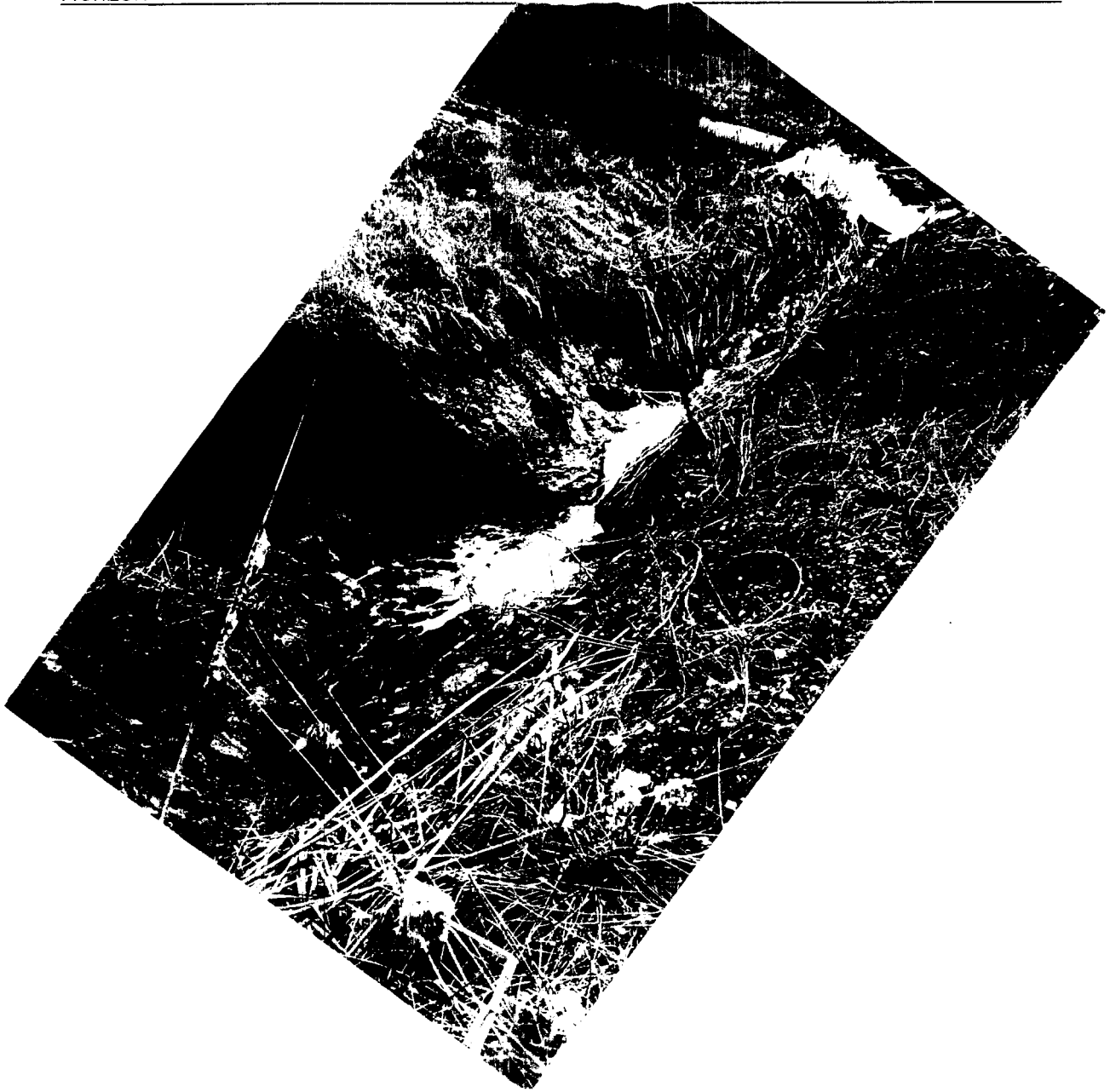
Picture 1. Active Ash Disposal Area - South end of Stilling Pond. Note high water level, floating ash, and unsecured floating skimmer.



Picture 2. Active Ash Disposal Area - Area of surface slip on exterior slope of south dike. Note steep slope of slip surface face west of riprap.

WIDOWS CREEK FOSSIL PLANT
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2001

Horizon



Picture 3. Active Gypsum Stacking Area - Outlet of new discharge pipe in Pond 2B. Note water flowing into hole in top of abandoned concrete pipe.

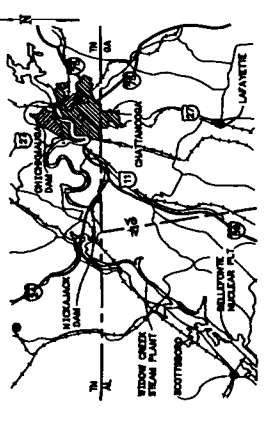
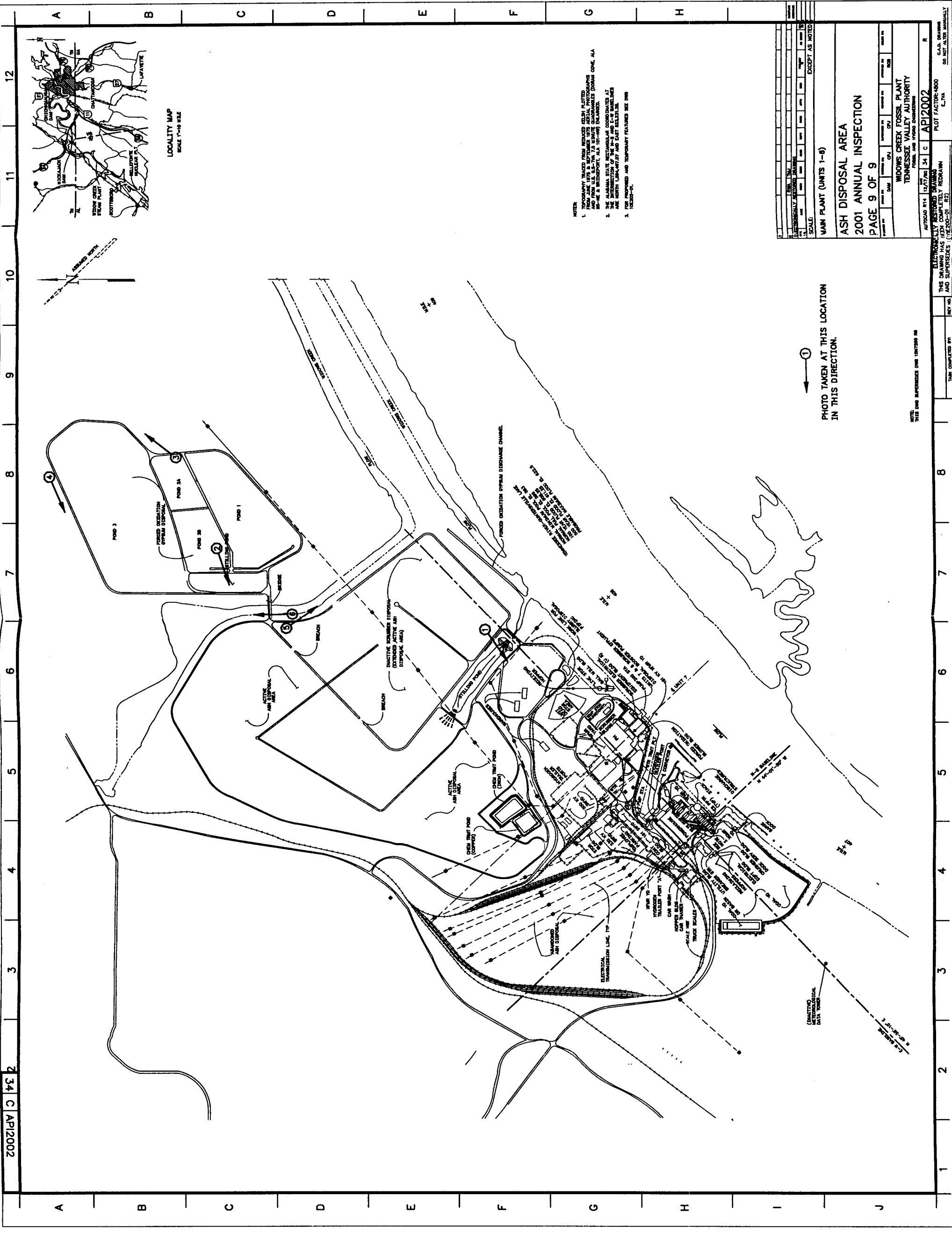
WIDOWS CREEK FOSSIL PLANT
NPDES PERMIT NO. AL0003875
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2001



Picture 4. Active Gypsum Stacking Area - Looking north along east dike. Note steep exterior slope of gypsum stack.



Picture 5. Active Gypsum Stacking Area - Looking west along north dike. Note erosion of gypsum material into covered slope and perimeter ditch from uncovered slope above.



LOCALITY MAP
SCALE 1"=10 MILES

- NOTES:
1. PHOTOGRAPHS TAKEN FROM HELICOPTER FLIGHTS FROM JUNE 1978 TO SEPTEMBER 1979. AERIAL PHOTOGRAPHS AND FROM U.S. G.S. 7.5 INCH QUADRANGULAR MAP OF 1960-61, 7.5 INCH QUADRANGULAR MAP OF 1968-69, AND 15 MINUTE QUADRANGULAR MAP OF 1968-69. THE PHOTOGRAPHS WERE OBTAINED FROM THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AT THE INTERSECTION OF THE 84-W AND E-W MERIDIAN AND THE NORTH 100-W-07-27 AND EAST BOUNDARIES.
 2. FOR PROPOSED AND TEMPORARY FEATURES SEE DWG 102500-01.

DATE	12/27/80	SCALE	AS NOTED
BY	CJL	PROJECT NO.	AP/2002
CHECKED BY			
APPROVED BY			
<p>WIDDOWS CREEK FOSSIL PLANT TENNESSEE VALLEY AUTHORITY FOSSIL AND HYDRO DIVISIONS</p>			
<p>PLANT FACTOR-4000 C.V.N. DO NOT ALTER MANUALLY</p>			

PHOTO TAKEN AT THIS LOCATION
IN THIS DIRECTION.



March 29, 2002

Douglas H. Finke, WCF 1A-STA

WIDOWS CREEK FOSSIL PLANT (WCF) - STABILITY INSPECTION OF THE WASTE DISPOSAL AREAS

Attached is a report from Ron Powell concerning the latest dike stability inspection of CUF ash disposal areas. The inspection was performed on December 4, 2001.

The report includes recommendations for corrective work. I concur with those recommendations.

If you have questions, please contact Ron Purkey at Chattanooga extension 4820, or Ron Powell at Chattanooga extension 8912.

J. G. Adair FOR
James G. Adair, Manager
Engineering Design Services
LP 2G-C

REP:RDP:LMV

Attachment

cc (w/Attachment):

M. A. Cones, Dam Safety Files, LP 1H-C
R. E. Johnson, LP 2L-C
K. R. Lowery, MF 1B-M
G. R. MacDonald, LP 5E-C
M. C. Thomas, WCF 1A-STA
EDMS, EB 5G-C

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**TENNESSEE VALLEY AUTHORITY
WIDOWS CREEK FOSSIL PLANT**

*ANNUAL STABILITY INSPECTION OF
WASTE DISPOSAL AREA DIKES*

Prepared By: Ronald D. Powell
Date: March 29, 2002

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2002**

INTRODUCTION

The waste disposal areas at Widows Creek Fossil Plant (WCF) were inspected for dike structural stability on December 4, 2001. This inspection was conducted by Ron Powell of TVA's Fossil Engineering Services. He was accompanied by Morgan Thomas, WCF Environmental Program Administrator and Dennis Hicks, HED Production Coordinator for WCF. The previous annual inspection was performed on February 20, 2001.

The results of the annual dike stability inspection are listed below according to location.

ACTIVE ASH DISPOSAL AREA

All bottom ash and fly ash continues to be sluiced into the southwest corner of this area. The bottom ash drops out near the outfall of the pipes and is periodically worked with bulldozers. The fly ash flows northeast into the active ash pond, around the deflector dikes, and southeast through a breach in the interior divider dike, and into the inactive scrubber pond adjacent to the active ash pond. Water is discharged from the inactive scrubber pond back into the active ash pond through another breach in the interior divider dike southwest of the previously mentioned breach. Water is then discharged through five standard spillways with skimmers into the stilling pond. Water is discharged from the stilling pond through another five standard spillways with skimmers into the pumping station pond. From the pumping station pond, water is either discharged into Guntersville Reservoir through three overflow pipes or it is pumped, primarily to the CCW intake, with a portion being pumped into the wet gypsum system as make up water.

The pumps were not operating at the time of this inspection and water was discharging through the three overflow pipes into Guntersville Reservoir. When the system is operating under this condition, the water levels in the stilling pool and the pumping station pond are higher than when the pumps are operating due to the inlet elevation of the overflow pipes. Both of these ponds had only about two feet of freeboard remaining. The skimmers on the standard spillway standpipes, discharging from the stilling pool to the pumping station pond, were completely submerged.

The five standard spillways with skimmers discharging from the active ash pond to the stilling pond appeared to be in good condition and operating properly. The long floating skimmer north of these spillways had some of the floater attachments broken loose on the western end and needs to be repaired.

The exterior and interior dike slopes of the active ash pond generally appear to be in good condition with no signs of instability. They have an excellent vegetative cover and the exterior slopes had been recently mowed. However, patches of undesirable trees are present over some areas of these slopes. Animal burrows were observed in the interior dike slope just above the water level in some areas along the northwestern dike of this area. These burrows could cause surface sluffs in the dike slope if not repaired. The previously noted seeps at the toe of the exterior slope of the east dike, both north and south of the bridge over Widows Creek, are still present.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2002**

The ditch along the exterior toe of both the south and west dikes of this area, that drains surface runoff and seepage to the containment basin, was clear. This is a long ditch with a relatively flat slope and it will require periodic maintenance to keep it functioning properly. Water in the containment basin is pumped across the dike into the active ash pond.

The previously noted surface slip on the exterior dike slope in the southwest corner of this area, and the seepage flow from this vicinity, does not appear to have changed from previous observations. Riprap was placed in this area after the slip occurred in March, 1997, however, the western portion of the slip face remains steep. There were no signs of any recent movement of earth material in this area.

INACTIVE SCRUBBER POND AREA WEST OF WIDOWS CREEK

This area has been incorporated into the active ash pond system by breaching the divider dike between them at two locations and constructing interior deflector dikes of bottom ash to direct the flow of sluice water as described in the previous section of this report. Fly ash is presently being deposited in the east portion of this area.

The riprap cover on the interior slope of the eastern dike is in good condition and there were no signs of additional erosion in that area. However, vegetative cover is generally sparse on the remainder of the interior dike slopes and some other areas are showing signs of damage due to erosion, particularly in the northwest corner and along the divider dike.

The exterior dike slopes appear to be in good condition with no signs of instability. They have a good vegetative cover and had been recently mowed.

FORCED OXIDATION GYPSUM STACKING AREA EAST OF WIDOWS CREEK

The development of this area is being managed by TVA's Heavy Equipment Division (HED). The gypsum material is sluiced into this area alternately at two locations: (1) The southwest corner of Pond 3, from which it flows north and east around an interior deflector dike, constructed of gypsum material, which extends into the northeast portion of Pond 3. It can be turned into Pond 3 at any point along the deflector dike. (2) The west end of Pond 1, from which it flows east and is discharged into the east end of Pond 2A. Pond 2A can be discharged either into Pond 2B or into Pond 3. The sluice water is discharged from Pond 3 into Pond 2B and from the northwest corner of Pond 2B into the perimeter ditch, which discharges into the northeast corner of the Stilling Pool. Water is discharged from the Stilling Pool by gravity through a long pipe and into a channel south of the Inactive Scrubber Pond and flows into Guntersville Reservoir. Prior to the last annual inspection, an additional pipe discharging from the southwest corner of Pond 2B into the perimeter ditch was constructed. In order to discharge the flow from this pipe into the Stilling Pool, the perimeter ditch was excavated down to the top of the abandoned concrete pipe, which discharged the original Pond 2 area into the Stilling Pool, and a hole was broken through the top of the pipe.

The slopes of the gypsum stack in Pond 1, and the lower slopes of the stack in Pond 2A,

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2002**

Pond 2B, and Pond 3 have been covered with earth and seeded, and generally have a good cover of vegetation. However, in some areas, gypsum material is being eroded from the uncovered stack slopes above onto the previously covered slopes below.

The perimeter dikes surrounding the gypsum stacking area appear to be in good condition with no signs of instability. The exterior slopes of these dikes generally have an excellent vegetative cover. The interior slopes of the Stilling Pool dikes are in good condition and have a good vegetative cover.

INACTIVE ASH POND AREA WITHIN THE RAILROAD LOOP

This disposal site is no longer in use. The area is covered in trees and vegetation.

COAL YARD DRAINAGE BASIN

The Coal Yard Drainage Basin is located west of the plant adjacent to the northwest side of the coal yard area. It receives rainfall runoff from the coal pile and yard equipment areas. Both the exterior and interior dike slopes of this area are in good condition with a good vegetative cover. The discharge from this pond is pumped into the active ash pond area.

CHEMICAL TREATMENT PONDS

Both the iron and copper chemical treatment ponds are located within the active ash disposal area in its southwest corner. Effluent from plant chemical cleaning processes is discharged into these ponds and treated before it is pumped into the active ash pond.

Both ponds were excavated below grade and have only interior slopes. All interior slopes of these ponds are covered with riprap and are in good condition.

ACTIONS SINCE LAST INSPECTION

- Plant personnel have continued to make periodic observations of the dikes of the waste disposal areas for surface sloughs, wave erosion damage, new seepage areas, etc.
- Plant personnel have continued to monitor the seepage areas along the bank of Widows Creek for any signs of material movement or changes in seepage flow.
- At the time of this inspection, plant personnel had recently mowed the exterior dike slopes of the Active Ash Disposal Area and the Inactive Scrubber Pond Area.
- Plant personnel have repaired the cutoff valves at the end of the gypsum sluice pipes to the Inactive Scrubber Pond Area West of Widows Creek that were leaking at the time of the previous annual inspection.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2002**

- Plant personnel have flattened the slopes of the gypsum stack along the east dike, covered them with earth, and seeded them in accordance with the design drawings. They appear to be establishing a good vegetative cover.

RECOMMENDATIONS

- Plant personnel should continue to make periodic observations of the dikes of the waste disposal areas for surface sloughs, wave erosion damage, new seepage areas, etc. and make repairs as needed and/or notify Fossil Engineering Services.
- Establish a schedule for periodic mowing of the exterior slopes of all dikes. This will eliminate many of the small trees that can become a problem if they are allowed to grow larger.
- Continue to monitor the seepage areas along the bank of Widows Creek for any signs of material movement or changes in seepage flow. Please notify Fossil Engineering Services immediately if any change is noted.
- Bottom ash should be stacked in accordance with the stacking plan shown on drawings 10W7463-1 and -2 or used to extend the deflector dike into the Inactive Scrubber Pond Area as shown on drawings 10W7420 and 10W7420-1.
- Repair the broken floater attachments to the western end of the floating skimmer north of the standard spillways in the Active Ash Disposal Area.
- Extend the riprap cover placed over the surface slip on the exterior dike slope in the southwest corner of the Active Ash Disposal Area approximately 200 feet west to cover the remaining steep area in the dike slope.
- Remove the area of sediment buildup that has developed at the outlets of the pipes which discharge the perimeter ditches of the Active Gypsum Stacking Area into the Stilling Pool.
- Remove the additional pipe discharging from the southwest corner of Pond 2B into the perimeter ditch of the Active Gypsum Stacking Area and repair the abandoned concrete pipe, which discharged the original Pond 2 area into the Stilling Pool. Construct a new spillway and pipe which discharges from Pond 3 to the perimeter ditch at the north end of the Stilling Pool. The location of the new spillway and pipe should be coordinated with Air, Gas, and Water Systems personnel.
- Flatten and cover the exterior slopes of the gypsum stack as it is raised and seed all covered areas. As the gypsum stack is raised, the tops of the dikes must always be maintained sloped to the inside with an earth berm along their exterior edge to prevent erosion of the gypsum material onto the previously covered slopes.
- Pond 2B and Pond 3 of the Active Gypsum Stacking Area have been raised above the

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2002**

- elevation at which underdrain systems should have been placed. Construct underdrain systems in these areas as closely as possible in accordance with drawings 10E7416-1, 10E7416-2, and 10W7416-3. If underdrain systems are not placed at these locations, the factors of safety for the stack slopes developed by Ardaman & Associates, Inc., which are the design basis for the stack configuration, will not be applicable.

WIDOWS CREEK FOSSIL PLANT
NPDES PERMIT NO. AL0003875
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2002

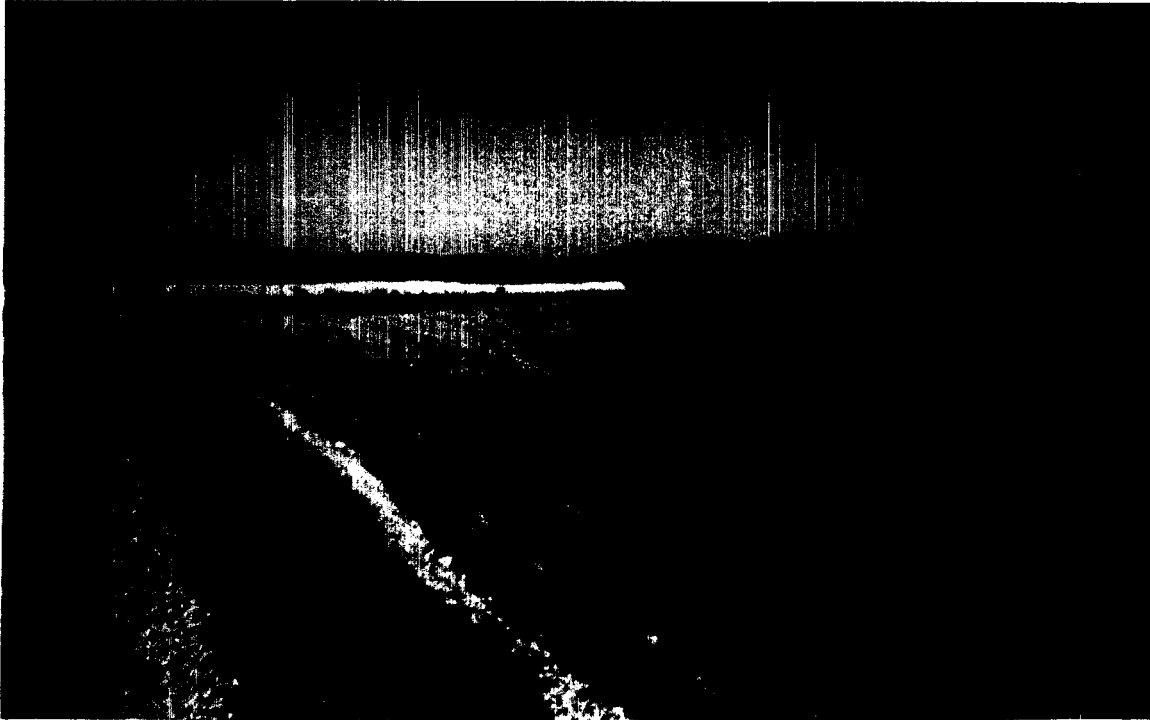


Picture 1. Active Ash Disposal Area - South end of Stilling Pond. Note high water level completely submerging the skimmers for the standard spillways.



Picture 2. Active Gypsum Stacking Area - Outlet of concrete pipe discharging into Stilling Pool. Note sediment build-up beyond outlet.

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2002



Picture 3. Active Gypsum Stacking Area - Exterior slope of gypsum stack along east dike; has been flattened, covered, and seeded since the previous annual inspection.



Picture 4. Active Gypsum Stacking Area - Exterior slope of gypsum stack along north dike. Note uncovered gypsum material at top of slope.

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2002



Picture 5. Active Ash Disposal Area - Looking south along east dike of Inactive Scrubber Pond Area. Note recently mowed exterior slope.



Picture 6. Active Ash Disposal Area - Seepage area at toe of slope of east dike just north of the bridge across Widows Creek.

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MASTER
FILE

February 12, 2003

M. A. Cooper, WCF 1A-STA

WIDOWS CREEK FOSSIL PLANT (WCF) - STABILITY INSPECTION OF THE WASTE
DISPOSAL AREAS

Attached is a report from Ron Powell concerning the latest dike stability inspection of WCF ash disposal areas. The inspection was performed on December 16, 2002.

The report includes recommendations for corrective work. I concur with those recommendations.

If you have questions, please contact Ron Purkey at Chattanooga extension 4820 or Ron Powell at Chattanooga extension 8912.

J. G. Adair FOR

James G. Adair, Manager
Engineering Design Services
LP 2G-C

REP:RDP:LMV

Attachment

cc (w/Attachment):

M. A. Cones, LP 1H-C
G. L. Hemmer Jr., WCF 1A-STA
R. E. Johnson, LP 2L-C
J. L. Ward, WCF 1A-STA
G. R. MacDonald, LP 5E-C
M. C. Thomas, WCF 1A-STA
EDMS, EB 5G-C

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**TENNESSEE VALLEY AUTHORITY
WIDOWS CREEK FOSSIL PLANT**

*ANNUAL STABILITY INSPECTION OF
WASTE DISPOSAL AREA DIKES*

Prepared By: Ronald D. Powell
Date: January 31, 2003

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2003**

INTRODUCTION

The waste disposal areas at Widows Creek Fossil Plant (WCF) were inspected for dike structural stability on December 16, 2002. This inspection was conducted by Ron Powell and Ken Stier of TVA's Fossil Engineering Services. They were accompanied by Morgan Thomas, Environmental Program Administrator for WCF and Jeff Ward, Yard Operations Supervisor for WCF. The previous annual inspection was performed on December 4, 2001.

The results of the annual dike stability inspection are listed below according to location.

ACTIVE ASH DISPOSAL AREA

All bottom ash and fly ash continues to be sluiced into the southwest corner of this area. The bottom ash drops out near the outfall of the pipes and is periodically worked with bulldozers. The fly ash flows northeast into the active ash pond, around the deflector dikes, and southeast through a breach in the interior divider dike, and into the inactive scrubber pond adjacent to the active ash pond. Water is discharged from the inactive scrubber pond back into the active ash pond through another breach in the interior divider dike southwest of the previously mentioned breach. Water is then discharged through five standard spillways with skimmers into the Stilling Pond. Water is discharged from the Stilling Pond through another five standard spillways with skimmers into the Pumping Station Pond. From the Pumping Station Pond, water is either discharged into Gunterville Reservoir through three overflow pipes or it is pumped, primarily to the CCW intake, with a portion being pumped into the wet gypsum system as make up water.

The south and west Stilling Pool dikes were raised from Elevation 610 to Elevation 613.5 with bottom ash fill material this past summer as a part of the Ash Pond Mitigation System Project for pH control (photo 1). The five standard spillways with skimmers in this area will also be raised as a part of this project, but that had not been accomplished at the time of this inspection. The pumps were operating at the time of this inspection and the water surface was at a level where these spillways were operating normally. They appeared to be in good condition and functioning properly (photo 2). A storm drainage pipe was placed beneath the access ramp to the CO₂ tank when the south dike was raised. The inlet of this pipe was not placed in an excavated ditch and the storm water is flowing around the inlet of the pipe instead of into it (photo 3). Also the area around the outlet of this pipe needs to be regraded to drain into the ditch (photo 4).

The five standard spillways with skimmers discharging from the active ash pond to the stilling pond appeared to be in good condition and operating properly. The long floating skimmer north of these spillways had some of the floater attachments broken loose on the western end and needs to be repaired.

The exterior and interior dike slopes of the active ash pond have an excellent vegetative cover and appear to be in good condition with no signs of instability. However, patches of undesirable trees are present over some areas of these slopes. Animal burrows have been observed in the interior dike slope just above the water level in some areas along the northwestern dike of this area in the past. None were noted during this inspection. The previously noted seeps at the toe

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2003**

of the exterior slope of the east dike, both north and south of the bridge over Widows Creek, are still present.

The ditch along the exterior toe of both the south and west dikes of this area, that drains surface runoff and seepage to the containment basin, was clear. This is a long ditch with a relatively flat slope and it will require periodic maintenance to keep it functioning properly. Water in the containment basin is pumped across the dike into the active ash pond.

The previously noted surface slip on the exterior dike slope in the southwest corner of this area, and the seepage flow from this vicinity, does not appear to have changed from previous observations. Riprap was placed in this area after the slip occurred in March, 1997, however, the western portion of the slip face remains steep. There were no signs of any recent movement of earth material in this area.

INACTIVE SCRUBBER POND AREA WEST OF WIDOWS CREEK

This area has been incorporated into the active ash pond system by breaching the divider dike between them at two locations and constructing interior deflector dikes of bottom ash to direct the flow of sluice water as described in the previous section of this report. Fly ash is presently being deposited in the east portion of this area.

The riprap cover on the interior slope of the eastern dike is in good condition and there were no signs of additional erosion in that area. However, vegetative cover is generally sparse on the remainder of the interior dike slopes and some other areas are showing signs of damage due to erosion, particularly in the northwest corner and along the divider dike.

The exterior dike slopes appear to be in good condition with no signs of instability. They have a good vegetative cover.

FORCED OXIDATION GYPSUM STACKING AREA EAST OF WIDOWS CREEK

The development of this area is being managed by TVA's Heavy Equipment Division (HED). The gypsum material is sluiced into this area alternately at two locations: (1) The southwest corner of Pond 3, from which it flows north and east around an interior deflector dike, constructed of gypsum material, which extends into the northeast portion of Pond 3 (photo 5). It can be turned into Pond 3 at any point along the deflector dike. (2) The west end of Pond 1, from which it flows east and is discharged into the east end of Pond 2A. Pond 2A can be discharged either into Pond 2B or into Pond 3. The sluice water is discharged from Pond 3 into Pond 2B and from the northwest corner of Pond 2B into the perimeter ditch, which discharges into the northeast corner of the Stilling Pool. Water is discharged from the Stilling Pool by gravity through a long pipe and into a channel south of the Inactive Scrubber Pond and flows into Guntersville Reservoir. In the summer of 2000, an additional pipe discharging from the southwest corner of Pond 2B into the perimeter ditch was constructed. In order to discharge the flow from this pipe into the Stilling Pool, the perimeter ditch was excavated down to the top of the abandoned concrete pipe, which discharged the original Pond 2 area into the Stilling Pool, and a hole was broken through the top of the pipe. The inlet to this pipe has been blocked and it has

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2003**

been taken out of service (photo 6).

The slopes of the gypsum stack in Pond 1, and the lower slopes of the stack in Pond 2A, Pond 2B, and Pond 3 have been covered with earth and seeded, and generally have a good cover of vegetation. However, in some areas, gypsum material is being eroded from the uncovered stack slopes above onto the previously covered slopes below.

The perimeter dikes surrounding the gypsum stacking area appear to be in good condition with no signs of instability. The exterior slopes of these dikes generally have an excellent vegetative cover. The interior slopes of the Stilling Pool dikes are in good condition and have a good vegetative cover.

INACTIVE ASH POND AREA WITHIN THE RAILROAD LOOP

This disposal site is no longer in use. The area is covered in trees and vegetation.

COAL YARD DRAINAGE BASIN

The Coal Yard Drainage Basin is located west of the plant adjacent to the northwest side of the coal yard area. It receives rainfall runoff from the coal pile and yard equipment areas. Both the exterior and interior dike slopes of this area are in good condition with a good vegetative cover. The discharge from this pond is pumped into the active ash pond area. The depth survey of this area was not performed because money had already been budgeted for the cleanout of the basin.

CHEMICAL TREATMENT PONDS

Both the iron and copper chemical treatment ponds are located within the active ash disposal area in its southwest corner. Effluent from plant chemical cleaning processes is discharged into these ponds and treated before it is pumped into the active ash pond.

Both ponds were excavated below grade and have only interior slopes. All interior slopes of these ponds are covered with riprap and are in good condition.

ACTIONS SINCE LAST INSPECTION

- Plant personnel have continued to make periodic observations of the dikes of the waste disposal areas for surface sloughs, wave erosion damage, new seepage areas, etc.
- Plant personnel have continued to monitor the seepage areas along the bank of Widows Creek for any signs of material movement or changes in seepage flow.
- The south and west Stilling Pool dikes were raised from Elevation 610 to Elevation 613.5 with bottom ash fill as a part of the Ash Pond Mitigation System Project for pH control.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2003**

RECOMMENDATIONS

- Plant personnel should continue to make periodic observations of the dikes of the waste disposal areas for surface sloughs, wave erosion damage, new seepage areas, etc. and make repairs as needed and/or notify Fossil Engineering Services.
- Maintain a schedule for periodic mowing of the exterior slopes of all dikes. This will eliminate many of the small trees that can become a problem if they are allowed to grow larger.
- Continue to monitor the seepage areas along the bank of Widows Creek for any signs of material movement or changes in seepage flow. Please notify Fossil Engineering Services immediately if any change is noted.
- The areas around both the inlet and outlet of the pipe beneath the access ramp to the CO2 tank need to be regarded so the pipe will function properly and storm water will flow into the ditch.
- Bottom ash should be stacked in accordance with the stacking plan shown on drawings 10W7463-1 and -2.
- Repair the broken floater attachments to the western end of the floating skimmer north of the standard spillways in the Active Ash Disposal Area.
- Extend the riprap cover placed over the surface slip on the exterior dike slope in the southwest corner of the Active Ash Disposal Area approximately 200 feet west to cover the remaining steep area in the dike slope (approximately 600 tons).
- Remove the area of sediment buildup that has developed at the outlets of the pipes which discharge the perimeter ditches of the Active Gypsum Stacking Area into the Stilling Pool.
- Remove or abandon the additional pipe discharging from the southwest corner of Pond 2B into the perimeter ditch of the Active Gypsum Stacking Area and repair the abandoned concrete pipe, which discharged the original Pond 2 area into the Stilling Pool. Construct a new spillway and pipe which discharges from Pond 3 to the perimeter ditch at the north end of the Stilling Pool. The location of the new spillway and pipe should be coordinated with Air, Gas, and Water Systems personnel.
- Flatten and cover the exterior slopes of the gypsum stack as it is raised and seed all covered areas. As the gypsum stack is raised, the tops of the dikes must always be maintained sloped to the inside with an earth berm along their exterior edge to prevent erosion of the gypsum material onto the previously covered slopes.
- Pond 2B and Pond 3 of the Active Gypsum Stacking Area have been raised above the elevation at which underdrain systems should have been placed. Construct underdrain systems in these areas as closely as possible in accordance with drawings 10E7416-1, 10E7416-2, and 10W7416-3. If underdrain systems are not placed at these locations, the factors of safety for the stack slopes developed by Ardaman & Associates, Inc., which are the design basis for the stack configuration, will not be applicable.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2003**

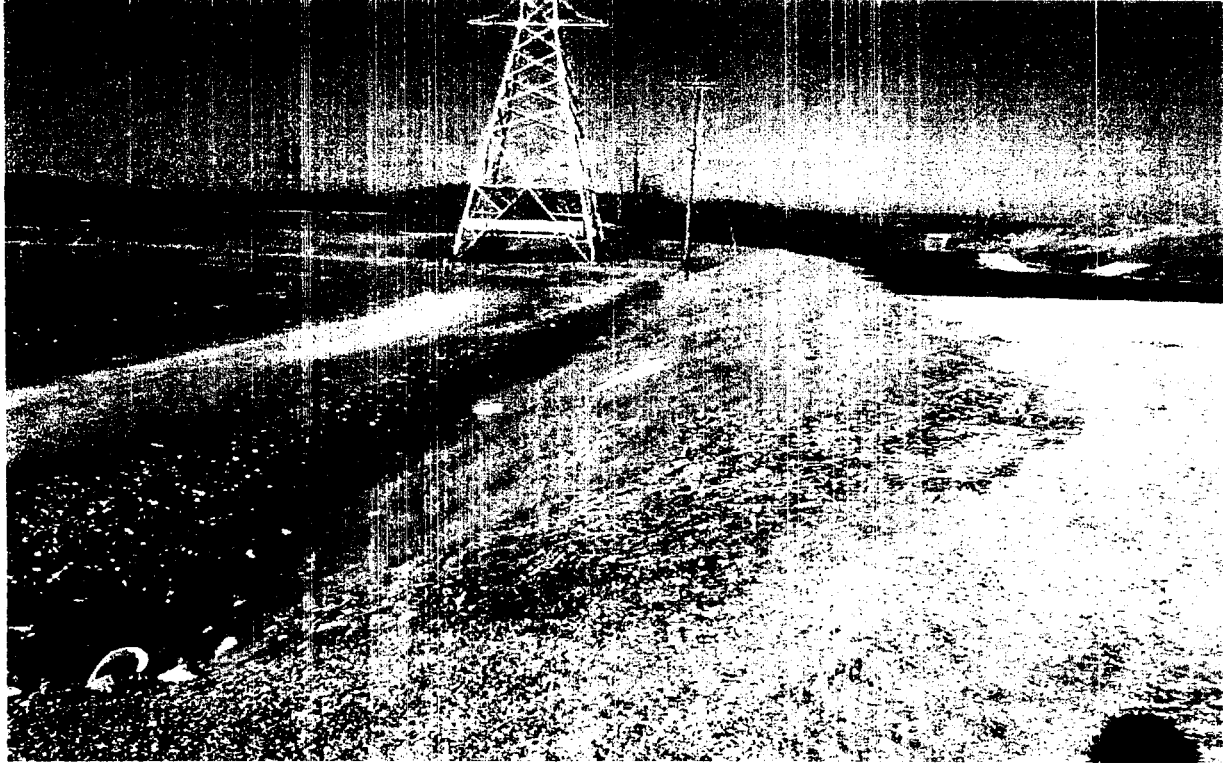


Photo 1. Active Ash Disposal Area – Raised west dike of the Stilling Pool Area.

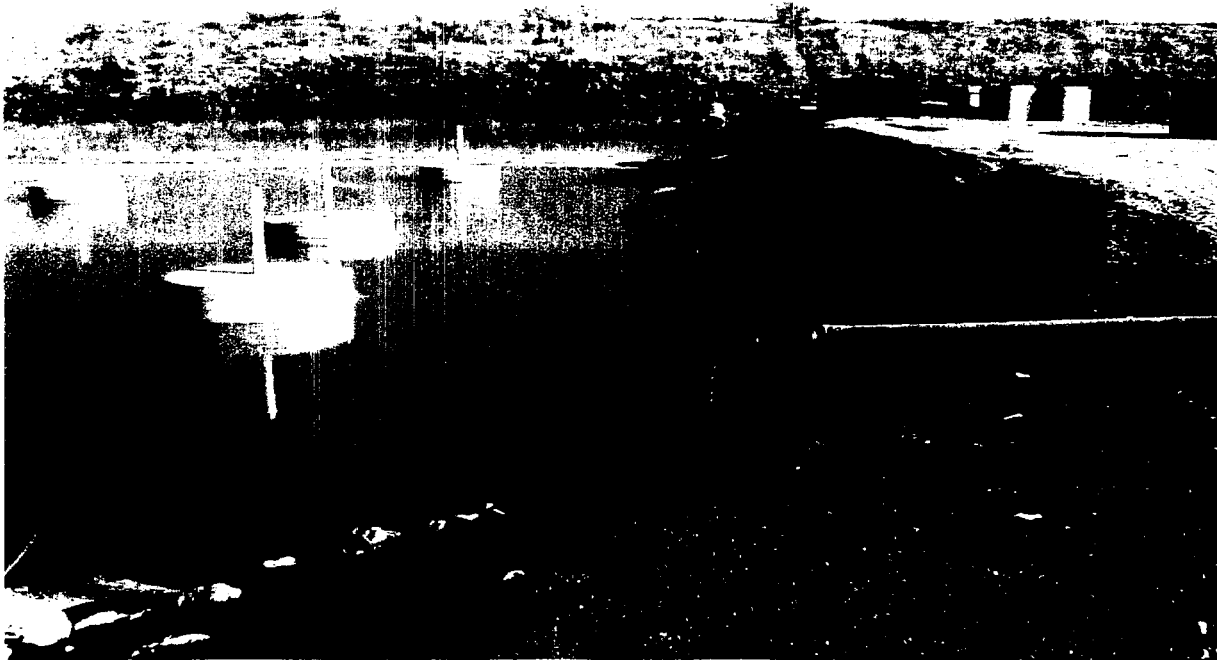


Photo 2. Active Ash Disposal Area – Standard spillways with skimmers in Stilling Pool Area

WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2003

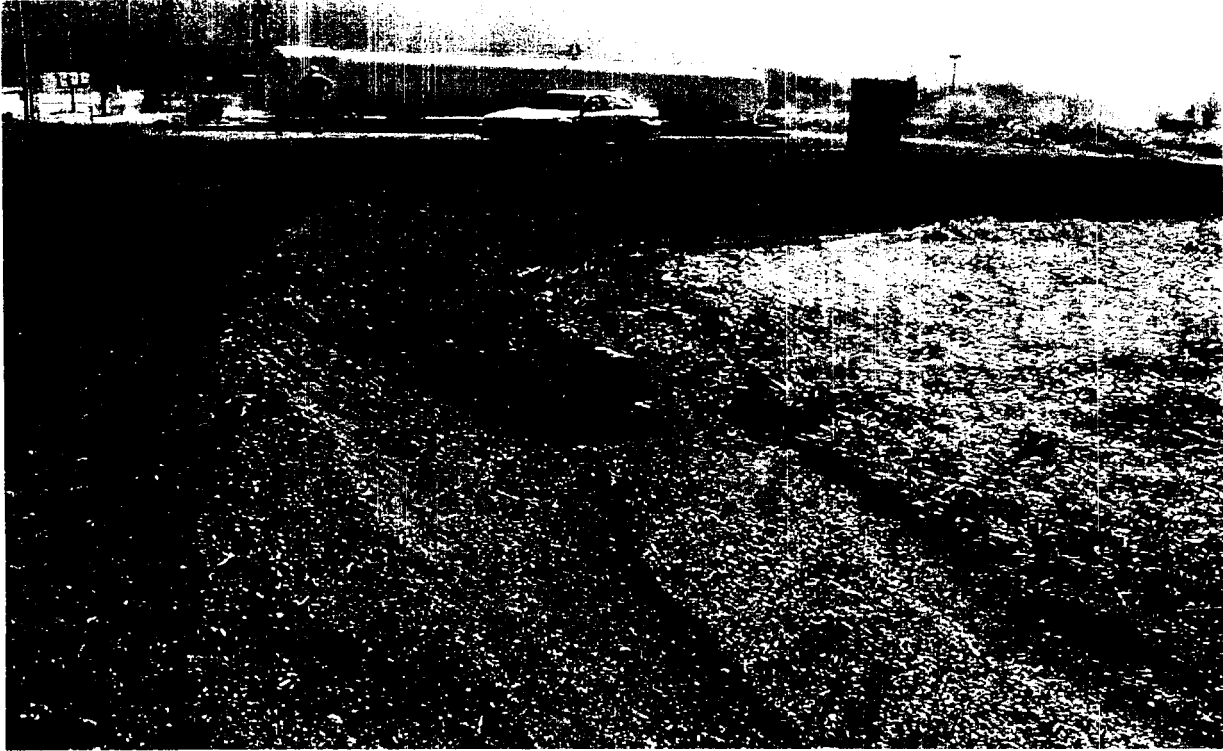
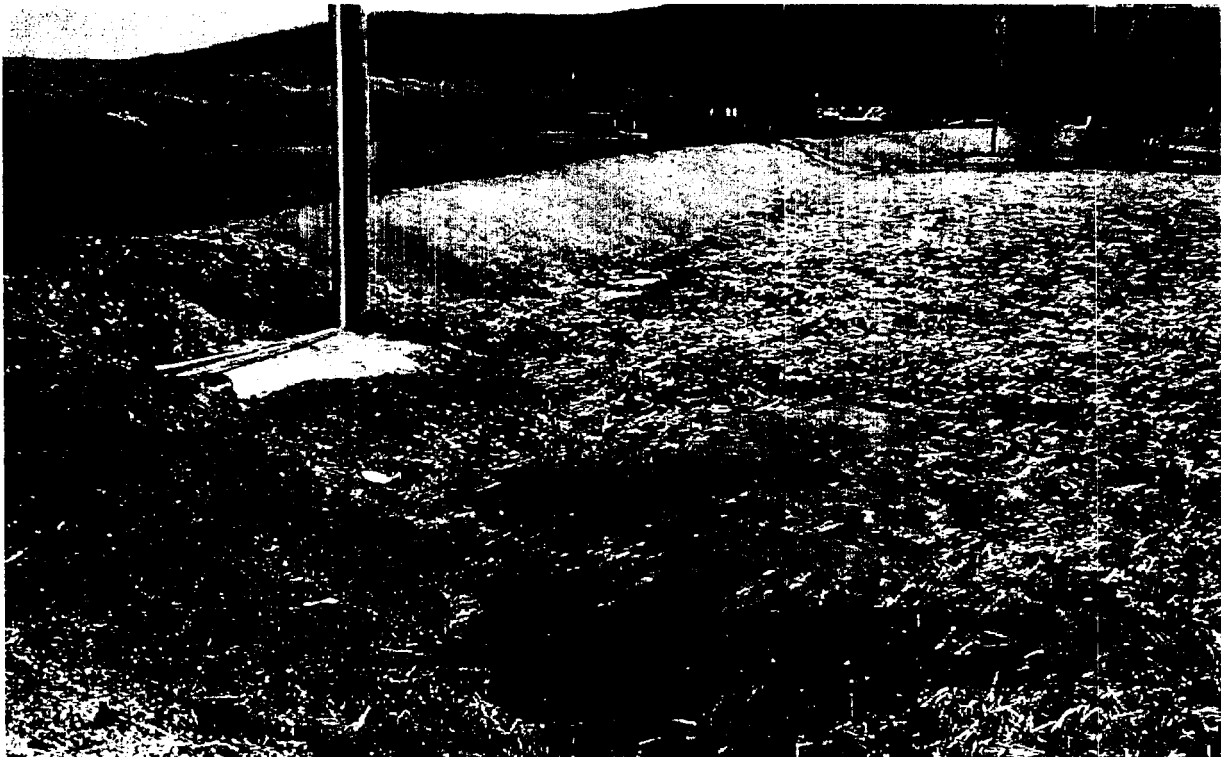


Photo 3. Active Ash Disposal Area – Inlet of pipe beneath access ramp to CO2 tank.



Picture 4. Active Ash Disposal Area – Outlet area of pipe beneath access ramp to CO2 tank.

WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2003

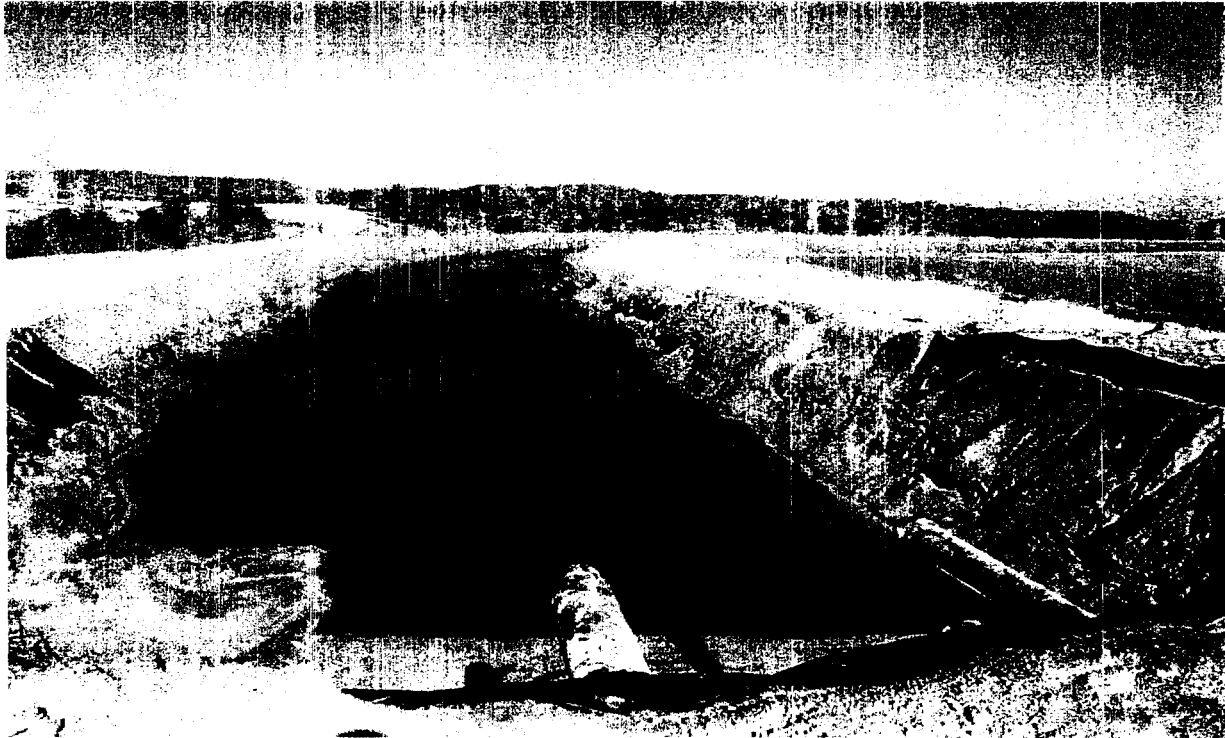
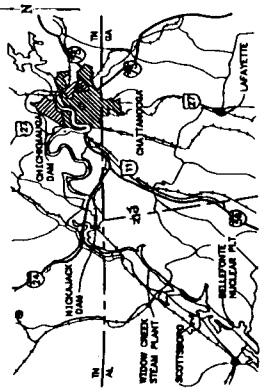
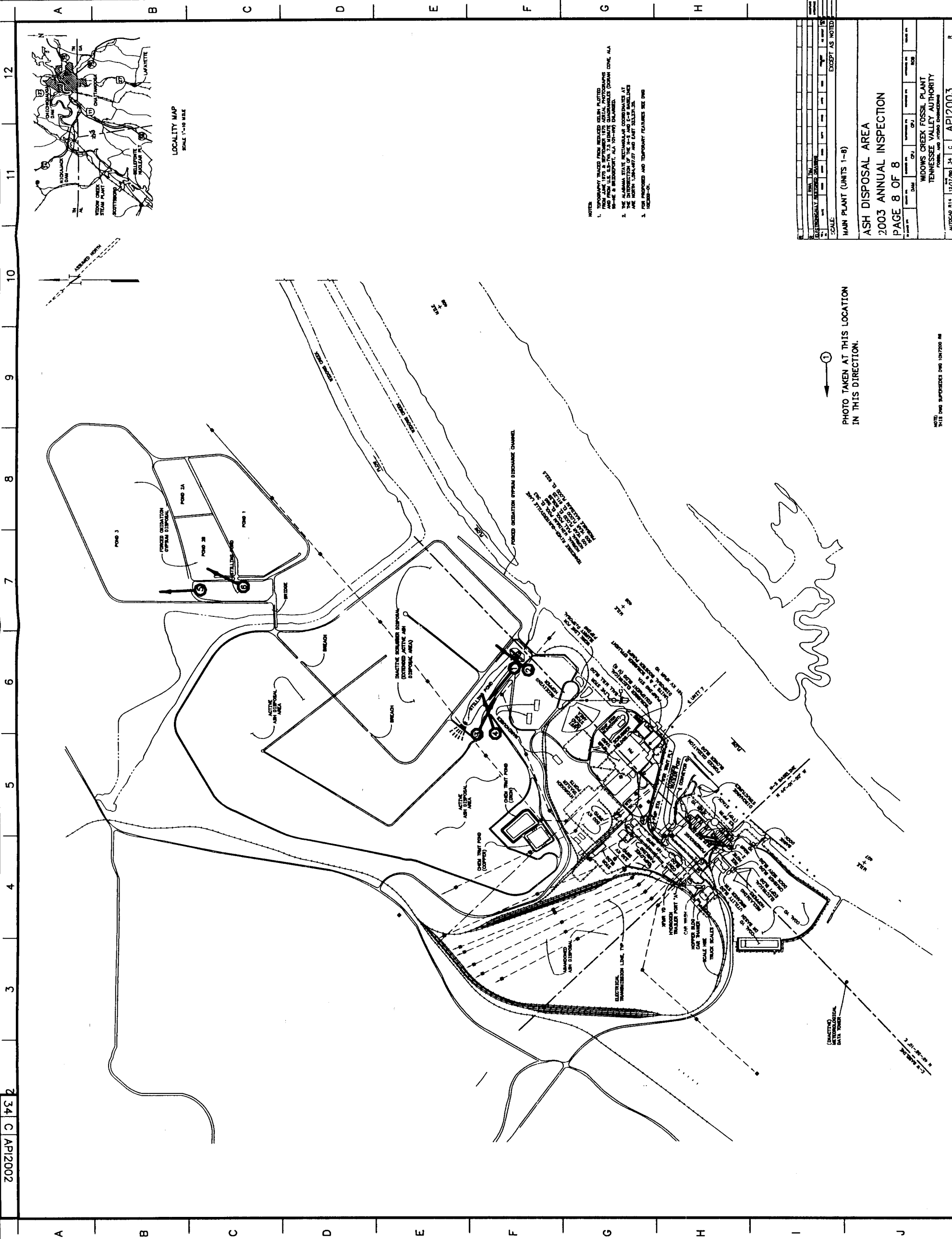


Photo 5. Active Gypsum Stacking Area – Gypsum sluice pipe discharge into Area 3.



Picture 6. Active Gypsum Stacking Area – Blocked inlet of pipe discharging from the southwest corner of Pond 2B into the perimeter ditch



LOCALITY MAP
SCALE 1"=10 MILES

- NOTES:**
1. TOPOGRAPHY TRACED FROM REDUCED RELIEF PLATED AND FROM U.S. GEOLOGICAL SURVEY 7.5-MINUTE QUADRANGULAR COORDINATE SYSTEM, ALA. SHEET 8, WETUMPKA, ALA. 101-100 DATED 1963.
 2. THE ALABAMA STATE RECTANGULAR COORDINATES AT THE INTERSECTION OF 30° 30' 00" N. AND 85° 00' 00" W. ARE 1000000.000 EASTING AND 1000000.000 NORTHING.
 3. PERMANENT AND TEMPORARY FEATURES SEE THE DRAWING.

PHOTO TAKEN AT THIS LOCATION
IN THIS DIRECTION.

①

SCALE:

MAIN PLANT (UNITS 1-8)

ASH DISPOSAL AREA

2003 ANNUAL INSPECTION

PAGE 8 OF 8

WIDOWS CREEK FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY

PROJECT NO. 12/27/00 34 C API2003

DATE: 12/27/00

BY: [Signature]

APPROVED BY: [Signature]

SCALE: EXCEPT AS NOTED

NOTE: THIS DRAWING SUPERSEDES THE 10/17/00 DRAWING.

May 11, 2004

Gerald Hemmer, WCF 1A-STA

WIDOWS CREEK FOSSIL PLANT (WCF) - STABILITY INSPECTION OF THE WASTE DISPOSAL AREAS

Attached is a report from Ron Powell and Ted Stammer concerning the latest dike stability inspection of WCF ash disposal areas. The inspection was performed on October 16, 2003.

The report includes recommendations for corrective work. I concur with those recommendations.

If you have questions, please contact Ron Purkey at Chattanooga extension 4820 or Ron Powell at Chattanooga extension 8912.



James G. Adair, Manager
Engineering Design Services
LP 2G-C

REP:RDP:LMV

Attachment

cc (w/Attachment):

- V. A. Newell, LP 1F-C
- R. E. Johnson, LP 2L-C
- J. L. Ward, WCF 1A-STA
- G. R. MacDonald, LP 5E-C
- M. C. Thomas, WCF 1A-STA
- M.E. Stiefel, LP 5D-C
- EDMS, WT CA-K

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**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2004**

INTRODUCTION

The waste disposal areas at Widows Creek Fossil Plant (WCF) were inspected for dike structural stability on October 16, 2003. This inspection was conducted by Ron Powell and Ted Stammler of TVA's Fossil Engineering Services. The previous annual inspection was performed on December 16, 2002.

The results of the annual dike stability inspection are listed below according to location.

ACTIVE ASH DISPOSAL AREA

All bottom ash and fly ash continues to be sluiced into the southwest corner of this area. The bottom ash drops out near the outfall of the pipes and is periodically worked with bulldozers. The fly ash flows northeast into the active ash pond, around the deflector dikes, and southeast through a breach in the interior divider dike, and into the inactive scrubber pond adjacent to the active ash pond. Water is discharged from the inactive scrubber pond back into the active ash pond through another breach in the interior divider dike southwest of the previously mentioned breach. Water is then discharged through five standard spillways with skimmers into the Stilling Pond. Water is discharged from the Stilling Pond through another five standard spillways with skimmers into the Pumping Station Pond. From the Pumping Station Pond, water is either discharged into Guntersville Reservoir through three overflow pipes or it is pumped, primarily to the CCW intake, with a portion being pumped into the wet gypsum system as make up water.

The ditch from the pipe discharge point (units 1 through 6 –Sluice Water) to the active ash pond is currently being routed along the west dike in order to dry the interior for ash excavation which will be used for construction of the new dredge pond. (photo 1).

The south and west Stilling Pool dikes were raised from Elevation 610 to Elevation 613.5 with bottom ash fill material in 2002 as a part of the Ash Pond Mitigation System Project for pH control. The five standard spillways in this area were also raised and new skimmers installed as a part of this project. The pumps were operating at the time of this inspection and the water surface was at a level where these spillways were operating normally. They appeared to be in good condition and functioning properly (photo 2 & 5).

The five standard spillways with skimmers discharging from the active ash pond to the stilling pond appeared to be in good condition and operating properly. The long floating skimmer north of these spillways had some of the floater attachments broken loose on the western end and needs to be repaired. This is unchanged from the previous year.

The exterior and interior dike slopes of the active ash pond have an excellent vegetative cover and appear to be in good condition with no signs of instability. However, patches of undesirable trees are present over some areas of these slopes. Animal burrows have been observed in the interior dike slope just above the water level in some areas along the northwestern dike of this area in the past. None were noted during this inspection. The previously noted seeps at the toe of the exterior slope of the east dike, both north and south of the bridge over Widows Creek,

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2004**

are still present.

The ditch along the exterior toe of both the south and west dikes of this area, that drains surface runoff and seepage to the containment basin, was clear. This is a long ditch with a relatively flat slope and it will require periodic maintenance to keep it functioning properly. Water in the containment basin is pumped across the dike into the active ash pond.

The previously noted surface slip on the exterior dike slope in the southwest corner of this area, and the seepage flow from this vicinity, does not appear to have changed from previous observations. Riprap was placed in this area after the slip occurred in March, 1997; however, the western portion of the slip face remains steep. There were no signs of any recent movement of earth material in this area.

At the time of this inspection ash was being dredged from the northeast portion of this area into the Inactive Scrubber Disposal Area in preparation for construction of the new dredge pond dikes. (photo 4)

INACTIVE SCRUBBER POND AREA WEST OF WIDOWS CREEK

This area has been incorporated into the active ash pond system by breaching the divider dike between them at two locations and constructing interior deflector dikes of bottom ash to direct the flow of sluice water as described in the previous section of this report. Fly ash is presently being dredged into a low area along the northwest dike.

The exterior dike slopes appear to be in good condition with no signs of instability. They have a good vegetative cover.

A new dredge cell is currently under construction in this area. The two transmission towers in this area have been coated for the higher water elevation.

Post Inspection Notes:

1. The deflector dike in this area has been extended to close with the east raised perimeter dike and fly ash is being dredged into the area south of this dike to increase free water volume.
2. During the weekend of 3-6-04, a rainfall event occurred which resulted in the loss of cenospheres into the discharge channel for the Active Ash Disposal Area. The cenospheres were eroded from the dike slopes of the new dredge cell presently under construction in this area. TVA was charged with a Reportable Environmental Event (REE) as a result of this occurrence.

FORCED OXIDATION GYPSUM STACKING AREA EAST OF WIDOWS CREEK

The development of this area is being managed by TVA's Heavy Equipment Division (HED). The gypsum material is sluiced into this area alternately at two locations: (1) The southwest corner of Pond 3, from which it flows north and east around an interior deflector dike (photo 6), constructed of gypsum material, which extends into the northeast portion of Pond 3. It can be

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2004**

turned into Pond 3 at any point along the deflector dike. (2) The west end of Pond 1, from which it flows east and is discharged into the east end of Pond 2A. Pond 2A can be discharged either into Pond 2B or into Pond 3. The sluice water is discharged from Pond 3 (photo 7) into Pond 2B and from the northwest corner of Pond 2B into the perimeter ditch (photo 9), which discharges into the northeast corner of the Stilling Pool. Water is discharged from the Stilling Pool by gravity through a long pipe and into a channel south of the Inactive Scrubber Pond and flows into Guntersville Reservoir. In the summer of 2000, an additional pipe discharging from the southwest corner of Pond 2B into the perimeter ditch was constructed. In order to discharge the flow from this pipe into the Stilling Pool, the perimeter ditch was excavated down to the top of the abandoned concrete pipe, which discharged the original Pond 2 area into the Stilling Pool, and a hole was broken through the top of the pipe. The inlet to this pipe has been blocked and it has been taken out of service.

The slopes of the gypsum stack in Pond 1, and the lower slopes of the stack in Pond 2A, Pond 2B, and Pond 3 have been covered with earth and seeded, and generally have a good cover of vegetation. However, in some areas, gypsum material is being eroded from the uncovered stack slopes above onto the previously covered slopes below.

The perimeter dikes surrounding the gypsum stacking area appear to be in good condition with no signs of instability. However, the newly stacked slopes of gypsum at the top of the stacking area are too steep (photo 8). They should be flattened and final cover placed on them as soon as possible. The exterior slopes of these dikes generally have an excellent vegetative cover. The interior slopes of the Stilling Pool dikes are in good condition and have a good vegetative cover. Sediment build up has developed in the Stilling Pool Area to the point that it needs to be cleaned out. Also, an oil sheen was observed to be covering a large portion of the surface area and should be removed.

Post Inspection Note: The previously noted rainfall event of 3-6-04 also resulted in the loss of some oil from the surface of the Stilling Pool Area into the discharge channel for this area. The oil was contained before it went into the discharge channel for the Active Disposal Area by the placement of an absorbent floating skimmer. This event was classified as an REE near miss.

INACTIVE ASH POND AREA WITHIN THE RAILROAD LOOP

This disposal site is no longer in use. The area is covered in trees and vegetation.

COAL YARD DRAINAGE BASIN

The Coal Yard Drainage Basin is located west of the plant adjacent to the northwest side of the coal yard area. It receives rainfall runoff from the coal pile and yard equipment areas. Both the exterior and interior dike slopes of this area are in good condition with a good vegetative cover. The discharge from this pond is pumped into the active ash pond area. The depth survey of this area was not performed because the pond was recently cleaned out.

CHEMICAL TREATMENT PONDS

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2004**

Both the iron and copper chemical treatment ponds are located within the active ash disposal area in its southwest corner. Effluent from plant chemical cleaning processes is discharged into these ponds and treated before it is pumped into the active ash pond.

Both ponds were excavated below grade and have only interior slopes. All interior slopes of these ponds are covered with riprap and are in good condition.

ACTIONS SINCE LAST INSPECTION

- Plant personnel have continued to make periodic observations of the dikes of the waste disposal areas for surface sloughs, wave erosion damage, new seepage areas, etc.
- Plant personnel have continued to monitor the seepage areas along the bank of Widows Creek for any signs of material movement or changes in seepage flow.
- Dike construction has begun on the new dredge cell in the Inactive Scrubber Disposal Area.

RECOMMENDATIONS

- Plant personnel should continue to make periodic observations of the dikes of the waste disposal areas for surface sloughs, wave erosion damage, new seepage areas, etc. and make repairs as needed and/or notify Fossil Engineering Services.
- Maintain a schedule for periodic mowing of the exterior slopes of all dikes. This will eliminate many of the small trees that can become a problem if they are allowed to grow larger.
- Continue to monitor the seepage areas along the bank of Widows Creek for any signs of material movement or changes in seepage flow. Please notify Fossil Engineering Services immediately if any change is noted.
- Bottom ash should be stacked in accordance with the stacking plan shown on drawings 10W7463-1 and -2.
- Repair the broken floater attachments to the western end of the floating skimmer north of the standard spillways in the Active Ash Disposal Area. (same recommendation as 2003).
- Extend the riprap cover placed over the surface slip on the exterior dike slope in the southwest corner of the Active Ash Disposal Area approximately 200 feet west to cover the remaining steep area in the dike slope (approximately 600 tons).
- Remove sediment buildup and surface oil sheen that has developed in the Stilling Pool.
- Flatten and cover the exterior slopes of the gypsum stack as it is raised and seed all covered areas. As the gypsum stack is raised, the tops of the dikes must always be maintained sloped to the inside with an earth berm along their exterior edge to prevent erosion of the gypsum material onto the previously covered slopes. The construction is not per design drawings. Slopes shall be in accordance with the stacking plan drawings.
- Pond 2B and Pond 3 of the Active Gypsum Stacking Area have been raised above the elevation at which underdrain systems should have been placed. Construct underdrain systems in these areas as closely as possible in accordance with drawings 10E7416-1, 10E7416-2, and 10W7416-3. If underdrain systems are not placed at these locations, the factors of safety for the stack slopes developed by Ardaman & Associates, Inc., which are the design basis for the stack configuration, will not be applicable.
- Closely monitor the perimeter ditches for the new dredge cell, especially prior to predicted

**WIDOWS CREEK FOSSIL PLANT
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rainfall events, to ensure they are clear and will contain the runoff and sedimentation that will occur as a result of these events.



Photo 1. Newly constructed channel from Units 1 thru 6 ash sluice line discharge pipes to ash pond.

WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2004

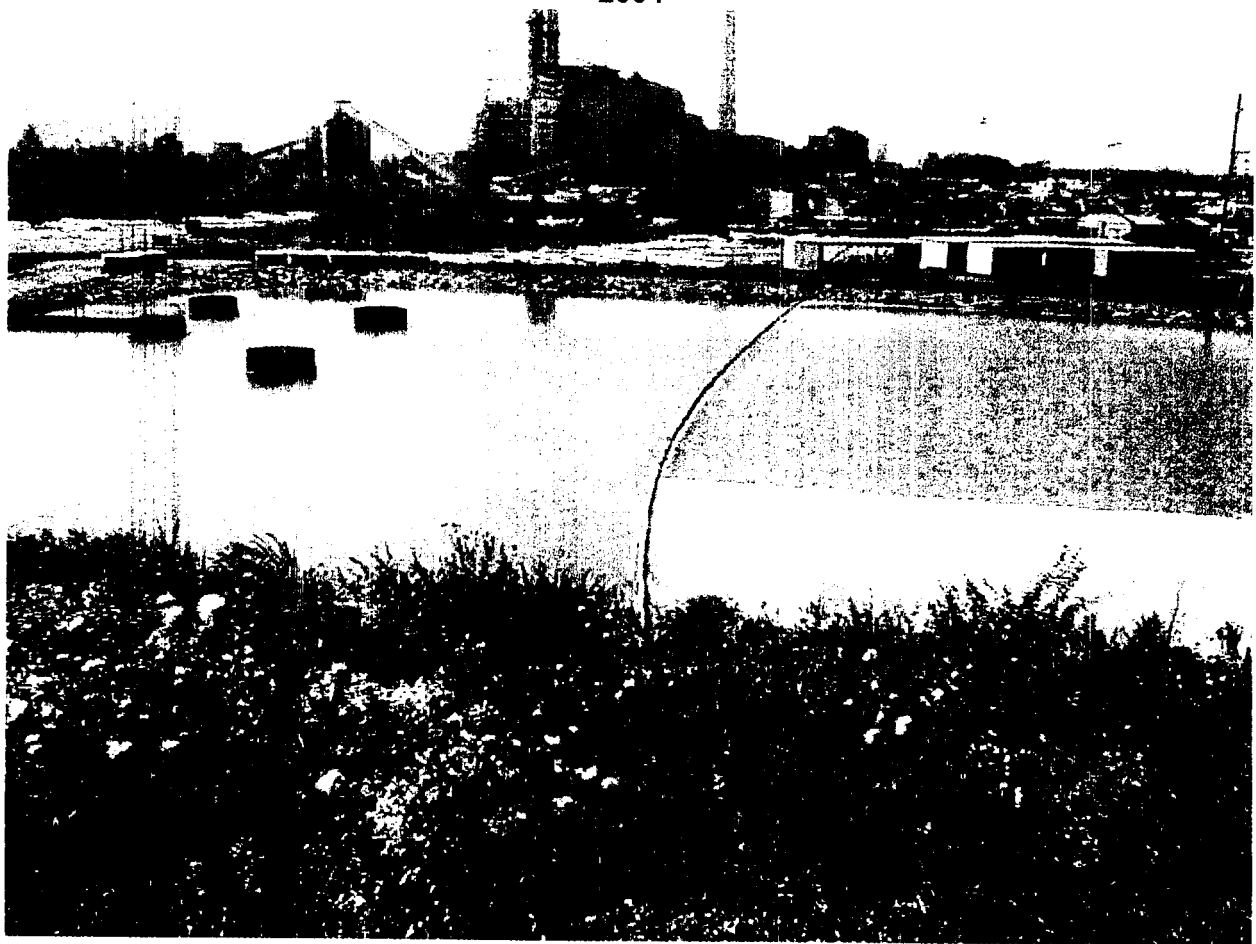


Photo 2. Active Ash Disposal Area – Standard spillways with skimmers in Stilling Pool Area.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2004**



Photo 3. Active Ash Disposal Area.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2004**

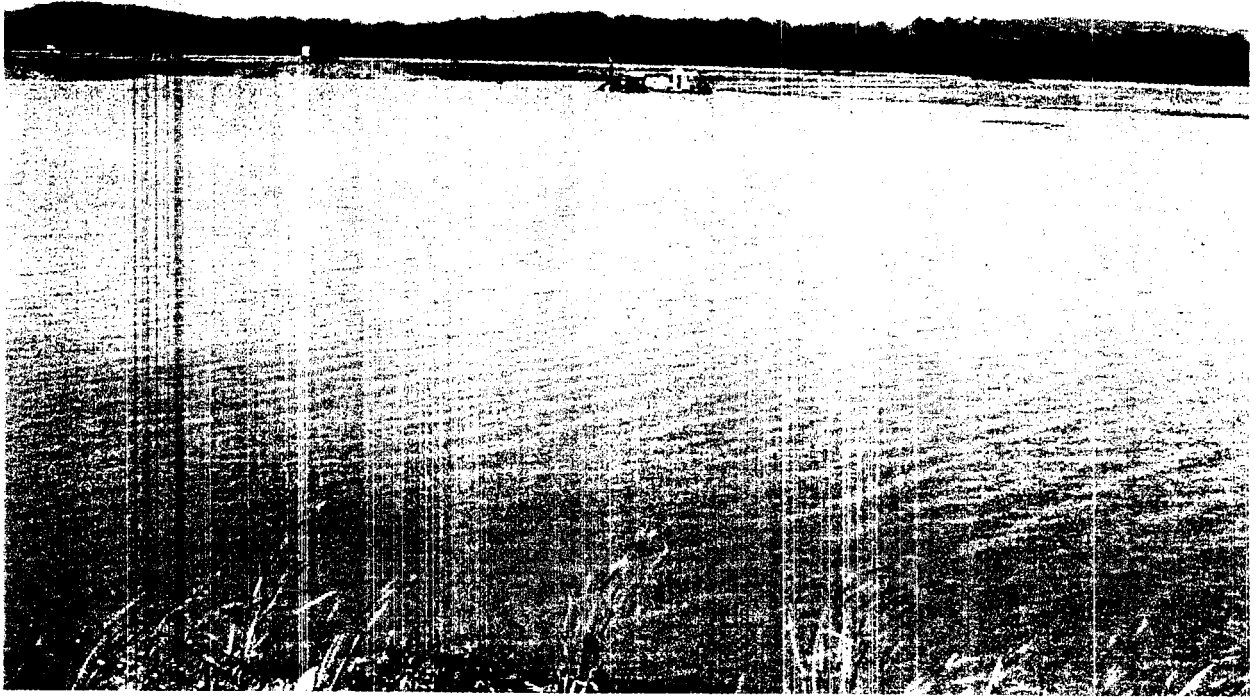


Photo 4. Active Ash Disposal Area – new dredge cell.

WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2004



Photo 5. Active Ash Disposal Area – Stilling Pond discharge to Pumping Station Pond with new skimmers.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2004**



Photo 6. Active Gypsum Stacking Area – Gypsum sluice pipe discharge into Area 3 showing ditch being cleaned.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2004**

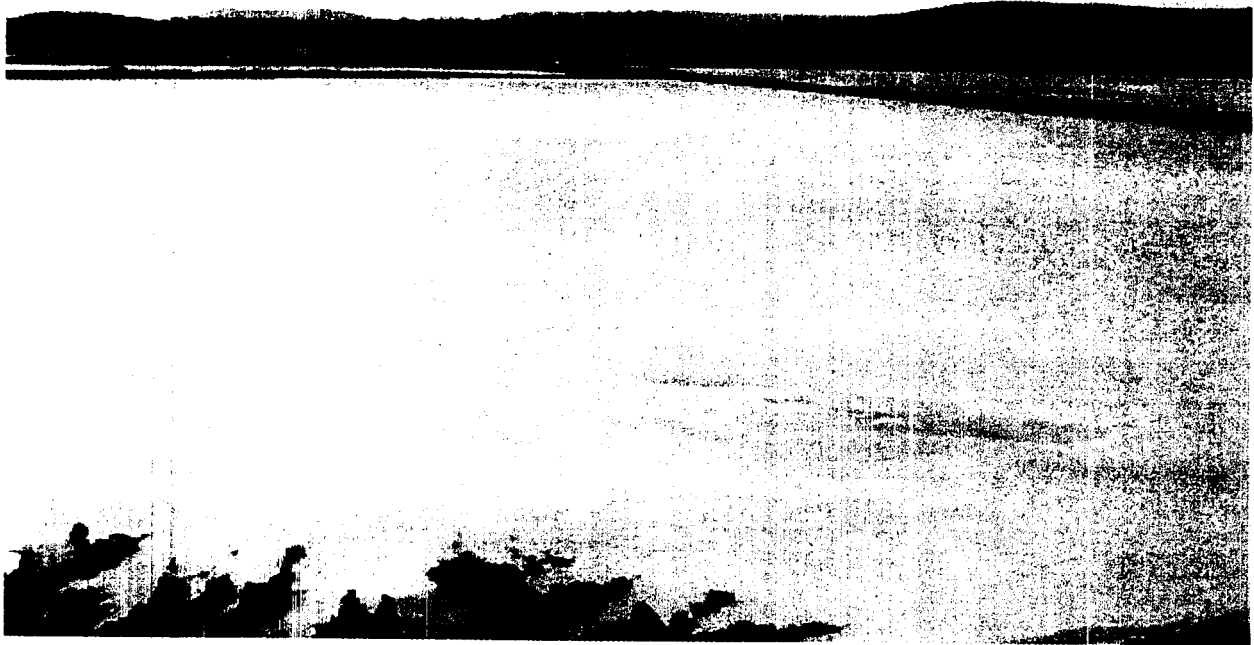


Photo 7. Active Gypsum Stacking Area – looking across Pond 3.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2004**

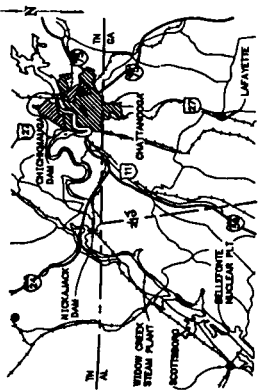
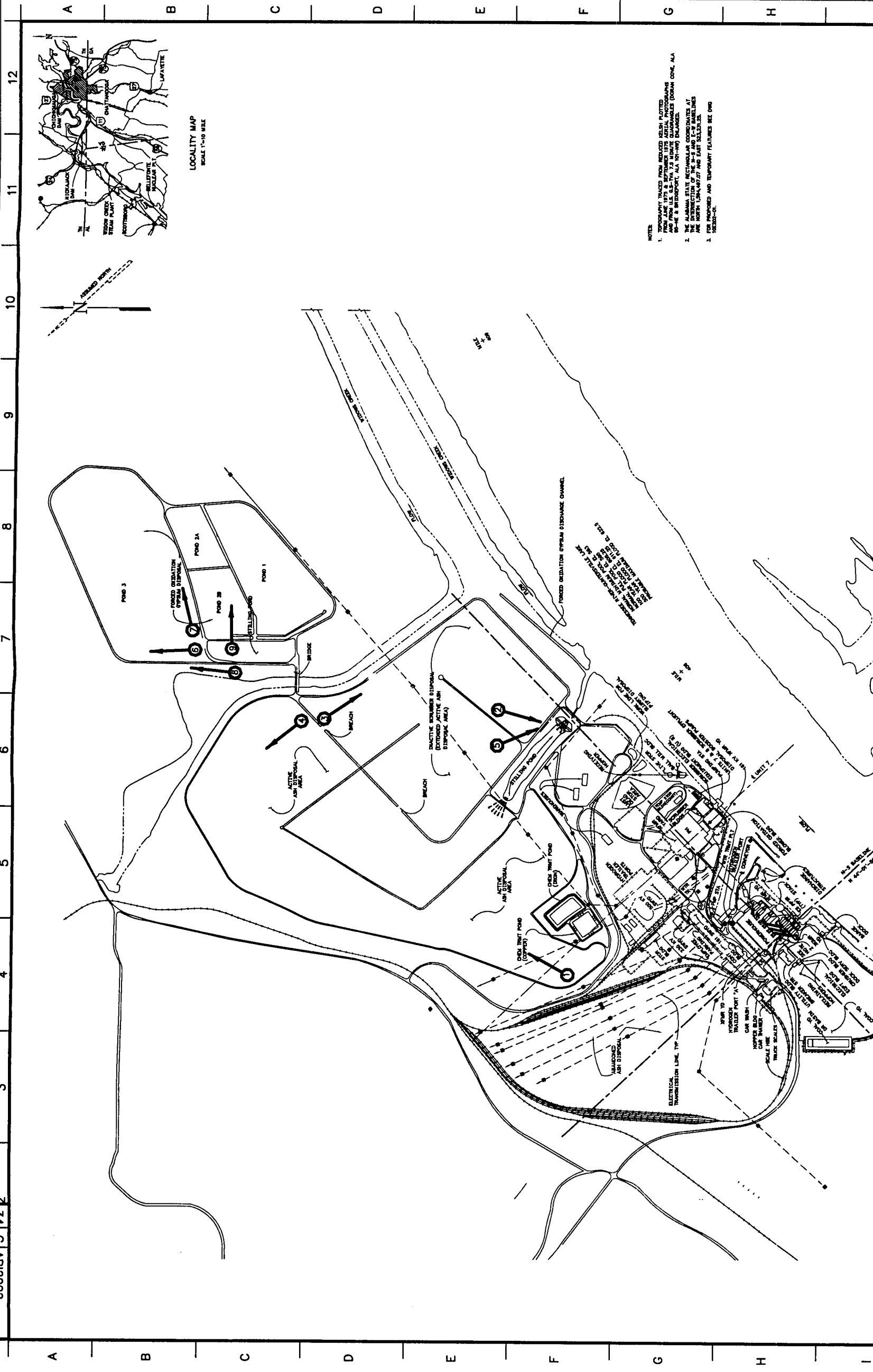


Photo 8. Active Gypsum Stacking Area (dike area of Pond 3)— new gypsum being stacked too steep.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE STABILITY INSPECTION
2004**



Photo 9. Active Gypsum Stacking Area – pipe discharging from pond 2b to perimeter ditch prior to discharge to stilling pond.



LOCALITY MAP
SCALE 1"-10 MILE

NOTES
 1. TOPOGRAPHY TRACED FROM REDUCED MESH PLOTTED FROM JAN. 1975 & SUPPLEMENTED WITH AERIAL PHOTOGRAPHS OF AREA & PHOTOGRAPHS OF SUBJECTS (DURHAM CO. ALA. & INTRODUCTION, ALA. 101-100) INLAND.
 2. THE ALABAMA STATE RECTANGULAR COORDINATES AT THE INTERSECTION OF THE 2"-2" AND 1"-2" MARKS ARE 1344-87.27' AND EAST 8533.51'.
 3. FOR PROPOSED AND TEMPORARY FEATURES SEE DWG. 102200-01.

DATE	BY	CHECKED	DATE	BY

SCALE: EXCEPT AS NOTED
 MAIN PLANT (UNITS 1-9)
 ASH DISPOSAL AREA
 2003 ANNUAL INSPECTION
 PAGE 8 OF 8

WIDOWS CREEK FOSSIL PLANT
 TENNESSEE VALLEY AUTHORITY
 FORMAL AND HYDRO DRAINAGE

AUTOCAD FILE: 10/27/03 24 C API2003
 PLOT FACTOR: 4000
 L:TW
 E:VA
 C.A.D. DRAWING
 DO NOT ALTER MANUALLY

PHOTO TAKEN AT THIS LOCATION
 IN THIS DIRECTION.



NOTE:
 THIS DWM SUPERSEDES DWM 1027200-01

TENNESSEE VALLEY AUTHORITY
WIDOWS CREEK FOSSIL PLANT

ANNUAL ASH POND DIKE
STABILITY INSPECTION



Prepared by: Sherman G. Garrett
Date: January 21, 2005

**WIDOWS CREEK FOSSIL PLANT
ASH POND DIKE STABILITY INSPECTION
2005**

The waste disposal areas at Widows Creek Fossil Plant were inspected for dike structural stability on January 11, 2005. The inspection was performed by Sherman G. Garrett of TVA Engineering Design Services. The previous annual inspection had been performed on October 16, 2003.

The results of the annual dike stability inspection are listed below according to location within the ash disposal area. Reference is made to inspection drawing API05.

ACTIVE ASH DISPOSAL AREA

All bottom ash and fly ash continues to be sluiced into the southwest corner of this area. The bottom ash drops out near the outfall of the pipes and is periodically removed. The fly ash flows northeast into the active ash pond, around the deflector dikes, and southeast through a breach in the interior divider dike. The breaches into the expanded ash pond (inactive SO₂ scrubber pond) have been closed. Water is then discharged through five standard spillways with skimmers into the stilling pond. Water is discharged from the stilling pond through another five standard spillways with skimmers into the pumping station pond. From the pumping station pond, water is either discharged into Guntersville Reservoir through three overflow pipes or it is pumped primarily to the CCW intake with a portion being pumped into the wet gypsum system as make-up water.

The ditch from the pipe discharge point (units 1–6 sluice water) to the active ash pond is currently routed along the west dike allowing ash to dry for use in raising dikes for the dredge pond.

The five standard spillways with skimmers discharging from the active ash pond to the stilling pond appeared to be in good condition and operating properly. There was a loose connection securing the walkway to bollards (photo 1) There was no walkway to the two easternmost spillways preventing closer inspection (photo 2). The five standard spillways discharging from the stilling pond into the pumping station pond area also appeared to be in good condition and functioning properly. There seems to be an over-reliance on floating skimmers to keep debris and cenospheres from discharging from the ponds. Floating skimmers were scattered throughout both the active and inactive ash disposal areas. While the discharge spillways appeared to be functioning as designed, debris and cenospheres were on both sides of the floating skimmers.

The exterior and interior dike slopes of the active ash pond have an excellent vegetative cover and appear to be in good condition with no signs of instability. However, there are some large trees on the exterior slopes (photos 3 & 4). Previous reports indicate observation of animal burrows in the interior dike slope just above the water level in some areas along the northwestern dike of this area. None were noted during this inspection. Seeps, noted in previous reports, at the toe of the exterior slope of the east dike, both north and south of the bridge over Widows Creek, were not observed. However, they may still be present.

At the time of this inspection ash was being dredged from the northeast portion of the active ash pond into the southwest portion.

**WIDOWS CREEK FOSSIL PLANT
ASH POND DIKE STABILITY INSPECTION
2005**

INACTIVE SCRUBBER POND AREA WEST OF WIDOWS CREEK

This area has been returned to temporary inactive status by closing the two breaches in the divider dike separating this area from the active ash pond. This area has been divided into two sections by extending a deflector dike. No dredging or sluicing was observed in this area, but the two transmission towers in the northern area have been coated for higher water elevations.

Most of the lower exterior dike slopes of the inactive ash pond have a good vegetative cover and appear to be in good condition with no signs of instability (photo 5). However, on the lower northeastern slope adjacent to Widows Creek, there was significant erosion. This area needs repair with an earth cover and seeding and mulching (photos 6 & 7). The open channel outside the southeastern side of this area appeared to have no obstructions to flow. On the upper portion of the western, southern, and northern exterior slopes, grass cover has failed to be successfully established (photos 8 & 9). This area needs repair. In addition, on the northeastern slope, there appear to be animal trenches on the surface with holes burrowed into the dike (photo 10). Remedial action should be taken to restore this area.

The ditch along the exterior toe of the west, south, and east dikes of this area that drains surface runoff and seepage to the containment basin, did not appear to have any obstructions. This is a long ditch with a relatively flat slope and requires periodic maintenance to keep it functioning properly. There were several areas of standing water.

FORCED OXIDATION GYPSUM STACKING AREA EAST OF WIDOWS CREEK

The development of this area is being managed by TVA's Heavy Equipment Division (HED). The gypsum material is sluiced into this area alternately at two locations. 1—At the southwest corner of Pond 3, from which it flows north and east around an interior deflector dike, constructed of gypsum material, which extends into the northeast portion of Pond 3. It can be turned into Pond 3 at any point along the deflector dike. 2—At the west end of Pond 1, from which it flows east and is discharged into the east end of Pond 2A. Pond 2A can be discharged either into Pond 2B or into Pond 3. The sluice water is discharged from Pond 3 into Pond 2B and from the northwest corner of Pond 2B into the perimeter ditch, which discharges into the northeast corner of the Stilling Pond. Water is discharged from the Stilling Pond by gravity through a long pipe and into a channel south of the inactive scrubber disposal area and flows into Guntersville Reservoir.

The slopes of the gypsum stack in Pond 1, and the lower slopes of the stack in Pond 2A, Pond 2B, and Pond 3 have been covered with earth and seeded, and generally have a good cover of vegetation. However, in some areas, gypsum material is being eroded from the uncovered stack slopes above onto the previously covered slopes below (photo 11).

The perimeter dikes surrounding the gypsum stacking area appear to be in good condition with no signs of instability. However, the newly stacked slopes of gypsum at the top of the stacking area are too steep (photo 12). A capital project is currently planned to correct the deficiencies.

The interior slopes of the stilling pond are in good condition and have a good vegetative cover. Sediment build up that has developed in the stilling pond area is currently being cleaned out. It appears that an oily sheen is covering the surface of the stilling pond.

**WIDOWS CREEK FOSSIL PLANT
ASH POND DIKE STABILITY INSPECTION
2005**

INACTIVE ASH POND AREA WITHIN THE RAILROAD LOOP

This disposal site is no longer in use. The area is covered in trees and vegetation.

CHEMICAL TREATMENT PONDS

Both the iron and copper chemical treatment ponds are located within the active ash disposal area in its southwest corner. Effluent from plant chemical cleaning processes is discharged into these ponds and treated before it is pumped into the active ash pond.

These ponds have no exterior slopes. All interior slopes were covered with riprap in good condition with no signs of erosion. Small trees and brush were growing along the edges of the copper pond (photo 13).

COAL YARD DRAINAGE BASIN

The coal yard drainage basin is located west of the plant adjacent to the northwest side of the coal yard area. This basin also has no exterior slopes. The interior slopes were vegetated and showed no signs of erosion (photo 14). It receives rainfall runoff from the coal pile and yard equipment areas. The discharge from this pond is pumped into the active ash pond area. No boats were available for sounding the depth of the basin due to their use in dredging operations. However, rough measurements were performed along with visual observation of silt buildup.

At the time of inspection, the water in the pond was at approximate elevation 602. The bottom elevation of the pond is approximately 594 along its 450 ft. bottom length. Based on an assumed maximum elevation of 603 for storage of coal fines, grit, and silt runoff, approximately 53% of the pond storage capacity is being used. The depth of grit and silt is estimated to average 5'-3".

ACTIONS SINCE LAST INSPECTION

- Plant personnel have continued to make periodic observations of the dikes of the waste disposal areas for surface sloughs, wave erosion damage, new seepage areas, etc.
- Plant personnel have established a schedule for mowing exterior slopes of all dikes two times each year.
- HED is performing bottom ash stacking in accordance with the stacking plan shown on drawings 10W7463-1 and -2.
- Plant personnel will replace broken floater attachments upon completion of dredging.
- A capital project is pending to correct the exterior slopes of the gypsum stack.
- An approved O&M project will install an underdrain system in Pond 2B and Pond 3 of the Active Gypsum Stacking Area.

RECOMMENDATIONS

- Closely monitor the perimeter ditches for the inactive scrubber disposal area, especially prior to predicted rainfall events, to ensure they are clear and will contain the runoff and sedimentation that will occur as a result of these events.

**WIDOWS CREEK FOSSIL PLANT
ASH POND DIKE STABILITY INSPECTION
2005**

- Repair the erosion and washouts on the lower northeastern slope of the inactive scrubber disposal area (extended ash disposal area). Estimated 5,000 cy of earth fill and 7,500 sy of seeding and mulching.
- Seed and mulch the upper slopes of the inactive scrubber disposal area (extended ash disposal area). Estimated quantity of 9,000 sy.

WIDOWS CREEK FOSSIL PLANT

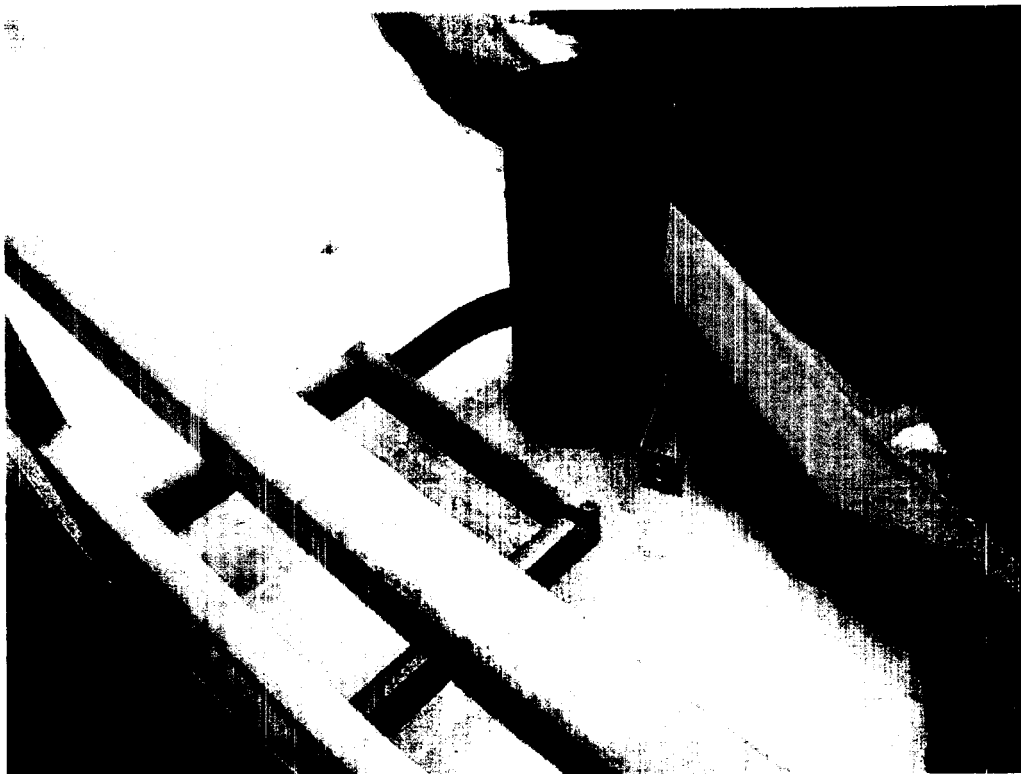


Photo 1—Loose walkway connection at active ash pond spillway skimmers



Photo 2—Looking north at active ash pond spillway skimmers. Note absence of access walkway

WIDOWS CREEK FOSSIL PLANT



Photo 3—Looking west along dike road at exterior slope of active ash disposal area



Photo 4—Looking north along dike road at exterior slope of active ash disposal area

WIDOWS CREEK FOSSIL PLANT



Photo 5—Looking northeast at southeast exterior dike slope of inactive scrubber pond

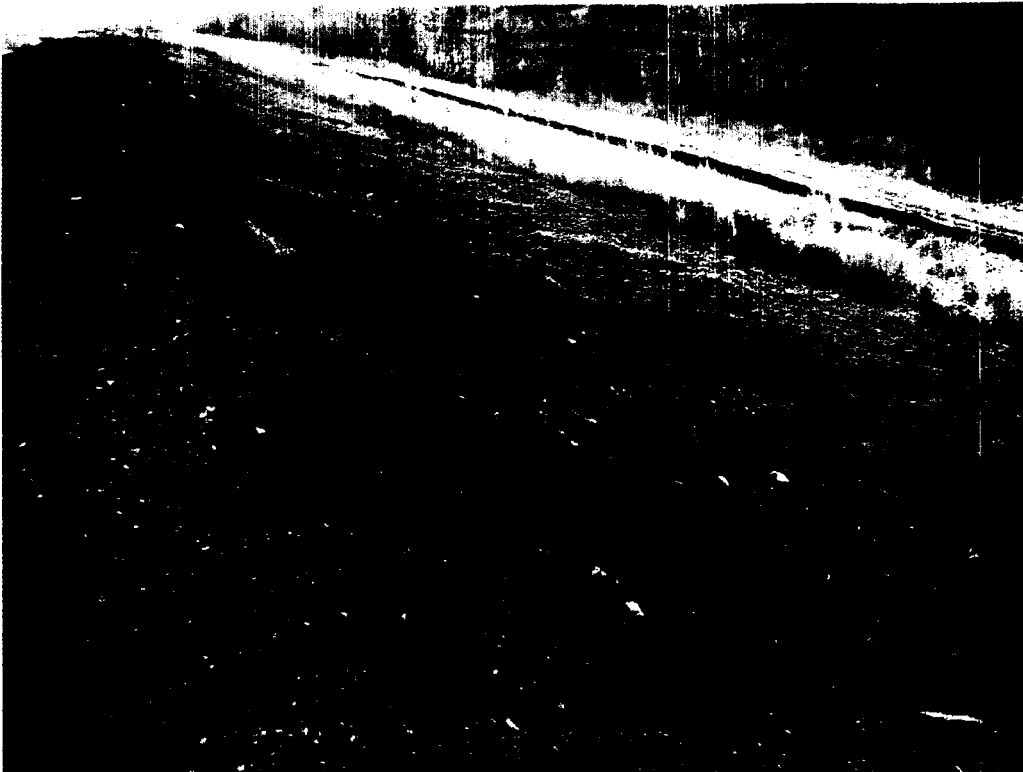


Photo 6—Looking northwest: Erosion along northeast lower exterior dike of inactive scrubber pond

WIDOWS CREEK FOSSIL PLANT

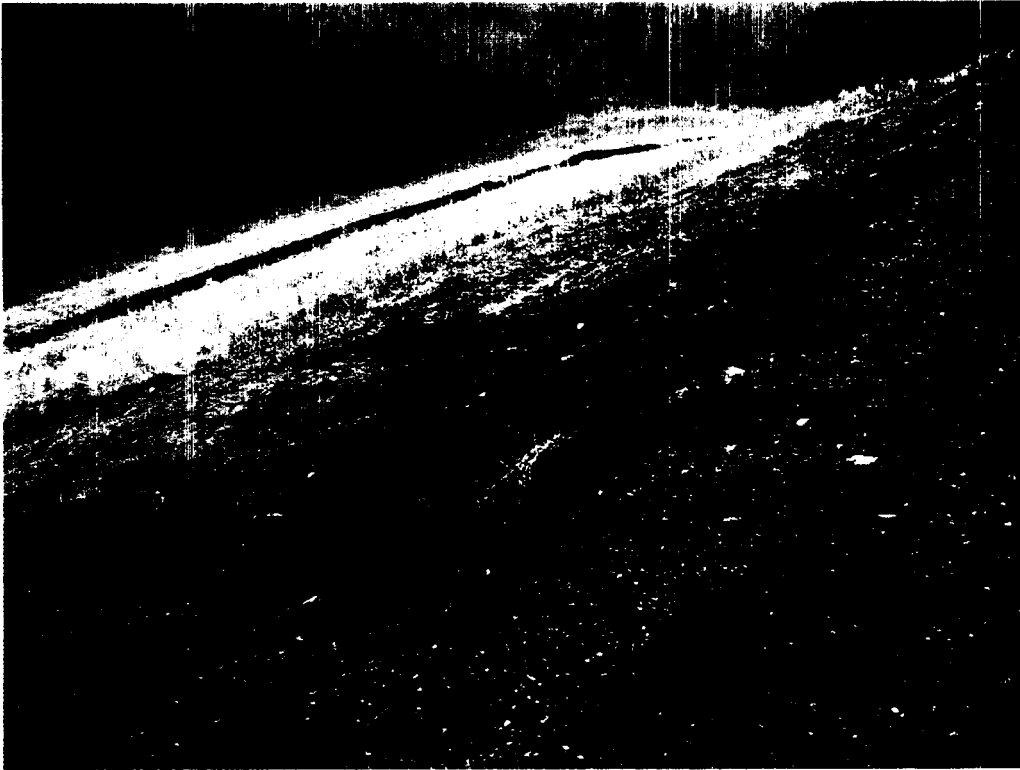


Photo 7— Looking southeast: Erosion along northeast lower exterior dike of inactive scrubber pond



Photo 8— Looking southwest at upper exterior dike slopes near easternmost corner of inactive scrubber pond

WIDOWS CREEK FOSSIL PLANT



Photo 9—Looking northwest at upper exterior dike slopes near easternmost corner of inactive scrubber pond



Photo 10—Animal trenches on eastern upper dike slope of inactive scrubber pond

WIDOWS CREEK FOSSIL PLANT



Photo 11—Erosion of gypsum material on exterior eastern slope of gypsum stacking area



Photo 12—Looking north at steep slopes of gypsum on eastern side of stacking area

WIDOWS CREEK FOSSIL PLANT

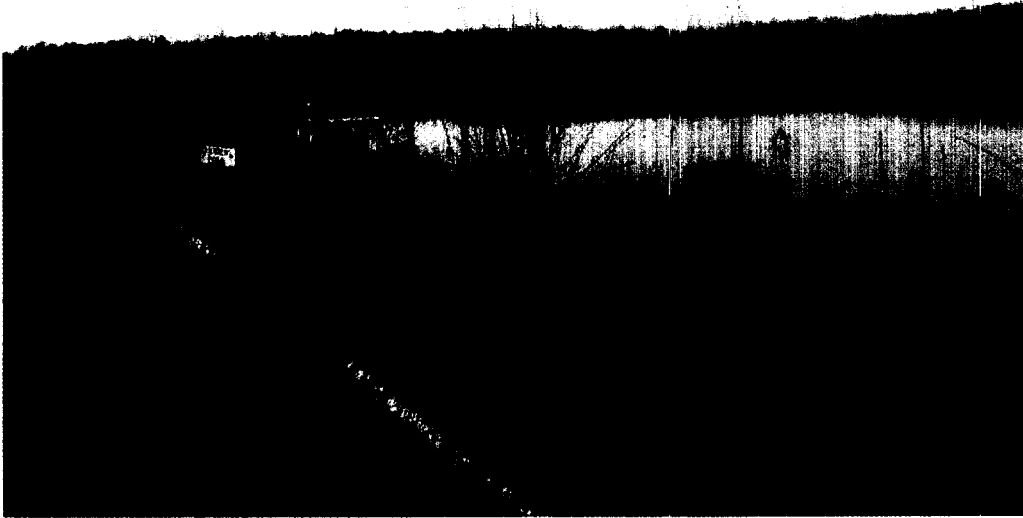


Photo 13—Looking west at trees and brush along interior slopes of chemical treatment pond (copper)



Photo 14—Looking south at coal yard drainage basin

March 30, 2006

Gerald L. Hemmer, Plant Manager
WCF 1A-STA

**WIDOW'S CREEK FOSSIL PLANT (WCF) - ANNUAL ASH POND DIKE STABILITY
INSPECTION**

Attached is the latest dike stability inspection for your plant. The report was prepared by Michael S. Hughes of Civil Engineering. Mike performed the dike stability inspection on March 2, 2006. The report includes recommendations for repairs and corrective actions. I concur with those recommendations.

If you have questions or comments, please call Mike Hughes at (423) 751-2783.

Dennis Lundy, Manager
Engineering Design Services
LP 2G-C

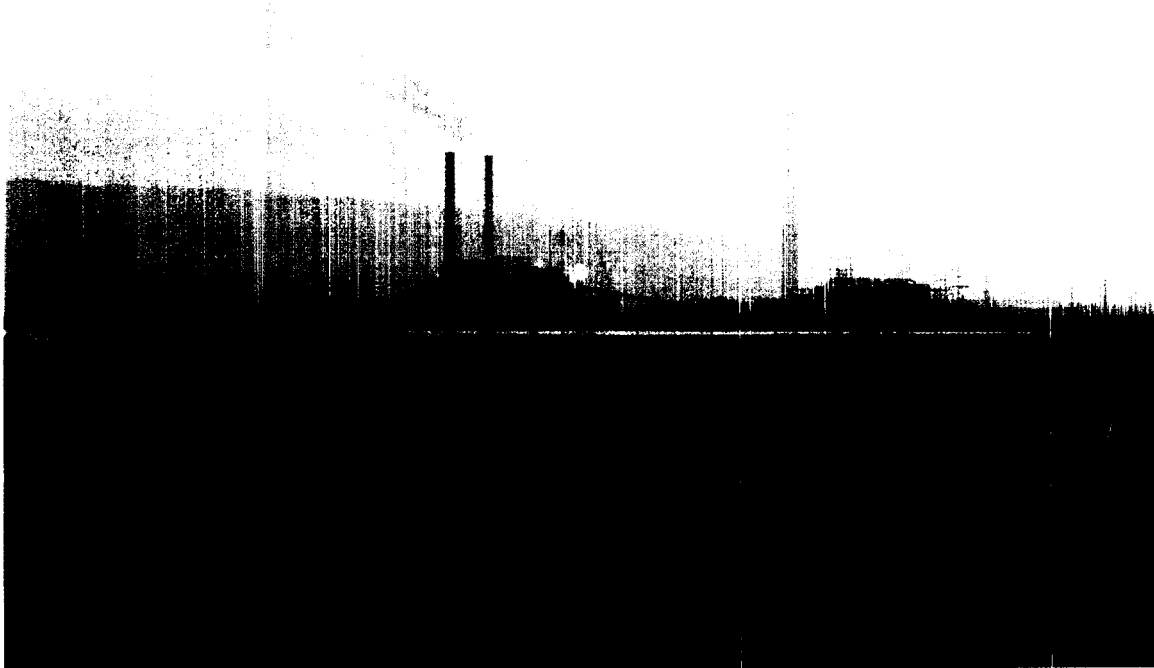
REP:HLP:MSH
Attachment

cc (w/attachment):

Steve Baugh, LP 5G-C
Michael Davis, LP 5E-C
Mike Stiefel, LP 5D-C
Gary MacDonald, LP 5E-C
S.R. Kramer, LP 1F-C
David Blizard, WCF 1A-STA
John Pinnix, WCF 1A-STA

TENNESSEE VALLEY AUTHORITY
WIDOWS CREEK FOSSIL PLANT

ANNUAL ASH POND DIKE
STABILITY INSPECTION



Prepared by: Michael S. Hughes, P.E.
Date: March 30, 2006

**WIDOWS CREEK FOSSIL PLANT
ASH POND DIKE STABILITY INSPECTION
2006**

The waste disposal areas at Widows Creek Fossil Plant were inspected for dike structural stability on March 2 and 3, 2006. The inspection was performed by Michael S. Hughes of TVA Engineering Design Services. The previous annual inspection had been performed on January 11, 2005.

The results of the annual dike stability inspection are listed below according to location within the ash disposal area. Reference is made to inspection drawing API06.

ACTIVE ASH DISPOSAL AREA

All bottom ash and fly ash continues to be sluiced into the southwest corner of this area. The bottom ash drops out near the outfall of the pipes and is periodically removed. The fly ash flows northeast into the active ash pond, around the deflector dikes, and southeast through a breach in the interior divider dike. The breaches into the expanded ash pond (inactive SO₂ scrubber pond) have been closed and a dredge cell has been constructed over this area. Water is then discharged through five standard spillways with skimmers into the stilling pond. Water is discharged from the stilling pond through another five standard spillways with skimmers into the pumping station pond. From the pumping station pond, water is either discharged into Gunterville Reservoir through three overflow pipes or it is pumped primarily to the CCW intake with a portion being pumped into the wet gypsum system as make-up water (see Picture 1).

The ditch from the pipe discharge point (from units 1–6 sluice water) to the active ash pond is currently routed along the west dike allowing ash to dry for use in raising dikes for the dredge pond.

The five standard spillways with skimmers discharging from the active ash pond to the stilling pond appeared to be in good condition and operating properly. There was a loose connection securing the walkway to bollards. There was no walkway to the two easternmost spillways preventing closer inspection (see Picture 2). The five standard spillways discharging from the stilling pond into the pumping station pond area also appeared to be in good condition and functioning properly (see Picture 3). There seems to be an over-reliance on floating skimmers to keep debris and cenospheres from discharging from the ponds. Floating skimmers were scattered throughout both the active and inactive ash disposal areas. The discharge spillways appeared to be functioning as designed, however, there was access available to only one of the skimmers.

The exterior and interior dike slopes of the active ash pond have an excellent vegetative cover and appear to be in good condition with no signs of instability. However, there are some trees on the exterior slopes. Previous reports indicate observation of animal burrows in the interior dike slope just above the water level in some areas along the northwestern dike of this area. None were noted during this inspection. Seeps, noted in previous reports, at the toe of the exterior slope of the east dike, both north and south of the bridge over Widows Creek, were not observed. However, they may still be present.

At the time of this inspection ash was being dredged from the southeast portion of the active ash pond into the southern portion of the Widows Creek Dredge Cell.

**WIDOWS CREEK FOSSIL PLANT
ASH POND DIKE STABILITY INSPECTION
2006**

WIDOWS CREEK DREDGE CELL (FORMERLY THE "INACTIVE SCRUBBER DISPOSAL AREA")

A portion of this area has been returned to temporary inactive status by closing the two breaches in the divider dike separating this area from the active ash pond. This area has been divided into two sections by extending a deflector dike. Sluicing was observed to the southern most section of this area, and the two transmission towers in the northern area are been coated for higher water elevations. The interior of the dikes had excessive erosion, especially in the southern area, but extreme erosion was occurring in the northern portion as well (see Pictures 4 and 5).

Most of the lower exterior dike slopes of the area have a good vegetative cover and appear sound. There were no signs of instability. However, on the lower southeastern slope adjacent to Widows Creek, there was significant erosion (see Pictures 6 and 7). This area needs repair with seeding and mulching. Last year, it was reported that the lower northeastern slope had significant erosion. At the time of this inspection, this portion of the slope looked well vegetated and stable. The open channel outside the southeastern side of this area appeared to have no obstructions to flow. On the upper portion of the western, southern, and northern exterior slopes, grass cover has been established, but is sparse (see Pictures 8 and 9).

The ditch along the exterior toe of the west, south, and east dikes of this area that drains surface runoff and seepage to the containment basin did not appear to have any obstructions. This is a long ditch with a relatively flat slope and requires periodic maintenance to keep it functioning properly. There were several areas of standing water.

FORCED OXIDATION GYPSUM STACKING AREA EAST OF WIDOWS CREEK

The development of this area is being managed by TVA's Heavy Equipment Division (HED). The gypsum material is sluiced into this area alternately at two locations. First, sluicing occurs in the southwest corner of Pond 3, and flows north and east around an interior deflector dike, constructed of gypsum material, which extends into the northeast portion of Pond 3. It can be turned into Pond 3 at any point along the deflector dike. Second, sluicing occurs at the west end of Pond 1 and flows east and is being discharged into the east end of Pond 2A. Pond 2A can be discharged either into Pond 2B or into Pond 3. The sluice water is discharged from Pond 3 into Pond 2B, and from the northwest corner of Pond 2B into the perimeter ditch. The perimeter ditch discharges into the northeast corner of the Stilling Pond. Water is discharged from the Stilling Pond by gravity through a long pipe into a channel south of the inactive scrubber disposal area and into Guntersville Reservoir.

The exterior slopes of the gypsum stack in Pond 1, and the lower slopes of the stack in Pond 2B have been covered with earth and seeded, and generally have a good cover of vegetation.

The perimeter dikes surrounding the gypsum stacking have been reworked to provide a stable 2.75:1 or gentler slope. Toes drains have been installed with manholes and outlet pipes to drain the stack (see Picture 10). A blanket drain has been installed at the northeast corner of the stack to allow gypsum to be stacked to the original design footprint. This Project was undertaken to prevent further sloughing of the stacks that occurred in early 2005. Additional work needs to be completed in the north face of the stack to address some installation deficiencies (see Picture 11)

The interior slopes of the stilling pond are in good condition and have a good vegetative cover.

**WIDOWS CREEK FOSSIL PLANT
ASH POND DIKE STABILITY INSPECTION
2006**

Three turbidity curtains have been installed in the stilling pond to prevent the migration of cenospheres into the spillways.

INACTIVE ASH POND AREA WITHIN THE RAILROAD LOOP

This disposal site is no longer in use. The area is covered in trees and vegetation.

CHEMICAL TREATMENT PONDS

Both the iron and copper chemical treatment ponds are located within the active ash disposal area in its southwest corner. Effluent from plant chemical cleaning processes is discharged into these ponds and treated before it is pumped into the active ash pond.

These ponds have no exterior slopes. All interior slopes were covered with riprap in good condition with no signs of erosion. Small trees and brush were growing along the edges of the copper pond.

The ditch along the contractor's entrance road at the area adjacent to the chemical treatment ponds exhibits excessive red water seepage (see Pictures 12 and 13). It is not believed that this is from the chemical treatment ponds as both ponds are lined with 3 to 4 feet thick clay liners. An investigation is ongoing to locate the source of the seeps. Once the source is identified, measures can be taken to stop the seepage or interim measures taken to protect the outer dike at this location.

COAL YARD DRAINAGE BASIN

The coal yard drainage basin is located west of the plant adjacent to the northwest side of the coal yard area. This basin also has no exterior slopes. The interior slopes were vegetated and showed no signs of erosion. It receives rainfall runoff from the coal pile and yard equipment areas. The discharge from this pond is pumped into the active ash pond area. No boats were available for sounding the depth of the basin due to their use in dredging operations. However, rough measurements were performed along with visual observation of silt buildup.

At the time of inspection, the water in the pond was at approximate elevation 602. The bottom elevation of the pond is approximately 594.5 +/- along its 450 ft. bottom length. Based on an assumed maximum elevation of 603 for storage of coal fines, grit, and silt runoff, approximately 54% of the pond storage capacity is being used. The depth of grit and silt is estimated to average 5'-5". The drainage basin should be dredged annually to maintain storage capacity.

In the future, others will be surveying the Coal Yard Drainage Basin to more accurately determine the storage capacity remaining. These measurements indicate that the Coal Yard Drainage Basin needs dredging.

ACTIONS SINCE LAST INSPECTION

- Plant personnel have continued to make periodic observations of the dikes of the waste disposal areas for surface sloughs, wave erosion damage, new seepage areas, etc.
- Plant personnel have established a schedule for mowing exterior slopes of all dikes two times each year.
- HED is performing bottom ash stacking in accordance with the stacking plan on Drawings

**WIDOWS CREEK FOSSIL PLANT
ASH POND DIKE STABILITY INSPECTION
2006**

10W7464-1 and -2.

- Plant personnel should replace broken floater attachments upon completion of dredging.
- A capital project was initiated to correct the exterior slopes of the gypsum stack.
- An approved O&M project installed an underdrain system in Pond 3, Pond 2a and a portion of Pond 1 of the Active Gypsum Stacking Area.

RECOMMENDATIONS

- Closely monitor the perimeter ditches for the Widows Creek Dredge Cell, especially prior to predicted rainfall events, to ensure they are clear and will contain the runoff and sedimentation that will occur as a result of these events.
- Repair the erosion and washouts on the lower southeastern slope of the Widows Creek Dredge Cell. Reseed and mulch the upper slopes of the Widows Creek Dredge Cell (extended ash disposal area). Repair the erosion in the interior dikes of the Widows Creek Dredge Cell, both the northern and the southern portions.
- Continue to install bench drains in the gypsum stack as the dike is raised.
- Correct manhole and toe drain installations along the northern portion of the gypsum stack.
- Dredge the coal yard drainage basin as indicated by coal yard drainage basin surveys.

WIDOWS CREEK FOSSIL PLANT



Picture 1: Pumping station

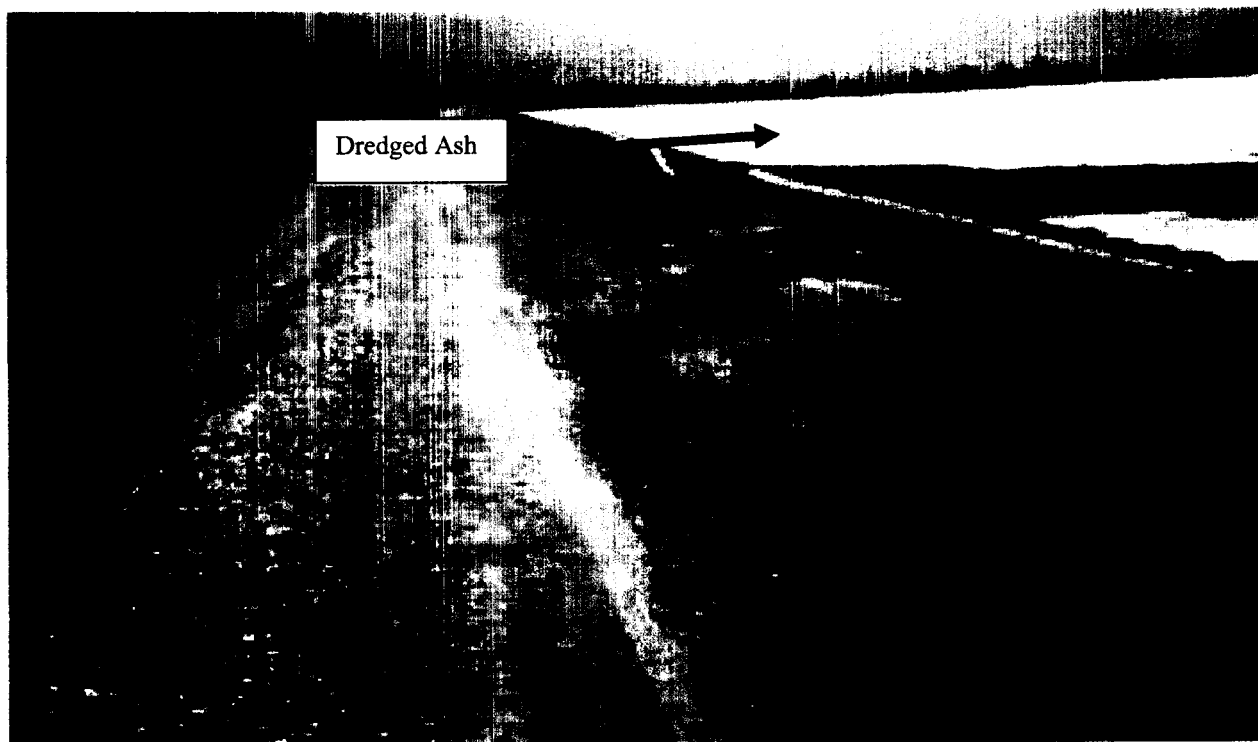


Picture 2: Spillways from the active ash pond, no walkway to the east

WIDOWS CREEK FOSSIL PLANT



Picture 3: Spillways from stilling pond, note access to only one structure

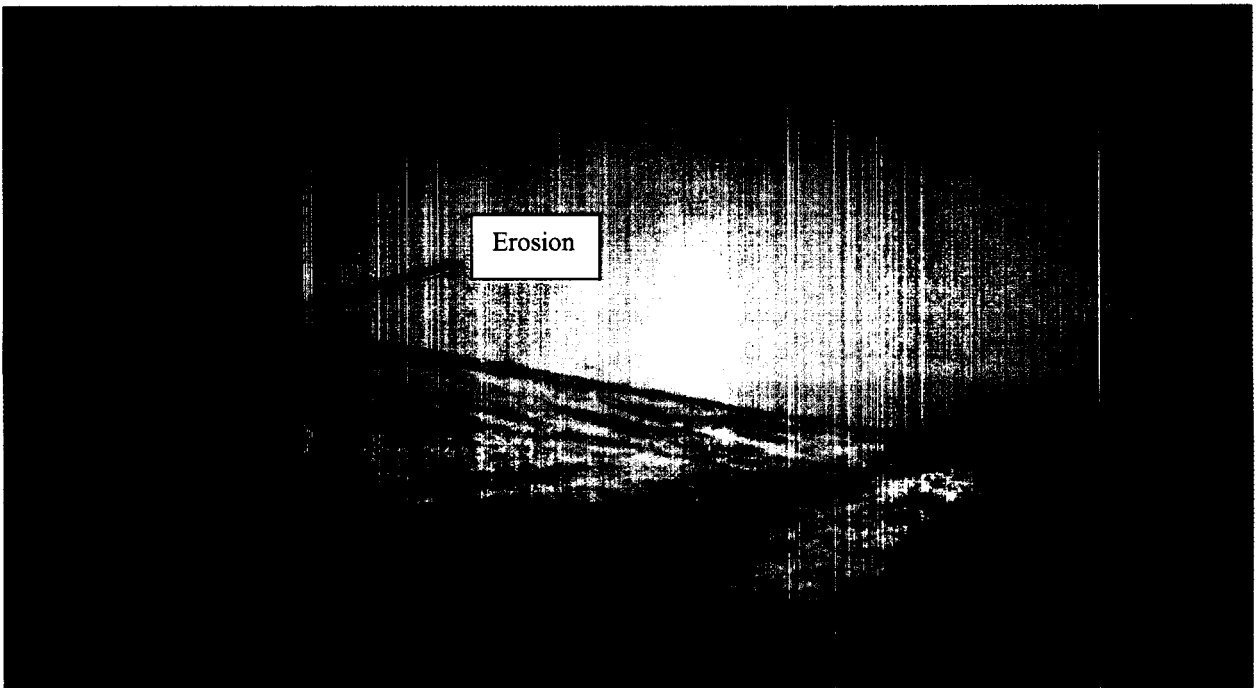


Picture 4: Erosion in upper dike, northern section of Widows Creek Dredge Cell

WIDOWS CREEK FOSSIL PLANT

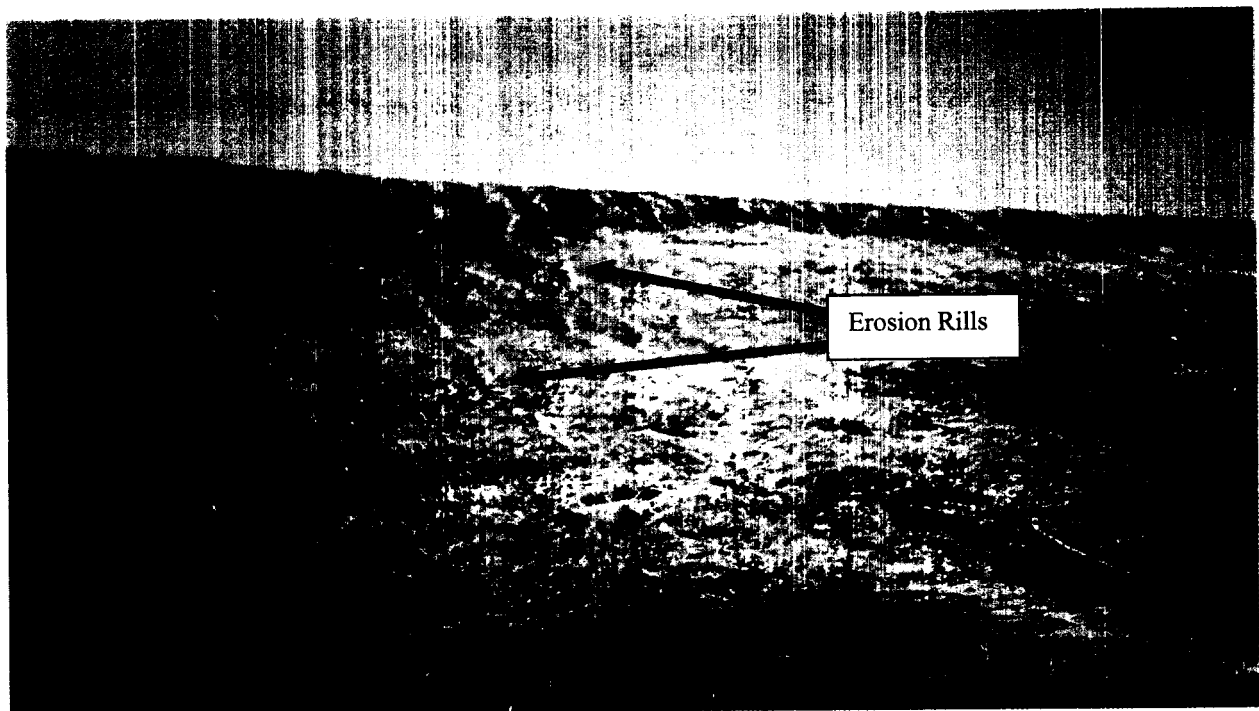


Picture 5: Erosion in upper dike at Widows Creek Dredge Cell

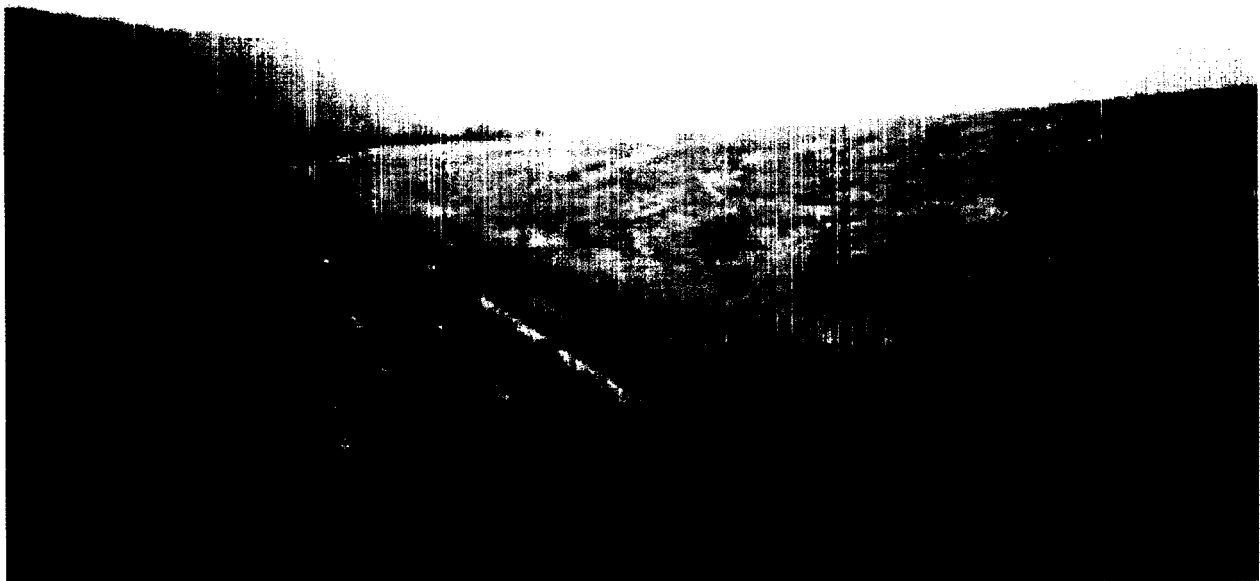


Picture 6. Southeast corner of lower exterior dike, note erosion at top of dike

WIDOWS CREEK FOSSIL PLANT

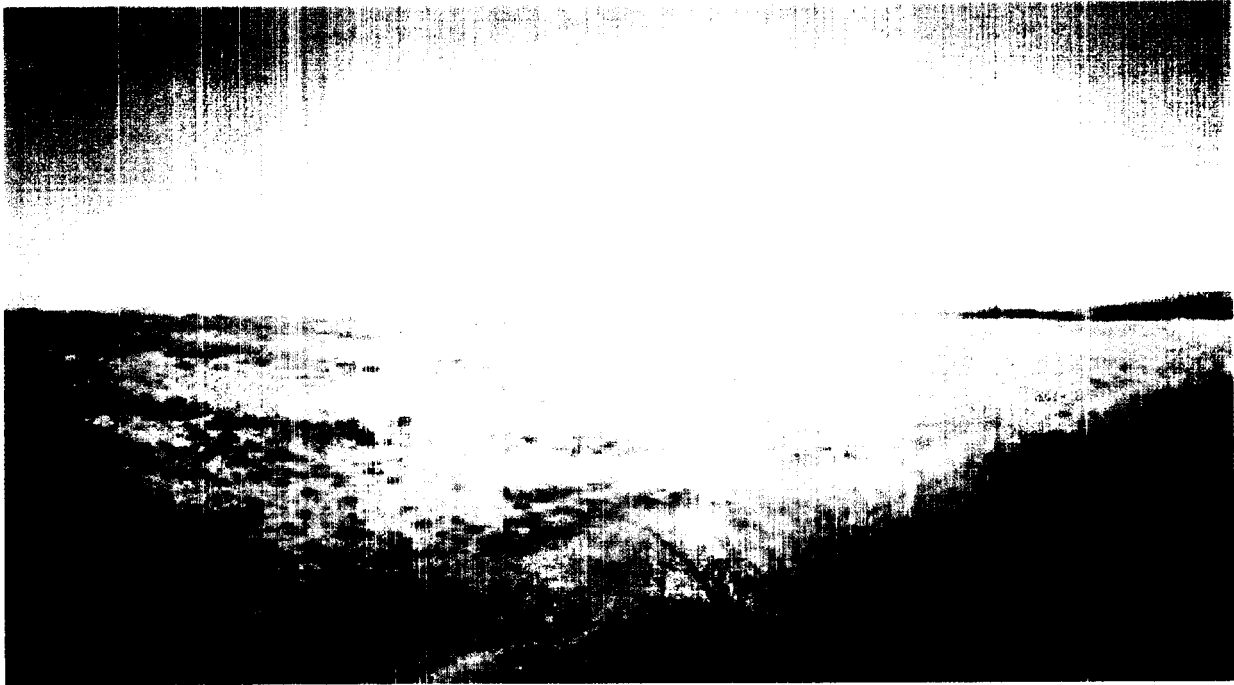


Picture 7: Erosion in top of dike

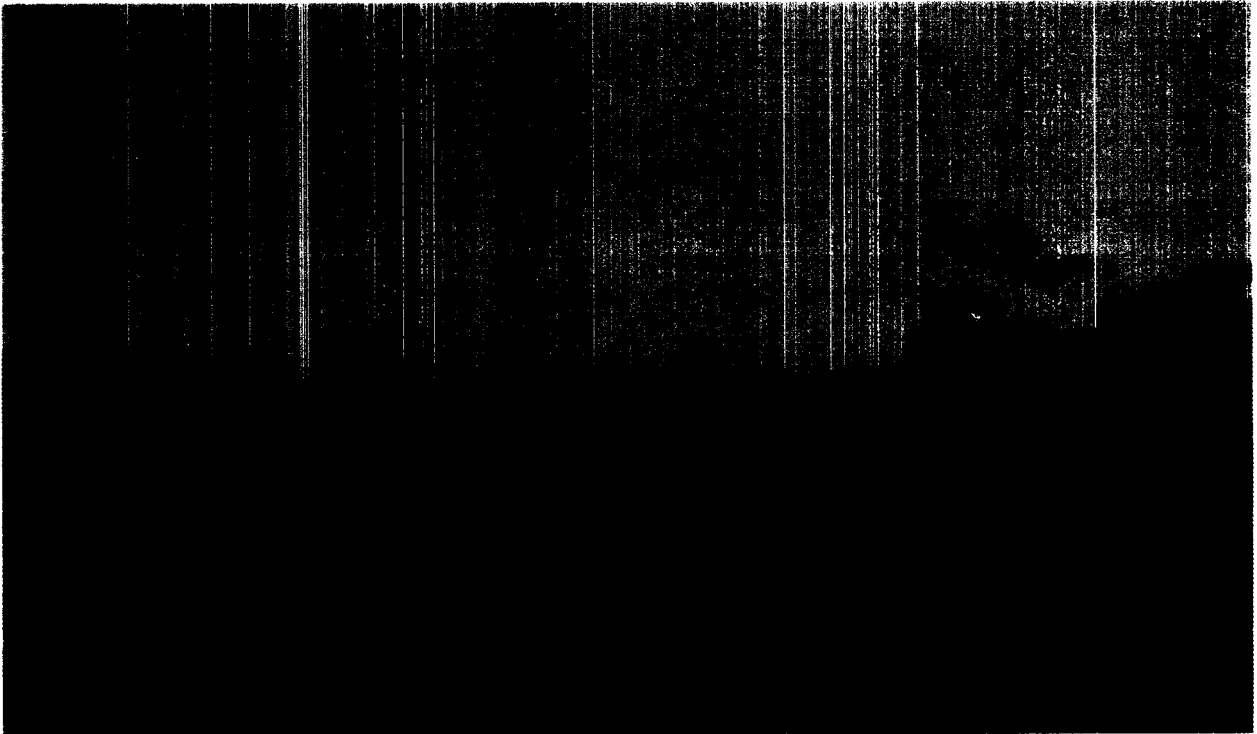


Picture 8: Upper exterior dike, note sparse vegetation

WIDOWS CREEK FOSSIL PLANT

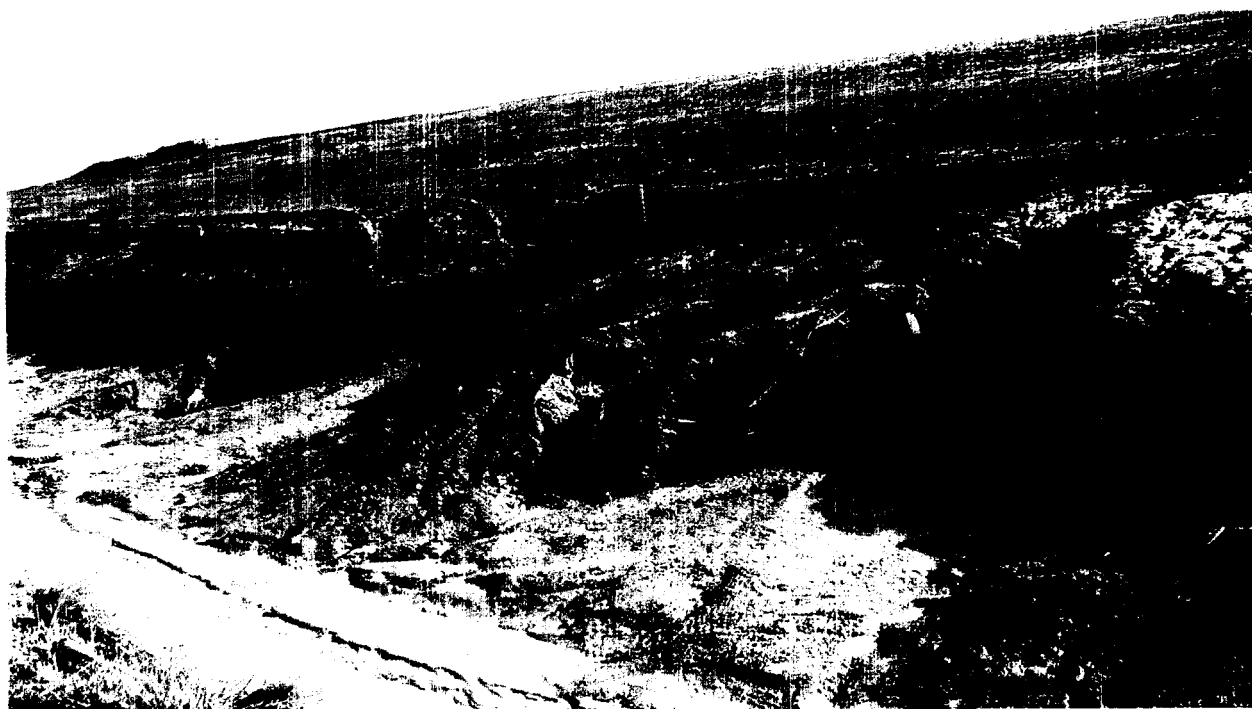


Picture 9: Sparse vegetation on upper dike



Picture 10: Reworking gypsum stack slopes

WIDOWS CREEK FOSSIL PLANT



Picture 11: Additional work to be done on north slope of gypsum stack

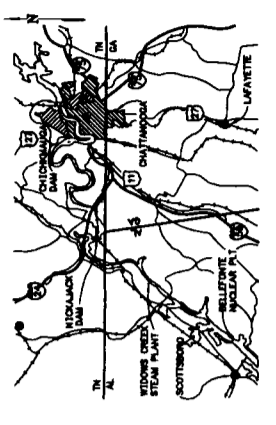
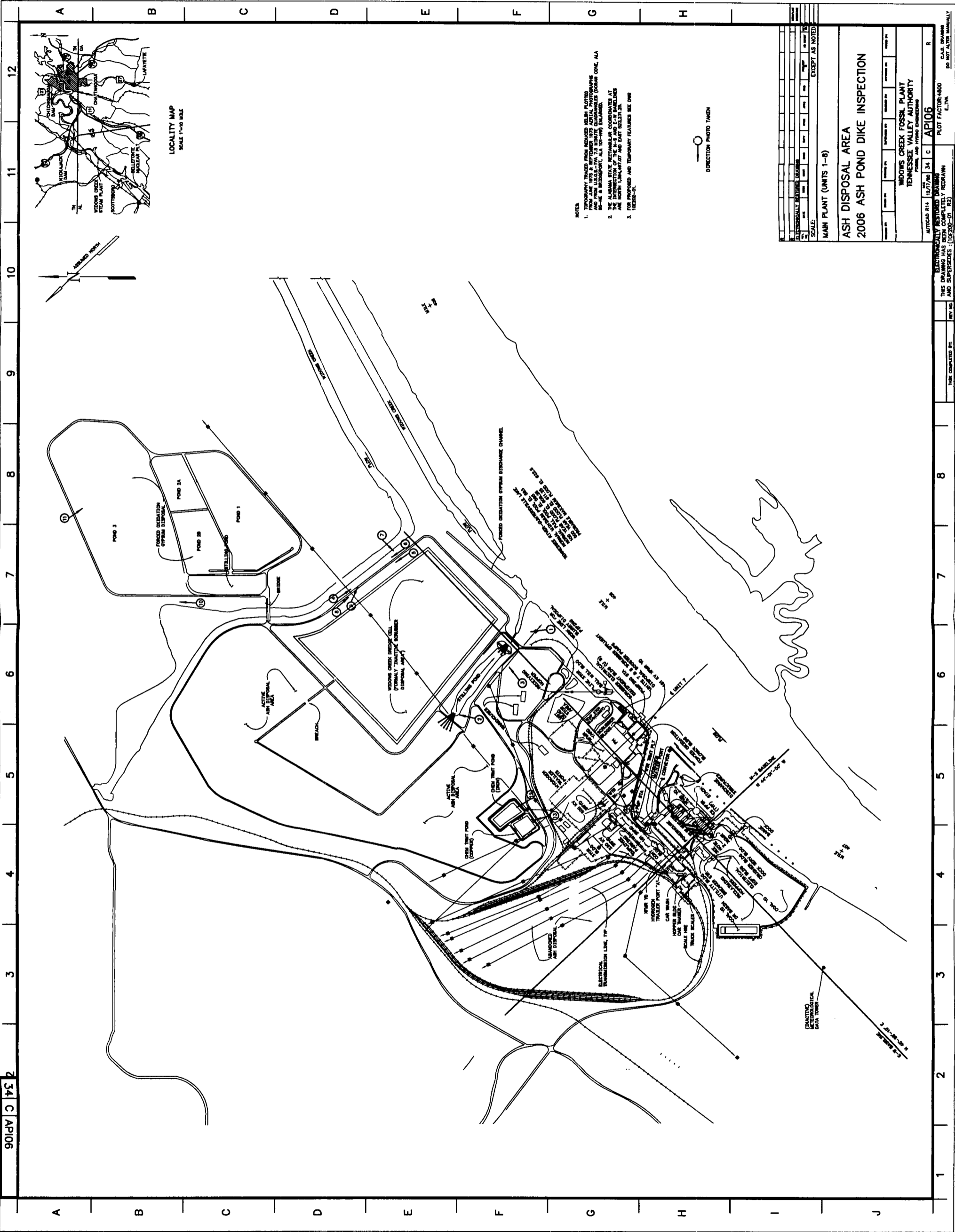


Picture 12: Redwater seeps at contractor's road

WIDOWS CREEK FOSSIL PLANT



Picture 13: Redwater seeps at contractor's road



LOCALITY MAP
SCALE 1"=10 MILE

- NOTES
1. TEMPORARY TRACKS FROM AERIAL PHOTOGRAPHS WERE PLOTTED FROM JUNE 1973 & SEPTEMBER 1975 AERIAL PHOTOGRAPHS WERE PLOTTED FROM AERIAL PHOTOGRAPHS FROM 1973 & 1975. THE TRACKS WERE PLOTTED FROM AERIAL PHOTOGRAPHS FROM 1973 & 1975. THE TRACKS WERE PLOTTED FROM AERIAL PHOTOGRAPHS FROM 1973 & 1975.
 2. THE ALABAMA STATE GEOLOGICAL SURVEY COORDINATES AT THE INTERSECTION OF THE N-S AND E-W BOUNDARIES ARE NORTH 1264497.077 AND EAST 563137.321. (EQUATORIAL COORDINATES ARE 33° 08' 55" N AND 88° 00' 00" W).
 3. FOR PROPOSED AND TEMPORARY FEATURES SEE DWG 102228-01.

DIRECTION PHOTO TAKEN

ELECTRONICALLY RESTORED DRAWING		EXCEPT AS NOTED	
SCALE:			
MAIN PLANT (UNITS 1-8)			
ASH DISPOSAL AREA			
2006 ASH POND DIKE INSPECTION			
MIDCOWS CREEK FOSSIL PLANT		TENNESSEE VALLEY AUTHORITY	
AUTOCAD R14 (12/17/96)		PLOT FACTOR: 4800	
34 C		API06	
THIS DRAWING HAS BEEN COMPLETELY REDRAWN AND SUPERSEDES (102228-01) (R2)		DO NOT ALTER MANUALLY	

34 C API06

1 2 3 4 5 6 7 8 9 10 11 12

B65 070205 265

February 5, 2007

Gerald L. Hemmer, WCA 1A-STA

WIDOWS CREEK FOSSIL PLANT (WCF) - STABILITY INSPECTION OF THE WASTE DISPOSAL AREAS

Attached is a report from Kelly Evans concerning the latest dike stability inspection of WCF ash disposal areas. The inspection was performed on November 27, 28, and 29 in 2006.

The report includes recommendations for corrective work. I concur with those recommendations.

If you have questions, please contact Ron Purkey at Chattanooga extension 4820, or Kelly Evans at Chattanooga extension 4653.



John C. Kammeyer, Manager
Engineering Design Services
LP 2G-C

REP:HLP:KEE:SRF

Attachment

cc (w/Attachment):

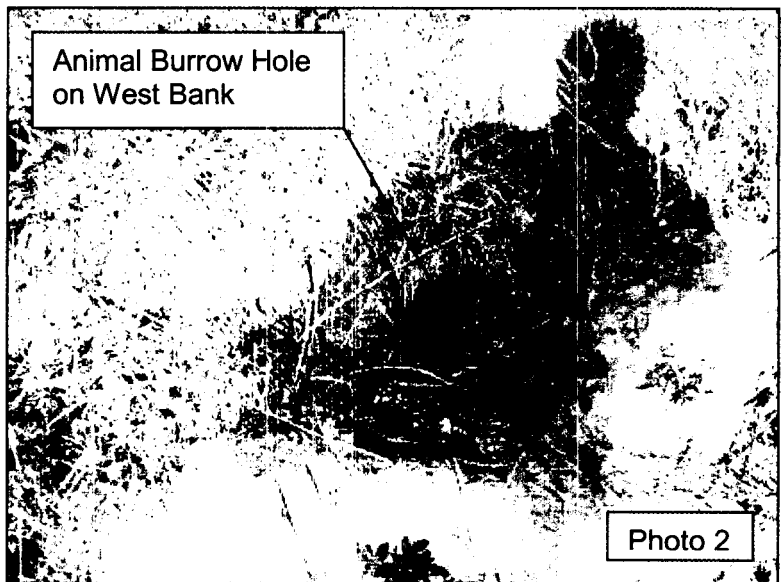
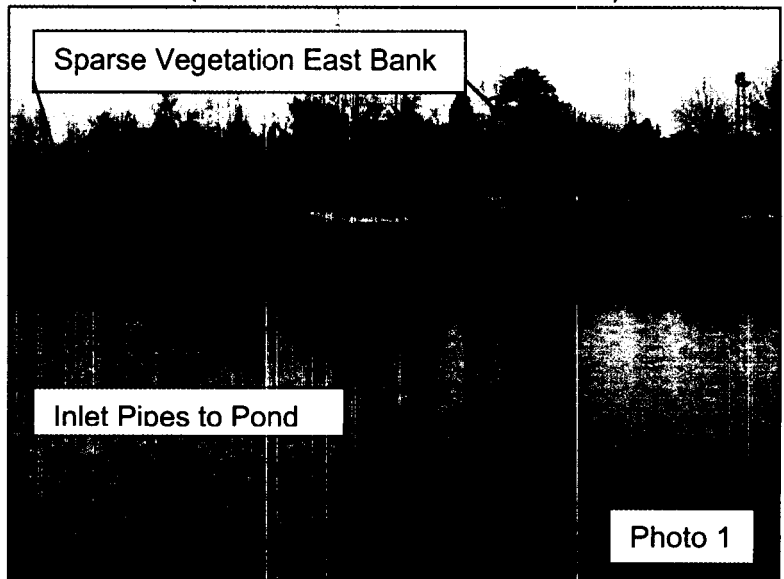
- J. S. Baugh, LP 5G-C
- D. K. Blizzard, WCA-TA-STA
- S. H. Bramlett, WCA-TA-STA
- M. D. Davis, LP 5E-C
- K. E. Evans, LP 2G-C (2 copies)
- R. F. Knox, LP 5G-C
- S. R. Kramer, LP 1F-C
- G. R. MacDonald, LP 5E-C
- J. C. Pinnix, WCA-TA-STA
- K. R. Pruett, WCA-TA-STA
- A. L. Smith, LP 5D-C
- M. B. Stiefel, LP 5D-C
- EDMS, WT CA-K

**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007**

The waste disposal areas at Widows Creek Fossil Plant (WCF) were inspected for dike structural stability on November 27, 28, and 29, 2006 by Kelly Evans of TVA Fossil Engineering Design Services (EDS). The previous annual inspection was performed on March 2 and 3, 2006. The results of the inspection of the Coal Yard Drainage Basin, Coal Yard Perimeter Ditch, Limestone Pile Drainage Basin, Wet Gypsum Stacking Area, Stilling Pond for the Wet Gypsum Stacking Area, Active Ash Pond, Stilling Pond for Active Ash Pond, Stilling Pond for the Active Ash Pond, Perimeter Dikes, Red Water Pond, Chemical Treatment Pond, and the Abandoned Ash Disposal Area are listed below. A summary of recommendations is also provided.

COAL YARD DRAINAGE BASIN

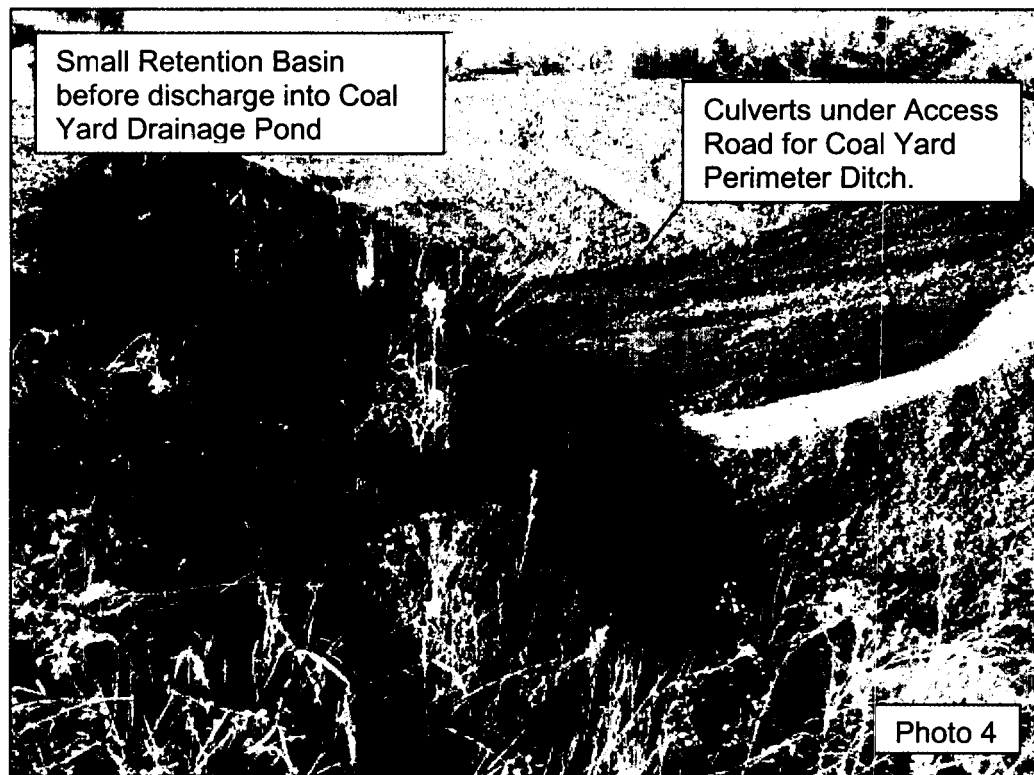
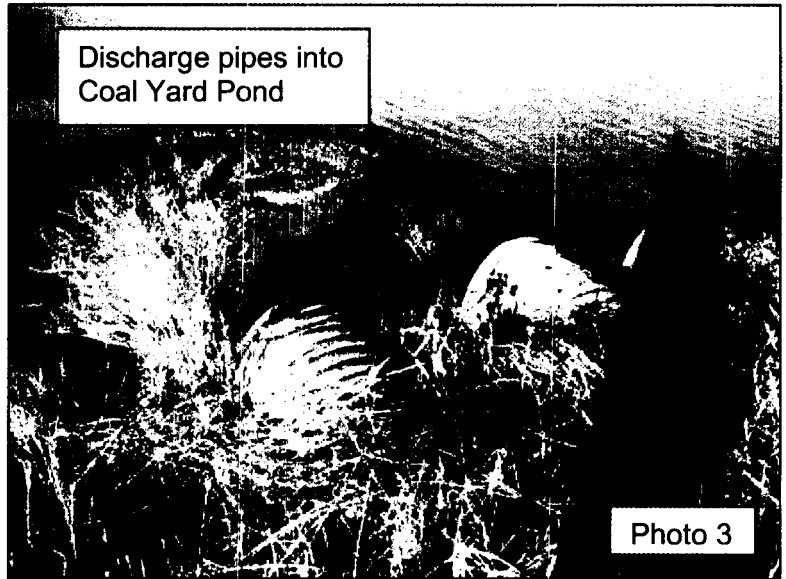
- **Location** - West of Powerhouse and Coal Pile (Directions based on Plant North).
- **Effluent** - Pumped to Active Ash Pond.
- **Observations**
 - Interior Slopes - Satisfactory; vegetation on East slopes (Photos 1 and 2).
 - ◆ Animal Burrow West bank. Appears active.
 - Sediment Level - The sediment level appears to be high, as judged by sediment at the discharge pipes (Photo 3).
 - ◆ Small retention basin before pond inlet is full of coal fines (Photos 4 and 5).
 - Pump - Satisfactory; however, personnel stated that float switch not operable pump manual switch must be wired opened (Photo 6).
- **Actions Since Previous Inspection**
 - None that inspector is aware of.



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007**

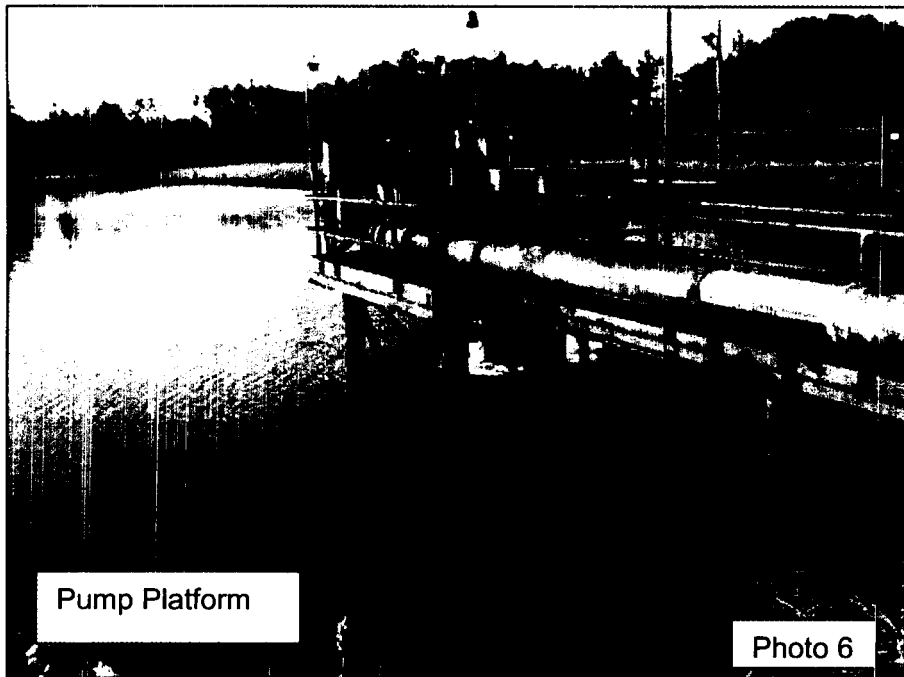
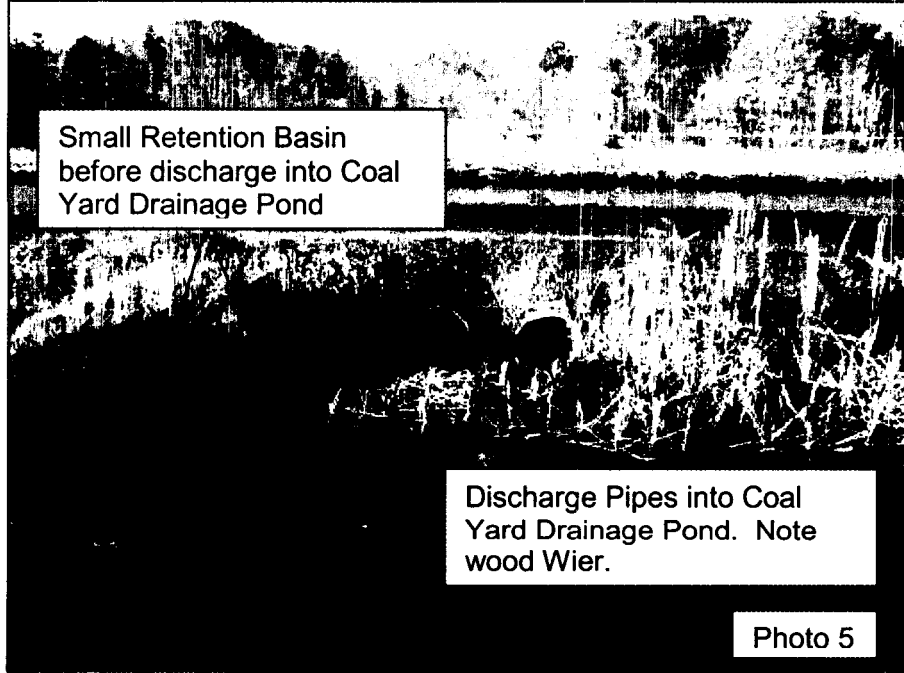
COAL YARD DRAINAGE BASIN (continued)

- **Recommendations**
 - Monitor the East interior slope. If erosions starts, place suitable earth material on slope prior to seeding and mulching.
 - ◆ Notify EDS of any changes.
 - Dredge/Clean pond to remove sediment. HED was scheduled to do this shortly after this inspection.
 - Eradicate animal and fill burrow hole with concrete (1 yds³)
 - Repair pump float switch so that pump can run in automatic mode.



WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007

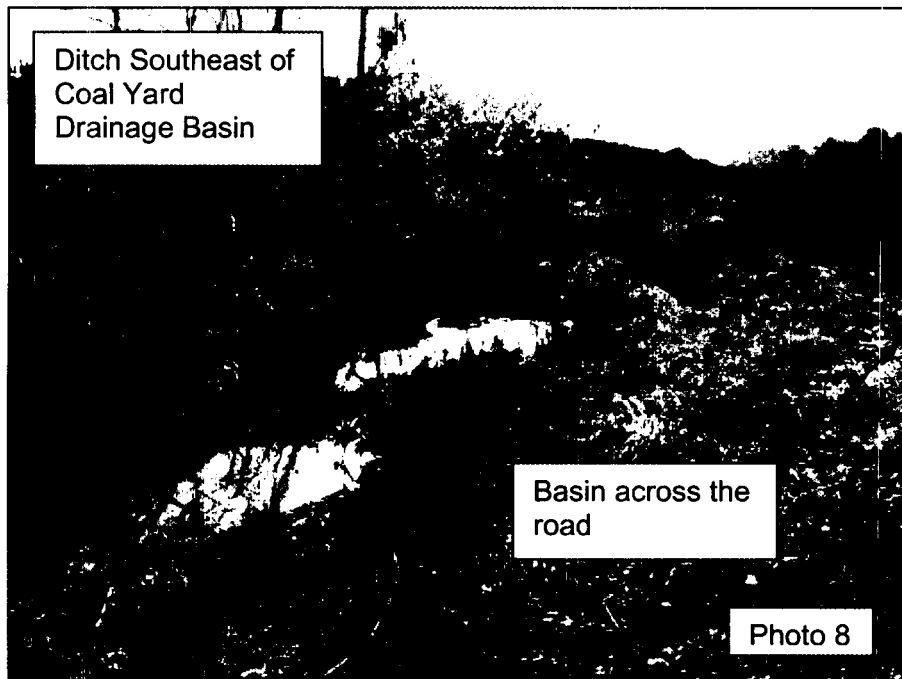
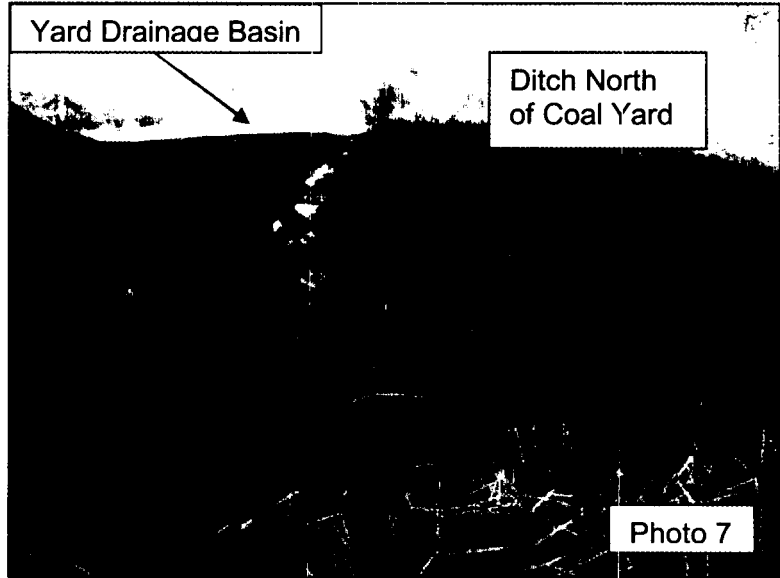
COAL YARD DRAINAGE BASIN (continued)



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007**

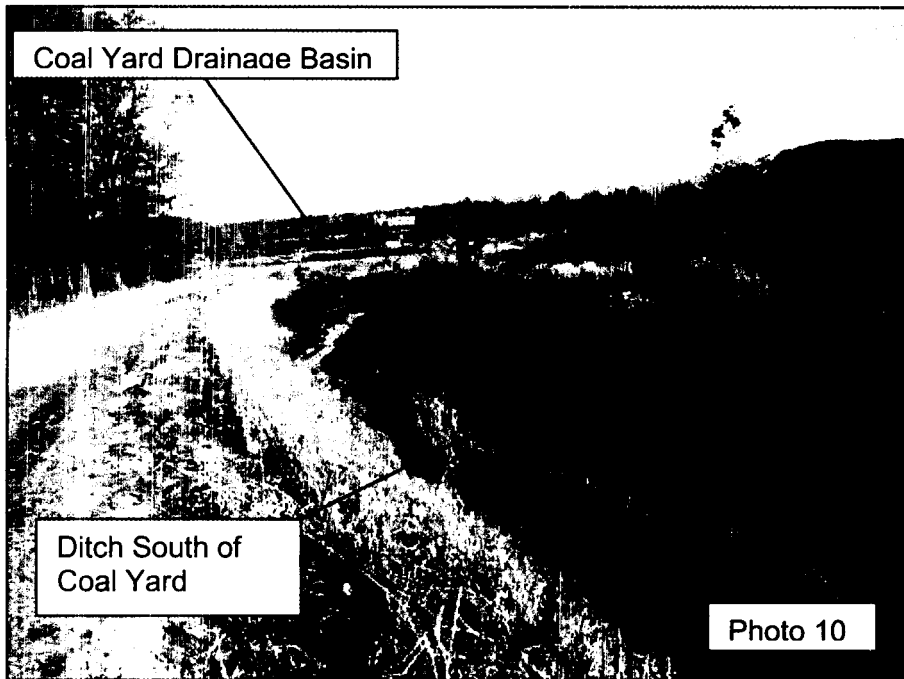
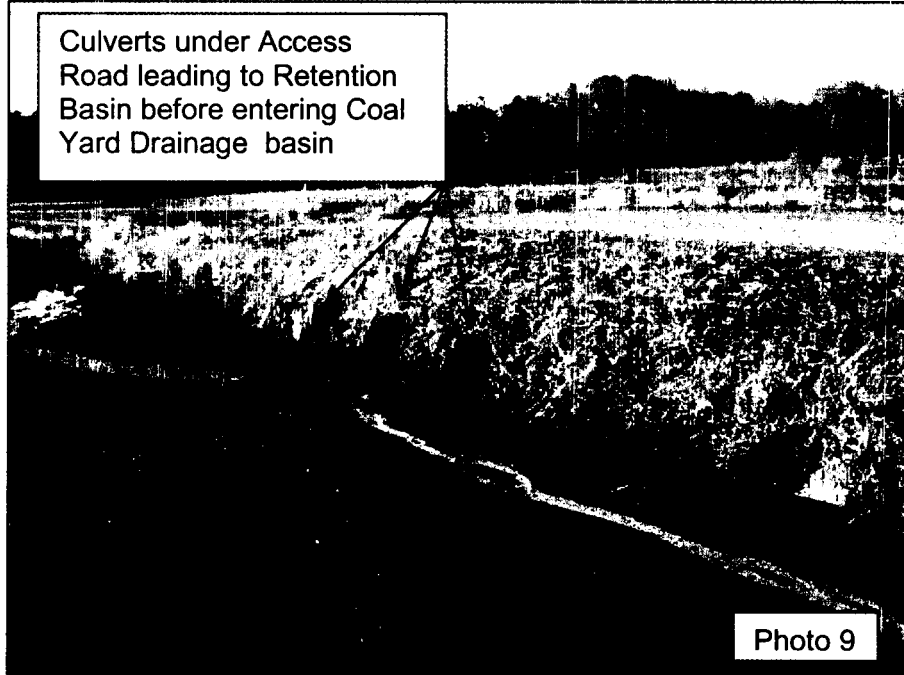
COAL YARD PERIMETER DITCH

- **Location** - Perimeter of Coal Yard West of the Powerhouse.
- **Effluent** - Drains to the coal yard drainage basin.
- **Observations**
 - Sediment and coal fines filling ditch (Photos 7-10).
- **Actions Since Previous Inspection**
 - Plant personnel stated that cleaning ditch has been done as routine maintenance.
- **Recommendation**
 - Clean perimeter ditch.



WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007

COAL YARD PERIMETER DITCH (continued)



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007**

LIMESTONE PILE DRAINAGE BASIN

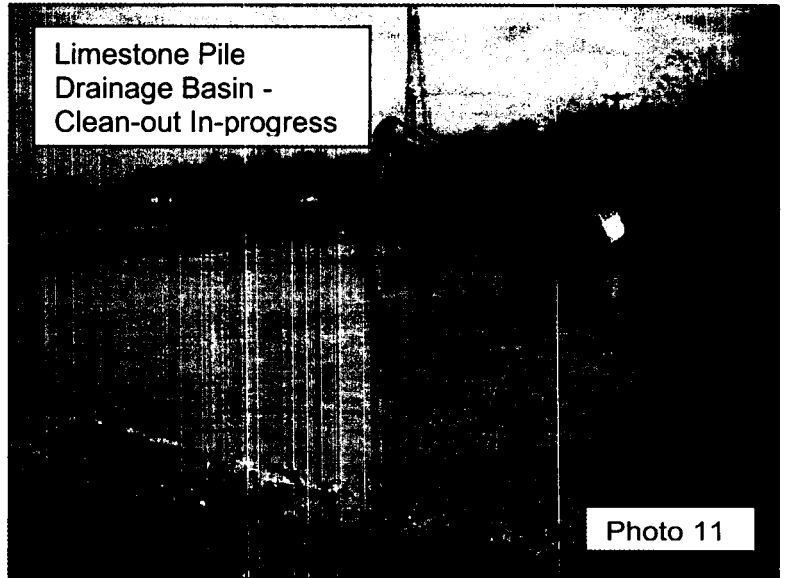
- **Location** - East of Powerhouse.

- **Effluent**

- Discharges to a series of stilling ponds.
- Final stilling pool discharges to Outfall 005 into Guntersville Reservoir.

- **Observations**

- Interior Slopes - Satisfactory condition with no vegetation (See Photo 11).
 - ◆ No erosion detected.
- Sediment Level - Pond being cleaned (See Photo 12).
- Discharge - submerged
- Final Stilling Pond
 - ◆ Interior slopes - Good condition (See Photo 13)
 - ◆ Discharge structure - Good condition - replaced on 2005 (See Photo 14)
 - ◆ Outfall 005 - discharged water has reddish coloration (See Photo 15).

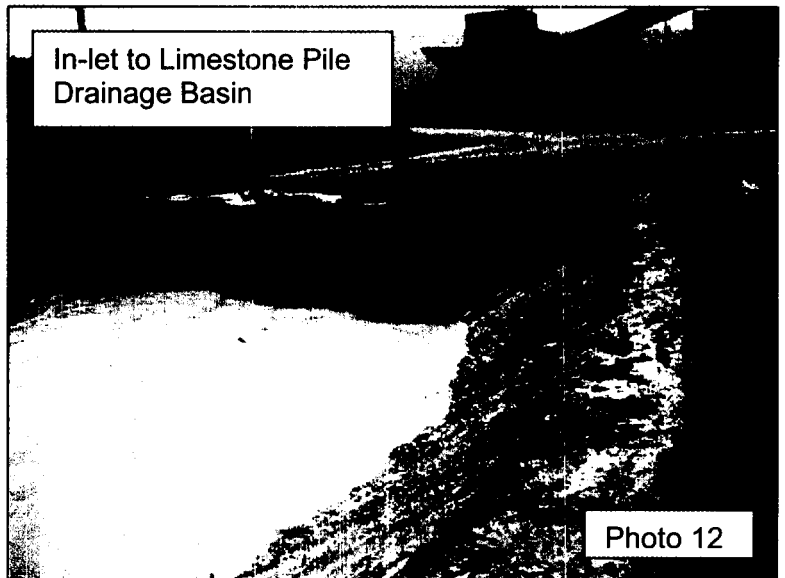


- **Actions Since Previous Inspection**

- Cleaning Pond - In-progress during the inspection.
- Replacement of discharge structure in final stilling pond (See Photo 14).

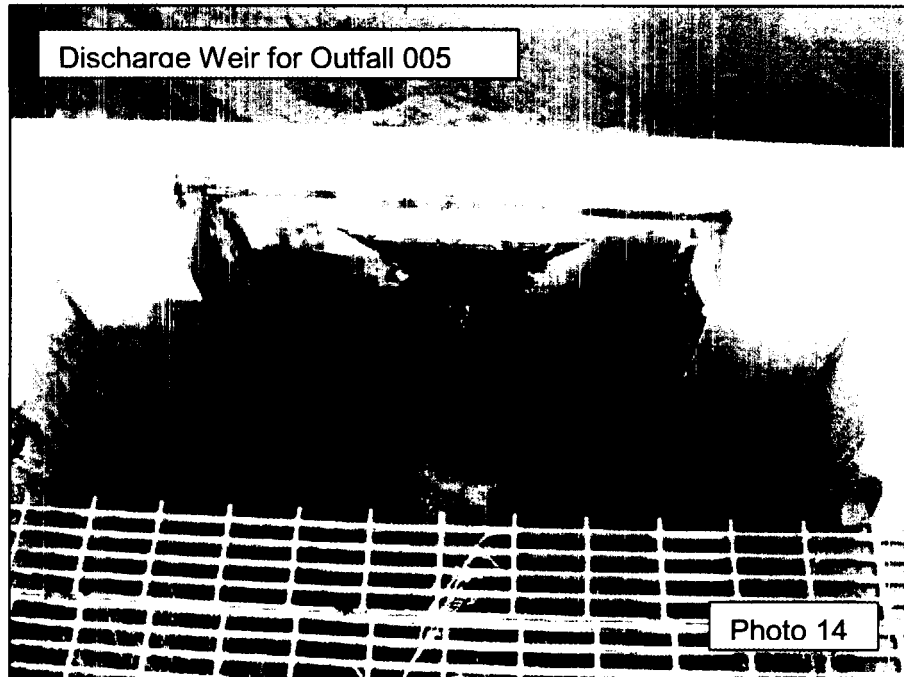
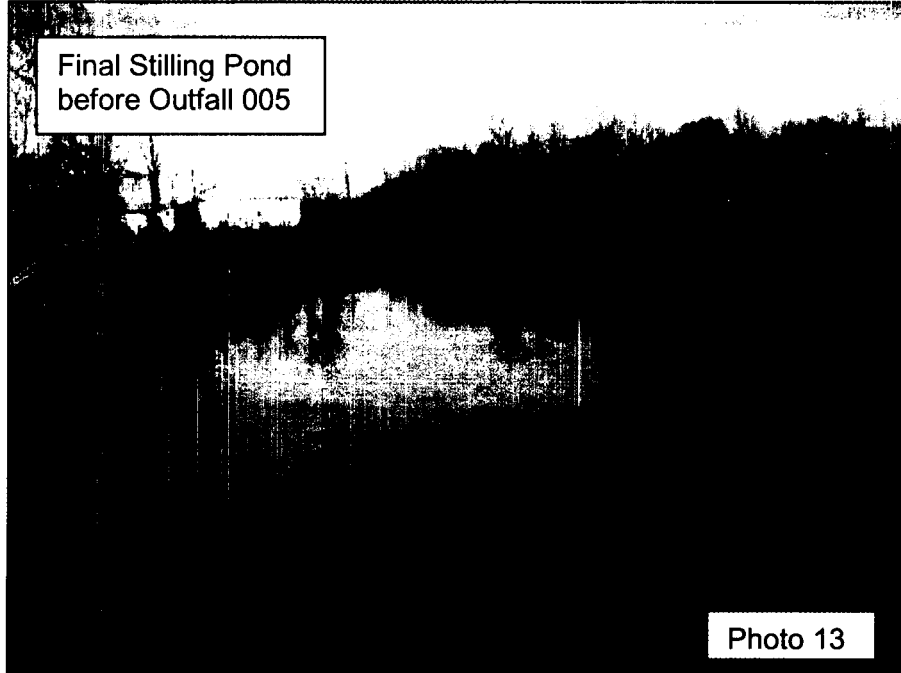
- **Recommendations**

- Continue good management practices utilized in maintaining the Limestone Pile Drainage Basin.



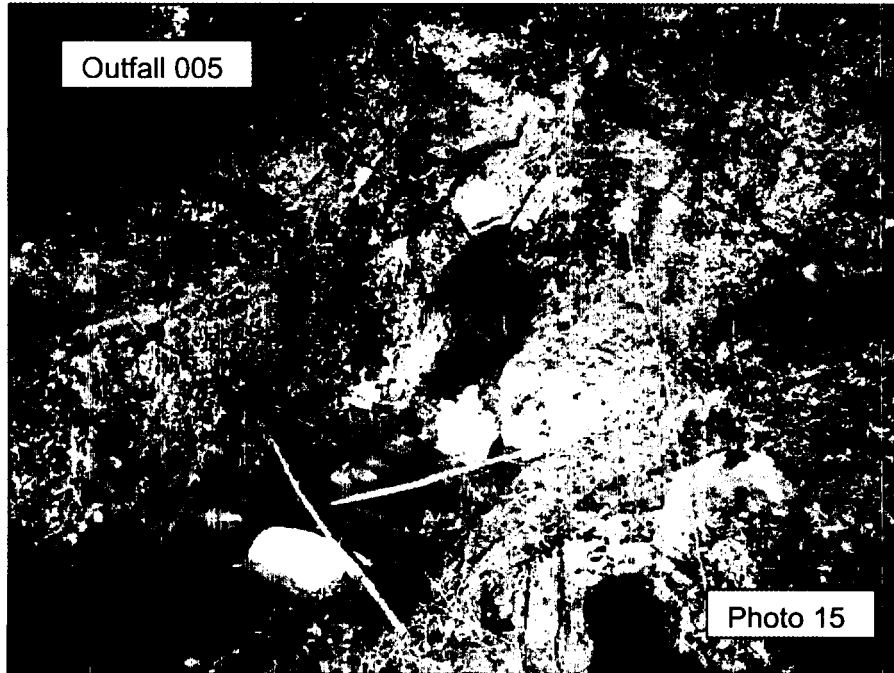
WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007

LIMESTONE PILE DRAINAGE BASIN (continued)



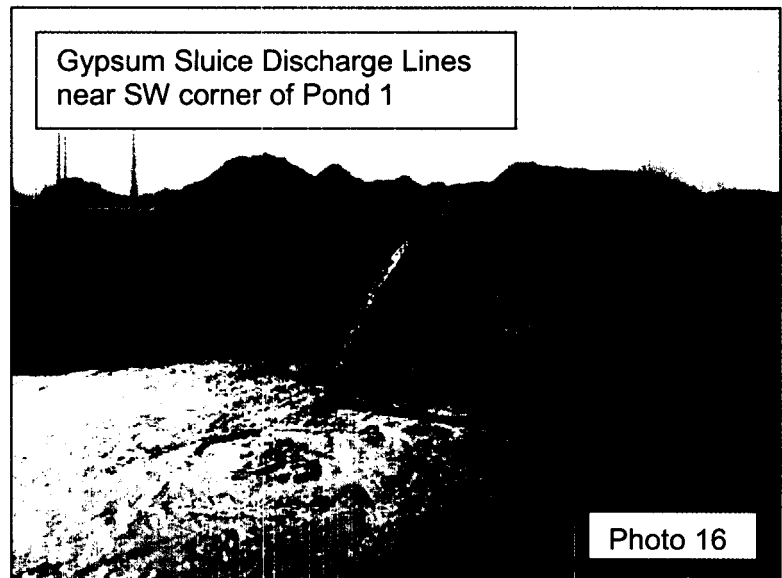
**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007**

LIMESTONE PILE DRAINAGE BASIN (continued)



WET GYPSUM STACKING AREA

- **Location** - East side of Widows Creek which borders the East side of the Active Ash Pond.
- **Effluent** - Discharges into Gypsum Stilling Pond.
- **Observations**
 - The development of the dry stack area appears to be in general accordance with the stacking plan. See DCN WCF-04-1016 for details of stacking plans (Photos 16-24).
 - Vegetation only on lower slopes/perimeter dikes which are below the perimeter access road.



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007**

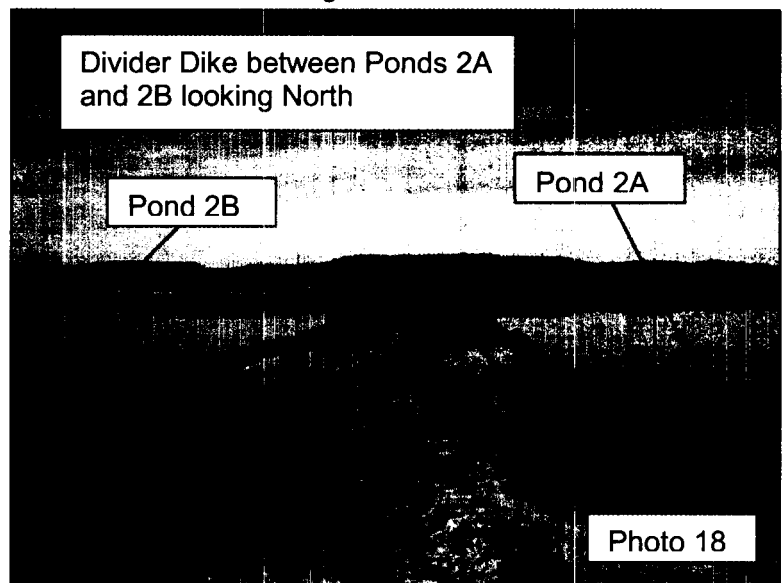
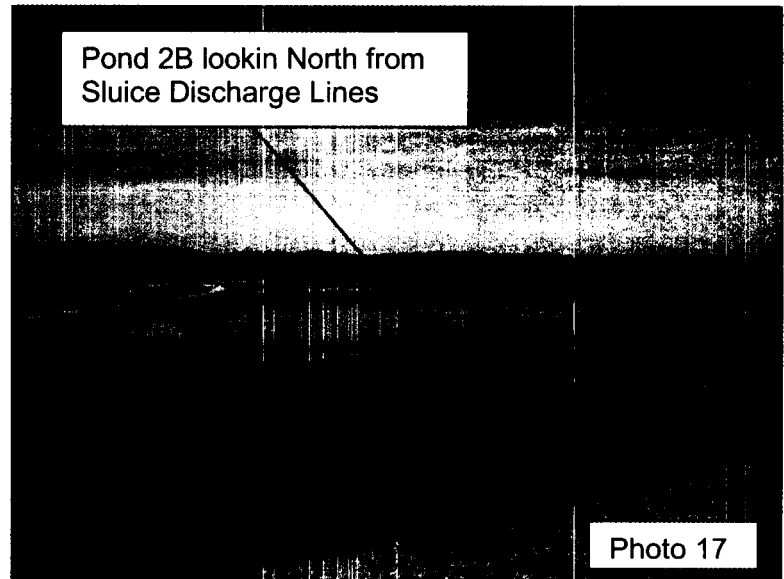
WET GYPSUM STACKING AREA (continued)

• **Observations (continued)**

- Lower perimeter dikes were generally in good condition.

- ◆ General terrain at base of lower perimeter dike is low lying and drains poorly. This is worse on the South and East dikes (Photo 25).
- ◆ Bottom 15 feet and toe of slope was saturated for ~80 feet in an area along the southern perimeter dike (see note on attached drawing API07).
- ◆ Access road to plant dump is eroding (Photo 26.)
- ◆ Several distinct bare spots (4) noted at the base of the South perimeter dike. Areas were saturated and were approximately 5 feet by 10 feet (Photos 27 and 28).
- ◆ Woody growth was noted in areas along North slope and a few areas near the base West slope South of the Stilling Pond (Photos 29 and 30).
- ◆ Animal paths noted at various locations. No rutting observed.

- Upper slopes have various degrees of erosion.
 - ◆ Rutting is worse along the North slope (Photo 31).
 - ◆ Sloughing of the lower portion of the West slope next to the stilling pond was noted. This area is to be reworked this year once the discharge weirs are raised (Photo 32).
 - ◆ Erosion is present at the South discharge outlet (Photo 33).



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007**

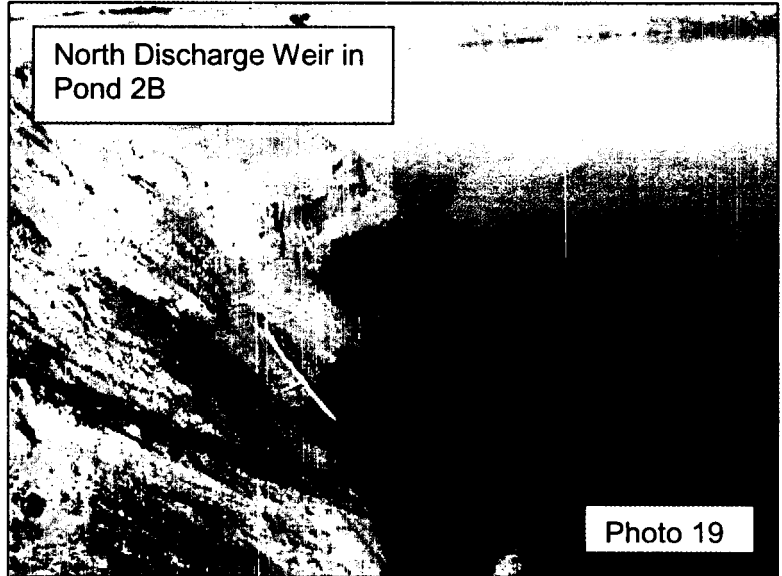
WET GYPSUM STACKING AREA (continued)

• **Observations (continued)**

- Upper slopes have various degrees of erosion. (continued).

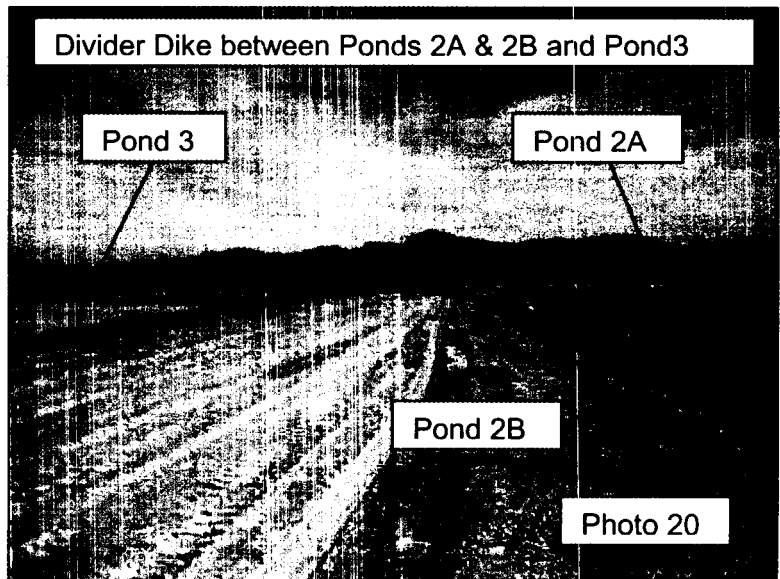
- ◆ Erosion will continue to be a problem until soil cover and vegetation starts. Construction staff is continuously repairing ruts during stacking operations.

- Toe drains installed at bench elevation 650.
- Soil cover being placed on slopes above the access road starting on the East slope on the North end of the stilling pond (Photo 34).
- The access road at the northeast corner of the stack has severe ruts next to the perimeter ditch (Photo 35).
- Toe drain outlet pipes are laying in the perimeter ditch and covered with sediment material at various locations. This was noted after the inspection from another EDS engineer.
- Sediment accumulation was noted in the perimeter ditch (Photo 36).
- Erosion observed around Sluice line Valves (Photo 37).



• **Actions Since Previous Inspection**

- Toe drains installed at bench elevation 650.
- Upper Perimeter Dikes regarded to design slopes according to DCN WCF-04-1016 up to elevation 650 bench.
- Blanket Drain installation completed on East Perimeter Dike (Northeast Stacking Area) according to DCN WCF-04-1016.
- Regraded perimeter ditch to drain.

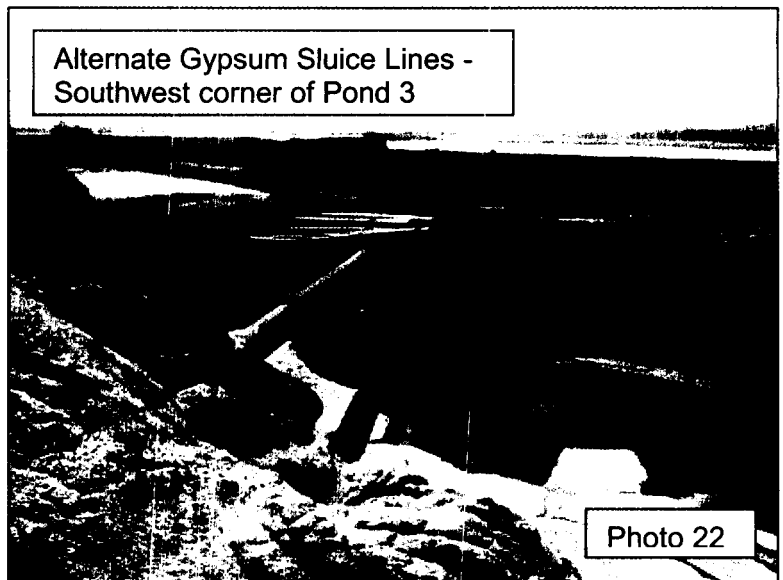
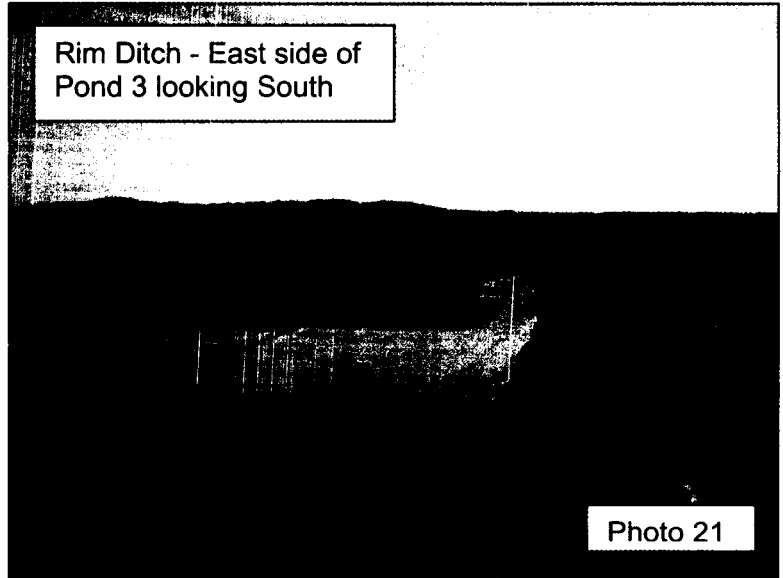


**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007**

WET GYPSUM STACKING AREA (continued)

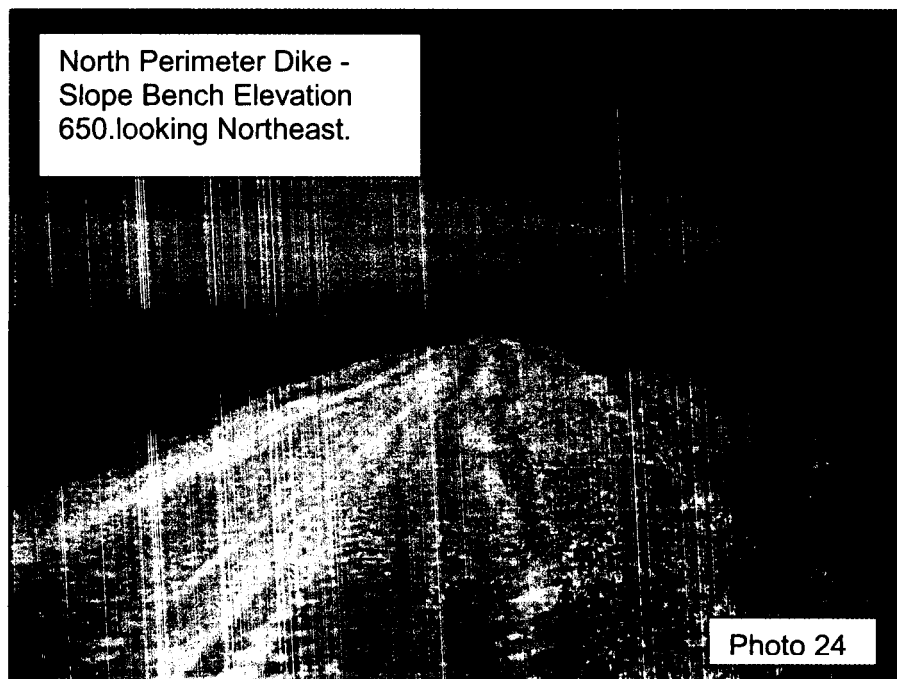
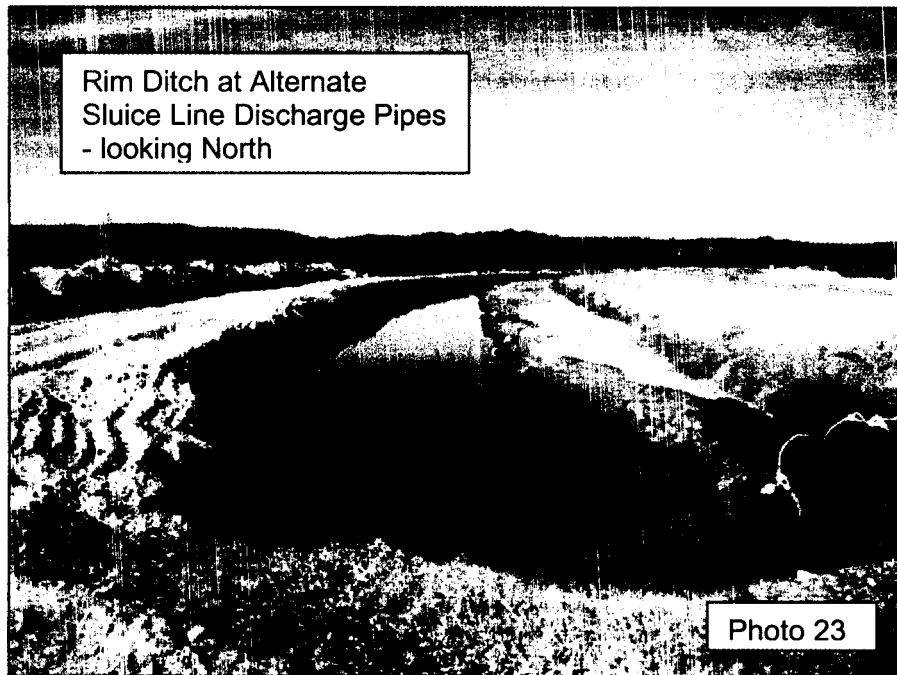
• **Recommendations**

- Continue operations in accordance with the existing permit requirements.
- Monitor wet area along the Southern lower perimeter dike.
- Regrade plant dump access road surface and stabilize to prevent erosion
 - ◆ Estimate 100 yd².
- Monitor four bare spots observed at the toe of the North lower perimeter dike.
- Remove trees and woody growth from the North and West lower perimeter dikes.
- Repair erosion along gypsum upper perimeter dike slopes on a continuous basis until soil cover is placed and vegetation is established. This includes reworking a portion of the West slope next to the Stilling Pond once new weir discharge lines are installed.
- Regrade perimeter road surface and stabilize to prevent erosion
 - ◆ Estimated Area - 50 yd².
- Clean-out toe drain outlets.
- Remove sediment from perimeter ditch to insure drainage. This will be on a continuous basis until soil cover is placed and vegetation is established on the upper slopes.
- Repair erosion around the sluice line valves at Southeast corner of Stilling Pond.
- Continue maintenance of the dike slopes by mowing annually. This will also inhibit woody growth.



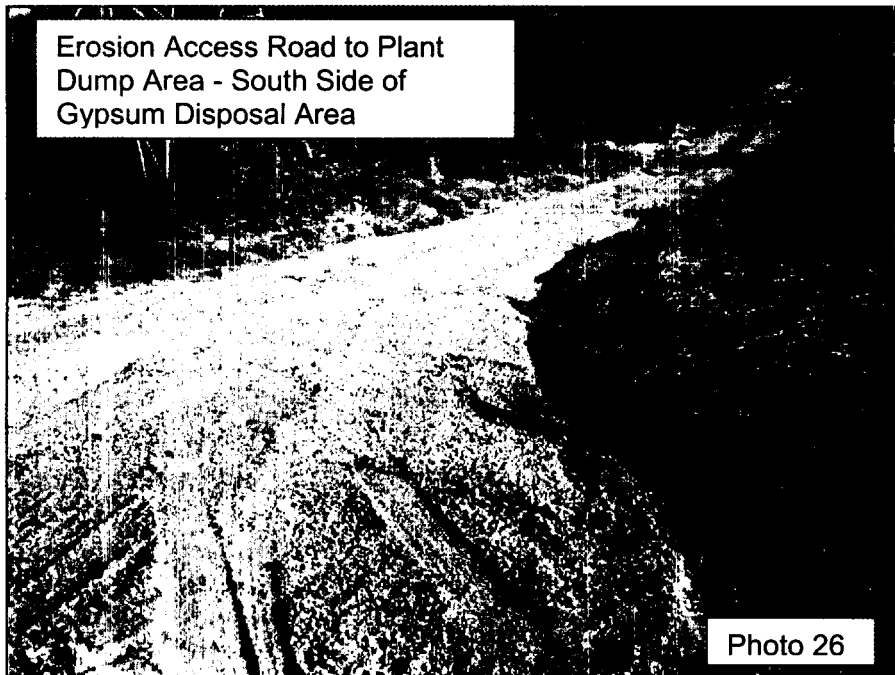
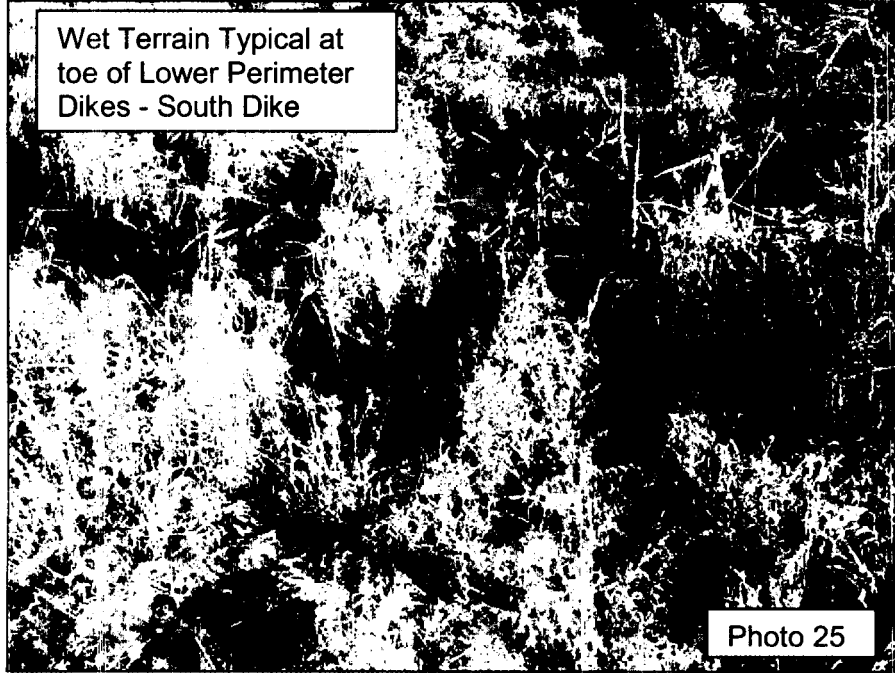
WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007

WET GYPSUM STACKING AREA (continued)



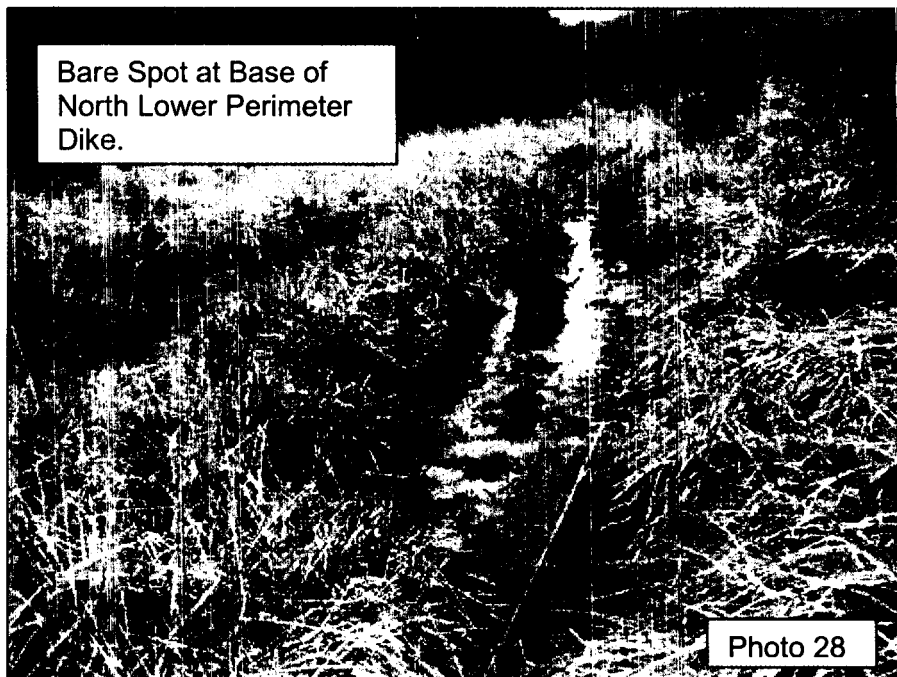
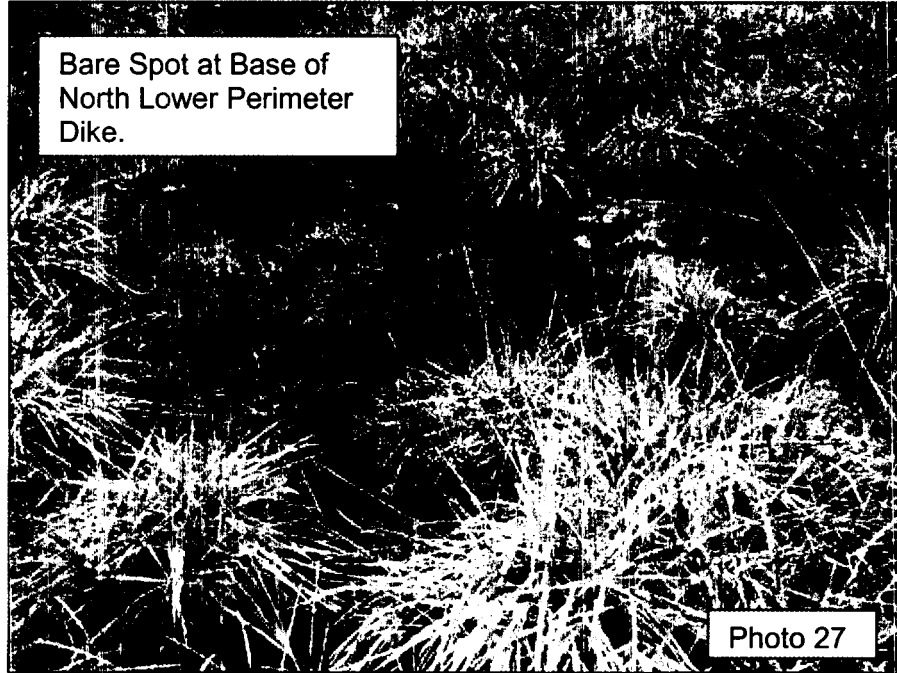
WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007

WET GYPSUM STACKING AREA (continued)



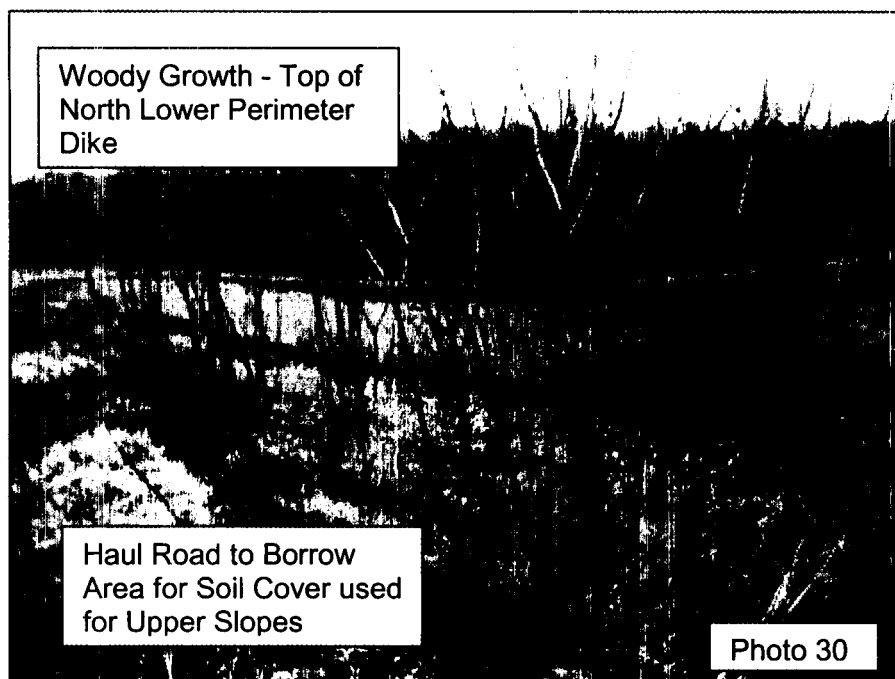
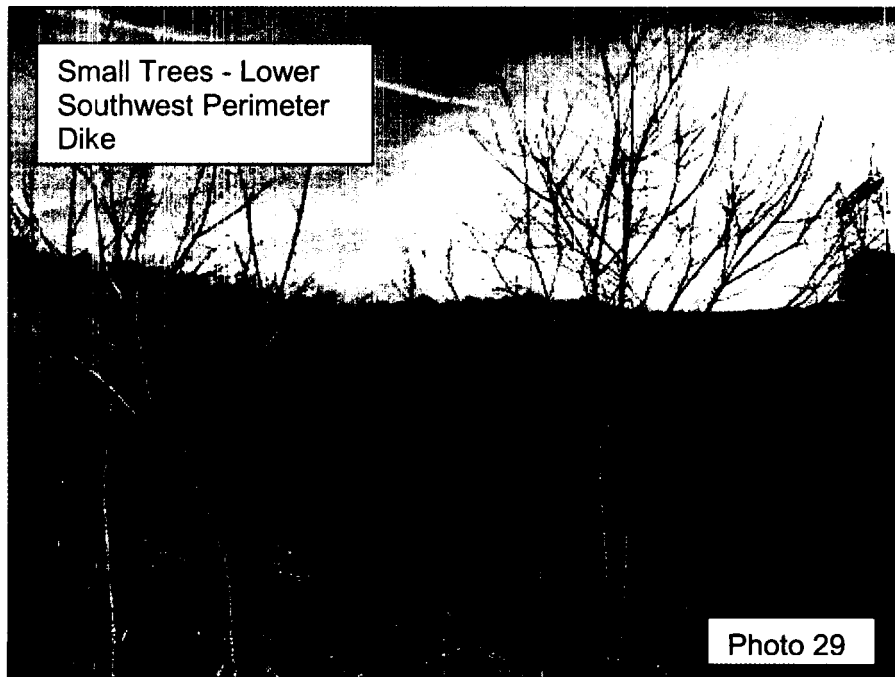
WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007

WET GYPSUM STACKING AREA (continued)



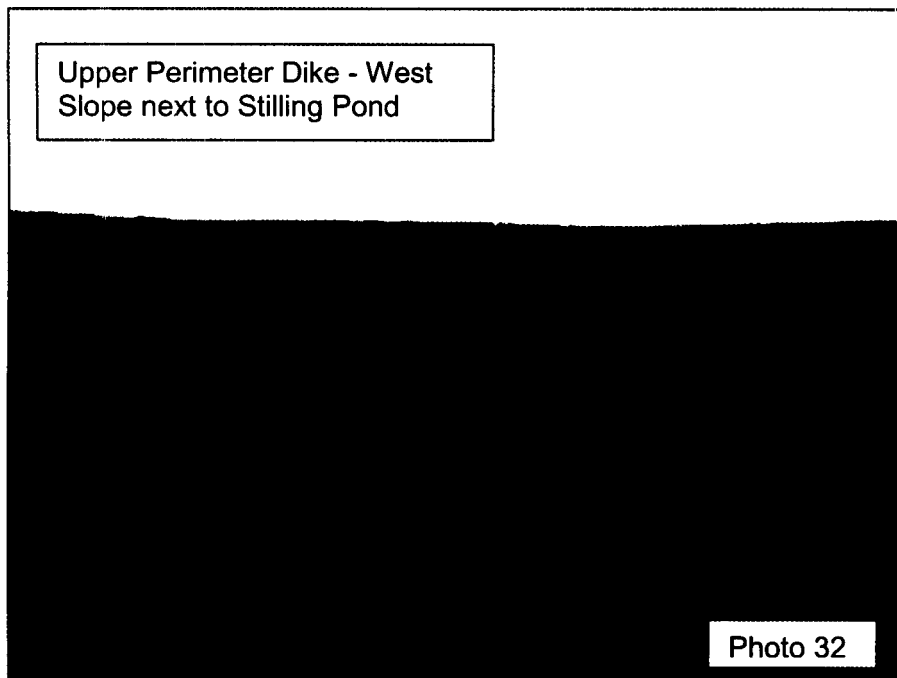
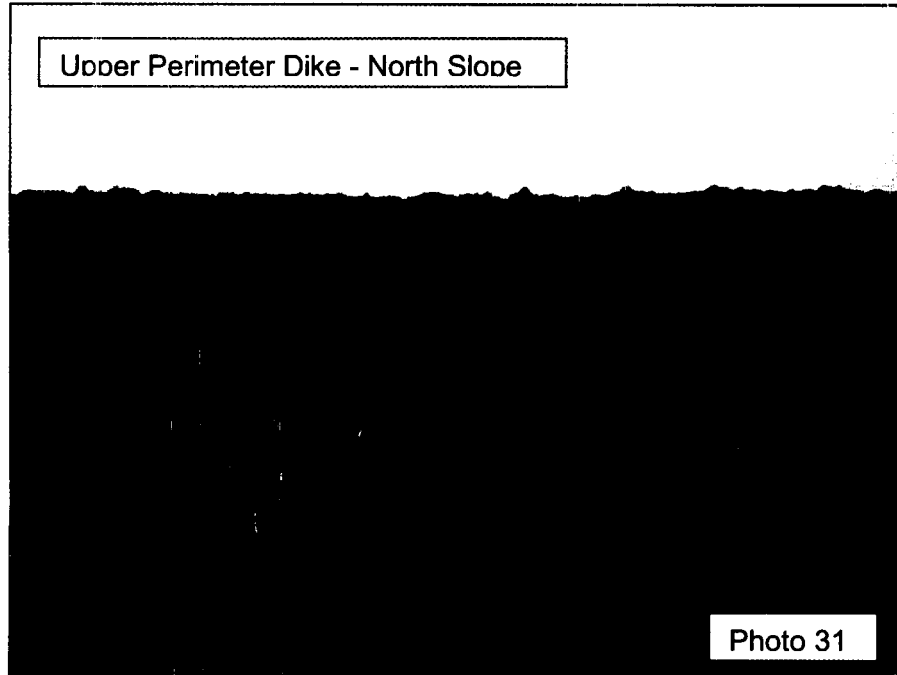
WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007

WET GYPSUM STACKING AREA (continued)



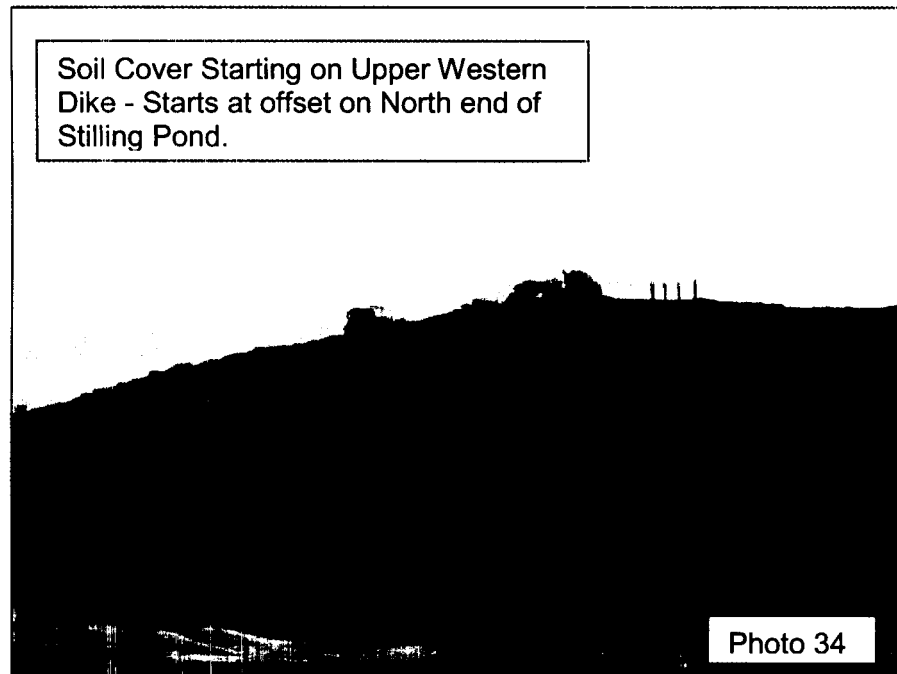
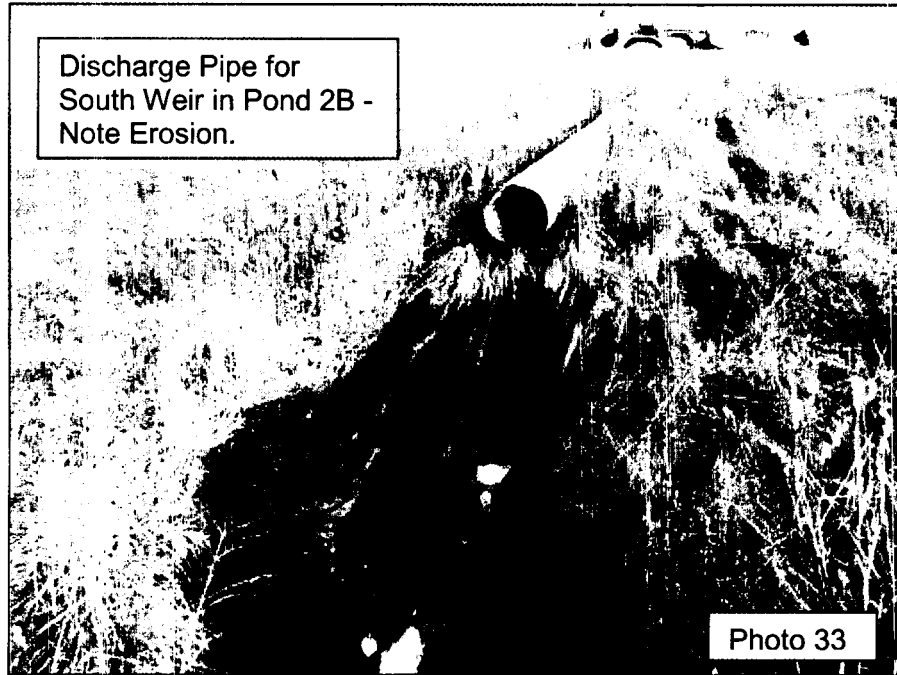
WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007

WET GYPSUM STACKING AREA (continued)



WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007

WET GYPSUM STACKING AREA (continued)



WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007

WET GYPSUM STACKING AREA (continued)

Erosion on Perimeter Road - near Northeast corner of Gypsum Disposal Area.

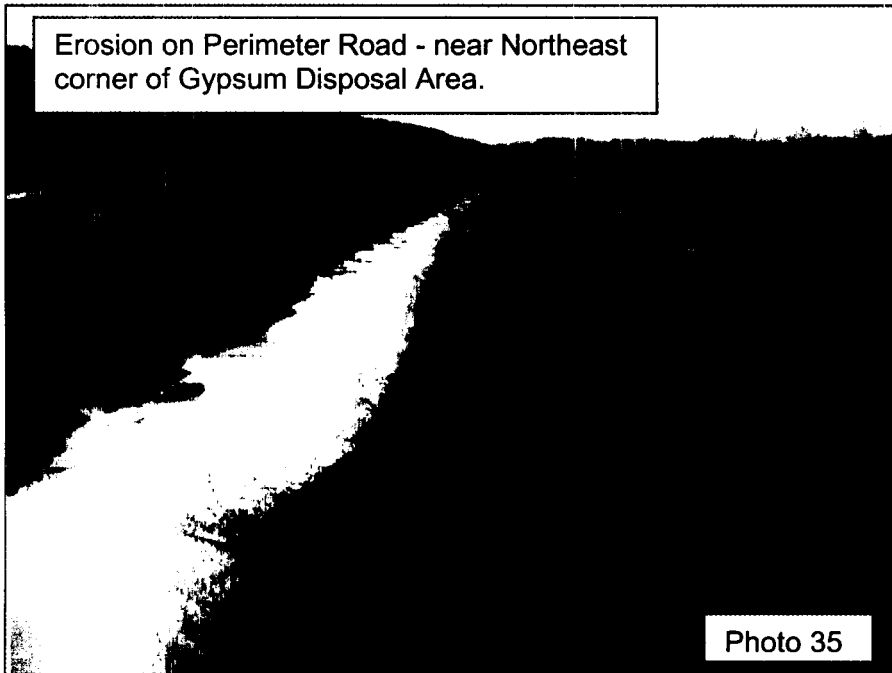


Photo 35

Toe Drain Outlet Pipes. Note Sediment in Perimeter Ditch

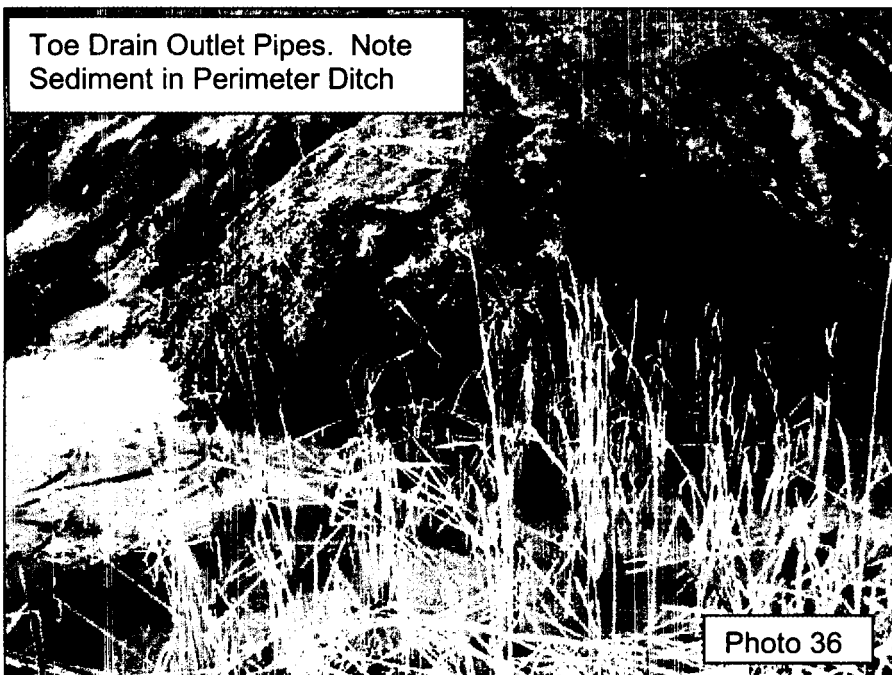
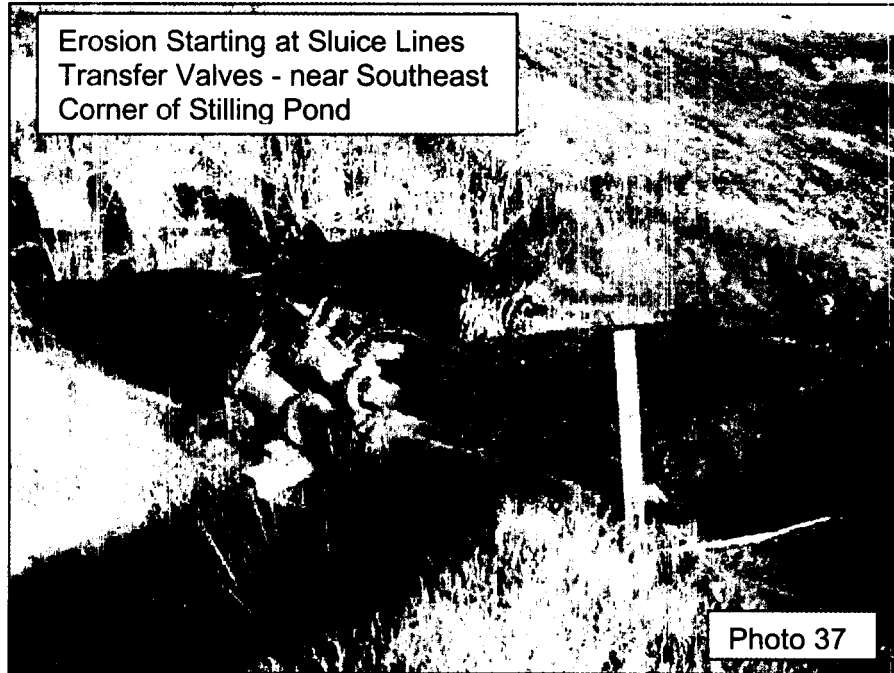


Photo 36

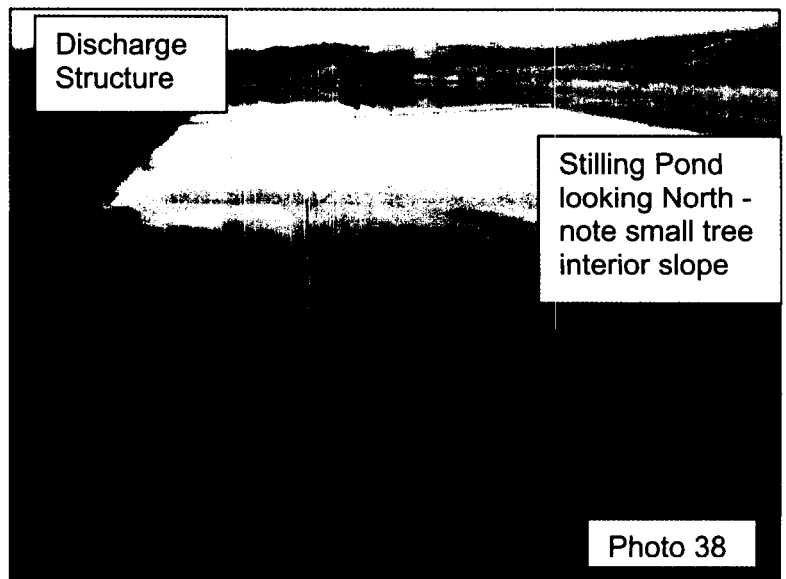
WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007

WET GYPSUM STACKING AREA (continued)



STILLING POND FOR WET GYPSUM STACKING AREA

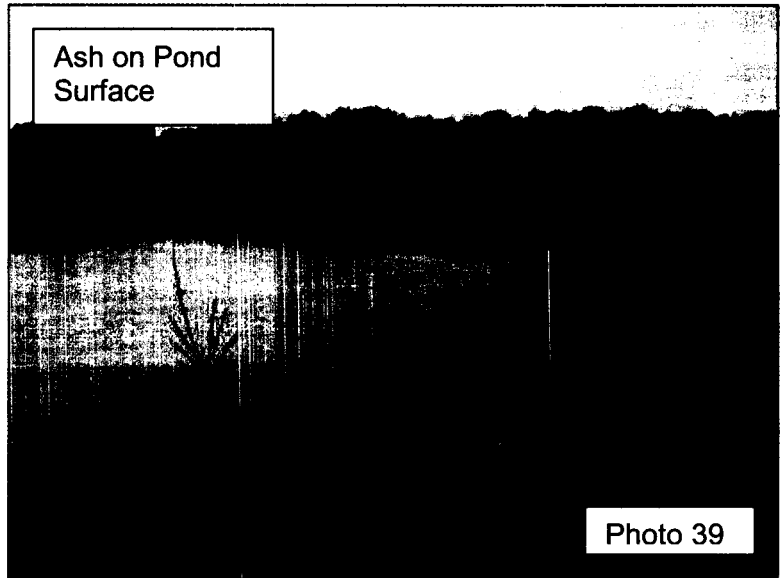
- **Location** - West of Wet Gypsum Stacking Area
- **Effluent** - Gravity Drains to Outfall 008 into Gunter'sville Reservoir (Photo 43).
- **Observations**
 - Pond Surface - some floating ash (Photos 38 and 39)
 - Discharge pipes into Pond from Gypsum Wet Stack are in good condition (Photos 40-42)
 - ◆ Southern Discharge is the existing concrete pipe for old gypsum discharge weir. Hole has been knocked through top of pipe wall so water from perimeter ditch can enter.



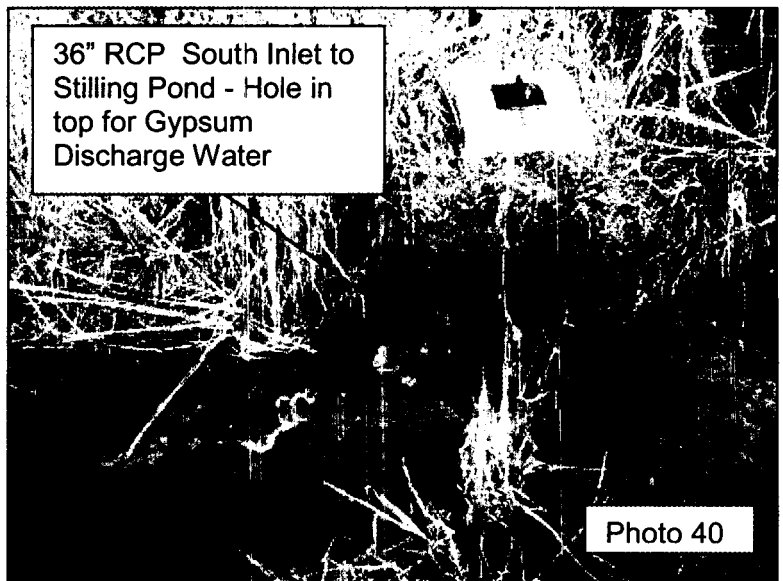
**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007**

STILLING POND FOR WET GYPSUM STACKING AREA (continued)

- **Observations (continued)**
 - Wooden Discharge Structure in satisfactory condition (Photo 43).
 - ◆ Access walkway not very stable.
 - Interior Slopes - established vegetation with some woody growth.
 - ◆ Northern end has a gap in dike for Gypsum perimeter ditch discharge. Two 36 inch HDPE pipes will be placed here and the gap filled per design (Photo 44).
 - Exterior Slopes - established vegetation with some woody growth (Photo 45).

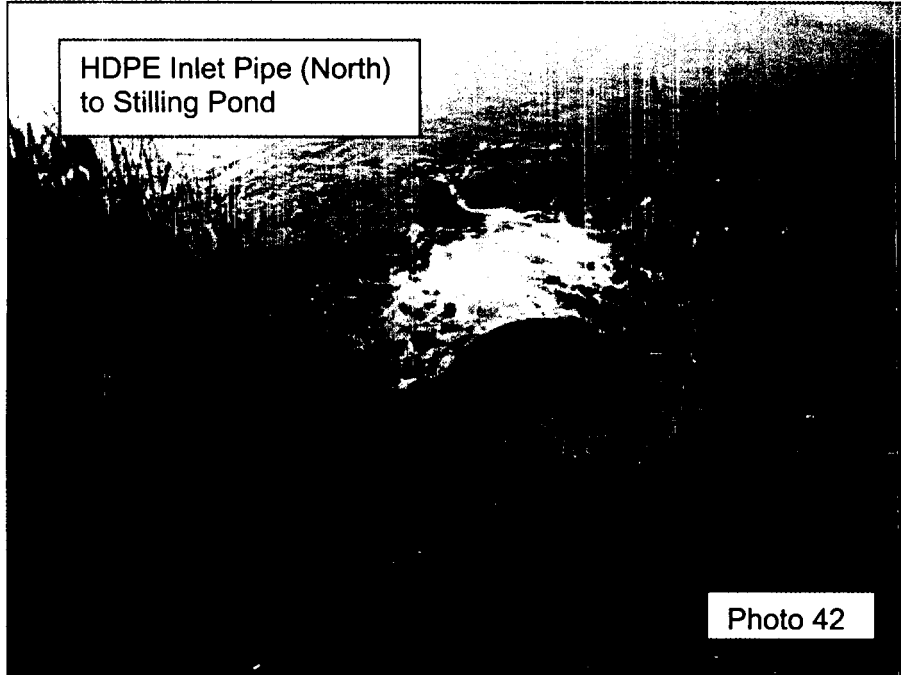
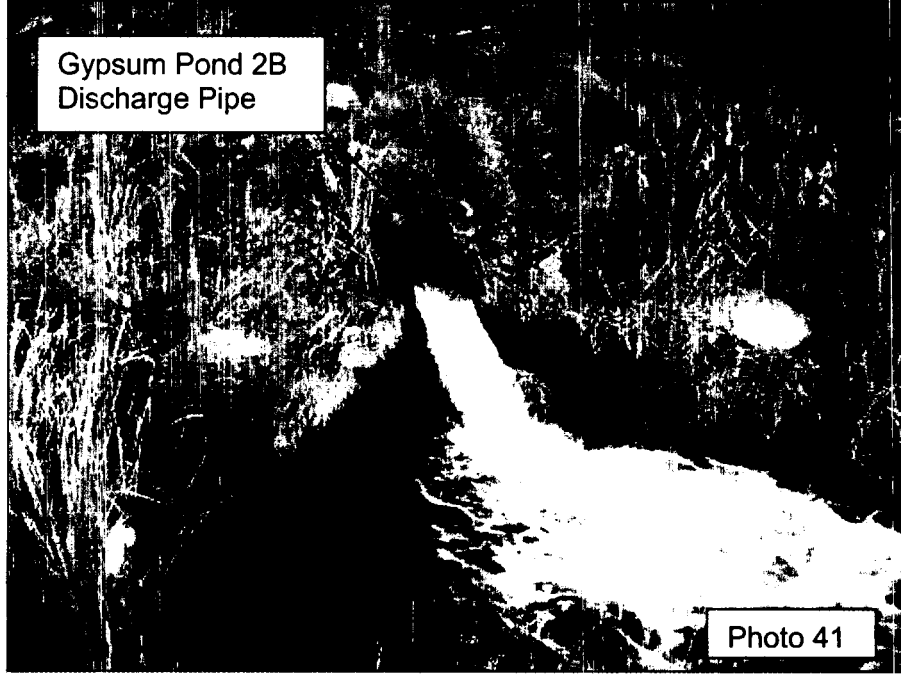


- **Actions Since Previous Inspection**
 - None that inspector is aware of.
- **Recommendations**
 - Clean floating ash from pond surface.
 - Remove trees and woody growth from the interior and exterior slopes.
 - Install HDPE pipes at North end of pond per DCN WCF-04-1016 when construction sequence allows.
 - Continue maintenance of the dike slopes by mowing annually. This will also inhibit woody growth.



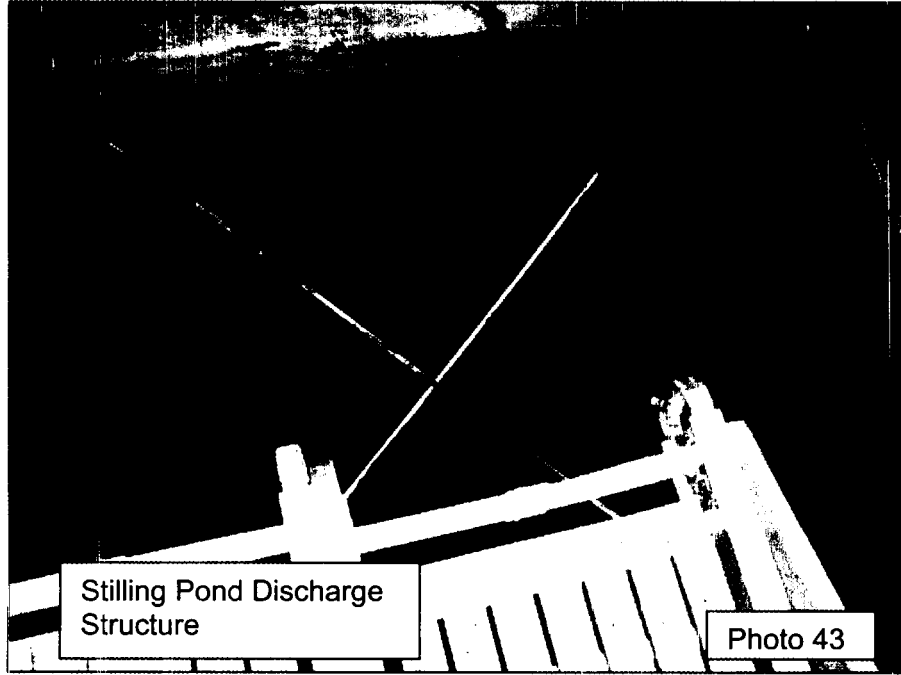
WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007

STILLING POND FOR WET GYPSUM STACKING AREA (continued)



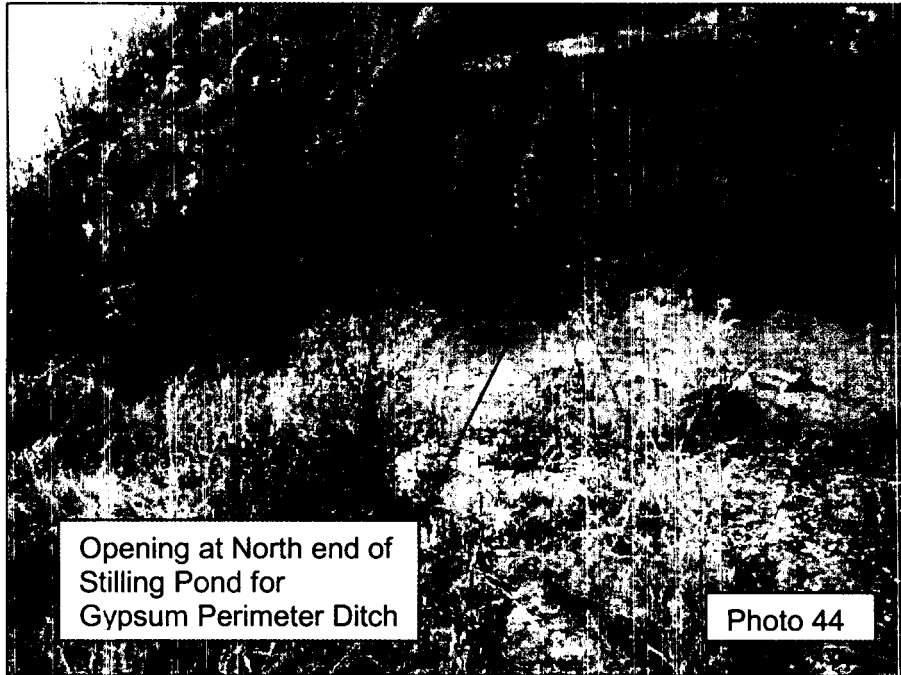
WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007

STILLING POND FOR WET GYPSUM STACKING AREA (continued)



Stilling Pond Discharge Structure

Photo 43



Opening at North end of Stilling Pond for Gypsum Perimeter Ditch

Photo 44

**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007**

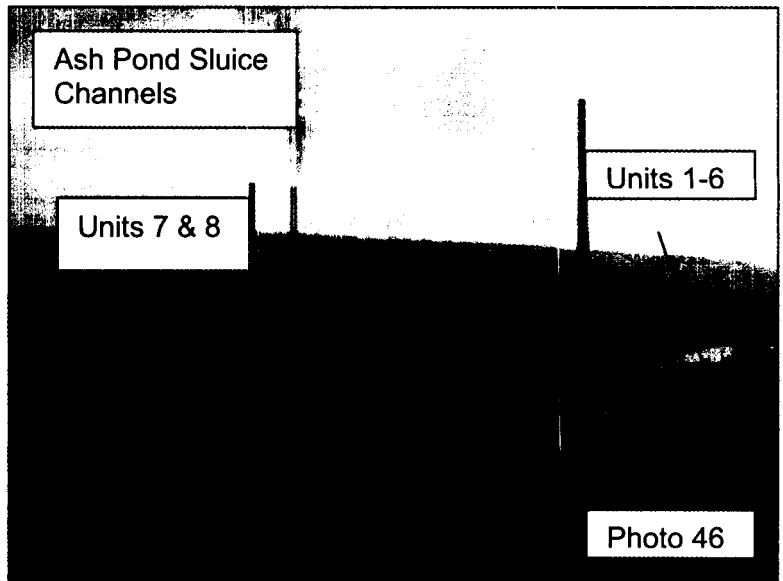
STILLING POND FOR WET GYPSUM STACKING AREA (continued)

Stilling Pond Exterior
Slope South End



ACTIVE ASH POND

- **Location** - Northeast of Powerhouse
- **Effluent** - Discharges to Active Ash Pond Stilling Pond
- **Observations**
 - Interior Slopes - Satisfactory (Photo 46).
 - Pond Surface - small amount of floating ash observed
 - ◆ Contractor in process of removing floating ash (cenospheres).
 - Discharge Structures - Good condition (Photos 47-50)
 - ◆ Only three of five structures could be inspected.

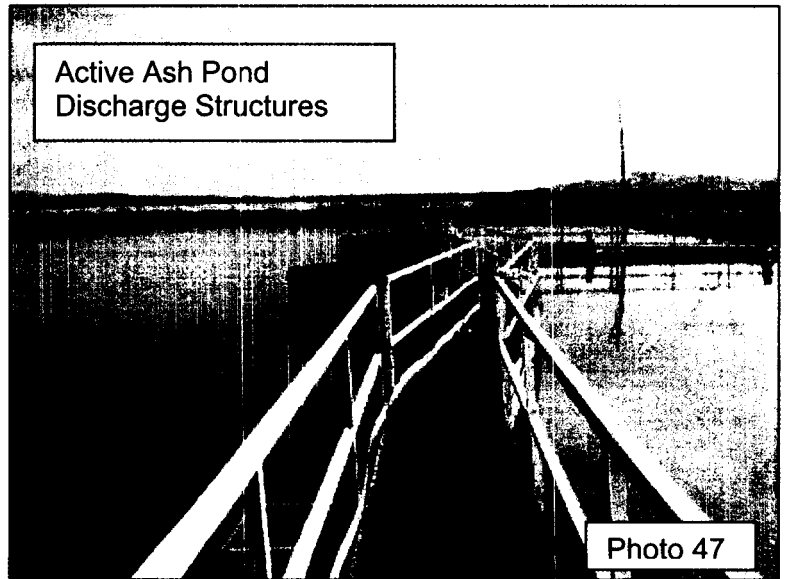


**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007**

ACTIVE ASH POND (continued)

• **Observations - (continued)**

- ◆ Access walkways has deficiencies
 - Grading missing on one end.
 - Handrail open on one end.
 - Guide strap broken
- Top exterior slopes - little to no vegetation (Photos 51 and 52).
 - ◆ Slopes have been seeded numerous times. Material does not support vegetation.
 - ◆ Perimeter ditch at base of slope blocked in some areas by gypsum slurry line.
 - ◆ Sediment accumulation in some areas of perimeter ditch.

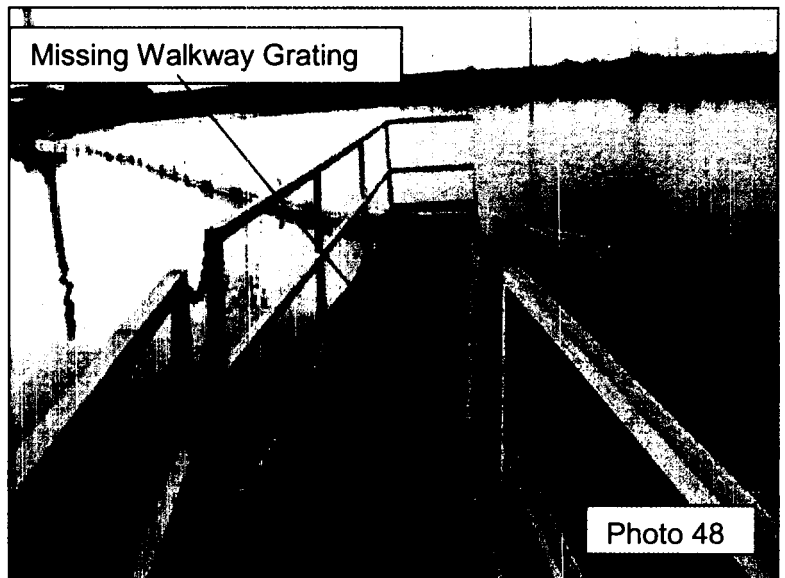


• **Actions Since Last Inspection**

- Divider dike raised between Active Disposal Area and Inactive Scrubber Disposal Area.
- Inactive Scrubber Disposal Area being developed as a dredge cell.

• **Recommendations**

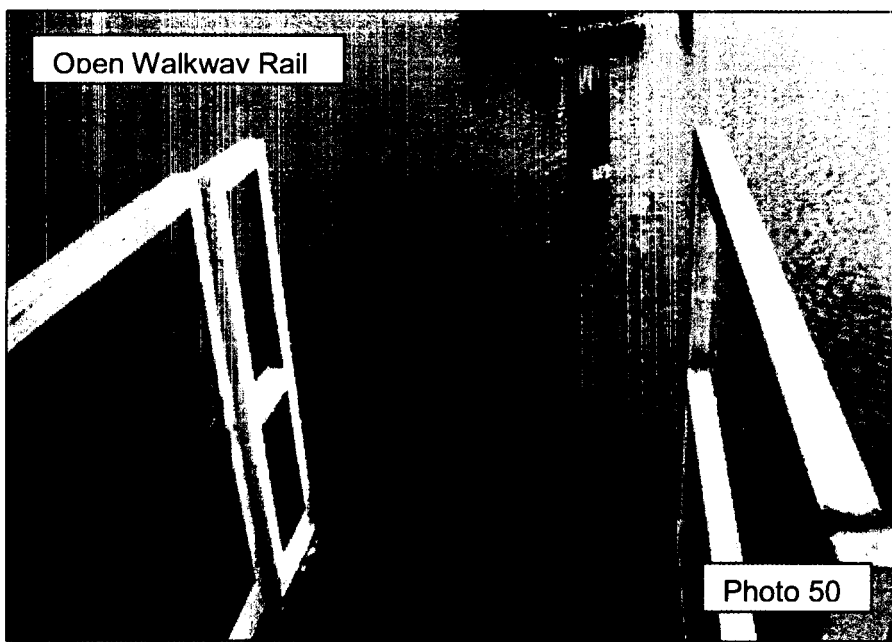
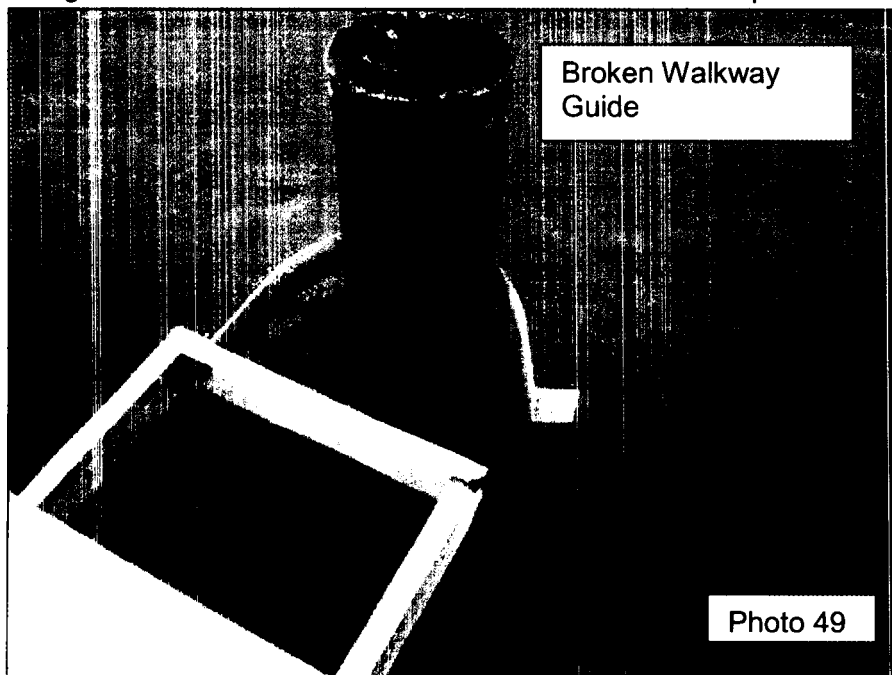
- Utilize Best Management Practices (BMPs) to prevent erosion on top exterior slopes.
- Move Gypsum Sluice Line out of perimeter ditch.
- Repair deficiencies on Discharge Structure access walkways.



WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007

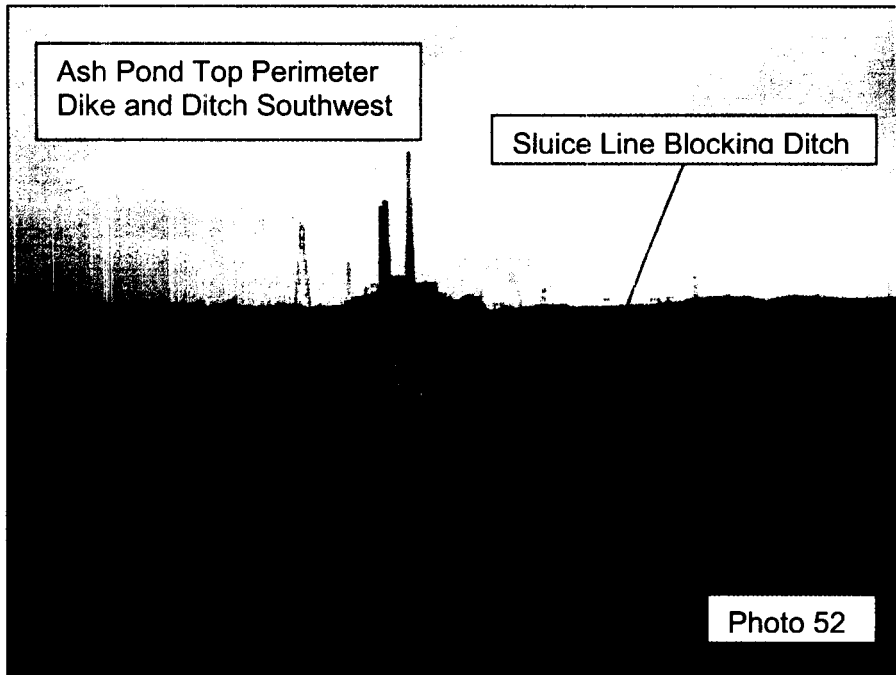
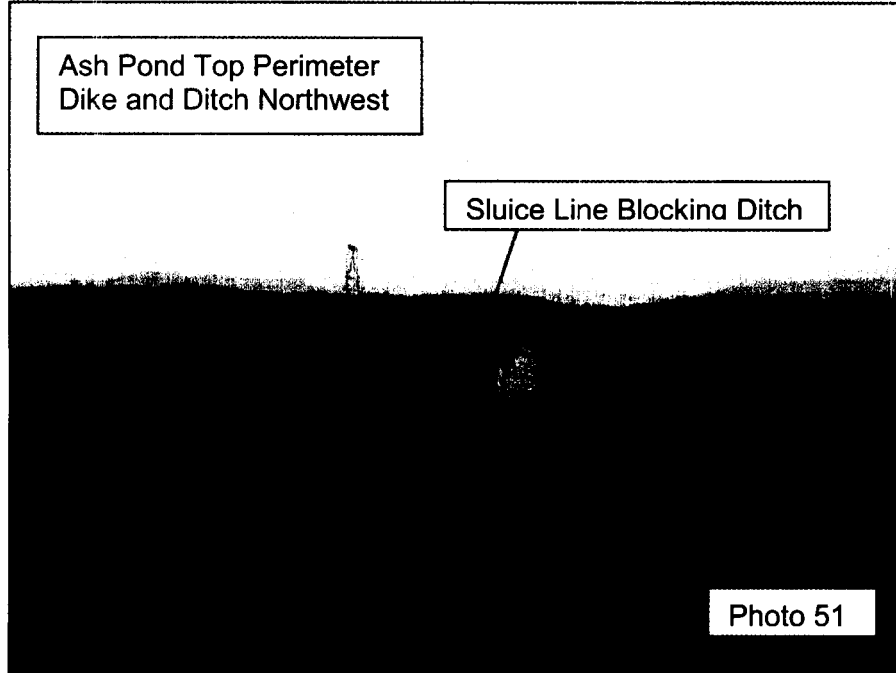
ACTIVE ASH POND (continued)

- **Recommendations (continued)**
 - Clean-out perimeter ditch in areas of sediment accumulation - mainly at ditch turns.
 - Continue good maintenance and BMP's for Active Ash Pond Operations.



WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007

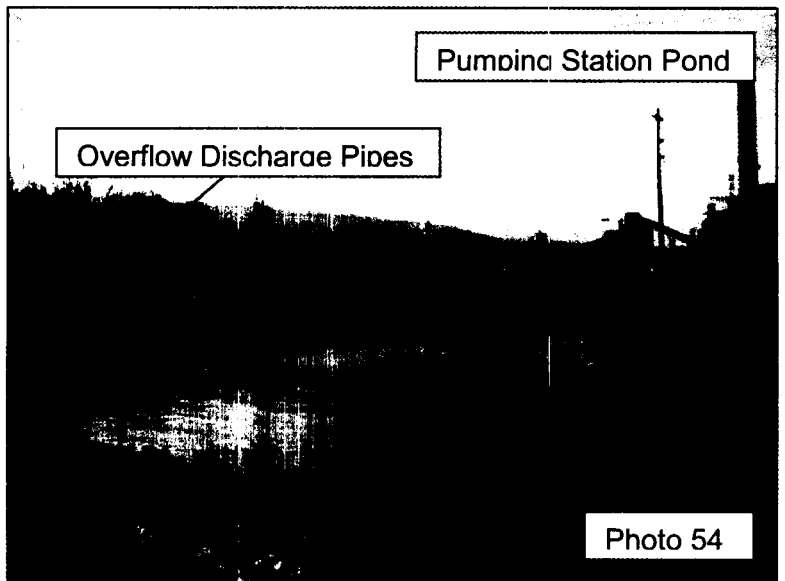
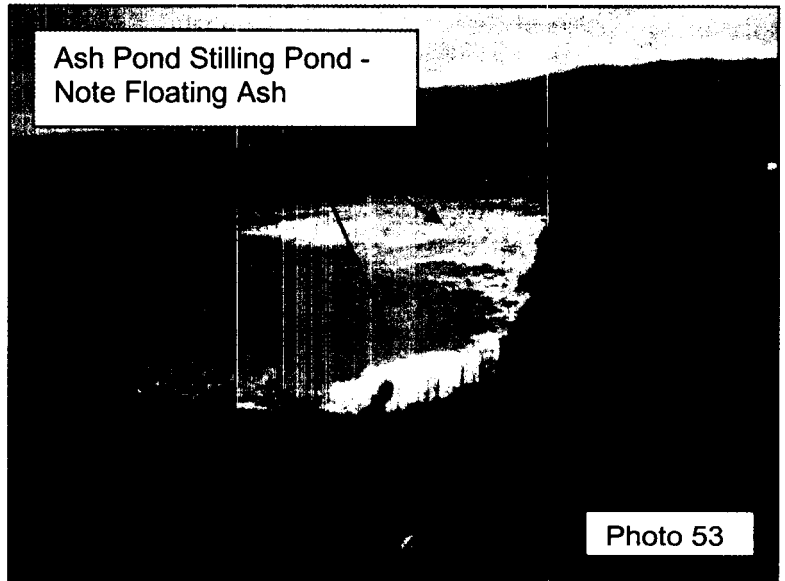
ACTIVE ASH POND (continued)



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007**

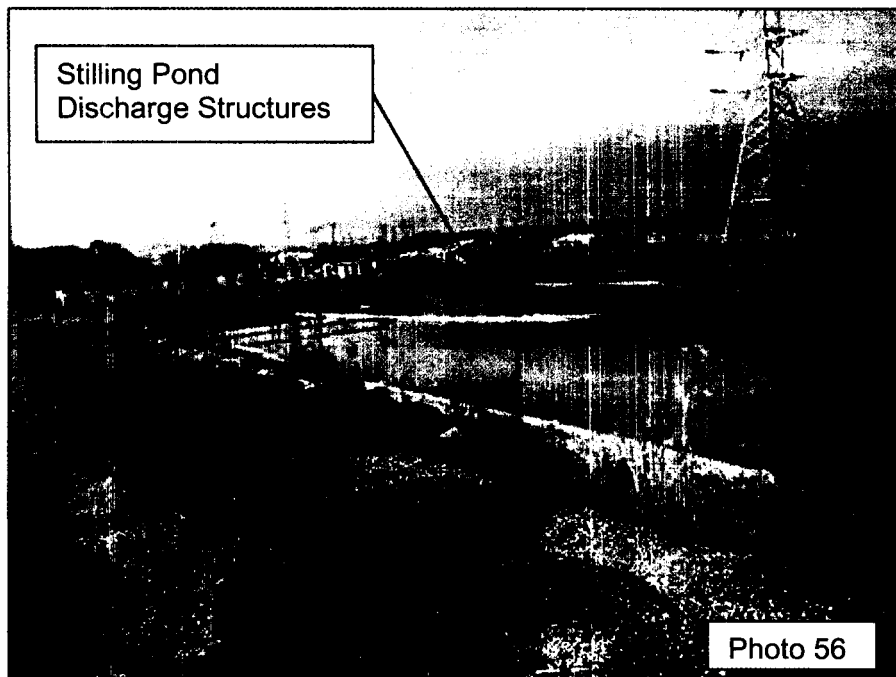
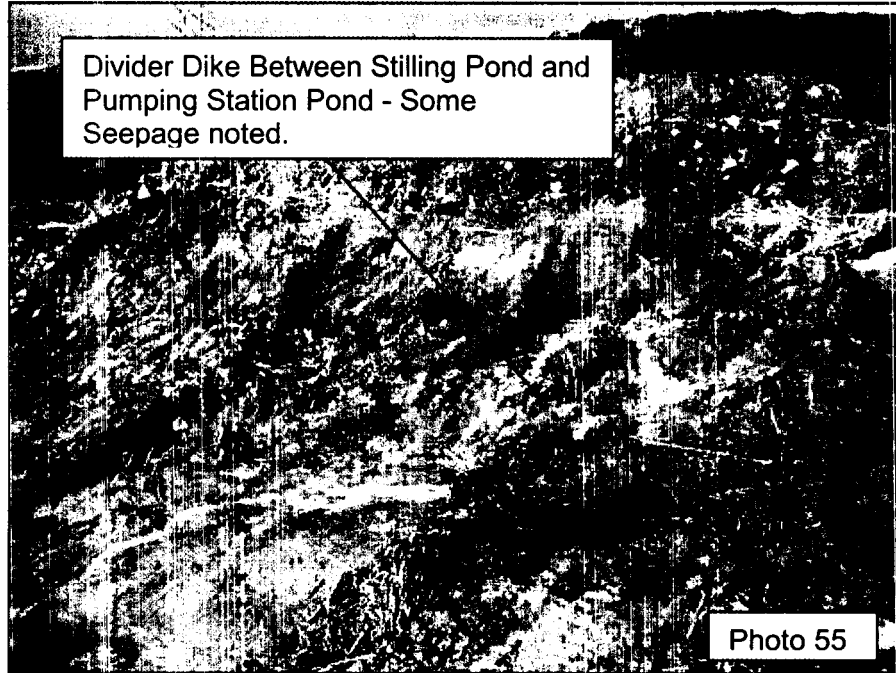
Active Ash Pond Stilling Pond and Pumping Station Pond

- **Location** - Southeast of Active Ash Pond
- **Effluent**
 - Stilling Pond discharges to Pumping Station Pond
 - Pumping Station Pond - pumped to Condenser Cooling Water (CCW) Intake with a portion pumped to wet gypsum system or overflows into outfall 001 into Guntersville Reservoir.
- **Observations**
 - Stilling Pond surface has some floating ash accumulation (Photo 53).
 - Interior Slopes - Good condition with vegetation (Photos 53-55).
 - ◆ Pumping Station Pump just has Riprap.
 - ◆ Pumping Station Pond interior slope bordering Stilling Pond appears to have some seepage.
 - Discharge Structures - Good condition (Photos 56-58)
 - ◆ Only one structure was accessible.
- **Actions Since Last Inspection**
 - None that inspector is aware of.
- **Recommendations**
 - Remove floating ash.
 - Continue good maintenance and BMP's for Active Ash Stilling Pond operations.
 - Monitor seep in dike between Stilling Pond and Pumping Station Pond.



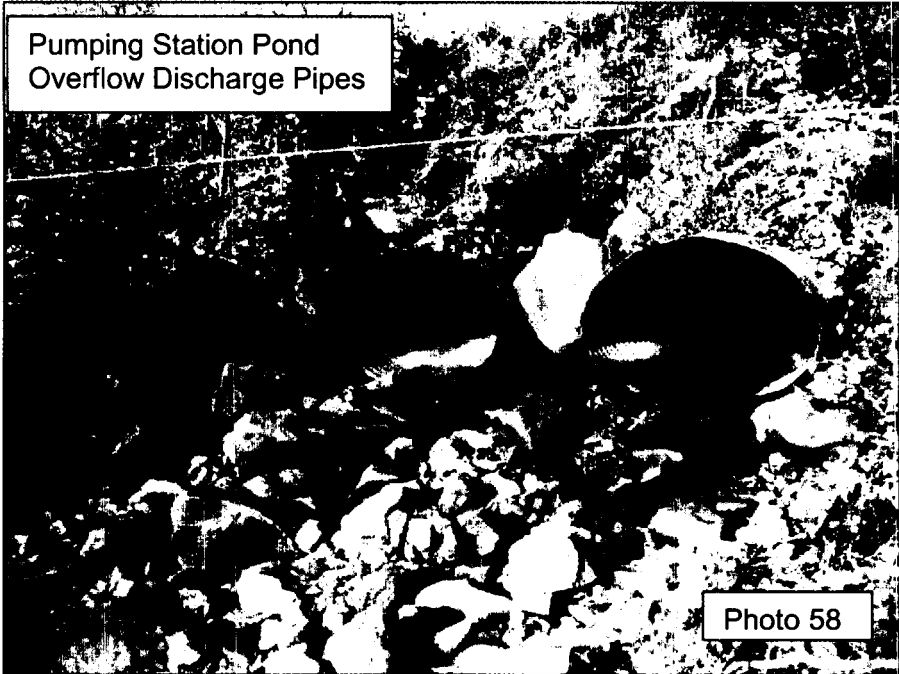
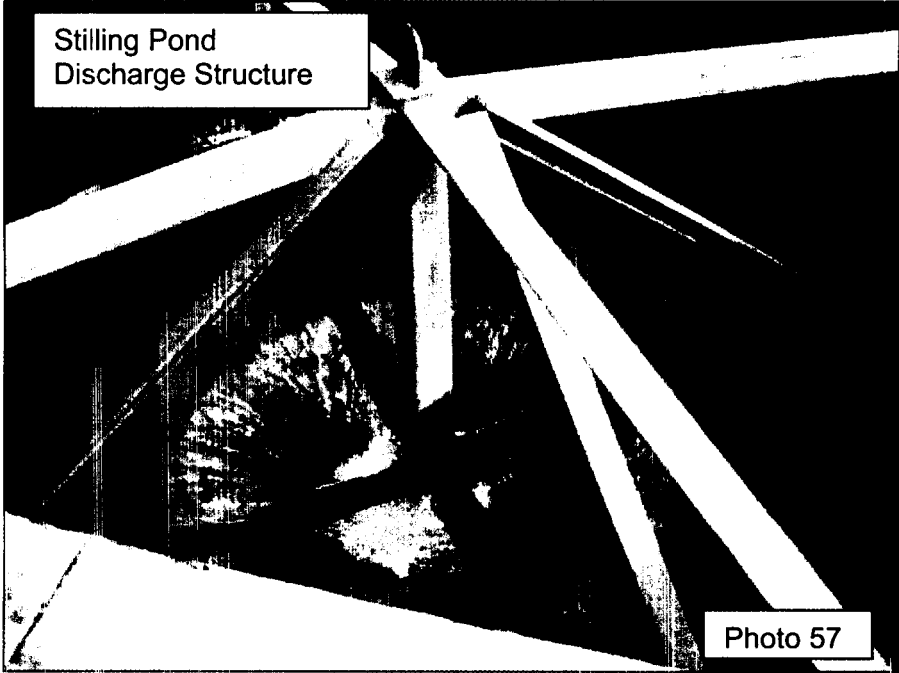
WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007

Active Ash Pond Stilling Pond and Pumping Station Pond (continued)



WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007

Active Ash Pond Stilling Pond and Pumping Station Pond (continued)



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007**

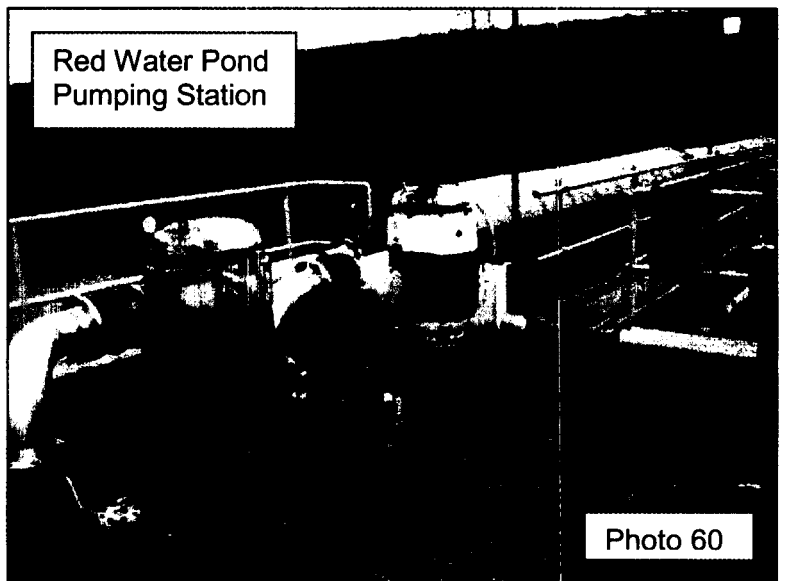
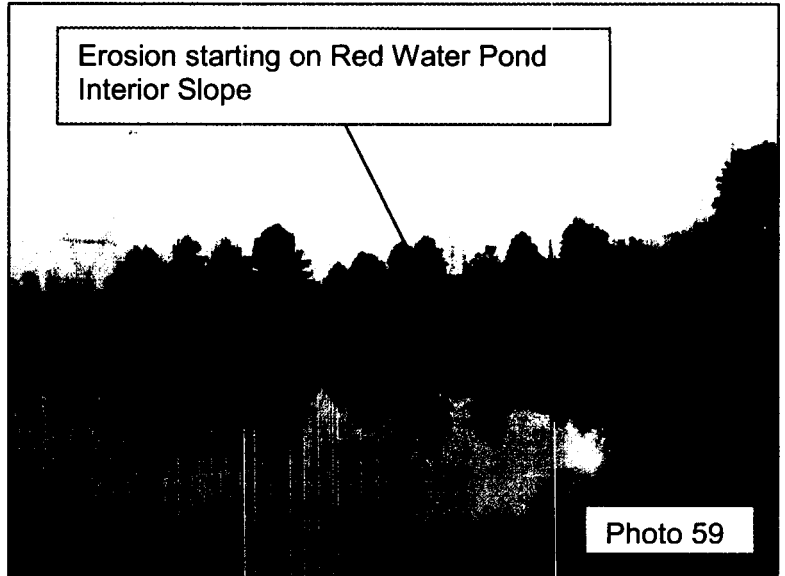
ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND

• **Location**

- **Perimeter Dikes** - Borders all sides of the Active Ash Pond and encloses the Chemical Ponds. Runs parallel to Widows Creek on along the North and East side.
- **Red Water Pond** - Located between the railroad tracks and West Active Ash Pond Perimeter Dike.

• **Effluent** - Surface runoff drains to various locations.

- A portion of the South dike (starting at the Units 7 and 8 ash trench) and all of the Western dike drain into the Red Water Pond. A perimeter ditch receives run-off from the portion of the South dike and diverts water to the Red Water Pond.
- Dike surface runoff drains into Widows Creek starting near the North corner of the Active Ash Disposal Area and extending to the South corner of the Ash Pond Area. This is essentially the entire Eastern half of the disposal area and a portion of the Southern side.
- Surface runoff from the perimeter dike that borders the Stilling Pond flows into the Stilling Pond.
- Surface runoff of the remaining portion of the South dike, starting at the units 7 and 8 ash trench and ending at the Stilling Pond, drain to constructed wetlands and then to a stilling pond before exiting outfall 005. This is accomplished via a perimeter ditch starting at the units 7 and 8 ash trench.



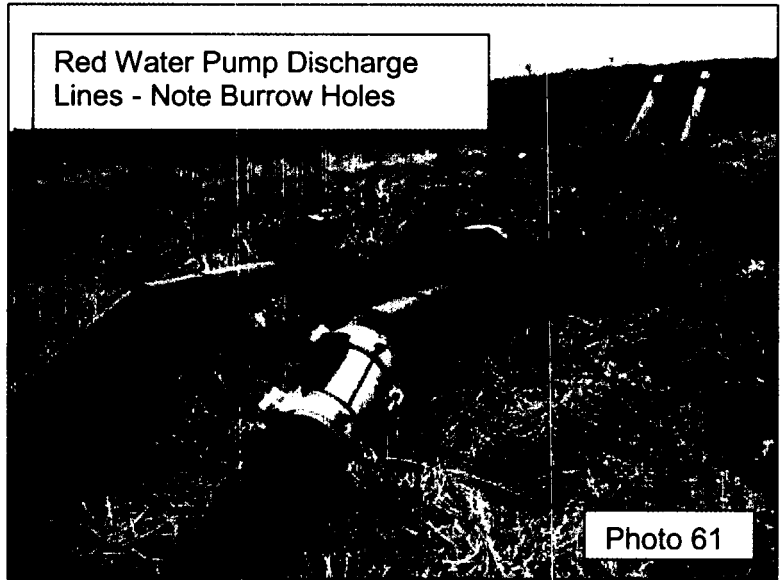
**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007**

ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)

• **Observations**

▪ **Red Water Pond**

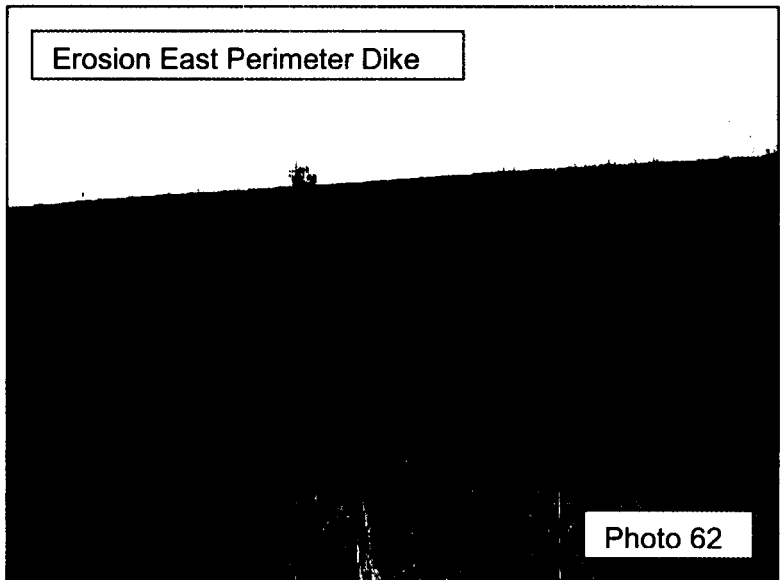
- ◆ Interior Slopes in good condition. Riprap and vegetation covers slopes. One area of erosion noted on west slope (Photo 59)
- ◆ Pump platform was in satisfactory condition (Photo 60).
- ◆ Groundhog observed in the area. Active burrow holes were located around pipe sleeves for the pump discharge pipes (Photo 61).



▪ **Perimeter Dikes generally have good vegetative cover.**

Areas of erosion were observed.

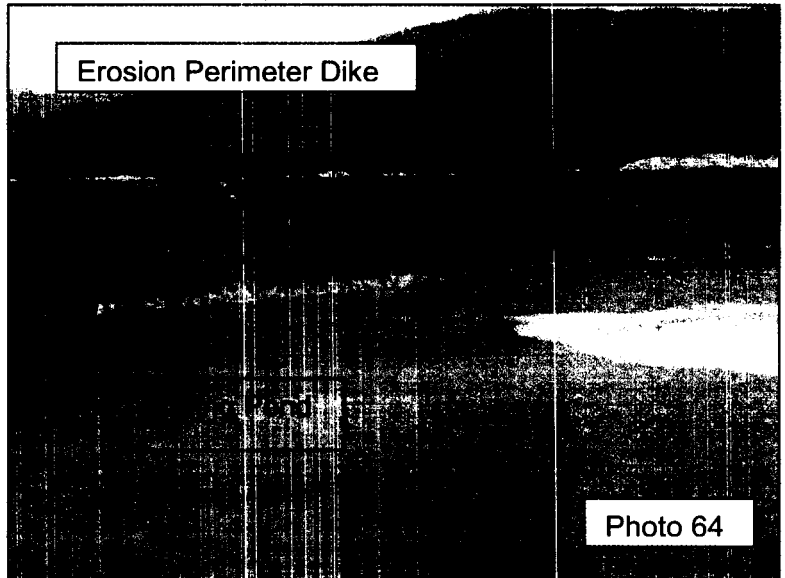
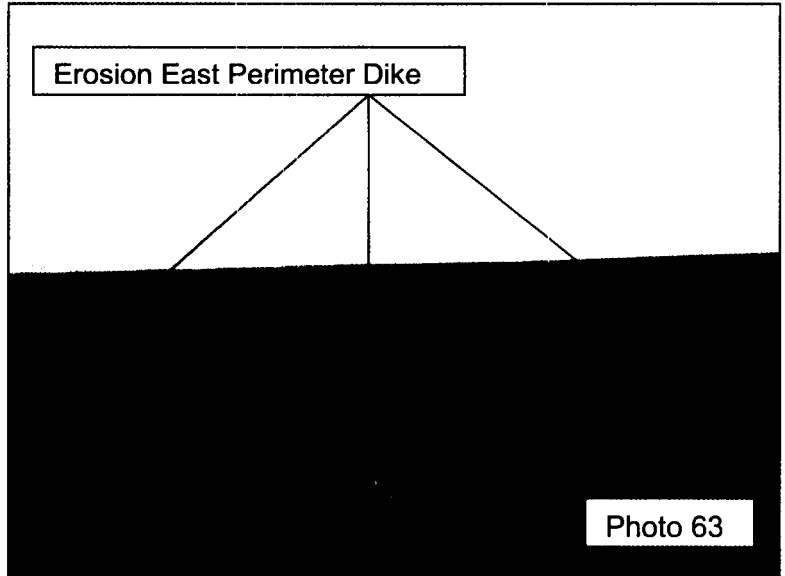
- ◆ Erosion observed on South Dike near the Eastern end. Approximately 650 feet along the dike extending an average of 40 feet down the slope from the top. This area was repaired based on the last inspection but is starting to erode again (Photos 62 and 63).
- ◆ Some erosion was noted at the top of the perimeter dike next to the Stilling Pond (Photo 64).
- ◆ Erosion noted starting at access road from the Stilling Pond and extending approximately 1400 feet west. Starts at the top of the dike and extends down the slope. The paved plant perimeter access road runs parallel to this area (Photos 65 - 68).



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007**

ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)

- Perimeter Dikes Slope observations continued.
 - ◆ Slight erosion at the chemical pond basin area outlet pipes. Runoff from this area runs down the perimeter dike slope (Photos 69 and 70)
 - ◆ Animal burrow hole observed near the chemical pond basin area discharge pipes (Photo 71).
 - ◆ Rutting noted top of dike at Northwest corner of disposal area. Appears that equipment has been accessing the top perimeter dike through this area (Photo 72).
 - ◆ Tree growth was noted at the Gypsum Disposal Area bridge abutment (Photo 73).
 - ◆ Tree growth was also observed on the Western perimeter dike slopes running parallel to the wetlands and Red Water Pond (Photo 74).
- The red water seepage along the southern dike parallel to the paved plant perimeter access road is still present. In comparison with the last inspection report it hasn't worsened (Photos 78- 85)
- Several wet areas and some rutting was observed on the East perimeter dike slope just South of the bridge accessing the Gypsum disposal area. There is a bench formed in the slope here which the Gypsum Stilling Pond discharge line is buried. The bench flows the slope of the drain line to it's discharge point at outfall 008 (Photo 75)



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007**

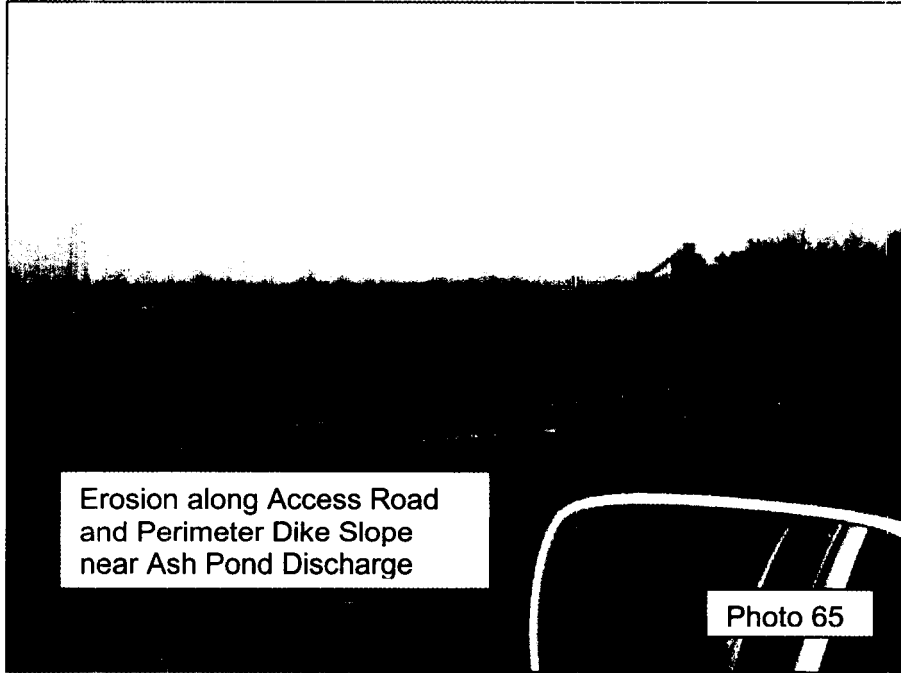
ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)

- **Actions Since Last Inspection**
 - Placed riprap along South dike perimeter ditch next to the plant perimeter road (Photos 75-85).

- **Recommendations**
 - Monitor erosion at the Red Water Pond interior slope. Notify EDS if erosion worsens. Placement of riprap is the recommended repair but not warranted at this time.
 - Eradicate groundhog and fill burrow holes at pump discharge line culverts. (Estimate 15 ft³ concrete).
 - Continue maintenance of the dike slopes by mowing annually. This will also inhibit woody growth.
 - Place suitable earth material atop of the existing earth material that is not supporting vegetative cover on the East perimeter dike. This material shall then be seeded and mulched so that vegetative cover can be established. Some type of grass matting is recommended for this area. Estimated area to be covered, graded, and seeded - 3500 yd².
 - Place suitable earth material atop of the existing earth material that is not supporting vegetative cover on the South perimeter dike. This material shall then be seeded and mulched so that vegetative cover can be established. Some type of grass matting is recommended for this area. Estimated area to be covered, graded, and seeded - 6500 yd². If dirt access road is used in this area surface and gravel. Estimated area is 800 yd².
 - Place riprap in front of Chemical Pond Basin Area runoff discharge pipes. Estimated quantity - 1 yd³.
 - Eradicate animal and fill burrow hole at the Chemical Pond Basin Area runoff discharge pipes.(Estimate 9 ft³ concrete).
 - Repair erosion at the Northwest corner of the perimeter dike. Regrade area so the water will drain and seed and mulch. Estimated area approximately 100 yd².
 - Monitor the seepage along the South perimeter dike next to the Plant perimeter road. Notify EDS of any changes.
 - Monitor wet areas along the Eastern perimeter dike. Notify EDS of any changes.
 - Remove trees at the bridge abutment and where possible along the east slope.

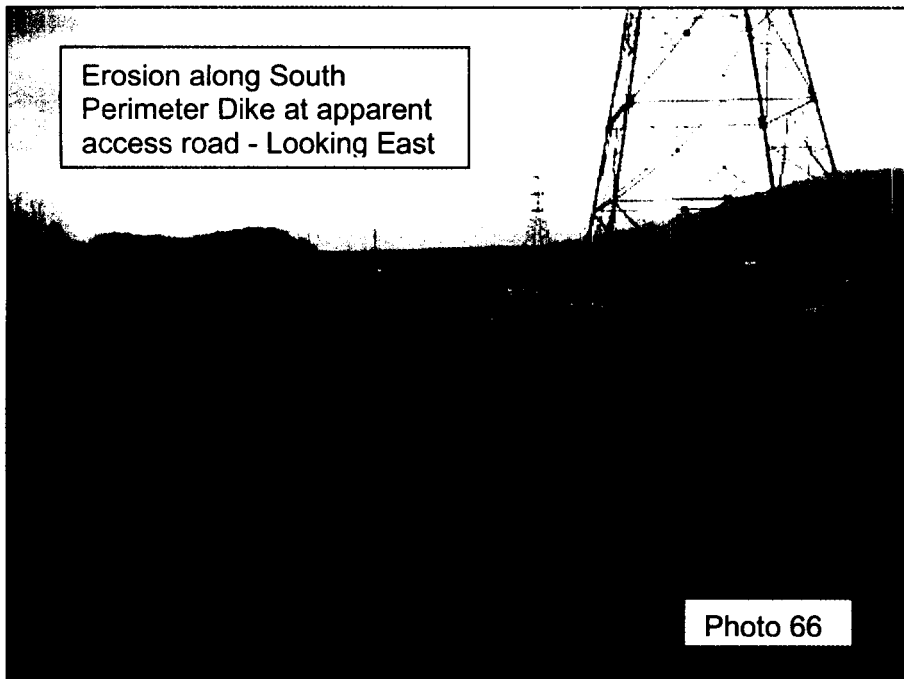
WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007

ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)



Erosion along Access Road
and Perimeter Dike Slope
near Ash Pond Discharge

Photo 65

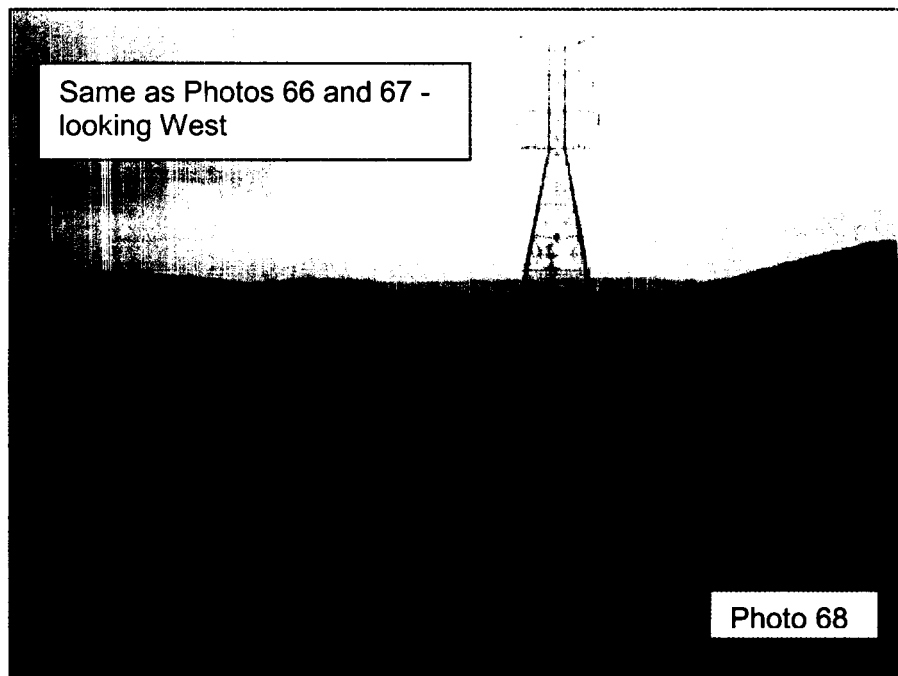
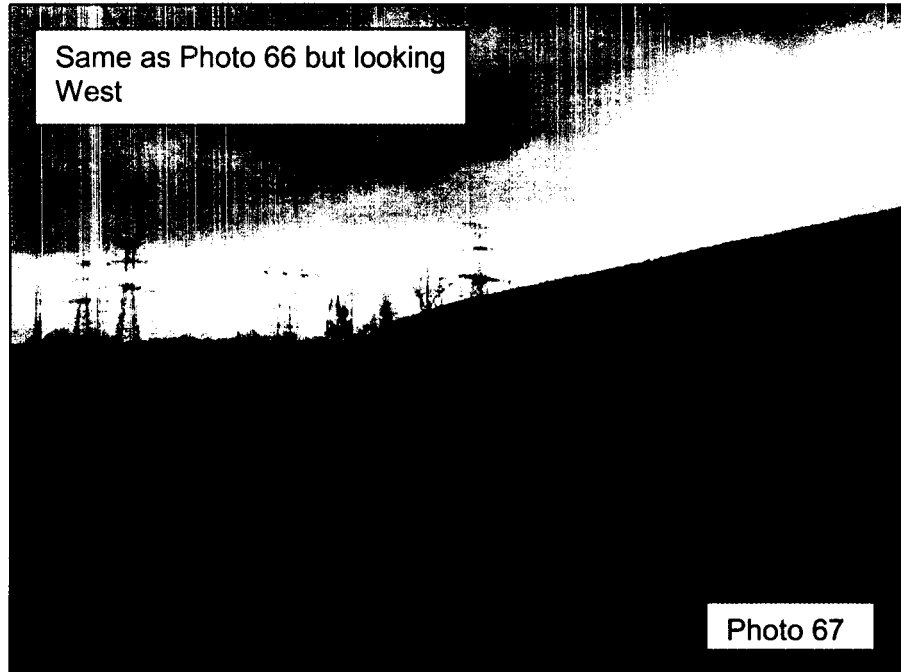


Erosion along South
Perimeter Dike at apparent
access road - Looking East

Photo 66

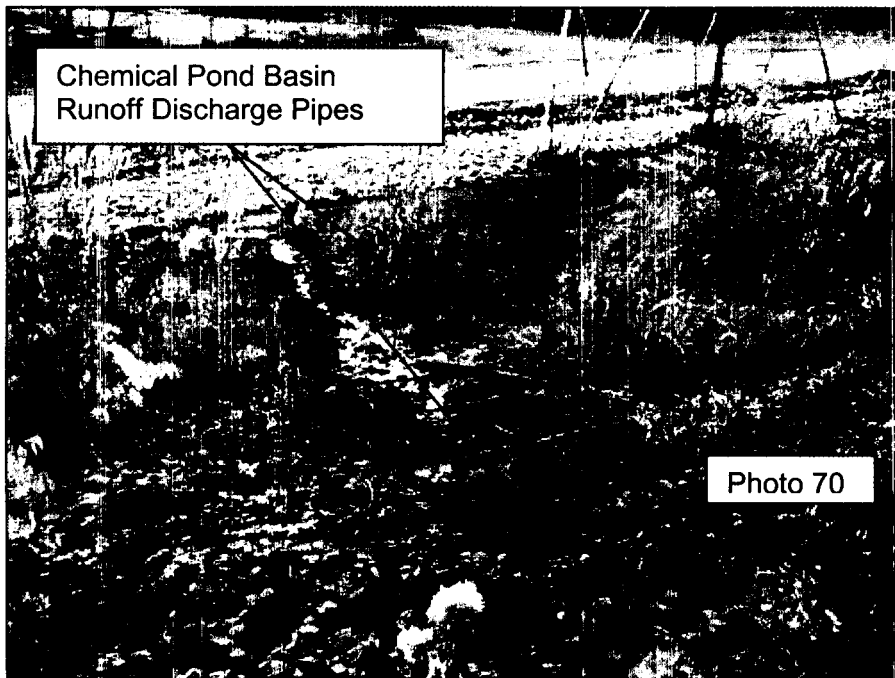
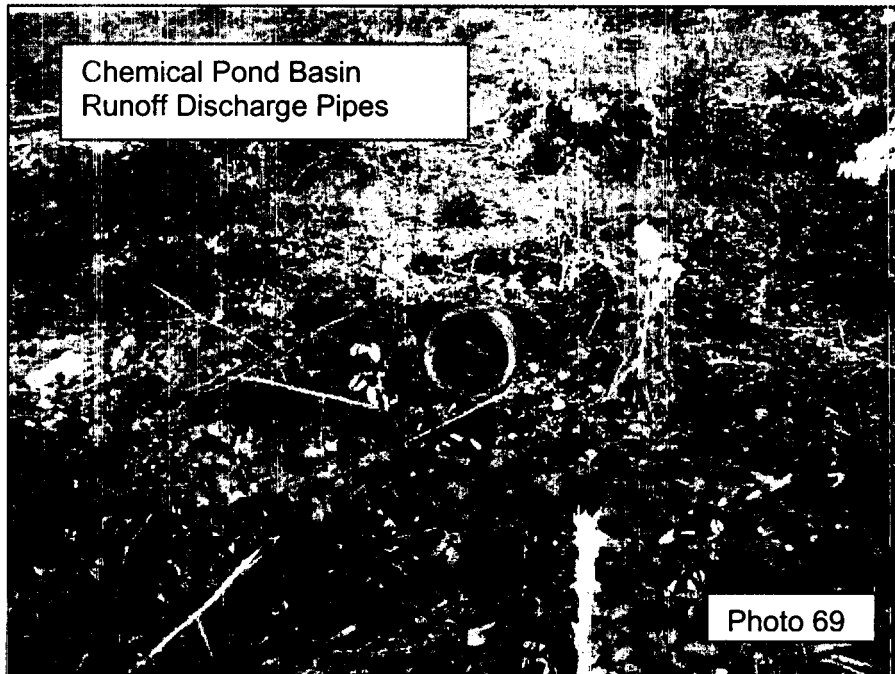
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ANNUAL ASH POND DIKE STABILITY INSPECTION
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ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)



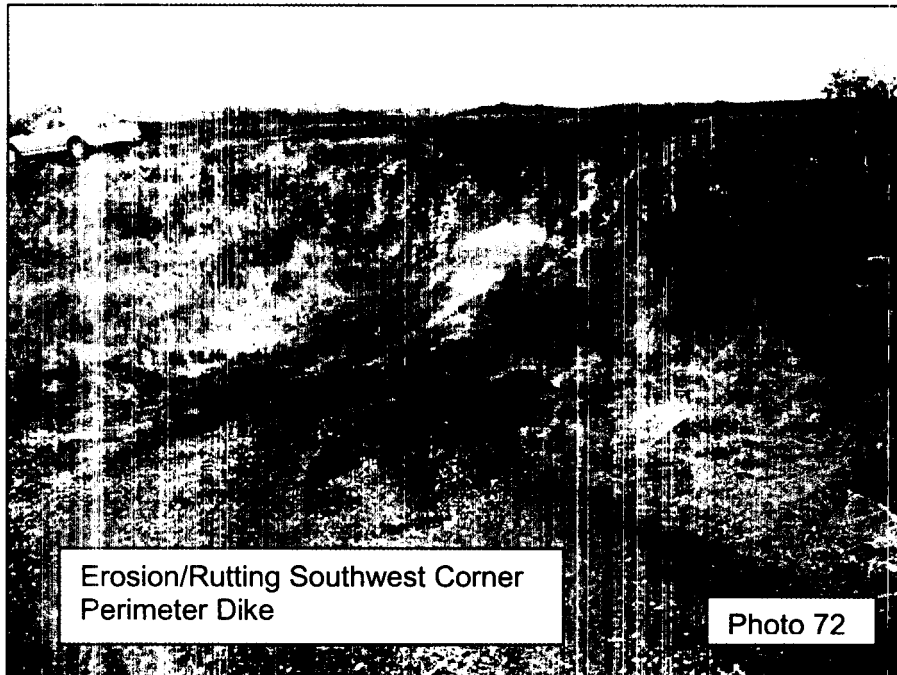
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ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)



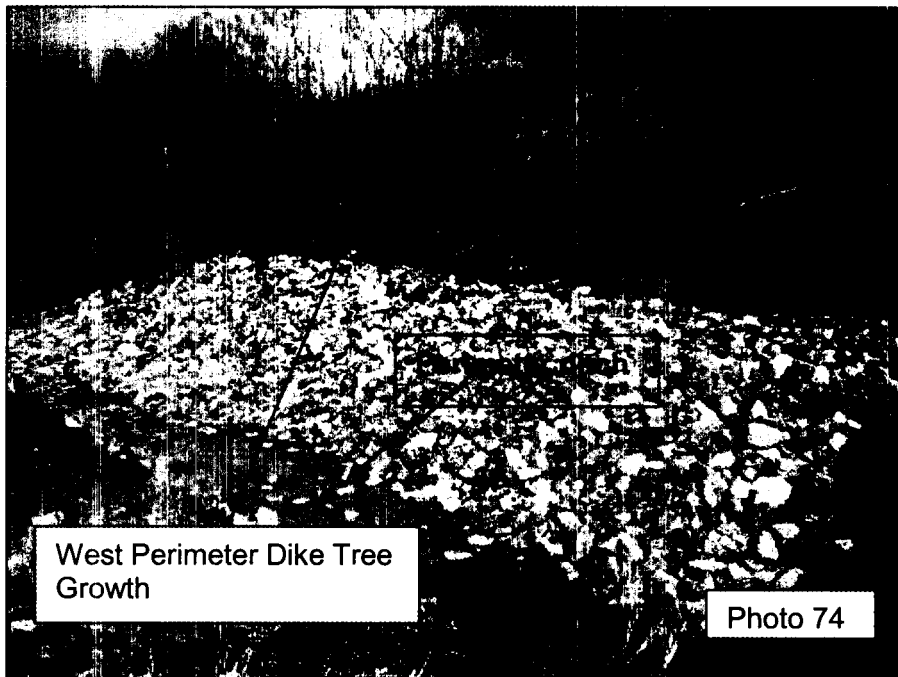
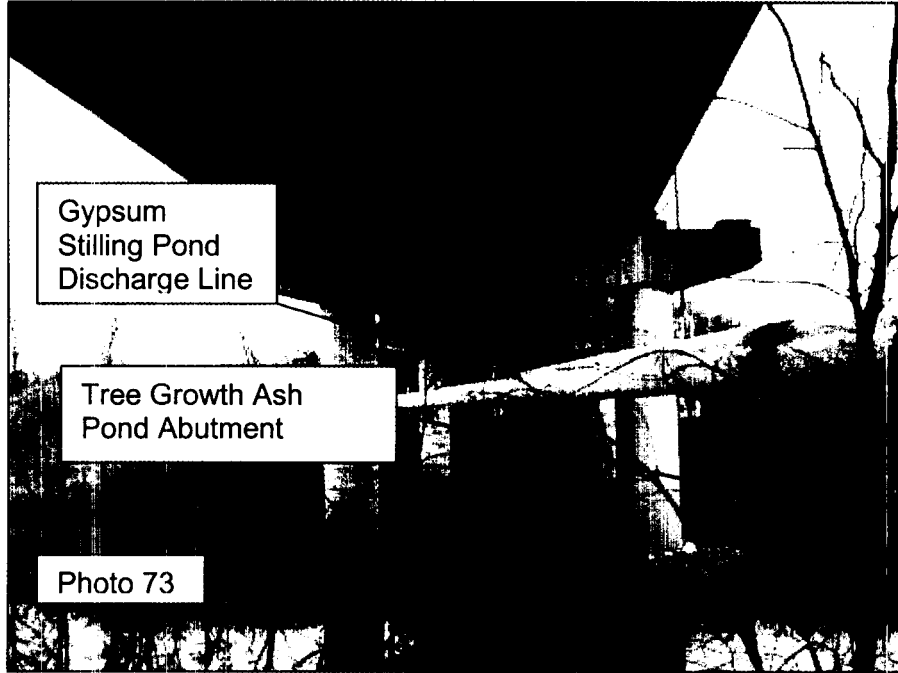
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ANNUAL ASH POND DIKE STABILITY INSPECTION
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ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)



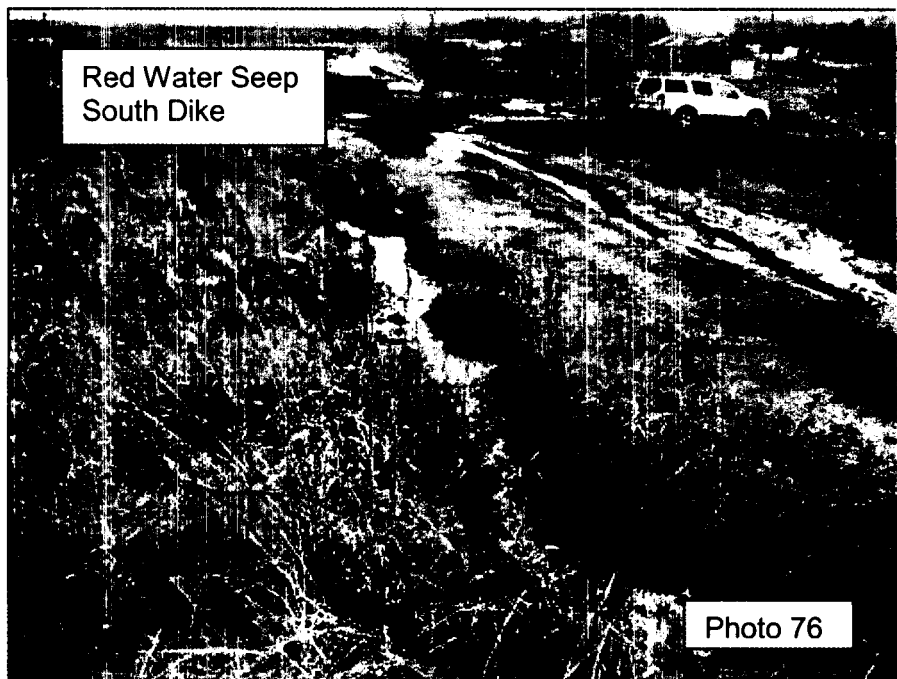
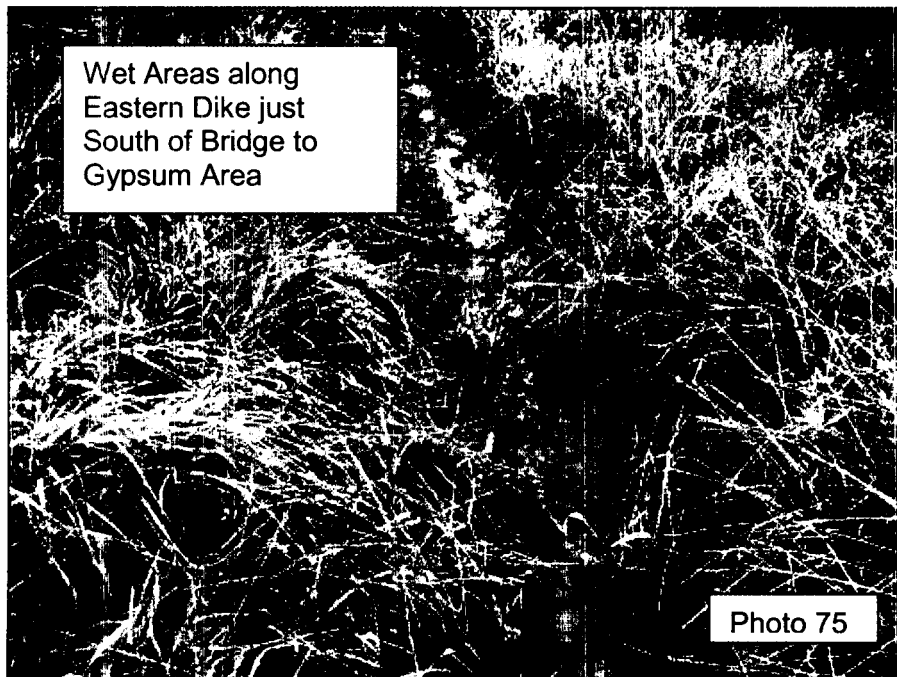
WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
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ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)



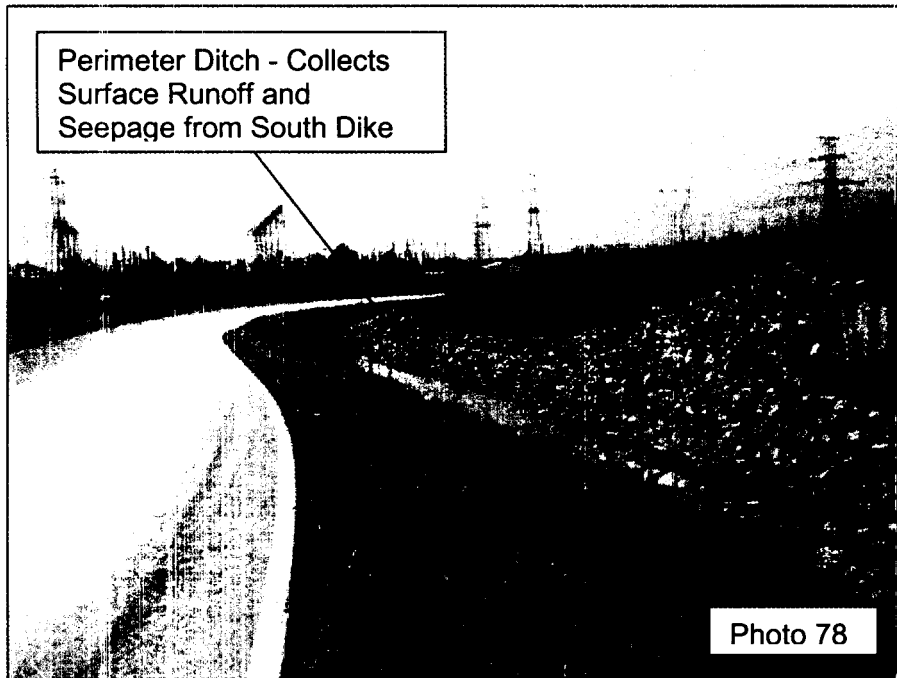
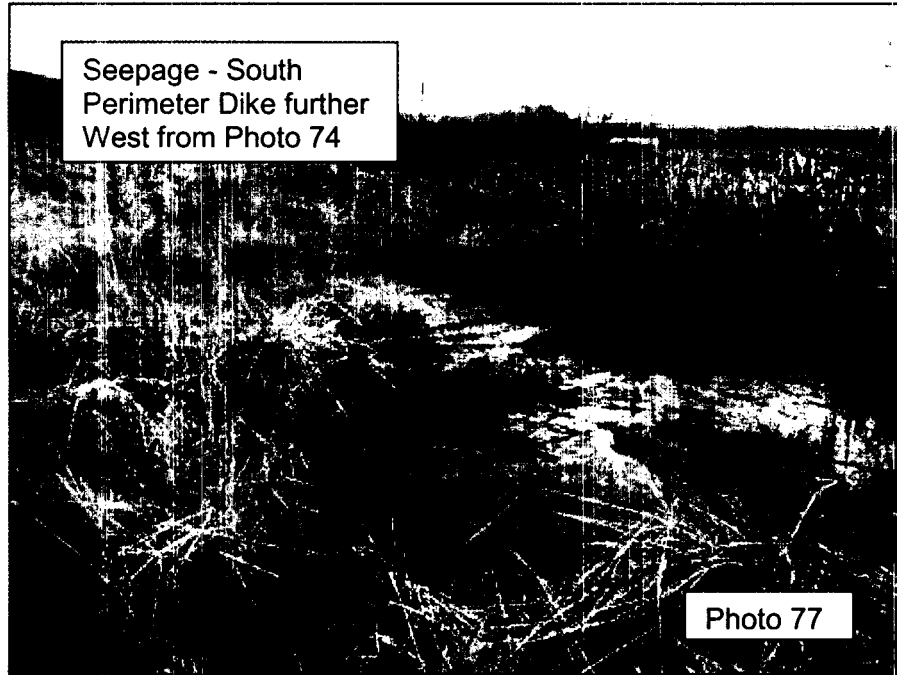
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ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)



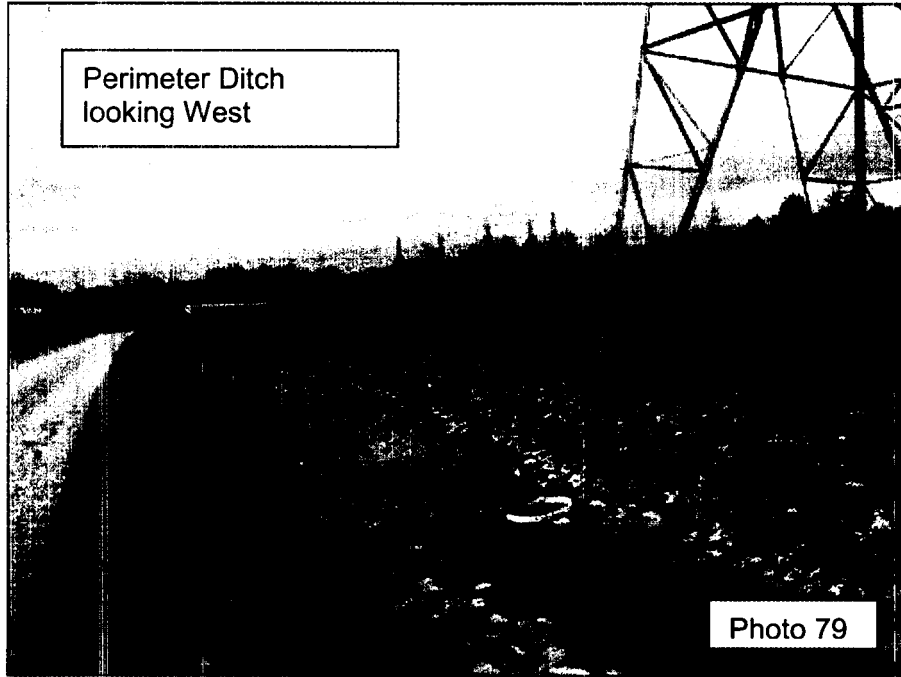
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ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)



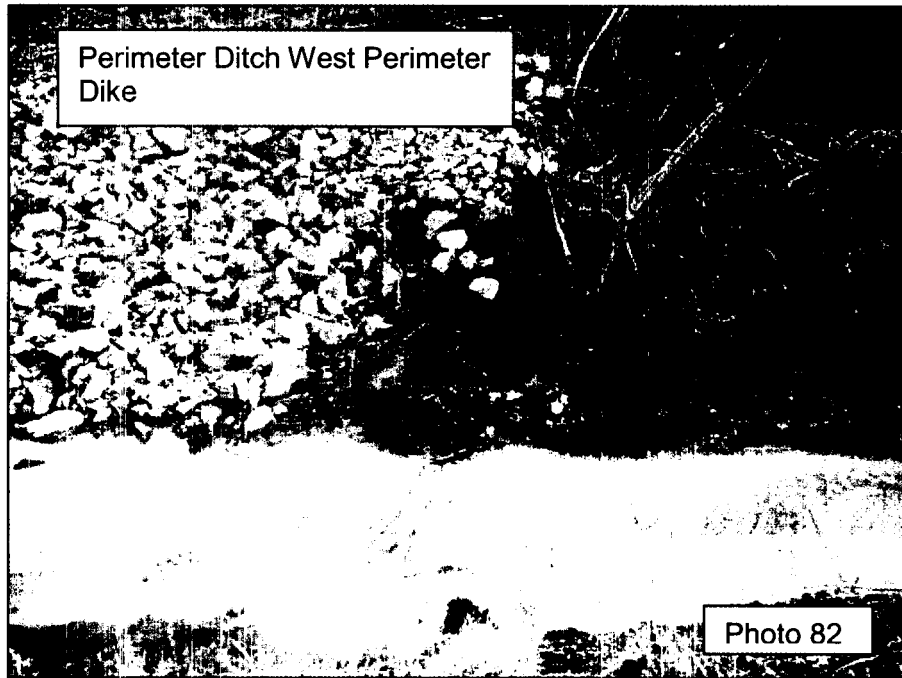
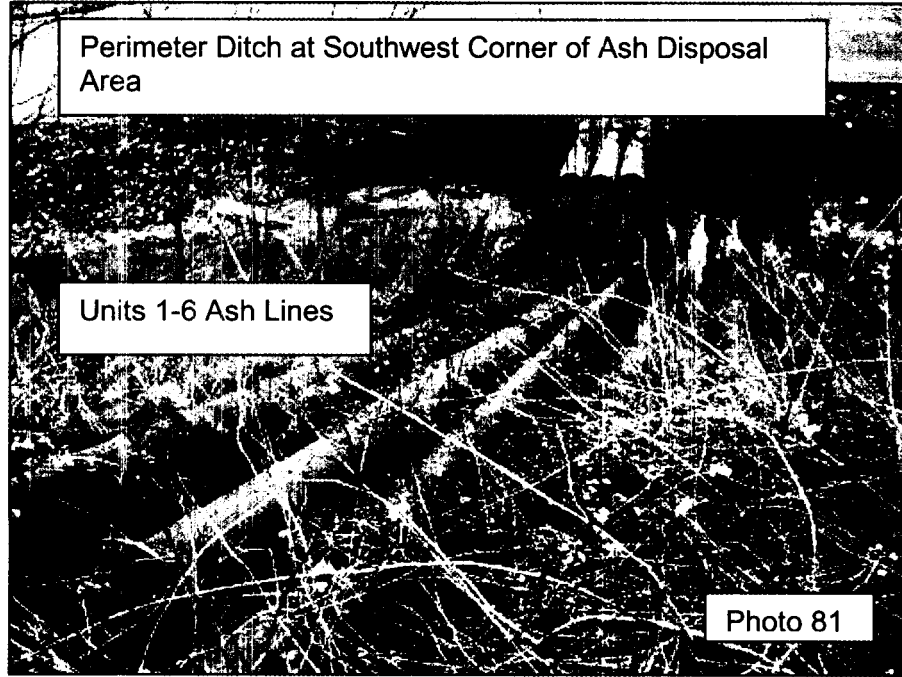
WIDOWS CREEK FOSSIL PLANT
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ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)



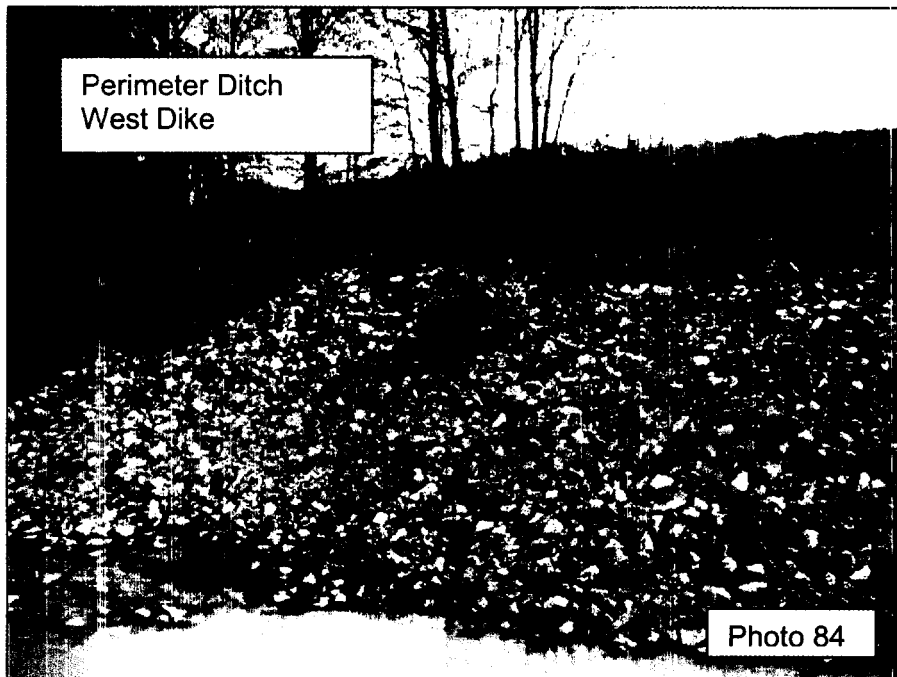
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ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)



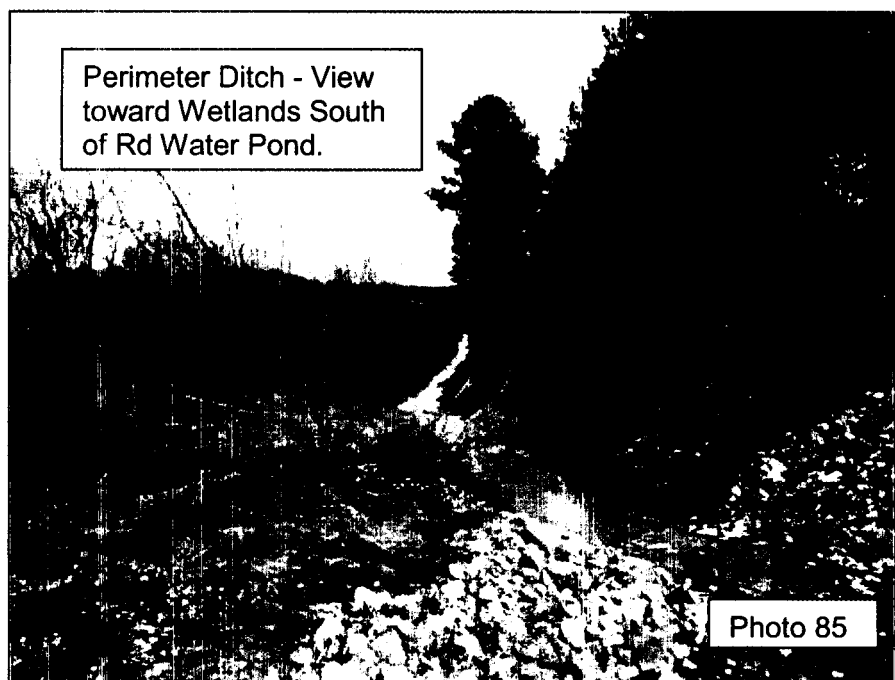
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ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)



**WIDOWS CREEK FOSSIL PLANT
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ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)

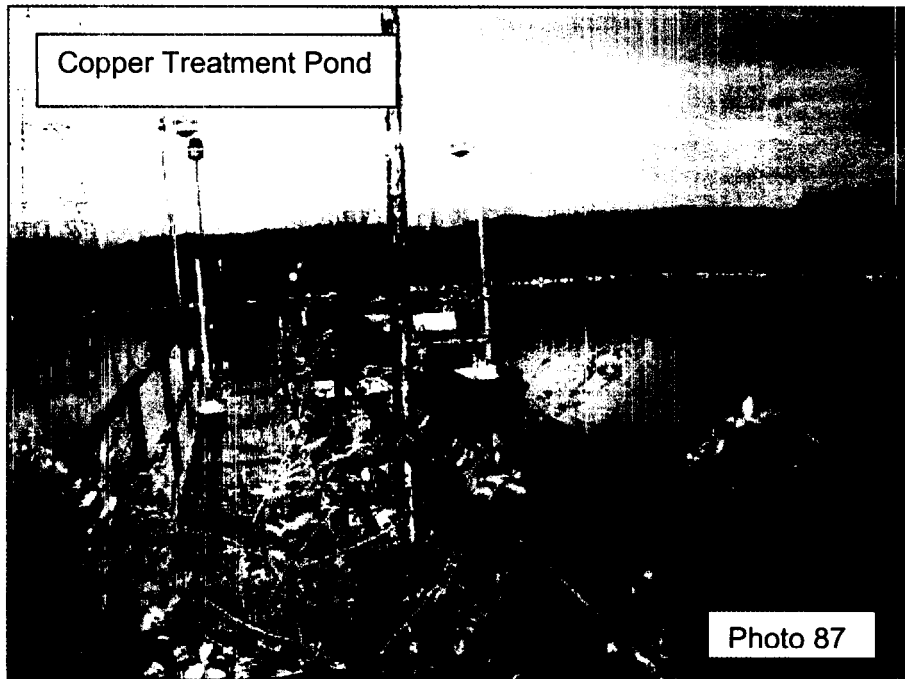
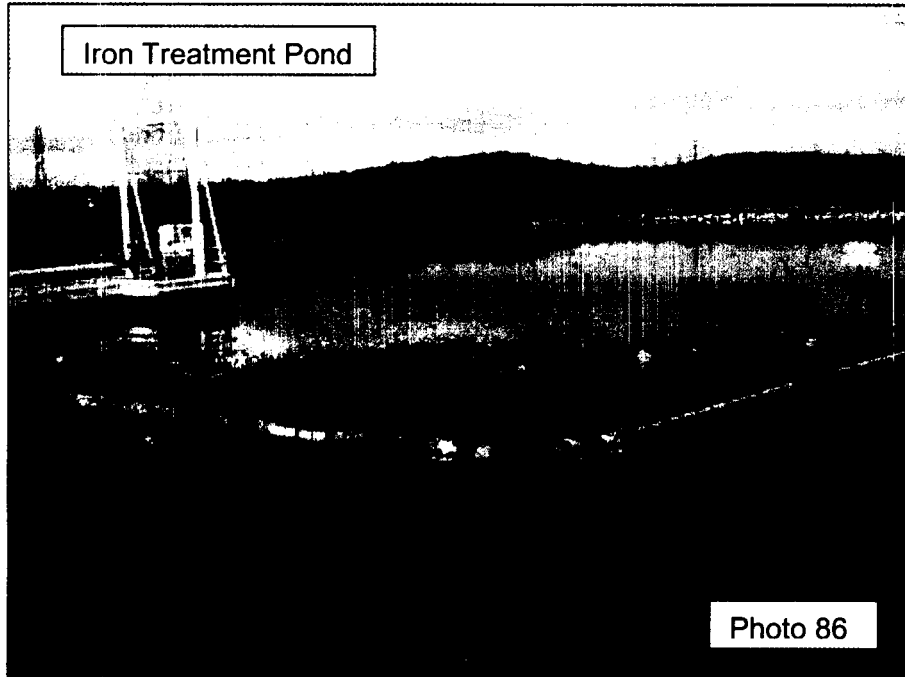


CHEMICAL PONDS

- **Location** - Inside the Ash Pond Perimeter Dikes Northwest of Powerhouse
- **Effluent** - Discharged into Active Ash Pond
- **Observations**
 - Interior slopes - Satisfactory with a few small trees and brush present along the edges of the Copper Pond (Photos 86 and 87).
 - ◆ Riprap cover in good condition.
 - Ponds are enclosed by perimeter dikes forming a basin
 - ◆ Runoff from this area flows through two drainage pipes which penetrate the outside perimeter dike and runs down the slope to the perimeter ditch.
 - ◆ Inlet to these two pipes is partially clogged (Photo 88)
- **Actions Since Previous Inspection**
 - None that inspector is aware of.
- **Recommendations**
 - Unclog drainage pipes and place riprap at entrance point to catch sediment (1 yd³)

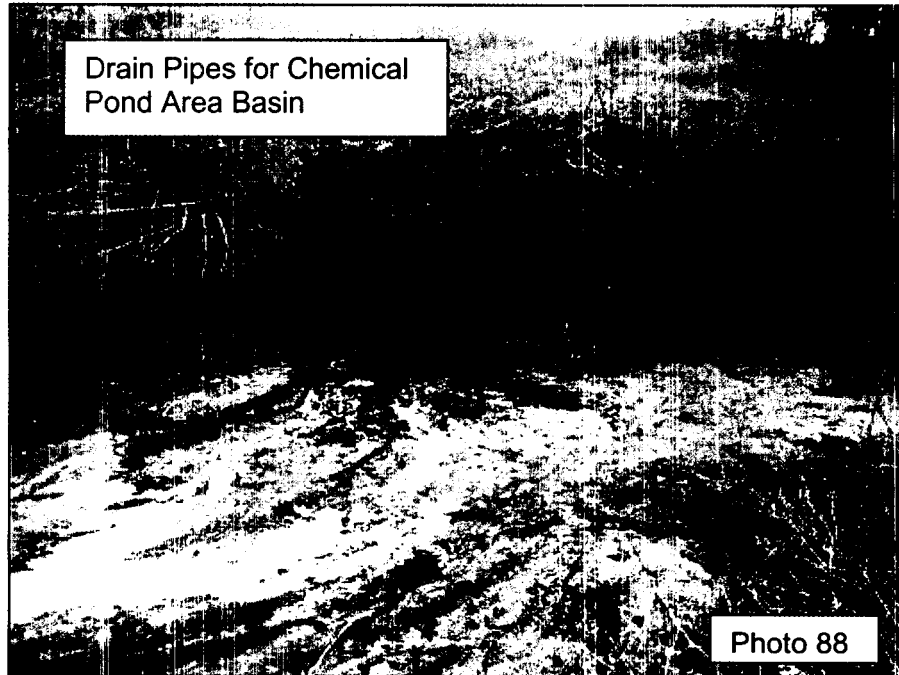
WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007

CHEMICAL PONDS (continued)



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007**

CHEMICAL PONDS (continued)

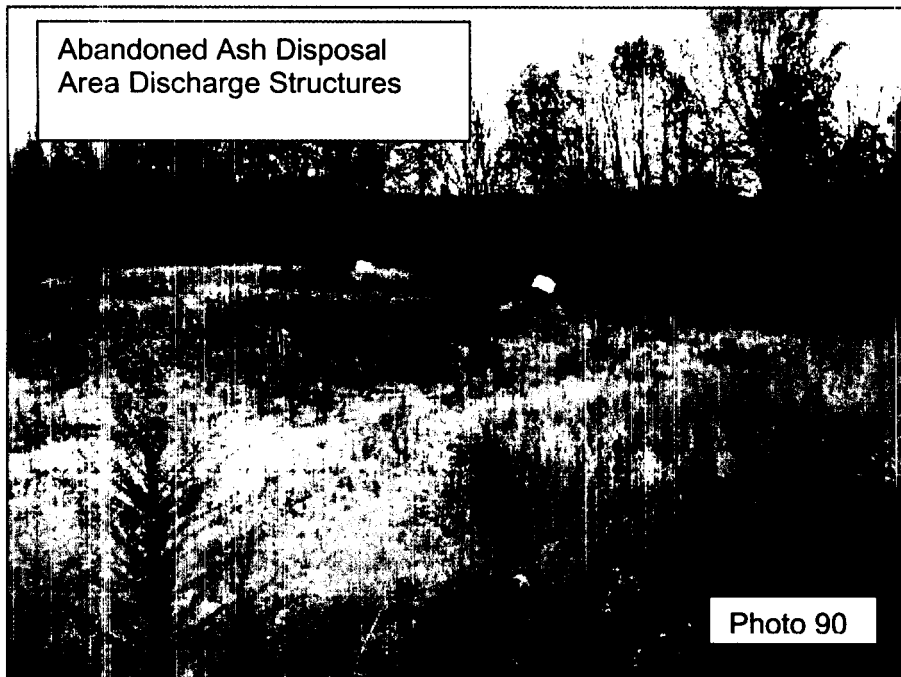
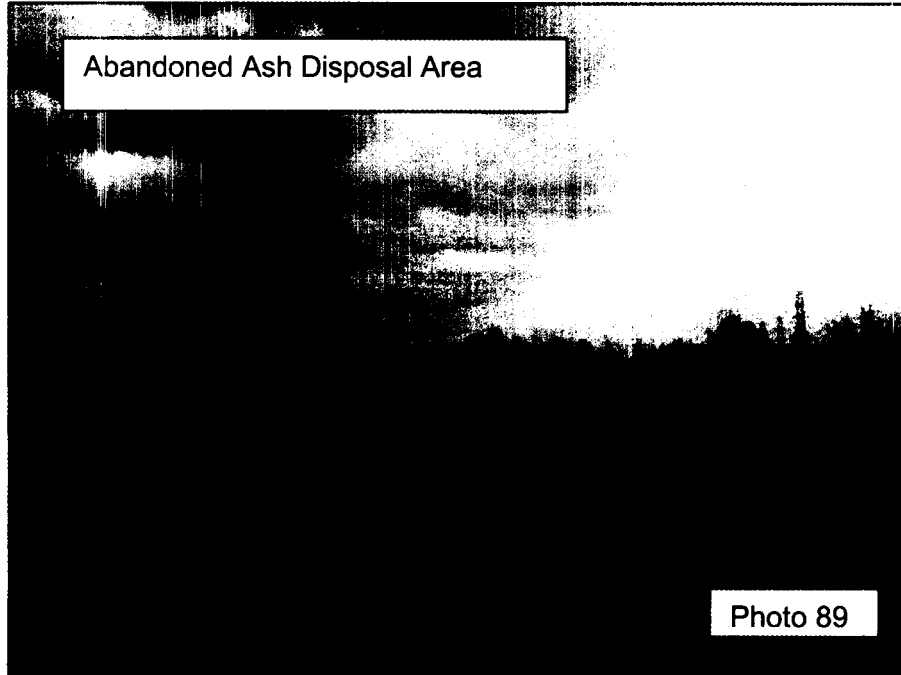


ABANDONED ASH DISPOSAL AREA

- **Location** - Inside the Railroad Loop Northwest of Powerhouse
- **Effluent** - Majority of runoff goes to the Red Water Pond
- **Observations**
 - Heavily wooded in areas with thriving vegetation throughout area (Photo 89).
 - Old discharge structures still present (Photos 90 and 91)
- **Actions Since Previous Inspection**
 - None that inspector is aware of.
- **Recommendations**
 - None

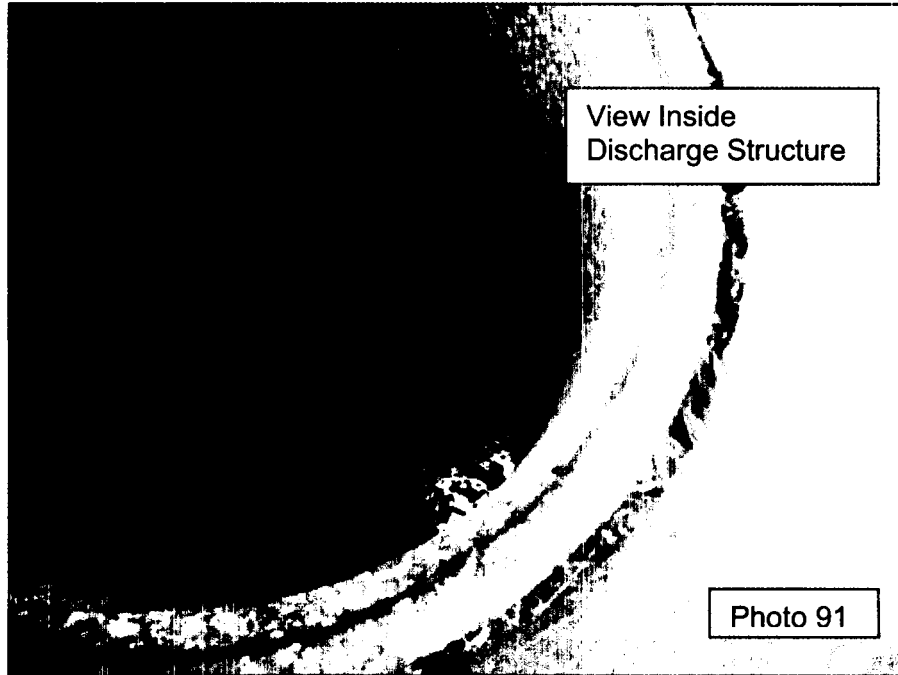
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ABANDONED ASH DISPOSAL AREA (continued)



WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007

ABANDONED ASH DISPOSAL AREA (Continued)



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007**

SUMMARY OF RECOMMENDATIONS

COAL YARD DRAINAGE BASIN

- Monitor the East interior slope. If erosion starts, place suitable earth material on slope prior to seeding and mulching.
 - Notify EDS of any changes.
- Dredge/Clean pond to remove sediment. HED was scheduled to do this shortly after this inspection.
- Eradicate animal and fill burrow hole with concrete (1 yds³)
- Repair pump float switch so that pump can run in automatic mode.

COAL YARD PERIMETER DITCH

- Clean coal fines from the ditch to insure proper drainage.

LIMESTONE PILE DRAINAGE BASIN

- Continue good management practices utilized in maintaining the Limestone Pile Drainage Basin.

WET GYPSUM STACKING AREA

- Continue operations in accordance with the existing permit requirements.
- Monitor wet area along the Southern lower perimeter dike.
- Regrade plant dump access road surface and stabilize to prevent erosion
 - Estimate 100 yd².
- Monitor four bare spots observed at the toe of the North lower perimeter dike.
- Remove trees and woody growth from the North and West lower perimeter dikes. Size of trees are less than 3 inches in diameter and may be cut. If the trees are allowed to grow larger then they must be removed completely, including stumps and roots.
- Repair erosion along gypsum upper perimeter dike slopes on a continuous basis until soil cover is placed and vegetation is established. This includes reworking a portion of the West slope next to the Stilling Pond once new weir discharge lines are installed.
- Regrade perimeter road surface and stabilize to prevent erosion
 - Estimated Area - 50 yd².
- Clean-out toe drain outlets.
- Remove sediment from perimeter ditch to insure drainage. This will be on a continuous basis until soil cover is placed and vegetation is established on the upper slopes.
- Repair erosion around the sluice line valves at Southeast corner of Stilling Pond.
- Continue maintenance of the dike slopes by mowing annually. This will inhibit woody growth.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007**

SUMMARY OF RECOMMENDATIONS (continued)

WET GYPSUM STACKING STILLING POND

- Clean floating ash from pond surface.
- Remove trees and woody growth from the interior and exterior slopes. Size of trees are less than 3 inches in diameter and may be cut. If the trees are allowed to grow larger then they must be removed completely, including stumps and roots.
-
- Install HDPE pipes at North end of pond per DCN WCF-04-1016 when construction sequence allows.
- Continue maintenance of the dike slopes by mowing annually. This will inhibit woody growth.

ACTIVE ASH POND

- Utilize Best Management Practices (BMPs) to prevent erosion on top exterior slopes.
- Move Gypsum Sluice Line out of perimeter ditch.
- Repair deficiencies on Discharge Structure access walkways
- Clean-out perimeter ditch in areas of sediment accumulation - mainly at ditch turns.
- Continue good maintenance and BMP's for Active Ash Pond Operations.

ACTIVE ASH POND STILLING POND AND PUMPING STATION POND

- Remove floating ash.
- Continue good maintenance and BMP's for Active Ash Stilling Pond operations.
- Monitor seep in dike between Stilling Pond and Pumping Station Pond.

ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND

- Monitor erosion at the Red Water Pond interior slope. Notify EDS if erosion worsens. Placement of riprap is the recommended repair but not warranted at this time.
- Eradicate groundhog and fill burrow holes at pump discharge line culverts. (15 ft³ concrete).
- Continue maintenance of the dike slopes by mowing annually. This will inhibit woody growth.
- Place suitable earth material atop of the existing earth material that is not supporting vegetative cover on the East perimeter dike. This material shall then be seeded and mulched so that vegetative cover can be established. Some type of grass matting is recommended for this area. Estimated area to be area to be covered, graded, and seeded - 3500 yd².
- Place suitable earth material atop of the existing earth material that is not supporting vegetative cover on the South perimeter dike. This material shall then be seeded and mulched so that vegetative cover can be established. Some type of grass matting is recommended for this area. Estimated area to be area to be covered, graded, and seeded - 6500 yd². If dirt access road is used in this area surface and gravel. Est. area is 800 yd².
- Place riprap in front of Chemical Pond Basin Area runoff discharge pipes. Est - 1 yd³.
- Eradicate animal and fill burrow hole at the Chemical Pond Basin Area runoff discharge pipes.(Estimate 9 ft³ concrete).
- Repair erosion at the Northwest corner of the perimeter dike. Regrade area so the water will drain and seed and mulch. Estimated area approximately 100 yd².

**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2007**

SUMMARY OF RECOMMENDATIONS (continued)

ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)

- Monitor the seepage along the South perimeter dike next to the Plant perimeter road. Notify EDS of any changes.
- Monitor wet areas along the Eastern perimeter dike. Notify EDS of any changes.
- Remove trees at the bridge abutment and where possible along the east slope. Size of trees are less than 3 inches in diameter and may be cut. If the trees are allowed to grow larger then they must be removed completely, including stumps and roots.

CHEMICAL PONDS

- Unclog drainage pipes and place riprap at entrance point to catch sediment (1 yd³)

ABANDONED ASH DISPOSAL AREA

- None

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

FDP '83 1017 003

TO : H. S. Fox, Director of Fossil and Hydro Power, 716 EB-C

FROM : M. N. Sprouse, Manager of Engineering Design, W11A9 C-K

DATE : OCT 17 1983

SUBJECT: WIDOWS CREEK STEAM PLANT - ANNUAL REFUSE DISPOSAL AREA INSPECTION

Attached is a report from J. P. Hillier Stivers to R. E. Harris dated October 14, 1983 (FDP 831014 019), concerning the joint inspection of the refuse disposal areas at Widows Creek Steam Plant. This report includes recommendations for corrective actions. I concur with these recommendations.

M. N. Sprouse

REN

OPT:JPHS:CY

Attachments

- cc: R. O. Barnett, W9D224 C-K
- C. Bonine, Jr., E7B24 C-K
- J. P. Darling, 546 CST2-C, w/attachments
- MEDS, W5B63 C-K
- O. P. Thornton, 102 SPT-K
- F. Van Meter, 500 SPT-K (3), w/attachments

Principally Prepared By: J. P. Hillier Stivers, Extension 3273

FDP272.05

EC/PM: CR3

MO: _____



UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

FDP '83 1014 019

TO : R. E. Harris, Civil Project Engineer, Fossil Design Project, 338 SPT-K

FROM : J. P. Hillier Stivers, Civil Engineer, Fossil Design Project,
337 SPT-K

DATE : OCT 14 1983

SUBJECT: WIDOWS CREEK STEAM PLANT - ANNUAL REFUSE DISPOSAL AREA INSPECTION

On August 31, 1983, Britt Holiday and Jerry Chumley of F&H PR, Chattanooga, G. R. Hoodenpyl, Power Plant Results Engineer, Widows Creek Steam Plant, and S. B. Amhed (CEB) and I of EN DES inspected the refuse disposal area at Widows Creek Steam Plant. Our findings were discussed with G. R. Hoodenpyl.

The last annual inspection was made on August 9, 1982 (CDB 820823 010), with an interim inspection on March 10, 1983 (FDP 830411 008).

The different areas are designated on the attached prints of drawings 10N7400, 10N7420, and 10N7421.

Abandoned Ash Disposal Area - Units 1 through 6 Area

There has been no change in this area since last inspection. This area is filled and abandoned. The dikes show no signs of instability.

Ash Disposal Area - Units 7 and 8

Change In Dikes Since Last Inspection

Construction Services Branch (CSB) is constructing a base prior to raising the dikes. With the construction in progress, very little could be inspected. CSB has covered the exterior slopes of the south and east dikes with earth in an effort to stop seepage through the dikes. The slopes have been seeded, and the grass has established a good cover. The dikes appear to be stable; however, they were raised by plant personnel with earth, ash, and a mixture of ash and earth. All compaction was by hauling equipment.

Change In Operation Since Last Inspection

There has been no change in operation since last inspection. All ash (units 1-8) is sluiced into this area then flows through a breach in the northeast dike into the new ash disposal area. The bottom ash from this area was used as a foundation for raising the dikes in the new disposal area, units 7 and 8 area, and the scrubber area.

Action on Recommendations of Last Inspection

1. Plant personnel have not made much of an effort to remove the trees from the slopes as recommended.



R. E. Harris

OCT 14 1983

WIDOWS CREEK STEAM PLANT - ANNUAL REFUSE DISPOSAL AREA INSPECTION

Recommendations

1. Remove the trees and bushes from the slopes and keep them removed.

New Ash Disposal Area

Change In Dikes Since Last Inspection

CSB has built a base for raising the dikes using bottom ash from units 7 and 8 area and has started placing earth in accordance with design drawings.

The dikes appear to be in good condition, with no signs of instability. The exterior slopes have a good cover of vegetation with some small trees and bushes growing on them (see recommendations). The top of the dike has been disturbed by the construction and will be reworked during the final phases of construction.

During the inspection of the spillways and outlet on the exterior slope of the spillway dike, a large hole and an underground passage for water was found. CSB provided a backhoe and an operator. Investigation of this area with the above equipment showed the area to be in good condition. The passageway was through the soft earth on the top of the dike. See recommendations.

Change In Pond Operation Since Last Inspection

There has been no change in pond operation since last inspection. The light ash and water flows through a breach in the northeast corner of units 7 and 8 area into the new area. The water then flows through standard spillways and skimmers into the stilling pool then through additional spillways into the pumping station reservoir. During normal operations, the water is pumped into the intake channel (condition at the time of this inspection). When the pumps are not functioning properly, water discharges through three overflow pipes into the original Widows Creek channel and into Gunter'sville Reservoir.

Condition of Spillways, Skimmers, and Outlet

The five standard spillways and skimmers in the new ash disposal area appear to be in good condition. Weirs were not installed on these spillways as required (see recommendations). The outlets were submerged and could not be inspected. There was no sign of loss of

R. E. Harris

OCT 14 1983

WIDOWS CREEK STEAM PLANT - ANNUAL REFUSE DISPOSAL AREA INSPECTION

ash into the stilling pool. There is no evidence of loss of ash from the stilling pool or from the pumping station reservoir.

Action on Recommendation of Last Inspection

1. There has been very little, if any, effort to remove the small trees from the dike slopes.

Recommendations

1. Observe closely the spillway dike where the large hole and water passageway was found. If any unusual conditions are seen, they are to be reported to EN DES and F&H PR immediately.
2. Install weirs on the spillways so as to enable the correct measurement of the quantity of water to be made.
3. Remove the small trees and bushes from the dike slopes.

SO₂ Scrubber Disposal AreaChange In Dikes Since Last Inspection

CSB has completed the raising of the dikes except for the divider dike between the new ash disposal area and the scrubber disposal area. The divider dike was left uncompleted to serve as a roadway for heavy equipment when raising the dikes of the ash disposal area.

The top of the dike has not been surfaced with crushed stone due mainly to the use of the top as a roadway (see recommendations).

The slopes have been seeded and mulched; but due to the dry weather, no cover was established (picture 3).

The northeast and southeast dikes have a large number of tension cracks, both laterally and longitudinally (pictures 1 and 2) that are approximately 15 inches deep. The tension cracks were caused by dry weather, and the large number of heavy loads (loaded earth moving equipment) to build the southwest dike. These cracks will have to be repaired.

R. J. Harris
OCT 14 1983

WIDOWS CREEK STEAM PLANT - ANNUAL REFUSE DISPOSAL AREA INSPECTION

The north end of the northeast dike has a vertical wall approximately three feet high (picture 4). The vertical wall is the result of wave action erosion on the inside toe of the dike and unless stopped will continue to erode the dike (see recommendations).

Several small trees and bushes were seen on the exterior slope of the original dikes (see recommendations).

Change In Pond Operation Since Last Inspection

There is no change in pond operation. All scrubber waste is pumped into the south corner of the area where the solids begin to settle and the water and lighter solids flow around the deflector dike. The water flows to a pumping station in the northwest corner of the area where the water is pumped back to the scrubbers for reuse.

Spillways, Skimmers, and Outlets

There are no spillways, skimmers, or outlets in the SO₂ scrubber disposal area.

Action on Recommendations from Last Inspection

There were no recommendations from last inspection.

RecommendationsI. To Be Performed by Plant Personnel

1. Remove the small trees and bushes from the exterior slope of the original dikes.
2. Place bottom ash, as it becomes available, at the inside toe of the exterior dike as an aid in reducing the erosion of the toe.

II. To be Performed by Construction Services Branch

1. During construction of the pipe dike (for the forced oxidation sluice pipes, drawings to be issued later), repair the tension cracks in the top of the northeast and southeast dike by removing the top 18 inches of earth, scarify the base to ensure a good bond, and recompact the earth. The tension crack repair will extend from station 80+ to station 113+ (drawing 10N7420).

R. E. Harris

OCT 14 1983

WIDOWS CREEK STEAM PLANT - ANNUAL REFUSE DISPOSAL AREA INSPECTION

- 2. Delay placing the crushed stone surfacing on the scrubber area dikes from station 69+ to station 114+ until after the repair of the tension cracks.

J.P. Hillier Stivers
 J. P. Hillier Stivers

Concur: *R. E. Harris*
 R. E. Harris

Concur: *O. P. Thornton*
 O. P. Thornton

JPHS:CY
 Attachments

cc: O. P. Thornton, 102 SPT-K, w/attachments

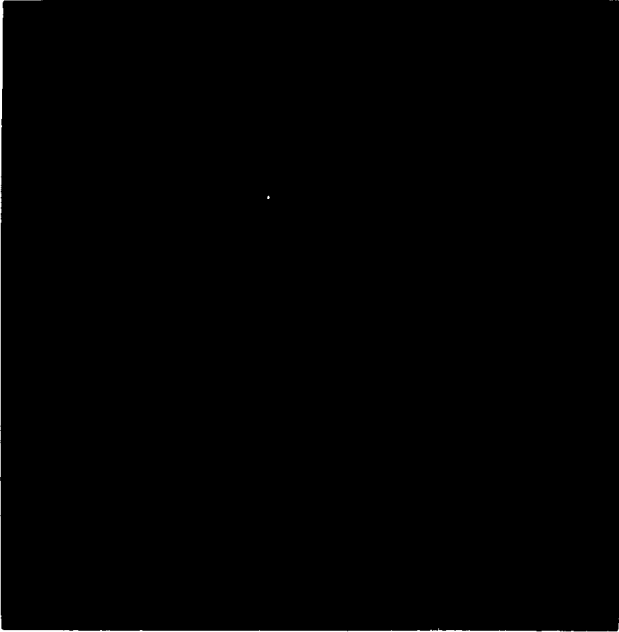
OPT:CY - OCT 14 1983

cc: R. O. Barnett, W9D224 C-K, w/attachments.
 MEDS, W5B63 C-K, w/attachments, except drawings
 M. N. Sprouse, W11A9 C-K

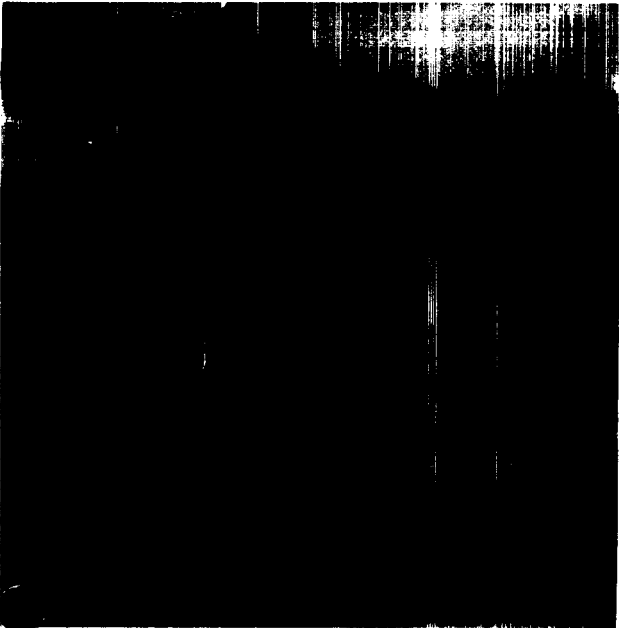
Principally PreparedBy: J. P. Hillier Stivers, Extension 3273

FDP272.05

*WIDOWS CREEK
STEAM PLANT
AUGUST 1983*



① *TOP OF RAISED SCRUBBER
AREA DIKES. NOTE: TENSION
CRACKS.*

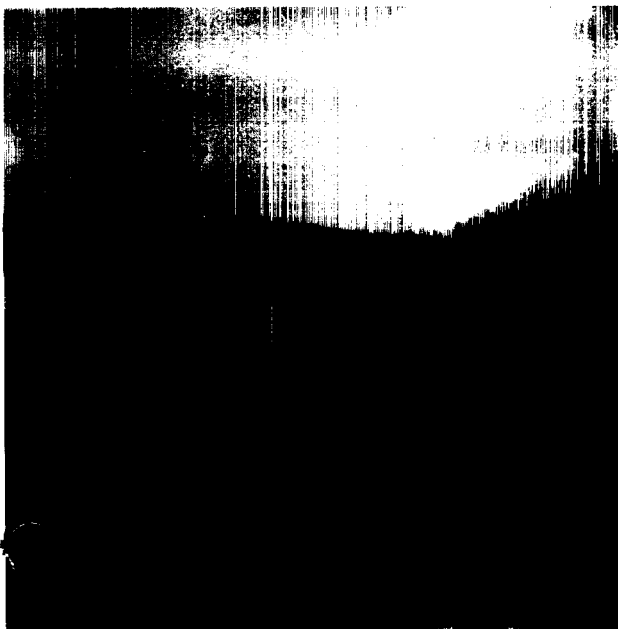


② *TOP OF RAISED SCRUBBER
AREA DIKES. NOTE: TENSION
CRACKS.*

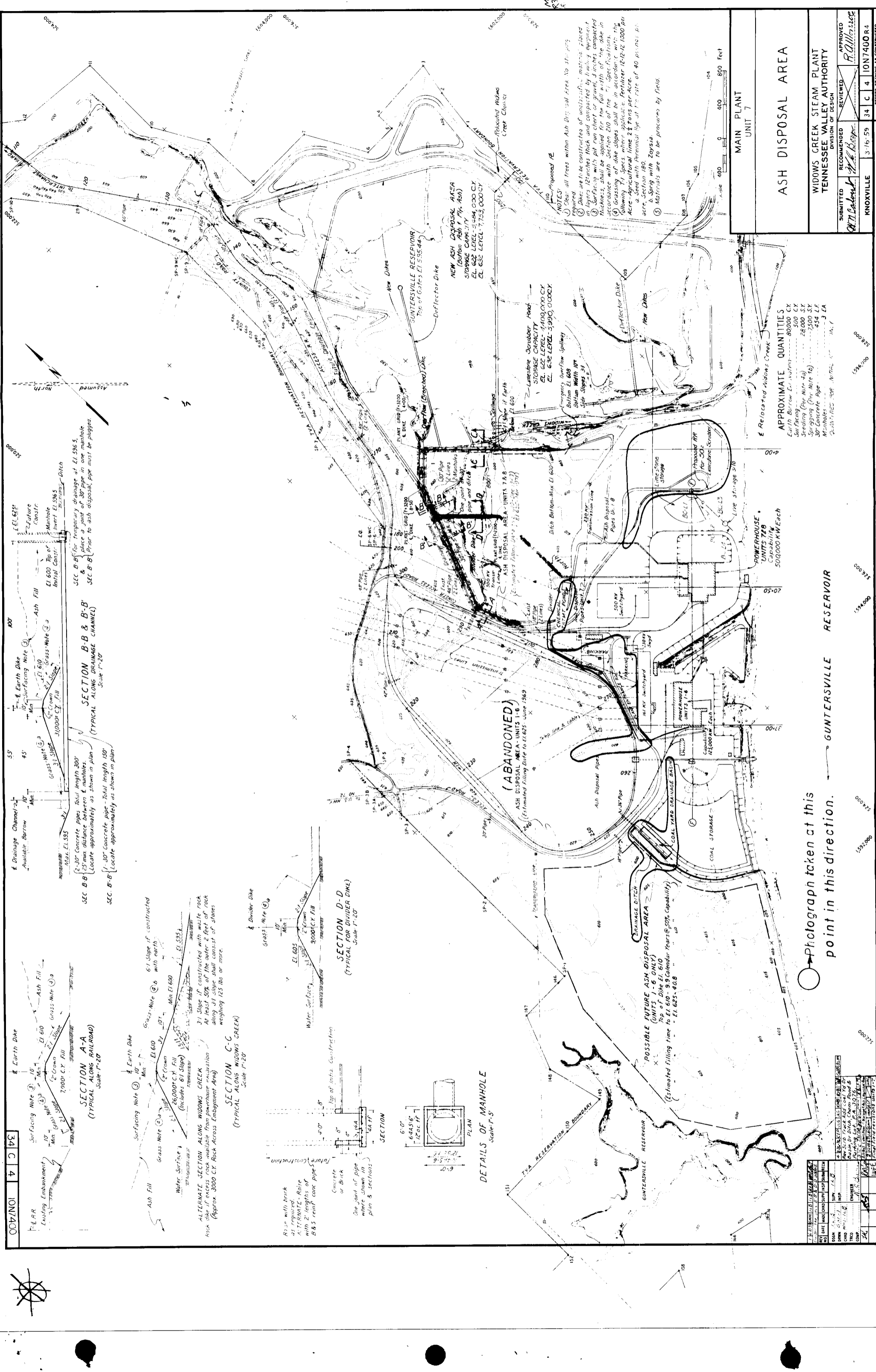
*WIDOWS CREEK
STEAM PLANT
AUGUST 1983*



- ③ *EXTERIOR SLOPE OF RAISED
SCRUBBER AREA DIKES.
NOTE: SPARSE VEGETATION.*



- ④ *INSIDE SLOPE OF SCRUBBER
AREA DIKE. NOTE: WAVE
EROSION OF TOE.*



34	C	4	10N7400
----	---	---	---------

SECTION A-A
(TYPICAL ALONG RAILROAD)
Scale: 1"=20'

SECTION B-B & B'-B'
(TYPICAL ALONG DRAINAGE CHANNEL)
Scale: 1"=20'

SECTION C-C
(TYPICAL ALONG WIDOWS CREEK)
Scale: 1"=20'

SECTION D-D
(TYPICAL FOR DIVIDER DIKE)
Scale: 1"=20'

DETAILS OF MANHOLE
Scale: 1"=5'

APPROXIMATE QUANTITIES
 Earth Borrow (Est. volume) 80,000 CY
 Bar Piling (Per Note 4) 500 CY
 Spigging (Per Note 16) 28,000 SY
 30" Concrete Pipe 454 LF
 Manholes 3 EA
 QUANTITY FOR APPROXIMATE

NOTES:
 1) These all trees within Ash Disposal Area No. 310-1000
 2) Dikes are to be constructed of unconsolidated material placed in layers 12 inches thick and compacted by heavy equipment
 3) Surface with pit run chert or gravel, 3 inches compacted thickness shall be applied for the full width of the dike in accordance with Section 210 of the T. Specifications.
 4) Grassing of dike slopes shall be in accordance with the following T. Specs. where applicable: Fertilizer 12-12-12 1000 lbs./Acre - Agricultural lime 2 1/2 tons per Acre.
 a. Seed with Perennial type at 1/4 rate of 40 lbs./Acre.
 b. Spring with Zoysia
 5) Materials are to be procured by field.

RELOCATED WIDOWS CREEK
 CREEK CHANNEL
 RELOCATED WIDOWS CREEK

POWERHOUSE UNITS 7 & 8
 Capacity 50,000 KW Each

ASH DISPOSAL AREA - UNITS 1 & 2
 (Estimated Filling Date to 11-6-85 - Year 1989)
 (Estimated Filling Date to 11-6-85 - Year 1989)

ASH DISPOSAL AREA - UNITS 3 & 4
 (Estimated Filling Date to 11-6-85 - Year 1989)
 (Estimated Filling Date to 11-6-85 - Year 1989)

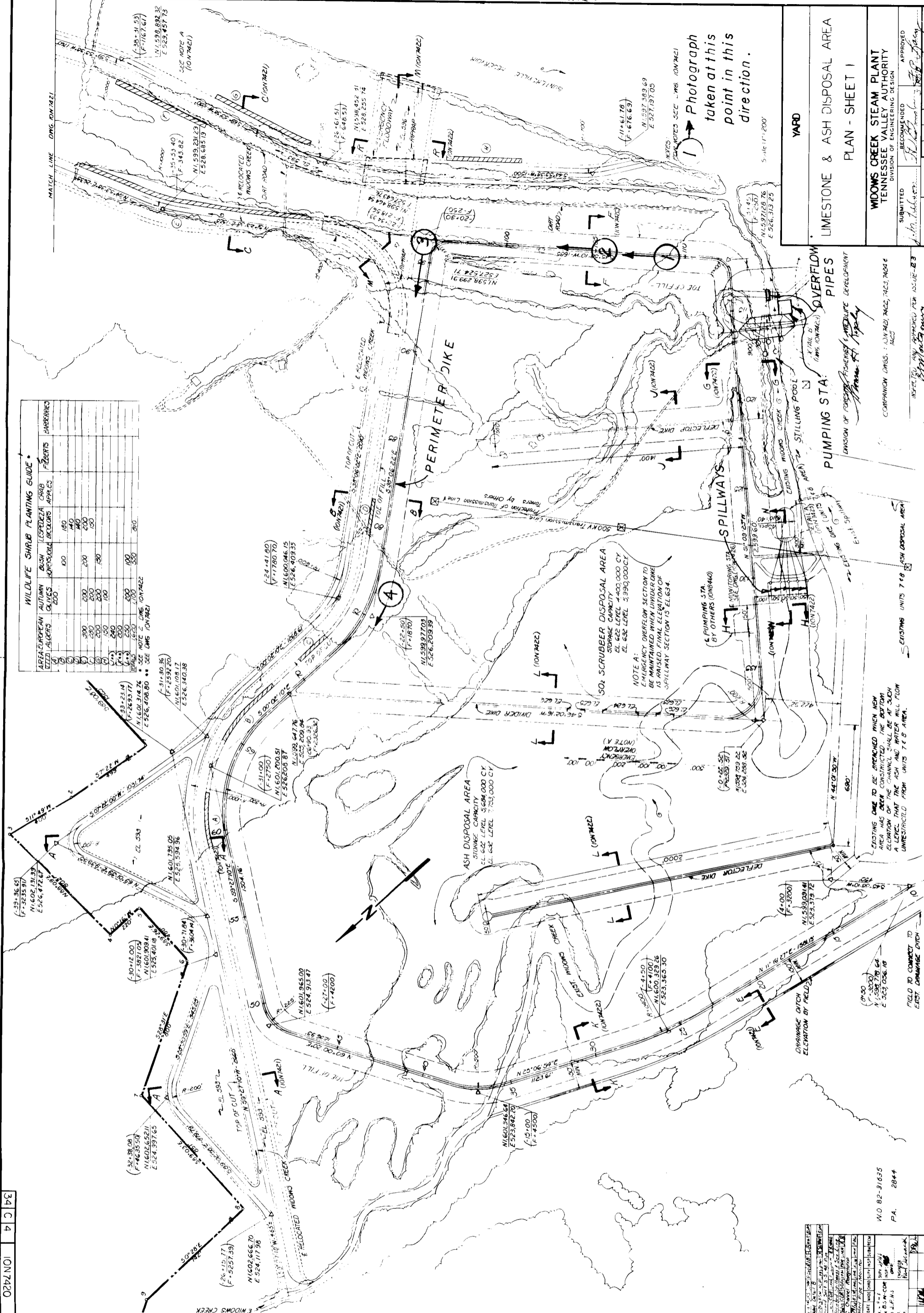
PHOTOGRAPH TAKEN AT THIS POINT IN THIS DIRECTION.

WIDOWS CREEK STEAM PLANT
 TENNESSEE VALLEY AUTHORITY
 DIVISION OF DESIGN
 APPROVED: R. Allister
 REVIEWED: J. B. Cooper
 SUBMITTED: M. J. Cabot
 KNOXVILLE 3-16-59 34 C 4 10N7400 R 4
 RECORD DRAWING AS CONSTRUCTED 9-26-61

WILDLIFE SHRUB PLANTING GUIDE

AREA	AUTUMN OLIVES	BUSH LOCUSTS	GRAB APPLES	BARBERIES
(1)	200	100	100	100
(2)	300	200	100	100
(3)	200	200	100	100
(4)	200	200	100	100
(5)	200	200	100	100
(6)	200	200	100	100
(7)	200	200	100	100
(8)	200	200	100	100
(9)	200	200	100	100
(10)	200	200	100	100
(11)	200	200	100	100
(12)	200	200	100	100
(13)	200	200	100	100
(14)	200	200	100	100
(15)	200	200	100	100
(16)	200	200	100	100
(17)	200	200	100	100
(18)	200	200	100	100
(19)	200	200	100	100
(20)	200	200	100	100

SEE NOTE A (ION 7421)
SEE NOTE B (ION 7422)
SEE NOTE C (ION 7423)
SEE NOTE D (ION 7424)
SEE NOTE E (ION 7425)
SEE NOTE F (ION 7426)
SEE NOTE G (ION 7427)
SEE NOTE H (ION 7428)
SEE NOTE I (ION 7429)
SEE NOTE J (ION 7430)
SEE NOTE K (ION 7431)
SEE NOTE L (ION 7432)
SEE NOTE M (ION 7433)
SEE NOTE N (ION 7434)
SEE NOTE O (ION 7435)
SEE NOTE P (ION 7436)
SEE NOTE Q (ION 7437)
SEE NOTE R (ION 7438)
SEE NOTE S (ION 7439)
SEE NOTE T (ION 7440)
SEE NOTE U (ION 7441)
SEE NOTE V (ION 7442)
SEE NOTE W (ION 7443)
SEE NOTE X (ION 7444)
SEE NOTE Y (ION 7445)
SEE NOTE Z (ION 7446)



YARD
LIMESTONE & ASH DISPOSAL AREA
PLAN - SHEET 1

WIDOWS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

APPROVED
RECOMMENDED
SUBMITTED

ION 7420/85

OVERFLOW PIPES
PUMPING STA.
STILLING POOL
WIDOWS CREEK

50% SCRUBBER DISPOSAL AREA
STORAGE CAPACITY 3,990,000 CY
EL. 622 LEVEL 4,400,000 CY
EL. 632 LEVEL 3,990,000 CY

NOTE A:
EMERGENCY OVERFLOW SECTION TO BE RAISED WHEN FINAL ELEVATION OF SPILLWAY SECTION IS ESTABLISHED.

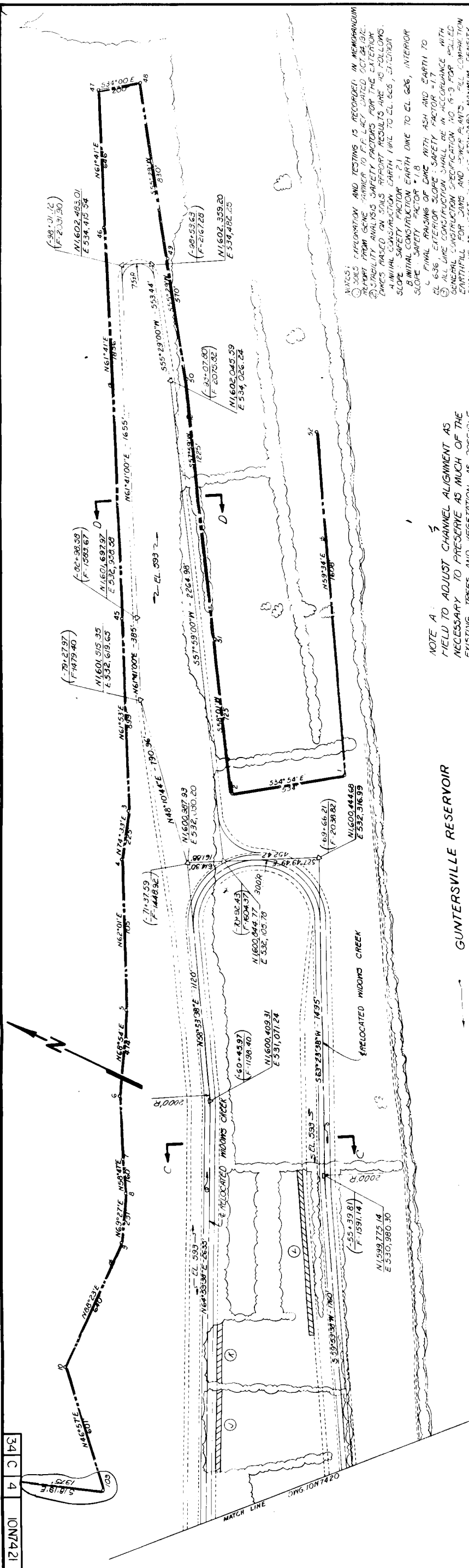
ASH DISPOSAL AREA
STORAGE CAPACITY 3,684,000 CY
EL. 622 LEVEL 3,684,000 CY
EL. 632 LEVEL 3,684,000 CY

EXISTING ONE TO BE OBTAINED WHEN NEW ONE IS CONSTRUCTED. THE EXISTING ELEVATION OF THE CHANNEL SHALL BE AT LEAST EQUAL TO THE ASH AND WATER FLOW UNRESTRICTED FROM UNITS 7 & 8 AREA.

FIELD TO CONNECT TO EXIST. DRAINAGE DITCH

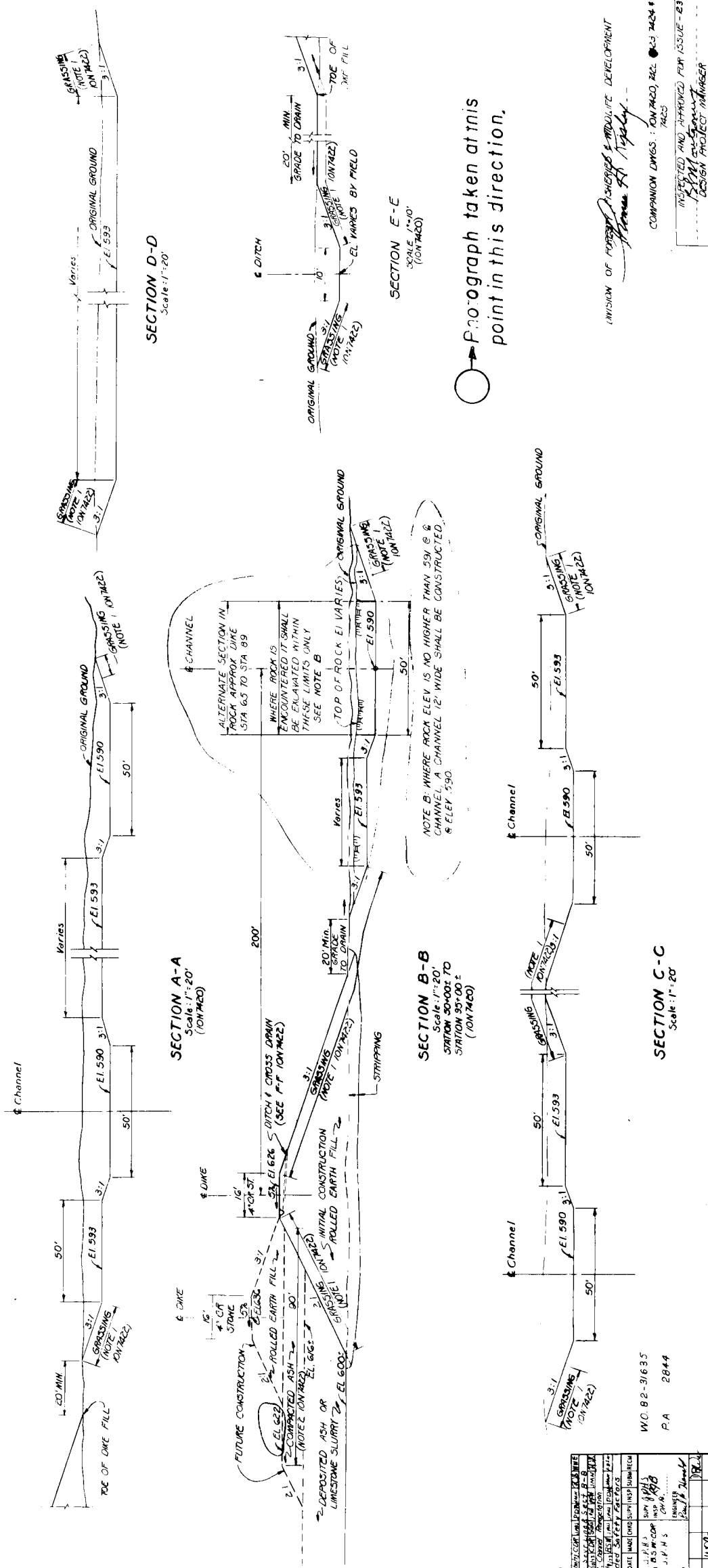
W.O. 82-31635
P.A. 2844

ION 7420/85



NOTE A:
FIELD TO ADJUST CHANNEL ALIGNMENT AS NECESSARY TO PRESERVE AS MUCH OF THE EXISTING TREES AND VEGETATION AS POSSIBLE.

- NOTES:**
- SOILS EXPLORATION AND TESTING IS RECORDED IN MEMORANDUM REPORT FROM GENE HARMER TO F.F. LACY DATED OCT 24/62.
 - STABILITY ANALYSIS SAFETY FACTORS FOR THE EXISTING DIME ARE BASED ON SOILS REPORT RESULTS ARE AS FOLLOWS:
MINIMUM CONSTRUCTION EARTH FILL TO EL 528, EXISTING SLOPE SAFETY FACTOR = 2.1
 - INITIAL CONSTRUCTION EARTH DIME TO EL 528, INTERIOR SLOPE SAFETY FACTOR = 1.8
 - FINAL RAISING OF DIME WITH ASH AND EARTH TO EL 536, EXISTING SLOPE SAFETY FACTOR = 1.7
 - ALL LINE CONSTRUCTION SHALL BE IN ACCORDANCE WITH GENERAL CONSTRUCTION SPECIFICATION NO. 6-9 FOR POLLED EARTH/FILL FOR DAMS AND SLURRY PLANTS. ALL CONSTRUCTION SHALL BE AT LEAST 30% OF STANDARD MAXIMUM DENSITY AND FILL MOISTURE CONTENT SHALL NOT BE MORE THAN 4% ABOVE OPTIMUM, AS DETERMINED BY THE CENTRAL SOIL LABORATORY. REPORT SHOWS GENERALLY CLAY SOILS SOFT NEAR GROUND SURFACE WATER TABLE AT OR NEAR GROUND SURFACE. MOISTURE CONTENT OF THE SOILS TESTED FOR BORROW IN THE CHANNEL RELOCATION AND IN LOCATIONS WITHIN THE DISPOSAL AREA SAME FOUNDATION EXCAVATION NEEDS TO BE ONLY THE MINIMUM PRESCRIBED IN 6-9; OVER TRAVEL WITH HEAVY EQUIPMENT CAN CREATE MUDDY CONDITIONS AND DIFFICULT FOUNDATION PREPARATION FOR FILL PLACING SPECIAL ATTENTION TO LITCHING AND DRAINAGE WILL REQUIRE PLACEMENT TO REDUCE MOISTURE CONTENT.
 - ALL OTHER CONSTRUCTIONS SHALL BE IN ACCORDANCE WITH HIGHWAY SPECIFICATIONS NO. T-1.
 - CUT SLOPES ADJACENT TO EXISTING OR PROPOSED DIMES SHALL NOT BE EXCAVATED STEEPER THAN 3:1 AND TOP OF CUT SHALL BE A MINIMUM OF 20' FROM THE TOE OF ANY DIME.
 - WHEN CONNECTING THE ENDS OF THE NEW LINE TO THE OLD LINE EXTREME CARE SHALL BE USED TO INSURE AN IMPROVED AND SMOOTH CONNECTION. THE EXISTING DIME SHALL BE STRIPPED OF ALL VEGETATION, BENCHED TO A MINIMUM DEPTH OF 6" AND IMPACTED SO AS TO FORM A BOND WITH THE NEW "FILL". CARE TO THE STEEP SIDE SLOPES OF THE EXISTING DIMES. THE UTMOST CAUTION SHALL BE USED IN REINCHING THE EXISTING DIMES SLOPES SO AS NOT TO CREATE AN UNSAFE CONDITION. SMALL BENCHES OF MINIMUM DEPTH SHALL BE USED. COORDINATES OF PIS ARE GIVEN IN PLANT COORDINATES (2-250) AND ALABAMA STATE COORDINATES (2-323, 2-328).
 - ALABAMA STATE COORDINATES WERE COMPUTED FROM THE ORIGINAL COORDINATES OF THE INTERSECTION OF THE BASE LINES OF UNIT 7, AS GIVEN IN 1938.
 - PIPING - PIPING SHALL BE PLACED AT LOCATIONS AS SHOWN ON DRAWINGS. THE STONE SHALL BE WELL GRADED PIPE CORNER OR ROUND. CHANNEL STONE PER SECTION B-B-B SHALL BE 24" THICK WITH AT LEAST 50% BY WEIGHT BEING 200 LBS. OR MORE AND WITH THE MAXIMUM HEIGHT 2 TIMES THE 50% WEIGHT AND NOT MORE THAN THE PIPER BASKET SHALL BE 8" THICK AND IN ACCORDANCE WITH SECTION 836 OF THE T-1 SPECIFICATIONS.



Photograph taken at this point in this direction.

DESIGNED BY	W.C. 82-31635
CHECKED BY	P.A. 2844
DATE	10/24/62
PROJECT NO.	10N7421
DRAWN BY	J.H.S.
SCALE	AS SHOWN
APPROVED	[Signature]
DATE	10/24/62

INFORM OF PROJECT CHANGES & MODULATE DEVELOPMENT

COMPANION DIMS.: 10N7420, 10N7421, 10N7422, 10N7423

DESIGNED AND APPROVED FOR ISSUE - E-3

DESIGN PROJECT MANAGER

YARD

LIMESTONE & ASH DISPOSAL AREA

PLAN - SHEET 2

WIDOWS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

SUBMITTED: [Signature]
APPROVED: [Signature]

NOV 15 1962

KNOXVILLE 2 15 73

34 C 4 10N7421R3

RECORD DRAWING AS CONSTRUCTED

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

FDP '83 0411 006

TO : H. S. Fox, Director of Fossil and Hydro Power, 716 EB-C

FROM : M. N. Sprouse, Manager of Engineering Design, W11A9 C-K

DATE : APR 11 1983

SUBJECT: WIDOWS CREEK STEAM PLANT - INTERIM WASTE DISPOSAL AREA INSPECTIONS

Attached are the interim waste disposal area inspection reports from J. P. H. Stivers to R. E. Harris for Widows Creek Steam Plant. There are no recommendations for corrective work in this report.

M. N. Sprouse

MHM
REH

MNS
OPT:JPHS:PH
Attachments

cc: R. O. Barnett, W9D224 C-K
Charles Bonine, Jr., E7B24 C-K
J. P. Darling, 546 CST2-C - w/attachments
MEDS, W5B63 C-K
O. P. Thornton, 102 SPT-K
F. Van Meter, 500 SPT-K (3)

Principally Prepared By: J. P. H. Stivers, Extension 3273.

OPB
BC/PM

MO

SEARCHED	INDEXED
SERIALIZED	FILED
APR 17 1983	
FBI - MEMPHIS	

S53089.11



UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

FDP '83 0411 008

TO : Robert E. Harris, Civil Project Engineer, Fossil Design Project, 338 SPT-K

FROM : J. P. Hillier Stivers, Civil Engineer, Fossil Design Project, 337 SPT-K

DATE : APR 11 1983

SUBJECT: INTERIM DISPOSAL AREA INSPECTION

Plant: Widows Creek Area: Ash and SO₂ scrubber disposal areas

Date of last annual inspection: August 10, 1982

Date of this inspection: March 10, 1983 Weather: clear and cool

Inspected by: Jerry Chumley (F&H PR)

J.P.H. Stivers (EN DES)

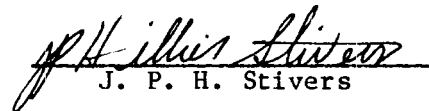
S. B. Ahmed (EN DES)

Discussed with: _____

	Excellent	Good	Poor
General condition of perimeter dikes	_____	<u>X</u>	_____
Vegetative cover on slopes	<u>X</u>	_____	_____
Condition of standard skimmers and spillways	_____	<u>X</u>	_____
Condition of outlet structure and channel	_____	<u>X</u>	_____
General condition of divider dike	_____	<u>X</u>	_____
Signs of loss of ash? _____ Yes <u>X</u> No			

Has action been taken on recommendations of annual inspection report? X Yes _____ No

Comments: CSB continues to raise the dikes at the SO₂ scrubber disposal area and is preparing the dikes of the ash disposal area for raising.


J. P. H. Stivers

JPHS:PH
cc: O. P. Thornton, 102 SPT-K

03
OPT:PH - 4/11/83
cc: R. O. Barnett, W9D224 C-K
MEDS, W5B63 C-K
M. N. Sprouse, W11A9 C-K

S53089.11



UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

FDP '83 0411 007

TO : Robert E. Harris, Civil Project Engineer, Fossil Design Project, 338 SPT-K
 FROM : J. P. Hillier Stivers, Civil Engineer, Fossil Design Project, 337 SPT-K
 DATE : APR 11 1983
 SUBJECT: INTERIM DISPOSAL AREA INSPECTION

Plant: Widows Creek Area: Ash Disposal Area Units 7 & 8
 Date of last annual inspection: August 9, 1982
 Date of this inspection: March 10, 1983 Weather: clear and cool
 Inspected by: Jerry Chumley (F&H PR)
 J.P.H. Stivers (EN DES)
 S. B. Ahmed (EN DES)

Discussed with: _____

	Excellent	Good	Poor
General condition of perimeter dikes	_____	<u>X</u>	_____
Vegetative cover on slopes	_____	<u>X</u>	_____
Condition of standard skimmers and spillways	<u>NA</u>	_____	_____
Condition of outlet structure and channel	<u>NA</u>	_____	_____
General condition of divider dike	<u>NA</u>	_____	_____
Signs of loss of ash? Yes <u>X</u> No			

Has action been taken on recommendations of annual inspection report? X Yes _____ No

Comments: CSB is preparing the area for the raising of the dikes.

J.P.H. Stivers

 J. P. H. Stivers

JPHS:PH
 cc: O. P. Thornton, 102 SPT-K
 OPT:PH - 4/11/83
 cc: R. O. Barnett, W9D224 C-K
 MEDS, W5B63 C-K
 M. N. Sprouse, W11A9 C-K

S53089.11



UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

FEP '840925 006

TO : C. C. Schonhoff, Director of Fossil and Hydro Power, 716 EB-C

FROM : R. G. Domer, Director of Engineering Projects, W11A6 C-K

DATE : September 25, 1984

SUBJECT: WIDOWS CREEK STEAM PLANT - ANNUAL ASH DISPOSAL AREA INSPECTION

Attached is a report from J. P. Hillier Stivers to R. E. Harris dated September 25, 1984, (FEP 840925 005), concerning the joint inspections of the Widows Creek Steam Plant ash disposal areas. This report includes recommendations for corrective work. I concur with these recommendations.

Original Signed By

 R. G. Domer

OPT:MHM:TAS

Attachment

cc (Attachment):

R. O. Barnett, W9D224 C-K

C. Bovine, E7B24 C-K

MEDS, W5B63 C-K

O. P. Thornton, 102 SPT-K

F. Van Meter, 500 SPT-K (3) - Note scrubber pond recommendation No. 1.

Principally Prepared By: M. H. Miller, Extension 2956



UNITED STATES GOVERNMENT

Memorandum

FEP '840925 005
TENNESSEE VALLEY AUTHORITY

TO : R. E. Harris, Civil Project Engineer, Fossil Engineering Projects,
338 SPT-K

FROM : J. P. Hiller Stivers, Civil Engineer, Fossil Engineering Projects,
337 SPT-K

DATE : SEP 25 1984

SUBJECT: WIDOWS CREEK STEAM PLANT - ANNUAL REFUSE DISPOSAL AREA INSPECTION

On August 15, 1984, Britt Holliday of F&H PR, Dennis E. Gowan, Assistant Power Plant Results Supervisor, Widows Creek Steam Plant, and R. G. Spencer and I of OE inspected the refuse disposal areas at Widows Creek Steam Plant. No one was available for us to discuss our findings.

The last annual inspection was made on August 31, 1983 (FDP 831014 019). An interim inspection was made on May 3, 1984 (FDP 840514 002).

The areas inspected are designated on drawings 10N7400, 10N7420, and 10N7421.

Abandoned Ash Disposal Area - Units 1 Through 6 Area

There has been no change in this area since the last inspection. This area has been filled and abandoned. The dikes show no visible signs of instability.

Ash Disposal Area Units 7 and 8

Change In Dikes Since Last Inspection

Construction Services Branch (CSB) is raising the dikes of units 7 and 8 and are approximately 90 percent complete (picture 4 and recommendation No. 1).

As part of the dike raising, a contractor constructed a Bentonite Slurry Cutoff Wall. Construction of the cutoff wall was completed on July 6, 1984.

Visual inspection of the dikes indicated they were stable with no visible signs of instability. However, some areas of seepage could still be seen along the toe of the west dike (station 25+ to 36+). This seepage is much less than before construction began and still seems to be diminishing.

The drainage ditch between the limestone haul road and the west dike is blocked by units 1 through 6 ash sluice lines (recommendation No. 2).

Change In Pond Operation Since Last Inspection

There has been no change in pond operation since the last inspection. All ash (units 1 through 8) is sluiced into units 7 and 8 area. The light ash and water flows through a break in the northeast corner of units 7 and 8 area into the new area. The water then flows through standard spillways and skimmers into the stilling pool then through additional spillways into



R. E. Harris

SEP 25 1984

WIDOWS CREEK STEAM PLANT - ANNUAL REFUSE DISPOSAL AREA INSPECTION

the pumping station reservoir. During normal operations, the water is pumped into the intake channel. When the pumps are not operating, water discharges through overflow pipes into the original Widows Creek channel and into Gunter'sville Reservoir (condition at the time of this inspection).

Action on Recommendations of Last Inspection

1. Some effort has been made toward removing the trees and brush from the dike slopes. However, much more remains to be done. See recommendation No. 3.

Recommendation

1. An acceptance inspection of the dike raising should be done by representatives from OE, F&H PR, and CSB as soon as possible after construction and cleanup are complete.
2. The units 1 through 6 ash sluice lines should be raised or some other method employed to provide positive drainage along the ditch between the limestone haul road and west dike.
3. Plant personnel should continue, but at an accelerated rate, the removal of trees and brush from the dikes slopes.

New Ash Disposal Area

Change In Dikes Since Last Inspection

CSB has virtually completed raising the dikes according to design drawings and specification. Minor dressing up and a portion of the divider dike between the new ash disposal area and the scrubber pond are all that is left to do. The dikes appear to be in good condition with no visible signs of instability. The exterior slopes, except for the raised portion, have a good cover of vegetation. In fact the vegetation was so thick that walking the toe of the dike was impossible (see recommendation No. 1).

An area of dead grass approximately 40 feet wide and 60 feet long was observed at the toe of the dike (pictures 2 and 3 drawing 10N7420). Test on the water in this area showed a very low PH and high concentrations of iron and manganese, which indicate a possibility of seepage from inside the pond (see recommendation No. 3).

Small trees and brush were growing on the exterior slope as well as some kind of thistle. If the thistles becomes established in large area, they will impede the inspection (see recommendation No. 4).

R. E. Harris
SEP 25 1984

WIDOWS CREEK STEAM PLANT - ANNUAL REFUSE DISPOSAL AREA INSPECTION

Change In Pond Operation Since Last Inspection

For operation of pond see units 7 and 8 area.

Condition of Spillways, Skimmers, and Outlets

The standard spillways and skimmers appear to be in good condition. The outlets were submerged and could not be inspected. There were no signs of loss of ash from the area, the stilling pool, or the pumping station reservoir.

Action on Recommendations of Last Inspection

1. Plant personnel have watched the spillway dike with no unusual conditions noted.
2. Wiers have been installed on the spillways.
3. A divider dike with a floating skimmer has not been installed (see recommendation No. 2).
4. No effort was made to remove the trees and brush from the dike slopes; however, Mr. Gowan said they were scheduled to begin the week of August 20, 1984.

Recommendations

1. Plant personnel should clear an area along the toe of the dike to allow adequate inspection of the toe.
2. A divider dike with a floating skimmer should be installed to keep floating ash away from the skimmers.
3. To determine the source of the suspected seepage, the area should be investigated (by digging a test trench through the lower portion of the dike into foundation material) before the wet weather season.
4. Plant personnel should continue to remove the trees and brush as well as the thistles from the exterior slopes of the dikes.

R. E. Harris
SEP 25 1984

WIDOWS CREEK STEAM PLANT - ANNUAL REFUSE DISPOSAL AREA INSPECTION

SO₂ Scrubber Disposal Area

Change In Dikes Since Last Inspection

CSB has completed raising the dikes except for the divider dike between the new ash disposal area and the scrubber disposal area, which is being completed at this time. CSB has also added 10 feet to the top width of the dike from 70 +00 + to station 113 +00 + for pipe support for the wet stack area. A portion of the top has been surfaced with crushed stone. The seeding of the slope for dike widening did not produce the required cover of vegetation and needs to be reseeded (picture 1 and recommendation No. 1). Small trees and brush are still visible on the slopes as well as some kind of thistle (see recommendation No. 2).

Change In Pond Operation Since Last Inspection

There is no change in pond operation. All scrubber waste is pumped into the south corner of the area where the solids begin to settle and the water and lighter solids flow around the deflector dike. The water flows to a pumping station in the northwest corner of the area where the water is pumped back to the scrubbers for reuse.

Spillways, Skimmers, and Outlets

There are no spillways, skimmers, or outlets in the SO₂ scrubber disposal area.

Action on Recommendation of Last Inspection

1. No effort was made to remove the trees and brush from the exterior slope of the dikes; however, Mr. Gowan said they were scheduled to begin the week on August 20, 1984.
2. CSB repaired the tension cracks in the top of the northeast and southeast dikes.
3. Due to a shortage of bottom ash, no bottom ash has been placed at the inside toe of the exterior dike as recommended (see recommendation No. 3).

R. E. Harris
 SEP 25 1984

WIDOWS CREEK STEAM PLANT - ANNUAL REFUSE DISPOSAL AREA INSPECTION

Recommendation

1. The exterior slope of the raised portion of the dike from station 70+ to station 113+ should be reseeded, fertilized, limed, and mulched in accordance with note 4, drawing 10N7422.
2. The trees, brush, and thistles should be removed from the exterior slope of the dikes.
3. As bottom ash becomes available, it should be placed along the inside toe of the exterior dike as an aid in reducing the erosion of the toe.

J. P. Hillier Stivers
 J. P. Hillier Stivers

Concur:

Robert E. Harris
 Robert E. Harris

O. P. Thornton
 O. P. Thornton

JPHS:TAS

Attachments

cc: O. P. Thornton, 102 SPT-K (Attachments)

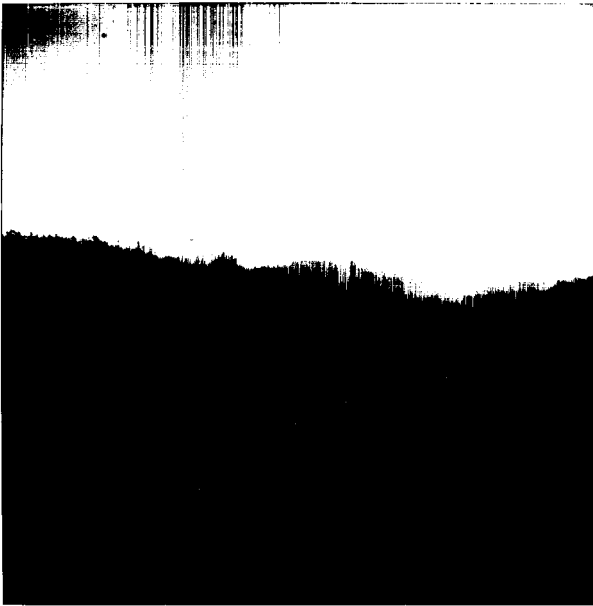
9/25/84 - OPT:JPHS:TAS

cc (Attachments):

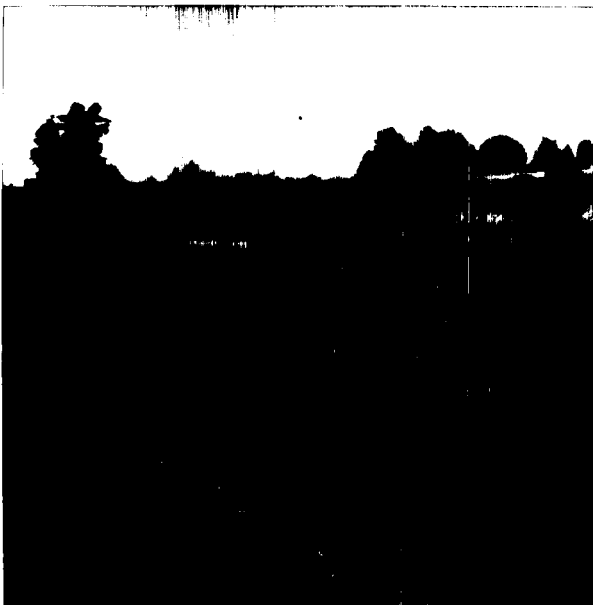
R. O. Barnett, W9D224 C-K
 C. Bonine, E7B24 C-K
 R. G. Domer, W11A6 C-K
 MEDS, W5B63 C-K (except drawings)
 F. Van Meter, 500 SPT-K (3)

Principally Prepared By: J. P. H. Stivers, Extension 7072

WIDOWS CREEK STEAM PLANT
AUGUST 1984



- ① SCRUBBER POND
NOTE LACK OF VEGETATION
AT TOP OF DIKE

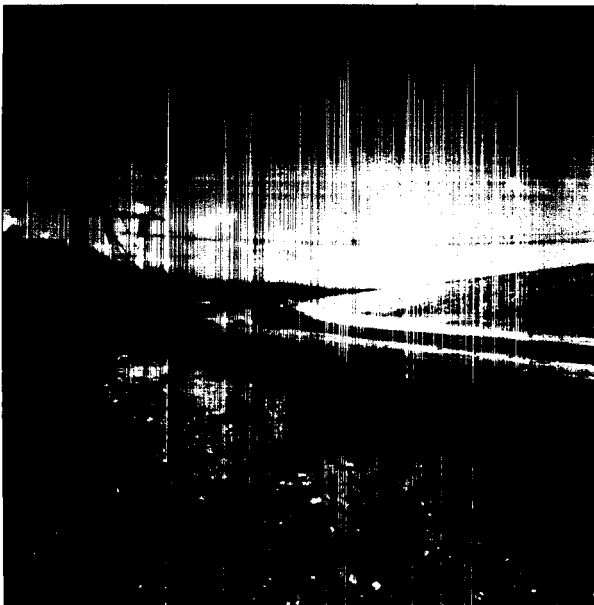


- ② NEW ASH DISPOSAL AREA
NOTE DEAD GRASS IN CENTER
OF PICTURE. THIS AREA IS
A SUSPECTED SEEPAGE AREA

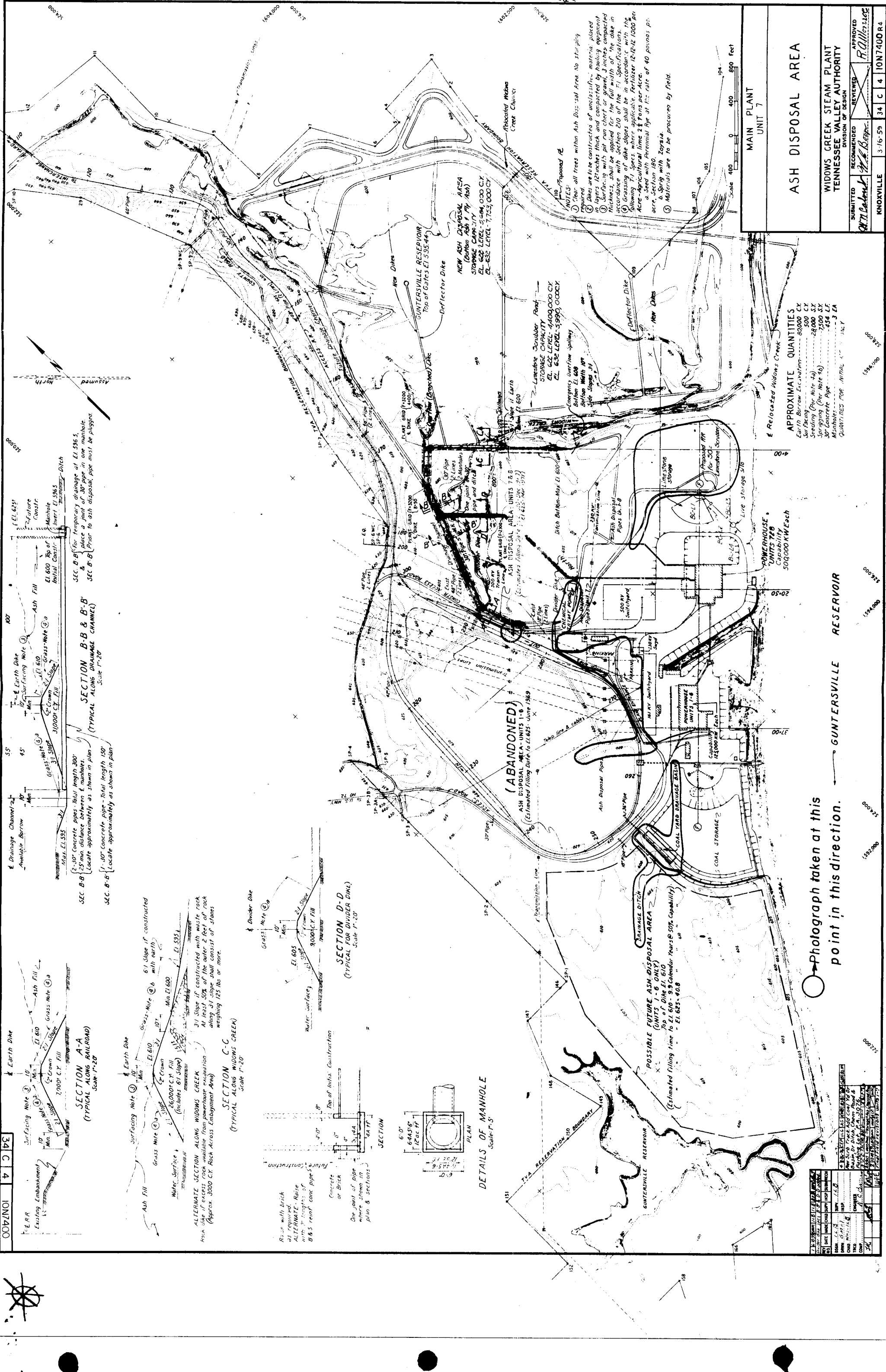
WIDOWS CREEK STEAM PLANT
AUGUST 1984



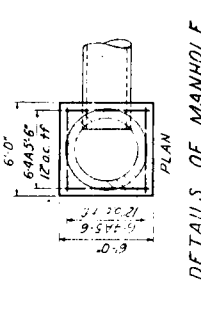
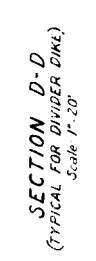
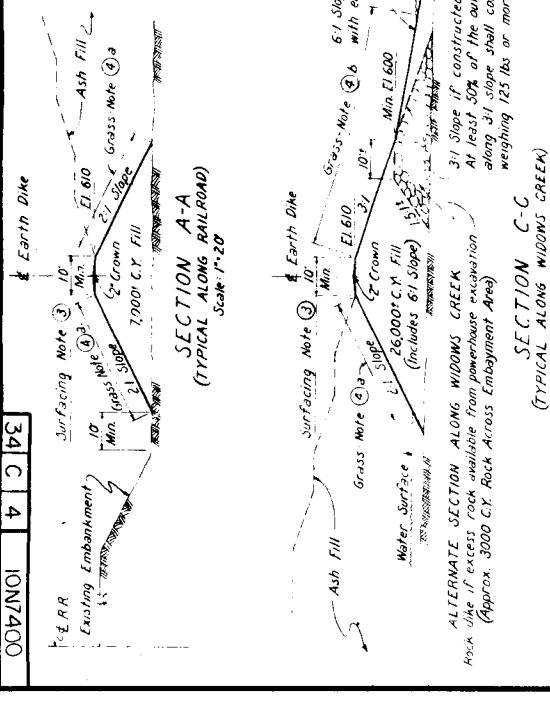
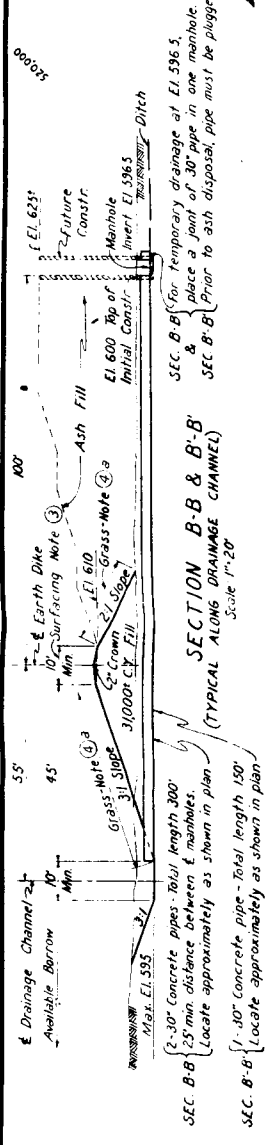
- ③ NEW ASH DISPOSAL AREA
NOTE DEAD GRASS IN CENTER
OF PICTURE.



- ④ UNITS 7 & 8 AREA. NOTE
COMPLETED DIKE RAISING
IN RIGHT CENTER OF PICTURE



34 C 4 ION7400



Photograph taken at this point in this direction.

ASH DISPOSAL AREA

MAIN PLANT UNIT 7
WIDOWS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY
APPROVED BY R. Williams
SUBMITTED BY W. B. ...

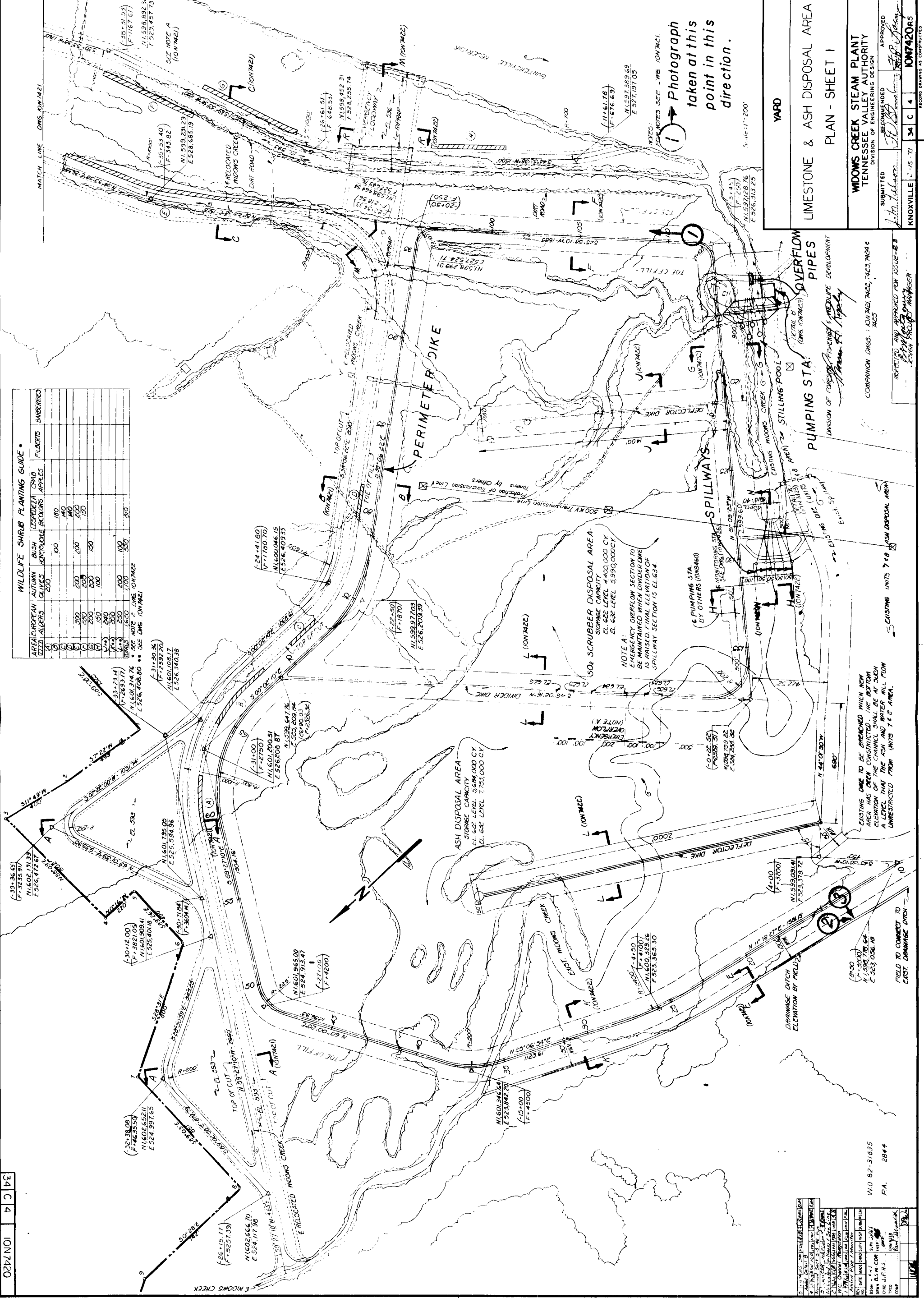
Table with 2 columns: APPROXIMATE QUANTITIES and QUANTITIES FOR ANAL. Rows include Earth Excavation, Sand, Gravel, etc.

ION7400 R4
RECORD DRAWING AS CONSTRUCTED
9 26 68

WILDLIFE SHRUB PLANTING GUIDE

AREA	AUTUMN	WILDEZZA	ORAB	FILBERTS	BARBERIES
1	200	100	100	100	100
2	300	150	150	150	150
3	400	200	200	200	200
4	500	250	250	250	250
5	600	300	300	300	300
6	700	350	350	350	350
7	800	400	400	400	400
8	900	450	450	450	450
9	1000	500	500	500	500
TOTALS	6600	3300	3300	3300	3300

SEE NOTE 2 DMS 10N7421
SEE DMS 10N7421



YARD

LIMESTONE & ASH DISPOSAL AREA

PLAN - SHEET 1

WIDOWS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

APPROVED: [Signature]
SUBMITTED: [Signature]
RECOMMENDED: [Signature]

NO. 34 C 4 10N7420A5
KNOXVILLE, TENN. 37624

OVERFLOW PIPES

PUMPING STA.

SPILLWAYS

PERIMETER DIKE

ASH DISPOSAL AREA
STORAGE CAPACITY 1,400,000 CY
EL. 622 LEVEL 568,000 CY
EL. 632 LEVEL 590,000 CY

500 SCRUBBER DISPOSAL AREA
STORAGE CAPACITY 1,400,000 CY
EL. 622 LEVEL 568,000 CY
EL. 632 LEVEL 590,000 CY

STILLING POOL

DEFLECTOR DIKE

DRAINAGE DITCH
ELEVATION OF FIELDS

FIELD TO CONNECT TO EXISTING DITCH

EXISTING ONE TO BE APPROVED WHEN NEW AREA HAS BEEN CONSTRUCTED. THE BOTTOM ELEVATION OF THE CHANNEL SHALL BE AT SUCH A LEVEL THAT THE ASH AND WATER WILL FLOW UNRESTRICTED FROM UNITS 7 & 8 AREA.

EXISTING UNITS 7 & 8 ASH DISPOSAL AREA

UNRESTRICTED FLOW

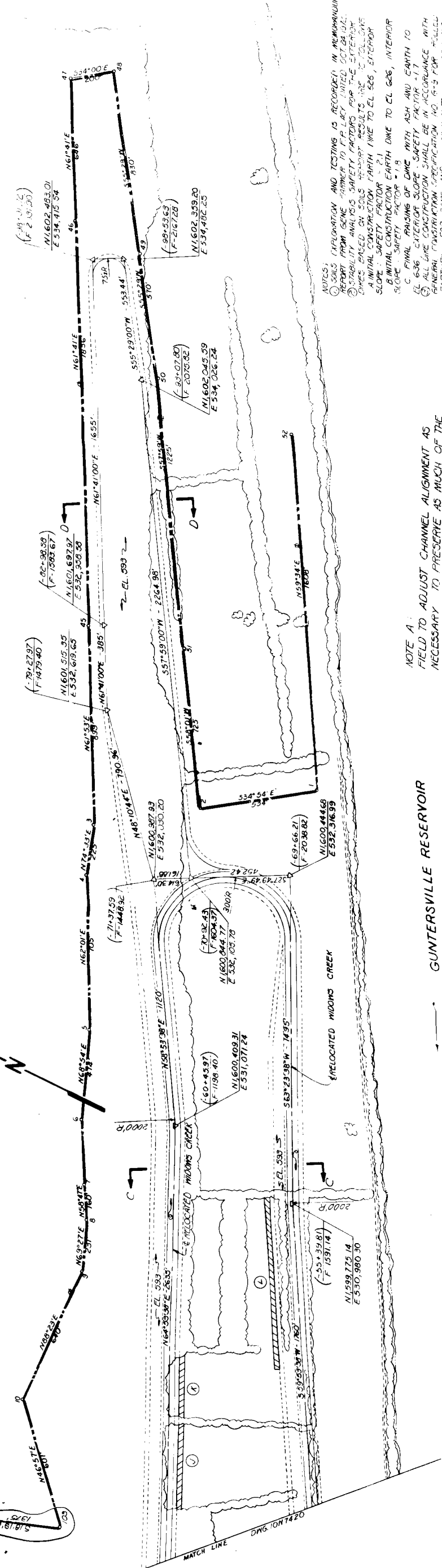
DESIGN PRODUCT MANAGER

INSPECTED AND APPROVED FOR ISSUE-83

COMPARISON DMS: 10N7421, 7422, 7423, 7424 & 7425

W.O. 82-31635

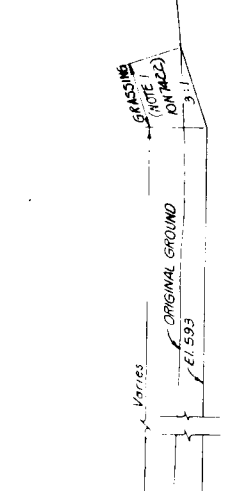
P.A. 2844



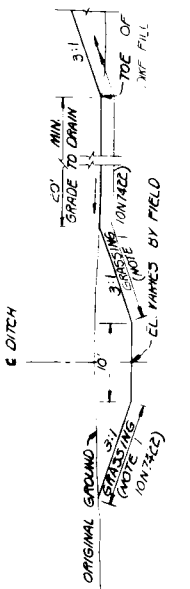
NOTE A:
FIELD TO ADJUST CHANNEL ALIGNMENT AS NECESSARY TO PRESERVE AS MUCH OF THE EXISTING TREES AND VEGETATION AS POSSIBLE.

GUNTERSVILLE RESERVOIR

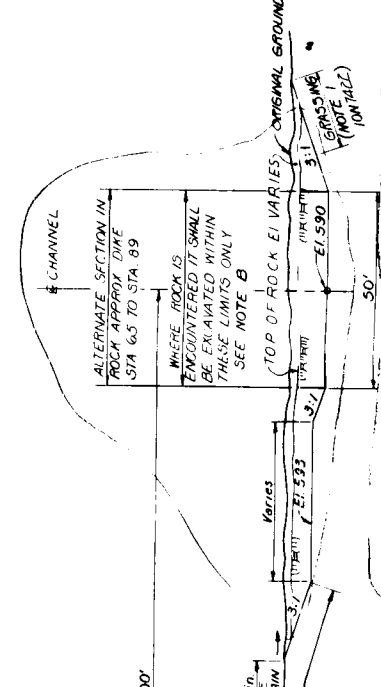
- NOTES:
- SOILS INFORMATION AND TESTING IS PROVIDED IN MEMORANDUM REPORT FROM GEOTECHNICAL ENGINEER DATED OCTOBER 1988.
 - STABILITY ANALYSIS FACTORS FOR THE EXISTING CHANNELS BASED ON SOILS TEST RESULTS ARE AS FOLLOWS:
INITIAL CONSTRUCTION WITH FILL TO CL 526, EXISTING SLOPE SAFETY FACTOR = 1.8
INITIAL CONSTRUCTION WITH FILL TO CL 526, EXISTING SLOPE SAFETY FACTOR = 1.8
 - FINAL PLACING OF DIME WITH ASH AND EARTH TO CL 536 EXISTING SLOPE SAFETY FACTOR = 1.7
 - FINAL CONSTRUCTION SHALL BE IN ACCORDANCE WITH GENERAL CONSTRUCTION SPECIFICATION NO. 5-3 FOR EARTH-FILL FOR DAMS AND TANK PLANTS. ALL MATERIAL SHALL BE AT LEAST 95% OF STANDARD MAXIMUM DENSITY AND ALL MOISTURE CONTENT SHALL NOT BE MORE THAN 4% ABOVE OPTIMUM, AS DETERMINED BY THE CENTRAL SOIL LABORATORY.
 - THE SOILS REPORT SHOWS GENERALLY CLAY SOILS SOFT NEAR GROUND SURFACE. WATER TABLE AT OR NEAR GROUND SURFACE, AND HIGH MOISTURE CONTENT OF THE SOILS IS A CONCERN IN THE CHANNEL RELOCATION AND IN LOCATIONS WITHIN THE DISPOSAL AREA. DIME FOUNDATION EXCAVATION NEEDS TO BE ONLY THE MINIMUM PRESCRIBED IN 5-3 OVER TRAIL WITH HEAVY EQUIPMENT CAN CREATE MUDDY CONDITIONS AND DIFFICULT FOUNDATION PREPARATION FOR FILL PLACING. FILL FROM THE EXISTING BORROW SOURCES WILL REQUIRE SPECIAL ATTENTION TO DITCHING AND DRAINAGE AND OTHER DRAINAGE PROVISIONS AT THE SOURCE AND DURING PLACING.
 - ALL OTHER CONSTRUCTIONS SHALL BE IN ACCORDANCE WITH HIGHWAY SPECIFICATIONS NO. T-1.
 - CUT STEEPS ADJACENT TO EXISTING OR PROPOSED DICES SHALL NOT BE EXCAVATED STEEPER THAN 3:1 AND TOP OF CUT SHALL BE A MINIMUM OF 20' FROM THE TOE OF ANY DIME.
 - WHEN CONNECTING THE ENDS OF THE NEW DIME TO THE OLD DIME, EXTREME CARE SHALL BE USED TO INSURE AN UNIFORM AND STABLE CHANNEL SECTION. THE EXISTING DIME SHALL BE FULLY AND COMPACTED SO AS TO FORM A BOND WITH THE NEW DIME. THE STEEP SLOPE OF THE EXISTING DICES SHALL BE TO THE STEEP SLOPE OF THE EXISTING DICES. FULL WIDTH OF THE EXISTING DICES SHALL BE MAINTAINED. ALL EXISTING CUTS SHALL BE FULLY REPAIRED TO ORIGINAL GRADE. SMALL GULLIES SHALL BE REPAIRED TO ORIGINAL GRADE. ALL DICES SHALL BE GIVEN IN PLANT COORDINATES (ALABAMA STATE COORDINATES) (2 523 752.8).
 - ALABAMA STATE COORDINATES WERE COMPUTED FROM THE ORIGINAL COORDINATES OF THE INTERSECTION OF THE BASE LINES OF UNIT 7 AS GIVEN IN 1988.
 - ALL PIPES SHALL BE PLACED AT LOCATIONS AS SHOWN ON DRAWING. THE STONE SHALL BE WELL GRADED AND SHALL BE 1/2" TO 1/4" IN SIZE PER SECTION 5-3 OF THE T-1 SPECIFICATIONS. THE PIPES SHALL BE A MINIMUM OF 2" THICK WITH AT LEAST 50% BY WEIGHT BEING 200 LBS OR MORE AND MORE THAN 5% PASSING THE #10 SIEVE.
 - ALL FILTERS SHALL BE 2" THICK AND IN ACCORDANCE WITH SECTION 5-3 OF THE T-1 SPECIFICATIONS.



SECTION D-D
Scale: 1"=20'

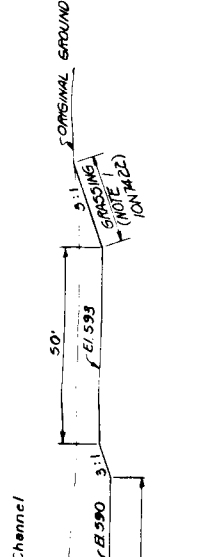


SECTION E-E
Scale: 1"=20'



SECTION A-A
Scale: 1"=20'

SECTION B-B
Scale: 1"=20'
STATION 30+00 TO STATION 35+00
(ON T-1)



SECTION C-C
Scale: 1"=20'

Photograph taken at this point in this direction.



VISION OF PROJECT ENGINEER & MODIFIED DEVELOPMENT
Home A Agency

COMPANION DINGS: 10N7420, 10N7421, 10N7422, 10N7423, 10N7424, 10N7425

REVISED AND APPROVED FOR ISSUE-83
P.A. PROJECT MANAGER

PROJECT NO.	10N7421
DATE	10/14/88
BY	W.C. B-2
CHECKED	P.A. 2844
SCALE	AS SHOWN
DRAWN BY	W.C. B-2
DATE	10/14/88
PROJECT	WIDOWS CREEK ASH DISPOSAL AREA
CLIENT	TENNESSEE VALLEY AUTHORITY
ENGINEER	W.C. B-2
DATE	10/14/88
PROJECT	WIDOWS CREEK ASH DISPOSAL AREA
CLIENT	TENNESSEE VALLEY AUTHORITY
ENGINEER	W.C. B-2
DATE	10/14/88

YARD
LIMESTONE & ASH DISPOSAL AREA
PLAN - SHEET 2

WIDOWS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

APPROVED
RECOMMENDED
SUBMITTED
J. P. Helms
R. B. Helms
T. B. Helms

NOV 1 1988

RECORD DRAWING AS CONSTRUCTED
KNOXVILLE 2 15 73 34 C 4 10N7421B

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY
FDP '84 0514 002

TO : H. S. Fox, Director of Fossil and Hydro Power, 716 EB-C

FROM : R. W. Cantrell, Manager of Engineering Design (Acting), W11A9 C-K

DATE : MAY 14 1984

SUBJECT: WIDOWS CREEK STEAM PLANT - INTERIM WASTE DISPOSAL AREA INSPECTIONS

Attached are the interim waste disposal area inspection reports from J. P. H. Stivers to R. E. Harris for Widows Creek Steam Plant. I concur with the recommendations for corrective work as noted in the reports.

R. W. Cantrell

OPT:JPHS:JAG

Attachments

cc (Attachments):

R. O. Barnett, W9D224 C-K
C. Bonine, E7B24 C-K
J. P. Darling, 546 CST2-C
MEDS, W5B63 C-K
O. P. Thornton, 102 SPT-K
F. Van Meter, 500 SPT-K (3)

Principally Prepared By: J. P. H. Stivers, Extension 7072

S74131.04



UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

TO : Robert E. Harris, Civil Project Engineer, Fossil Design Projects, 338 SPT-K
 FROM : J. P. Hillier Stivers, Civil Engineer, Fossil Design Projects, 337 SPT-K
 DATE : MAY 14 1984
 SUBJECT: INTERIM DISPOSAL AREA INSPECTION

Plant: Widows Creek Area: Ash and SO₂ scrubber disposal area

Date of last annual inspection: August 31, 1983

Date of this inspection: May 3, 1984 Weather: cloudy and wet

Inspected by: Joel Parris (F&H PR) G. R. Hoodenpyl (Power Plant Results Engineer)
H. Ray Threlkeld (EN DES) J. P. Hillier Stivers (EN DES)

Discussed with: G. R. Hoodenpyl

	<u>Good</u>	<u>Fair</u>	<u>Poor</u>
General condition of perimeter dikes	<u>X</u>	_____	_____
	see comment		
Vegetative cover on slopes	<u>No. 1</u>	_____	_____
Condition of standard skimmers and spillways	<u>X</u>	_____	_____
Condition of outlet structure and channel	<u>X</u>	_____	_____
General condition of divider dike	<u>X</u>	_____	_____

Signs of loss of ash? X Yes _____ No

Has action been taken on recommendations of annual inspection report? X Yes _____ No

Comments: 1. CSB is continuing construction of the dikes and have started seeding the slopes. 2. A floating skimmer and divider dike should be installed in the ash disposal area to keep as much of the floating ash away from the spillways as possible.


 J. P. Hillier Stivers

JPHS:JAG

S74131.04



UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

TO : Robert E. Harris, Civil Project Engineer, Fossil Design Projects, 338 SPT-K
 FROM : J. P. Hillier Stivers, Civil Engineer, Fossil Design Projects, 337 SPT-K
 DATE : MAY 14 1984
 SUBJECT: INTERIM DISPOSAL AREA INSPECTION

Plant: Widows Creek Area: Ash disposal area
units 7 and 8
 Date of last annual inspection: August 31, 1983
 Date of this inspection: May 3, 1984 Weather: cloudy and wet
 Inspected by: Joel Parris (F&H PR) G. R. Hoodenpyl (Power
H. Ray Threlkeld (EN DES) Plant Results Engineer
J. P. Hillier Stivers
(EN DES)

Discussed with: _____

	<u>Good</u>	<u>Fair</u>	<u>Poor</u>
General condition of perimeter dikes	_____	_____ <u>X</u> _____	_____
Vegetative cover on slopes	_____	_____ <u>see comments</u> _____	_____
Condition of standard skimmers and spillways	_____ <u>na</u> _____	_____	_____
Condition of outlet structure and channel	_____ <u>na</u> _____	_____	_____
General condition of divider dike	_____ <u>na</u> _____	_____	_____

Signs of loss of ash? Yes No
 Has action been taken on recommendations of annual inspection report? Yes No

Comments: 1. Due to construction this area was not inspected very closely but will receive a very close inspection during the annual inspection and when construction is complete.

J. P. Hillier Stivers
 J. P. Hillier Stivers

JPHS:JAG
 S74131.04



UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

B65 '85 0618 003

TO : C. C. Schonhoff, Director of Fossil and Hydro Power, 716 EB-C

FROM : R. G. Domer, Director of Engineering Projects, W12A5 C-K

DATE : JUN 18 1985

SUBJECT: WIDOWS CREEK STEAM PLANT - ANNUAL ASH DISPOSAL AREA INSPECTION

Attached is a report from W. M. Martin to R. E. Harris dated June 11, 1985 (B41 850611009), concerning the joint inspections of the Widows Creek Steam Plant waste disposal areas. This report includes recommendations for corrective work. I concur with these recommendations.

 R. G. Domer

REH: WMM

HWB
RBA

OPT:WMM:EFS

Attachment

cc (Attachment):

RIMS, SL26 C-K (w/o drawings)

R. O. Barnett, W9D224 C-K

C. Bonine, 12-108 SB-K

O. P. Thornton, W3D224 C-K

F. Van Meter, 10-103 SB-K (3) - Note Item 4.1.

 Principally Prepared By: W. M. Martin, Extension 3858
BC/PM: OPJ

MO: _____

S65154.01



TENNESSEE VALLEY AUTHORITY

OFFICE OF ENGINEERING
OFFERING EXCELLENCE

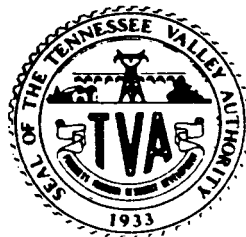
CIVIL ENGINEERING BRANCH

WIDOWS CREEK STEAM PLANT

WASTE DISPOSAL AREAS

JOINT OE - F&H PR

INSPECTION



CEB REPORT

TVA 10782 (0E11-84)

TITLE WIDOWS CREEK STEAM PLANT - ALL UNITS WASTE DISPOSAL AREAS - ANNUAL JOINT INSPECTION REPORT BY THE DIVISION OF ENGINEERING PROJECTS AND THE DIVISION OF FOSSIL AND HYDRO POWER			REPORT NO. 85-13	
VENDOR			CONTRACT NO.	
KEY NOUNS			UNID SYSTEM(S)	
REV	(FOR MEDS USE)	MEDS ACCESSION NUMBER		
R0		B41 '85 0 611 009		
APPLICABLE DESIGN DOCUMENTS	R1			
	R2			
REFERENCES	R3			
	R4			

TENNESSEE VALLEY AUTHORITY
 OFFICE OF ENGINEERING
 CIVIL ENGINEERING BRANCH

	REVISION 0	R1	R2	R3	R4
DATE	JUN 11 1985				
PREPARED	<i>WMM Martin</i>				
CHECKED	<i>K. W. Burnett</i>				
SUBMITTED	<i>K. W. Burnett</i>				
REVIEWED					
RECOMMENDED	<i>R. E. Harris</i>				
APPROVED	<i>R. D. Burnett</i>				

Executive Summary

The refuse disposal areas and spillway structures were inspected on May 7, 1985. This was a visual inspection of the surface conditions made jointly by representatives of F&H PR and OE. The previously noted deficiencies were checked to see if the recommendations had been completed. Some additional recommendations were made. The overall general condition of the disposal areas was satisfactory.

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

TO : R. E. Harris, Civil Project Engineer, Fossil Engineering Projects,
 FROM : W2D220 C-K
 DATE : W. M. Martin, Civil Engineer, Fossil Engineering Projects, W2D207 C-K
 JUN 11 1985
 SUBJECT:

WIDOWS CREEK STEAM PLANT - ANNUAL REUSE DISPOSAL AREA INSPECTION

1.0 General

- 1.1 The annual refuse disposal area inspection was conducted on May 7, 1985.
- 1.2 The following personnel were present:
- Bill Martin - OE - CEB
 Britt Holliday - F&H PR
 Randall Hoodenpyl - Plant Results Supervisor
 Jim Hoskins - OE - CEB - (GGEG)
- 1.3 The last annual inspection was made on August 15, 1984 (FEP 840925 005).
- 1.4 The first annual inspection was made on July 26, 1967, memorandum W. N. Calvert to W. C. Boop dated September 14, 1967.
- 1.5. The areas inspected are designated on drawings 10N7400, 10N7420 and 10N7421.
- 1.6 This was a visual inspection made to check the conditions of the various dikes for slope stability, possible leaks, vegetative cover, road surface, spillways, and other general conditions.
- 1.7 The weather was warm and a heavy ~~30~~³⁰⁺ min thundershower occurred about 11 a.m. with intermittent very light sprinkles throughout the remainder of the day. This made it impossible to inspect for leaks or damp spots on the dike slopes.

2.0 Condition of Dikes and Spillway Structures

- 2.1 A seepage monitoring program was begun for the bentonite slurry cutoff wall and dike raising project between station 25+00(+) and the southeast corner of the copper treatment pond. The ditch along the dike had been flooded by a rupture in one of the ash sluice lines, repairs had been completed.
- 2.1.1 The first inspection was made on September 28, 1984 (FEP 841107 003), and the latest inspection was made on March 6, 1985 (B65 185063 002).



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WIDOWS CREEK STEAM PLANT - ANNUAL REUSE DISPOSAL AREA INSPECTION

- 2.1.2 The plant is presently filling the low storm water ponding area at the southwest corner of the copper treatment pond and plans to drain that area through the ash pond dike. This is one of the main concerns pointed out in the monitoring program reports. The low area at the southeast corner of the iron pond has already been filled in.
 - 2.1.3 In 1984 when the ash pond dikes were raised from elevation 626 to 636 and the slurry wall constructed, the top of the old 16-foot wide dike was supposed to be left. That is, there should now be a 16-foot-wide berm with its original crushed stone surface (section K-K drawings 10N7420 and 10N7422). The crushed stone surface has either been removed or covered with earth. In any event, the elevation 626 berm is bare earth now. (Picture No. 6)
- 2.2 Ash Disposal Area - Units 1 Through 6 - Changes Since Last Inspection
- 2.2.1 This abandoned pond area was not inspected, since studies and cost estimates are presently underway by OE to collect and treat redwater seepages from this area to outfall point 019.
- 2.3 Ash Disposal Area For Units 7 and 8 and Limestone Scrubber Area Ponds - Changes Since Last Inspection.
- 2.3.1 Work by Construction Services Branch (CSB) in raising the dikes was essentially completed last fall.
 - 2.3.2 Grass cover is well established on both slopes of the dike (picture No. 1) from station 10+00 to the bridge across Widows Creek at approximate station 69+00.
 - 2.3.3 The grass cover is sparse on both slopes (maybe 40 percent cover) from the bridge to approximate station 112+50 (picture No. 2 taken at southeastern corner approximate station 100+00 looking east). Grass has not been planted on the divider dike slopes along the emergency overflow spillway where the four equalizer pipes were installed (500+).

R. E. Harris

JUN 11 1985

WIDOWS CREEK STEAM PLANT - ANNUAL REUSE DISPOSAL AREA INSPECTION

- 2.3.4 Crushed stone surfacing is very inadequate on top of the dike (picture No. 1) from approximate station 35+00 to the bridge at approximate station 69+00 (maybe one inch deep, plans call for four inches).
- 2.3.5 Minor erosion gullies have occurred in both the interior and exterior dike slopes from the bridge to approximate station 112+00 (three to six inches deep at the top of dike to one foot deep at the water line by two foot wide; picture No. 2). This is the same area described in 2.3.3 where the grass cover is inadequate.
- 2.3.6 There are a few small patches of small trees and brush (all pictures) in particular on the perimeter dike around the SO₂ scrubber pond.
- 2.3.7 Vehicles have driven down the outside dike slope at approximate station 49+00 (extreme north corner of ash pond) leaving wheel rutts on dike slope.
- 2.3.8 The interim report dated May 14, 1984 (FDP 840514 002) recommended installing a floating skimmer in the ash disposal area. Randall Hoodenpyl said that a plan had been received from F&H PR, which the plant had returned to Chattanooga for some recommended changes. The problem still exists. (Picture No. 4)

3.0 Changes In Pond Operation Since the Last Inspection

- 3.1 There has been no change in the pond operation since the last inspection. All ash (units 1 through 8) is sluiced into the units 7 and 8 area. The water flows out of the ash pond area through five standard spillways with skimmers into the stilling pool (picture 3), then through five more spillways with skimmers into the pumping station pond. During normal operations, the water is pumped into the intake channel. When pumps are not operating, water is discharged through overflow pipes into the original Widows Creek channel and into Guntersville reservoir.

R. E. Harris
JUN 11 1985

WIDOWS CREEK STEAM PLANT - ANNUAL REUSE DISPOSAL AREA INSPECTION

4.0 Actions on Recommendation Of Last Inspection

- 4.1 This inspection and report can serve as an acceptance inspection for the dike raising project by directing a copy to CSB for their action to complete work outlined in item numbers 2.3.3, 2.3.4, and 2.3.5.
- 4.2 The proposal to provide positive drainage in the ditch between the limestone haul road and the ash pond dike is presently covered in item 2.1.
- 4.3 Plant personnel should continue to remove trees and brush from dike slopes; item 2.3.6
- 4.4 A floating skimmer has not been installed upstream from spillways, item 2.3.8.
- 4.5 OE will continue slurry wall monitoring program, item 2.1, after plant completes recommended work in 2.1.2.

5.0 Condition of Spillway Structures and Skimmers

- 5.1 The standard spillway structures and skimmers appear to be in a good operating condition.
- 5.2 There were no signs of loss of ash from the ash pond area or pumping station pond.

6.0 Recommendations

- 6.1 Plant to clear patches of small trees and brush, items 2.3.6 (picture No. 4).
- 6.2 Plant to complete work described in 2.1.2.
- 6.3 Plant to pursue item 2.3.8.
- 6.4 CSB to complete work described in item 2.3.3, 2.3.4, and 2.3.5.
- 6.5 An interim inspection should be conducted in the fall when the dike slopes are dry and the vegetation cover is dormant, for a more thorough slopes inspection.

R. E. Harris
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WIDOWS CREEK STEAM PLANT - ANNUAL REUSE DISPOSAL AREA INSPECTION

- 6.6 Construct a ramp per 2.3.7 and surface with 4 inches crushed stone to provide vehicle access to outfall point 019 for use by the plant in taking water samples. (Picture No. 5)

W.M. Martin
W. M. Martin

Concur: R. E. Harris
R. E. Harris

O. P. Thornton
O. P. Thornton

WMM:EFS
Attachments

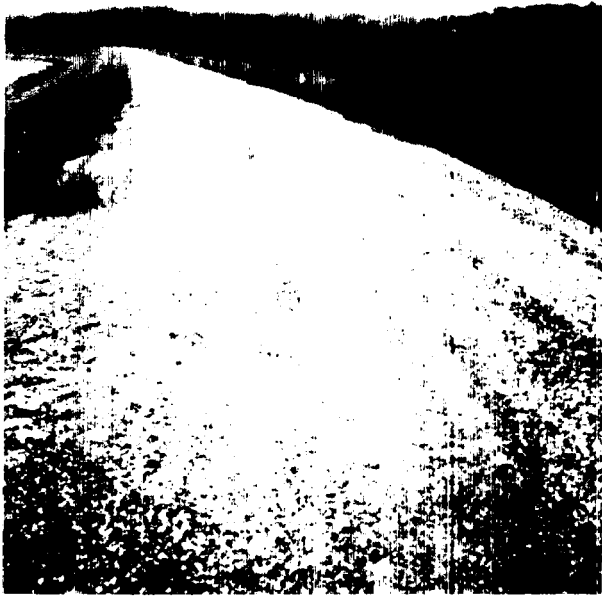
cc: O. P. Thornton, W3D224 C-K (Attachments)

OPT:EFS - JUN 11 1985

cc (Attachments):
RIMS, SL26 C-K (w/o drawings)
R. O. Barnett, W9D224 C-K

Principally Prepared By: W. M. Martin, Extension 3858

WIDOWS CREEK STEAM PLANT
MAY 1985



- 1 NOTE: FULL GRASS COVER
ON BOTH DIKE SLOPES,
ALSO, VERY INADEQUATE
CRUSHED STONE SURFACING
(APPROXIMATELY 1 INCH)



- 2 NOTE: SPARSE GRASS COVER
AND WASHED OUT ERRSION
GULLIES IN SLOPE.



- 3 NOTE: FLOATING ASH
AROUND SKIMMER STURC-
TURES.

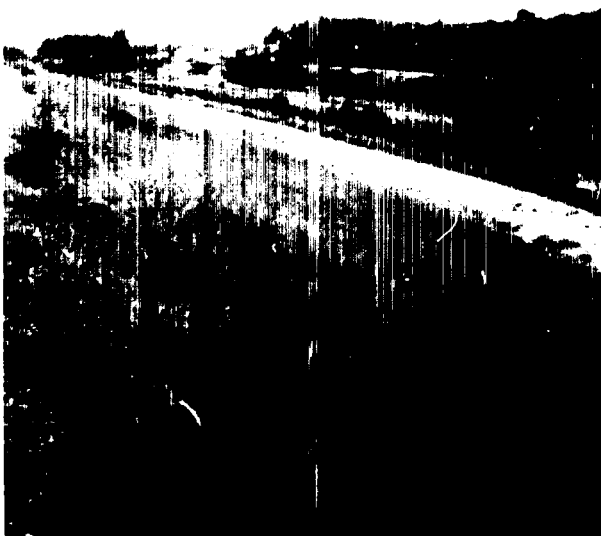
WIDOWS CREEK STEAM PLANT
MAY 1985



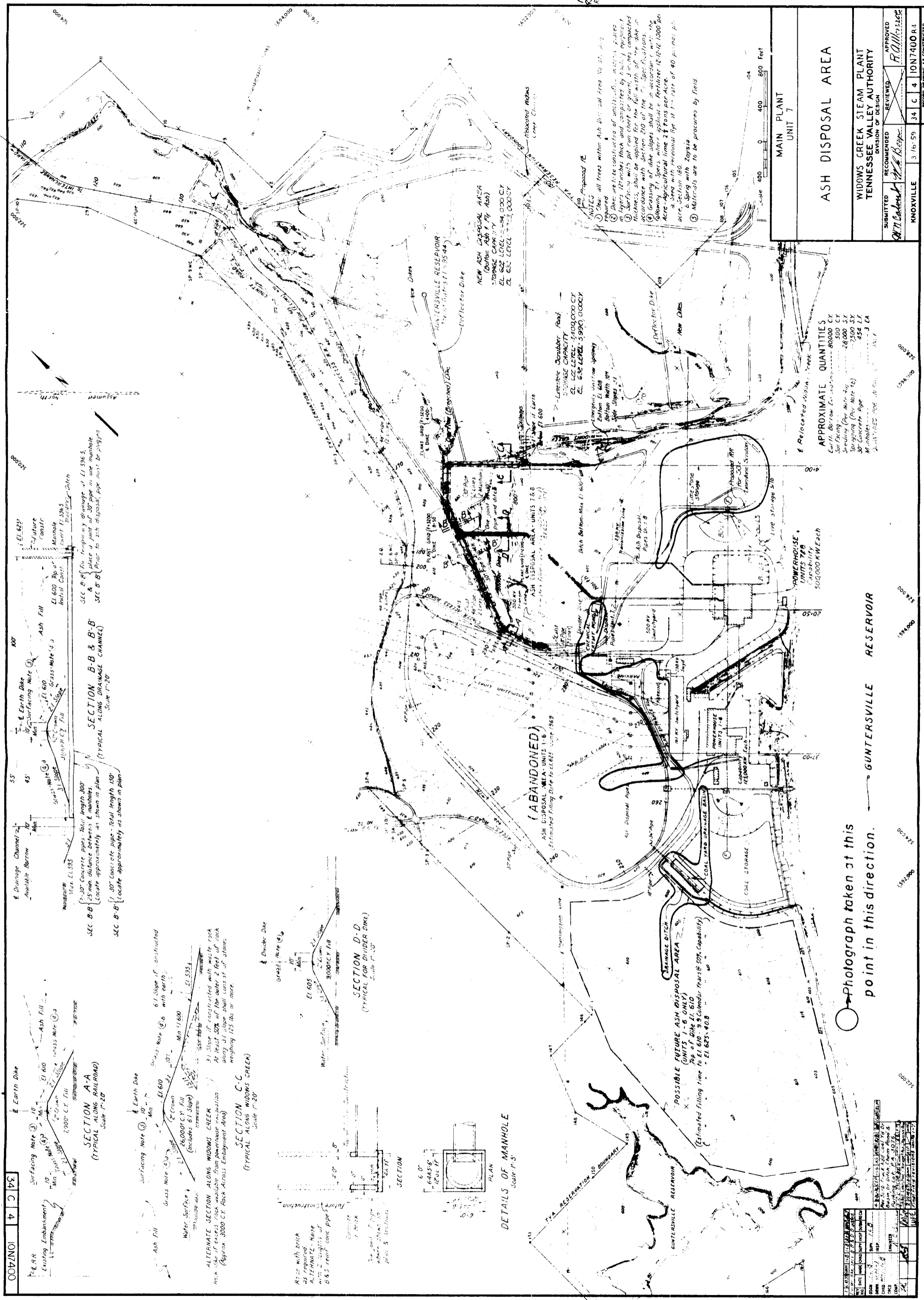
- 4 STILLING POOL WITH SMALL
PATCHES OF BRUSH AND
SMALL TREES.



- 5 PROPOSED LOCATION TO
CONSTRUCT RAMP DOWN
OUTSIDE FACE OF DIKE.



- 6 NOTE: BARE EARTH BERM
ON OUTSIDE SLOPE OF THE
NORTH DIKE FROM STATION
10+00 TO 50+00.



34 C 4 10N7400

SECTION A-A
TYPICAL ALONG RAILROAD
Scale 1"=20'

SECTION B-B & B'-B'
TYPICAL ALONG DRAINAGE CHANNEL
Scale 1"=20'

SECTION C-C
TYPICAL ALONG WIDOWS CREEK
Scale 1"=20'

SECTION D-D
TYPICAL FOR DIVIDER DIKE
Scale 1"=20'

DETAILS OF MANHOLE
Scale 1"=5'

APPROXIMATE QUANTITIES

APPROXIMATE QUANTITIES
Earth, Borrow (Est. 100000) 80000 CY
Surfacing (Est. 100000) 28000 SY
Spalling (Est. 100000) 17500 SY
30 Concrete Pipe 4524 LF
Manholes (Est. 100000) 3 EA
2.25 TIMES FOR 100' DIA. 100' DIA.

NOTES

1. Clear all trees within Ash Disposal Area to 50' radius required.

2. Dikes are to be constructed of compacted earth in layers 12" thick and compacted by hand or equipment in layers 12" thick or gravel, 3 inches compacted thickness, shall be applied for the full width of the dike in accordance with Section 210 of the T.S. Specifications.

3. Grassing of dike slopes shall be in accordance with following T.S. Specs. where applicable: Fertilizer 12-12-12 1000 lbs/Acre - Agricultural lime 2 Tons per Acre.

4. Seed with Perennial Ryegrass at rate of 40 pounds per acre, Section 180.

5. Spring with Zoysia.

6. Materials are to be procured by field.

REVISIONS

NO.	DATE	BY	DESCRIPTION
1	12-15-59	W. J. B.	PRELIMINARY
2	1-15-60	W. J. B.	REVISED
3	2-15-60	W. J. B.	REVISED
4	3-15-60	W. J. B.	REVISED
5	4-15-60	W. J. B.	REVISED
6	5-15-60	W. J. B.	REVISED
7	6-15-60	W. J. B.	REVISED
8	7-15-60	W. J. B.	REVISED
9	8-15-60	W. J. B.	REVISED
10	9-15-60	W. J. B.	REVISED
11	10-15-60	W. J. B.	REVISED
12	11-15-60	W. J. B.	REVISED
13	12-15-60	W. J. B.	REVISED
14	1-15-61	W. J. B.	REVISED
15	2-15-61	W. J. B.	REVISED
16	3-15-61	W. J. B.	REVISED
17	4-15-61	W. J. B.	REVISED
18	5-15-61	W. J. B.	REVISED
19	6-15-61	W. J. B.	REVISED
20	7-15-61	W. J. B.	REVISED
21	8-15-61	W. J. B.	REVISED
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27	2-15-62	W. J. B.	REVISED
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29	4-15-62	W. J. B.	REVISED
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84	11-15-66	W. J. B.	REVISED
85	12-15-66	W. J. B.	REVISED
86	1-15-67	W. J. B.	REVISED
87	2-15-67	W. J. B.	REVISED
88	3-15-67	W. J. B.	REVISED
89	4-15-67	W. J. B.	REVISED
90	5-15-67	W. J. B.	REVISED
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96	11-15-67	W. J. B.	REVISED
97	12-15-67	W. J. B.	REVISED
98	1-15-68	W. J. B.	REVISED
99	2-15-68	W. J. B.	REVISED
100	3-15-68	W. J. B.	REVISED

WIDOWS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF DESIGN

APPROVED
R. Williams

REVIEWED
W. J. B.

SUBMITTED
W. J. B.

NOVEMBER 1965

34 C 4 10N7400 R 4

RECORD DRAWING AS CONSTRUCTED

4-85-58

9-26-67

PHOTOGRAPH TAKEN AT THIS POINT IN THIS DIRECTION.

ASH DISPOSAL AREA

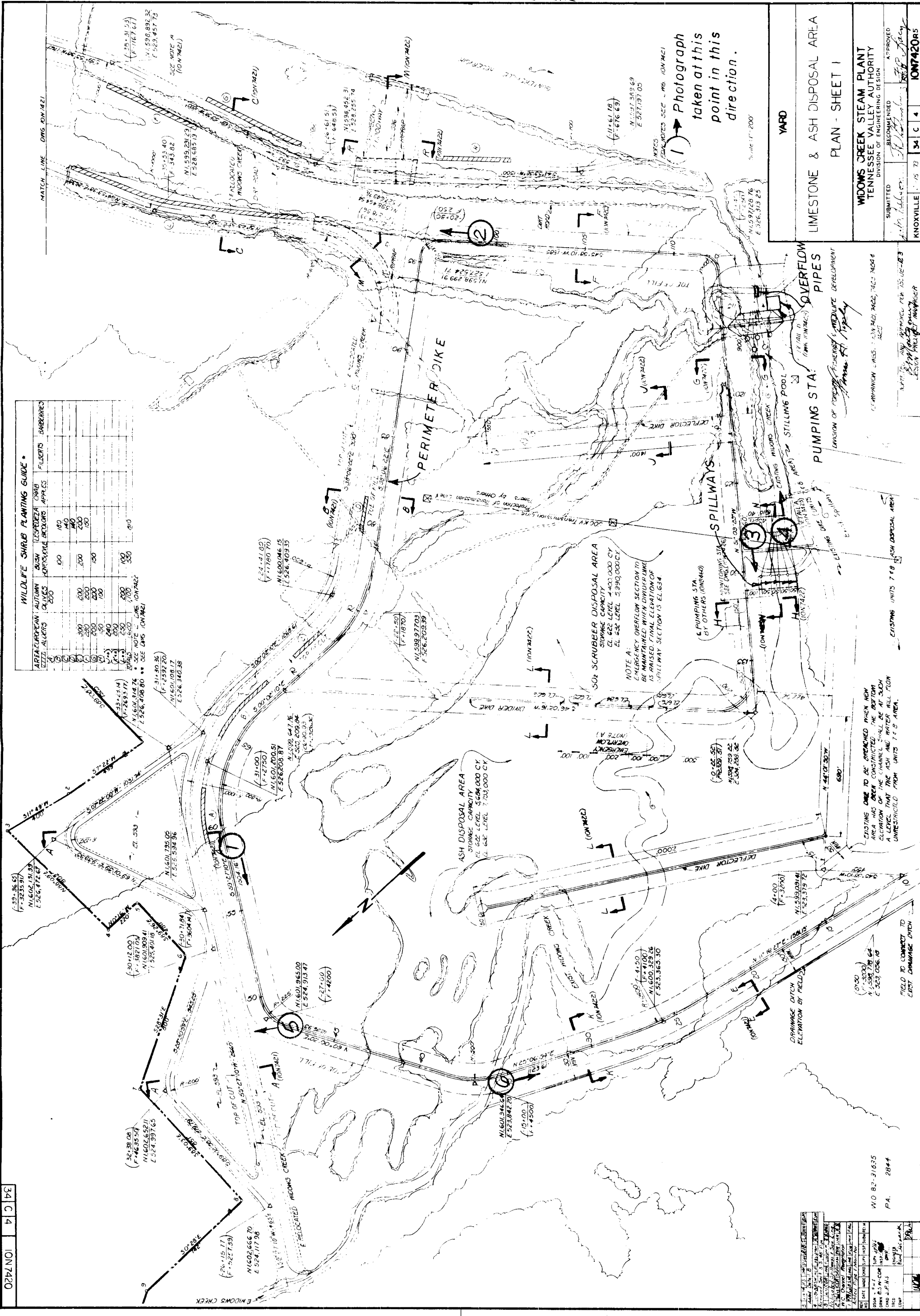
UNIT 7

Scale 1"=200 Feet

WILDLIFE SHRUB PLANTING GUIDE *

AREA	PLANTING	AUTUMN	WINTER	SPRING	SUMMER	TOTAL
1	100	100	100	100	100	500
2	200	200	200	200	200	1000
3	300	300	300	300	300	1500
4	400	400	400	400	400	2000
5	500	500	500	500	500	2500
6	600	600	600	600	600	3000
7	700	700	700	700	700	3500
8	800	800	800	800	800	4000
9	900	900	900	900	900	4500
10	1000	1000	1000	1000	1000	5000

* SEE NOTE 4 FOR DETAILS
 ** SEE NOTE 5 FOR DETAILS



LIMESTONE & ASH DISPOSAL AREA
PLAN - SHEET 1

YARD

WIDOWS CREEK STEAM PLANT
 TENNESSEE VALLEY AUTHORITY
 DIVISION OF ENGINEERING DESIGN

APPROVED: [Signature]
 SUBMITTED: [Signature]
 RECOMMENDED: [Signature]

NOV 1974
 34 C 14 ION7420

RECORD DRAWING AS CONSTRUCTED

UNION OF PROFESSIONAL ENGINEERS & ARCHITECTS DEVELOPMENT
 FROM R. J. [Signature]

EXISTING UNITS 718 ASH DISPOSAL AREA

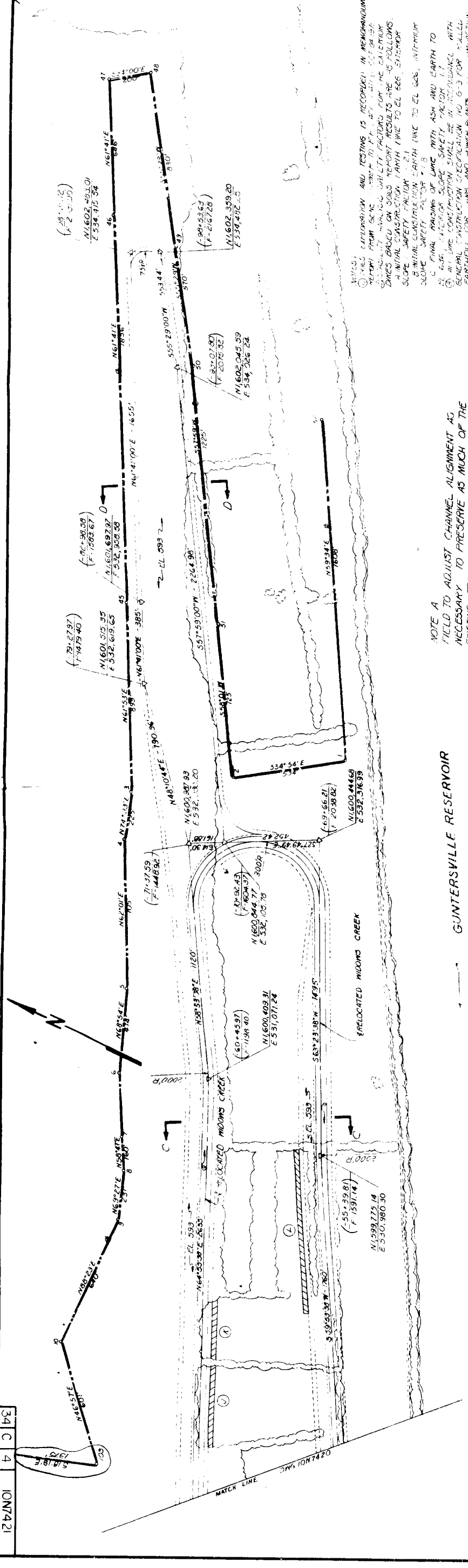
EXISTING ONE TO BE OPERATED WHEN NEW AREA HAS BEEN CONSTRUCTED. THE BOTTOM ELEVATION OF THE CHANNEL SHALL BE AT SUCH A LEVEL THAT THE ASH AND WATER WILL FLOW UNRESTRICTED FROM UNITS 718 AREA.

NOTE A:
 EMERGENCY OVERFLOW SECTION TO BE MAINTAINED WHEN DIVIDER DIKE IS RAISED. FINAL ELEVATION OF SPILLWAY SECTION IS EL. 634.

FIELD TO CONNECT TO EAST DRAINAGE DITCH

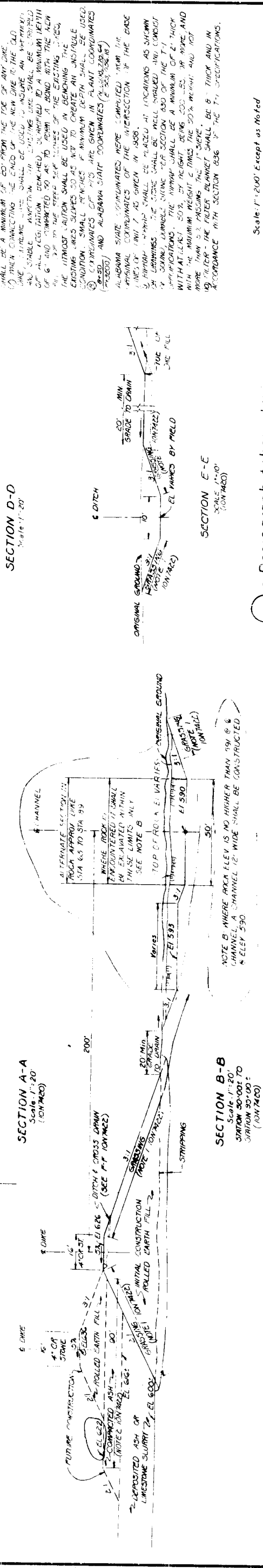
W.O. 82-31635
 P.A. 2844

DATE: 11/15/74
 DRAWN BY: J.P.H.
 CHECKED BY: [Signature]
 DESIGNED BY: [Signature]



NOTE A
FIELD TO ADJUST CHANNEL ALIGNMENT AS NECESSARY TO PRESERVE AS MUCH OF THE EXISTING TREES AND VEGETATION AS POSSIBLE.

NOTES:
 (1) SOILS INFORMATION AND TESTING IS RECORDED IN MEMORANDUM REPORT FROM SOILS REPORT TO P.P. 1071, DATED 10/27/54.
 (2) SOILS TESTS WERE MADE AT STATIONS 45, 46, 47 AND 48. TESTS WERE MADE AT STATIONS 45, 46, 47 AND 48. TESTS WERE MADE AT STATIONS 45, 46, 47 AND 48.
 (3) INITIAL CONSTRUCTION WITHIN LIME TO EL 566.51. INITIAL CONSTRUCTION WITHIN LIME TO EL 566.51.
 (4) INITIAL CONSTRUCTION WITHIN LIME TO EL 566.51. INITIAL CONSTRUCTION WITHIN LIME TO EL 566.51.
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Scale: 1"=200'. Except as Noted

YARD		
LIMESTONE & ASH DISPOSAL AREA		
PLAN - SHEET 2		
WIDOWS CREEK STEAM PLANT		
TENNESSEE VALLEY AUTHORITY		
DIVISION OF ENGINEERING DESIGN		
SUBMITTED	RECOMMENDED	APPROVED
J. H. Helman	H. C. Helman	J. H. Helman
KNOXVILLE 3-15-73	34 C 4	ION7421RS

DESIGN OF PROJECT BY *[Signature]* DEVELOPMENT BY *[Signature]*

PHOTOGRAPH TAKEN AT THIS POINT IN THIS DIRECTION.

NOTE: WHERE ROCK ELEV. IS NO HIGHER THAN 591.6' CHANNEL CHANNEL 12' WIDE SHALL BE CONSTRUCTED @ ELEV. 590.

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UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

B65 '86 0708 007

TO : Paul Wade, Director of Fossil and Hydro Power, LP 3S 58K-C

FROM : W. M. Bivens, Manager of Power Engineering, 12-113 SB-K

DATE : July 8, 1986

SUBJECT: WIDOWS CREEK STEAM PLANT - ANNUAL JOINT INSPECTION OF THE WASTE DISPOSAL AREAS BY POWER ENGINEERING AND FOSSIL AND HYDRO POWER

Attached is a report from W. M. Martin to R. E. Harris dated April 30, 1986 (B65 860808 006) concerning the joint inspection of the Widows Creek Steam Plant waste disposal areas. This report includes recommendations for corrective work. I concur with these recommendations.

Original Signed By
W. M. Bivens

W. M. Bivens

OPT:WMM:EES

Attachments

cc (Attachments):

RIMS, SL 26 C-K
R. O. Barnett, W9 D224 C-K
G. L. Buchanan, W3 C126 C-K
Gene Farmer, 12-109 SB-K
O. P. Thornton, W3 D224 C-K

This was prepared principally by W. M. Martin, extension 4346.



Y76163.04

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

TENNESSEE VALLEY AUTHORITY

OFFICE OF POWER

POWER ENGINEERING
FOSSIL ENGINEERING PROJECT

INSPECTION OF

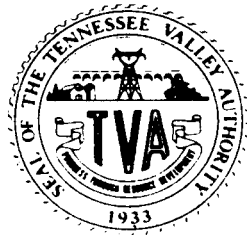
WIDOWS CREEK STEAM PLANT

ASH DISPOSAL AREAS

JOINT PE-F&H PR

INSPECTION

INSPECTED: APRIL 30, 1986



FEP REPORT

TVA 10752 (OE-6-85)

TITLE WIDOWS CREEK STEAM PLANT - ALL UNITS - ANNUAL JOINT INSPECTION BY THE DIVISION OF POWER ENGINEERING AND CONSTRUCTION AND THE DIVISION OF FOSSIL AND HYDRO POWER			REPORT NO. FEP-ASH-86-1	
VENDOR			CONTRACT NO.	
KEY NOUNS			SAR SECTIONS	
UNID SYSTEM(S)			RIMS ACCESSION NUMBER B65 '86 0708 006	
REV (FOR RIMS USE)			RIMS ACCESSION NUMBER	
APPLICABLE DESIGN DOCUMENTS			R0	
R1			R2	
R3			R4	
REFERENCES			R3	
R4			R4	

TENNESSEE VALLEY AUTHORITY
OFFICE OF POWER
FOSSIL ENGINEERING PROJECT

	REVISION 0	R1	R2	R3	R4
DATE					
PREPARED	<i>Wm Martin</i>				
CHECKED	<i>William Stewart</i>				
REVIEWED	<i>R. W. Burnett</i>				
	<i>R. E. Lewis</i>				
APPROVED	<i>O. Thornton</i>				

cc: RIMS, SL26 C-K

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

B65 '86 0708 006

TO : R. E. Harris, Civil Project Engineer, Fossil Engineering Projects,
W2 D224 C-K

FROM : W. M. Martin, Civil Engineer, Fossil Engineering Projects, W2 D207 C-K

DATE : APR 30 1986

SUBJECT: WIDOWS CREEK STEAM PLANT - ANNUAL JOINT INSPECTION OF THE WASTE DISPOSAL
AREAS BY POWER ENGINEERING (PE) AND FOSSIL AND HYDRO POWER (F&H PR)

1.0 GENERAL

- 1.1 The annual joint inspection of the ash and gypsum disposal areas was conducted on April 30, 1986. The weather was warm and dry.
- 1.2 The following personnel were present.
- Bill Martin, PE - FEP - Knoxville
Syed Ahmed, DNE - CEB(GGEG) - Knoxville
David Buckley, F&H PR - Chattanooga
Curtis Taylor, Plant Results Section
- 1.3 The last joint annual inspection was made May 7, 1985 (Report B65 850618 003).
- 1.4 The first joint annual inspection was July 26, 1967, memorandum from W. N. Calvert to W. O. Boop dated September 14, 1967.
- 1.5 The areas inspected are designated on drawings 10N7400, 10N7420, 10W7465-01, and 10W215-4.
- 1.6 This was a visual inspection made to check the condition of the various dikes for stability, possible damp spots or obvious leaks, vegetative cover, condition of spillways, roadway surface, and other general conditions.

2.0 CONDITION OF DIKES AND CHANGES SINCE LAST INSPECTION FOR ASH AND LIMESTONE SCRUBBLE WASTE PONDS FOR ALL UNITS The waste areas are shown on drawings 10W7465-01, 10N7400 and 10N7420.)

- 2.1 The redwater seepage, which begins in the access road ditch (picture 2) south of the copper pond (picture 1 and drawing 10W7465-01) and continues west and north, appears to be about the same as reported last year (section 2.1.1, last year's report B65 850618 003).
- 2.2 This redwater flows to a wetlands area development consisting of 3 cells (out fall 019), which is presently being constructed between the north dike and the plant access railroad. Picture 3 looks west from the dike to the railroad track over cells 2 and 3. Picture 4 shows the dike for cell 3 and is typical for

Y76163.04



Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

R. E. Harris
APR 30 1986

WIDOWS CREEK STEAM PLANT - ANNUAL JOINT INSPECTION OF THE WASTE DISPOSAL
AREAS BY POWER ENGINEERING AND FOSSIL AND HYDRO POWER

all dikes. Note the emergency overflow spillway protected by paper bags filled with dry mix concrete. All dikes have culverts with an adjustable height spillway for controlling water level in the cells as needed.

- 2.3 The perimeter and interior dikes around the ash ponds, the limestone scrubber pond, and the stilling pond are in a dry and stable condition except for redwater leakage described in section 2.1. The roadway surface on all dikes have been regraded and crushed stone surface applied as called for in last year's report. Also, dike slopes have a good (lush) stand of grass and the void areas noted last year have been covered.
- 2.4 There are a few small patches of small or medium size trees on some dike slopes and in particular along the east dike of the limestone scrubber pond and on both sides of the stilling pond perimeter dike. (pictures 2, 3, and 5).
- 2.5 The floating ash condition still exist at the spillways (picture 6) as reported last year in section 12.3.8. David Buckley said F&H PR plans to have construction start correcting this problem soon.

3.0 CHANGES IN POND OPERATION SINCE THE LAST INSPECTION

- 3.1 There has been no change in the pond operation since the last inspection. All ash (units 1 through 8) is sluiced into the units 7 and 8 area. The water flow meanders through the ash pond area and around the deflector dike where it flows out of the ash pond area through five standard spillways with skimmers (picture 6) into the stilling pool. (picture 5). From there it flows through five more spillways with skimmers into the pumping station pond. During normal operations the water is pumped into the intake channel. When pumps are not operating, water is discharged through overflow pipes into the original Widows Creek channel and into Guntersville reservoir.

4.0 CHANGES SINCE THE LAST INSPECTION FOR ASH DISPOSAL AREA - UNITS 1 THROUGH 6 (see drawing 10N7400).

- 4.1 This retired disposal site was not inspected since the wetlands treatment areas are being constructed in the two outfall drainage ditches for storm water from this area.

R. E. Harris

APR 30 1986

WIDOWS CREEK STEAM PLANT - ANNUAL JOINT INSPECTION OF THE WASTE DISPOSAL
AREAS BY POWER ENGINEERING AND FOSSIL AND HYDRO POWER

4.2 The wetlands treatment area for outfall ditch 018 is west of the coal yard drainage pond and consist of three treatment cells. Picture 7 looks south from the plant access road across cell 1 and 2. Note the planting is half completed in cell 1. Picture 8 is showing south from cell 2 dike across cell 3 which is not yet impounded. Note the culverts for the spillway structures under each dike.

5.0 CONDITIONS OF DIKES AND CHANGES SINCE THE LAST INSPECTION FOR THE GYPSUM STACK

- 5.1 Construction was completed for this area in the fall. All field inspections for ground truthing of the pond bottom and dikes was completed and the pond was turned over to the plant for sluicing of gypsum early in 1986. (Reference B65 860208 001).
- 5.2 The sluicing of gypsum began in February and continued for about 3 months and was discontinued because makeup water was not yet available from the ash pond. According to David Buckley, the ash pond spillways are presently being raised in elevation enough to force a discharge through pipes in the divider dike to the limestone pond. This should furnish enough makeup water to operate the gypsum sluicing system.
- 5.3 The perimeter dikes were found to be in stable conditions, the roadways were surfaced and the dike slopes have a lush ground cover of grass. (Picture 8)
- 5.4 Some damp spots (3 or 4) were found along the toe of the south perimeter dike about 75 or 100 feet on either side of station 24 + 00 (+) (see section A3-A3 drawing 10W215-04). The spots were slightly damp (not wet) and were noticeable by a heavier stand of grass (picture 9). The water in the pond is deeper at this point than any other location. No corrective action is recommended as a result of this; however, the plant should check this area occasionally for any change.
- 5.5 The area on the hill, south of the new pond, that was used for borrowing material to raise the ash pond dikes in 1984 has been seeded with grass and mulched with straw. (Picture 11)
- 5.6 Since the ponds were out of service at the time of this inspection, we were not able to observe the spillway and gravity drain in operation. (Picture 12, temporary wooden skimmer)

R. E. Harris

APR 30 1986

WIDOWS CREEK STEAM PLANT - ANNUAL JOINT INSPECTION OF THE WASTE DISPOSAL
AREAS BY POWER ENGINEERING AND FOSSIL AND HYDRO POWER6.0 CONDITION OF THE SPILLWAY DISCHARGE STRUCTURES AND SKIMMERS

- 6.1 Ash Pond for Units 1 through 6 The spillway discharge structures are no longer active at this site. (See section 3.5).
- 6.2 Ash and Stilling Ponds for All Units The spillway and discharge structures with skimmers serving this area are in good operating condition. (See section 2.5 for floating ash comments).
- 6.3 Gypsum Area Ponds The spillway and discharge structures with skimmers were completed and placed in service early this year, but were used for only a couple of months (see section 4.0 for more details). (See picture 12).

7.0 ACTIONS ON RECOMMENDATIONS OF LAST INSPECTION

- 7.1 Plant personnel should continue to remove trees and brush from the dike slopes. The most effective way to remove the trees is to pull them out roots and all when possible. (See section 2.4).
- 7.2 The finger dikes and floating skimmer have not been installed upstream from the ash pond skimmer structures. (See comments, section 2.5).
- 7.3 The slurry wall monitoring program was discontinued. (See sections 2.1 and 2.2).

8.0 RECOMMENDATIONS

- 8.1 The plant should continue to clear the small trees and brush on the dike slopes. (See section 2.4).
- 8.2 The plant should implement to construct finger dikes and a floating skimmer upstream from the ash pond skimmers. (See section 5.2).
- 8.3 The plant should continue to monitor the gypsum pond dike in the area described in section 4.4. A 15-foot berm should have been reserved between the toe of the dike fill and the beginning of the cut for borrow. This was not done for an area of 400 to 500 feet around section A3-A3, drawing 10W215-04. Section A3-A3 was cut at the point of the highest dike embankment and

R. E. Harris
APR 30 1986

WIDOWS CREEK STEAM PLANT - ANNUAL JOINT INSPECTION OF THE WASTE DISPOSAL
AREAS BY POWER ENGINEERING AND FOSSIL AND HYDRO POWER

consideration should be given to going back and building a
15-foot berm along the toe of the dike fill. This would also
keep surface drainage away from the toe of the dike fill.
(Picture 10).

WMM Martin

W. M. Martin

R. E. Harris

R. E. Harris

O. P. Thornton

O. P. Thornton

KWB WMM:EES

REA Attachments

cc (Attachments):

RIMS, SL 26 C-K (w/o drawings)

G. L. Buchanan, W3 C126 C-K

O. P. Thornton, W3 D224 C-K

R. O. Barnett, W9 D224 C-K

This was prepared principally by W. M. Martin, extension 4346.

WIDOWS CREEK S.P.
MAY 1986



- ① ASH POND DIKE SOUTH OF
CHEMICAL TREATMENT PONDS.



- ② DITCH AT UNITS 1-6
SLUICE PIPES.

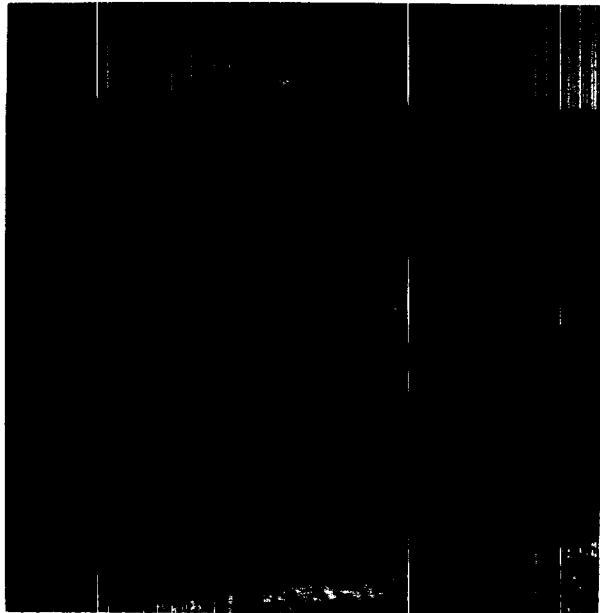


- ③ WETLANDS PLANTING AREA
FOR OUTFALL 019.

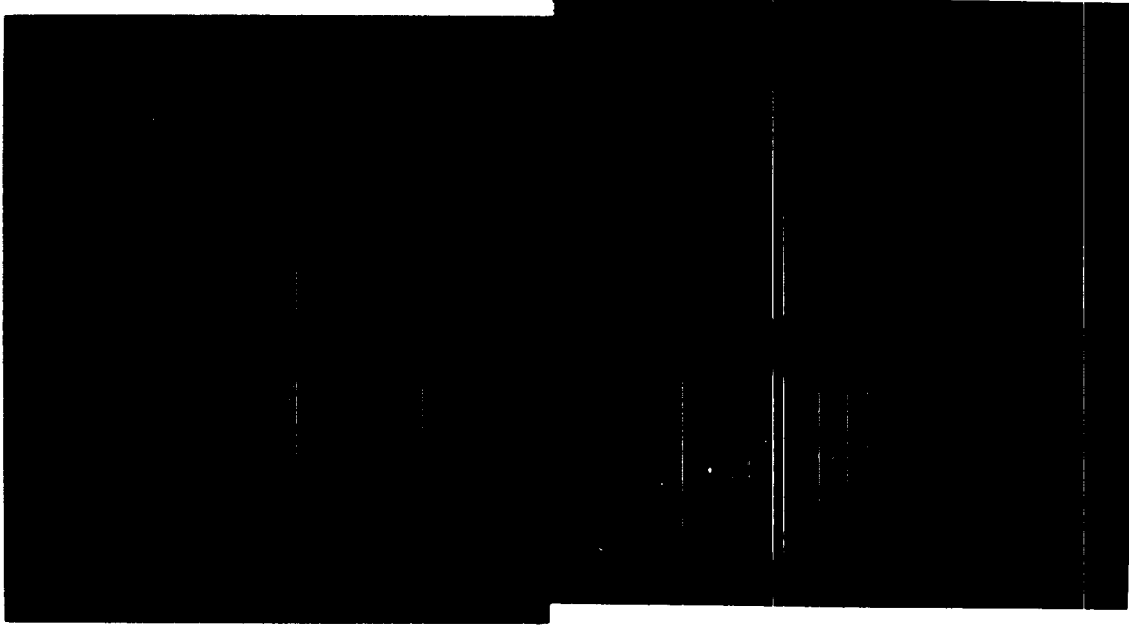
WIDOWS CREEK S.P.
MAY 1986



④ DAM AT CELL 3
OUTFALL 019 LOOKING
EAST.

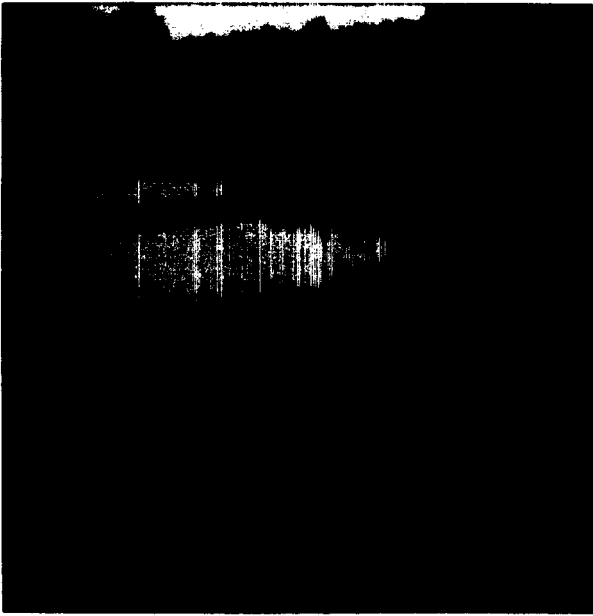


⑤ ASH POND STILLING
POOL.



⑥ ASH POND SPILLWAYS. NOTE: FLOATING ASH.

WIDOWS CREEK S.P.
MAY 1986



- 7) OUTFALL 018 CELLS 1 & 2.
NOTE: PLANTINGS IN CELL 1.

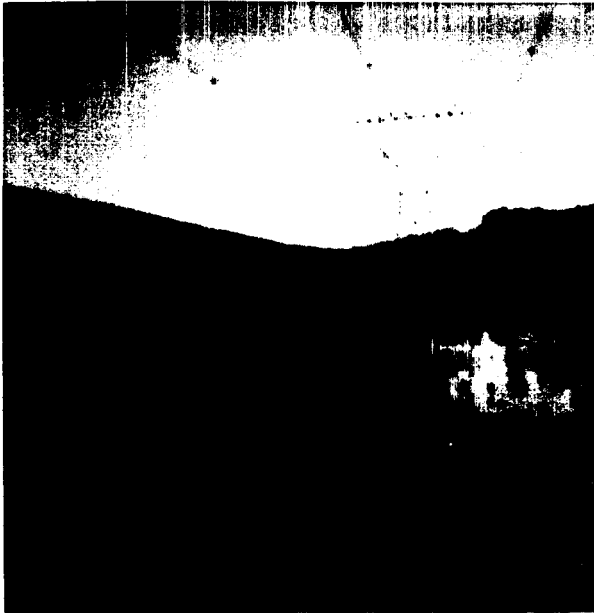


- 8) CELL 3 OUTFALL 018.
NOTE: SPILLWAY PIPES.

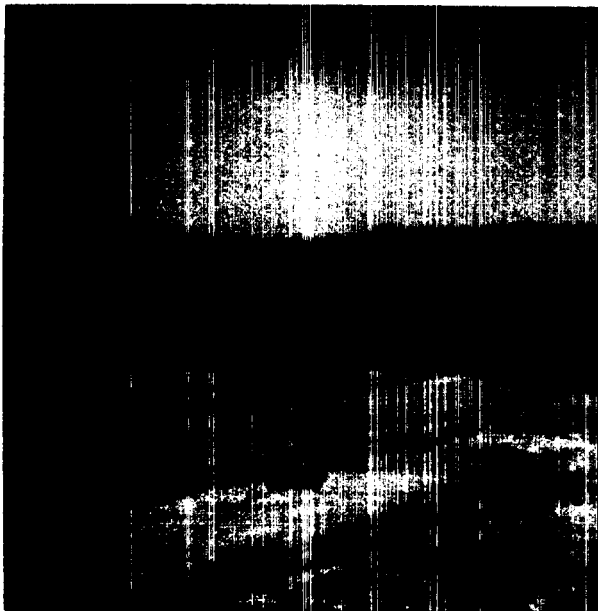


- 9) SOUTHWEST CORNER OF
POND 1 PHASE I GYPSUM
STACKING AREA.

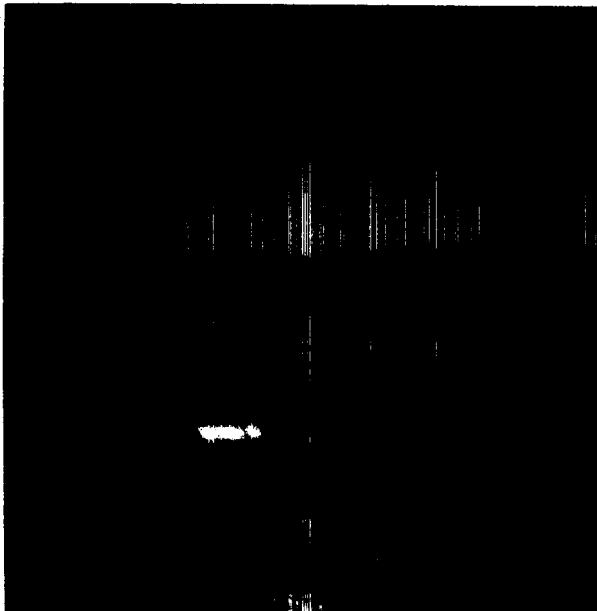
WIDOWS CREEK S.P.
MAY 1986



- 10 TOE OF SOUTH DIKE PHASE I GYPSUM STACKING AREA.
NOTE: DENSE GRASS AT DAMP SPOTS.



- 11 GYPSUM FLYASH SEDIMENTS IN SOUTHWEST CORNER DISCHARGE DITCH PHASE I GYPSUM STACKING AREA.

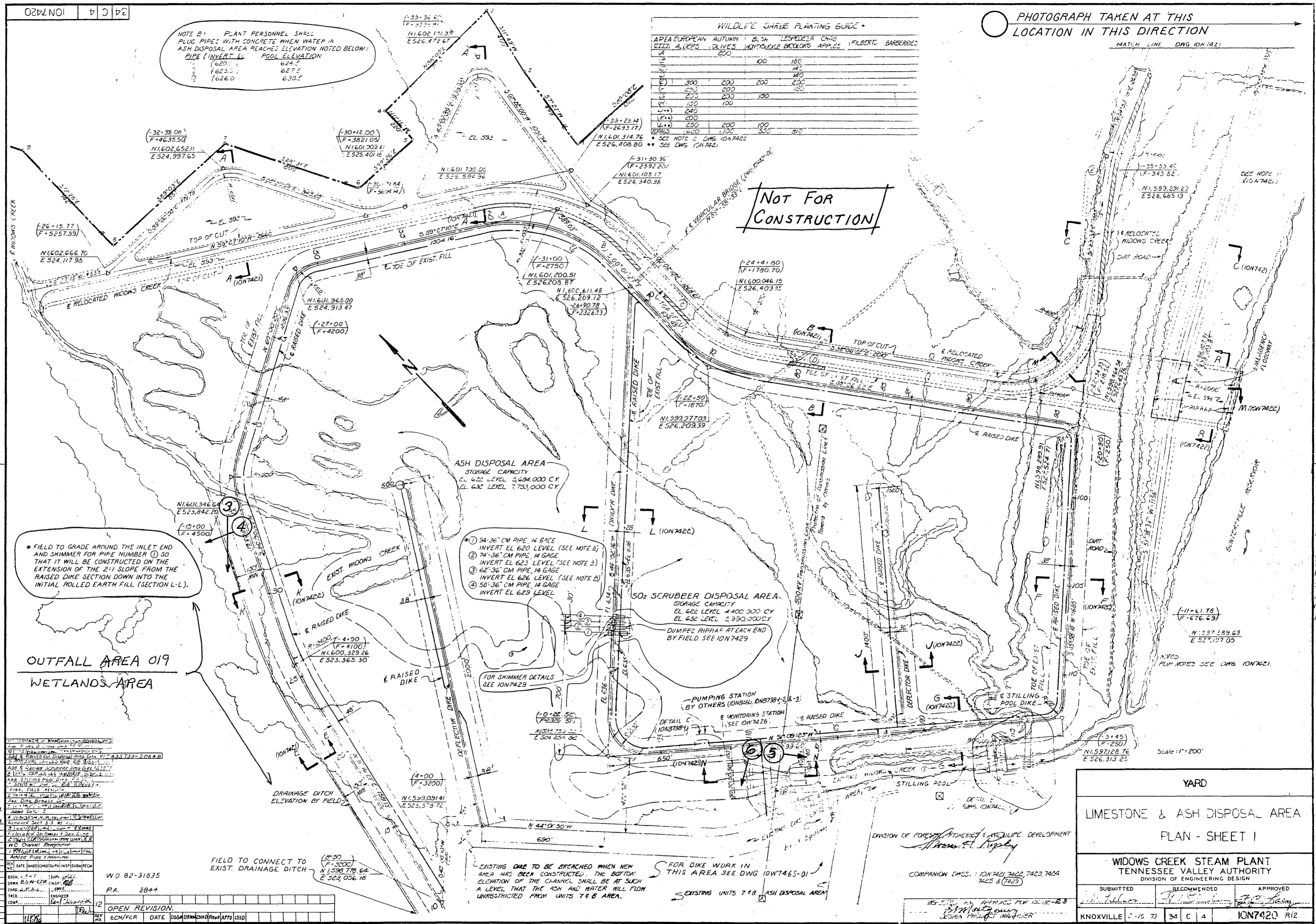


- 12 TEMPORARY WOODEN SKIMMER AND SPILLWAY POND 2 PHASE I GYPSUM STACKING AREA.

PHOTOGRAPH TAKEN AT THIS LOCATION IN THIS DIRECTION

WILDLIFE SHRUB PLANTING GUIDE

AREA	EUROPEAN ALDER	AUTUMN OLIVES	B.L. SH. HONEYLOC	LESPEDEZA CHASE	FLORIB. BARBERIES
A	200	100	100	100	100
B	300	200	200	200	200
C	250	200	200	200	200
D	250	200	150	150	150
E	150	100	100	100	100
F	200	100	100	100	100
G	200	100	100	100	100
H	200	100	100	100	100
I	200	100	100	100	100
J	200	100	100	100	100
K	200	100	100	100	100
L	200	100	100	100	100
M	200	100	100	100	100
N	200	100	100	100	100
O	200	100	100	100	100
P	200	100	100	100	100
Q	200	100	100	100	100
R	200	100	100	100	100
S	200	100	100	100	100
T	200	100	100	100	100
U	200	100	100	100	100
V	200	100	100	100	100
W	200	100	100	100	100
X	200	100	100	100	100
Y	200	100	100	100	100
Z	200	100	100	100	100



NOTE B: PLANT PERSONNEL SHALL PLUG PIPE WITH CONCRETE WHEN WATER IN ASH DISPOSAL AREA REACHES ELEVATION NOTED BELOW:

PIPE (INVERT EL)	POOL ELEVATION
620.0	626.5
623.0	627.5
626.0	630.5

NOT FOR CONSTRUCTION

FIELD TO GRADE AROUND THE INLET END AND SKIMMER FOR PIPE NUMBER ① SO THAT IT WILL BE CONSTRUCTED ON THE EXTENSION OF THE 2:1 SLOPE FROM THE RAISED DIKE SECTION DOWN INTO THE INITIAL ROLLED EARTH FILL (SECTION L-L).

- ① 34-36" CM PIPE 14 GAGE INVERT EL 620 LEVEL (SEE NOTE B)
- ② 74-36" CM PIPE 14 GAGE INVERT EL 623 LEVEL (SEE NOTE B)
- ③ 62-36" CM PIPE 14 GAGE INVERT EL 626 LEVEL (SEE NOTE B)
- ④ 50-36" CM PIPE 14 GAGE INVERT EL 629 LEVEL

SO2 SCRUBBER DISPOSAL AREA STORAGE CAPACITY EL 622 LEVEL 4,400,000 CY EL 632 LEVEL 2,390,000 CY DUMPED RIPRAAP AT EACH END BY FIELD. SEE 10N7429

OUTFALL AREA 019 WETLANDS AREA

PRINTS RECD-R-2

NO.	DATE	BY	FOR
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EXISTING DIKE TO BE BREACHED WHEN NEW AREA HAS BEEN CONSTRUCTED. THE BOTTOM ELEVATION OF THE CHANNEL SHALL BE AT SUCH A LEVEL THAT THE ASH AND WATER WILL FLOW UNRESTRICTED FROM UNITS 7 & 8 AREA.

FOR DIKE WORK IN THIS AREA SEE DWG 10N7465-01

EXISTING UNITS 7 & 8 ASH DISPOSAL AREA

YARD

LIMESTONE & ASH DISPOSAL AREA

PLAN - SHEET I

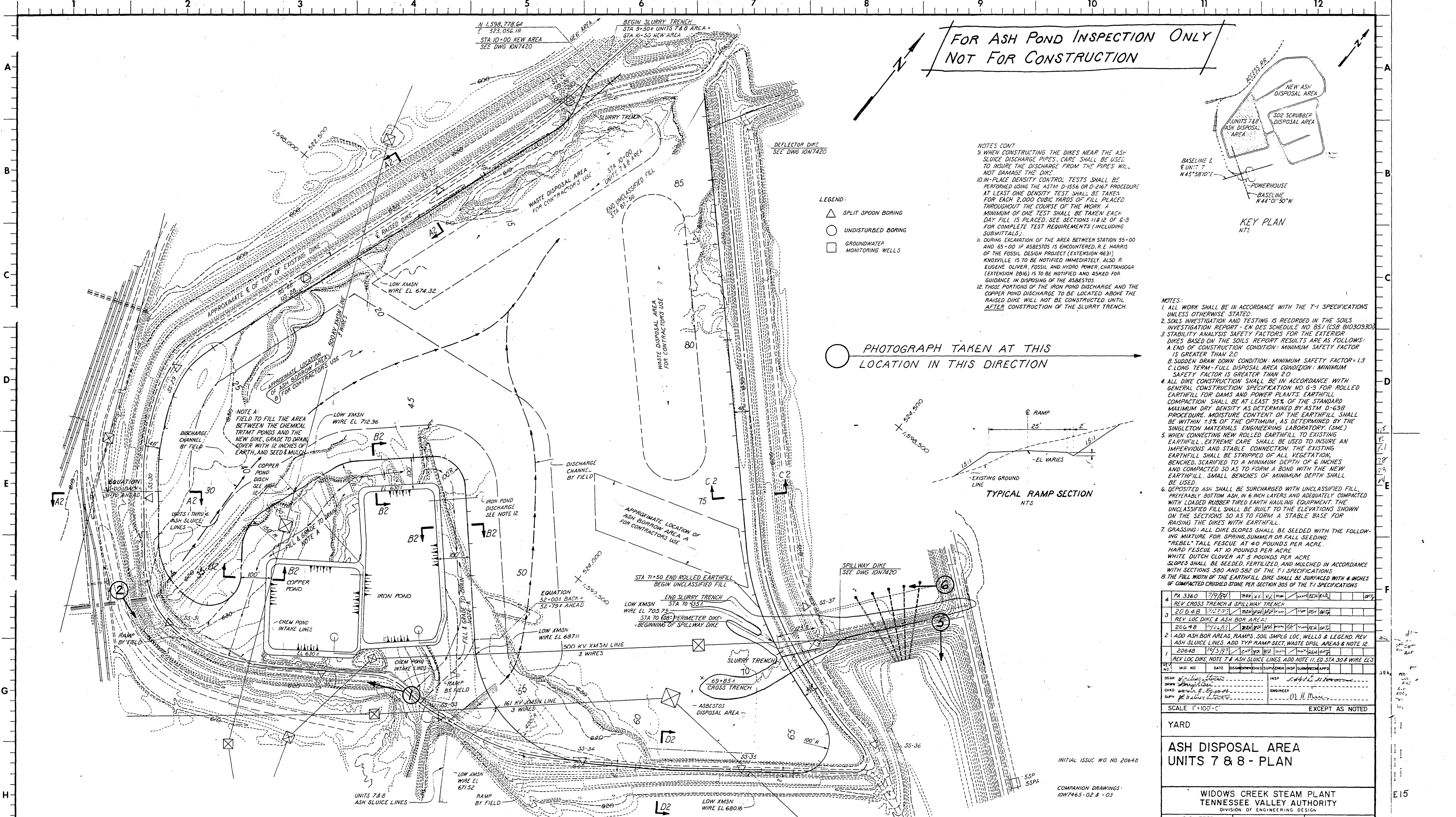
WIDOWS CREEK STEAM PLANT

TENNESSEE VALLEY AUTHORITY

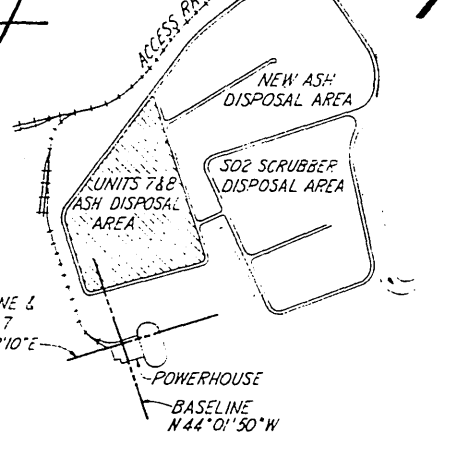
DIVISION OF ENGINEERING DESIGN

SUBMITTED	RECOMMENDED	APPROVED

KNOXVILLE 2-15-73 34 C 4 10N7420 R12



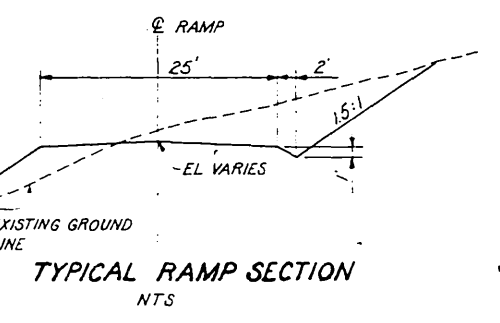
FOR ASH POND INSPECTION ONLY
NOT FOR CONSTRUCTION



NOTES CONT.
9. WHEN CONSTRUCTING THE DIKES NEAR THE ASH SLUICE DISCHARGE PIPES, CARE SHALL BE USED TO INSURE THE DISCHARGE FROM THE PIPES WILL NOT DAMAGE THE DIKES.
10. IN-PLACE DENSITY CONTROL TESTS SHALL BE PERFORMED USING THE ASTM D-1556 OR D-2167 PROCEDURE AT LEAST ONE DENSITY TEST SHALL BE TAKEN FOR EACH 2,000 CUBIC YARDS OF FILL PLACED THROUGHOUT THE COURSE OF THE WORK. A MINIMUM OF ONE TEST SHALL BE TAKEN EACH DAY FILL IS PLACED. SEE SECTIONS 11 & 12 OF 6-9 FOR COMPLETE TEST REQUIREMENTS (INCLUDING SUBMITTALS).
11. DURING EXCAVATION OF THE AREA BETWEEN STATION 55+00 AND 65+00 IF ASBESTOS IS ENCOUNTERED, R.E. HARRIS OF THE FOSSIL DESIGN PROJECT (EXTENSION 4631) KNOXVILLE IS TO BE NOTIFIED IMMEDIATELY. ALSO R. EUGENE OLIVER, FOSSIL AND HYDRO POWER, CHATTANOOGA (EXTENSION 2816) IS TO BE NOTIFIED AND ASKED FOR GUIDANCE IN DISPOSING OF THE ASBESTOS.
12. THOSE PORTIONS OF THE IRON POND DISCHARGE AND THE COPPER POND DISCHARGE TO BE LOCATED ABOVE THE RAISED DIKE WILL NOT BE CONSTRUCTED UNTIL AFTER CONSTRUCTION OF THE SLURRY TRENCH.

- LEGEND:
△ SPLIT SPOON BORING
○ UNDISTURBED BORING
□ GROUNDWATER MONITORING WELLS

○ PHOTOGRAPH TAKEN AT THIS LOCATION IN THIS DIRECTION



- NOTES:
1. ALL WORK SHALL BE IN ACCORDANCE WITH THE T-1 SPECIFICATIONS UNLESS OTHERWISE STATED.
2. SOILS INVESTIGATION AND TESTING IS RECORDED IN THE SOILS INVESTIGATION REPORT - EN DES SCHEDULE NO. B51 (CSB 81030930)
3. STABILITY ANALYSIS SAFETY FACTORS FOR THE EXISTING DIKES BASED ON THE SOILS REPORT RESULTS ARE AS FOLLOWS:
A. END OF CONSTRUCTION CONDITION - MINIMUM SAFETY FACTOR IS GREATER THAN 2.0
B. SUDDEN DRAW DOWN CONDITION - MINIMUM SAFETY FACTOR = 1.3
C. LONG TERM - FULL DISPOSAL AREA CONDITION - MINIMUM SAFETY FACTOR IS GREATER THAN 2.0
4. ALL DIKE CONSTRUCTION SHALL BE IN ACCORDANCE WITH GENERAL CONSTRUCTION SPECIFICATION NO. 6-3 FOR ROLLED EARTHFILL FOR DAMS AND POWER PLANTS. EARTHFILL COMPACTION SHALL BE AT LEAST 95% OF THE STANDARD MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-698 PROCEDURE. MOISTURE CONTENT OF THE EARTHFILL SHALL BE WITHIN ±3% OF THE OPTIMUM, AS DETERMINED BY THE SINGLETON MATERIALS ENGINEERING LABORATORY. (SME.)
5. WHEN CONNECTING NEW ROLLED EARTHFILL TO EXISTING EARTHFILL, EXTREME CARE SHALL BE USED TO INSURE AN IMPERVIOUS AND STABLE CONNECTION. THE EXISTING EARTHFILL SHALL BE STRIPPED OF ALL VEGETATION, BENCHED, SCARIFIED TO A MINIMUM DEPTH OF 6 INCHES AND COMPACTED SO AS TO FORM A BOND WITH THE NEW EARTHFILL. SMALL BENCHES OF MINIMUM DEPTH SHALL BE USED.
6. DEPOSITED ASH SHALL BE SURCHARGED WITH UNCLASSIFIED FILL, PREFERABLY BOTTOM ASH, IN 6 INCH LAYERS AND ADEQUATELY COMPACTED WITH LOADED RUBBER Tired EARTH HAULING EQUIPMENT. THE UNCLASSIFIED FILL SHALL BE BUILT TO THE ELEVATIONS SHOWN ON THE SECTIONS SO AS TO FORM A STABLE BASE FOR RAISING THE DIKES WITH EARTHFILL.
7. GRASSING: ALL DIKE SLOPES SHALL BE SEEDED WITH THE FOLLOWING MIXTURE FOR SPRING, SUMMER OR FALL SEEDING.
"REBEL" TALL FESCUE AT 40 POUNDS PER ACRE.
HARD FESCUE AT 10 POUNDS PER ACRE
WHITE DUTCH CLOVER AT 5 POUNDS PER ACRE
SLOPES SHALL BE SEEDED, FERTILIZED, AND MULCHED IN ACCORDANCE WITH SECTIONS 580 AND 582 OF THE T-1 SPECIFICATIONS
8. THE FILL WIDTH OF THE EARTHFILL DIKE SHALL BE SURFACED WITH 4 INCHES OF COMPACTED CRUSHED STONE PER SECTION 305 OF THE T-1 SPECIFICATIONS

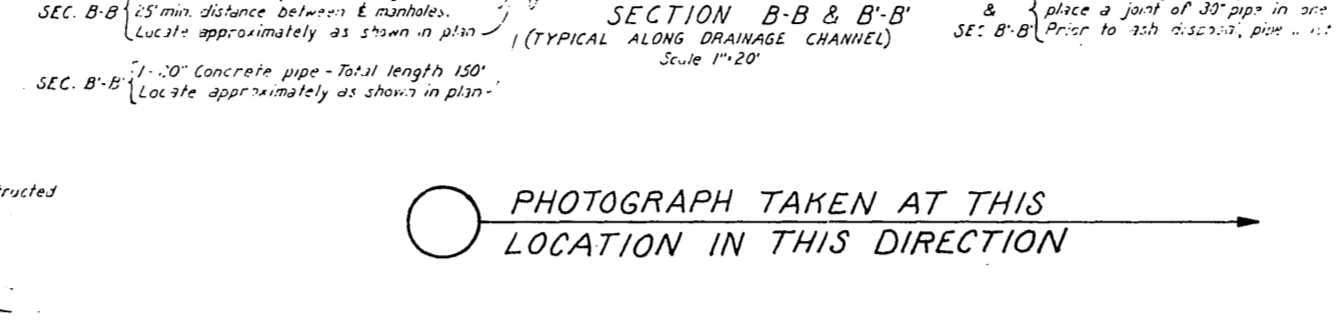
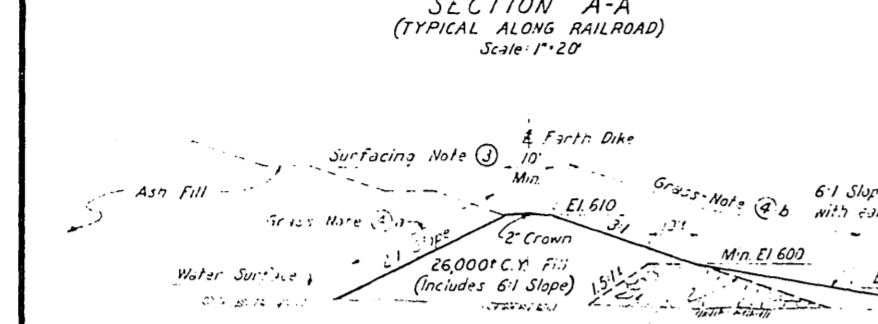
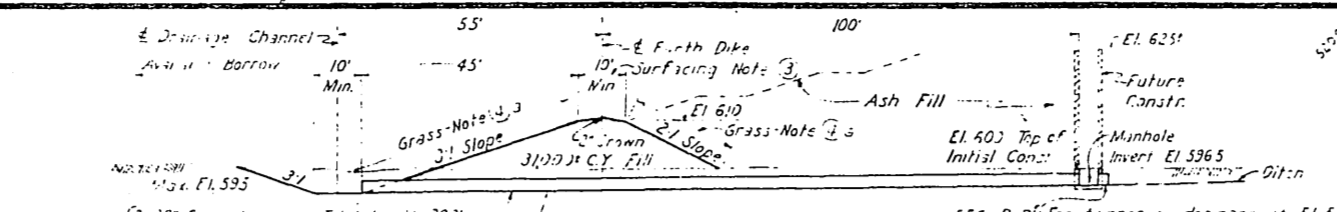
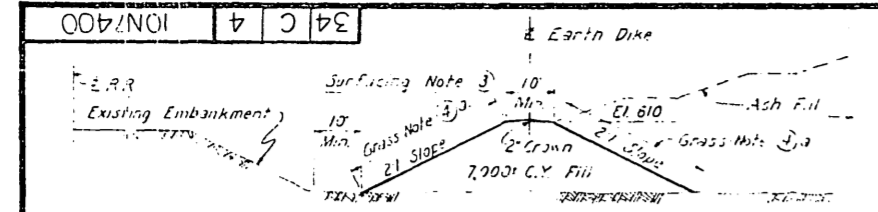
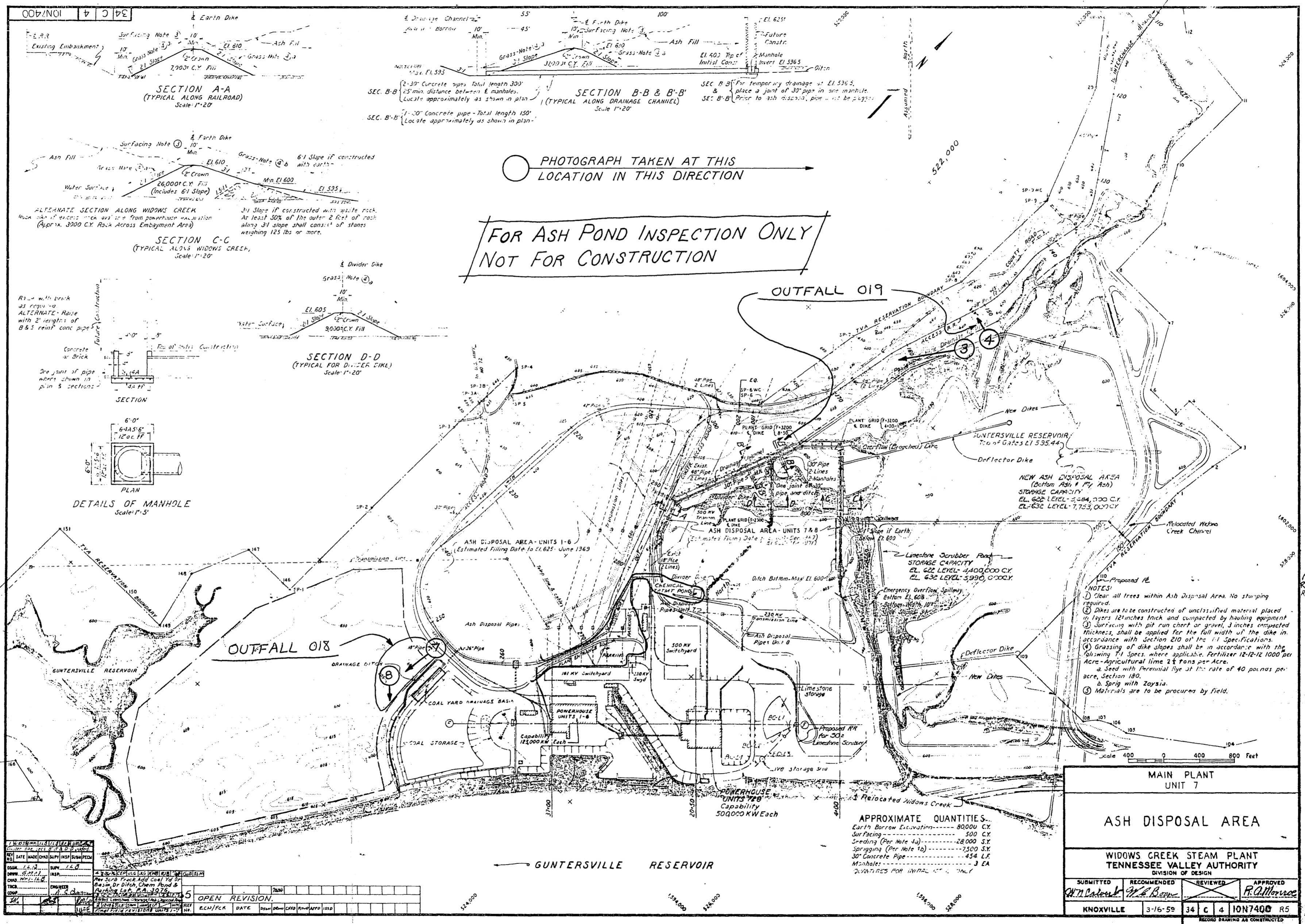
Revision table with columns for revision number, date, description, and initials.

YARD
ASH DISPOSAL AREA
UNITS 7 & 8 - PLAN
WIDOWS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN
SUBMITTED: M.H.M.
RECOMMENDED: R.E. Harris
APPROVED: S.P. Harris
KNOXVILLE 7/14/79 34 C 10W7465-01 R5

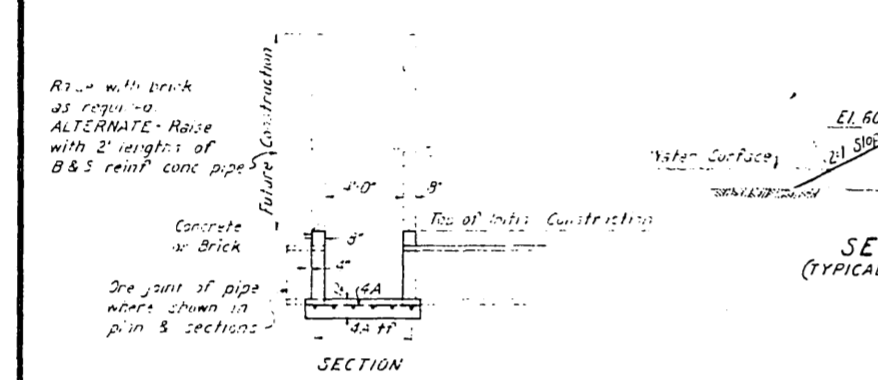
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INSPECTED AND APPROVED FOR ISSUE
SCALE 1"=100'-0"
EXCEPT AS NOTED

INITIAL ISSUE NO. 20646
COMPANION DRAWINGS:
10W7465-02 & -03



ALTERNATE SECTION ALONG WIDOWS CREEK
 2:1 Slope if constructed with waste rock. At least 50% of the outer 2 feet of rock along 2:1 slope shall consist of stones weighing 125 lbs or more.



PHOTOGRAPH TAKEN AT THIS LOCATION IN THIS DIRECTION

FOR ASH POND INSPECTION ONLY
 NOT FOR CONSTRUCTION

- NOTES:
- Clear all trees within Ash Disposal Area. No stumping required.
 - Dikes are to be constructed of unclassified material placed in layers 12 inches thick and compacted by hauling equipment.
 - Surfacing with pit run chert or gravel, 3 inches compacted thickness, shall be applied for the full width of the dike in accordance with section 210 of the T-1 Specifications.
 - Grassing of dike slopes shall be in accordance with the following T-1 Specs. where applicable. Fertilizer 12-12-12 1000 lbs per acre. Agricultural lime 2 tons per acre.
 - Seed with Perennial Ryegrass at the rate of 40 pounds per acre. Section 180.
 - Sprig with Zoysia.
 - Materials are to be procured by field.

APPROXIMATE QUANTITIES:

Earth Borrow Excavation	80000 CY
Surfacing	600 CY
Seeding (Per Note 4)	28000 SX
Springing (Per Note 10)	7500 SX
30" Concrete Pipe	454 LF
Manholes	3 EA

NO.	DATE	BY	CHKD.	APP.	REVISION
1	10/1/59	W.C.			AS SHOWN
2	10/1/59	W.C.			REVISION
3	10/1/59	W.C.			REVISION
4	10/1/59	W.C.			REVISION
5	10/1/59	W.C.			REVISION

MAIN PLANT
UNIT 7

ASH DISPOSAL AREA

WIDOWS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF DESIGN

SUBMITTED	RECOMMENDED	REVIEWED	APPROVED
W.C. Calvert	W.C. Brown		R. Galloway
KNOXVILLE	3-16-59	34 C 4 10N7400 R5	RECORD DRAWING AS CONSTRUCTED

A

B

C

D

E

F

G

ESTIMATED BORROW AVAILABLE	
POND 1	151,300 CY
POND 2	113,530 CY
POND 3	21,200 CY
TOTAL	286,030 CY

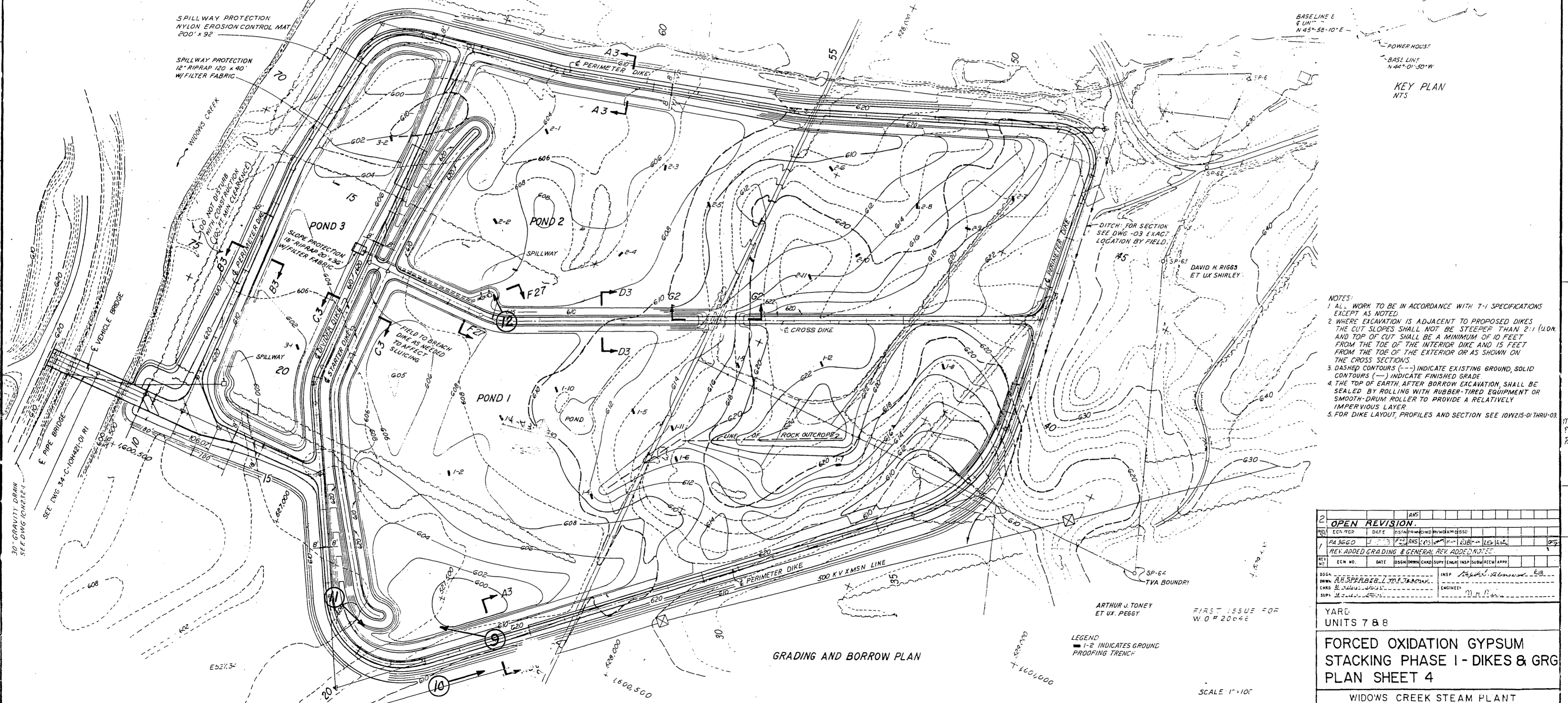
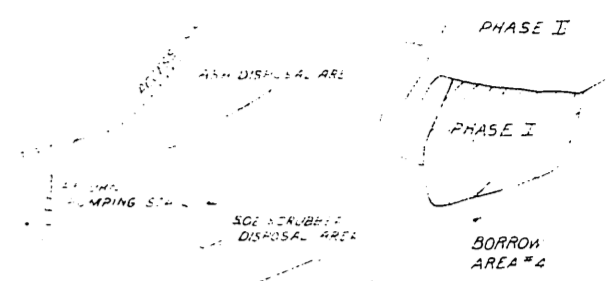
BORROW NOTES:

- BORROW QUANTITIES SHOWN WERE OBTAINED BY CALCULATING "IN PLACE" FILL VOLUME FROM THE DIKE X-SECTION AND INCREASING THIS BY 20% TO ALLOW FOR WASTE AND SHRINKAGE (FROM "INSITU" DENSITIES TO "COMPACTED FILL" DENSITIES), FOUNDATION PREPARATION QUANTITIES WERE CALCULATED ASSUMING AN AVERAGE OF 12" OF SOFT MATERIAL AND SOIL WOULD BE REMOVED BEFORE PLACING DIKE FILL.
- INITIAL DIKE X-SECTION SHOWING ORIGINAL GROUND AND X-SECTIONS AFTER FOUNDATION PREPARATION SHALL BE SUBMITTED TO FEP CIVILS. THESE SECTIONS WILL BE USED TO OBTAIN FINAL IN-PLACE FILL AND FOUNDATION PREPARATION VOLUMES.
- CONSTRUCTION SHALL USE EXTREME CAUTION WHEN EXCAVATING BORROW FROM WITHIN THE LIMITS OF THE POND. THE BORROW CONTOURS REPRESENT ELEVATIONS AT LEAST 3 FEET ABOVE KNOWN ROCK ELEVATIONS. TO SATISFY PERMIT REQUIREMENTS THIS 3 FOOT LAYER OVER THE ROCK OR PERVIOUS SOILS MUST BE MAINTAINED TO SERVE AS A LINE AFTER THE BORROW IS REMOVED FROM WITHIN THE POND. FINAL POND BOTTOM ELEVATIONS SHALL BE SUBMITTED TO FEP CIVILS. SOME GROUND TRUTHING WILL BE REQUIRED (UNDER THE DIRECTION OF GE) TO VERIFY THE 3 FOOT CLAY LINER.
- CLASSIFIED BORROW SHALL BE OBTAINED FROM WITHIN POND (AREAS 1, 2 & 3) AND IF NECESSARY FROM THE EXISTING BORROW.

AREAS SOUTH OF AND ADJACENT TO THE 500 KV TRANSMISSION LINE (AREA 4) UNCLASSIFIED BORROW SHALL BE OBTAINED FROM AREA 4.

- TOP SOIL OF UNSUITABLE SOIL SHALL BE STOCK PILED FOR FUTURE USE BY POWER TO ESTABLISH VEGETATION. (COORDINATE LOCATION WITH PLAN)
- SHOULD BORROW EXCAVATION UNCOVER PERVIOUS SOILS OR HIGH PORTION OF ROCK, A MINIMUM BACKFILL OF 3 FEET OF COMPACTED CLAY WILL BE INSTALLED. IF OUTCROPS ARE ENCOUNTERED ON THE EXISTING GROUND THEY WILL ALSO BE COVERED WITH A MINIMUM BLANKET OF 3 FEET OF COMPACTED CLAY.

PHOTOGRAPH TAKEN AT THIS LOCATION IN THIS DIRECTION



NOTES:

- ALL WORK TO BE IN ACCORDANCE WITH T-1 SPECIFICATIONS EXCEPT AS NOTED.
- WHERE EXCAVATION IS ADJACENT TO PROPOSED DIKES THE CUT SLOPES SHALL NOT BE STEEPER THAN 2:1 (H:V) AND TOP OF CUT SHALL BE A MINIMUM OF 10 FEET FROM THE TOE OF THE INTERIOR DIKE AND 15 FEET FROM THE TOE OF THE EXTERIOR OR AS SHOWN ON THE CROSS SECTIONS.
- DASHED CONTOURS (---) INDICATE EXISTING GROUND, SOLID CONTOURS (—) INDICATE FINISHED GRADE.
- THE TOP OF EARTH, AFTER BORROW EXCAVATION, SHALL BE SEALED BY ROLLING WITH RUBBER-TIRED EQUIPMENT OR SMOOTH-DRUM ROLLER TO PROVIDE A RELATIVELY IMPERVIOUS LAYER.
- FOR DIKE LAYOUT, PROFILES AND SECTION SEE IOW215-01 THRU-03.

OPEN REVISION	
NO.	DESCRIPTION
1	REVISED GRADING & GENERAL REV. ADDED NOTES

YARD UNITS 7 & 8

FORCED OXIDATION GYPSUM STACKING PHASE I - DIKES & GRG PLAN SHEET 4

WIDOWS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

INSPECTED AND APPROVED FOR ISSUE: [Signature]

DESIGN PROJECT MANAGER: [Signature]

KNOXVILLE 11-29-23 34 C IOW215-04 R2

**FOR ASH POND INSPECTION ONLY
NOT FOR CONSTRUCTION**

SCALE 1"=10'

COMPANION DWGS IOW215-01

INSPECTED AND APPROVED FOR ISSUE

DESIGN PROJECT MANAGER

E15

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

B65 '87 0520 006

TO : Paul Wade, Director of Fossil and Hydro Power, LP 3S 58K-C

FROM : W. M. Bivens, Manager of Power Engineering, 12-113 SB-K

DATE : MAY 20 1987

SUBJECT: WIDOWS CREEK STEAM PLANT - ANNUAL JOINT INSPECTION OF THE WASTE DISPOSAL
AREAS BY POWER ENGINEERING AND FOSSIL AND HYDRO POWER

Attached is a report from W. M. Martin to R. E. Harris dated April 27, 1987 (B65 870427 001) concerning the joint inspection of the Widows Creek Steam Plant waste disposal areas. This report includes recommendations for corrective work. I concur with these recommendations.

Original Signed By
O. P. Thornton

W. M. Bivens

wmm
KWB
REH
AS
JLG:WMM:MCC

Attachments

cc (Attachments):

RIMS, SL 26 C-K

G. Farmer, 12-109 SB-K

J. L. Golden, W3 D224 C-K

This was prepared principally by W. M. Martin, extension 4346.

S77135.02



FEP REPORT

TVA 10752 (OE 6-85)

TITLE WIDOWS CREEK STEAM PLANT - ALL UNITS - ANNUAL JOINT INSPECTION BY THE DIVISION OF POWER ENGINEERING AND CONSTRUCTION AND THE DIVISION OF FOSSIL AND HYDRO POWER		REPORT NO. FEP-STR-87-7	
VENDOR		CONTRACT NO.	KEY NOUNS
			UNID SYSTEM(S)
		REV (FOR RIMS USE)	RIMS ACCESSION NUMBER
		R0	B65 '87 0427 001
APPLICABLE DESIGN DOCUMENTS		R1	
		R2	
REFERENCES		R3	
		R4	

**TENNESSEE VALLEY AUTHORITY
OFFICE OF POWER
FOSSIL ENGINEERING PROJECT**

	REVISION 0	R1	R2	R3	R4
DATE	APR 27 1987				
PREPARED	<i>W.M. Martin</i>				
CHECKED	<i>H. W. Burnett</i>				
REVIEWED	<i>H. W. Burnett</i>				
	<i>R. E. Harris</i>				
APPROVED	<i>[Signature]</i>				

cc: RIMS, SL26 C-K

TENNESSEE VALLEY AUTHORITY

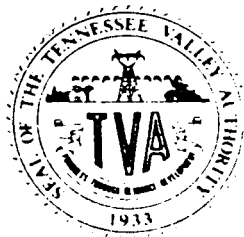
OFFICE OF POWER

POWER ENGINEERING
FOSSIL ENGINEERING PROJECT

INSPECTION OF

WIDOWS CREEK STEAM PLANT
ASH DISPOSAL AREAS

JOINT PE-F&H PR
INSPECTION
INSPECTED: APRIL 8, 1987



UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

B65 '87 0427 001

TO : R. E. Harris, Civil Project Engineer, Fossil Engineering Projects,
W2 D224 C-K

FROM : W. M. Martin, Civil Engineer, Fossil Engineering Projects, W2 D207 C-K

DATE : **APR 27 1987**

SUBJECT: WIDOWS CREEK STEAM PLANT - ANNUAL JOINT INSPECTION OF THE WASTE DISPOSAL
AREAS BY POWER ENGINEERING (PE) AND FOSSIL AND HYDRO POWER (F&H PR)

1.0 GENERAL

- 1.0 The annual joint inspection of the ash and gypsum disposal areas was conducted on April 8, 1987. The weather was warm and dry.
- 1.2 The following personnel were present.
- W. M. Martin, PE-FEP-Knoxville
Ken Burnett, PE-FEP-Knoxville
David Buckley, F&H PR - Chattanooga
Randall Hoodenpyl, Power Plant Results Supervisor
- 1.3 The last joint annual inspection was made April 30, 1986 (Report B65 860708 006).
- 1.4 The first joint annual inspection was July 26, 1967, memorandum from W. N. Calvert to W. O. Boop dated September 15, 1967.
- 1.5 The areas inspected are designated on drawings 10N7400, 10N7420, 10W7465.01, and 10W215-4.
- 1.6 This was a visual inspection made to check the condition of the various dikes for stability, possible damp spots or obvious leaks, vegetative cover, condition of spillways, roadway surface and other general conditions.

2.0 CONDITION OF DIKES AND CHANGES SINCE LAST INSPECTION FOR ASH AND LIMESTONE SCRUBBLE WASTE PONDS FOR ALL UNITS The Waste areas are shown on drawings 10W7465N01, 10N7400 and 10N7420.

- 2.1 The redwater seepage, which begins in the access road ditch south of the copper pond (Drawing 10W7465-01) and continues west and north, appears to be about the same as reported last year.
- 2.2 This redwater flows to a wetland area development consisting of 3 cells (out fall 019), which is presently in service between the north dike and the plant access railroad. (Picture 1). A tank to contain a caustic material has recently been installed to use in treating the acid condition of the water (picture 2.)
- 2.3 The perimeter and interior dikes around the ash ponds, the limestone scrubber pond, and the stilling pond are in a dry and stable condition except for redwater leakage described in section 2.1.



R. E. Harris

APR 27 1987

WIDOWS CREEK STEAM PLANT - ANNUAL JOINT INSPECTION OF THE WASTE DISPOSAL AREAS BY POWER ENGINEERING (PE) AND FOSSIL AND HYDRO POWER (F&H PR)

- 2.4 The roadway surface on all dikes is in satisfactory condition except for the divider dike. CSG is using this dike to haul earth borrow from the hillside borrow area and after this work is completed the dike should be regraded and resurfaced with four inches of 1032 crushed stone.
- 2.5 Only a very few small trees remain on the dike slopes, most have been removed through the plants removal program this past year.
- 2.6 The small gulleys washed out in the dike slopes have been repaired and a lush grass cover has been established on all dike slopes.
- 2.7 A floating boom skimmer has been placed upstream from the five primary ash pond spillway skimmer structures as recommended in past reports. (picture 3)
- 2.8 The plant is presently raising the ash pond spillway elevations by four feet, as recommended in past reports, in order to force ash pond water into the limestone scrubber pond to provide additional water for the gypsum sluicing system.
- 2.9 The plant has completed the work of placing an earth cover and establishing a grass cover on the low areas around the chemical treatment ponds and installing pipe culverts through the original perimeter dike to pass storm drainage through. This eliminated the ponds of standing water and was recommended in past reports. (picture 4)

3.0 CHANGES IN POND OPERATION SINCE THE LAST INSPECTION

- 3.1 There has been no change in the pond operation since the last inspection. All ash (units 1 through 8) is sluiced into the units 7 and 8 area. The water flow meanders through the ash pond area and around the deflector dike where it flows out of the ash pond area through the five primary standard spillways with skimmers into the pumping station pond. During normal operations, the water is pumped into the intake channel. When pumps are not operating, water is discharged through the overflow pipes into the original Widows Creek channel and into Guntersville reservoir.

R. E. Harris

APR 27 1987

WIDOWS CREEK STEAM PLANT - ANNUAL JOINT INSPECTION OF THE WASTE DISPOSAL AREAS BY POWER ENGINEERING (PE) AND FOSSIL AND HYDRO POWER (F&H PR)

4.0 CHANGES SINCE THE LAST INSPECTION FOR ASH DISPOSAL AREA - UNITS 1 THROUGH 6 (see drawing 10N7400)

- 4.1 This retired disposal site was not inspected since the outfall drainage ditches for storm water from this area pass through the wetlands developed for outfall .018 and .019 (See section 2.2).
- 4.2 The south half of this area is drained by outfall .018 where the drainage passes through a wetland on the west side of the coal yard drainage basin (Picture 5).

The wetlands empties into a weir box (picture 5) where it is monitored for acid level and quantity of flow. This discharge is also being treated in order to raise the Ph to an acceptable level before it enters the Tennessee River.

5.0 CONDITIONS OF DIKES AND CHANGES SINCE THE LAST INSPECTION FOR THE GYPSUM STACK

- 5.1 Construction was completed for this area in the fall of 1985 and the pond was turned over to the plant for sluicing of gypsum early in 1986. (Reference B65 860208 001).
- 5.2 The sluicing of gypsum began in February 1986 and continues to date. The ash pond spillways are presently being raised in elevation to force a discharge through pipes in the divider dike to the limestone pond. This will furnish enough makeup water to operate the gypsum sluicing system at all times. (see section 2.8)
- 5.3 The perimeter dikes were found to be in stable condition, the roadways are surfaced and the dike slopes have a lush ground cover of grass. (Picture 7 and 8).
- 5.4 The damp spots found last year along the toe of the south dike slope (Picture 7) do not present a structural problem and the area along the toe still has some standing water. Randall said the plant has already given a work order to CSG to drain this area as suggested in last years report (section 8.3).
- 5.5 The gravity drain is functioning good. One small problem was discovered and the plant took a proper action to correct the problem. A noise was noticed at the first manhole and the plant installed a vent pipe which promptly handled the problem. (See picture 9 for outlet ditch with weir structure).

R. E. Harris

APR 27 1964

WIDOWS CREEK STEAM PLANT - ANNUAL JOINT INSPECTION OF THE WASTE DISPOSAL AREAS BY POWER ENGINEERING (PE) AND FOSSIL AND HYDRO POWER (F&H PR)

6.0 CONDITION OF THE SPILLWAY DISCHARGE STRUCTURES AND SKIMMERS

- 6.1 Ash Pond for Units 1 through 6 The spillway structures are no longer active at this site.
- 6.2 Ash and Stilling Ponds for All Units The spillway and discharge structures with skimmers serving this area are in good operating condition. (See section 2.7 for floating ash comments).
- 6.3 Gypsum Area Ponds The spillway and discharge structures with skimmers are in good working order. (See comment 5.5)

7.0 ACTIONS ON RECOMMENDATIONS OF LAST INSPECTION

- 7.1 Plant personnel have cleared the dike slopes of brush and trees so that this is no longer a problem.
- 7.2 The plant personnel have constructed a floating boom skimmer upstream from the primary ash pond skimmers. (see section 2.7)
- 7.3 The plant is taking action to correct the standing water along the south dike on the gypsum pond (see comment 5.4)

8.0 RECOMMENDATIONS

- 8.1 The plant is in the process of raising the water level in the ash pond and they should monitor the perimeter slopes during this process to observe if any dike seepage is caused by the extra water head. Also, an interim joint inspection of this situation should be conducted in late fall, say October.


W. M. Martin

See page 5 for distribution.

5

R. E. Harris

APR 27 1987

WIDOWS CREEK STEAM PLANT - ANNUAL JOINT INSPECTION OF THE WASTE DISPOSAL
AREAS BY POWER ENGINEERING (PE) AND FOSSIL AND HYDRO POWER (F&H PR)

KWB WMM:FFS

Attachments

cc (Attachments):

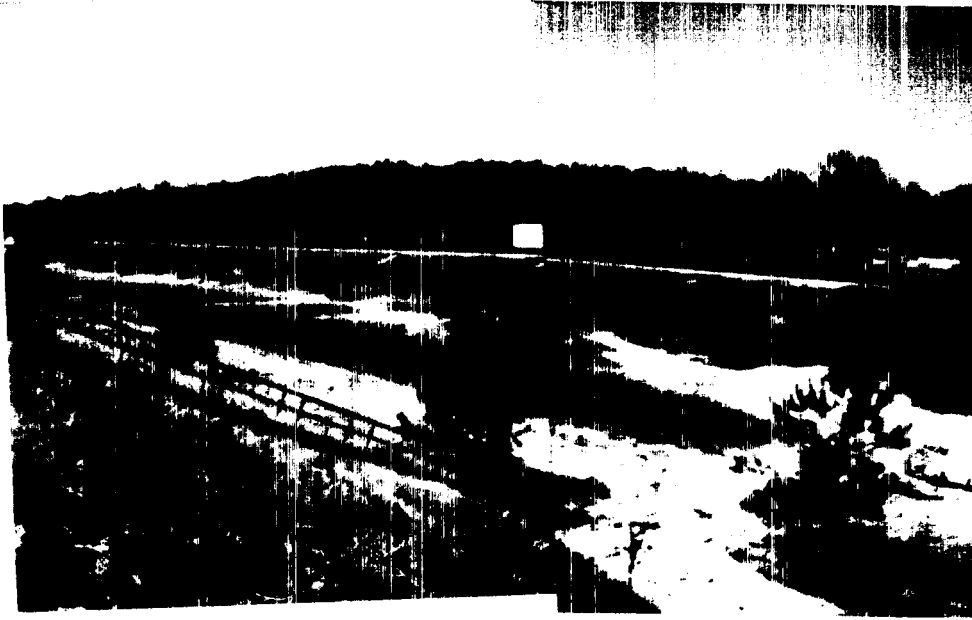
RIMS, SL 26 C-K

J. L. Golden, W3 D224 C-K

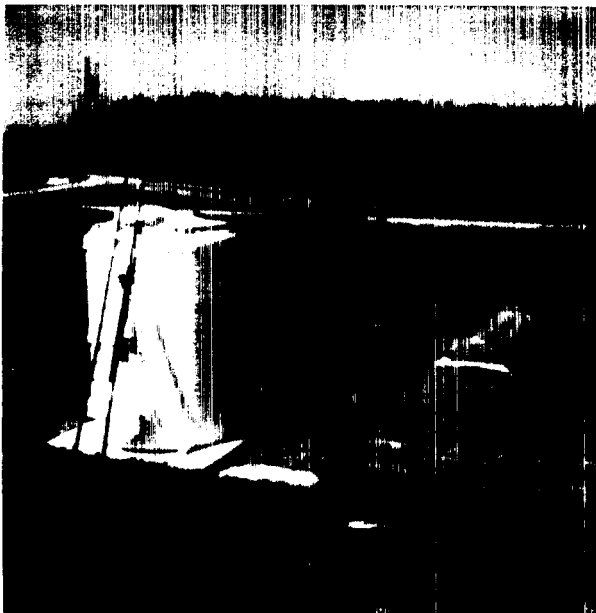
This was prepared principally by W. M. Martin, extension 4346.

S77114.04

WIDOWS CREEK S. P.
APRIL 1987



① OUTFALL .019 AREA CELL #3
NOTE NEW GRASS COVER OF RR FILL.

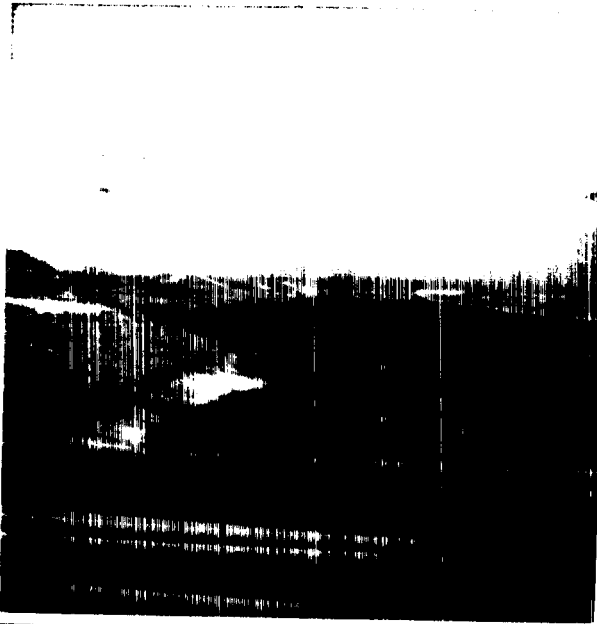


② OUTFALL .019 WETLANDS
- CAUSTIC TREATMENT TANK
FOR PH ADJUSTMENT.

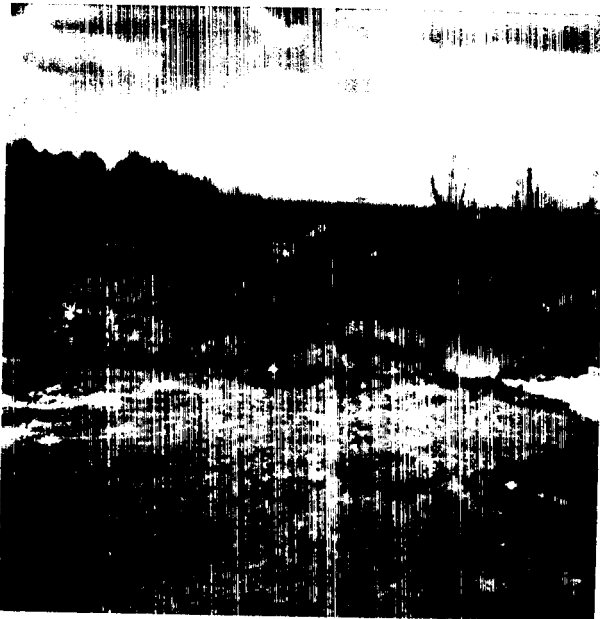


③ ASH PONDS - PRIMARY
SKIMMERS - NEW FLOATING
SKIMMER BOOM.

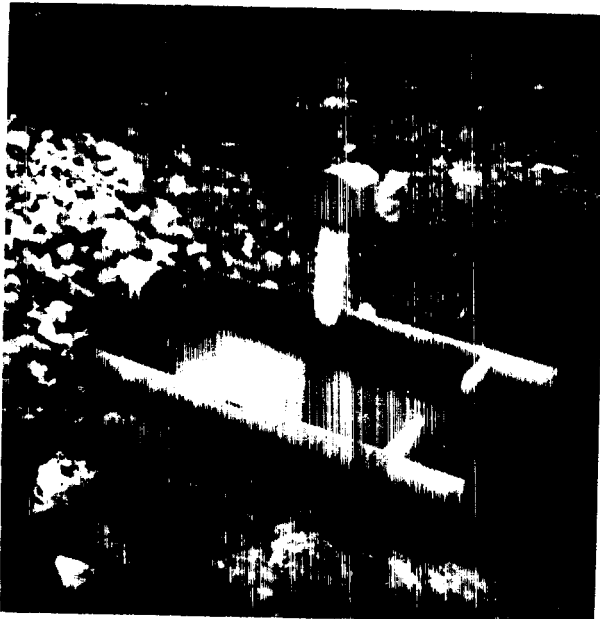
WIDOWS CREEK S. P.
APRIL 1987



- 4 1-6 SLURRY PIPE LINES
ON TOP OF ASH POND DIKE
LOOKING SOUTH TOWARD
CHEMICAL TREATMENT
PONDS.

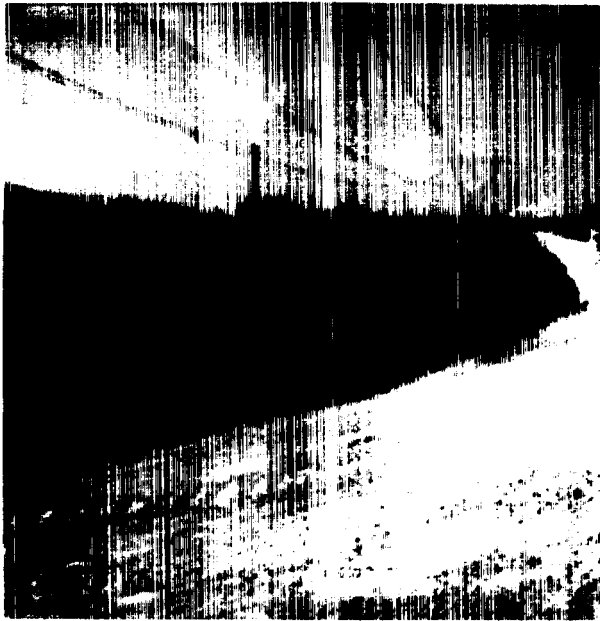


- 5 OUTFALL .018 WETLANDS
PLANTING AREA WEST OF
COAL STORAGE YARD.



- 6 OUTFALL .018 OUTFALL
WEIR & MONITORING STATION
FOR .018.

WIDOWS CREEK S. P.
APRIL 1987



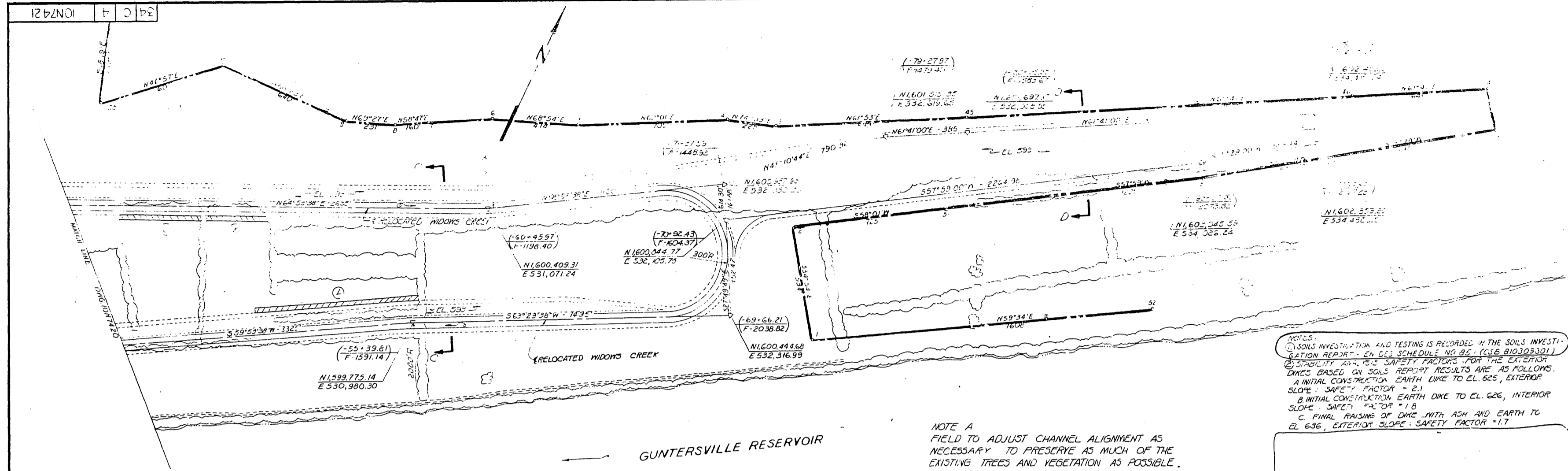
- 7 F.O.G. PHASE I WET
STACKING AREA SOUTH
DIKE - NOTE WET AREA
ALONG TOE OF DIKE (300'±).



- 8 F.O.G. PHASE I STACK -
WET STACKING AREA -
PLANT IS EXTENDING
STARTER DIKE TO THE
EAST.



- 9 F.O.S. GRAVITY DRAIN
AT OUTLET TO WEIR AND
OUTFALL .020.



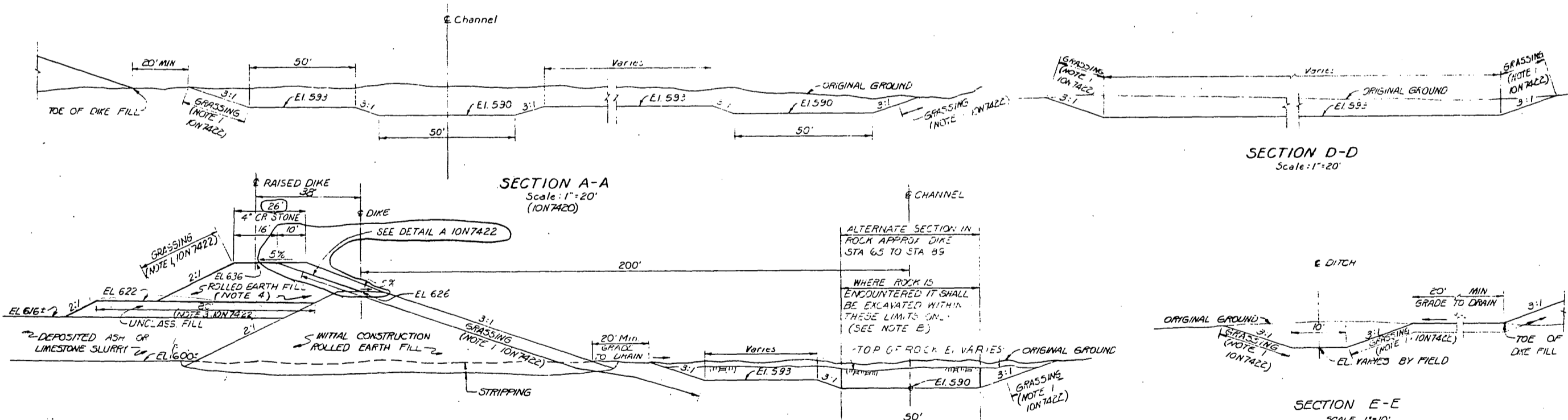
NOTES:
 1. SOIL INVESTIGATION AND TESTING IS RECORDED IN THE SOILS INVESTIGATION REPORT - EN 625 SCHEDULE NO. 95 (CSB 810305301)
 2. STABILITY ANALYSIS SAFETY FACTORS FOR THE EXISTING DAMS BASED ON SOILS REPORT RESULTS ARE AS FOLLOWS:
 A. INITIAL CONSTRUCTION EARTH DIKE TO EL. 625, EXTERIOR SLOPE SAFETY FACTOR = 2.1
 B. INITIAL CONSTRUCTION EARTH DIKE TO EL. 626, INTERIOR SLOPE SAFETY FACTOR = 1.8
 C. FINAL RAISING OF DAM WITH ASH AND EARTH TO EL. 636, EXTERIOR SLOPE SAFETY FACTOR = 1.7

NOTE A
 FIELD TO ADJUST CHANNEL ALIGNMENT AS NECESSARY TO PRESERVE AS MUCH OF THE EXISTING TREES AND VEGETATION AS POSSIBLE.

3. ALL DIKE CONSTRUCTION SHALL BE IN ACCORDANCE WITH GENERAL CONSTRUCTION SPECIFICATION NO. 8-5 FOR ROLLED EARTH-FILL FOR DAMS AND POWER PLANTS. EARTH-FILL COMPACTION SHALL BE AT LEAST 95% OF THE STANDARD MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-698 PROCEDURE. MOISTURE CONTENT OF THE EARTH-FILL SHALL BE WITHIN $\pm 3\%$ OF THE OPTIMUM, AS DETERMINED BY THE SINGLETON MATERIALS ENGINEERING LABORATORY. (SME)

4. ALL OTHER CONSTRUCTION SHALL BE IN ACCORDANCE WITH HIGHWAY SPECIFICATIONS NO. T-1.
 5. CUT SLOPES ADJACENT TO EXISTING OR PROPOSED DIKES SHALL NOT BE EXCAVATED STEEPER THAN 3:1 AND TOP OF CUT SHALL BE A MINIMUM OF 20' FROM THE TOE OF ANY DIKE.
 6. WHEN CONNECTING THE ENDS OF THE NEW DIKE TO THE OLD DIKE, EXTREME CARE SHALL BE USED TO INSURE AN IMPERVIOUS AND STABLE CONNECTION. THE EXISTING DIKE SHALL BE STRIPPED AND ALL VEGETATION BENCHED. SCARIFIED TO A MINIMUM DEPTH OF 6" AND COMPACTED SO AS TO FORM A BOND WITH THE NEW FILL. DUE TO THE STEEP SIDE SLOPES OF THE EXISTING DIKES, THE UTMOST CAUTION SHALL BE USED IN BENCHING THE EXISTING DIKE SLOPES SO AS NOT TO CREATE AN UNSTABLE CONDITION. SMALL BENCHES OF MINIMUM DEPTH SHALL BE USED.
 7. COORDINATES OF PYS ARE SHOWN IN PLANT COORDINATES (NAD 83) AND ALABAMA STATE COORDINATES (NAD 83) (2,825,036.18)

ALABAMA STATE COORDINATES WERE COMPUTED FROM THE ORIGINAL COORDINATES OF THE INTERSECTION OF THE BASE LINES OF UNIT 7 AS GIVEN IN 1958.
 8. RIPRAP - RIPRAP SHALL BE PLACED AT LOCATIONS AS SHOWN ON DRAWINGS. THE STONE SHALL BE WELL GRADED AND CONFORMS TO SOURCE DURABLE STONE PER SECTION 830 OF THE T-1 SPECIFICATIONS. THE RIPRAP SHALL BE A MINIMUM OF 2" THICK WITH AT LEAST 50% BY WEIGHT BEING 200 LBS. OR MORE AND MORE THAN 5% PASSING THE 1" SIEVE.
 9. FILTER - THE FILTER BLANKET SHALL BE 8" THICK AND IN ACCORDANCE WITH SECTION 836 OF THE T-1 SPECIFICATIONS.



NOTE B: WHERE ROCK ELEV. IS NO HIGHER THAN 591 @ CHANNEL A CHANNEL 12' WIDE SHALL BE CONSTRUCTED @ ELEV 592

PHOTOGRAPH TAKEN AT THIS LOCATION IN THIS DIRECTION

FOR ASH POND INSPECTION ONLY
 NOT FOR CONSTRUCTION

NO.	DATE	BY	CHKD.	APPD.	DESCRIPTION
1					ISSUED FOR CONSTRUCTION
2					REVISED
3					REVISED
4					REVISED
5					REVISED
6					REVISED
7					REVISED
8					REVISED
9					REVISED
10					REVISED

W.O. 82-31635	P.A. 2844				
OPEN REVISION					
ECN/FCR	DATE	ISSN	DATE	APPD.	ISSD

YARD
 LIMESTONE & ASH DISPOSAL AREA
 PLAN - SHEET 2

WIDOWS CREEK STEAM PLANT
 TENNESSEE VALLEY AUTHORITY
 DIVISION OF ENGINEERING DESIGN

SUBMITTED	RECOMMENDED	APPROVED
J. G. Wilson	J. G. Wilson	J. G. Wilson
KNOXVILLE	2-15-73	34 C 4 ION7421 RT

ME
 R1
 R2
 R3
 R4
 R5
 R6

E15

Scale: 1" = 20' Except as Noted

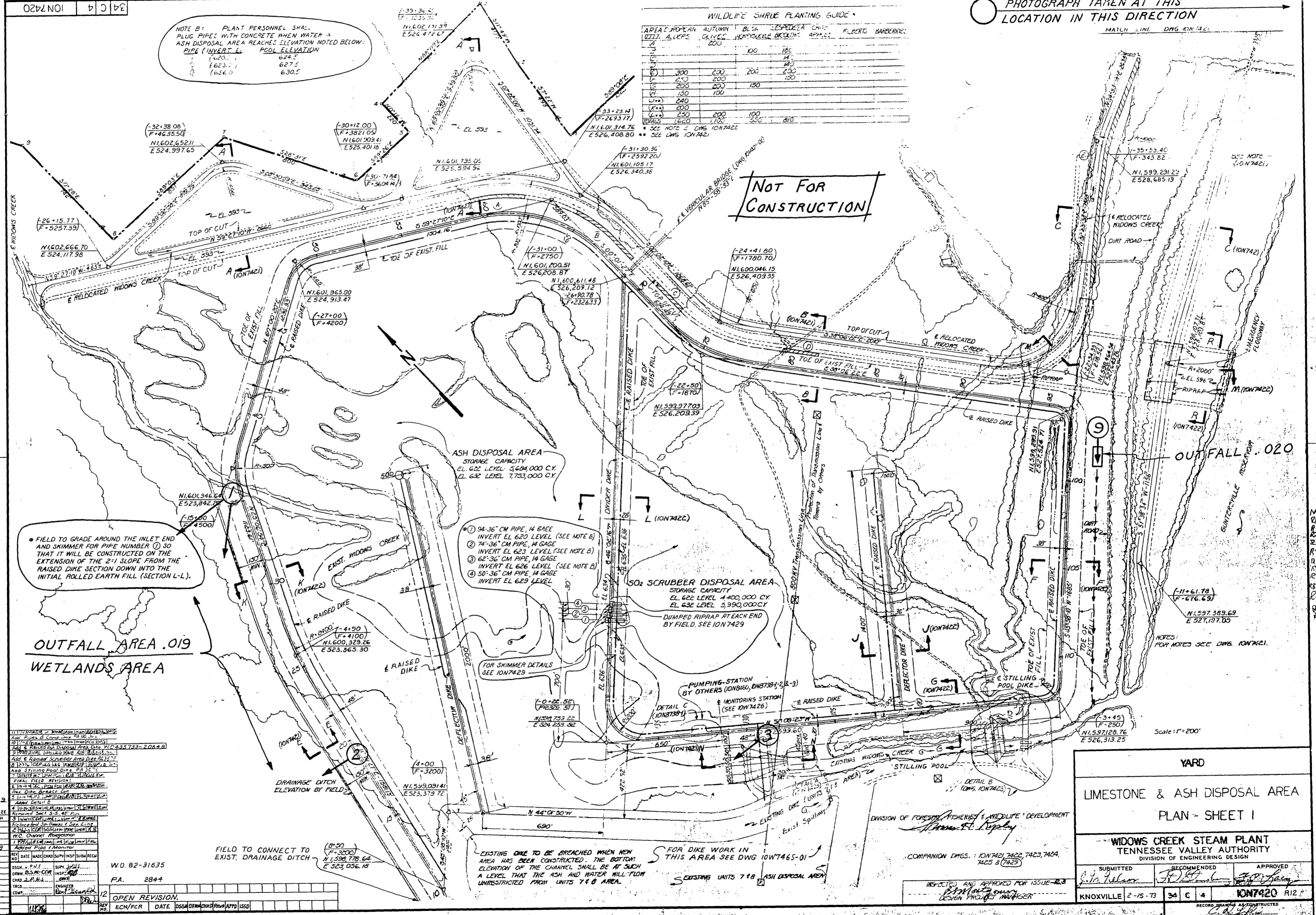
DIVISION OF FOREST FISHERY & WILDLIFE DEVELOPMENT
 J. G. Wilson, P.E., Director

COMPANION DWGS.: ION 7420, 7421, 7422, 7423, 7424

INSPECTED AND APPROVED FOR ISSUE - B3
 J. G. Wilson, Design Project Manager

RECORD DRAWING AS CONSTRUCTED
 23-10-31-73

PHOTOGRAPH TAKEN AT THIS LOCATION IN THIS DIRECTION



WILDLIFE SHRUB PLANTING GUIDE

AREA	PLANT	AUTUMN	BLUSH	LESPEDeza	CHINA	FLORIDA	BARBERCANE
AREA 1	ALBIFLORA	200	100	180	140	100	100
AREA 2	ALBIFLORA	200	200	200	200	200	200
AREA 3	ALBIFLORA	200	200	100	100	100	100
AREA 4	ALBIFLORA	200	200	100	100	100	100
AREA 5	ALBIFLORA	200	200	100	100	100	100
AREA 6	ALBIFLORA	200	200	100	100	100	100
AREA 7	ALBIFLORA	200	200	100	100	100	100
AREA 8	ALBIFLORA	200	200	100	100	100	100
AREA 9	ALBIFLORA	200	200	100	100	100	100
AREA 10	ALBIFLORA	200	200	100	100	100	100

NOTE B: PLANT PERSONNEL SHALL PLUG PIPES WITH CONCRETE WHEN WATER IN ASH DISPOSAL AREA REACHES ELEVATION NOTED BELOW: PIPE (INVERT EL) POOL ELEVATION

624.5	627.5
624.0	630.5

NOT FOR CONSTRUCTION

FIELD TO GRADE AROUND THE INLET END AND SKIMMER FOR PIPE NUMBER 10 SO THAT IT WILL BE CONSTRUCTED ON THE EXTENSION OF THE 2:1 SLOPE FROM THE RAISED DIKE SECTION DOWN INTO THE INITIAL ROLLED EARTH FILL (SECTION L-L).

- 1) 34'-36" CM PIPE, 14 GAGE INVERT EL 620 LEVEL (SEE NOTE B)
- 2) 74'-36" CM PIPE, 14 GAGE INVERT EL 623 LEVEL (SEE NOTE B)
- 3) 62'-36" CM PIPE, 14 GAGE INVERT EL 626 LEVEL (SEE NOTE B)
- 4) 50'-36" CM PIPE, 14 GAGE INVERT EL 629 LEVEL

50% SCRUBBER DISPOSAL AREA STORAGE CAPACITY EL 622 LEVEL 4,400,000 CY EL 632 LEVEL 5,990,000 CY DUMPED RIPRAP AT EACH END BY FIELD. SEE ION7429

OUTFALL AREA .019 WETLANDS AREA

Scale: 1" = 200'

PRINTS RECORD

NO.	DATE	BY	CHKD.	APPD.
1				
2				
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4				
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11				
12				

W.O. 82-31635 P.A. 2844

OPEN REVISION

NO.	DATE	BY	CHKD.	APPD.
1				
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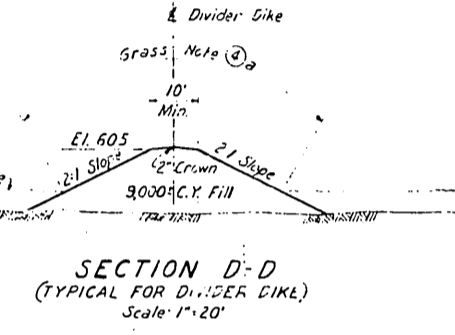
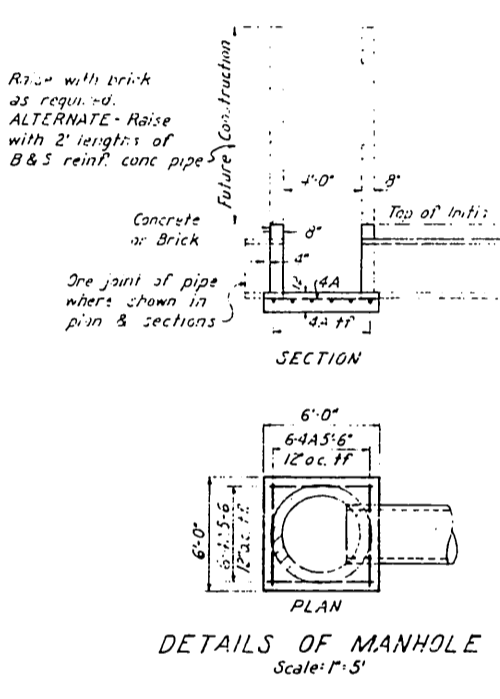
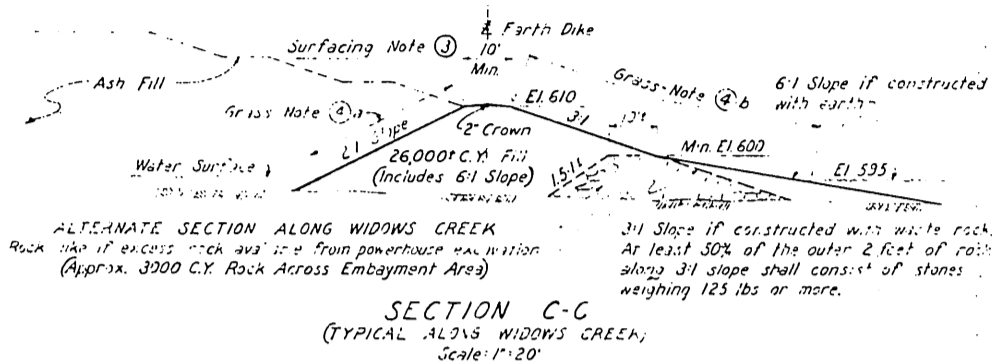
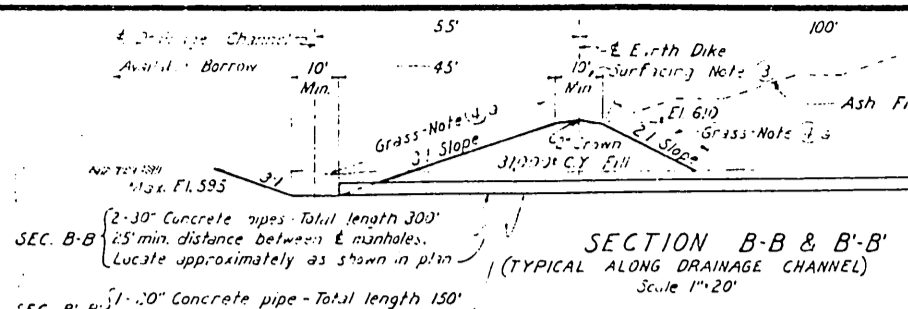
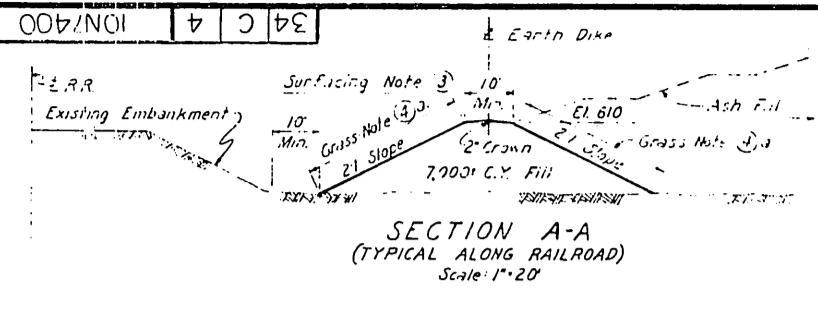
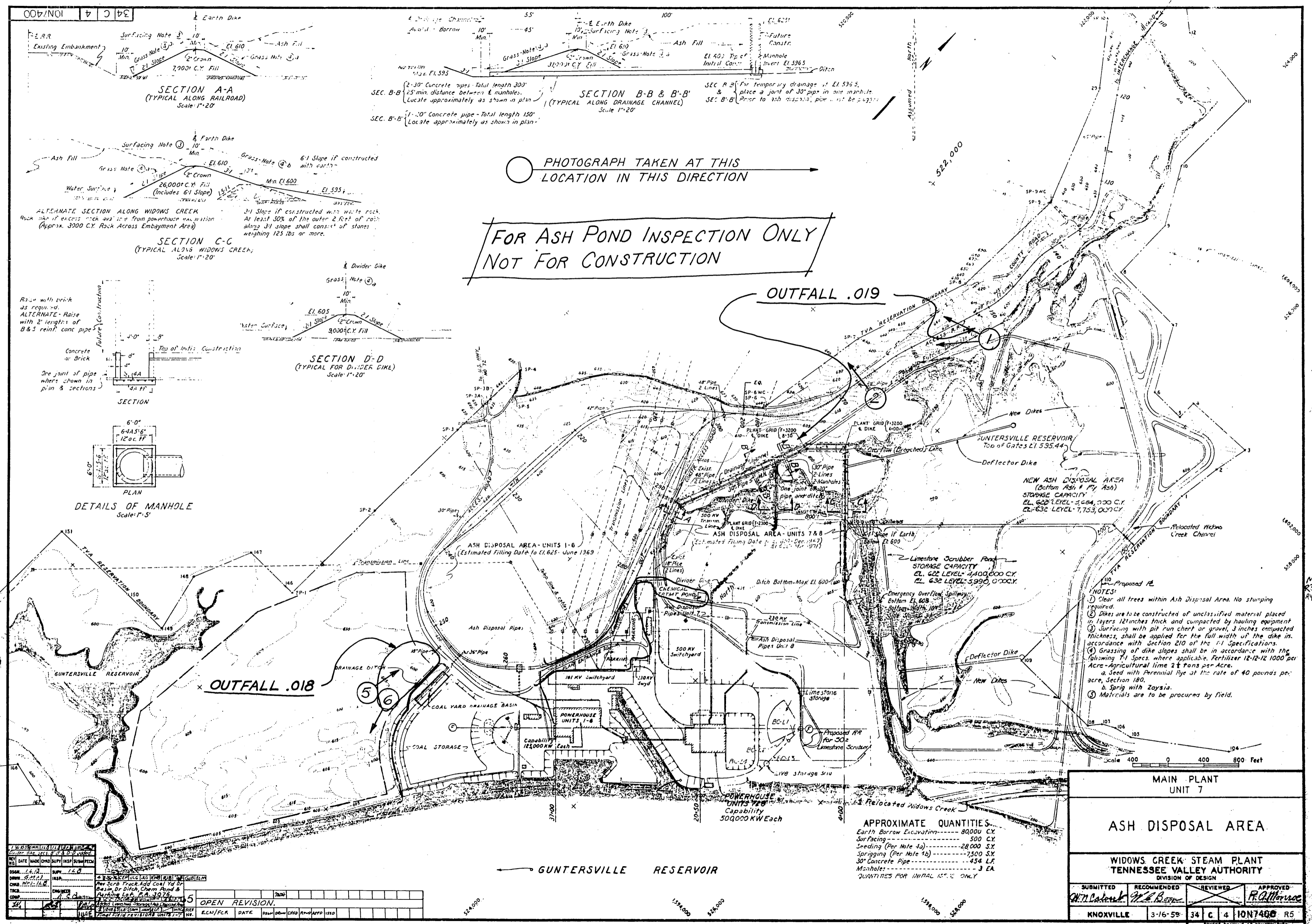
YARD

LIMESTONE & ASH DISPOSAL AREA PLAN - SHEET I

WIDOWS CREEK STEAM PLANT TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN

SUBMITTED: [Signature] RECOMMENDED: [Signature] APPROVED: [Signature]

KNOXVILLE 2-15-73 34 C 4 ION7420 R12



PHOTOGRAPH TAKEN AT THIS LOCATION IN THIS DIRECTION

FOR ASH POND INSPECTION ONLY
NOT FOR CONSTRUCTION

- NOTES:
- Clear all trees within Ash Disposal Area. No stumping required.
 - Dikes are to be constructed of unclassified material placed in layers 12 inches thick and compacted by hauling equipment.
 - Surfacing with pit run chert or gravel, 3 inches compacted thickness, shall be applied for the full width of the dike in accordance with Section 210 of the T-1 Specifications.
 - Grassing of dike slopes shall be in accordance with the following T-1 Specs where applicable. Fertilizer 12-12-12 1000 per Acre - Agricultural lime 2 tons per Acre.
 - a. Seed with Perennial Ryegrass at the rate of 40 pounds per acre, Section 180.
 - b. Sprig with Zoysia.
 - Materials are to be procured by field.

APPROXIMATE QUANTITIES

Earth Borrow Excavation	80000 CY
Surfacing	500 CY
Seeding (Per Note 4a)	28000 SY
Sprigging (Per Note 4b)	7500 SY
30" Concrete Pipe	454 LF
Manholes	3 EA

QUANTITIES FOR INITIAL 100% ONLY

MAIN PLANT UNIT 7

ASH DISPOSAL AREA

WIDDOWS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF DESIGN

SUBMITTED	RECOMMENDED	DESIGNED	APPROVED
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
KNOXVILLE	3-16-59	34 C 4 10N7400	R5

RECORD DRAWING AS CONSTRUCTED
4-16-61 3-26-60

NO.	DATE	BY	CHKD.	REVISION
1	10/17/40			
2				
3				
4				
5				OPEN REVISION.

ESTIMATED BORROW AVAILABLE	
POND	151,300 CY
POND 2	113,500 CY
POND 3	21,200 CY
TOTAL	286,000 CY

BORROW QUANTITIES SHOWN WERE OBTAINED BY CALCULATING "IN PLACE FILL VOLUME FROM THE DIKE X-SECTION AND INCREASING THIS BY 20% TO ALLOW FOR WASTE AND SHRINKAGE (FROM "INSITU" DENSITIES TO "COMPACTED FILL" DENSITIES). FOUNDATION PREPARATION QUANTITIES WERE CALCULATED ASSUMING AN AVERAGE OF 12" OF SOFT MATERIAL AND SOD WOULD BE REMOVED BEFORE PLACING DIKE FILL.

2. INITIAL DIKE X-SECTION SHOWING ORIGINAL GROUND AND X-SECTIONS AFTER FOUNDATION PREPARATION SHALL BE SUBMITTED TO FEP CIVILS. THESE SECTIONS WILL BE USED TO OBTAIN FINAL IN-PLACE FILL AND FOUNDATION PREPARATION VOLUMES.

3. CONSTRUCTION SHALL USE EXTREME CAUTION WHEN EXCAVATING BORROW FROM WITHIN THE LIMITS OF THE POND. THE BORROW CONTOURS REPRESENT ELEVATIONS AT LEAST 3 FEET ABOVE KNOWN ROCK ELEVATIONS. TO SATISFY PERMIT REQUIREMENTS THIS 3 FOOT LAYER OVER THE ROCK OR PREVIOUS SOILS MUST BE MAINTAINED TO SERVE AS A LAYER AFTER THE BORROW IS REMOVED FROM WITHIN THE POND. FINAL POND BOTTOM ELEVATIONS SHALL BE SUBMITTED TO FEP CIVILS. SOME GROUND TRUTHING WILL BE REQUIRED (UNDER THE DIRECTION OF CE) TO VERIFY THE 3 FOOT CLAY LINER.

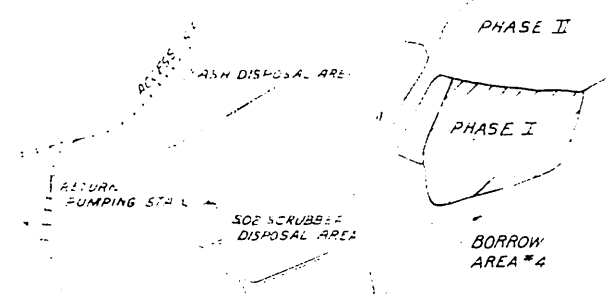
4. CLASSIFIED BORROW SHALL BE OBTAINED FROM WITHIN POND (AREAS 1, 2 & 3) AND IF NECESSARY FROM THE EXISTING BORROW.

AREAS SOUTH OF AND ADJACENT TO THE 500 KV TRANSMISSION LINE (AREA 4) UNCLASSIFIED BORROW SHALL BE OBTAINED FROM AREA 4.

5. ALL TOP SOIL OR UNSUITABLE SOIL SHALL BE STOCK PILED FOR FUTURE USE BY POWER TO ESTABLISH VEGETATION (COORDINATE LOCATION WITH PLAN).

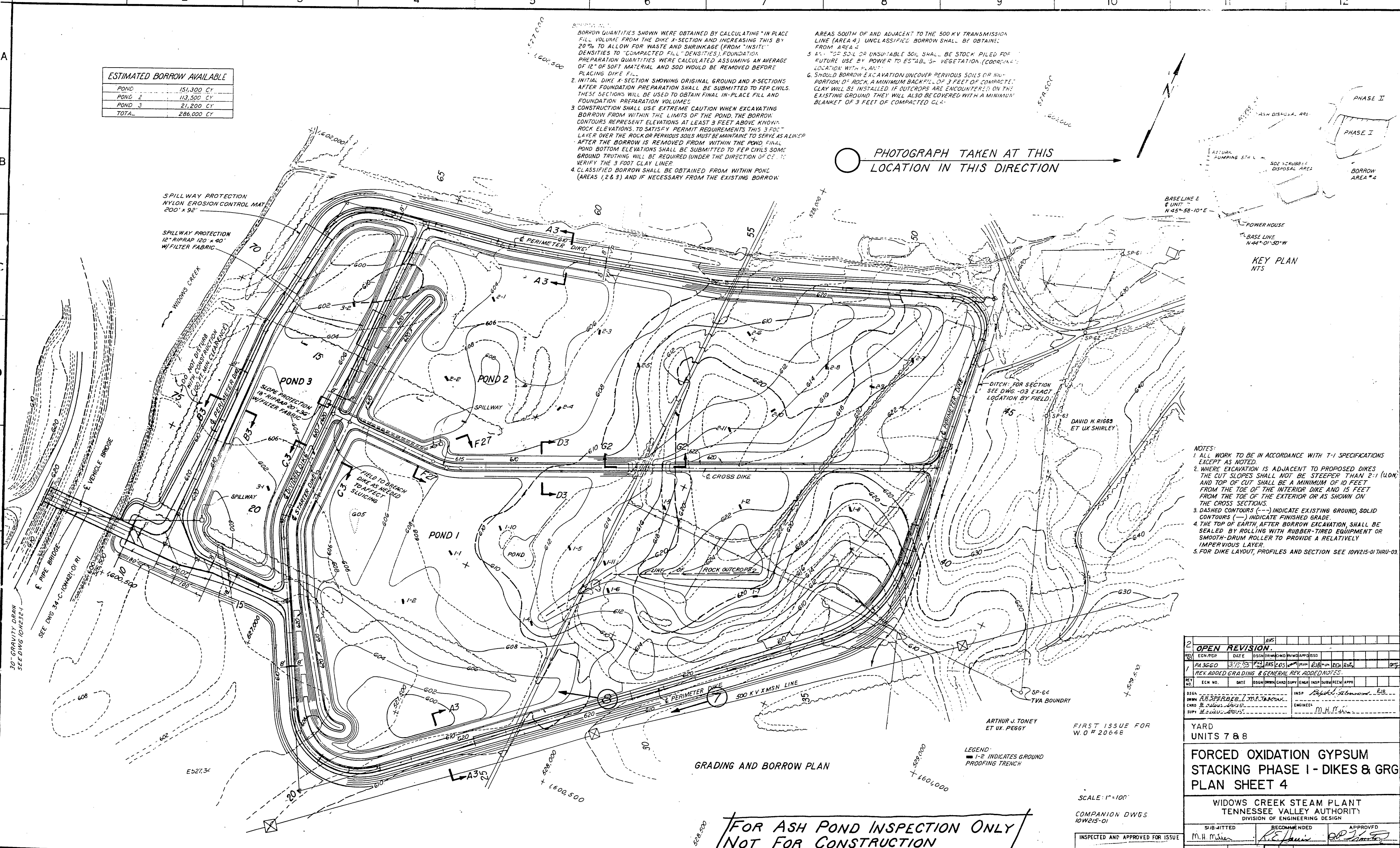
6. SHOULD BORROW EXCAVATION UNCOVER PREVIOUS SOILS OR REMEDIATION OF ROCK, A MINIMUM BACKFILL OF 3 FEET OF COMPACTED CLAY WILL BE INSTALLED IF OUTCROPS ARE ENCOUNTERED ON THE EXISTING GROUND THEY WILL ALSO BE COVERED WITH A MINIMUM BLANKET OF 3 FEET OF COMPACTED CLAY.

PHOTOGRAPH TAKEN AT THIS LOCATION IN THIS DIRECTION



NOTES:

1. ALL WORK TO BE IN ACCORDANCE WITH T-1 SPECIFICATIONS EXCEPT AS NOTED.
2. WHERE EXCAVATION IS ADJACENT TO PROPOSED DIKES THE CUT SLOPES SHALL NOT BE STEEPER THAN 2:1 (10:0) AND TOP OF CUT SHALL BE A MINIMUM OF 10 FEET FROM THE TOE OF THE INTERIOR DIKE AND 15 FEET FROM THE TOE OF THE EXTERIOR DIKE OR AS SHOWN ON THE CROSS SECTIONS.
3. DASHED CONTOURS (---) INDICATE EXISTING GROUND, SOLID CONTOURS (—) INDICATE FINISHED GRADE.
4. THE TOP OF EARTH, AFTER BORROW EXCAVATION, SHALL BE SEALED BY ROLLING WITH RUBBER-TIRED EQUIPMENT OR SMOOTH-DRUM ROLLER TO PROVIDE A RELATIVELY IMPERVIOUS LAYER.
5. FOR DIKE LAYOUT, PROFILES AND SECTION SEE 10W215-01 THRU-03.



GRADING AND BORROW PLAN

LEGEND:
1-2 INDICATES GROUND PROOFING TRENCH

FOR ASH POND INSPECTION ONLY
NOT FOR CONSTRUCTION

SCALE: 1"=100'

COMPANION DWGS 10W215-01

INSPECTED AND APPROVED FOR ISSUE
DESIGN PROJECT MANAGER

OPEN REVISION	
NO.	DESCRIPTION
1	REV. ADDED GRADING & GENERAL REV. ADDED NOTES.

YARD UNITS 7 & 8
FORCED OXIDATION GYPSUM STACKING PHASE I - DIKES & GRG PLAN SHEET 4

WIDOWS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

SUBMITTED: M.H. Miller
RECOMMENDED: R.E. [Signature]
APPROVED: [Signature]

PRINTS REQUIRED:
BR OF PROJ
DWG SIZE
1 1/2
ME
CE
AD
CD
ED
MD
SD
SW
BL
PA

TENNESSEE VALLEY AUTHORITY

OFFICE OF POWER

POWER ENGINEERING
FOSSIL ENGINEERING PROJECT

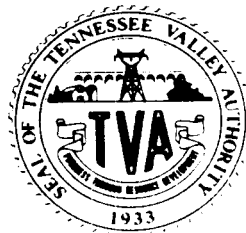
INSPECTION OF

WIDOWS CREEK FOSSIL PLANT

GYP SUM AND ASH DISPOSAL AREAS

JOINT PE&C-F&H PR
INSPECTION

INSPECTED: APRIL 5, 1988



FEP REPORT

TVA 10752 (OE-6-85)

TITLE WIDOWS CREEK FOSSIL PLANT - ALL UNITS - ANNUAL JOINT INSPECTION OF THE SOLID WASTE DISPOSAL AREAS BY THE DIVISION OF POWER ENGINEERING AND CONSTRUCTION AND THE DIVISION OF FOSSIL AND HYDRO POWER		REPORT NO. FEP-ASH-88-03	
		PLANT/UNIT WCF - ALL UNITS	
		SAR SECTIONS	
VENDOR	CONTRACT NO.	KEY NOUNS	
	REV	(FOR RIMS USE)	RIMS ACCESSION NUMBER
	R0		B65 '88 0505 001
APPLICABLE DESIGN DOCUMENTS	R1		
	R2		
REFERENCES	R3		
	R4		

TENNESSEE VALLEY AUTHORITY
OFFICE OF POWER
FOSSIL ENGINEERING PROJECT

	REVISION 0	R1	R2	R3	R4
DATE	MAY 05 1988				
PREPARED	<i>W.M. Martin</i>				
CHECKED					
REVIEWED	<i>K.W. Burnett</i>				
APPROVED	<i>A.E. Harris</i>				

cc: RIMS, SL26 C-K

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

B65 '88 0505 006

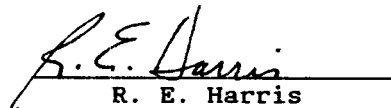
TO : Jerry L. Golden, Manager of Fossil Engineering, 8-197 SB-K

FROM : R. E. Harris, Civil Project Engineer, 7-198 SB-K

DATE : **MAY 05 1988**

SUBJECT: WIDOWS CREEK FOSSIL PLANT - ANNUAL POWER ENGINEERING AND CONSTRUCTION AND FOSSIL AND HYDRO POWER JOINT INSPECTION OF THE ASH DISPOSAL AREA AND WET GYPSUM STACK

Attached is the inspection report of the Widows Creek ash disposal areas and wet gypsum stack dated May 5, 1988 (B65 880505 001) performed on April 5, 1988. This report includes recommendations for corrective work. I concur with these recommendations.


R. E. Harris

REH:WMM:HLL
Attachment
cc (Attachment):
J. L. Golden, 8-197 SB-K

JLG:HLL - **MAY 05 1988**
cc (Attachment):
W. M. Bivens, 12-113 SB-K

WMB:HLL - **MAY 05 1988**
cc (Attachment):
RIMS, SL 26 C-K
Gene Farmer, 12-109 SB-K (3)
Paul Wade, LP 3S 58K-C (5)

This was prepared principally by W. M. Martin, extension 4346.

2499f



EXECUTIVE SUMMARY

On April 5, 1988, the annual joint inspection of the ash disposal areas was conducted by representatives of PE and F&H PR. This was a visual inspection to appraise the general condition of the ash disposal areas and their associated dikes. The action taken on recommendations of the last inspection was evaluated and additional recommendations for corrective work are made.

1.0 General

- 1.1 The annual joint inspection of the ash and gypsum disposal areas was conducted on April 5, 1988. The weather was warm and dry.
- 1.2 The following personnel were present.

D. R. Galloway, PE-FEP-Knoxville
W. M. Martin, PE-FEP-Knoxville
J. T. Weatherford, PE-FEP-Knoxville
G. L. Massey, F&H PR-Chattanooga
Randall Hoodenpyl, Power Plant Results Supervisor-Widows Creek
D. J. Clifford, F&H PR-Chattanooga
W. V. Lord, Jr., F&H PR-Chattanooga
- 1.3 The last joint annual inspection was made April 8, 1987 (Report B65 870427 001).
- 1.4 The first joint annual inspection was July 26, 1967, memorandum from W. N. Calvert to W. O. Boop dated September 15, 1967.
- 1.5 The areas inspected are designated on drawings 10N7400, 10N7420, 107645.01, and 10W215-4.
- 1.6 This was a visual inspection made to check the condition of the various dikes for stability, possible damp spots or obvious leaks, vegetative cover, condition of spillways, roadway surface and other general conditions.
- 1.7 A meeting was held before and after the field inspections with the plant manager and assistant, Carl McLaughlin and Walter Muirhead respectively to discuss the two seepage areas from the limestone scrubber pond and the ash pond. The plant had us inspect both areas in the past year.

2.0 CONDITION OF DIKES AND CHANGES SINCE LAST INSPECTION FOR ASH AND LIMESTONE SCRUBBER WASTE PONDS FOR ALL UNITS The Waste areas are shown on drawings 10W7465N01, 10N7400 and 10N7420.

- 2.1 The redwater seepage, which begins in the access road ditch south of the copper pond (Drawing 10W7465-01) and continues west and north, appears to be about the same as reported last year.
- 2.2 This redwater flows to out fall 019, a retention pond which will be pumped to the ash pond. (Pictures 1 and 2).
- 2.3 The perimeter and interior dikes around the ash ponds, the limestone scrubber pond, and the stilling pond are in a dry and stable condition.
- 2.4 The roadway surface on all dikes is in satisfactory condition. (Picture 3). However, the crushed stone surface should be reshaped occasionally with a patrol grader.
- 2.5 Only a very few small trees remain on the dike slopes, most have been removed through the plants removal program. It is recommended that the plant try pulling the trees, roots and all in the future.

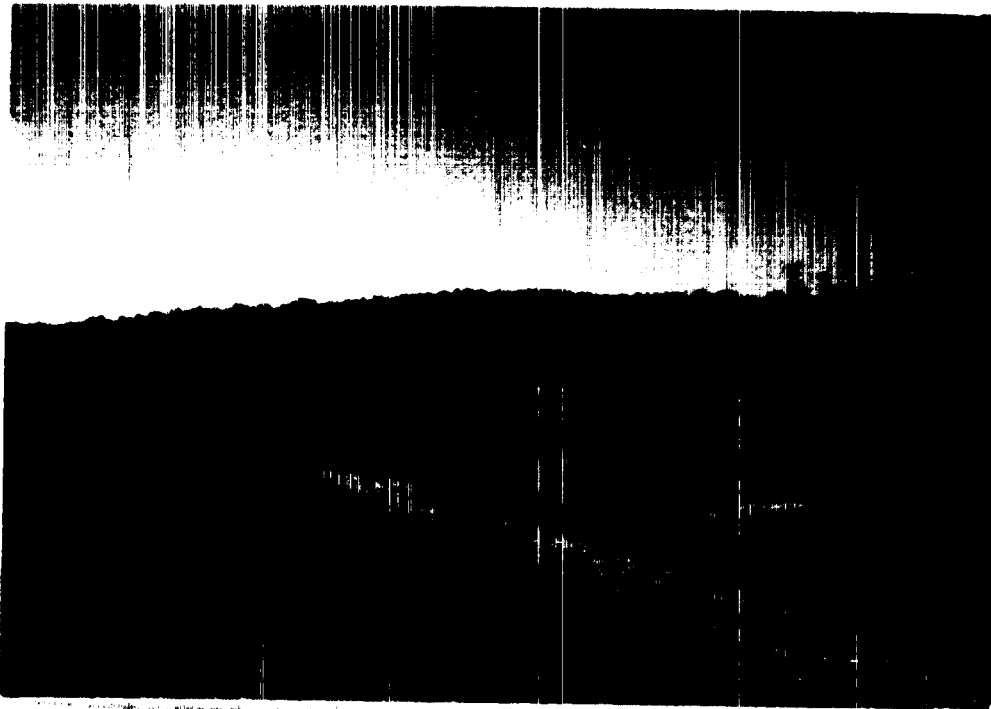
- 2.6 Lush grass cover has been established on all dike slopes and the slopes are in good condition. (See Picture 3).
- 2.7 The plant raised the ash pond spillway elevations by four feet, as recommended in past reports, in order to force ash pond water into the limestone scrubber pond to provide additional water for the gypsum sluicing system.
- 2.8 After the plant raised the ash pond water level by 4 feet, they noticed seepage in the ditch near the unit 7 and 8 sluice line bridge over the limestone haul road. They requested F&H PR in Chattanooga and PE in Knoxville to make a field inspection. It was recommended at the time of the field inspection for the plant to monitor the flow in the ditch. They have found the flows remain fairly constant. This flow is routed to the limestone stack runoff pond for treatment by mixing. (See picture 4).
- 2.9 In the fall of 1987, the plant noticed several seepage points along the toe of the dike along relocated Widows Creek from about 400 feet north of the bridge to about 2,000 feet south (down creek) from the bridge. The plant asked us and F&H PR in Chattanooga to field inspect this seepage and consider possible solutions to the seepage. At this meeting, we suggested a subsurface investigation program by drilling. F&H PR in Chattanooga asked us to prepare a drilling proposal within three weeks to aid in the studies for a solution. Several possible solutions were discussed at this meeting and F&H PR in Chattanooga agreed to prepare a list of the most desirable possible solutions for more detailed studies and cost estimates.

3.0 CHANGES IN POND OPERATION SINCE THE LAST INSPECTION

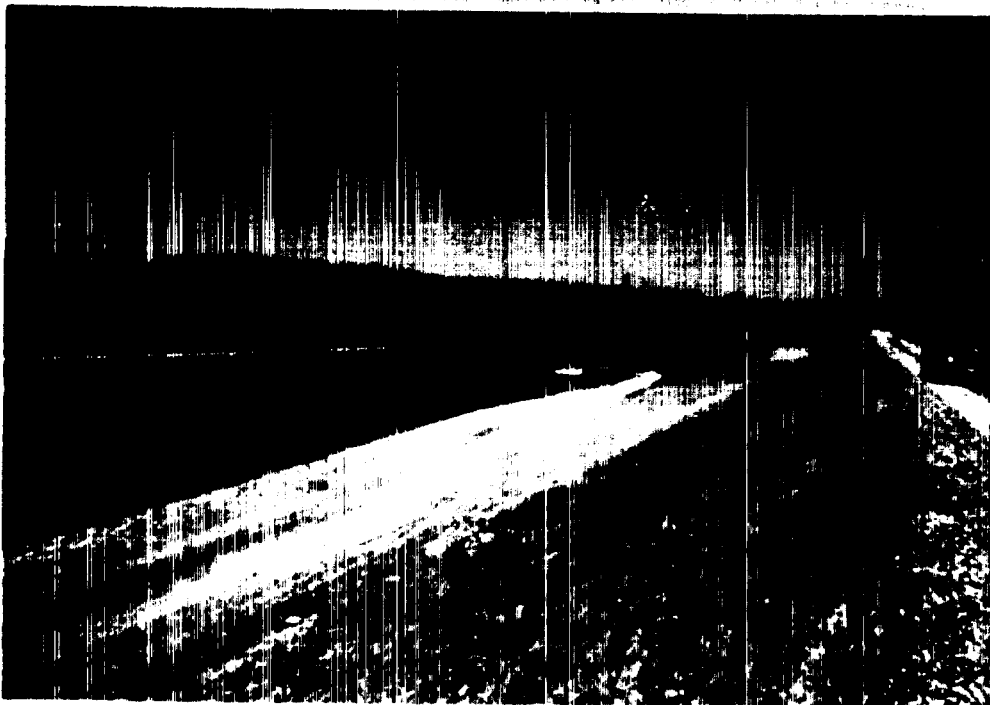
- 3.1 There has been no change in the pond operation since the last inspection. All ash (units 1 through 8) is sluiced into the units 7 and 8 area. The water flow meanders through the ash pond area and around the deflector dike where it flows out of the ash pond area through the five primary standard spillways with skimmers into the pumping station pond. During normal operations, the water is pumped into the intake channel. When pumps are not operating, water is discharged through the overflow pipes into the original Widows Creek channel and into Gunter'sville reservoir.

- 4.0 CHANGES SINCE THE LAST INSPECTION FOR ASH DISPOSAL AREA - UNITS 1 THROUGH 6 (see drawing 10N7400)
- 4.1 This retired disposal site was not inspected, since the outfall drainage ditches for storm water from this area pass through the wetlands developed for outfall .018 and the retention pond pump system for .019.
- 5.0 CONDITIONS OF DIKES AND CHANGES SINCE THE LAST INSPECTION FOR THE GYPSUM STACK
- 5.1 Construction was completed for this area in the fall of 1985 and the pond was turned over to the plant for sluicing of gypsum early in 1986. (References B65 860208 001).
- 5.2 The perimeter dikes were found to be in stable condition, the roadways are surfaced and the dike slopes have a lush ground cover of grass. (Picture 9).
- 5.3 The gravity drain is functioning properly.
- 6.0 CONDITION OF THE SPILLWAY DISCHARGE STRUCTURES AND SKIMMERS
- 6.1 Ash Pond for Units 1 through 6 The spillway structures are no longer active at this site.
- 6.2 Ash and Stilling Ponds for All Units The spillway and discharge structures with skimmers serving this area are in good operating condition. The plant has constructed walk bridges to each spillway for ease of monitoring the discharge. It was observed that some leakage is occurring between the weir ring and the 48-inch concrete riser pipe section. The plant was already aware of this and has proposed actions to correct it.
- 6.3 Gypsum Area Ponds The spillway and discharge structures with skimmers are in good working order.
- 7.0 ACTIONS ON RECOMMENDATIONS OF LAST INSPECTION
- 7.1 As recommended, the plant did monitor the dikes after raising the water level 4 feet in the ash pond and limestone pond.
- 8.0 RECOMMENDATIONS
- 8.1 Plant personnel should continue to monitor the exterior dike slopes for possible increased seepage. If there is any significant change in seepage, please notify F&H PR in Chattanooga and PE&C in Knoxville.
- 8.2 All bushes, trees, and/or vines should be removed from the dike slopes by attaching a cable or chain and then pulling out such as to remove the root system.

WIDOWS CREEK STEAM PLANT
APRIL 1988

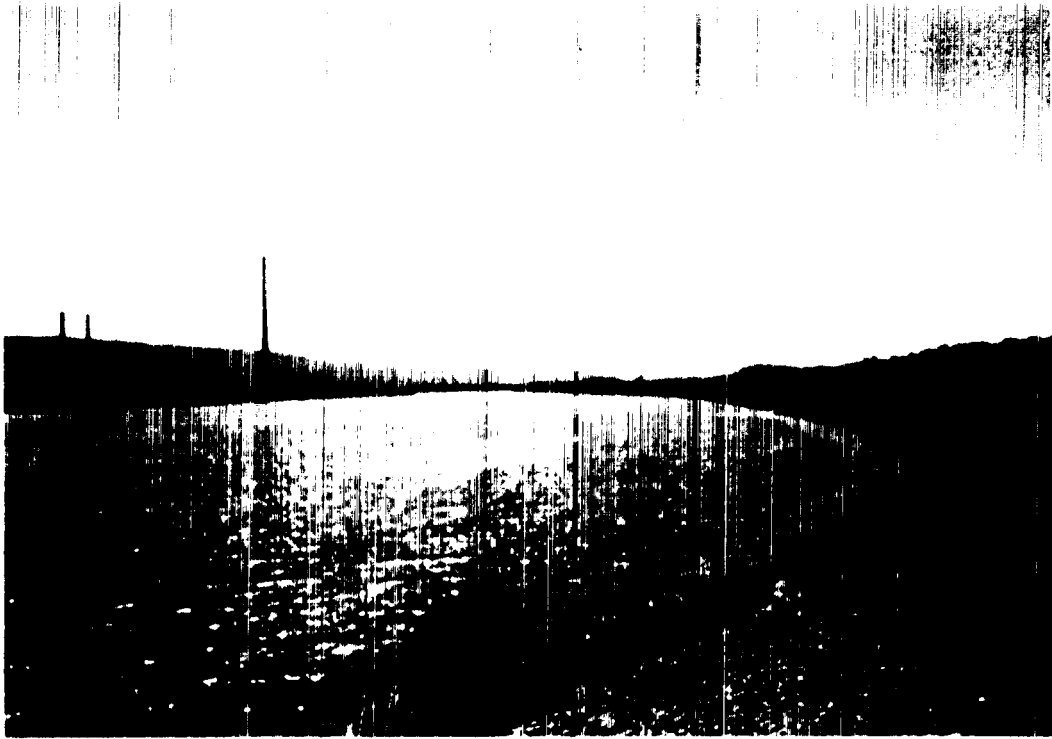


① REDWATER POND DIKE FOR OUTFALL .019



② REDWATER POND PUMP STATION FOR
OUTFALL .019 . ALSO ACCESS RAMP
FROM DIKE @ EL 626 .

WIDOWS CREEK STEAM PLANT
APRIL 1988



3 NORTH DIKE OPPOSIT OUTFALL .019 POND,
NOTE PUMP DISCHARGE PIPE FROM .019 POND.



4 REDWATER AT UNITS 7 & 8 ASH PIPE BRIDGE.

WIDOWS CREEK STEAM PLANT
APRIL 1988



5 LOOKING SOUTH FROM
BRIDGE OVER RELOCATED
WIDOWS CREEK AT REDWATER
SEEPS.

WIDOWS CREEK STEAM PLANT
APRIL 1988



6 LOOKING NORTH FROM BRIDGE OVER
RELOCATED WIDOWS CREEK AT REDWATER
SEEPS AND ROCK OUTCROPS.



7 REDWATER SEEPS SOUTH OF BRIDGE.

WIDOWS CREEK STEAM PLANT
APRIL 1988

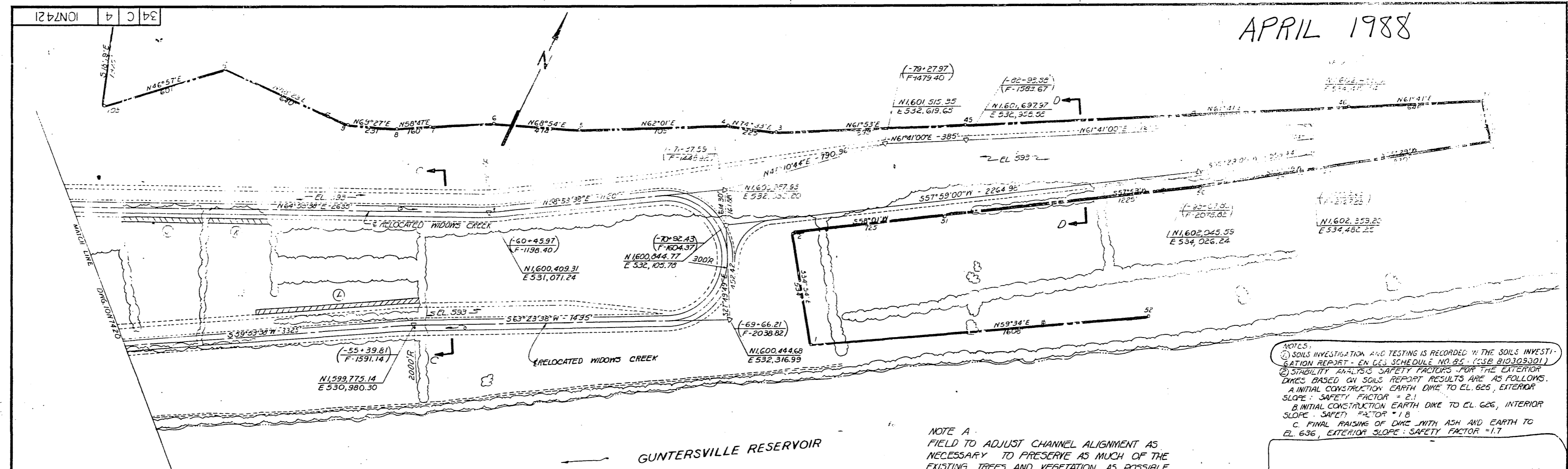


8 REDWATER SEEPS SOUTH OF BRIDGE.



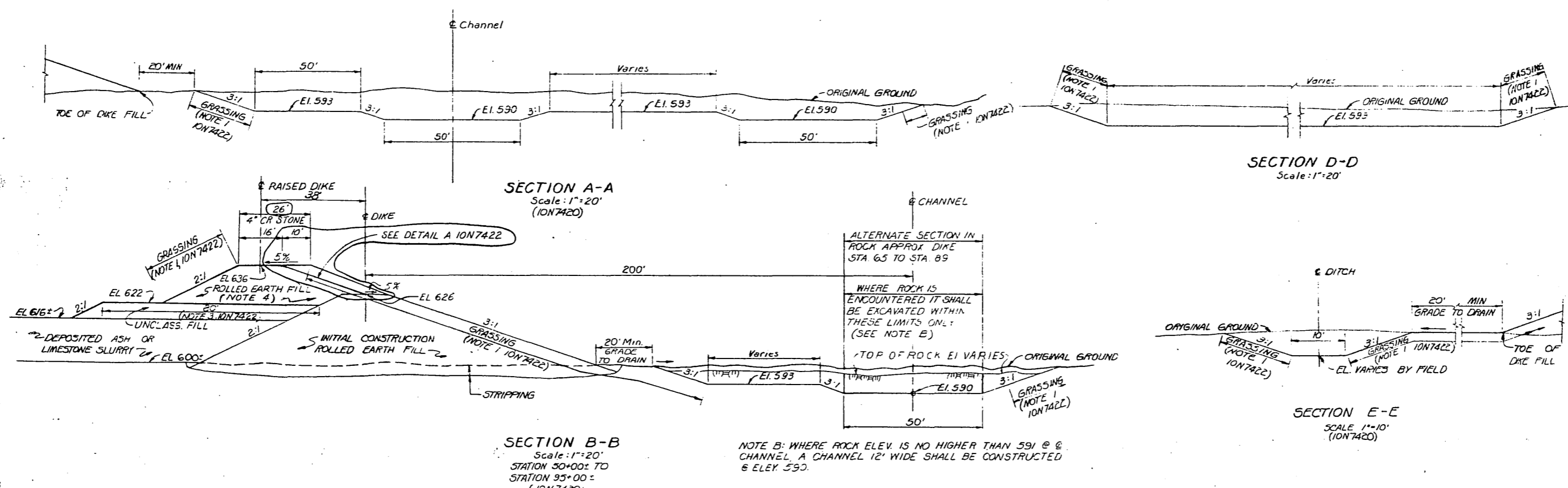
9 NORTH DIKE SCRUBBER POND LOOKING WEST

APRIL 1988



NOTES:
 1. SOILS INVESTIGATION AND TESTING IS RECORDED IN THE SOILS INVESTIGATION REPORT - EN 623 SCHEDULE NO. 95 (SSB 810309301)
 2. STABILITY ANALYSIS SAFETY FACTORS FOR THE EXTERIOR DIKES BASED ON SOILS REPORT RESULTS ARE AS FOLLOWS:
 A. INITIAL CONSTRUCTION EARTH DIKE TO EL. 625, EXTERIOR SLOPE SAFETY FACTOR = 2.1
 B. INITIAL CONSTRUCTION EARTH DIKE TO EL. 626, INTERIOR SLOPE SAFETY FACTOR = 1.8
 C. FINAL RAISING OF DIKE WITH ASH AND EARTH TO EL. 636, EXTERIOR SLOPE SAFETY FACTOR = 1.7
 3. ALL DIKE CONSTRUCTION SHALL BE IN ACCORDANCE WITH GENERAL CONSTRUCTION SPECIFICATION NO. 5-5 FOR ROLLED EARTH-FILL FOR DAMS AND POWER PLANTS. EARTH-FILL COMPACTION SHALL BE AT LEAST 95% OF THE STANDARD MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-698 PROCEDURE. MOISTURE CONTENT OF THE EARTH-FILL SHALL BE WITHIN +3% OF THE OPTIMUM, AS DETERMINED BY THE SINGLETON MATERIALS ENGINEERING LABORATORY (SME)

NOTE A:
 FIELD TO ADJUST CHANNEL ALIGNMENT AS NECESSARY TO PRESERVE AS MUCH OF THE EXISTING TREES AND VEGETATION AS POSSIBLE.

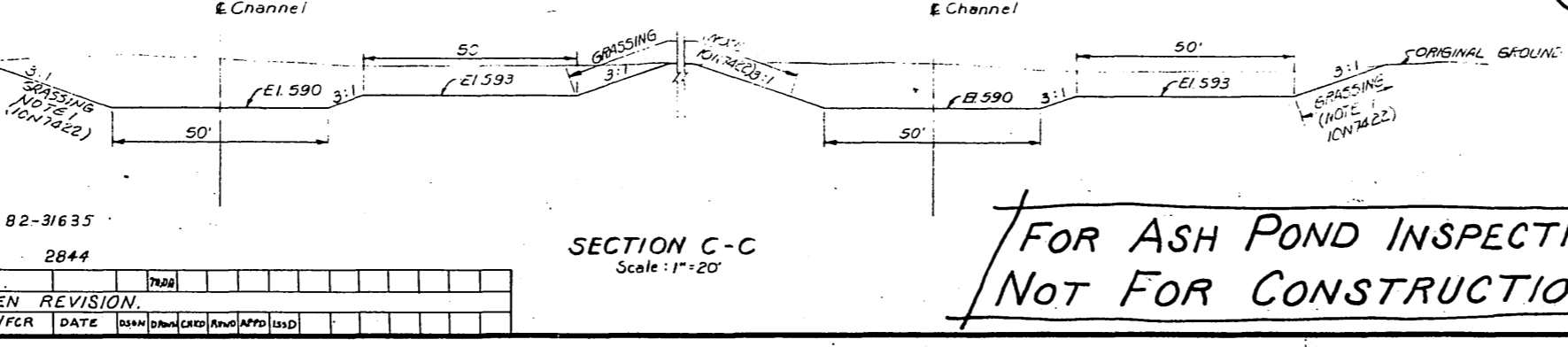


4. ALL OTHER CONSTRUCTION SHALL BE IN ACCORDANCE WITH HIGHWAY SPECIFICATIONS NO. T-1
 5. CUT SLOPES ADJACENT TO EXISTING OR PROPOSED DIKES SHALL NOT BE EXCAVATED STEEPER THAN 3:1 AND TOP OF CUT SHALL BE A MINIMUM OF 20' FROM THE TOE OF ANY DIKE.
 6. WHEN CONNECTING THE ENDS OF THE NEW DIKE TO THE OLD DIKE, EXTREME CARE SHALL BE USED TO INSURE AN IMPERVIOUS AND STABLE CONNECTION. THE EXISTING DIKE SHALL BE STRIPPED OF ALL VEGETATION, BENCHED, SCARPED TO A MINIMUM DEPTH OF 6" AND COMPACTED 50% AS TO FORM A BOND WITH THE NEW FILL. DUE TO THE STEEP SIDE SLOPES OF THE EXISTING DIKES, THE UTMOST CAUTION SHALL BE USED IN BENCHING THE EXISTING DIKE SLOPES SO AS NOT TO CREATE AN UNSTABLE CONDITION. SMALL BENCHES OF MINIMUM DEPTH SHALL BE USED.
 7. COORDINATES OF P'S ARE GIVEN IN PLANT COORDINATES (P-3200) AND ALABAMA STATE COORDINATES (P-3200).
 ALABAMA STATE COORDINATES WERE COMPUTED FROM THE ORIGINAL COORDINATES OF THE INTERSECTION OF THE BASE LINES OF UNIT 7 AS GIVEN IN 1958.
 8. RIPRAP - RIPRAP SHALL BE PLACED AT LOCATIONS AS SHOWN ON DRAWINGS. THE STONE SHALL BE WELL GRADED AND CONSIST OF SOUND, DURABLE STONE PER SECTION 830 OF THE T-1 SPECIFICATIONS. THE RIPRAP SHALL BE A MINIMUM OF 2" THICK WITH AT LEAST 50% BY WEIGHT, BEING 200 LBS. OR MORE AND WITH THE MAXIMUM WEIGHT 2 TIMES THE 50% WEIGHT AND NOT MORE THAN 5% PASSING THE 1" SIEVE.
 9. FILTER - THE FILTER BLANKET SHALL BE 8" THICK AND IN ACCORDANCE WITH SECTION 836 OF THE T-1 SPECIFICATIONS.

PHOTOGRAPH TAKEN AT THIS LOCATION IN THIS DIRECTION

FOR ASH POND INSPECTION ONLY
 NOT FOR CONSTRUCTION

PRINTS	ADD-R	5
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DIVISION OF FOREST FISHERIES & WILDLIFE DEVELOPMENT
 J. M. Helton
 COMPANION DWGS.: 10N7420, 7422, 7423, 7424, 7425
 INSPECTED AND APPROVED FOR ISSUE - 23
 15 APR 1988
 DESIGN PROJECT MANAGER

YARD
 LIMESTONE & ASH DISPOSAL AREA
 PLAN - SHEET 2

WIDOWS CREEK STEAM PLANT
 TENNESSEE VALLEY AUTHORITY
 DIVISION OF ENGINEERING DESIGN

SUBMITTED: J. M. Helton
 RECOMMENDED: J. M. Helton
 APPROVED: J. M. Helton

NO. 34 C 4
 10N7421 RT

34 C 4 ION7420

PHOTOGRAPH TAKEN AT THIS LOCATION IN THIS DIRECTION
APRIL 1988

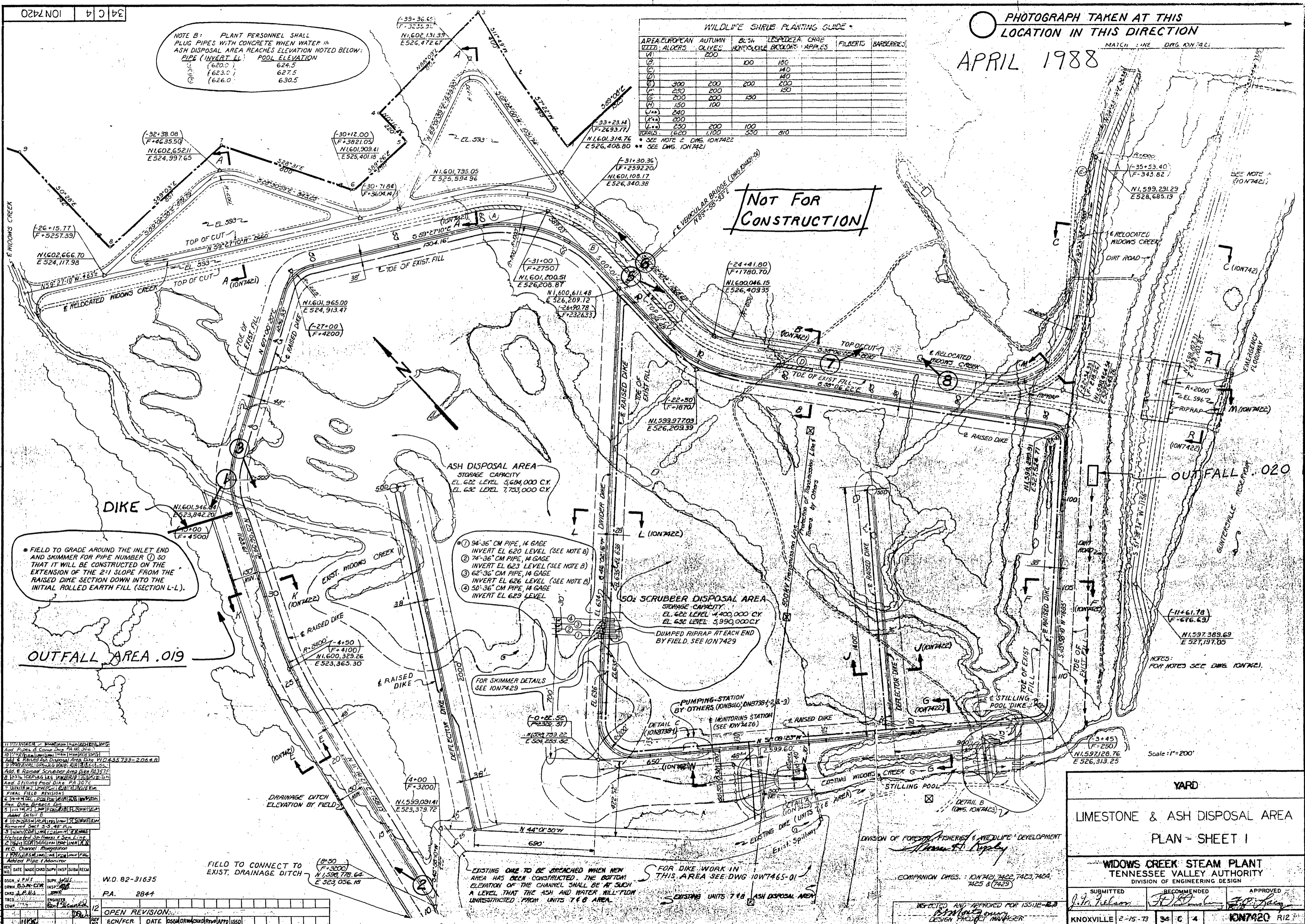
WILDLIFE SHRUB PLANTING GUIDE

AREA	EUROPEAN WILDS	AUTUMN OLIVES	BUSH HONEYUCKLE	LESPEDEZA BRACKENS	GRAPE APPLES	FILBERTS	BARBERIES
(1)	200	100	150				
(2)	300	200	200	200			
(3)	200	200	150	150			
(4)	100	100	150	150			
(5)	200	200	100	100			
(6)	200	200	100	100			
TOTALS	1620	1100	550	470			

NOTE B: PLANT PERSONNEL SHALL PLUG PIPES WITH CONCRETE WHEN WATER IN ASH DISPOSAL AREA REACHES ELEVATION NOTED BELOW:

PIPE (INVERT EL.)	POOL ELEVATION
(620.0)	624.5
(623.0)	627.5
(626.0)	630.5

NOT FOR CONSTRUCTION



FIELD TO GRADE AROUND THE INLET END AND SKIMMER FOR PIPE NUMBER O SO THAT IT WILL BE CONSTRUCTED ON THE EXTENSION OF THE 2:1 SLOPE FROM THE RAISED DIKE SECTION DOWN INTO THE INITIAL ROLLED EARTH FILL (SECTION L-L).

- ① 94" 36" CM PIPE, 14 GAGE INVERT EL 620 LEVEL (SEE NOTE B)
- ② 74" 36" CM PIPE, 14 GAGE INVERT EL 623 LEVEL (SEE NOTE B)
- ③ 62" 36" CM PIPE, 14 GAGE INVERT EL 626 LEVEL (SEE NOTE B)
- ④ 50" 36" CM PIPE, 14 GAGE INVERT EL 625 LEVEL

PRINTS READ-R-2

NO.	DATE	BY	REVISION
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W.D. 82-31635
P.A. 2844

OPEN REVISION

ECN/FCR	DATE	ISSUED BY	APPROVED BY

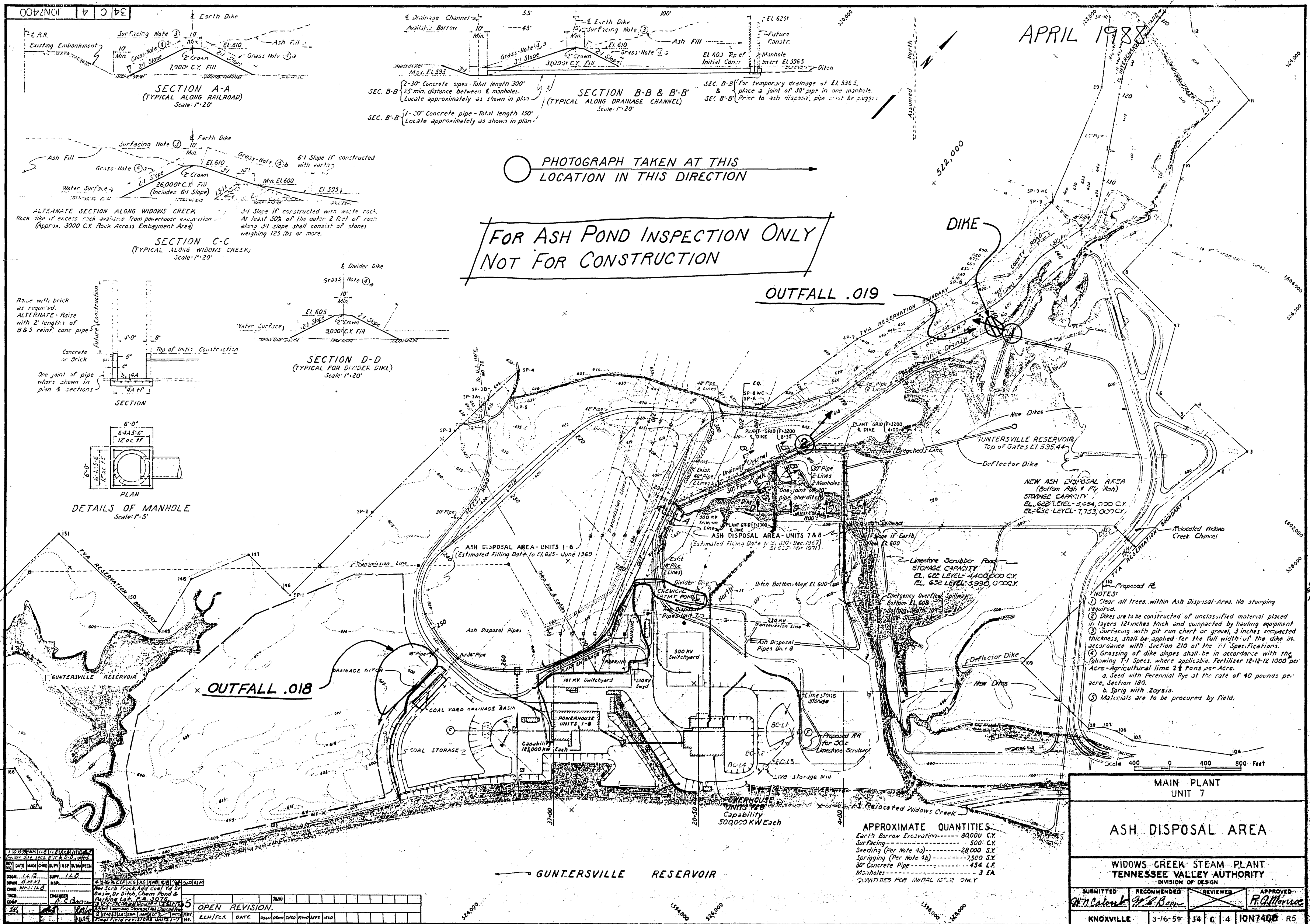
YARD

LIMESTONE & ASH DISPOSAL AREA
PLAN - SHEET I

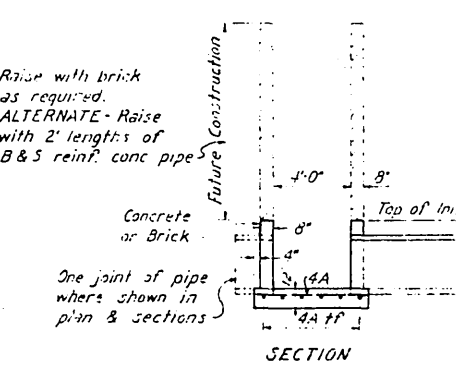
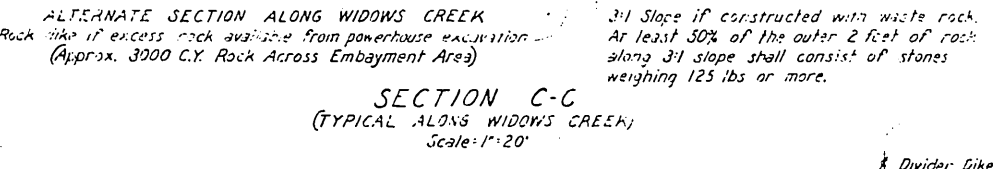
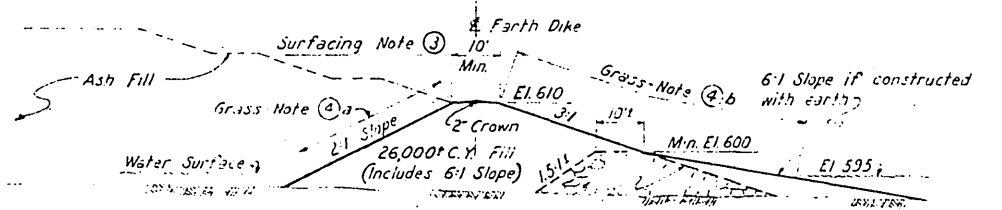
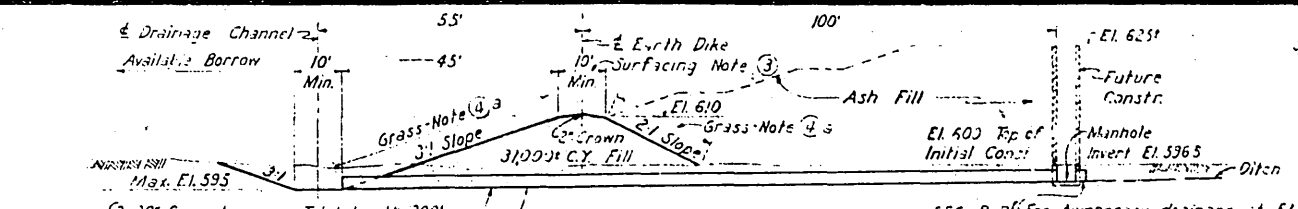
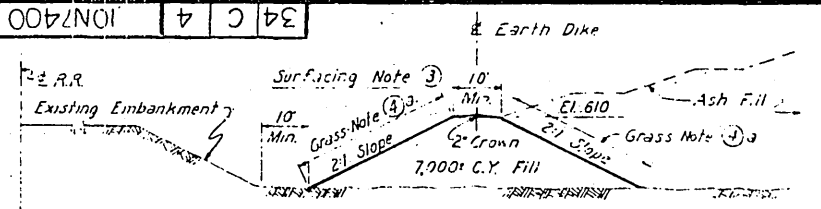
WIDOWS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF ENGINEERING DESIGN

SUBMITTED: J. H. Nelson
RECOMMENDED: R. D. ...
APPROVED: J. H. Nelson

KNOXVILLE 2-75-73 34 C 4 ION7420 R12



APRIL 1988



PHOTOGRAPH TAKEN AT THIS LOCATION IN THIS DIRECTION

FOR ASH POND INSPECTION ONLY
NOT FOR CONSTRUCTION

OUTFALL .019

DIKE

NEW ASH DISPOSAL AREA
(Bottom Ash & Fly Ash)
STORAGE CAPACITY
EL. 622 LEVEL - 5,084,000 C.Y.
EL. 632 LEVEL - 7,753,000 C.Y.

- NOTES:
- Clear all trees within Ash Disposal Area. No stumping required.
 - Dikes are to be constructed of unclassified material placed in layers 12 inches thick and compacted by hauling equipment.
 - Surfacing with pit run chert or gravel, 3 inches compacted thickness, shall be applied for the full width of the dike in accordance with section 210 of the T-1 Specifications.
 - Grassing of dike slopes shall be in accordance with the following T-1 Specs. where applicable: Fertilizer 12-12-12 1000 per Acre - Agricultural lime 2 1/2 tons per Acre. a. Seed with Perennial Ryegrass at the rate of 40 pounds per acre, Section 180. b. Sprig with Zoysia.
 - Materials are to be procured by field.

APPROXIMATE QUANTITIES:
Earth Borrow Excavation - 80000 C.Y.
Surfacing - 500 C.Y.
Seeding (Per Note 4a) - 28000 S.Y.
Sprigging (Per Note 4b) - 7500 S.Y.
30" Concrete Pipe - 434 L.F.
Manholes - 3 EA.
QUANTITIES FOR INITIAL 15% ONLY

NO.	DATE	BY	CHKD.	REVISION
1	10/1/87	J.M.P.	J.M.P.	ISSUE FOR PERMITS
2	10/1/87	J.M.P.	J.M.P.	ISSUE FOR CONSTRUCTION
3	10/1/87	J.M.P.	J.M.P.	ISSUE FOR ASH DISPOSAL
4	10/1/87	J.M.P.	J.M.P.	ISSUE FOR FINAL REVIEW
5	10/1/87	J.M.P.	J.M.P.	ISSUE FOR CONSTRUCTION

ECN	FLK	DATE	BY	CHKD.	REVISION

MAIN PLANT UNIT 7	
ASH DISPOSAL AREA	
WIDOWS CREEK STEAM PLANT TENNESSEE VALLEY AUTHORITY	
DIVISION OF DESIGN	
SUBMITTED W.M. Colburn	RECOMMENDED W.L. Brown
REVIEWED	APPROVED R. Allowance
KNOXVILLE	3-16-55
34 C 4 ION7400 R5	
RECORD DRAWING AS CONSTRUCTED	
4-18-61 9-25-60	

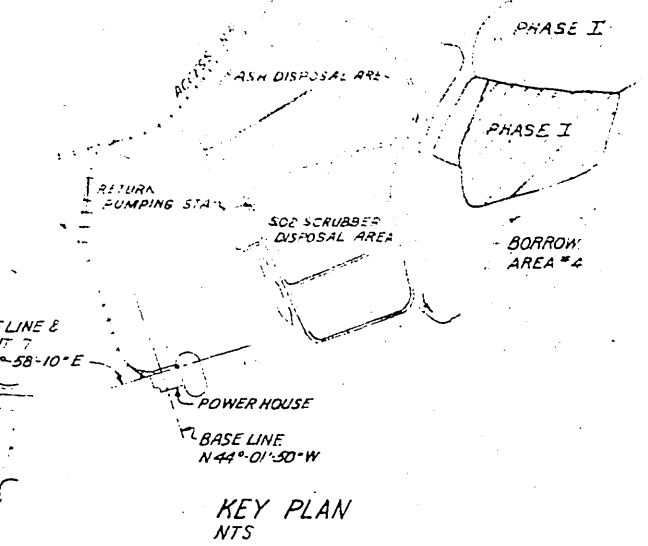
APRIL 1988

ESTIMATED BORROW AVAILABLE	
POND 1	151,300 CY
POND 2	113,500 CY
POND 3	21,200 CY
TOTAL	286,000 CY

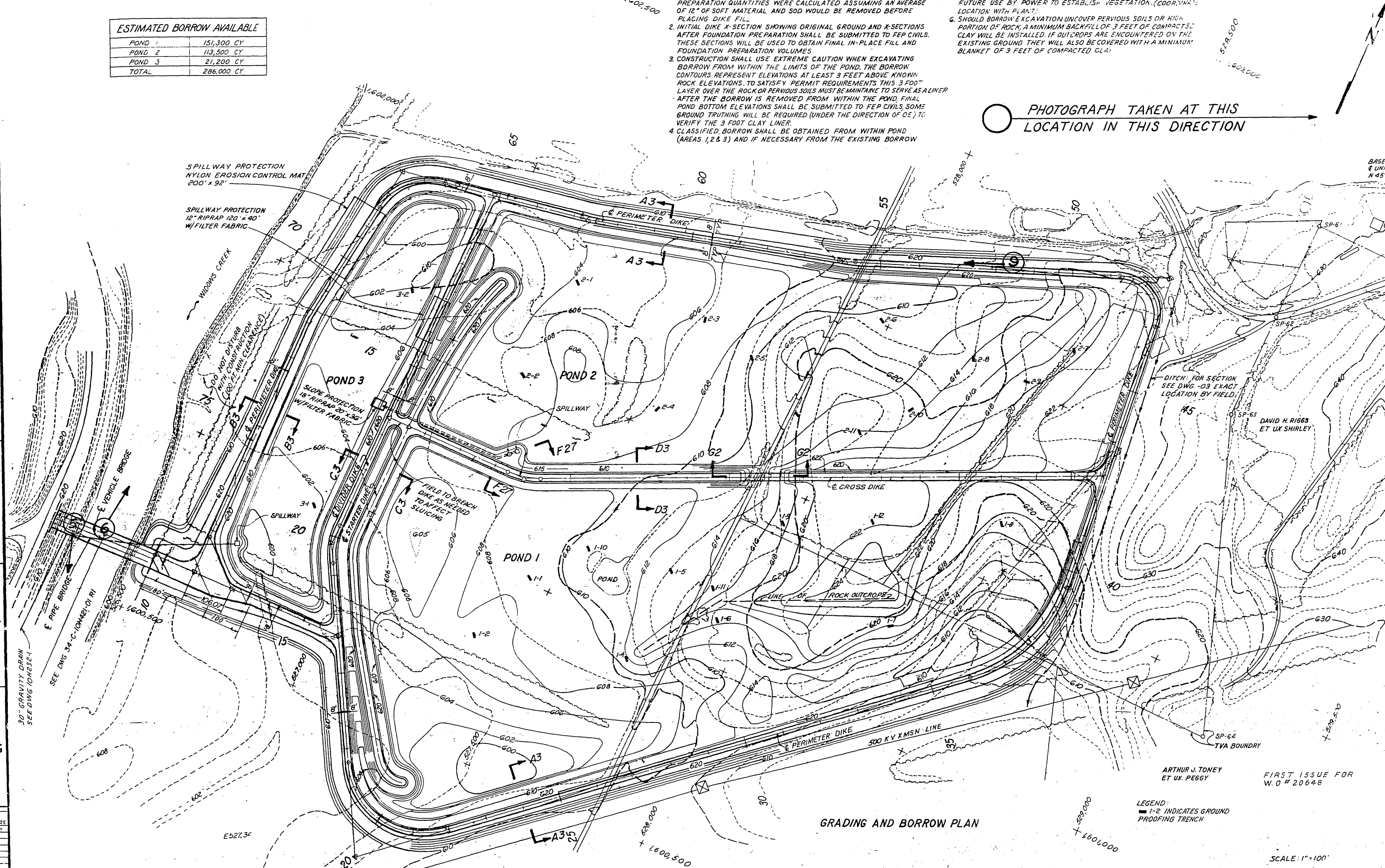
- BORROW NOTES:**
- BORROW QUANTITIES SHOWN WERE OBTAINED BY CALCULATING "IN PLACE FILL VOLUME FROM THE DIKE X-SECTION AND INCREASING THIS BY 20% TO ALLOW FOR WASTE AND SHRINKAGE (FROM "INSITU" DENSITIES TO "COMPACTED FILL" DENSITIES). FOUNDATION PREPARATION QUANTITIES WERE CALCULATED ASSUMING AN AVERAGE OF 12" OF SOFT MATERIAL AND SOD WOULD BE REMOVED BEFORE PLACING DIKE FILL.
 - INITIAL DIKE X-SECTION SHOWING ORIGINAL GROUND AND X-SECTIONS AFTER FOUNDATION PREPARATION SHALL BE SUBMITTED TO FEP CIVILS. THESE SECTIONS WILL BE USED TO OBTAIN FINAL IN-PLACE FILL AND FOUNDATION PREPARATION VOLUMES.
 - CONSTRUCTION SHALL USE EXTREME CAUTION WHEN EXCAVATING BORROW FROM WITHIN THE LIMITS OF THE POND. THE BORROW CONTOURS REPRESENT ELEVATIONS AT LEAST 3 FEET ABOVE KNOWN ROCK ELEVATIONS. TO SATISFY PERMIT REQUIREMENTS THIS 3 FOOT LAYER OVER THE ROCK OR PERVIOUS SOILS MUST BE MAINTAINED TO SERVE AS A LINER AFTER THE BORROW IS REMOVED FROM WITHIN THE POND. FINAL POND BOTTOM ELEVATIONS SHALL BE SUBMITTED TO FEP CIVILS. SOME GROUND TRUTHING WILL BE REQUIRED UNDER THE DIRECTION OF O&E TO VERIFY THE 3 FOOT CLAY LINER.
 - CLASSIFIED BORROW SHALL BE OBTAINED FROM WITHIN POND (AREAS 1, 2 & 3) AND IF NECESSARY FROM THE EXISTING BORROW

- AREAS SOUTH OF AND ADJACENT TO THE 500 KV TRANSMISSION LINE (AREA 4). UNCLASSIFIED BORROW SHALL BE OBTAINED FROM AREA 4.
- ANY TOP SOIL OR UNSUITABLE SOIL SHALL BE STOCK PILED FOR FUTURE USE BY POWER TO ESTABLISH VEGETATION. (COORDINATE LOCATION WITH PLAN).
 - SHOULD BORROW EXCAVATION UNCOVER PERVIOUS SOILS OR HIGH PORTION OF ROCK, A MINIMUM BACKFILL OF 3 FEET OF COMPACTED CLAY WILL BE INSTALLED. IF OUTCROPS ARE ENCOUNTERED ON THE EXISTING GROUND THEY WILL ALSO BE COVERED WITH A MINIMUM BLANKET OF 3 FEET OF COMPACTED CLAY.

○ PHOTOGRAPH TAKEN AT THIS LOCATION IN THIS DIRECTION



- NOTES:**
- ALL WORK TO BE IN ACCORDANCE WITH T-1 SPECIFICATIONS EXCEPT AS NOTED.
 - WHERE EXCAVATION IS ADJACENT TO PROPOSED DINES THE CUT SLOPES SHALL NOT BE STEEPER THAN 2:1 (LONG) AND TOP OF CUT SHALL BE A MINIMUM OF 10 FEET FROM THE TOE OF THE INTERIOR DIKE AND 15 FEET FROM THE TOE OF THE EXTERIOR OR AS SHOWN ON THE CROSS SECTIONS.
 - DASHED CONTOURS (---) INDICATE EXISTING GROUND, SOLID CONTOURS (—) INDICATE FINISHED GRADE.
 - THE TOP OF EARTH, AFTER BORROW EXCAVATION, SHALL BE SEALED BY ROLLING WITH RUBBER-TIRED EQUIPMENT OR SMOOTH-DRUM ROLLER TO PROVIDE A RELATIVELY IMPERVIOUS LAYER.
 - FOR DIKE LAYOUT, PROFILES AND SECTION SEE 10W215-01 THRU-03.



OPEN REVISION										
NO.	DATE	DESCRIPTION	BY	CHKD	APP'D	ISSD	REV	REV	REV	REV
1	3/15/88	REV ADDED GRA DING & GENERAL REV ADDED NOTES								

YARD UNITS 7 & 8		
FORCED OXIDATION GYPSUM STACKING PHASE I - DIKES & GRG PLAN SHEET 4.		
WIDOWS CREEK STEAM PLANT TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN		
DESIGN	INSPECTED	APPROVED
ARTHUR J. TONEY	M.H. Miller	M.H. Miller
DATE	DATE	DATE
4-29-88	4-29-88	4-29-88
KNOXVILLE 4-29-88 34 c 10W215-04 R2		

FOR ASH POND INSPECTION ONLY
NOT FOR CONSTRUCTION

September 22 , 1991

James E. Varner, Manager of Inspections and Small Projects, BR 4A-C

WIDOWS CREEK FOSSIL PLANT - INSPECTION OF THIS SOLID WASTE DISPOSAL
AREAS

1.0 General

- 1.1 The joint inspection of the ash and gypsum disposal areas was conducted on August 15, 1991. The weather was hot and humid. There was a heavy rain the evening of the 14th.
- 1.2 The inspection was coordinated with Robert Mason, Yard Operations Supervisor, and notification to Randall Hoodenpyl, Technical Service Supervisor, both of Widows Creek Fossil Plant.

The following persons performed the inspections:

Joel Paris, Engineering and Technical Services (E&TS)
Ron Powell, E&TS
Darlene Clifford, Fuels, By-product Marketing
Robert Harris, Fuels, By-product Managing

- 1.3 Mr. Hoodenpyl was called the following morning by Joel Paris and the inspection was discussed by phone since the inspection was completed after plant personnel had left the previous day.
- 1.4 The last joint inspection was made on April 5, 1988 (B65 880505 006).
- 1.5 The areas inspected are shown on drawings 10N7400, 10N7420, 10N7421, 10W7465-01 and 10W215-4.
- 1.6 This was a visual inspection to check the condition of the various dikes for stability, damp areas, seepage, vegetative cover and the condition of spillways, skimmers, roadway surfaces and other general conditions.

WIDOWS CREEK FOSSIL PLANT - INSPECTION OF THE SOLID WASTE DISPOSAL
AREAS

2.0 Active Ash Pond and Related Dikes (Drawing 10W7465-01)

- 2.1 All ash continues to be sluiced into this pond.
- 2.2 The redwater seepage, which begins in the access road ditch south of the copper pond, continues in a westerly direction around the toe of the dike to a collection pond .019. (Pictures 1 and 2). This redwater is collected in a detention pond and pumped to the ash pond.
- 2.3 Another redwater seep is located 150 feet upstream of the bridge over relocated Widows Creek (Picture 3). This seep is being measured and monitored to determine if change is occurring.
- 2.4 The perimeter dike around the ash pond and the stilling pond appear to be in a stable condition.
- 2.5 The roadway surfaces are in good condition (Picture 5).
- 2.6 Lush grass cover has been established on the dikes and the slopes are in good condition (Picture 5).
- 2.7 The floating ash is getting thick around the skimmers (Picture 4).

3.0 Limestone Scrubber Waste Ponds

Limestone Pond West of Widows Creek (Drawing 10W7420)

- 3.1 The scrubber waste is temporarily being sluiced into this pond (Picture 10) because of the remedial work taking place within the gypsum pond (Picture 10).

Post Inspection Note: This sluicing was rerouted to the Phase I area September 6, 1991.

- 3.2 The perimeter dike around the scrubber pond appears to be structurally stable. However, there are some places that must be watched because of seepage.

WIDOWS CREEK FOSSIL PLANT - INSPECTION OF THE SOLID WASTE DISPOSAL
AREAS

3.2.1 The first area of seepage is about two hundred feet downstream of the bridge.

3.2.2 The second area of seepage is downstream of the first and in the bend of the dike.

3.2.3 The third of the redwater seeps starts about 900 feet downstream of the bridge and ends at the 500KV overhead power lines (Picture 7). This seep appears to be increasing in length.

3.3 The inside of the north east dike is being eroded by wave action (Picture 6).

3.4 There are several trees (Picture 9) that have not been removed from the slope of the dike that were discussed in the 1988 inspection report.

3.5 Lush grass cover has been established on the slopes (Picture 9).

Gypsum Stacking East of Widows Creek (Phase I) (Drawing 10W215-04)

3.6 The gypsum stack is in the process of being reshaped by a contractor and no scrubber sludge is being sluiced into the pond.

Post Inspection Note: The sluicing was rerouted to this area September 6, 1991.

3.7 The toe of the south dike is soft and seeping (Pictures 11 and 12). This seep has not been reported in any previous inspection reports, however the plant notified E&TS as the seeps developed.

3.8 The seepage winds through several acres of cattails before entering Widows Creek. (See recommendation 5.2).

3.9 The second wet area is about 250 feet south of the road that crosses Widows Creek and half-way from the creek to the gypsum stack.

James E. Varner
September 22 , 1991
Page 4

WIDOWS CREEK FOSSIL PLANT - INSPECTION OF THE SOLID WASTE DISPOSAL
AREAS

3.10 Lush grass cover has been established on the dikes.

3.11 There is an area (Picture 8) of cattails on the north side of the road that crosses Widows Creek and west of the gypsum stack. This could be a wet area caused by improper drainage and not from the pond.

4.0 Actions on Recommendations of Last Inspection

4.1 All the trees, bushes and/or vines have not been removed from the dikes.

4.2 The plant notified E&TS and has kept them informed on the seepage from the scrubber ponds and the ash pond.

5.0 Recommendations

5.1 The trees should be removed from the dikes! The roots of the large trees (2 inches in diameter or larger) must also be removed.

5.2 A monitoring weir needs to be placed on the seep south of the gypsum stack. If the flow increases, notify E&TS in Chattanooga for evaluation.

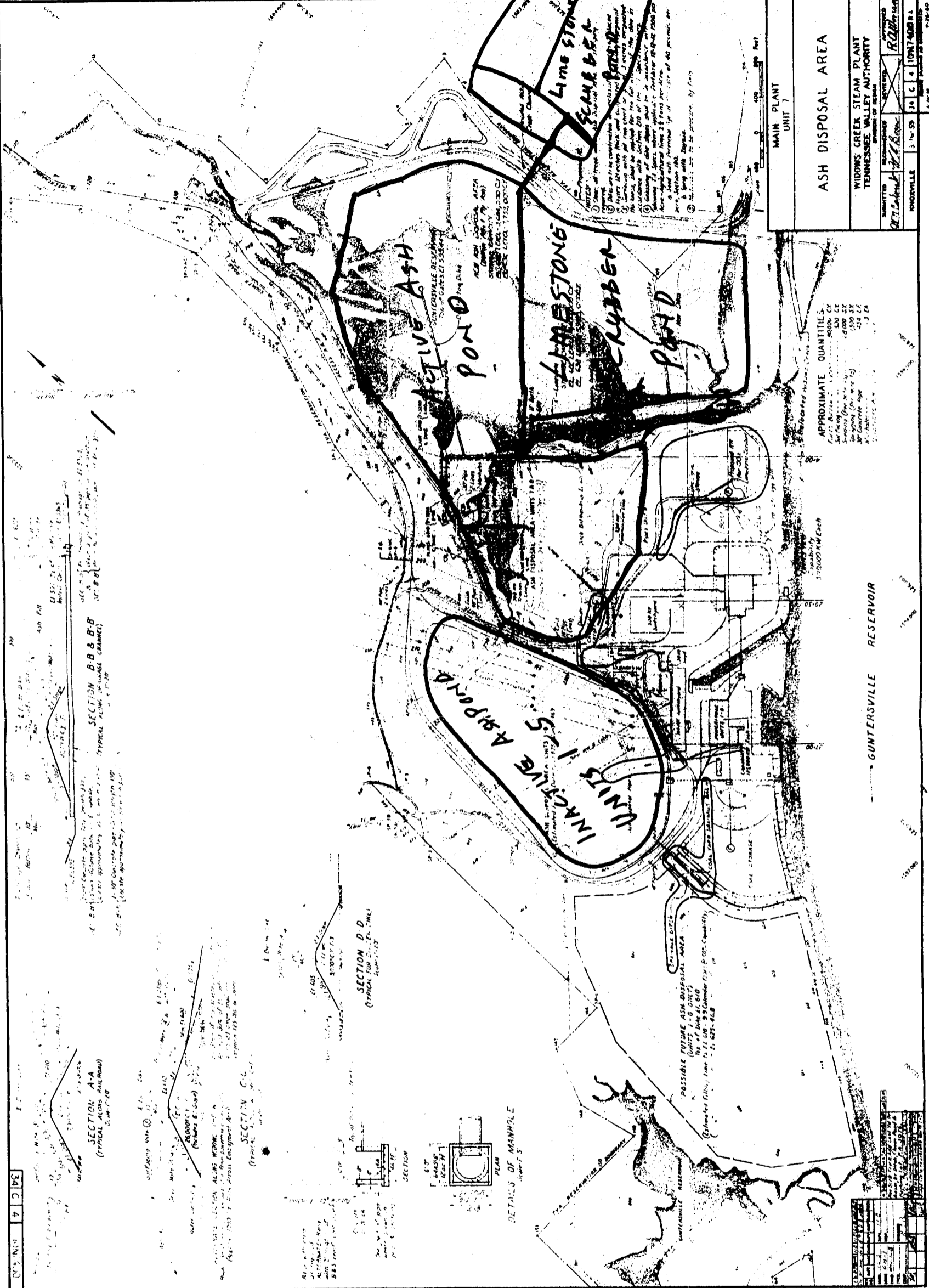
5.3 Remove floating ash from the active ash pond.

5.4 The inside of the northeast dike of the limestone pond should be repaired as needed to correct erosion.

Joel D. Paris
Joel D. Paris
Civil Engineer
Civil Engineering Department

Kenneth W. Burnett
for James H. Coulson
Manager
Civil Engineering Department

KWB:JDP:HLF
Attachments
cc: RIMS, MR 2F-C (w/o attachments)



ASH DISPOSAL AREA

MIDDONS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY

DESIGNED BY	ENGINEER	DATE	PROJECT NO.
REVISED BY	DATE	REVISION	
APPROVED BY			
PROJECT NO.	UNIT 7	DATE	10/24/60
PROJECT NAME	MIDDONS CREEK STEAM PLANT		
PROJECT LOCATION	GUNTERVILLE, TENN.		

APPROXIMATE QUANTITIES:

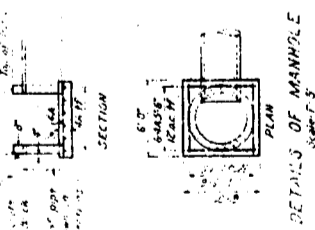
Excavation	4000 CY
Gravel	2000 CY
Concrete	1000 CY
Reinforcing Steel	200 TONS
Asphalt	500 TONS

SECTION A-A
(TYPICAL ALONG ROAD)

SECTION B-B & B-B'
(TYPICAL ALONG SWAGGE CHANNEL)

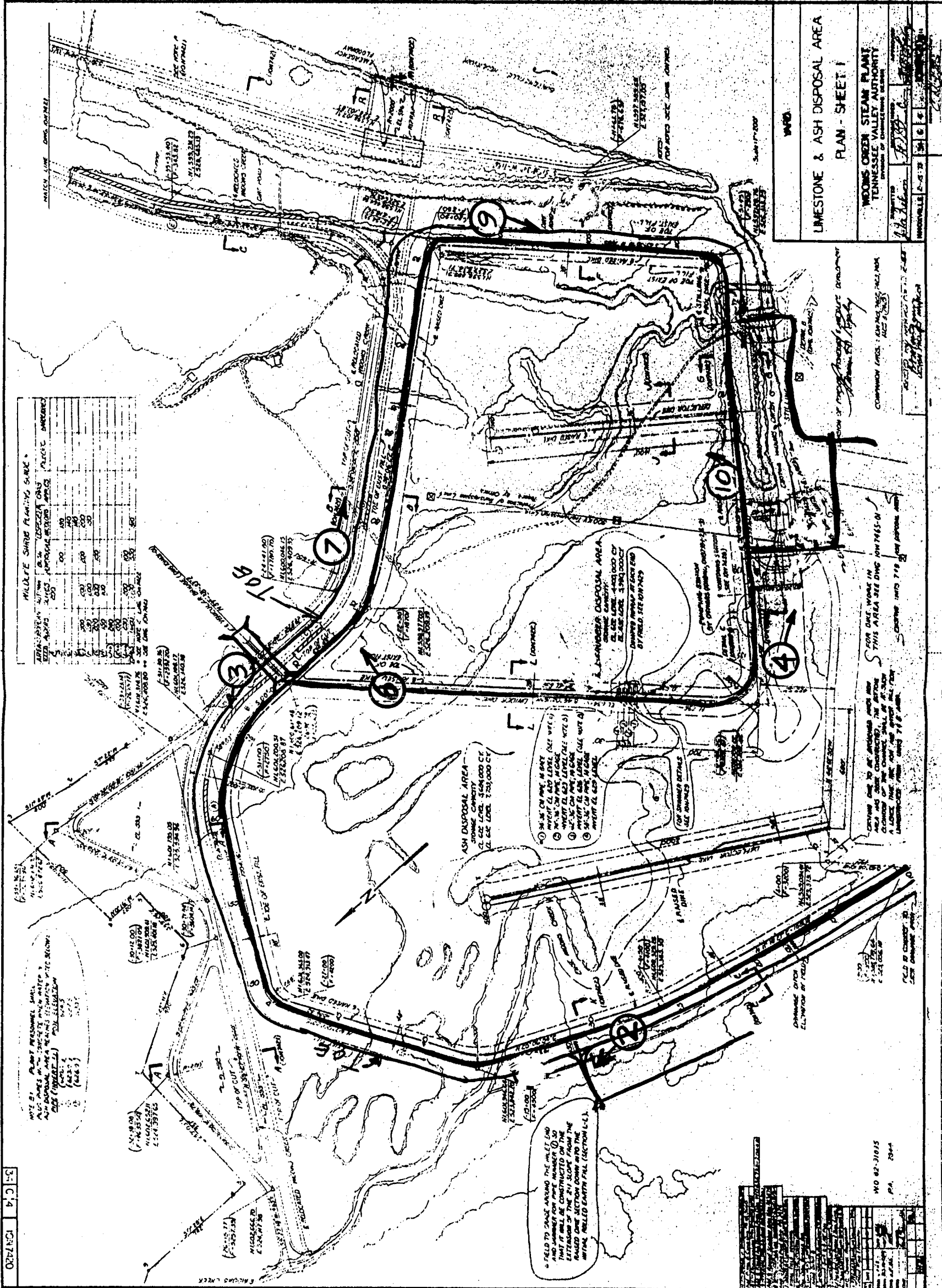
SECTION C-C
(TYPICAL)

SECTION D-D
(TYPICAL FOR 24" DIA. PIPE)



POSSIBLE FUTURE ASH DISPOSAL AREA
(UNITS 1-6 ONLY)
No. of Days at 810
(Estimated filling time is 14-20 - 30 Calendar Days @ 100% Capacity)
(Estimated filling time is 25-40-60 Days @ 50% Capacity)

34 C 4 10/24/60



MIDDLE SHEDS PLANNING SHEET

AREA	AREA NO.	AREA DESCRIPTION	AREA CAPACITY	AREA LEVEL	AREA DATE
1	100	ASH DISPOSAL AREA	1,000,000 CY	100	10/1/50
2	200	LIMESTONE DISPOSAL AREA	500,000 CY	200	10/1/50
3	300	WATER TREATMENT PLANT	1,000,000 GAL	300	10/1/50
4	400	WATER TREATMENT PLANT	1,000,000 GAL	400	10/1/50
5	500	WATER TREATMENT PLANT	1,000,000 GAL	500	10/1/50
6	600	WATER TREATMENT PLANT	1,000,000 GAL	600	10/1/50
7	700	WATER TREATMENT PLANT	1,000,000 GAL	700	10/1/50
8	800	WATER TREATMENT PLANT	1,000,000 GAL	800	10/1/50
9	900	WATER TREATMENT PLANT	1,000,000 GAL	900	10/1/50
10	1000	WATER TREATMENT PLANT	1,000,000 GAL	1000	10/1/50

NOTE: ALL POINTS SHOWN ON THIS PLAN ARE TO BE CONSIDERED AS APPROXIMATE ONLY. THE EXACT LOCATION OF ALL POINTS SHALL BE DETERMINED BY FIELD SURVEY.

3-1-C-4 CONT'D

FIELD TO BE MADE AROUND THE MILL END AND JUNCTION OF PIPE NUMBER 10 SO THAT IT WILL BE CONSTRUCTED ON THE EXTENSION OF THE 2% SLOPE FROM THE EXISTING ROAD SECTION DOWN TO THE ANIMAL FEEDLOT ENTRANCE (SECTION 1-1).

ASH DISPOSAL AREA -
 1. ASH DISPOSAL AREA
 2. ASH DISPOSAL AREA
 3. ASH DISPOSAL AREA
 4. ASH DISPOSAL AREA
 5. ASH DISPOSAL AREA
 6. ASH DISPOSAL AREA
 7. ASH DISPOSAL AREA
 8. ASH DISPOSAL AREA
 9. ASH DISPOSAL AREA
 10. ASH DISPOSAL AREA

NO.	DESCRIPTION	DATE	BY
1	AS SHOWN	10/1/50	J. H. [unclear]
2	AS SHOWN	10/1/50	J. H. [unclear]
3	AS SHOWN	10/1/50	J. H. [unclear]
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10	AS SHOWN	10/1/50	J. H. [unclear]

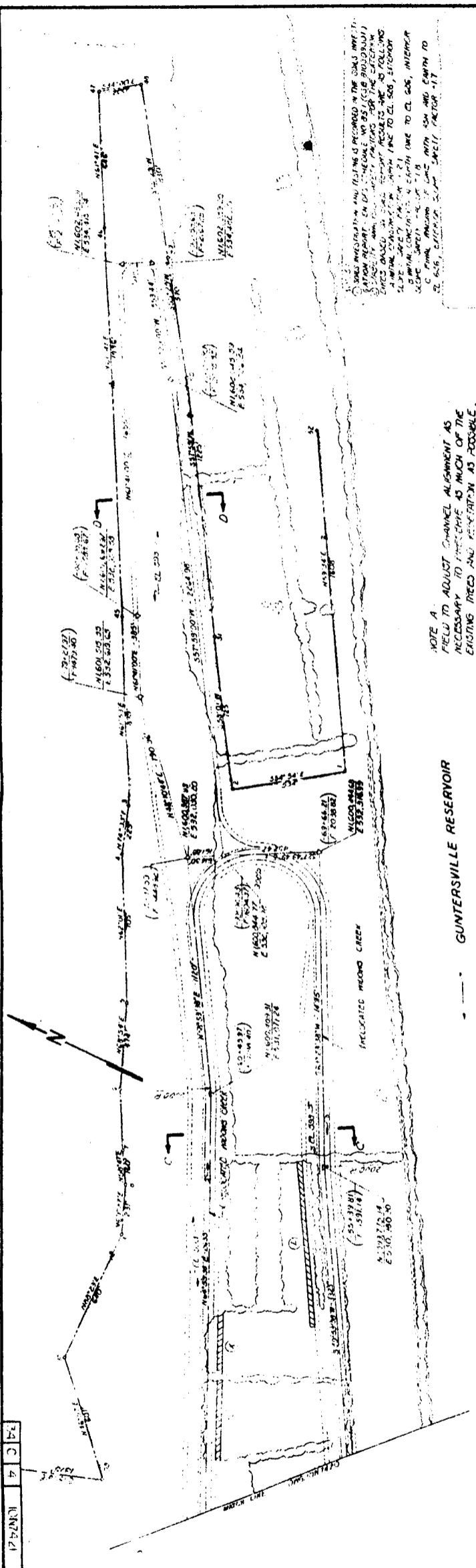
WO 82-31035 PA. 2044

WOODS GREEN STEAM PLANT
 TENNESSEE VALLEY AUTHORITY
 DIVISION OF CONSTRUCTION ADMINISTRATION
 MEMPHIS, TENNESSEE

LIMESTONE & ASH DISPOSAL AREA
 PLAN - SHEET 1

DATE: 10/1/50
 DRAWN BY: J. H. [unclear]
 CHECKED BY: J. H. [unclear]

FOR DATE WORK IN THIS AREA SEE DWG. 82-31035-N

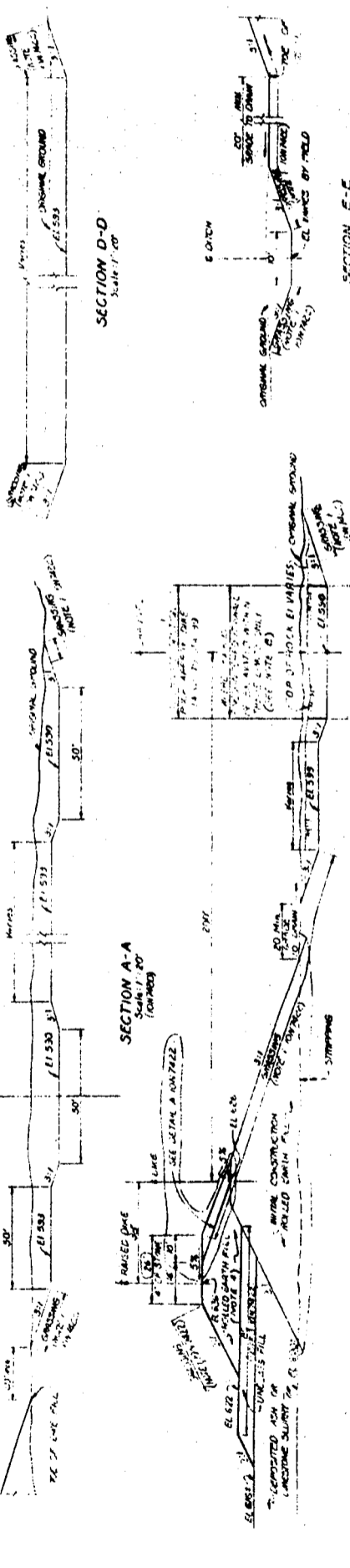


NOTE A
FIELD TO ADJUST CHANNEL ALIGNMENT AS
NECESSARY TO MAINTAIN AS MUCH OF THE
EXISTING BED AND VEGETATION AS POSSIBLE.

GUNTERSVILLE RESERVOIR

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE
DESIGN AND SPECIFICATIONS OF THE CONTRACT DOCUMENTS.
2. THE CONTRACTOR SHALL MAINTAIN THE EXISTING CHANNEL
ALIGNMENT AND VEGETATION AS MUCH AS POSSIBLE.
3. THE CONTRACTOR SHALL MAINTAIN THE EXISTING CHANNEL
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ALIGNMENT AND VEGETATION AS MUCH AS POSSIBLE.
7. THE CONTRACTOR SHALL MAINTAIN THE EXISTING CHANNEL
ALIGNMENT AND VEGETATION AS MUCH AS POSSIBLE.



NOTE B
CHANNEL SHALL BE CONSTRUCTED TO
MAINTAIN A CHANNEL VELOCITY OF
1.5 FT/SEC.

NOTE C
CHANNEL SHALL BE CONSTRUCTED TO
MAINTAIN A CHANNEL VELOCITY OF
1.5 FT/SEC.

NOTE D
CHANNEL SHALL BE CONSTRUCTED TO
MAINTAIN A CHANNEL VELOCITY OF
1.5 FT/SEC.

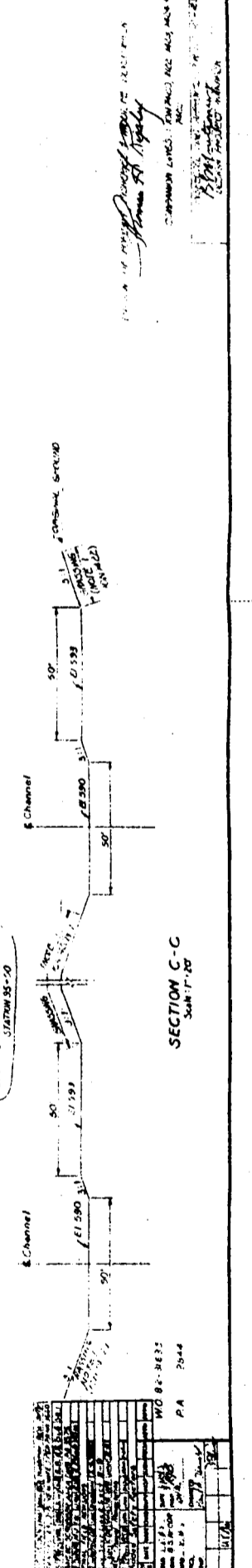
NOTE E
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MAINTAIN A CHANNEL VELOCITY OF
1.5 FT/SEC.

NOTE F
CHANNEL SHALL BE CONSTRUCTED TO
MAINTAIN A CHANNEL VELOCITY OF
1.5 FT/SEC.

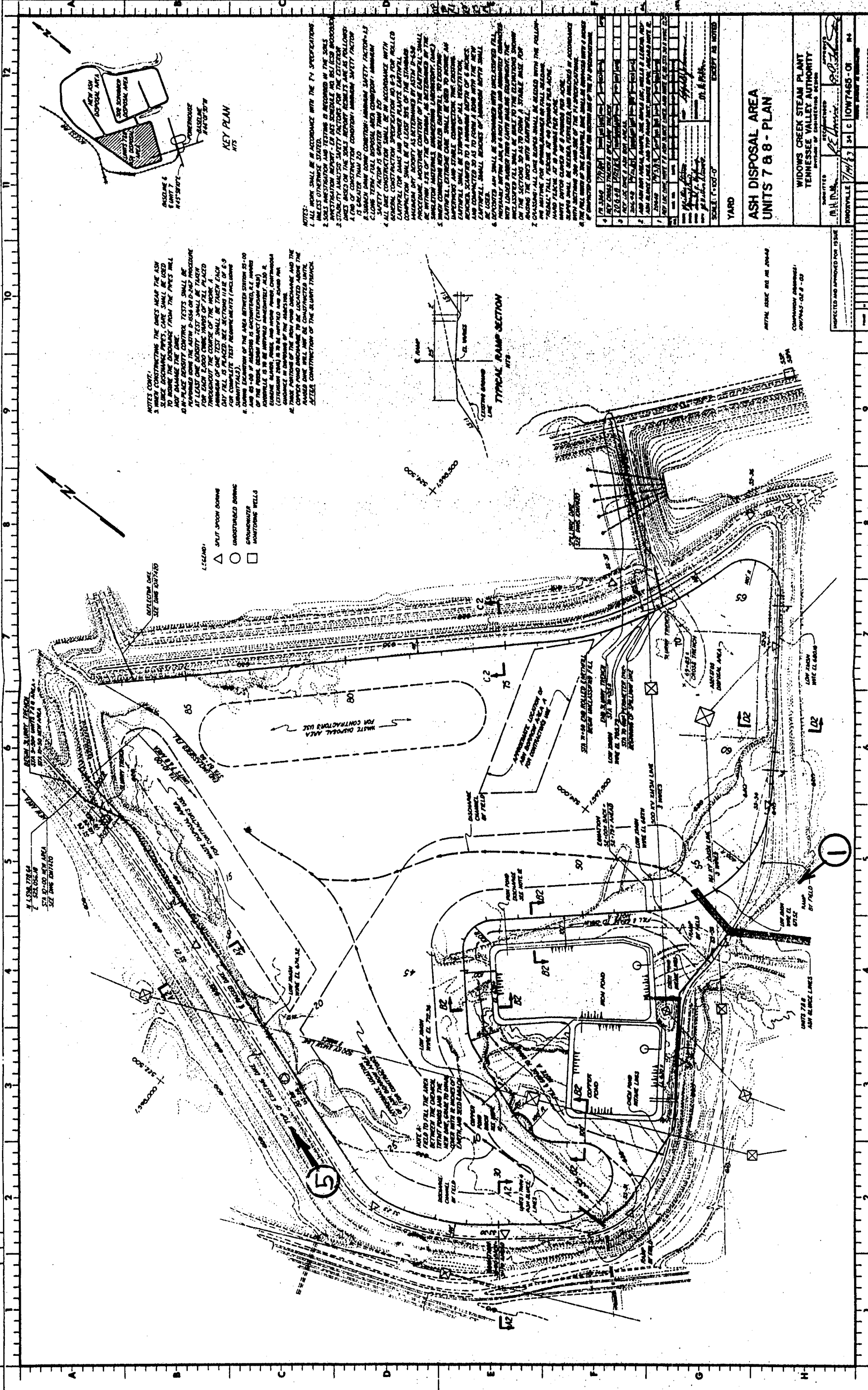
NOTE G
CHANNEL SHALL BE CONSTRUCTED TO
MAINTAIN A CHANNEL VELOCITY OF
1.5 FT/SEC.

NOTE H
CHANNEL SHALL BE CONSTRUCTED TO
MAINTAIN A CHANNEL VELOCITY OF
1.5 FT/SEC.

YARD	
LIMESTONE & ASH DISPOSAL AREA	
PLAN - SHEET 2	
PROJECT	MEIGS CREEK STEAM PLANT
LOCATION	TENNESSEE VALLEY
DATE	NOVEMBER 1954
SCALE	AS SHOWN
DESIGNED BY	W. H. HARRIS
CHECKED BY	J. H. HARRIS
APPROVED BY	J. H. HARRIS
NOVEMBER 1954	DMR:RHS



NOVEMBER 1954	DMR:RHS
DESIGNED BY	W. H. HARRIS
CHECKED BY	J. H. HARRIS
APPROVED BY	J. H. HARRIS



NOTES CONT.

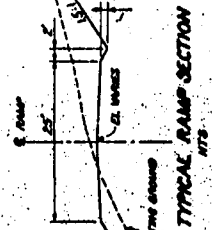
3. WHEN CONSTRUCTING THE DAMS NEAR THE ASH SLUDGE ACCUMULATION POND, CARE SHALL BE TAKEN TO MAINTAIN THE DAMS FROM THE POND'S WILL BE PLACED AGAINST THE DAMS.

4. IN-PLACE DENSITY CONTROL TESTS SHALL BE PERFORMED USING THE ASTM D-1556 OR D-1557 PROCEDURE AT LEAST ONE DENSITY TEST SHALL BE TAKEN FOR EACH 1,000 CUBIC YARDS OF FILL PLACED.

5. THE TEST SHALL BE TAKEN EACH DAY FILL IS PLACED. SEE SECTION 118.01 OF 6-9 FOR COMPLETE TEST REQUIREMENTS (INCLUDING SUBMITTALS).

6. ONE SET OF THE AREA STRIPES (SECTION 118.01) SHALL BE PLACED AT THE END OF EACH DAY OF FILL. THE STRIPES SHALL BE PLACED IN THE CENTER OF THE ROAD, CROSS PRODUCT (EXTENDING AWAY FROM THE ROAD) AND BE PLACED SEPARATELY ALSO IN THE CENTER OF THE ROAD, CROSS PRODUCT (EXTENDING AWAY FROM THE ROAD) AND BE PLACED SEPARATELY ALSO IN THE CENTER OF THE ROAD, CROSS PRODUCT (EXTENDING AWAY FROM THE ROAD).

7. THE POSITION OF THE ROAD CROSS PRODUCT AND THE CROSS PRODUCT MARKING TO BE LOCATED ABOVE THE DAMS SHALL NOT BE CONSIDERED UNTIL AFTER CONSTRUCTION OF THE DAMS THROUGH.



- LEGEND:**
- △ SPLIT JOINT CORNER
 - UNOBTAINED BORING
 - GROUNDWATER MONITORING WELLS

NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE PM SPECIFICATIONS.

2. ALL TESTS AND TESTS IS REQUIRED IN THE SOILS INVESTIGATION REPORT - EXACT SCHEDULE AND SOILS SUCCESS.

3. STABILITY ANALYSIS SAFETY FACTORS FOR THE CRITICAL DAMS BASED ON THE SOILS REPORT RESULTS ARE AS FOLLOWS:

- A. SLIP SURFACE THROUGH THE DAMS: 1.5
- B. SLIP SURFACE THROUGH THE DAMS: 1.5
- C. SLIP SURFACE THROUGH THE DAMS: 1.5
- D. SLIP SURFACE THROUGH THE DAMS: 1.5
- E. SLIP SURFACE THROUGH THE DAMS: 1.5
- F. SLIP SURFACE THROUGH THE DAMS: 1.5
- G. SLIP SURFACE THROUGH THE DAMS: 1.5
- H. SLIP SURFACE THROUGH THE DAMS: 1.5
- I. SLIP SURFACE THROUGH THE DAMS: 1.5
- J. SLIP SURFACE THROUGH THE DAMS: 1.5
- K. SLIP SURFACE THROUGH THE DAMS: 1.5
- L. SLIP SURFACE THROUGH THE DAMS: 1.5
- M. SLIP SURFACE THROUGH THE DAMS: 1.5
- N. SLIP SURFACE THROUGH THE DAMS: 1.5
- O. SLIP SURFACE THROUGH THE DAMS: 1.5
- P. SLIP SURFACE THROUGH THE DAMS: 1.5
- Q. SLIP SURFACE THROUGH THE DAMS: 1.5
- R. SLIP SURFACE THROUGH THE DAMS: 1.5
- S. SLIP SURFACE THROUGH THE DAMS: 1.5
- T. SLIP SURFACE THROUGH THE DAMS: 1.5
- U. SLIP SURFACE THROUGH THE DAMS: 1.5
- V. SLIP SURFACE THROUGH THE DAMS: 1.5
- W. SLIP SURFACE THROUGH THE DAMS: 1.5
- X. SLIP SURFACE THROUGH THE DAMS: 1.5
- Y. SLIP SURFACE THROUGH THE DAMS: 1.5
- Z. SLIP SURFACE THROUGH THE DAMS: 1.5

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YARD

ASH DISPOSAL AREA UNITS 7 & 8 - PLAN

SCALE: 1"=100'-0"

EXCEPT AS NOTED

WIDOWS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY

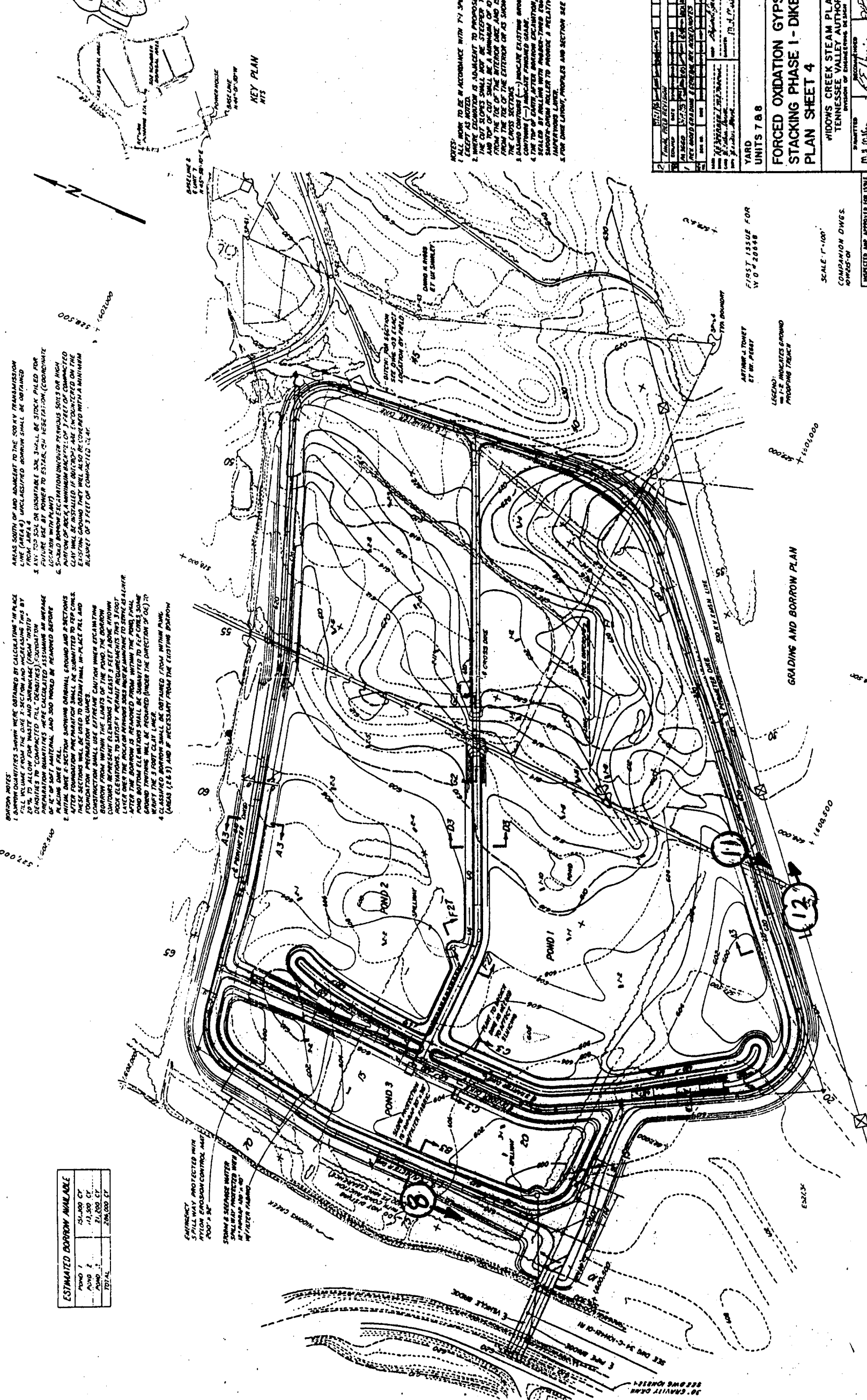
INSPECTED AND APPROVED FOR ISSUE

DATE: 11/13/53

34 C 10W7485-01

10W215-04

1 2 3 4 5 6 7 8 9 10 11 12



AREAS SOUTH OF AND ADJACENT TO THE 500 KV TRANSMISSION LINE (AREA 4) UNCLASSIFIED BORROW SHALL BE OBTAINED FROM THE 500 KV LINE OR USABLE SOIL SHALL BE STOCK PILED FOR FUTURE USE BY POWER TO ESTABLISH RESEEDING (COORDINATE LOCATION WITH PLANT)

5'-3" DRAIN EXCAVATION UNLESS PREVIOUS SOILS OR INCH THICKNESS OF ROCK A MINIMUM DEPTH OF 3 FEET OF COMPACTED EXISTING GROUND THAT WILL ALSO BE COMPACTED WITH A MINIMUM RELAXED OF 3 FEET OF COMPACTED SOIL

BORROW NOTES

1. BORROW QUANTITIES SHOWN WERE OBTAINED BY CALCULATING "IN PLACE" VOLUME FROM THE DYE X-SECTION AND INCREASING THIS BY 25% TO ALLOW FOR WASTE AND SHORING (FROM "VOID")
2. BORROW QUANTITIES WERE OBTAINED BY CALCULATING "IN PLACE" VOLUME FROM THE DYE X-SECTION AND INCREASING THIS BY 25% TO ALLOW FOR WASTE AND SHORING (FROM "VOID")
3. PREPARATION QUANTITIES WERE CALCULATED ASSUMING AN AVERAGE OF 4" OF SOFT MATERIAL, AND SOIL WOULD BE REMOVED BEFORE PLACING DYE FILL.
4. INITIAL DYE X-SECTION SHOWING ORIGINAL GROUND AND A-SECTIONS WERE OBTAINED FROM THE DYE X-SECTION AND INCREASING THIS BY 25% TO ALLOW FOR WASTE AND SHORING (FROM "VOID"). THESE SECTIONS WILL BE USED TO OBTAIN FINAL "IN PLACE" FILL AND FOUNDATION PREPARATION VOLUMES.
5. CONSTRUCTION SHALL USE EXTREME CAUTION WHEN EXCAVATING BORROW FROM WITHIN THE LIMITS OF THE POND. THE BORROW QUANTITIES WERE OBTAINED BY CALCULATING "IN PLACE" VOLUME FROM THE DYE X-SECTION AND INCREASING THIS BY 25% TO ALLOW FOR WASTE AND SHORING (FROM "VOID").
6. AFTER THE BORROW IS REMOVED FROM WITHIN THE POND, FINAL POND BOTTOM ELEVATIONS SHALL BE SUBMITTED TO FPC DURING SOME GROUND TYPING WILL BE REQUIRED (UNDER THE DIRECTION OF FPC) TO CLASSIFIED BORROW SHALL BE OBTAINED FROM WITHIN POND.
7. (AREAS 1, 2, 3) AND IF NECESSARY FROM THE EXISTING BORROW

ESTIMATED BORROW AVAILABLE	
POND 1	51,400 CY
POND 2	13,500 CY
POND 3	21,000 CY
TOTAL	85,900 CY

ENTRANCE SPILLWAY PROTECTED WITH PYLON EROSION CONTROL MAT 100' x 50'

STRONG STORAGE WATER SHALL BE STORED WITHIN 10 FEET OF POND

30' GRAVITY DRAIN

NOTES

1. ALL WORK TO BE IN ACCORDANCE WITH FV SPECIFICATIONS
2. WHERE DRAINAGE IS ADJACENT TO PROPOSED DIKES THE CUT SLOPES SHALL NOT BE STEEPER THAN 2:1 (H:V) AND TOP OF CUT SHALL BE A MINIMUM OF 10 FEET FROM THE TOP OF THE INTERIOR DYE AND 15 FEET FROM THE TOP OF THE EXTERIOR DYE
3. THE EXISTING GROUND SHALL BE MAINTAINED TO THE EXISTING ELEVATIONS
4. THE TOP OF DYE AFTER BORROW EXCAVATION SHALL BE MAINTAINED TO THE EXISTING ELEVATIONS
5. THE TOP OF DYE SHALL BE MAINTAINED TO THE EXISTING ELEVATIONS
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12. THE TOP OF DYE SHALL BE MAINTAINED TO THE EXISTING ELEVATIONS

NO. 1	DATE	DESCRIPTION
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YARD UNITS 7 & 8

FORCED OXIDATION GYPSUM STACKING PHASE I - DIKES & GRG PLAN SHEET 4

WIDOWS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY

ISSUED FOR PERMIT

NO. 1 10/15/04

NO. 2 10/15/04

NO. 3 10/15/04

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NO. 100 10/15/04

FIRST ISSUE FOR 10/15/04

SCALE: 1"=100'

COMPANION DWGS. 10W215-01 THROUGH 10W215-04

PROJECT AND APPROVED FOR ISSUE

ISSUED FOR PERMIT

GRADING AND BORROW PLAN

WIDOW CREEK'S INSPECTION PICTURES 8/91



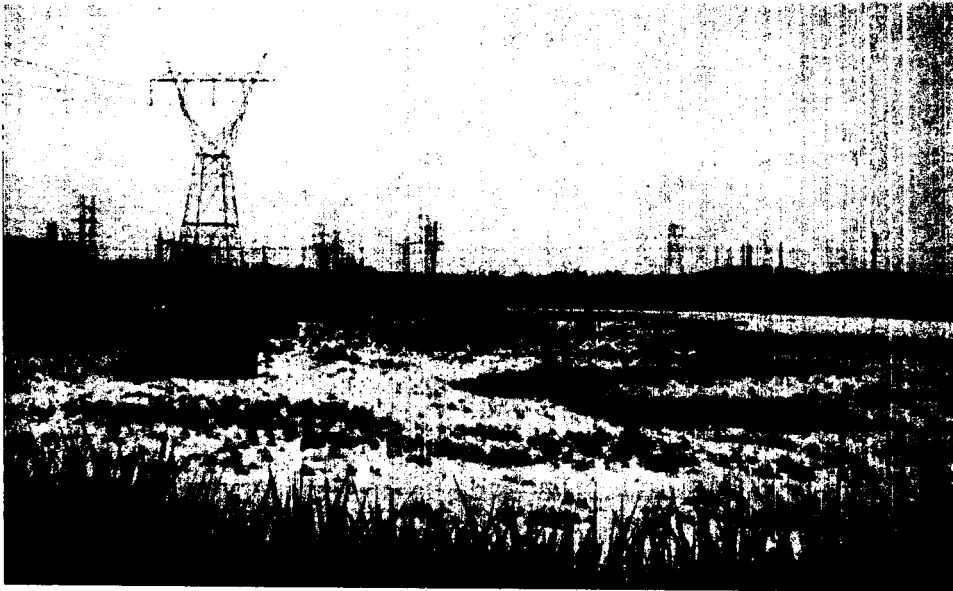
1.Red Water at
units 7 & 8 pipe
bridge.



2.Red Water pond
dike for outfall
.019.



3.Red Water seep
discharge 150 ft.
upstream of the
bridge over Widow
Creek.



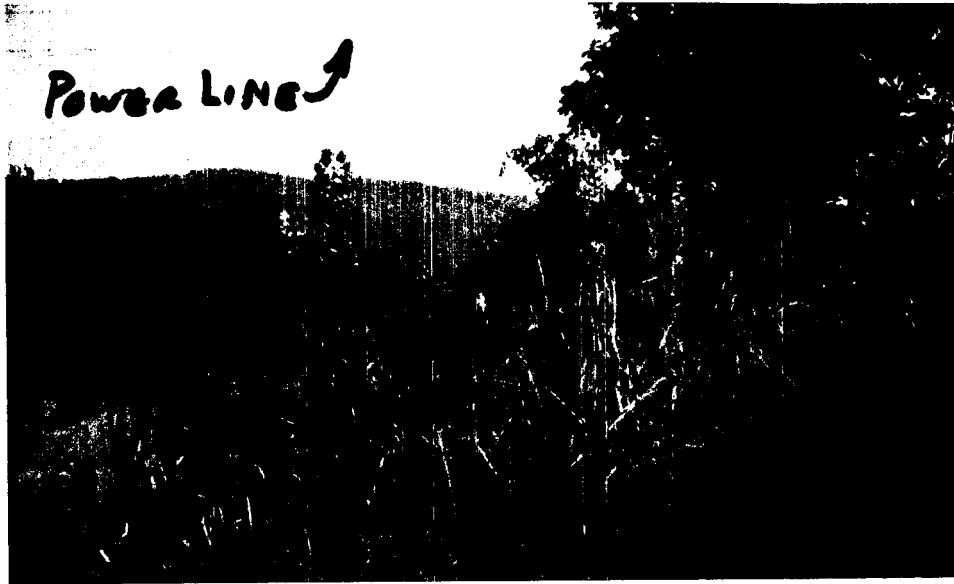
4. Ash Pond discharge structure.
Note: Floating Ash.



5. West side of active ash pond dike.
Note: Roadway cover and Dike cover.



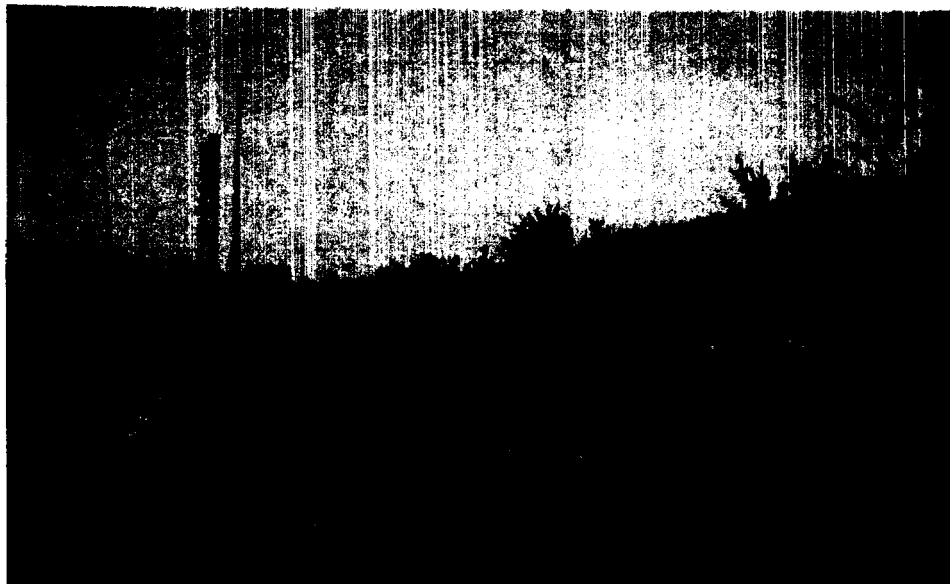
6. Scrubber Sluice Pond northeast dike.
Note: Eroding of dike by wave action.



7. Scrubber Sluice Pond seep upstream and adjacent to 500KV line.



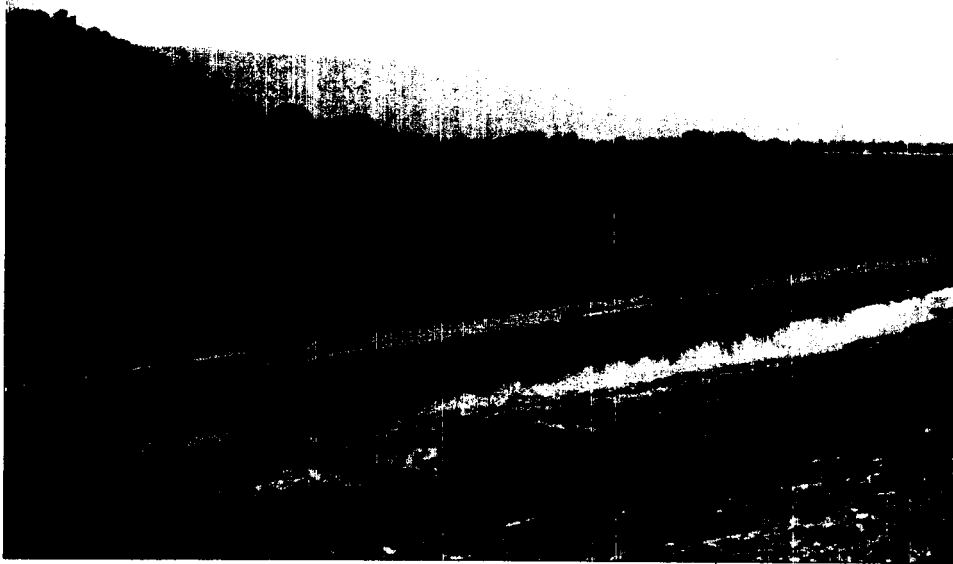
8. Wet Area 200 ft upstream of the bridge and adjacent to the Gypsum Pond.



9. Scrubber Sluice Pond.
Note: Vegetative cover and small trees growing on the dikes.



10. Discharge into
Scrubber Sluice
Pond.



11. Gypsum Stacking
Area. Looking south
from the top of the
south dike.



12. Gypsum Stacking
Area. Seepage from
the toe of the south
dike.

Joel Paris

B65 930805 205

August 10, 1993

T. W. Williams, Widows Creek Fossil Plant

WIDOWS CREEK FOSSIL PLANT - INSPECTION OF THE WASTE DISPOSAL AREAS

Attached is a report from J. D. Paris to K. W. Burnett dated August 10, 1993, concerning the joint inspection of Widows Creek Fossil Plant's waste disposal areas.

This report includes recommendations for corrective work. I concur with these recommendations.



Ralph G. Johnson
Manager, Fossil Engineering
BR 2B-C

KWB:JDP:PHF

Attachments

cc (Attachments):

R. L. Keyser, LP 2E-C
RIMS, CST 13B-C

1554J

August 10, 1993

K. W. Burnett, MR 3D-C

WIDOWS CREEK FOSSIL PLANT - INSPECTION OF THE WASTE DISPOSAL AREAS

1.0 General

- 1.1 The joint inspection of the ash and gypsum disposal areas was conducted on April 12, 1993. The weather was hot and humid.
- 1.2 The inspection was coordinated with Randall Hoodenpyl, Technical Service Supervisor, of Widows Creek Fossil Plant.

The following individuals were present during the inspection:

Joel Paris, Fossil Engineering/Site Engineering
John Pinnix, Widows Creek Fossil Plant
Jim Huber, Fossil Fuels
Dave Robinson, Fossil Fuels

- 1.3 Our findings were discussed with Randall Hoodenpyl and John Pinnix before leaving the plant.
- 1.4 The last joint inspection was made on August 19, 1991.
- 1.5 The areas inspected are shown on Drawings 10N7400, 10N7420, 10N7421, 10W7465-01 and 10W215-4.
- 1.6 This was a visual inspection to check the condition of the various dikes for stability, damp areas, seepage, vegetative cover and the condition of spillways, skimmers, roadway surfaces and other general conditions.

2.0 Active Ash Pond and Related Dikes (Drawing 10W7465-01)

- 2.1 All ash continues to be sluiced into this pond, and there has been no change in operation from the last inspection.
- 2.2 The redwater seepage, which begins in the access road ditch south of the copper pond, continues in a westerly direction around the toe of the dike to a collection pond DSN019 (Pictures 4 and 5). This redwater is collected in a detention pond and pumped to the ash pond.

- 2.2.1 The ditch between the chemical pond dike and the south access road is full, and the seepage is running down the edge of the road pavement. (See Recommendation 6.1.)
 - 2.2.2 There is a sluff or slide, west of the sluice pipes of Unit 7 and 8 (pictures 4 and 5) that should be monitored for movement. If movement occurs, this should be repaired. In addition, a large amount of seepage is occurring and needs to be reduced or eliminated. (See Recommendations 6.1 and 6.4.)
 - 2.3 Other redwater seeps are located 150 to 300 feet upstream of the bridge over relocated Widows Creek. These seeps are being measured and monitored to determine if change is occurring.
 - 2.4 The perimeter dike around the ash pond and the stilling pond appear to be in a stable condition.
 - 2.5 The roadway surfaces are in good condition.
 - 2.6 Lush grass cover has been established on the dikes and the slopes are in good condition.
 - 2.7 There is very little floating ash on the pond and most of this is being skimmed off (Picture 6).
 - 2.8 There are several small pine trees on the inside of the dike. (See Recommendation 6.2.)
 - 2.9 The trees noted in the 1988 and 1991 inspection reports have been cut. All remaining bushes or small trees can be cut when mowing.
- 3.0 Limestone Scrubber Waste Ponds
- Limestone Pond West of Widows Creek (Drawing 10W7420)
- 3.1 The scrubber waste was temporarily sluiced into this pond prior to September 6, 1991 during of remediation work on Pond 1 of the Phase I Gypsum Area.
 - 3.2 The perimeter dike around the scrubber pond appears to be structurally stable. However, there are some places that must be monitored because of seepage.
 - 3.2.1 The first area of seepage is about 200 feet downstream from the bridge.

- 3.2.2 The second area of seepage is downstream from the first and in the bend of the dike. A temporary pipe was placed in this area to measure flow.
- 3.2.3 The third of the redwater seeps started about 900 feet downstream from the bridge and ended at the 500KV overhead power lines at the time of the 1991 inspection. This seep is increasing in length and now extends past the power line. The seep was flowing and the ground is very soft.
- 3.3 The inside of the north east dike was being eroded by wave action; however, the area is now being filled with waste material such as concrete blocks, cobble stone, etc.
(See Recommendation 6.5.)
- 3.4 There were several trees noted in the 1988 and 1991 inspection report that have been removed from the slope of the dike. The only trees, now, can be cut with a bush hog.
- 3.5 Lush grass cover has been established on the slopes.

Gypsum Stacking East of Widows Creek (Drawing 10W215-04)

- 3.6 Managing the gypsum stack is under contract to Trans Ash for rim ditch stacking.
 - 3.6.1 Pond I has been raised, slopes covered, under drains put in, berm ditches built, and a good grass cover established by Trans Ash. (See picture 3.)
 - 3.6.2 The wet area previously drained into and meandered through a wetland, then into Widows Creek. The wetland is now a beaver pond that backs up to the toe of the dike. A second wet area is about 250 feet south of the road across Widows Creek and halfway from the gypsum stack to the creek. There appears to be no change in this area.
(See Recommendation 6.3.)
 - 3.6.3 The existing seep appears larger, and water is flowing in some areas. No material movement is noticeable at this time. Vegetation is dying, and cattails are abundant on the slopes. There is a third wet area that is above the perimeter road as it turns south. This is directly below the point of discharge into Pond I. Fly ash appears to be separating from the gypsum in this area and filling the drainage ditch. Trans Ash was to repair this as part of their contract, according to Jim Huber.
(See Recommendation 6.6.)

3.7 The toe of the south dike is soft and seepage is occurring (Pictures 1 and 2). This seep has increased in size, but the slope is stable. The plant should notify Fossil Engineering if the seep increases significantly in size.

3.8 The seepage originally flowed through several acres of cattails before entering Widows Creek. The several acres of cattails are now a beaver pond.

3.9 Lush grass cover has been established on the dike slopes.

4.0 Inactive Ash Pond Area Within Railroad Loop

This retired disposal site was last inspected in 1984. Since 1985 the outfall drainage ditches for storm water pass through the wetlands developed for DSN018 and the retention pond pump system for DSN019. This area will no longer be inspected as a waste disposal area.

5.0 Actions on Recommendations of Last Inspection

5.1 All the trees, bushes and/or vines were removed from the dikes between inspections, but this is a continuing maintenance problem.

5.2 The plant continues to keep engineering informed on the seepage from the scrubber ponds and the ash ponds.

5.3 The floating ash has been removed from the active ash pond.

5.4 The inside of the northeast dike of the limestone pond is being repaired.

6.0 Recommendations


6.1 The seepage in the ditch between the chemical pond dike and south access road should be monitored and any change reported to Fossil Engineering.

6.2 Small trees on the dikes should be removed by pulling them out by the roots to prevent regrowth.

6.3 The beavers have a dam built below the gypsum stacking pond east of Widows Creek Phase I. The water is backed to the pond dike and at this time no problem is noticeable. However, beavers have a habit of tunnelling into banks and this activity should be closely monitored and reported to Fossil Engineering.

K. W. Burnett
Page 5
August 10, 1993

- 6.4 The sluff or slide of the active ash pond needs to be repaired. The road will start deteriorating because of the constant standing water in the ditch.
- 6.5 The inside of the northeast dike of the limestone pond should continue to be repaired as needed to correct erosion. The plant should follow up on this to assure that Trans Ash completes the work.
- 6.6 The plant should follow up on this to assure that Trans Ash completes the work.


Joel D. Paris
Site Engineering
MR 3D-C

KWB:JDP:PHF
cc: R. L. Keyser, LP 2E-C (w/ drawings)
RIMS, MR 2F-C (Re: B65 910923 077)

1555J

PICTURES OF THE GYPSUM STACKING AREA



1. Seepage at the toe of the South dike. A strip 10 to 20 feet wide.

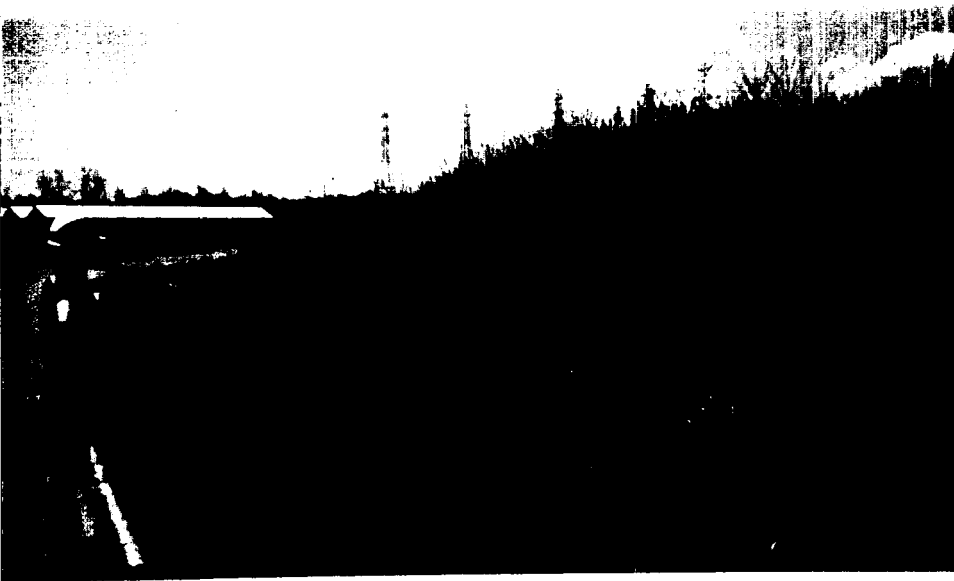


2. This is typical of the seepage area.



3. Discharge of the 6" underdrain pipes from Pond 1.

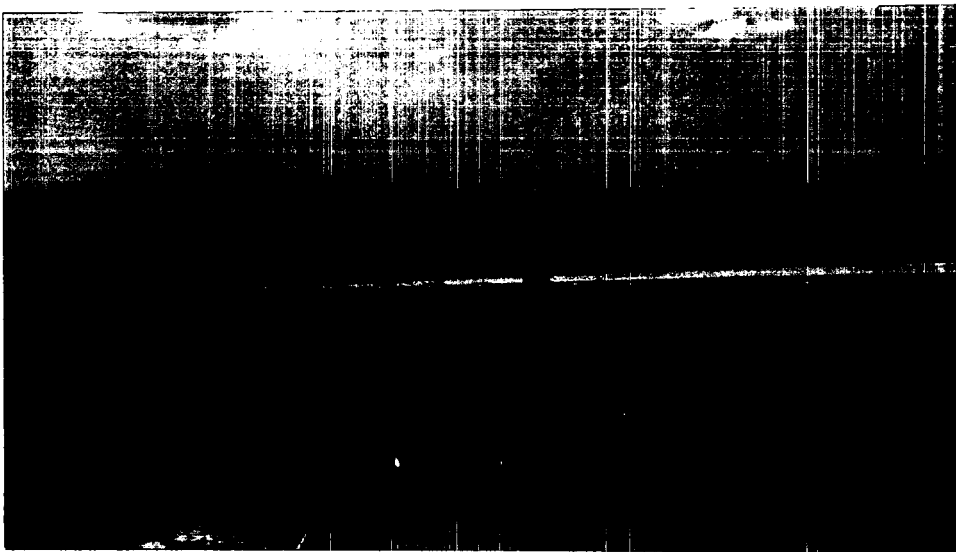
ACTIVE ASH POND



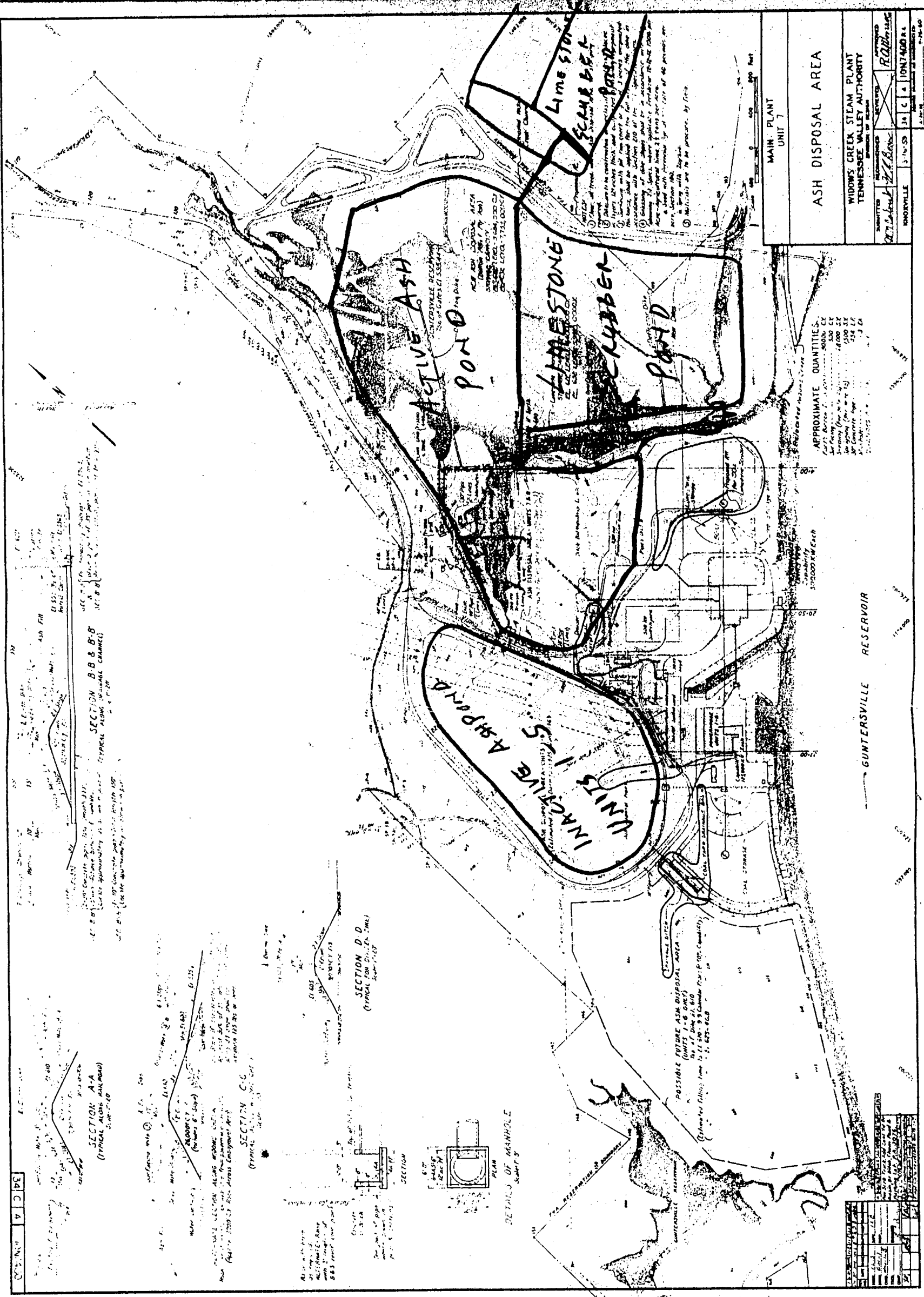
4. Sluff of dike adjacent to the chemical pond.



5. Flowing water from the slumped area.



6. Skimmer keeping floating ash from around the skimmers.



APPROXIMATE QUANTITIES

Unit 1-6	40000 CY
Unit 7	50000 CY
Unit 8	100000 CY
Unit 9	100000 CY
Unit 10	100000 CY
Unit 11	100000 CY
Unit 12	100000 CY
Unit 13	100000 CY
Unit 14	100000 CY
Unit 15	100000 CY
Unit 16	100000 CY
Unit 17	100000 CY
Unit 18	100000 CY
Unit 19	100000 CY
Unit 20	100000 CY

ASH DISPOSAL AREA

WIDOWS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY

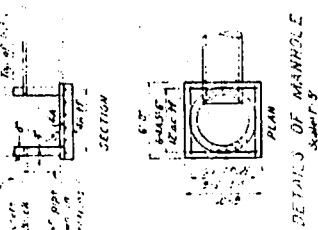
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NO. 19	30	10/17/60
NO. 20	30	10/17/60

SECTION A-A
(TYPICAL ALONG ROAD)

SECTION B-B & B'-B'
(TYPICAL ALONG CHANNEL)

SECTION C-C
(TYPICAL ALONG DRAINAGE)

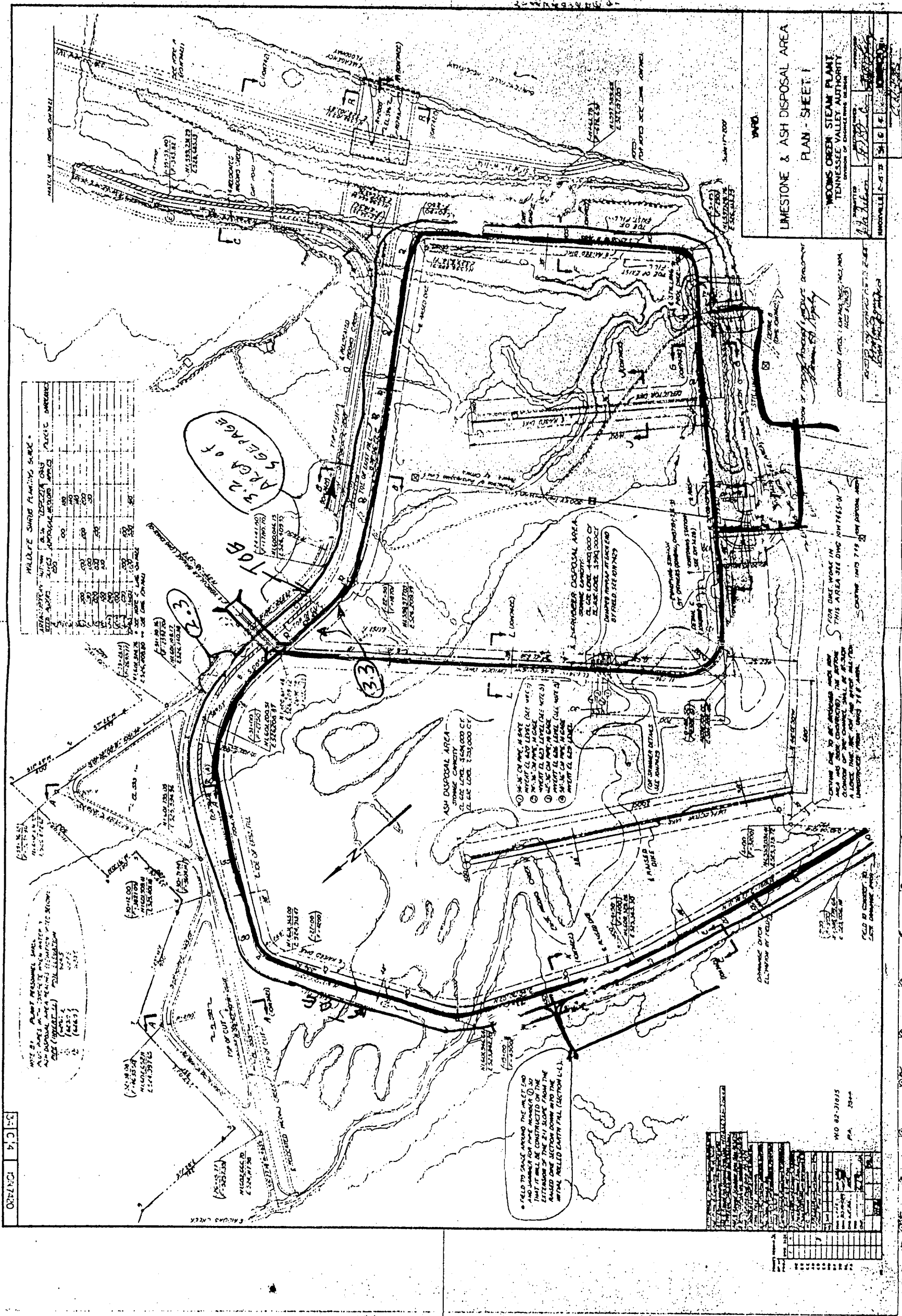
SECTION D-D
(TYPICAL FOR DRAINAGE)



POSSIBLE FUTURE ASH DISPOSAL AREA
(UNITS 1-6 ONLY)

GUNTERVILLE RESERVOIR

34 C A 10/17/60



MAJOR SHADES PLANNING SURVEY

AREA	AREA (AC)	AREA (SQ FT)	AREA (SQ YD)
1	100	6,969,600	100,000
2	100	6,969,600	100,000
3	100	6,969,600	100,000
4	100	6,969,600	100,000
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6	100	6,969,600	100,000
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SECTION 14 CONTRACT NO.

NO.	DESCRIPTION	DATE	BY
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WOODS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF DISSEMINATION OF INFORMATION

DATE: 12-15-78
SCALE: AS SHOWN
DRAWN BY: [Name]
CHECKED BY: [Name]

LIMESTONE & ASH DISPOSAL AREA
PLAN - SHEET 1

WOODS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF DISSEMINATION OF INFORMATION

WOODS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF DISSEMINATION OF INFORMATION

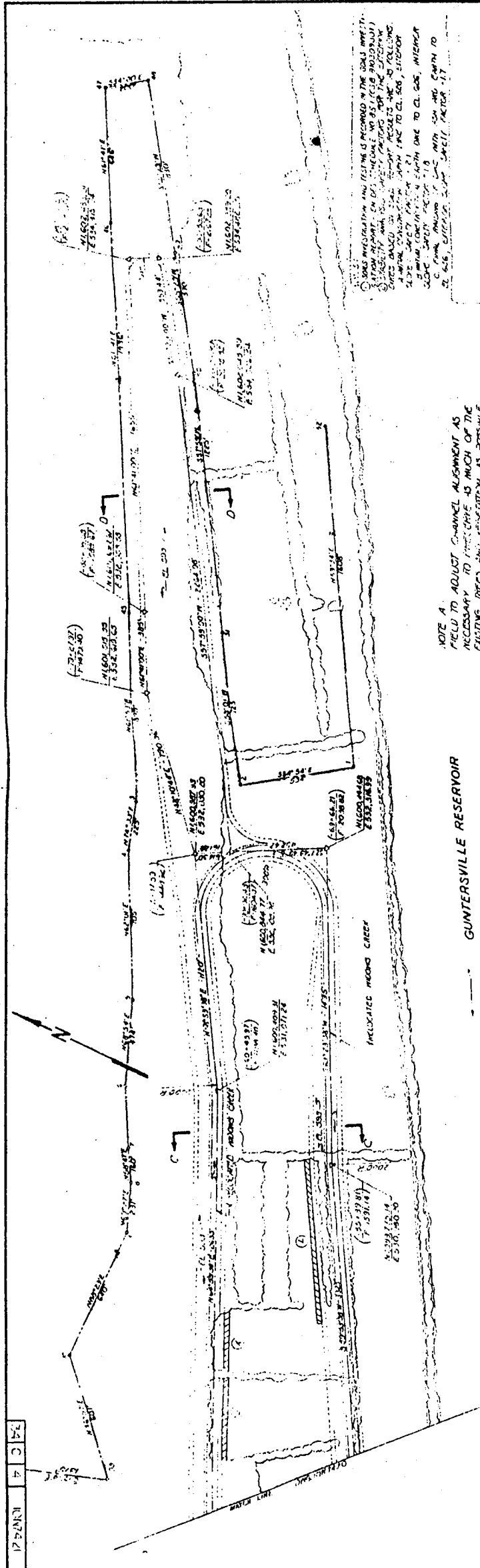
WOODS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF DISSEMINATION OF INFORMATION

WOODS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF DISSEMINATION OF INFORMATION

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TENNESSEE VALLEY AUTHORITY
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WOODS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF DISSEMINATION OF INFORMATION

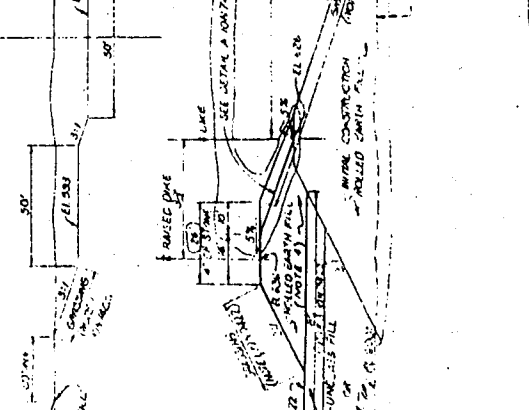
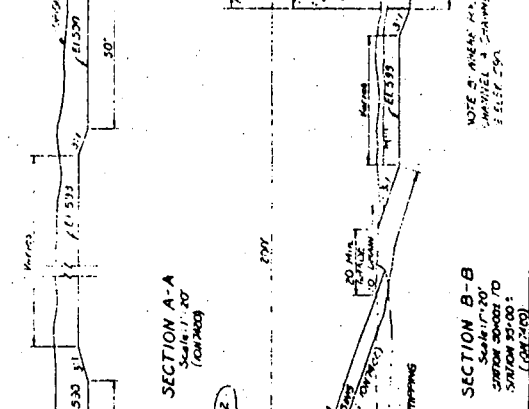
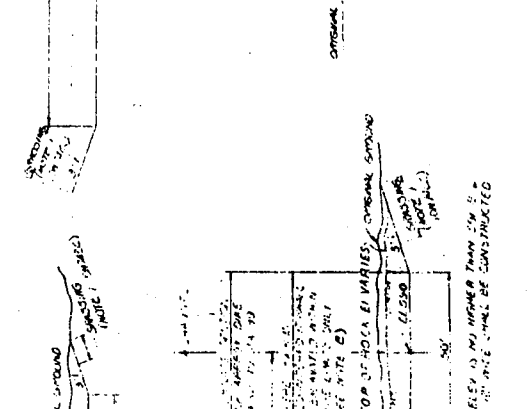
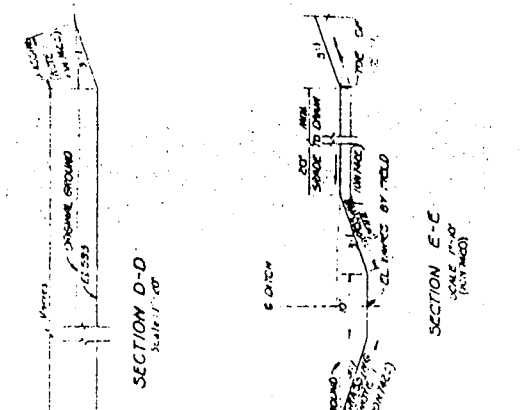
106216-
 9 APR 65
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NOTE A
 FIELD TO ADJUST CHANNEL ALIGNMENT AS NECESSARY TO PROVIDE AS MUCH OF THE EXISTING BEDS AND VEGETATION AS POSSIBLE.

GUNTERSVILLE RESERVOIR

1. SOIL INVESTIGATION AND TESTING IS REQUIRED IN THE SOILS IMPACTED BY THE PROPOSED DISPOSAL AREA. THE INVESTIGATION SHALL BE AT LEAST AS THOROUGH AS THAT REQUIRED BY THE FOLLOWING: (a) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (b) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (c) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (d) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (e) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (f) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (g) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (h) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (i) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (j) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (k) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (l) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (m) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (n) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (o) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (p) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (q) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (r) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (s) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (t) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (u) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (v) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (w) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (x) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (y) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515. (z) A MINIMUM OF 10 TESTS SHALL BE MADE TO DETERMINE THE SOIL TYPE AND TO CL. 505, 510 AND 515.



YARD
 LIMESTONE & ASH DISPOSAL AREA
 PLAN - SHEET 2

WIDOWS CREEK STEAM PLANT
 TENNESSEE VALLEY AUTHORITY
 DIVISION OF ENGINEERING DESIGN

APPROVED
 A. B. Helms
 REGISTERED PROFESSIONAL ENGINEER
 NO. 107928

KNOWLEDGE
 2 10 71
 14 C 1
 10N271.1

SCALE: 1:20 (Except as Noted)

NOTE: ANYWAY MAY BE ELEV. IS NO HIGHER THAN 210 IN CHANNEL. CHANNEL TO BE CONSTRUCTED TO ELEV. 250.

NOTE: ANYWAY MAY BE ELEV. IS NO HIGHER THAN 210 IN CHANNEL. CHANNEL TO BE CONSTRUCTED TO ELEV. 250.

SECTION A-A
 Scale 1:20
 (CONTR.)

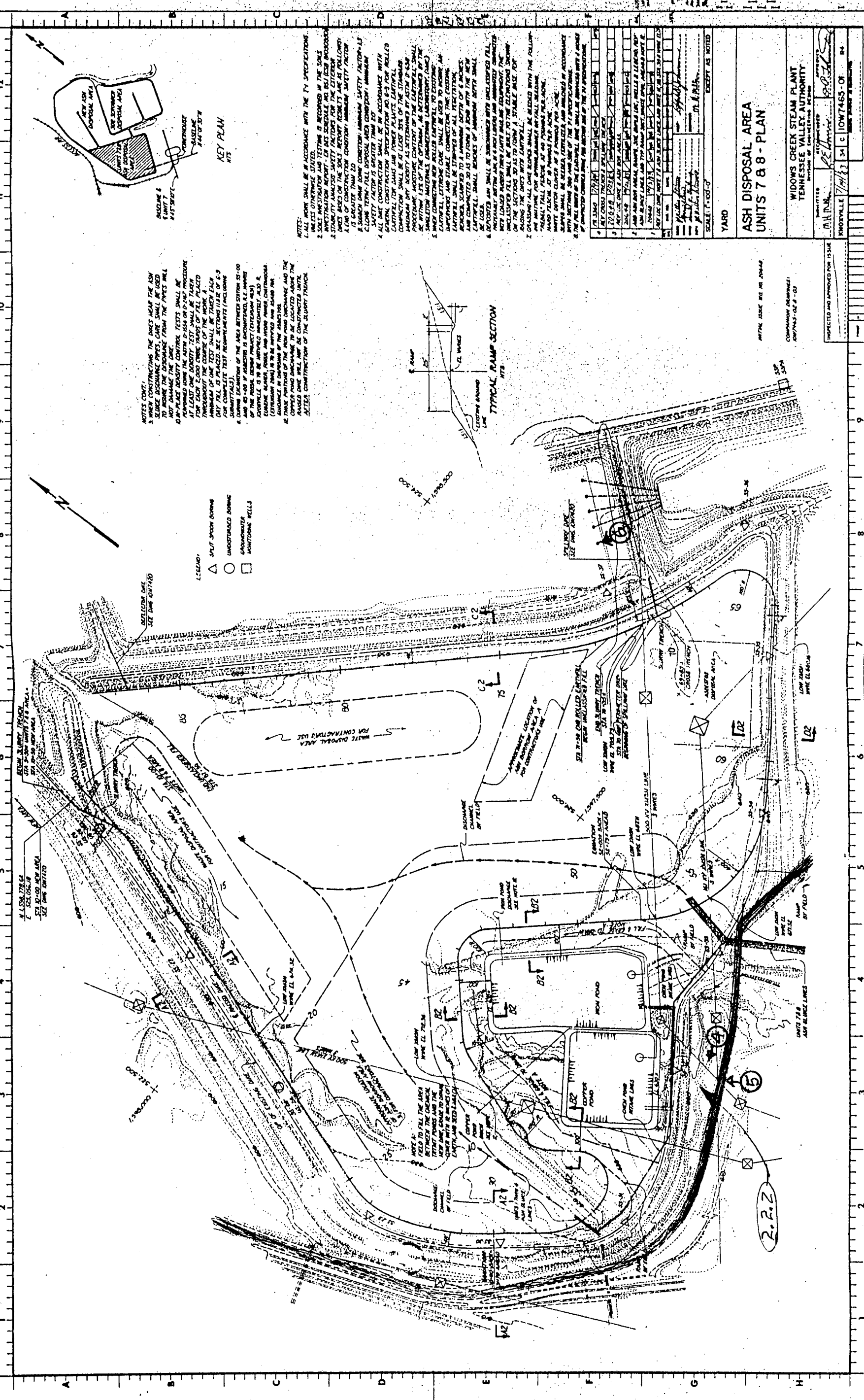
SECTION B-B
 Scale 1:20
 (CONTR.)

SECTION C-C
 Scale 1:20

SECTION D-D
 Scale 1:20

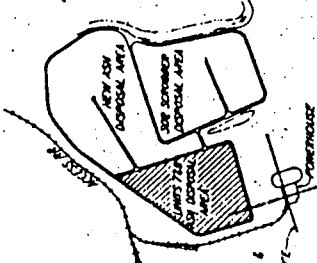
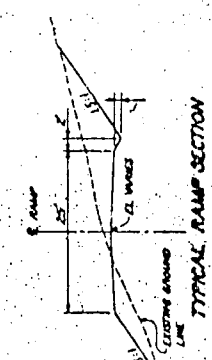
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2	CHECKED	11/10/64	A.B.H.	
3	APPROVED	11/10/64	A.B.H.	

W.D. 82-10633
 P.A. 2644



NOTES CONT.
 1. WHEN CONSTRUCTING THE DAMS NEAR THE ASH SLICE DISPOSAL AREA, CARE SHALL BE TAKEN TO PROTECT THE DAMS FROM THE PILES WILL NOT DAMAGE THE DAMS.
 2. ALL DAMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DESIGN AND CONSTRUCTION SPECIFICATIONS FOR DAMS AND SHALL BE DESIGNED TO WITHSTAND THE DESIGN LOADS.
 3. ALL DAMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DESIGN AND CONSTRUCTION SPECIFICATIONS FOR DAMS AND SHALL BE DESIGNED TO WITHSTAND THE DESIGN LOADS.
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 9. ALL DAMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DESIGN AND CONSTRUCTION SPECIFICATIONS FOR DAMS AND SHALL BE DESIGNED TO WITHSTAND THE DESIGN LOADS.
 10. ALL DAMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DESIGN AND CONSTRUCTION SPECIFICATIONS FOR DAMS AND SHALL BE DESIGNED TO WITHSTAND THE DESIGN LOADS.

- LEGEND:
- △ SPLIT SPREAD DOWNS
 - GROUNDWATER MONITORING WELLS
 - MONITORING WELLS



NOTES:
 1. ALL WORK SHALL BE IN ACCORDANCE WITH THE TV SPECIFICATIONS UNLESS OTHERWISE STATED.
 2. SOIL INVESTIGATION AND TESTING IS REQUIRED IN THE SOILS TO BE CONSTRUCTED ON AND THE RESULTS SHALL BE FURNISHED TO THE ENGINEER.
 3. STABILITY ANALYSIS SHALL BE PERFORMED FOR THE EXISTING AND PROPOSED SLOPES AND THE RESULTS SHALL BE FURNISHED TO THE ENGINEER.
 4. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE DESIGN AND CONSTRUCTION SPECIFICATIONS FOR DAMS AND SHALL BE DESIGNED TO WITHSTAND THE DESIGN LOADS.
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 10. ALL DAMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DESIGN AND CONSTRUCTION SPECIFICATIONS FOR DAMS AND SHALL BE DESIGNED TO WITHSTAND THE DESIGN LOADS.

NO.	DESCRIPTION	DATE	BY	CHECKED
1	REVISED TO SHOW THE RESULTS OF THE SOIL INVESTIGATION AND TESTING.	10/1/74	J. H. HARRIS	M. J. HARRIS
2	REVISED TO SHOW THE RESULTS OF THE STABILITY ANALYSIS.	10/1/74	J. H. HARRIS	M. J. HARRIS
3	REVISED TO SHOW THE RESULTS OF THE DESIGN AND CONSTRUCTION SPECIFICATIONS FOR DAMS.	10/1/74	J. H. HARRIS	M. J. HARRIS
4	REVISED TO SHOW THE RESULTS OF THE DESIGN AND CONSTRUCTION SPECIFICATIONS FOR DAMS.	10/1/74	J. H. HARRIS	M. J. HARRIS
5	REVISED TO SHOW THE RESULTS OF THE DESIGN AND CONSTRUCTION SPECIFICATIONS FOR DAMS.	10/1/74	J. H. HARRIS	M. J. HARRIS
6	REVISED TO SHOW THE RESULTS OF THE DESIGN AND CONSTRUCTION SPECIFICATIONS FOR DAMS.	10/1/74	J. H. HARRIS	M. J. HARRIS
7	REVISED TO SHOW THE RESULTS OF THE DESIGN AND CONSTRUCTION SPECIFICATIONS FOR DAMS.	10/1/74	J. H. HARRIS	M. J. HARRIS
8	REVISED TO SHOW THE RESULTS OF THE DESIGN AND CONSTRUCTION SPECIFICATIONS FOR DAMS.	10/1/74	J. H. HARRIS	M. J. HARRIS
9	REVISED TO SHOW THE RESULTS OF THE DESIGN AND CONSTRUCTION SPECIFICATIONS FOR DAMS.	10/1/74	J. H. HARRIS	M. J. HARRIS
10	REVISED TO SHOW THE RESULTS OF THE DESIGN AND CONSTRUCTION SPECIFICATIONS FOR DAMS.	10/1/74	J. H. HARRIS	M. J. HARRIS

ASH DISPOSAL AREA
 UNITS 7 & 8 - PLAN

WIDOWS CREEK STEAM PLANT
 TENNESSEE VALLEY AUTHORITY
 DIVISION OF ENGINEERING
 MEMPHIS, TENNESSEE
 PROJECT NO. 10W7465-01
 SHEET NO. 34 C

SCALE: 1" = 100'-0"
 YARD
 EXCEPT AS NOTED

REVISIONS:
 1. REVISED TO SHOW THE RESULTS OF THE SOIL INVESTIGATION AND TESTING.
 2. REVISED TO SHOW THE RESULTS OF THE STABILITY ANALYSIS.
 3. REVISED TO SHOW THE RESULTS OF THE DESIGN AND CONSTRUCTION SPECIFICATIONS FOR DAMS.

DATE: 10/1/74
 DRAWN BY: J. H. HARRIS
 CHECKED BY: M. J. HARRIS

PROJECTED AND APPROVED FOR: J. H. HARRIS
 DATE: 10/1/74

COMPANION DRAWINGS:
 10W7465-02, 03

2. P. 2

July 11, 1994

T. W. Williams, Widows Creek Fossil Plant

WIDOWS CREEK FOSSIL PLANT (WCF) - INSPECTION OF WASTE DISPOSAL AREAS

Attached is a report from C. L. Mount to K. W. Burnett dated July 11, 1994, concerning the inspection of WCF's waste disposal areas.

This report includes recommendations for corrective work. I concur with these recommendations.



Ralph G. Johnson
Manager, Fossil Engineering
LP 2G-C

KWB, CLM:RJB

cc (Attachment):

R. L. Keyser, LP 5G-C
RIMS, CST 13B-C

0601D

July 11, 1994

K. W. Burnett, LP 2G-C

WIDOWS CREEK FOSSIL PLANT- ANNUAL FOSSIL ENGINEERING INSPECTION OF
WASTE DISPOSAL AREAS

1.0 General

1.1 This inspection of the waste disposal areas was conducted on April 29, 1994 by the following personnel:

M. A. Hedgecoth, Fossil Fuels
G. L. Massey, WCF- Mechanical Engineer
C. L. Mount, Fossil Engineering
R. D. Powell, Fossil Engineering

1.2 The last inspection was made on April 12, 1993 (B65 930805 206).

1.3 The areas inspected are shown on Drawings 10N7400, 10N7420, 10N7421, 10W7465-01, 10W215-04, 10W215-04, and 10W216-01.

1.4 This was a visual inspection to appraise the condition of the waste disposal areas and their associated dikes and drainage features.

2.0 Active Ash Pond and Related Dikes (Drawing 10W7465-01)

2.1 All ash continues to be sluiced into this pond, and there has been no change in operation since the last inspection.

2.2 Redwater seepage from the western portion of this area drains into the ditch between the toe of the dike and the plant access road, and then flows along the toe of the dike and into a detention pond on the north side of this area (see section 8.1). Water is pumped from the detention pond into the ash pond.

2.2.1 The most apparent area of seepage is located along the dike south of the copper chemical treatment pond. A visible flow of water was observed in this area (see section 8.2 and

picture 1).

- 2.2.2 There is an old sluff or failure above and extending east from the major seepage area noted in section 2.2.1 that has been grown over with vegetation (see section 8.3).
 - 2.3 Redwater seepage from the eastern portion of this area drains into the relocated Widows Creek channel. During past inspections, an area of seepage was identified located approximately 150 to 300 feet upstream (north) of the bridge over Widows Creek. No seepage flow was observed during this inspection (see section 8.2).
 - 2.4 The dikes for this area appear to be in generally good condition. The tops of the dikes are sloped to the inside and have a good crushed stone surface. The dike slopes have a good vegetative cover.
 - 2.5 Some floating ash was observed in the area north of the spillway outlets (see section 8.4).
 - 2.6 Some small trees and heavy brush were observed on the slopes of the dikes of this area (see section 8.5).
 - 2.7 A small area of sluffing was observed on the west end of the divider dike on its north side (see section 8.3 and picture 2).
 - 2.8 During a period of heavy rainfall, a slide occurred in the south slope of the access road extension that runs along the north side of the redwater containment pond (see section 8.6 and picture 3). Also noted during the inspection of the slide area were large cracks running along the top of the north slope of the embankment for the access railroad (see section 8.5).
- 3.0 Scrubber Waster Disposal Areas
- 3.1 Inactive Scrubber Pond West of Widows Creek (Drawing 10N7420)
 - 3.1.1 Sluicing of scrubber waste to this area was discontinued in February 1986, when the Phase I Gypsum Stacking Area east of Widows Creek was placed in operation. The area was reactivated for a brief period in the summer of 1991 while remediation work was being performed in the Gypsum Stacking Area.

- 3.1.2 The dikes for this area appear to be in generally good condition with no sign of instability. However, the areas of seepage located downstream (south) of the bridge, and identified during past inspections, should continue to be monitored (see section 8.2).
 - 3.1.3 The tops of the dikes are sloped to the inside and have a good crushed stone surface. The dike slopes have a good vegetative cover, however some small trees and heavy brush were observed (see section 8.5).
- 3.2 Gypsum Stacking Area East of Widows Creek (Drawings 10W215-04 and 10W216-01)
- 3.2.1 Management of the gypsum stacking areas is currently contracted to Trans-Ash of Cincinnati, Ohio to develop and operate them utilizing the rim ditch wet stacking method.
 - 3.2.2 The Phase I area was placed in operation in February 1986, however, it was not initially operated by the rim ditch method. During the summer of 1991, Trans-Ash, under contract with TVA, performed the remediation work required to convert this area to the rim ditch method of operation.
 - 3.2.2.1 The perimeter dikes of this area appear to be in good condition with no signs of instability. The tops of the dikes are sloped to the inside and generally have a good crushed stone surface. The dike slopes have a good vegetative cover.
 - 3.2.2.2 The exterior slopes of the gypsum stack are being covered with earth and seeded as the stack is raised. These slopes appear to be stable and have a good vegetative cover.
 - 3.2.2.3 In the southwest corner of this area, surface wetness was observed at the toe of the gypsum stack above the perimeter ditch. Erosion of the gypsum waste and the earth cover is blocking flow in the

perimeter ditch and causing standing water (see section 8.8). A small area had no earth cover over the gypsum waster material (see section 8.9 and picture 5).

3.2.2.4 An area of sluffing was observed on the south end the dike separating the stilling pond (pond 3) from the gypsum stacking area (see section 8.3 and picture 6).

3.2.2.5 A beaver dam has been constructed across the channel that discharges into Widows Creek from the low wetlands area south of the south dike of the Phase I Gypsum Stacking Area. This has caused water to back up to the toe of the dike (see picture 4). This condition does not appear to be significantly affecting the stability of the dike at this time; there has been no sluffing or apparent movement of earthfill along this dike (see section 8.10). Some seepage appears to be occurring along this dike.

3.2.3 Construction of the Phase 2 area was completed in the fall of 1992. Trans-Ash is presently developing this area for the rim ditch method of operation.

3.2.3.1 The gypsum waste is sluiced into the southwest corner of this area and an interior dike has been constructed with the gypsum material channeling the flow of the sluice water north and then east along the north dike.

3.2.3.2 The perimeter dikes of this area appear to be in good condition with no signs of instability. The tops of the dikes are sloped to the inside and have a good crushed stone surface. The dike slopes have a good vegetative cover.

4.0 Inactive Ash Pond Area Within Railroad Loop

4.1 This retired disposal site was last inspected in 1984. Since 1985 the outfall drainage ditches for storm water pass through the wetlands developed for DSN018 and the retention pond pump system for DSN019. This area will no

longer be inspected as a waste disposal area.

5.0 Chemical Treatment Pond

- 5.1 The chemical treatment ponds (iron and copper) are located in the southwest portion of the active ash pond. These ponds are enclosed by the active ash pond dikes and appear to be in generally good condition.
- 5.2 All discharges from these ponds are pumped to the active ash pond.

6.0 Coal Yard Drainage Basin

- 6.1 The coal yard drainage basin is located at the northwest corner of the coal pile. The dikes appear to be in good condition.
- 6.2 All discharges from this pond are pumped to the active ash pond.

7.0 Actions on Recommendations of Last Inspection

- 7.1 The plant continues to keep Fossil Engineering informed on the seepage from the scrubber ponds and the ash ponds (see section 8.2).
- 7.2 Some small trees were observed to be growing on the slopes of the dikes of the active ash pond and the scrubber pond (see section 8.5).
- 7.3 Due to the presence of beavers, the area below the Phase 1 gypsum stacking pond east of Widows Creek has been monitored by plant personnel. No problems have been reported to Fossil Engineering (see section 8.10).
- 7.4 The sluff in the active ash pond dike west of the sluice pipes of Unit 7 and 8 has not been repaired. There has been no apparent recent movement of earthfill in this area (see section 8.3).
- 7.5 The inside of the northeast dike of the limestone pond has been repaired by Trans Ash to correct the erosion problem.
- 7.6 The bare area of gypsum waste in the exterior slope of the southwest corner of the Phase 1 area and the surface wetness around it are still present (see sections 8.8 and 8.9).

8.0 Recommendations

- 8.1 Plant personnel should maintain the ditch around the exterior toe of slope of the west end of the active ash pond in a clear and free flowing condition.
- 8.2 Plant personnel should periodically inspect all known areas of dike seepage. If any significant changes are noted, such as an increase in flow or movement of earthfill, Fossil Engineering in Chattanooga should be notified immediately.
- 8.3 Plant personnel should make periodic observations of all containment dikes on the plant reservation. Small areas of surface sluffing should be repaired; if any significant slides are observed, Fossil Engineering should be notified immediately.
- 8.4 Plant personnel should continue to remove the floating ash from the surface of the ash pond.
- 8.5 Plant personnel should continue to remove the trees and heavy brush from above the toe of slope of all containment dikes.
- 8.6 Subsequent to this inspection, Fossil Engineering provided G.L. Massey of the plant staff a sketch showing the proposed repair scheme for the slide in the south slope of the access road extension. The required repairs have since been completed.
- 8.7 Plant personnel should periodically observe the cracks along the top of the north slope of the embankment for the access railroad where it is adjacent to the access road extension. If any significant slides occur in this area, Fossil Engineering should be notified immediately.
- 8.8 Trans-Ash personnel should maintain the perimeter ditch around the toe of the gypsum stack in a clear and free flowing condition.
- 8.9 Trans-Ash personnel should replace and compact the earth cover and establish vegetative growth over any bare areas that develop in the exterior slopes of the gypsum stack.
- 8.10 We do not recommend that the beaver dam be removed at this time. However, both Trans-Ash and plant personnel should periodically observe the south dike for any sign of movement of earthfill or for evidence of beaver

K. W. Burnett
Page 7
July 11, 1994

tunneling into the toe of the dike along the edge of the water surface. Fossil Engineering should be notified immediately if either of these conditions should be observed.

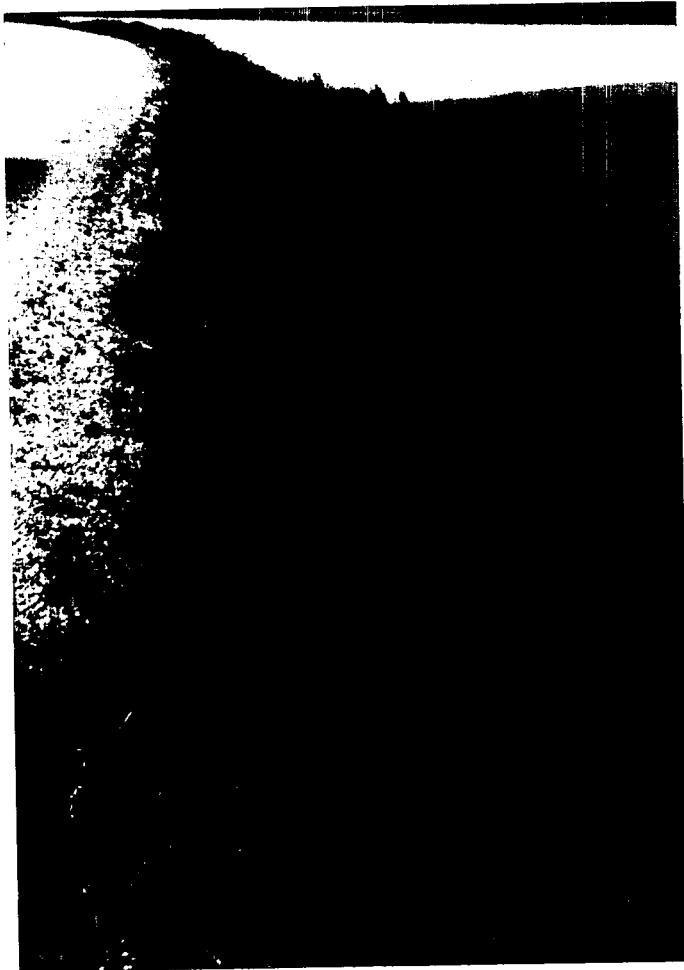


C. L. Mount
Site Engineering

CLM:clm
Attachments



1. Redwater seepage between the chemical pond dike and the south access road.



2. Sluff of dike on west end of the divider dike.



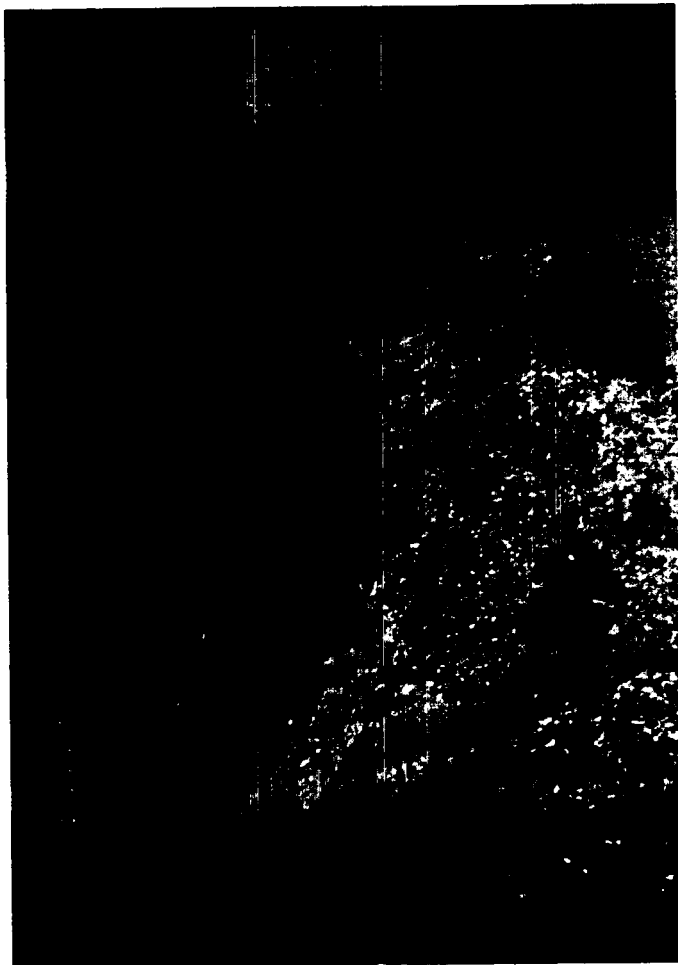
3. Slide on north side of redwater containment pond.



4. Beaver pond that backs up to the toe of the dike.



5. Fly ash which appears to be separating from the gypsum.



6. Sliding on the southeast dike of Pond 3.

BKE

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April 11, 1995

D. W. Howell, Widows Creek Fossil Plant

WIDOWS CREEK FOSSIL PLANT (WCF) - INSPECTION OF WASTE DISPOSAL
AREAS

Attached is a report from B. K. Elder to K. W. Burnett dated April 10, 1995, concerning the inspection of WCF's waste disposal areas.

This report includes recommendations for corrective work. I concur with these recommendations.



Ralph G. Johnson
Manager, Fossil Engineering
LP 2G-C

KWB:BKE:ER

Attachment

cc (Attachment):

J. S. Baugh, LP 5G-C
RIMS, CST 13B-C

c:\wcfir

April 11, 1995

K. W. Burnett, LP 2G - C

WIDOWS CREEK FOSSIL PLANT - INSPECTION OF THE WASTE DISPOSAL AREAS

1.0 General

- 1.1 This inspection of the waste disposal areas was conducted on March 24, 1995.
- 1.2 The last inspection was conducted on April 29, 1994.
- 1.3 This was a joint inspection by representatives of Fossil Fuels and Fossil Engineering (FE). The inspection was performed by M. A. Hedgecoth, Fossil Fuels; A. J. Fourroux, Fossil Fuels; R. D. Powell, FE; and B. K. Elder, FE.
- 1.4 Our findings during this inspection were not discussed with plant personnel the day of the inspection due to completion late in the day. Missy Hedgecoth agreed to discuss the findings with them at a scheduled meeting on April 28, 1995.
- 1.5 The areas referenced in the report are shown on the attached drawing prints 10N7400, 10N7420, 10W7465-01, 10W215-04, and 10W216-01.

2.0 Active Ash Pond and Related Dikes (Drawing 10W7465-01)

Bottom ash and fly ash are sluiced into the south end of this pond. The bottom ash is being worked with a bulldozer and a pan at the sluice pipe outlet. Sluice water flows northeast into the active ash pond, around the divider dike, and southwest to the spillways. The spillways drain into a stilling pond which eventually discharges into Guntersville Lake.

2.1 Changes in the Dikes Since Last Inspection

- 2.1.1 Redwater continues to seep from the western portion of this area into a drainage ditch between the toe of the dike and the plant access road. The ditch drains the redwater into a detention pond north of the area. Water from the detention pond is pumped into the active ash pond. The dike south of the copper chemical treatment pond continues to be the most prominent area of seepage (See Figure 1 and Recommendation 9.1).

- 2.1.2 Redwater seepage also exists on the eastern portion of this area and drains into the relocated Widows Creek channel. Past inspections have noted an area of seepage approximately 150 to 300 feet upstream of the bridge over Widows Creek. No visible seepage was noted during this inspection.
- 2.1.3 Several areas of localized sluffing were found on the dike separating the active ash pond from the inactive scrubber waste disposal area. (See Figure 2 and Recommendation 9.2)
- 2.1.4 The surface of the roads on the dikes were in good condition. A few areas of rutting were noted, but plant personnel had covered several areas with bottom ash which provided a stable driving surface.
- 2.1.5 A slide area was noted during the last inspection on the south slope of the access road extension dike which runs north of the redwater retention pond. The area has been repaired with riprap and is in good condition. (See Figure 3) Cracking along the top slope of the embankment for the railroad north of this area was also observed during the last inspection. This slope has also been covered with riprap and is in good condition.

2.2 Changes in Operations Since Last Inspection

- 2.2.1 The water level in the active ash pond was being raised by two feet at the time of the inspection. This will increase the capacity of the pond, which has decreased due to ash accumulation in the northern portion of the pond.
- 2.2.2 A large area of cenospheres were gathered behind the skimmer structure for the active ash pond spillways. These were being removed by Sphere Services for use in their products as part of a TVA waste product marketing strategy.
- 2.2.3 Bottom ash continues to be worked at the outfall of the ash sluice pipes with a dozer and pan. Personnel were doing an excellent job of keeping the ash sluice channel clear and of spreading the ash evenly.

3.0 Inactive Scrubber Pond West of Widows Creek (Drawing 10N7420)

Sluicing of scrubber waste to this area was discontinued in February 1986 when the Phase I Gypsum Stacking Area east of Widows Creek was placed in operation. The area was reactivated for a brief period in the summer of 1991 while remediation work was being performed in the Gypsum Stacking Area.

3.1 Changes in the Dikes Since Last Inspection

- 3.1.1 Previous inspections have noted a small amount of seepage approximately 300 yards south of the vehicular bridge over Widows Creek. The seepage was noted again during this inspection, but posed no visible structural threat to the integrity of the dike.
- 3.1.2 Several small trees and areas of thick brush were found on the outer slope above the berm on the eastern dike in this area. (See Figure 4 and Recommendation 9.3) Otherwise, the exterior slopes have an excellent vegetative cover.
- 3.1.3 The surface of the road on the dikes in this area was in good condition with a cover of crushed stone and a slope to the interior.

3.2 Changes in Operations Since Last Inspection

- 3.2.1 The pond is still inactive with a level pool that is maintained at the same elevation as the active ash pond via equalizing pipes through the dike that separates the two areas. As the active ash pond elevation is raised by two feet, the water surface of this area will also increase two feet.

4.0 Gypsum Stacking Area East of Widows Creek (Drawings 10W215-04 & 10W216-01)

Management of the gypsum stacking areas is currently contracted to Trans-Ash of Ohio. Trans-Ash utilizes the rim ditch wet stacking method to handle the waste in this area. The Phase I area was placed in operation in February 1986, but it was not initially operated with the rim ditch method. Trans-Ash performed the remediation work required to convert operations in this area to the rim ditch method in the summer of 1991 and began utilizing this method thereafter. Scrubber waste is sluiced into the area, and the water is discharged into a stilling pool west of the area where it enters a gravity drain culvert. The culvert drains into a channel southeast of the inactive scrubber pond which discharges into the abandoned Widows Creek Channel.

4.1 Changes in the Dikes Since Last Inspection

- 4.1.1 The perimeter dikes are in good condition with no signs of instability. The outer slopes have an excellent vegetative cover. The tops of the dikes have a good crushed stone surface.

- 4.1.2 The exterior slopes of the Phase I gypsum stack are being covered with earth and seeded as the stack progresses. The slopes are in good condition with a well-developed vegetative cover.
- 4.1.3 The previous inspection revealed an area in the southeast corner of the Phase I stack where gypsum material was seeping through the toe of the dike. Trans-Ash personnel have installed French drains and covered the area with a layer of earth. This remediation has relieved the problem, but a small area just to the west of the repaired area that is approximately 300 feet long remains to be covered. Trans-Ash will complete this work this fiscal year. (See Recommendation 9.4)
- 4.1.4 The perimeter ditch between the Phase I stack and the road is overgrown with cattail plants. (See Figure 5 and Recommendation 9.5)
- 4.1.5 Areas in the northwest and southeast corners of the Phase I stack are devoid of earth cover and the gypsum material is eroding into the perimeter ditch. (See Recommendation 9.6)

4.2 Changes in Operations Since Last Inspection

- 4.2.1 During the last inspection, scrubber waste was being sluiced into the southwest corner of the Phase II area and was being directed north and east by an interior dike. This operation has not changed.
- 4.2.2 Trans-Ash personnel were in the process of installing a new decanting structure closer to the center of the Phase I stack and just west of the existing decanting structure so that material can again be sluiced into the Phase I area.

5.0 Inactive Ash Pond Area Within Railroad Loop

- 5.1 This disposal site is no longer in use and was last inspected in 1984. Since 1985 a portion of the outfall drainage ditches for storm water discharge through the manmade wetlands and out a permitted discharge (currently DSN018) south of the area. The remainder of the storm water discharges into the retention pond pump system north of the area and is pumped back into the active ash pond. Emergency overflow from this area is discharged through a permitted discharge (currently DSN019) into Widows Creek.

- 5.2 This area is currently under study as a possible dredge cell area in the future. The area will continue to be monitored, and inspections will resume if the area is reactivated.

6.0 Chemical Treatment Ponds

- 6.1 The iron and copper chemical treatment ponds are located in the southwest corner of the active ash pond area. Both ponds had an excellent riprap cover on their inner slopes.
- 6.2 The discharge pipes from these ponds empty into the active ash pond area. The pipes appeared to be clear of debris and in good condition.

7.0 Coal Yard Drainage Basin

- 7.1 The coal yard drainage basin is located west of the plant adjacent to the coal yard. The dikes around the basin are in good condition with a good cover of vegetation.
- 7.2 Discharge from this pond is pumped into the active ash pond. From a visual inspection, the pipes and pumps appeared to be in good condition.

8.0 Condition of Spillways, Skimmers, and Outlets

- 8.1 The spillways in the active ash pond were being raised by 2 feet at the time of the inspection. The outlets are submerged and lead into the stilling pool south of the pond. Due to construction, these spillways could not be inspected.
- 8.2 The spillways in the active ash pond stilling pond were in good condition, and their skimmers were free of any debris. The overflow pipes in the secondary stilling pool were in good condition with no blockage.
- 8.3 The gravity drain leading from the gypsum stacking area stilling pool had a steady flow of water throughout. The pipe was checked at an intermediate manhole and was clear of debris. The outlet pipe for the drain was clear of obstruction. The open channel that carries the discharge from the drain was in excellent condition. A few areas of vegetative growth (mainly cattails) were found in the channel, but they were not causing any noticeable impediment to the flow. (See Figure 6)
- 8.4 All spillways and skimmers in the gypsum stacking area were in good working condition. There was a layer of floating ash present in the active sluice area

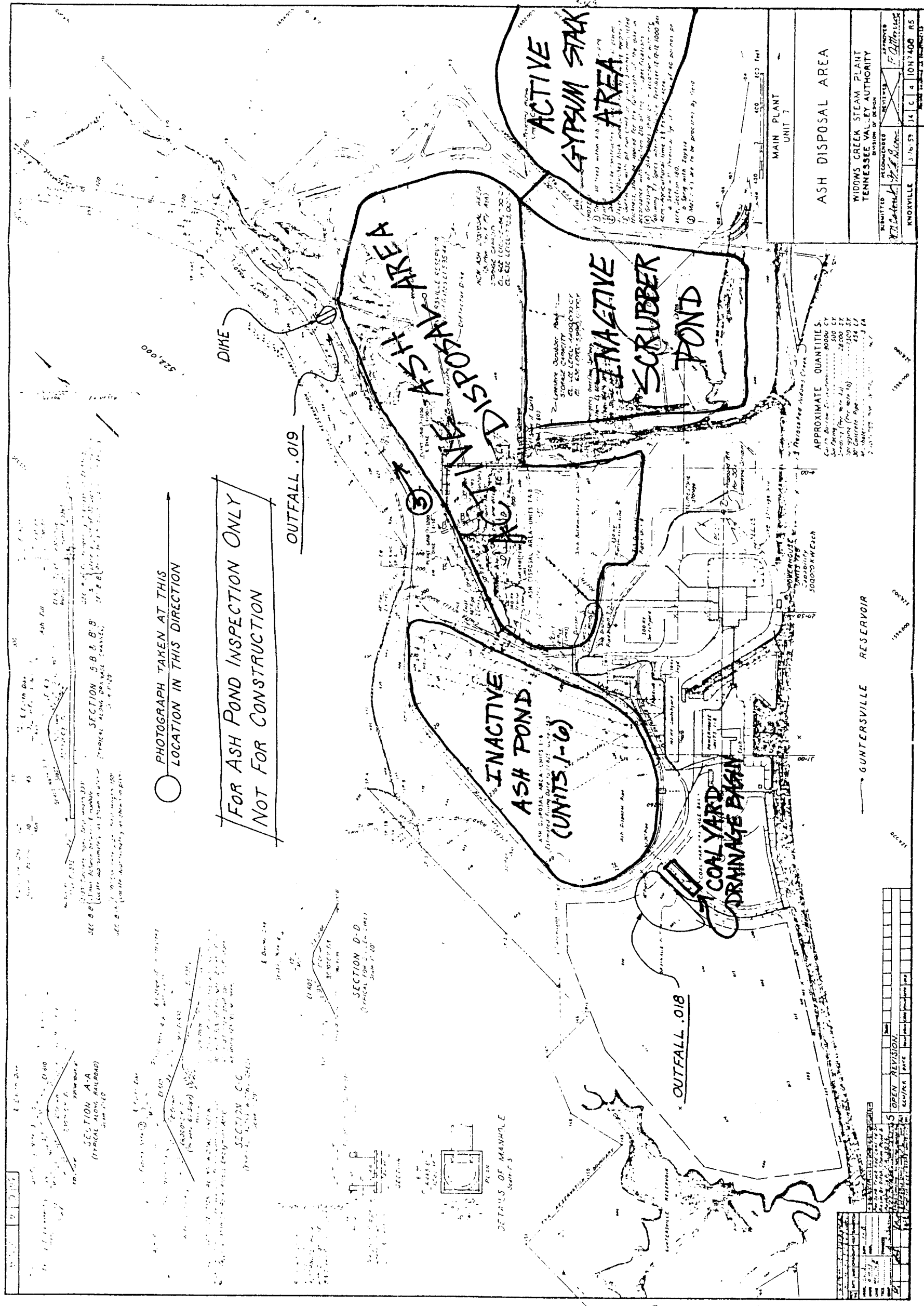
(north of pond 2), but this layer was contained by the skimmer device and no noticeable amount was present in the discharge into pond 2. The spillway for pond 3 (the stilling pool for this area) appeared in good working order with no floating ash or material present.

9.0 Recommendations

- 9.1 Plant personnel should continue to monitor the known areas of seepage. Any increase in flow or earthfill movements should be reported to Fossil Engineering immediately. (See sections 2.1.1, 2.1.2, and 4.1.3)
- 9.2 All dikes should be periodically inspected by plant personnel for sluffing. The areas mentioned in this report (section 2.1.3) and any new areas should be repaired by stabilizing the damaged slope with earth material. Critical areas should be stabilized with riprap. Fossil Engineering should be notified if any significant slides are noticed.
- 9.3 Any trees or thick brush located on the upper exterior slope of the dikes should be removed by pulling to ensure that the root system is also removed. (See section 3.1.2)
- 9.4 Trans-Ash personnel should continue the repairs to the toe of the Phase I gypsum stack. All exposed earth areas should be seeded to prevent erosion. (See section 4.1.3)
- 9.5 Cut and remove the cat-tail plants from the perimeter ditch around the Phase I gypsum stack to prevent poor drainage conditions. (See section 4.1.4)
- 9.6 Cover the exposed gypsum areas in the northwest and southeast corners of the Phase I stack with earth. Clean the ditches of the gypsum material and place the material back in the stack. (See section 4.1.5)



B. Keith Elder
Civil Engineer, Site and Environmental Engineering
LP 2G - C



○ PHOTOGRAPH TAKEN AT THIS LOCATION IN THIS DIRECTION

FOR ASH POND INSPECTION ONLY
NOT FOR CONSTRUCTION

APPROXIMATE QUANTITIES

Coal Yard Drainage Basin	40000 CY
Inert Scrubber Pond	40000 CY
Storage Capacity	28000 CY
Spilling (Per Site 10)	1200 CY
Concrete Area	254 SF
Water	3.24

ASH DISPOSAL AREA

MAIN PLANT UNIT 7

MIDDOWS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF DESIGN

APPROVED	DATE
REVISIONS	
NO. 1	10/17/55
NO. 2	10/17/55
NO. 3	10/17/55
NO. 4	10/17/55
NO. 5	10/17/55
NO. 6	10/17/55
NO. 7	10/17/55
NO. 8	10/17/55
NO. 9	10/17/55
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NO. 27	10/17/55
NO. 28	10/17/55
NO. 29	10/17/55
NO. 30	10/17/55

GUNTERVILLE RESERVOIR

NO.	DATE	BY	CHKD.	REVISION
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SECTION A-A (TYPICAL ALONG RAILROAD) DIM 1-45

SECTION B-B & B'B' (TYPICAL ALONG DIKE) DIM 1-45

SECTION C-C (TYPICAL ALONG DIKE) DIM 1-45

SECTION D-D (TYPICAL FOR W/CH. DIM) DIM 1-45

PHOTOGRAPH TAKEN AT THIS LOCATION IN THIS DIRECTION

FOR ASH POND INSPECTION ONLY
NOT FOR CONSTRUCTION

OUTFALL .019

OUTFALL .018

DIKE

ACTIVE ASH AREA

INACTIVE ASH POND (UNITS 1-6)

INACTIVE SCRUBBER POND

ACTIVE GYPSUM STACK AREA

COAL YARD DRAINAGE BASIN

GUNTERVILLE RESERVOIR

ASH DISPOSAL AREA

MAIN PLANT UNIT 7

MIDDOWS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY
DIVISION OF DESIGN

APPROXIMATE QUANTITIES

NO. 1 10/17/55

NO. 2 10/17/55

NO. 3 10/17/55

NO. 4 10/17/55

NO. 5 10/17/55

NO. 6 10/17/55

NO. 7 10/17/55

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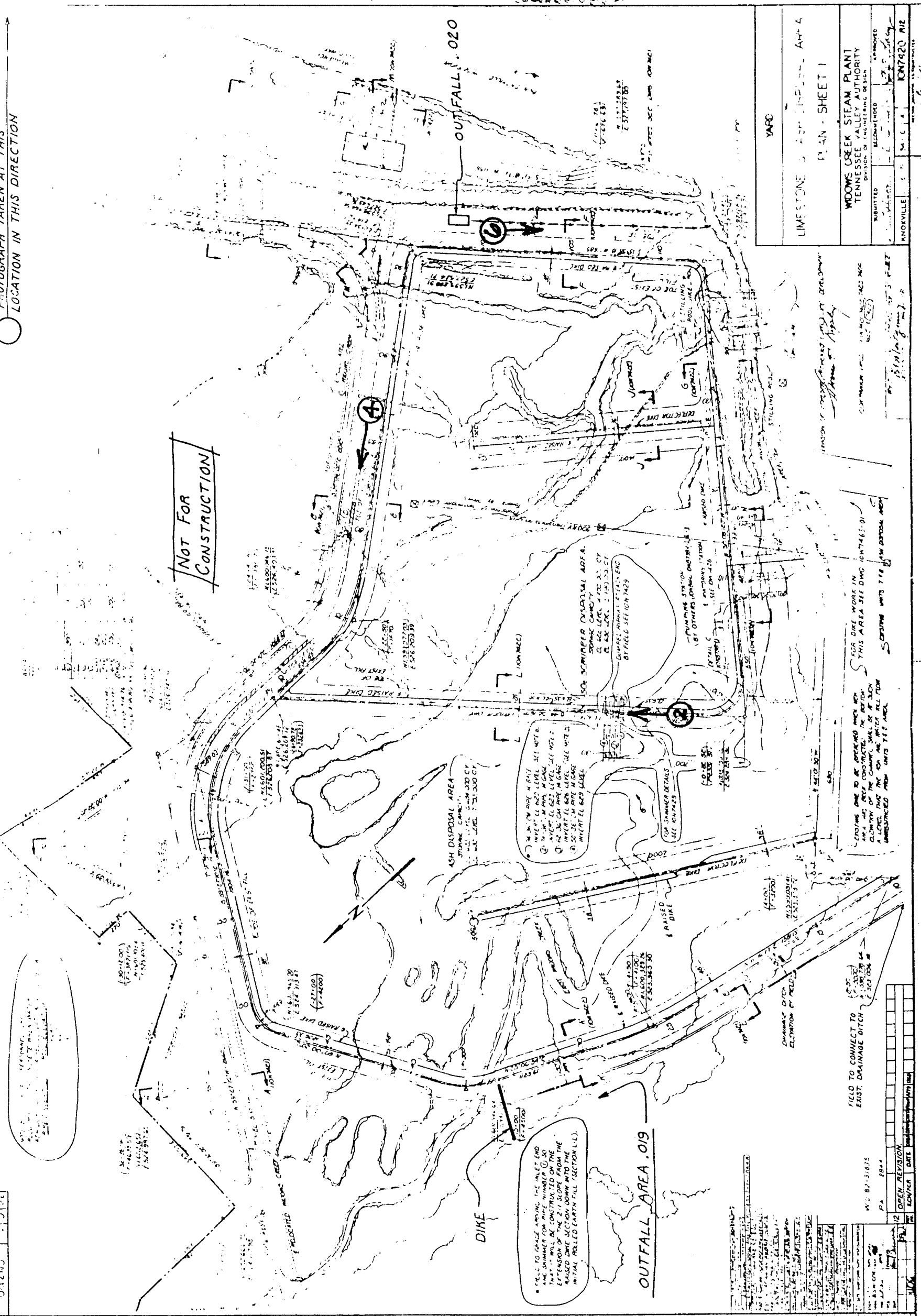
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NOT FOR CONSTRUCTION

OUTFALL .020

OUTFALL AREA .019

DIKE



* FILL TO GRADE ALONG THE INLET END AND CHANNEL FOR ONE NUMBER 10 SO THE SLOPE OF THE 2:1 SLOPE FROM THE RAISED ONE SECTION DOWN INTO THE INITIAL ROLLED EARTH FILL (SECTION 1.1).

FOR DIRT WORK IN THIS AREA SEE DWG (ONT465-01) FOR DIRT WORK IN THIS AREA SEE DWG (ONT465-01) FOR DIRT WORK IN THIS AREA SEE DWG (ONT465-01)

FIELD TO CONNECT TO EAST DRAINAGE DITCH

NO.	DATE	REVISION
1	11/10/83	ISSUED FOR PERMITS
2	11/10/83	ISSUED FOR PERMITS
3	11/10/83	ISSUED FOR PERMITS
4	11/10/83	ISSUED FOR PERMITS
5	11/10/83	ISSUED FOR PERMITS
6	11/10/83	ISSUED FOR PERMITS
7	11/10/83	ISSUED FOR PERMITS
8	11/10/83	ISSUED FOR PERMITS
9	11/10/83	ISSUED FOR PERMITS
10	11/10/83	ISSUED FOR PERMITS

YARD	LIMESTONE ASH DISPOSAL AREA
PLAN - SHEET 1	
WIDOWS CREEK STEAM PLANT TENNESSEE VALLEY AUTHORITY DIVISION OF ENGINEERING DESIGN	
APPROVED	DATE
DESIGNED	DATE
CHECKED	DATE
DRAWN	DATE
NO. 1	DATE
NO. 2	DATE
NO. 3	DATE
NO. 4	DATE
NO. 5	DATE
NO. 6	DATE
NO. 7	DATE
NO. 8	DATE
NO. 9	DATE
NO. 10	DATE

FOR ASH POND INSPECTION ONLY - NOT FOR CONSTRUCTION

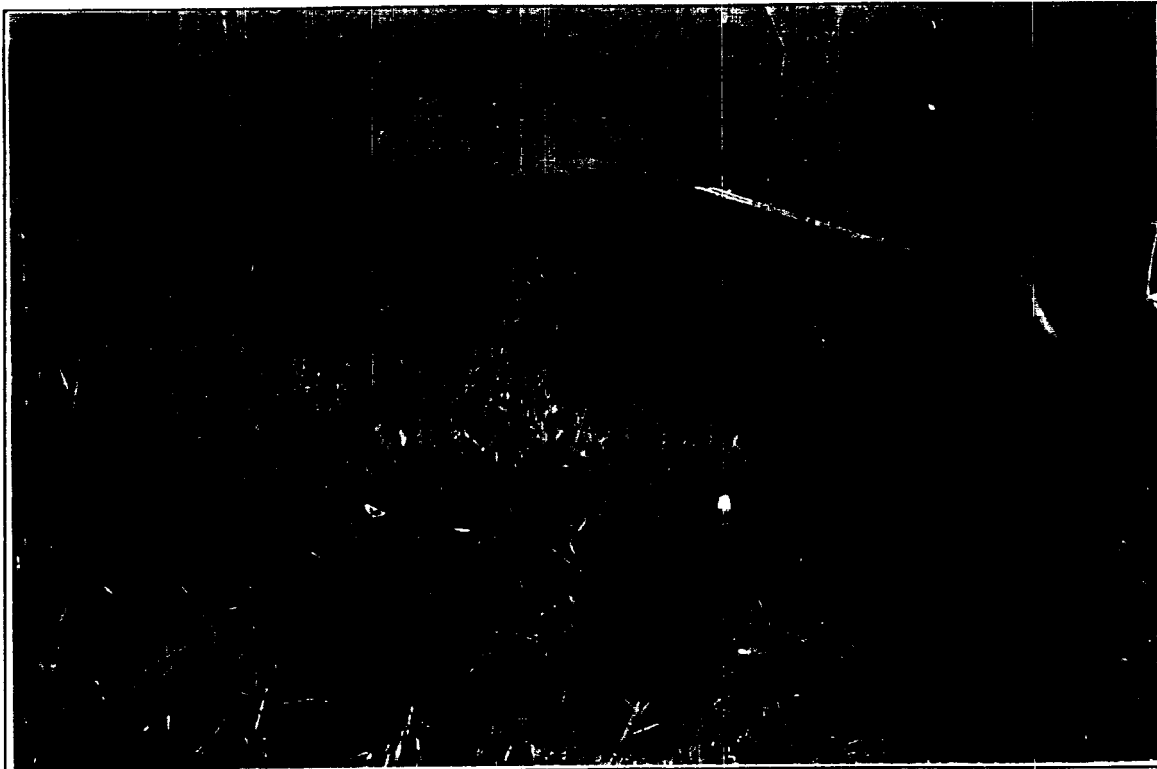


Figure 1 Redwater seepage from the dike south of the chemical treatment pond.

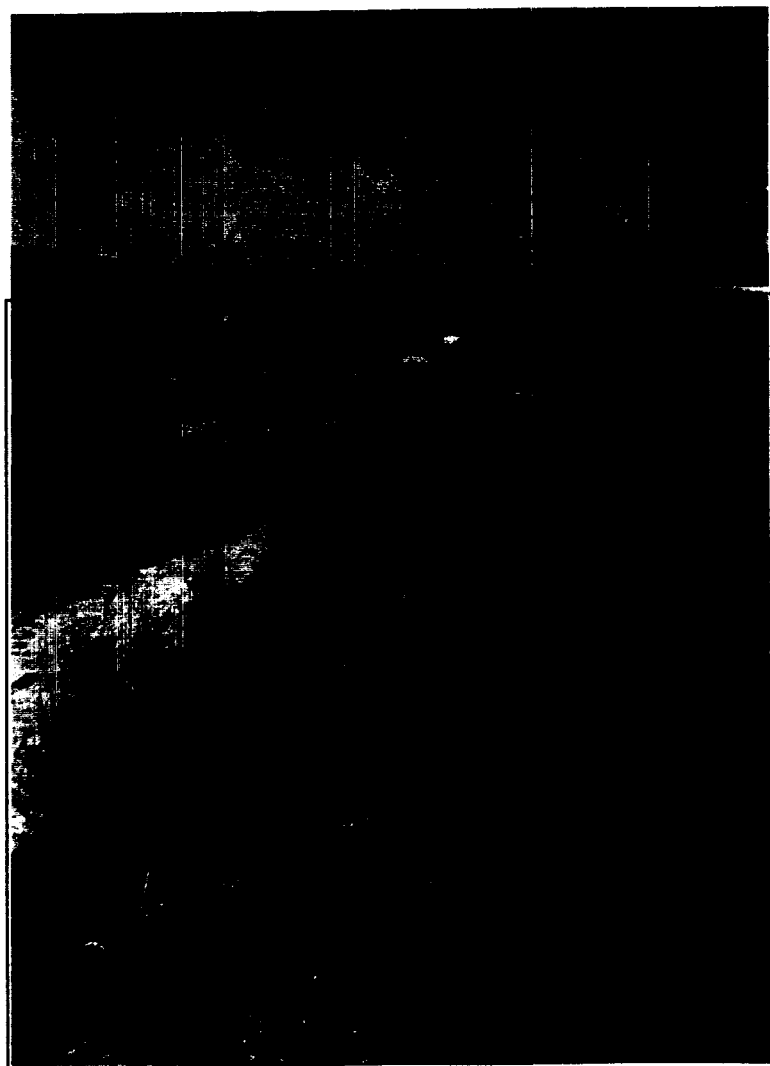


Figure 2 Localized sluffing along the divider dike between active ash pond & inactive scrubber waste area

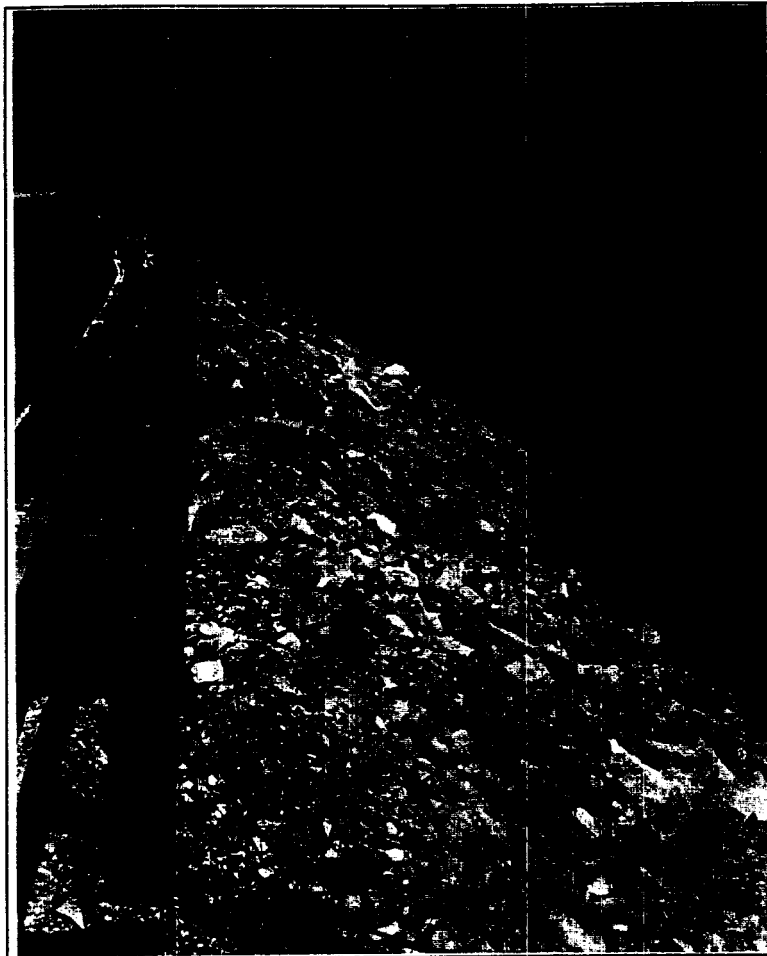


Figure 3 Cover of riprap used to repair sluff on dike north of redwater containment pond.

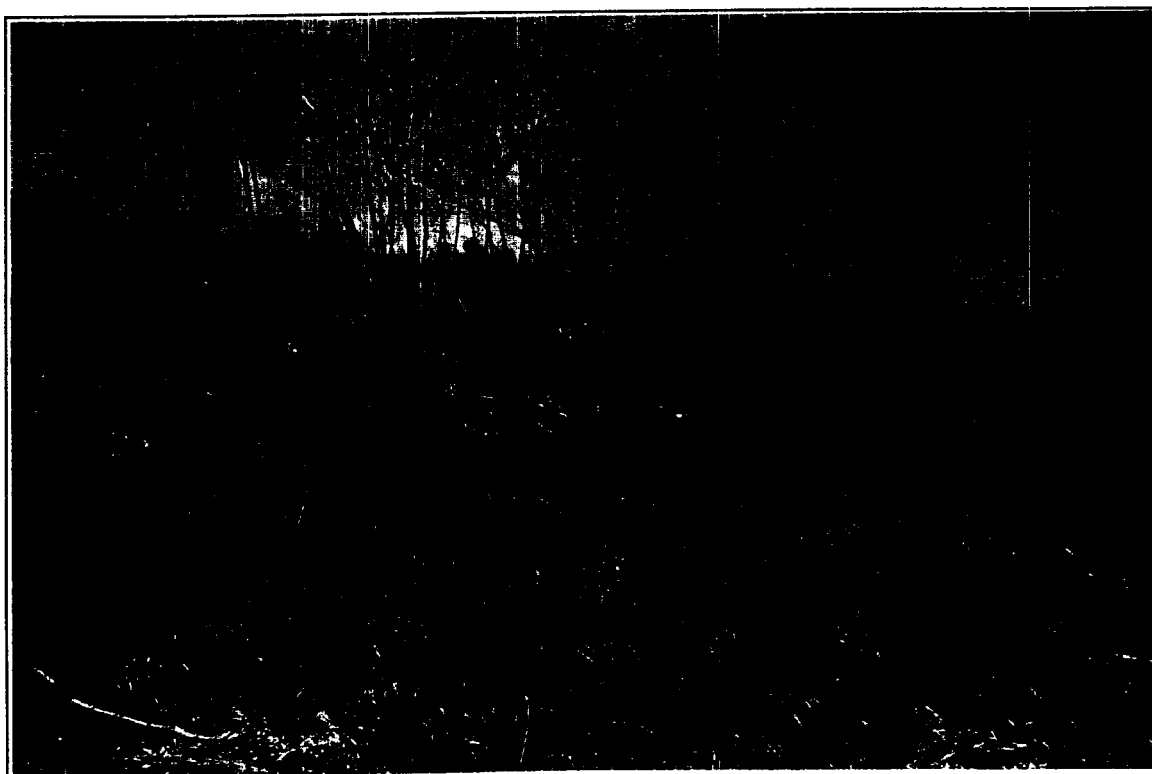


Figure 4 Patch of small trees growing on the eastern slope of the inactive scrubber waste area.

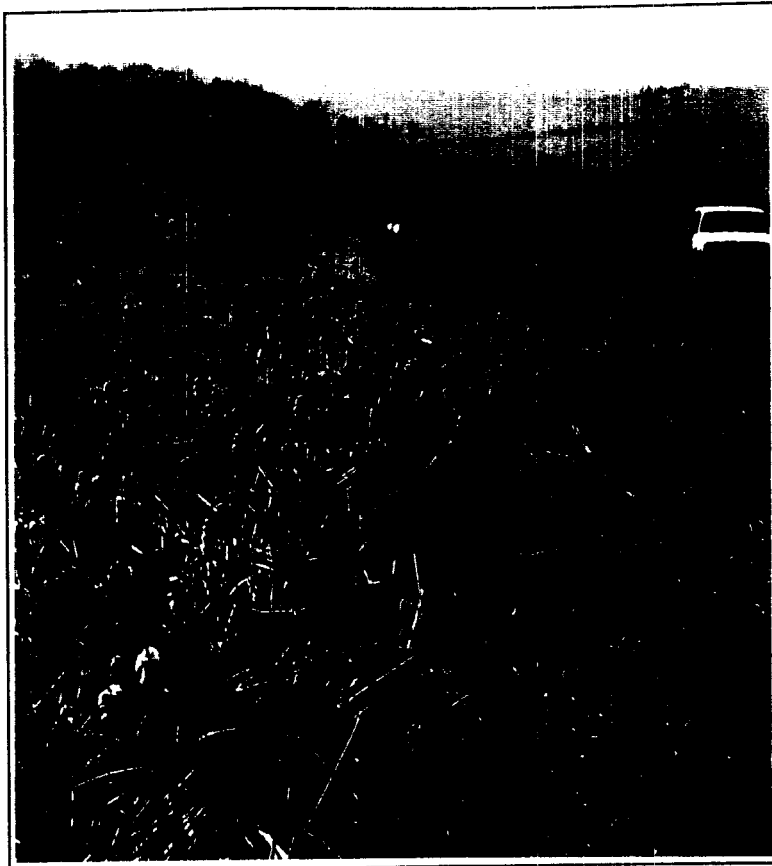


Figure 5 Vegetative growth that is impeding flow in the Phase I perimeter ditch

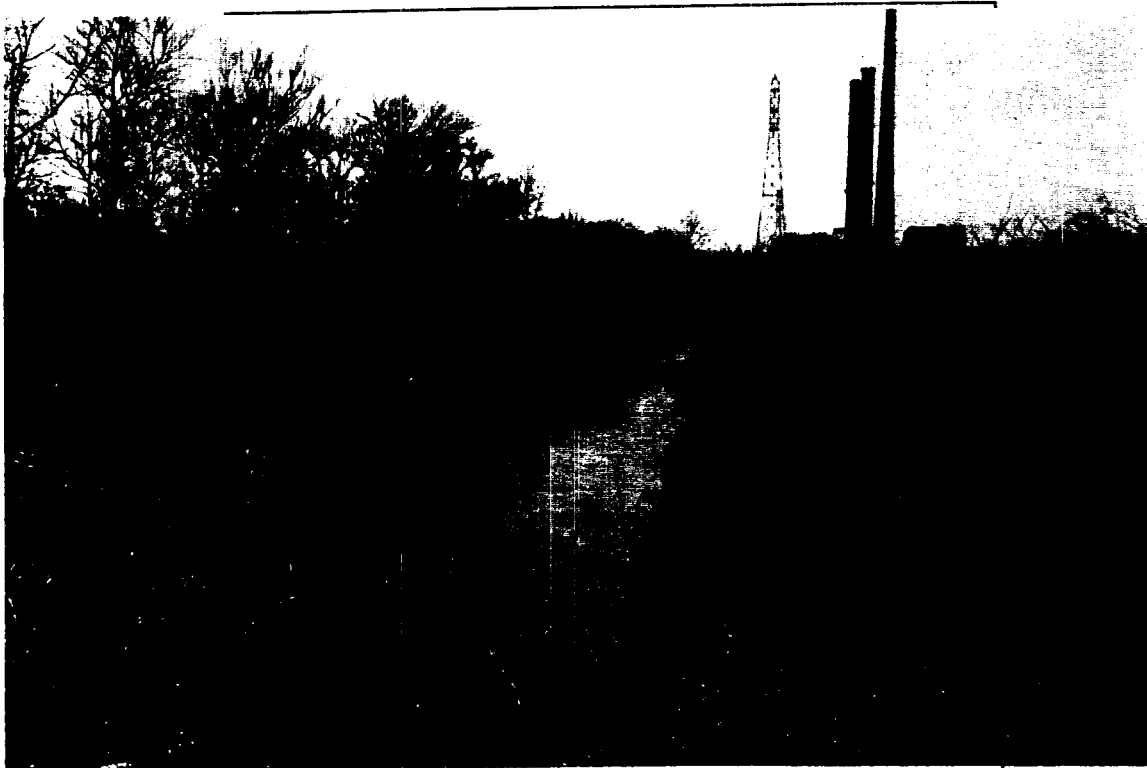


Figure 6 Discharge channel for gypsum stacking area gravity drain

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BKE

Master
File


May 20, 1996

D. W. Howell, Widows Creek Fossil Plant

WIDOWS CREEK FOSSIL PLANT (WCF) - INSPECTION OF WASTE DISPOSAL AREAS

Attached is a report from B. K. Elder to K. W. Burnett dated May 20, 1996, concerning the inspection of WCF's waste disposal areas.

This report includes recommendations for corrective work. I concur with these recommendations.



Ralph G. Johnson
Manager, Fossil Engineering
LP 2G-C

KWB:BKE:SRH

Attachment

cc (Attachment):

J. S. Baugh, LP 5G-C
RIMS, CST 13B-C

t:\wcfinsp.doc

May 20, 1996

K. W. Burnett, LP 2G - C

WIDOWS CREEK FOSSIL PLANT - INSPECTION OF THE WASTE DISPOSAL AREAS

INTRODUCTION

The waste disposal areas at Widows Creek Fossil Plant were inspected for dike structural stability on April 22, 1996. Melissa Hedgecoth of TVA Fossil Fuels and Keith Elder of TVA Fossil Engineering performed the inspection. The previous inspection was performed on March 24, 1995.

The results of the annual stability inspection are listed below according to location within the waste disposal area.

ACTIVE ASH POND AND RELATED DIKES (Dwg 10W7465-01)

Both bottom ash and fly ash continued to be sluiced into the south end of this area. Bottom ash was being worked at the outlet of the sluice pipes with bulldozers. Sluice water flowed northeast into the active ash pond, around the divider dike, and southwest to the spillways. The spillways drained into a stilling pond which discharged into Guntersville Lake.

The redwater seep that was present in the western portion of this area in previous inspections continued to exhibit a visible amount of seepage. This seepage drained into a ditch which flowed to a detention pond on the north side of this region. The water from this pond was then pumped into the active ash pond. A sluffed area of the slope above the seep was noted in prior inspections. This area was still present, but no significant change was noted. Seepage areas have also been noted on the eastern portion of this area near the bridge over the relocated Widows Creek Channel. No visible seeps were noted in this area on this inspection.

All other areas of the exterior dikes that surround this region were in excellent condition with good vegetative cover. A few small trees were noted along the upper berm of the north side of this area. The access roads along the tops of the exterior dikes were in good condition.

No changes have been made in the dikes of this area since the last inspection.

INACTIVE SCRUBBER POND WEST OF WIDOWS CREEK (Dwg 10N7420)

Sluicing of scrubber waste to this area was discontinued in February 1986 when the Phase I Gypsum Stacking Area east of Widows Creek was placed in operation. The area was reactivated for a brief period in the summer of 1991 while remediation work was being performed in the Gypsum Stacking

Area. The pond contained a level pool that remained at the same elevation as the adjacent active ash pond due to equalizing pipes in the divider dike between the two.

The exterior slopes of the dikes in this area were in good condition. No signs of structural instability were found. The interior slopes contained areas that were sluffing into the water, but these areas did not appear to pose a structural threat either. The road on the top of the exterior dikes in this area was in good condition. Several small trees were found along the upper berm on the exterior slope of the dike on the eastern side of this area.

GYPSUM STACKING AREA EAST OF WIDOWS CREEK (Dwgs 10W215-04 & 10W216-01)

This area was being raised by the rim ditch method of stacking. TVA Heavy Equipment Division was managing the operation of this area at the time of inspection. Scrubber waste was being sluiced into the area and the water that remained after settling was discharged to a stilling pool west of the area. The water entered a gravity drain culvert from this pond and discharged into a channel southeast of the inactive scrubber waste pond. This channel discharged into the abandoned Widows Creek Channel.

The exterior slopes of the dikes in this area were in good condition with excellent vegetative cover. No signs of instability were noted along any exterior areas. A few areas of stack had earth cover but needed to be seeded. An area in the southwest corner of this region still contained a construction ramp over the drainage ditch for the area. Runoff from the stack area was bypassing the ditch by running over this ramp and causing a small area of erosion on the exterior slope. The drainage structure that carried water from the upper berm to the lower drainage ditch in the southwest corner needed to be repaired by reconnecting the bottom section to the rest of the structure.

The exposed areas mentioned in the previous report had been seeded and grass was established in these areas. The repair of the toe in the southwest corner had been completed and covered with earth. The drainage ditch around the toe of the stack had been cleared of vegetation and was draining well.

INACTIVE ASH POND AREA WITHIN RAILROAD LOOP (Dwg 10N7400)

This disposal site is no longer in use. Since 1985 a portion of the outfall drainage ditches for storm water discharge through a manmade wetlands and out a permitted discharge (currently DSN018) south of the area. The remainder of the storm water discharges into the retention pond pump system north of the area and is pumped back into the active ash pond. Emergency overflow from this area is discharged through a permitted discharge (currently DSN019) into Widows Creek.

CHEMICAL TREATMENT PONDS (Dwg 10W7465)

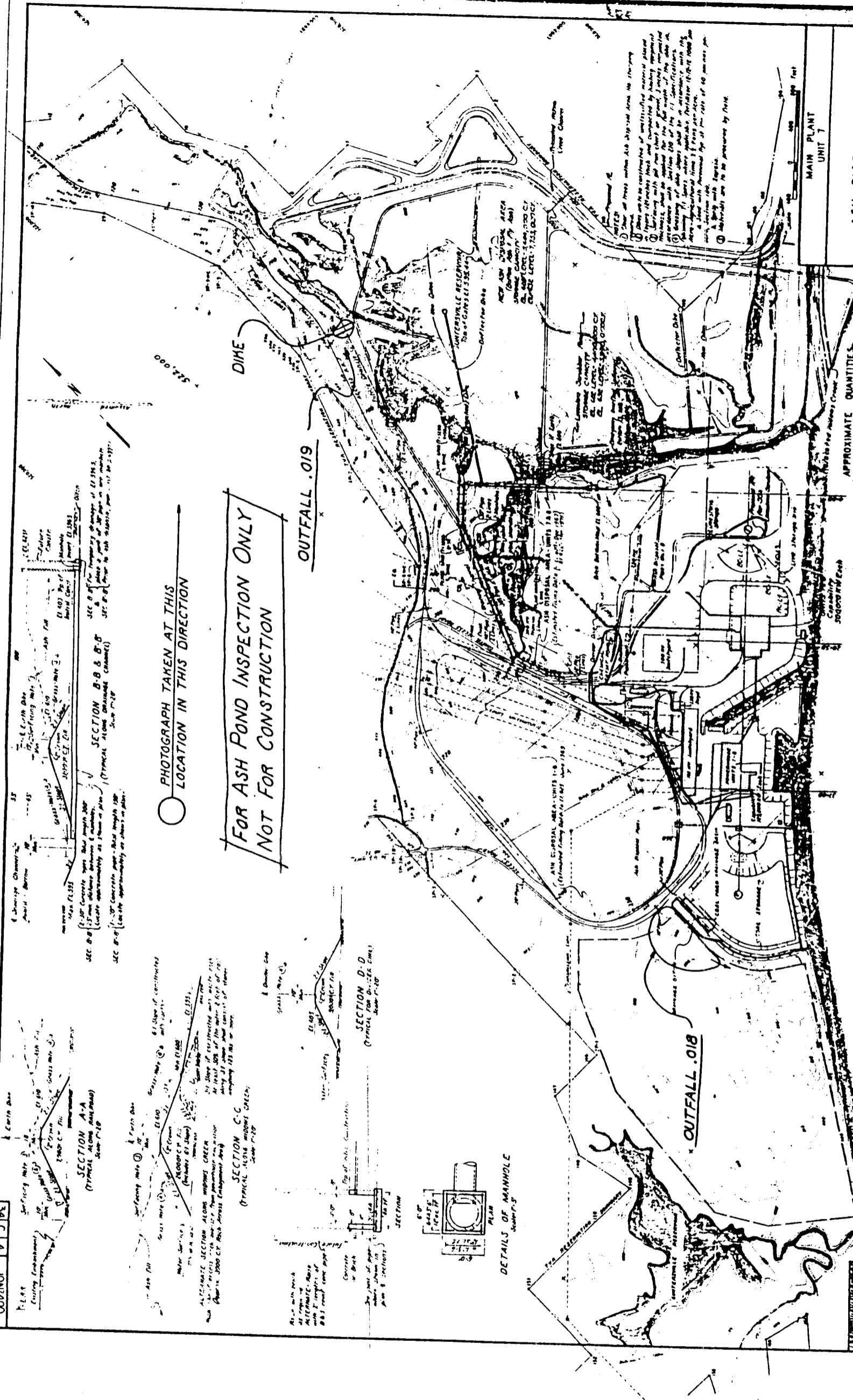
Both the iron and copper chemical treatment ponds are located in the southwest corner of the active ash disposal area. All slopes for these ponds are interior to the active ash pond except the southern slope of the copper pond, which is common to both the copper pond and the active ash pond. Discharge from these ponds is directed to the active ash pond via outlet pipes.

The southern slope has a history of and was exhibiting seepage as previously mentioned in the section on the active ash pond. As already mentioned, this seepage did not pose a visible threat to dike integrity. The interior slopes of both ponds had an adequate cover of riprap and showed no defects. The discharge pipes were in good condition with no apparent impediments to flow.

COAL YARD DRAINAGE BASIN (Dwg 10N7400)

This pond area is located west of the plant and coal yard. The pond accepts runoff from the coal yard. Water is pumped from this area into the active ash pond where it is eventually discharged to Guntersville Lake.

The exterior slopes of this pond were in good condition with an excellent cover of vegetation. The vegetation was high in places and contained some small trees on the slopes. No signs of instability were found on the dikes in this area.



ASH DISPOSAL AREA

WIDOWS GREEN STEAM PLANT
TENNESSEE VALLEY AUTHORITY

APPROXIMATE QUANTITIES

Earthwork Excavation	100000
Earthwork Embankment	100000
Concrete	100000
Reinforcing Steel	100000
Structural Steel	100000
Timber	100000
Gravel	100000
Crushed Stone	100000
Asphalt	100000
Other	100000
TOTAL	1000000

3/10/59
12 6 4 10/17/59
E15

PHOTOGRAPH TAKEN AT THIS LOCATION IN THIS DIRECTION

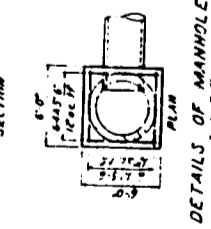
FOR ASH POND INSPECTION ONLY
NOT FOR CONSTRUCTION

SECTION A-A
(TYPICAL ALONG MAIN DRAIN)
Scale 1"=10'

SECTION B-B & B'-B'
(TYPICAL ALONG MAIN DRAIN)
Scale 1"=10'

SECTION C-C
(TYPICAL ALONG MAIN DRAIN)
Scale 1"=10'

SECTION D-D
(TYPICAL FOR DIVER DIME)
Scale 1"=10'



GUNTERVILLE RESERVOIR

MAIN PLANT UNIT 7

REVISION	NO.	DATE	BY	DESCRIPTION
1	1	3/10/59	J. L. ...	...
2	2	...	...	...
3	3	...	...	...
4	4	...	...	...
5	5	...	...	...

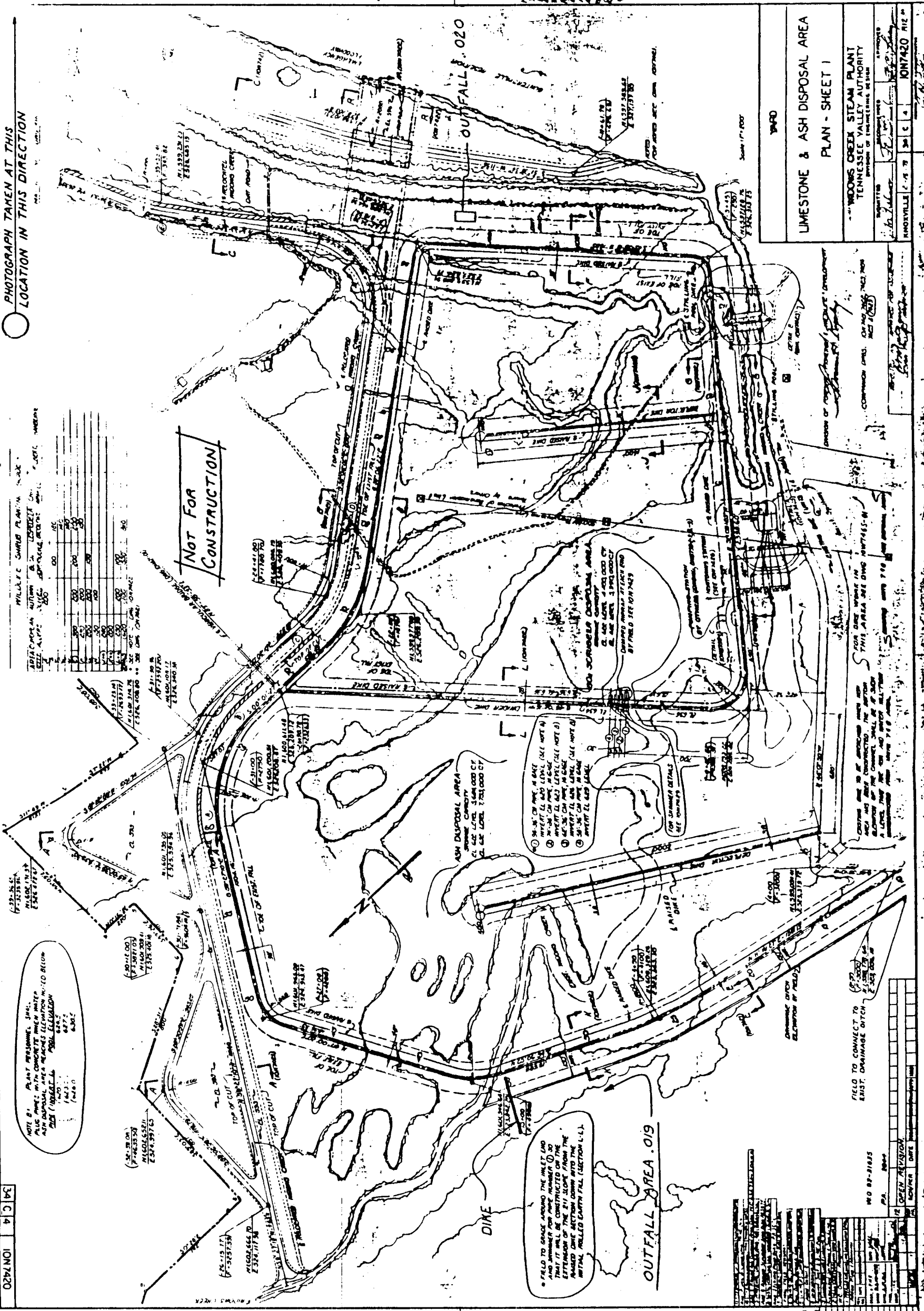
FOR ASH POND INSPECTION ONLY - NOT FOR CONSTRUCTION

PHOTOGRAPH TAKEN AT THIS LOCATION IN THIS DIRECTION

STATION	VERTICAL CURVE	VERTICAL ALIGNMENT	VERTICAL CURVE	VERTICAL ALIGNMENT
1+00	100	100	100	100
2+00	200	200	200	200
3+00	300	300	300	300
4+00	400	400	400	400
5+00	500	500	500	500
6+00	600	600	600	600
7+00	700	700	700	700
8+00	800	800	800	800
9+00	900	900	900	900
10+00	1000	1000	1000	1000

NOTE: PLANT PROVISIONS, SUCH AS THE CONCRETE WATER AND ASH DISPOSAL AREA, SHALL BE CONSTRUCTED TO THE ELEVATION INDICATED IN THE DRAWING.

34 C 4 ION7420



NOT FOR CONSTRUCTION

FIELD TO GRADE AROUND THE INLET AND THE PERIMETER OF THE CONCRETE WATER AND ASH DISPOSAL AREA SHALL BE CONSTRUCTED TO THE ELEVATION OF THE 2:1 SLOPE FROM THE RAISED DIME SECTION DOWN INTO THE INITIAL PAVED CARTON FILL (SECTION L.L.).

- 1. 30'-36" OF CONC. IN BASE (SEE NOTE A)
- 2. 12" OF 1/2" SAND LAYER (SEE NOTE A)
- 3. 12" OF 1/2" SAND LAYER (SEE NOTE A)
- 4. 12" OF 1/2" SAND LAYER (SEE NOTE A)
- 5. 12" OF 1/2" SAND LAYER (SEE NOTE A)
- 6. 12" OF 1/2" SAND LAYER (SEE NOTE A)
- 7. 12" OF 1/2" SAND LAYER (SEE NOTE A)
- 8. 12" OF 1/2" SAND LAYER (SEE NOTE A)
- 9. 12" OF 1/2" SAND LAYER (SEE NOTE A)
- 10. 12" OF 1/2" SAND LAYER (SEE NOTE A)

LIMESTONE & ASH DISPOSAL AREA
PLAN - SHEET 1

MOORE CREEK STEAM PLANT
 TENNESSEE VALLEY AUTHORITY
 DIVISION OF TRANSPORTATION

NO. 89-3185
 PA. 8044

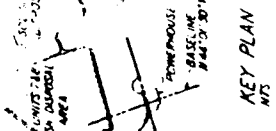
DATE: 10/17/57

SCALE: 1" = 100'

NO.	DATE	DESCRIPTION	BY	CHKD.
1	10/17/57	DESIGNED	J. H. HARRIS	
2	10/17/57	CHECKED	J. H. HARRIS	
3	10/17/57	APPROVED	J. H. HARRIS	

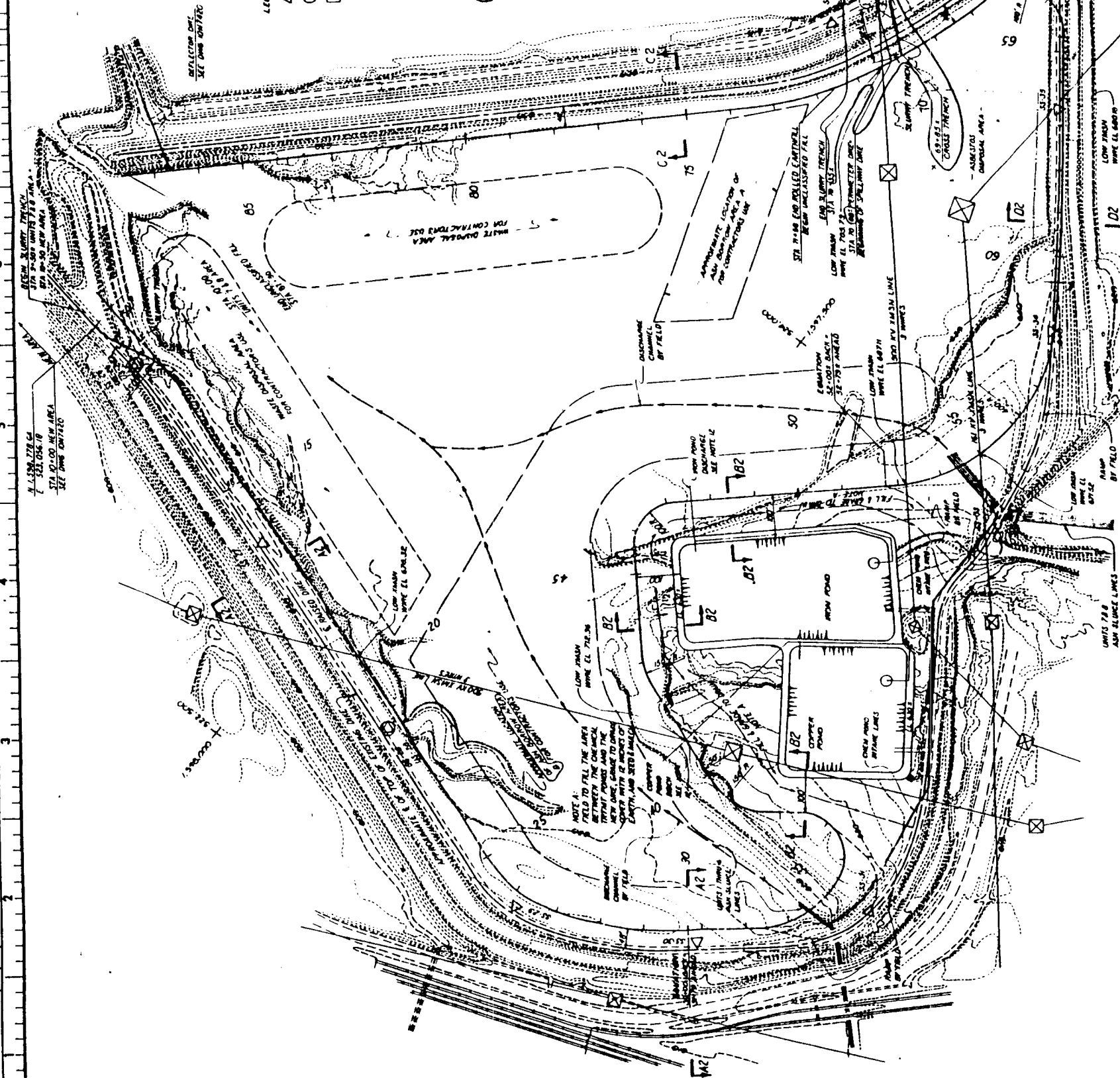
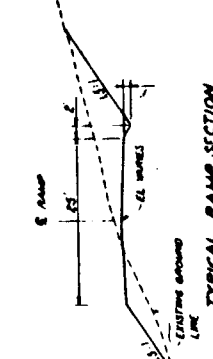
FOR CONSTRUCTION ONLY - NOT FOR CONSTRUCTION

FOR ASH POND INSPECTION ONLY
NOT FOR CONSTRUCTION



NOTES: 1. ALL WORK SHALL BE IN ACCORDANCE WITH THE T.I. SPECIFICATIONS... 2. SOIL INVESTIGATION AND TESTING IS REQUIRED IN THE SOILS... 3. STABILITY ANALYSIS OF THE SOILS REPORT RESULTS ARE AS FOLLOWS... 4. A FACTOR OF SAFETY OF 1.5 IS REQUIRED FOR ALL SLOPES... 5. ALL SLOPES SHALL BE SEEDING WITH THE FOLLOWING... 6. ALL SLOPES SHALL BE STABILIZED WITH UNCLASSIFIED FILL... 7. ALL SLOPES SHALL BE STABILIZED WITH UNCLASSIFIED FILL... 8. ALL SLOPES SHALL BE STABILIZED WITH UNCLASSIFIED FILL... 9. ALL SLOPES SHALL BE STABILIZED WITH UNCLASSIFIED FILL... 10. ALL SLOPES SHALL BE STABILIZED WITH UNCLASSIFIED FILL...

PHOTOGRAPH TAKEN AT THIS LOCATION IN THIS DIRECTION



ASH DISPOSAL AREA
UNITS 7 & 8 - PLAN

WIDOWS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY

Table with columns for 'NO.', 'DESCRIPTION', 'DATE', 'BY', 'CHECKED', 'APPROVED'. Includes project information like 'PROJECT NO. 10W7465-01' and 'DESIGNER'.

Table with columns for 'NO.', 'DESCRIPTION', 'DATE', 'BY', 'CHECKED', 'APPROVED'. Includes project information like 'PROJECT NO. 10W7465-01' and 'DESIGNER'.

Table with columns for 'NO.', 'DESCRIPTION', 'DATE', 'BY', 'CHECKED', 'APPROVED'. Includes project information like 'PROJECT NO. 10W7465-01' and 'DESIGNER'.

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Table with columns for 'NO.', 'DESCRIPTION', 'DATE', 'BY', 'CHECKED', 'APPROVED'. Includes project information like 'PROJECT NO. 10W7465-01' and 'DESIGNER'.

Table with columns for 'NO.', 'DESCRIPTION', 'DATE', 'BY', 'CHECKED', 'APPROVED'. Includes project information like 'PROJECT NO. 10W7465-01' and 'DESIGNER'.

Table with columns for 'NO.', 'DESCRIPTION', 'DATE', 'BY', 'CHECKED', 'APPROVED'. Includes project information like 'PROJECT NO. 10W7465-01' and 'DESIGNER'.

SCALE 1"=100'-0"

EXCEPT AS NOTED

YARD

UNITS 7 & 8

ASH DISPOSAL AREA

UNITS 7 & 8

ASH DISPOSAL AREA

UNITS 7 & 8

ASH DISPOSAL AREA

UNITS 7 & 8

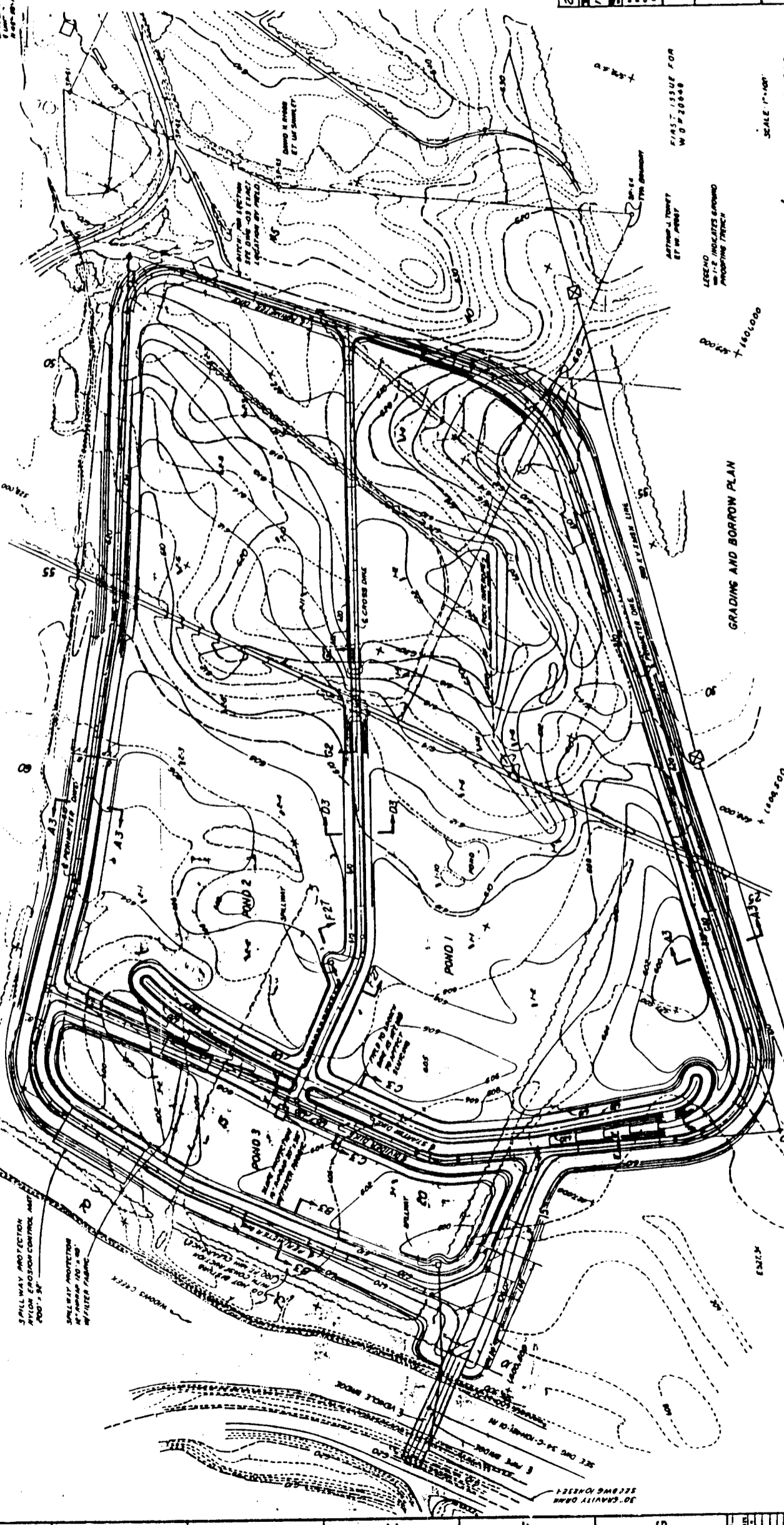
ASH DISPOSAL AREA

ESTIMATED BORROW AVAILABLE	
POND 1	25,000 CY
POND 2	113,500 CY
POND 3	21,000 CY
TOTAL	269,500 CY

BORROW NOTES:
 1. BORROW QUANTITIES SHOWN WERE OBTAINED BY CALCULATING "IN PLACE" FILL VOLUME FROM THE DIME P-SECTION AND INCREASING THIS BY 20% TO ALLOW FOR WASTE AND SHORING (FROM "IN PLACE" DEFICITS TO COMPACTED FILL DEFICITS).
 2. BORROW QUANTITIES WERE CALCULATED USING AN AVERAGE PERCENTAGE SUBSIDENCE OF 10% FOR ALL BORROW AREAS.
 3. BORROW AREAS ARE SHOWN AS DOTTED LINES.
 4. INITIAL DIME P-SECTION SHOWS ORIGINAL GROUND AND P-SECTIONS AFTER CONSTRUCTION OF POND SHALL BE SUBMITTED TO FPD CIMS.
 5. FOUNDATION PREPARATION VOLUMES CUSTOMER UNDER EXAMINATION.
 6. BORROW AREAS WITHIN THE LIMITS OF THE POND, THE BORROW AREAS, AND ELEVATIONS AT LEAST 5 FEET ABOVE HIGHEST ROCK ELEVATIONS TO SATISFY PERMIT REQUIREMENTS THIS 300' LAYER OVER THE POND ARE REMOVED AND MUST BE SUBMITTED TO FPD CIMS.
 7. AFTER THE BORROW IS REMOVED FROM WITHIN THE POND, SOME POND BOTTOM ELEVATIONS WILL BE SUBMITTED TO FPD CIMS SOME ABOVE THE 100' CLAY LAYER.
 8. CLASSIFIED BORROW SHALL BE OBTAINED FROM WITHIN POND (AREAS 1, 2, 3) AND IF NECESSARY FROM THE EXISTING BORROW

AREAS SOUTH OF AND ADJACENT TO THE 500 KV TRANSMISSION LINE (AREA 4) UNCLASSIFIED BORROW SHALL BE OBTAINED.
 3. ALL TOP SOIL OR UNSUITABLE SOIL SHALL BE STOCK PILED FOR FUTURE USE BY POWER TO ESTABLISH VEGETATION (COMBINATION) LOCATION WITH PLANT.
 4. SHOULD BORROW EXCAVATION UNCOVER ARCHAEOLOGICAL SOILS OR REMAINS OF ROCK, A MINIMUM BUREAU OF LAND MANAGEMENT CLAY SHALL BE OBTAINED FROM WITHIN THE BORROW AREA WITHIN A MINIMUM OF 3 FEET OF COMPACTED CLAY.

○ PHOTOGRAPH TAKEN AT THIS LOCATION IN THIS DIRECTION



NOTES:
 1. SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS EXCEPT AS NOTED.
 2. WHERE EXCAVATION IS ADJACENT TO PROPOSED DIKES THE CUT SLOPES SHALL NOT BE STEEPER THAN 2:1 (HIGH AND TOP OF CUT SHALL BE A MINIMUM OF 10 FEET FROM THE TOE OF THE EXISTING OR AS SHOWN ON THE CROSS SECTIONS).
 3. EXISTING DIKES (---) ADJACENT TO EXISTING BORROW SHALL BE MAINTAINED AS EXISTING UNLESS OTHERWISE NOTED.
 4. THE TOP OF EXISTING BORROW EXCAVATION SHALL BE SEALED BY FILLING WITH APPROVED-TYPE EQUIPMENT OR SAND-CLAY MIXTURE TO A MINIMUM OF 2 FEET.
 5. POND DIME LAYOUT, PROFILES AND SECTION SEE DRAWING 40-12401-04

2. OPEN REVISION	
NO.	DATE
1	10/15/04
2	10/15/04
3	10/15/04
4	10/15/04
5	10/15/04
6	10/15/04
7	10/15/04
8	10/15/04
9	10/15/04
10	10/15/04

YARD UNITS 7 & 8
 FORCED OXIDATION GYPSUM STACKING PHASE 1 - DIKES & GRG PLAN SHEET 4

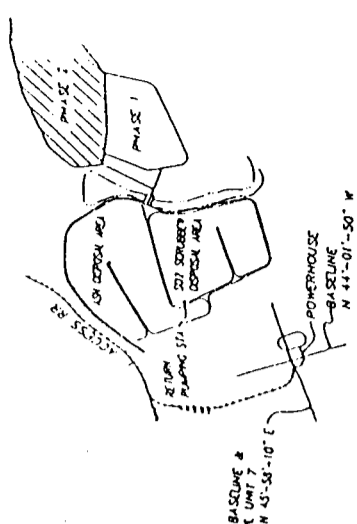
WIDOWS CREEK STEAM PLANT
 TENNESSEE VALLEY AUTHORITY
 DIVISION OF ENVIRONMENTAL PROTECTION
 PROJECT NO. 40-12401-04
 SHEET NO. 4 OF 4

FOR ASH POND INSPECTION ONLY
 NOT FOR CONSTRUCTION

SCALE 1"=100'
 COMPANION DWGS
 DRAWING NO. 40-12401-04

GRADING AND BORROW PLAN

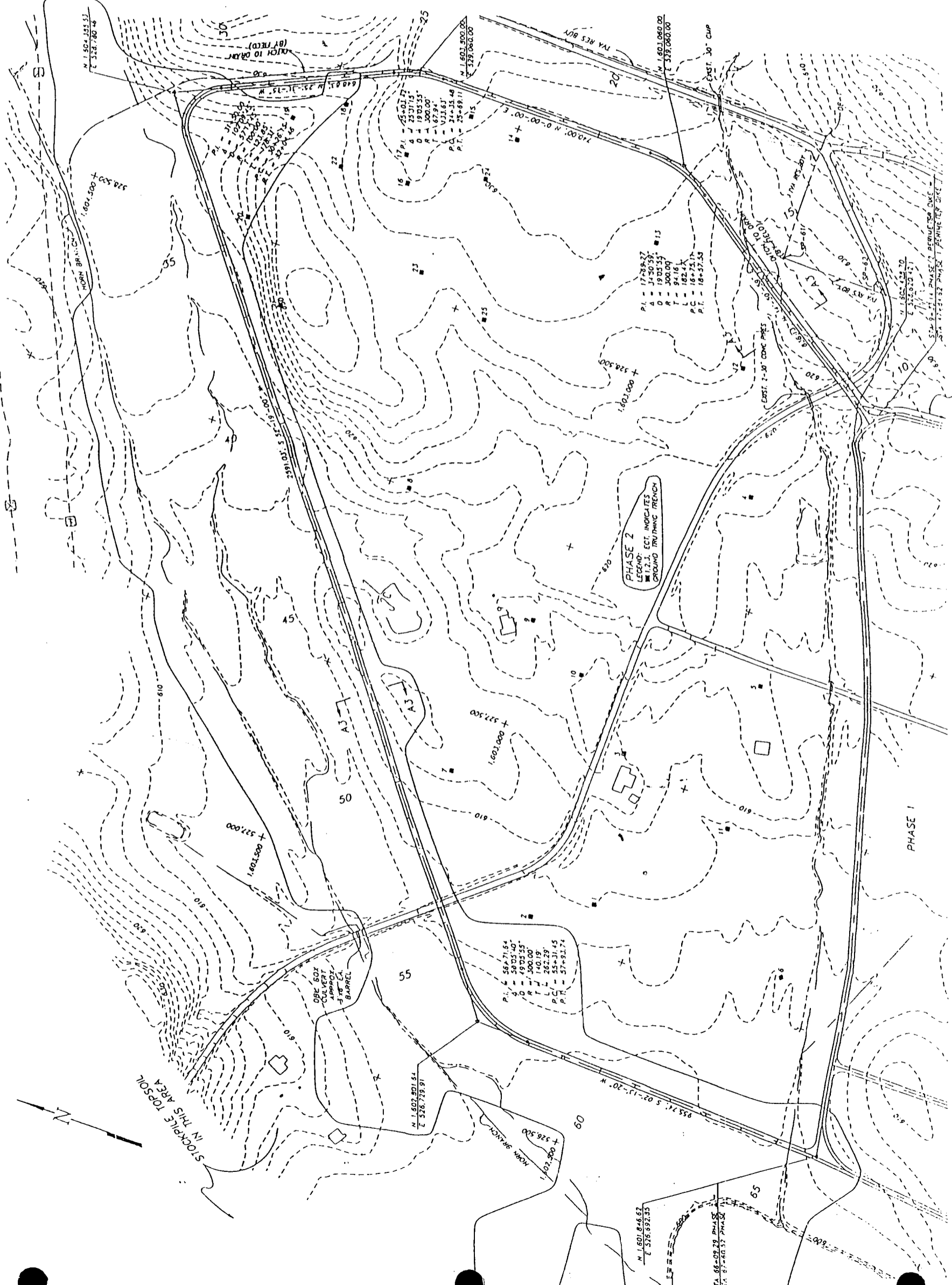
NO.	DATE	REVISION
1	10/15/04	ISSUED FOR PERMIT
2	10/15/04	ISSUED FOR CONSTRUCTION



NOTES

1. ALL WORK TO BE IN ACCORDANCE WITH THE SPECIFICATION AND NOTES OTHERWISE NOTED OR AGREED UPON BY THE TVA PROJECT ENGINEER.
2. AREAS DESIGNATED FOR GRASSING (SEE SECTIONS SHEET - 01) SHALL BE SEEDED WITH TYPE B MIXTURE FOR FALL SEEDING OR TYPE B MIXTURE FOR SPRING SEEDING. SEEDING AREAS ARE TO BE FERTILIZED AND MULCHED IN ACCORDANCE WITH SECTION 560 AND 587 RESPECTIVELY.
3. DIKE SURFACING 4 INCHES THICK SHALL BE IN ACCORDANCE WITH SECTION 560.
4. COORDINATES OF PINS ARE GIVEN IN ALABAMA STATE COORDINATES BASED ON THE E.C. OF THE VEHICULAR BRIDGE AND I OF PIER B (STA. 10+00) BEING N 1,600,533.21; E 528,384.92.
5. NOTES FOR DIKE CONSTRUCTION ARE ON DMC 10W216-01.

DATE	DESCRIPTION	BY	CHKD
11-13-53	PREP. LAYOUT	J.C. (J.C.)	(J.C.)
REV	DATE	BY	CHKD
1	01-20-54	J.C.	(J.C.)
2	02-10-54	J.C.	(J.C.)
3	03-10-54	J.C.	(J.C.)
4	04-10-54	J.C.	(J.C.)
5	05-10-54	J.C.	(J.C.)
6	06-10-54	J.C.	(J.C.)
7	07-10-54	J.C.	(J.C.)
8	08-10-54	J.C.	(J.C.)
9	09-10-54	J.C.	(J.C.)
10	10-10-54	J.C.	(J.C.)
11	11-10-54	J.C.	(J.C.)
12	12-10-54	J.C.	(J.C.)
13	01-10-55	J.C.	(J.C.)
14	02-10-55	J.C.	(J.C.)
15	03-10-55	J.C.	(J.C.)
16	04-10-55	J.C.	(J.C.)
17	05-10-55	J.C.	(J.C.)
18	06-10-55	J.C.	(J.C.)
19	07-10-55	J.C.	(J.C.)
20	08-10-55	J.C.	(J.C.)
21	09-10-55	J.C.	(J.C.)
22	10-10-55	J.C.	(J.C.)
23	11-10-55	J.C.	(J.C.)
24	12-10-55	J.C.	(J.C.)
25	01-10-56	J.C.	(J.C.)
26	02-10-56	J.C.	(J.C.)
27	03-10-56	J.C.	(J.C.)
28	04-10-56	J.C.	(J.C.)
29	05-10-56	J.C.	(J.C.)
30	06-10-56	J.C.	(J.C.)
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32	08-10-56	J.C.	(J.C.)
33	09-10-56	J.C.	(J.C.)
34	10-10-56	J.C.	(J.C.)
35	11-10-56	J.C.	(J.C.)
36	12-10-56	J.C.	(J.C.)
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38	02-10-57	J.C.	(J.C.)
39	03-10-57	J.C.	(J.C.)
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44	08-10-57	J.C.	(J.C.)
45	09-10-57	J.C.	(J.C.)
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50	02-10-58	J.C.	(J.C.)
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56	08-10-58	J.C.	(J.C.)
57	09-10-58	J.C.	(J.C.)
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87	03-10-61	J.C.	(J.C.)
88	04-10-61	J.C.	(J.C.)
89	05-10-61	J.C.	(J.C.)
90	06-10-61	J.C.	(J.C.)
91	07-10-61	J.C.	(J.C.)
92	08-10-61	J.C.	(J.C.)
93	09-10-61	J.C.	(J.C.)
94	10-10-61	J.C.	(J.C.)
95	11-10-61	J.C.	(J.C.)
96	12-10-61	J.C.	(J.C.)
97	01-10-62	J.C.	(J.C.)
98	02-10-62	J.C.	(J.C.)
99	03-10-62	J.C.	(J.C.)
100	04-10-62	J.C.	(J.C.)



ACTIONS SINCE LAST INSPECTION

The cat-tail plants that were impeding flow in the ditch around the gypsum stacking area had been cut. The ditch was clear and conveying water well in this location.

The repairs to the toe of the gypsum stack were complete. The drain was installed and the area was covered with earth.

The exposed areas of the gypsum stack had been covered with earth. Some areas needed to be seeded.

The majority of the cenospheres that were noticed in the last inspection had been removed. The water surfaces around all of the outlets were clear of any floating material that might hinder flow.

RECOMMENDATIONS

The erosion of the slopes on the divider dike between the active ash pond and the inactive scrubber waste area has worsened since the last inspection. This does not present a structural threat to the pond dike stability, but the access road along the top of this dike will be lost if repairs are not made. The areas of erosion should be repaired by filling with earth material, compacting, and seeding. Areas of severe erosion should be filled with rock.

The trees on the outer slope of the upper berm of the active ash pond area should be removed by pulling with a chain. This will insure that the root systems are also removed.

The temporary access ramp that was constructed over the drainage ditch in the southwest corner of the gypsum stacking area should be removed. The remainder of bare earth in the repaired toe area should be seeded.

Any other bare earth areas in the gypsum stacking area should be seeded.

The drainage structure in the southwest corner of the gypsum stacking area should be repaired by reattaching any damaged sections.

Plant personnel should continue to monitor the known areas of seepage and/or sluffing. If any significant changes or threats to the dike integrity are found, personnel should contact Fossil Engineering immediately.



B. Keith Elder

Civil Engineer, Site and Environmental Engineering LP 2G-C

October 20, 1995

~~Don P. Houston, WCF 1A-STA
John C. Pinnix, WCF 1A-STA~~

CALIBRATION OF WCF ASH POND WEIR DISCHARGE

Introduction

Per your request, personnel from Norris Engineering Laboratory performed flow calibration for the circular ash pond weirs on May 16, 1995. This work was supported by Work Agreement FHPE-95-157 between the Resource Group and F&HP.

To determine the head-discharge relationship for a weir, both flowrate and height of water above the weir crest (i.e., weir head) are needed. At Widows Creek, the dye-dilution technique was used to measure the flowrate over each weir by injecting Rhodamine WT dye into the weir opening and sampling the dye-water mixture at the outlet of the discharge pipe. The weir head is the difference between water surface elevation and weir crest elevation. During the tests, the ash pond water surface elevation was monitored by a pressure transducer and recorded by a datataker. The weir crest elevations used to calculate the weir head were those measured by G•UB•MK on May 5, 1995. On May 16, test personnel measured the weir elevations through the openings in the skimmer covers and found the levels to be essentially the same as those obtained by G•UB•MK. The weirs appeared to be clear of algae and free of any debris that may obstruct the flow.

Results

Test results for each weir are given in Table 1. Based on data recorded in the dye-dilution technique, the measured flowrates obtained in these tests are estimated to be within ± 3 percent of the true flowrates. In Figure 1, the average measured flowrates are compared with the design rating curve from TVA drawing 30N528 R0, dated 2/9/71, and the rating curve currently used by the plant. In Table 2, the error in flowrate for the design and plant rating curves is provided for each weir. The error is computed as the difference between the flowrate found by the design and plant curves, based on the measured head, and the flowrate measured by the dye-dilution technique. The following comments are provided.

- For weirs A, B, D and E, the flowrates from the design and plant rating curves were found to be within roughly ± 5 percent of the measured flowrates. For weirs A, D, and E, the computed flowrates underpredict the measured flowrates. In part, these discrepancies may be due to minor leakage through joints between riser sections of the weir. The sound of water splashing in the outlet conduits could be heard prior to the tests when the ash pond water surface was below the weir crests. For weir B, the computed flowrate overpredicts the measured flowrate, but falls within the measurement accuracy of the dye-dilution dilution technique.
- For weir C, the flowrates obtained by the design and plant rating curves underpredict the measured values by roughly 45 percent. This discrepancy undoubtedly is due to leakage. In

contrast to the other weirs, the sound of pre-overflow water discharging through the outlet conduit was substantially greater for weir C.

- In combined operation, the total flowrate computed by the design and plant rating curves underestimates the true flowrate by roughly 14 percent.

Analysis

Using a regression procedure which minimizes the mean square error between the computed and measured flowrates, the recommended equation for the discharge over the ash pond weirs is

$$Q_o = C_o L H_o^{1.5}, \quad (1)$$

where Q_o is the discharge in MGD, $C_o = 2.52 \text{ MGD/ft}^{2.5}$ is an overflow discharge coefficient, $L=13.26$ feet is the clear length of the circular crest, and H_o is the weir head in feet. Equation (1) is based on the Table 1 measurements for weirs A, B, D, and E, and assumes leakage for these weirs is negligible. This equation, however, is considered valid for the flow over each weir - A, B, C, D, and E. Computed values of Q_o are given in Table 3 as a function of weir head.

As summarized above, the leakage for weir C is not negligible and needs to be corrected to provide an acceptable estimate of the outflow. Assuming this discharge is submerged and behaves as an orifice, the recommended equation for the leakage is

$$Q_l = C_l A H_l^{0.5}, \quad (2)$$

where Q_l is the leakage discharge in MGD, $C_l = 2.52 \text{ MGD/ft}^{2.5}$ is a leakage discharge coefficient, A is the leak area in ft^2 , and H_l is the difference between water surface elevation and leak elevation (i.e., leakage head). The value of C_l given here is based on a leakage discharge estimated by subtracting the flow computed by equation (1) from the average measured flow for weir C. We understand that leakage of any significant amount did not occur prior to the recent modifications to add a new riser section to the weirs. Hence the corresponding value of H_l is based on a leak located at the joint between the old and new riser sections, roughly elevation 627.64 feet. The effect of leak area has been lumped into C_l by assigning $A = 1.0 \text{ ft}^2$ (i.e., C_l represents the discharge coefficient per unit area of leakage). With these assumptions, Table 4 gives the computed values of Q_l as a function of the leakage head.

Summary and Conclusions

Based on results from the dye-dilution technique, the recommended computed flowrate for each weir is given by

Don P. Houston
John C. Pinnix
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$$Q_A = Q_o, \quad (3)$$

$$Q_B = Q_o, \quad (4)$$

$$Q_C = Q_o + Q_l, \quad (5)$$

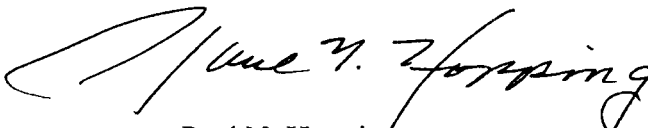
$$Q_D = Q_o, \quad (6)$$

$$Q_E = Q_o. \quad (7)$$

A comparison between the computed and measured flowrates is given in Figure 2. The computed flowrate for all weirs, expressed as a function of water surface elevation, is given in Table 5 (i.e., $Q_A + Q_B + Q_C + Q_D + Q_E$). In computing the values for Table 5 it should be noted that for a given water surface elevation, the head will be different for each weir depending on the elevation of the weir crest.

It needs to be emphasized that the above relationships are considered valid (i.e., within ± 10 percent of the true flowrates) only for clean weirs within the range of heads tested. In general, the discharge coefficients C_o and C_l will vary depending on the head. Also, the leak elevation for weir C has not been verified by field inspections or other measurements. It is possible that leaks at other elevations may have been created when the new riser section was added. Over time, the amount of leakage also may change due to the deposition of ash or other debris in the area of the leak openings. Additional dye-dilution tests would be required to determine the effects of head, approximate leak location, and temporal changes in leakage or other hydraulic conditions of the weirs.

Please call me at 632-1881 or Meihuei Lee at 1897 if you have questions concerning this information.


Paul N. Hopping
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MWL:CP
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CIRCULAR ASH POND WEIR DISCHARGE CALIBRATION

May 16, 1995

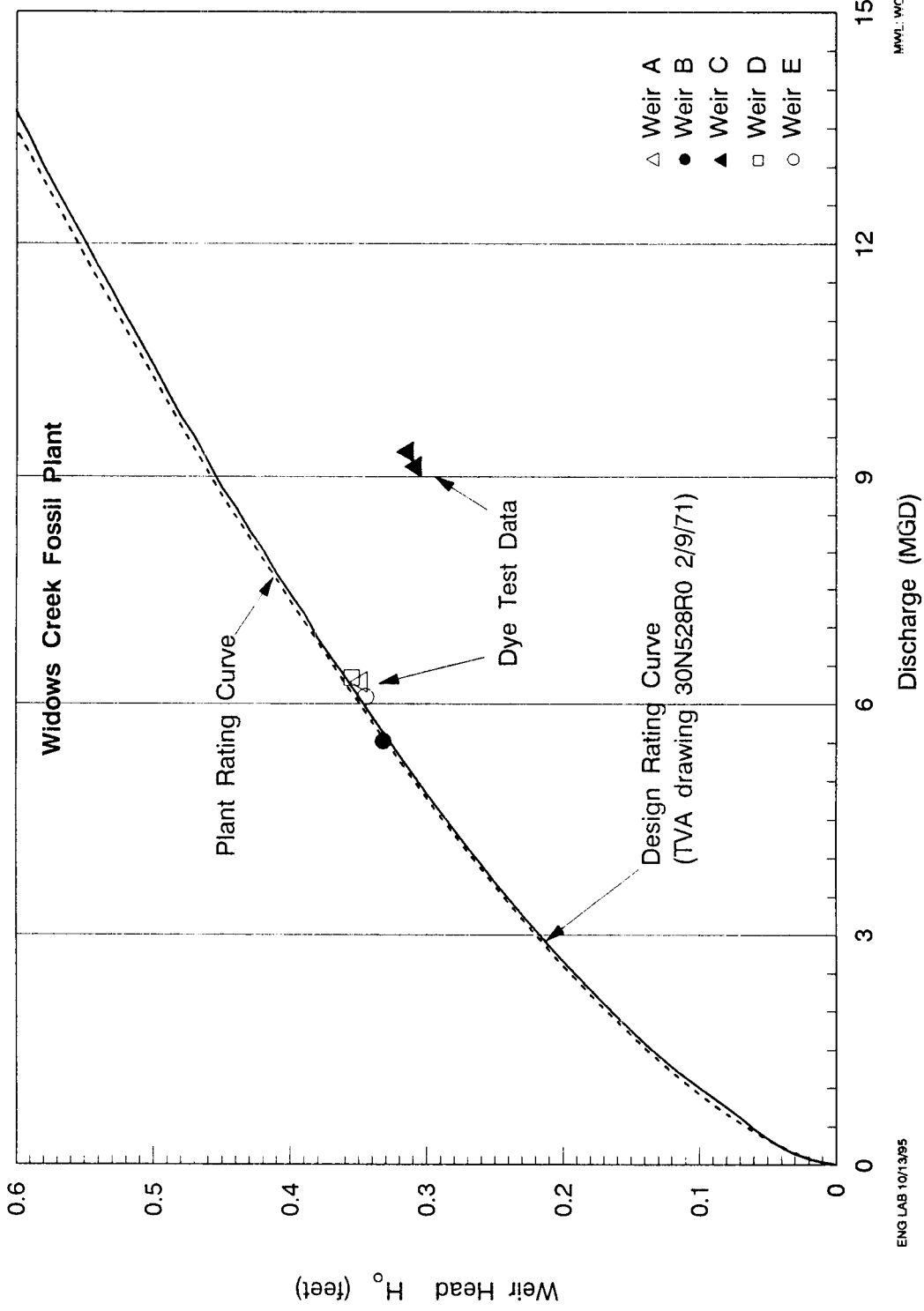
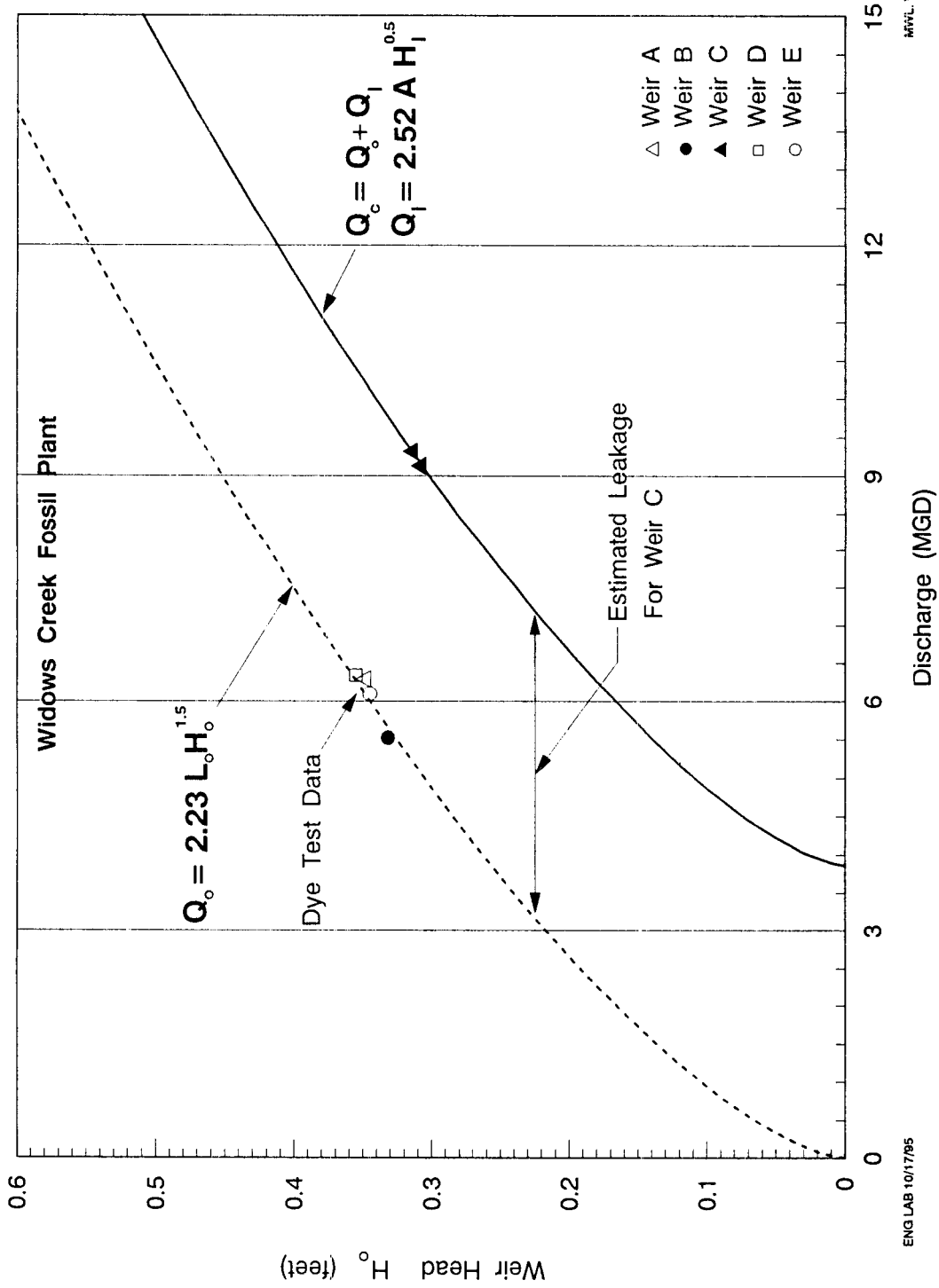


Figure 1. Measured Weir Outflow vs Design and Plant Rating Curves
Based on Dye-Dilution Tests of May 16, 1995

CIRCULAR ASH POND WEIR DISCHARGE CALIBRATION

May 16, 1995



ENGLAB 10/17/95

MWL, WWCFCAL.DRW

Figure 2. Ash Pond Weir Outflow and Leakage Flow Based on Dye-Dilution Tests of May 16, 1995

TABLE 1

Discharge Calibration Results for Ash Pond Weirs
 Dye-Dilution Tests of May 16, 1995
 Widows Creek Fossil Plant

Weir	Weir Elevation ⁽¹⁾ (feet)	H _o ⁽²⁾ Weir Head (feet)	Q _m Measured Flowrate			
			Run ⁽³⁾	Flowrate (gpm)	Avg Flowrate (gpm)	Avg Flowrate (MGD)
A	629.93	0.35	1	4,382	<i>9.73 CFS > 9.41</i> 4,366	6.29
			2	4,332		
			3	4,341		
			4	4,408		
B	629.95	0.33	1	3,916	<i>8.57 < 8.62</i> 3,832	5.52
			2	3,749		
			3	3,830		
C	629.97	0.31	1	6,238	<i>14.12 > 7.85</i> 6,339	9.13
			2	6,387		
			3	6,391		
C	629.97	0.31	1	6,524	<i>14.41 > 7.85</i> 6,469	9.32
			2	6,738		
			3	6,146		
D	629.92	0.36	1	4,467	<i>9.81 ≈ 9.82</i> 4,403	6.34
			2	4,363		
			3	4,378		
E	629.93	0.35	1	4,284	<i>9.44 > 9.41</i> 4,235	6.10
			2	4,185		

Notes:

- (1) Weir crest elevations were obtained from Greg Shipe of G·UB·MK.
- (2) The weir head H is the difference between the pond elevation as measured by Telog and the weir crest elevation.
- (3) For each weir, different dye injection rates were used to verify the flowrate over the weir. One "run" denotes the test results of one dye injection rate.

TABLE 2

Error in Flowrate For Design and Plant Rating Curves
 Dye-Dilution Tests of May 16, 1995
 Widows Creek Fossil Plant

Weir	H _o Weir Head (feet)	Q _m Measured Flowrate (MGD)	Q _c Computed Flowrate ⁽¹⁾ (MGD)		Error ⁽²⁾ (percent)
			Design	Plant	
A	0.35	6.29	Design	6.03	- 4.1
			Plant	5.95	- 5.4
B	0.33	5.52	Design	5.62	+ 1.8
			Plant	5.55	+ 0.5
C	0.31 ⁽³⁾	9.23 ⁽³⁾	Design	5.10	-44.7
			Plant	5.03	-45.5
D	0.36	6.34	Design	6.21	- 2.1
			Plant	6.13	- 3.3
E	0.35	6.10	Design	5.95	- 2.5
			Plant	5.88	- 3.6
PLANT TOTAL		33.47	Design	28.91	-13.6
			Plant	28.54	-14.7

Notes:

- (1) "Design" denotes flowrate shown in TVA design drawing 30N528 R0 dated 2-9-71.
 "Plant" denotes flowrate shown in the existing plant rating curve.
- (2) (+) = overestimate by computed flowrate.
 (-) = underestimate by computed flowrate.
- (3) This is the average of the two sets of data from Table 1.

TABLE 3
 Ash Pond Weir Overflow for Widows Creek Fossil Plant
 Single Weir Without Leakage - Q_o (MGD)

Weir Head H_o (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.000	0.030	0.084	0.154	0.237	0.331	0.435	0.548	0.669	0.798
0.1	0.935	1.08	1.23	1.39	1.55	1.72	1.89	2.07	2.26	2.45
0.2	2.65	2.85	3.05	3.26	3.48	3.70	3.92	4.15	4.38	4.62
0.3	4.86	5.10	5.35	5.61	5.86	6.12	6.39	6.66	6.93	7.20
0.4	7.48	7.76	8.05	8.34	8.63	8.93	9.23	9.53	9.83	10.1
0.5	10.5	10.8	11.1	11.4	11.7	12.1	12.4	12.7	13.1	13.4
0.6	13.7	14.1	14.4	14.8	15.1	15.5	15.9	16.2	16.6	16.9
0.7	17.3	17.7	18.1	18.4	18.8	19.2	19.6	20.0	20.4	20.8
0.8	21.2	21.6	22.0	22.4	22.8	23.2	23.6	24.0	24.4	24.8
0.9	25.2	25.7	26.1	26.5	26.9	27.4	27.8	28.2	28.7	29.1
1.0	29.6	30.0	30.5	30.9	31.4	31.8	32.3	32.7	33.2	33.7

- Notes:**
1. Overflow Q_o is based on dye-dilution tests of May 16, 1995.
 2. To read overflow, enter row with 0.1 foot value of head and enter column with 0.01 foot value of head. For example, for a weir head of 0.67 feet, the overflow is 16.2 MGD.
 3. $Q_o = C_o L H_o^{1.5}$
 where Q_o = discharge over weir in MGD,
 $C_o = 2.23 \text{ MGD/ft}^{2.5}$,
 L = clear length of weir crest, 13.26 feet, and
 H_o = weir head in feet.

TABLE 4
Ash Pond Weir C Leakage Flow for Widows Creek Fossil Plant - Q_i (MGD)

Leakage Head H_i (feet)	0	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.000	0.252	0.356	0.436	0.504	0.563	0.617	0.667	0.713	0.756
0.1	0.797	0.836	0.873	0.909	0.943	0.976	1.01	1.04	1.07	1.10
0.2	1.13	1.15	1.18	1.21	1.23	1.26	1.28	1.31	1.33	1.36
0.3	1.38	1.40	1.43	1.45	1.47	1.49	1.51	1.53	1.55	1.57
0.4	1.59	1.61	1.63	1.65	1.67	1.69	1.71	1.73	1.75	1.76
0.5	1.78	1.80	1.82	1.83	1.85	1.87	1.89	1.90	1.92	1.94
0.6	1.95	1.97	1.98	2.00	2.02	2.03	2.05	2.06	2.08	2.09
0.7	2.11	2.12	2.14	2.15	2.17	2.18	2.20	2.21	2.23	2.24
0.8	2.25	2.27	2.28	2.30	2.31	2.32	2.34	2.35	2.36	2.38
0.9	2.39	2.40	2.42	2.43	2.44	2.46	2.47	2.48	2.49	2.51
1.0	2.52	2.53	2.55	2.56	2.57	2.58	2.59	2.61	2.62	2.63
1.1	2.64	2.65	2.67	2.68	2.69	2.70	2.71	2.73	2.74	2.75
1.2	2.76	2.77	2.78	2.79	2.81	2.82	2.83	2.84	2.85	2.86
1.3	2.87	2.88	2.90	2.91	2.92	2.93	2.94	2.95	2.96	2.97
1.4	2.98	2.99	3.00	3.01	3.02	3.03	3.04	3.06	3.07	3.08
1.5	3.09	3.10	3.11	3.12	3.13	3.14	3.15	3.16	3.17	3.18
1.6	3.19	3.20	3.21	3.22	3.23	3.24	3.25	3.26	3.27	3.28
1.7	3.29	3.30	3.30	3.31	3.32	3.33	3.34	3.35	3.36	3.37
1.8	3.38	3.39	3.40	3.41	3.42	3.43	3.44	3.45	3.46	3.46
1.9	3.47	3.48	3.49	3.50	3.51	3.52	3.53	3.54	3.55	3.55
2.0	3.56	3.57	3.58	3.59	3.60	3.61	3.62	3.63	3.63	3.64
2.1	3.65	3.66	3.67	3.68	3.69	3.70	3.70	3.71	3.72	3.73
2.2	3.74	3.75	3.75	3.76	3.77	3.78	3.79	3.80	3.81	3.81
2.3	3.82	3.83	3.84	3.85	3.85	3.86	3.87	3.88	3.89	3.90
2.4	3.90	3.91	3.92	3.93	3.94	3.94	3.95	3.96	3.97	3.98
2.5	3.98	3.99	4.00	4.01	4.02	4.02	4.03	4.04	4.05	4.06
2.6	4.06	4.07	4.08	4.09	4.09	4.10	4.11	4.12	4.13	4.13
2.7	4.14	4.15	4.16	4.16	4.17	4.18	4.19	4.19	4.20	4.21
2.8	4.22	4.22	4.23	4.24	4.25	4.25	4.26	4.27	4.28	4.28
2.9	4.29	4.30	4.31	4.31	4.32	4.33	4.34	4.34	4.35	4.36
3.0	4.36	4.37	4.38	4.39	4.39	4.40	4.41	4.42	4.42	4.43
3.1	4.44	4.44	4.45	4.46	4.47	4.47	4.48	4.49	4.49	4.50
3.2	4.51	4.51	4.52	4.53	4.54	4.54	4.55	4.56	4.56	4.57
3.3	4.58	4.58	4.59	4.60	4.61	4.61	4.62	4.63	4.63	4.64
3.4	4.65	4.65	4.66	4.67	4.67	4.68	4.69	4.69	4.70	4.71
3.5	4.71	4.72	4.73	4.73	4.74	4.75	4.75	4.76	4.77	4.77

- Notes: 1. Leakage flow Q_i is based on dye-dilution tests of May 16, 1995.
2. To read leakage flow, enter row with 0.1 foot value of leakage head and enter column with 0.01 foot leakage head. For example, for H_i of 2.86 feet, the leakage flow is 4.26 MGD.
3. $Q_i = C_1 A H_i^{0.5}$
 where Q_i = leakage discharge in MGD,
 $C_1 = 2.52 \text{ MGD}/\text{ft}^{2.5}$,
 $A = 1.0 \text{ feet}^2$, and
 $H_i = \text{WSEL} - 627.64 \text{ feet}$.

TABLE 5
 Total Ash Pond Outflow for Widows Creek Fossil Plant
 All Weirs, Including Weir C Leakage - $Q_A + Q_B + Q_C + Q_D + Q_E$ (MGD)

WSEL (feet)	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
629.9	3.79	3.80	3.80	3.84	3.96	4.15	4.41	4.73	5.13	5.60
630.0	6.12	6.69	7.30	7.95	8.64	9.36	10.1	10.9	11.7	12.6
630.1	13.5	14.4	15.3	16.3	17.3	18.3	19.3	20.4	21.4	22.5
630.2	23.7	24.8	26.0	27.2	28.4	29.6	30.9	32.1	33.4	34.8
630.3	36.1	37.4	38.8	40.2	41.6	43.0	44.4	45.9	47.4	48.8
630.4	50.3	51.9	53.4	55.0	56.5	58.1	59.7	61.3	62.9	64.6
630.5	66.2	67.9	69.6	71.3	73.0	74.8	76.5	78.3	80.0	81.8
630.6	83.6	85.5	87.3	89.1	91.0	92.8	94.7	96.6	98.5	100
630.7	102	104	106	108	110	112	114	116	118	120
630.8	122	124	127	129	131	133	135	137	139	141
630.9	144	146	148	150	152	155	157	159	161	164
631.0	166	168	171	173	175	178	180	182	185	187

- Notes:**
1. Outflow $Q_A + Q_B + Q_C + Q_D + Q_E$ is based on dye-dilution tests of May 16, 1995.
 2. To read outflow, enter row with 0.1 foot value of WSEL and enter column with 0.01 foot value of WSEL. For example, for a WSEL of 630.67 feet, the outflow is 96.6 MGD.
 3. For $WSEL \leq 629.93$, $Q_A = 0$.
 For $WSEL > 629.93$, $Q_A = Q_o$ per Table 3 with $H_o = WSEL - 629.93$.
 4. For $WSEL \leq 629.95$, $Q_B = 0$.
 For $WSEL > 629.95$, $Q_B = Q_o$ per Table 3 with $H_o = WSEL - 629.95$.
 5. For $WSEL \leq 627.64$, $Q_C = 0$.
 For $627.64 < WSEL \leq 629.97$, $Q_C = Q_t$ per Table 4 with $H_t = WSEL - 627.64$
 For $WSEL > 629.97$, $Q_C = Q_o + Q_t$ per Tables 3 and 4 with $H_o = WSEL - 629.97$ and
 $H_t = WSEL - 627.64$.
 6. For $WSEL \leq 629.92$, $Q_D = 0$.
 For $WSEL > 629.92$, $Q_D = Q_o$ per Table 3 with $H_o = WSEL - 629.92$.
 7. For $WSEL \leq 629.93$, $Q_E = 0$.
 For $WSEL > 629.93$, $Q_E = Q_o$ per Table 3 with $H_o = WSEL - 629.93$.

Master
File

April 11, 1997

Plant Manager, Widows Creek Fossil Plant

WIDOWS CREEK FOSSIL PLANT (WCF) - ANNUAL INSPECTION OF WASTE
DISPOSAL AREAS

Attached is a report prepared by B. K. Elder dated April 10, 1997, concerning the inspection of the WCF waste disposal areas for dike stability.

This report includes recommendations for corrective work. I concur with these recommendations.



Ralph G. Johnson
Manager, Fossil Engineering
LP 2G-C

KWB:BKE:SRH

Attachments

cc (Attachments):

J. S. Baugh, LP 5H-C

W. D. Hall, LP 1H-C

RIMS, WR 4Q-C

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TENNESSEE VALLEY AUTHORITY
WIDOWS CREEK FOSSIL PLANT

*ANNUAL INSPECTION OF
WASTE DISPOSAL AREAS*

Prepared by: Keith Elder
Date: April 10, 1997

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE INSPECTION
1997**

INTRODUCTION

The waste disposal areas at Widows Creek Fossil Plant were inspected for dike structural stability on March 27, 1997. The inspection was performed by Jim Huber of TVA Fossil Fuels and Keith Elder of TVA Fossil Engineering. The previous annual inspection was performed on April 22, 1996.

The results of the annual stability inspection are listed below according to location within the waste disposal area.

ACTIVE ASH POND AREA AND RELATED DIKES (Dwgs 10W7465-01 & 10W7420)

Bottom ash and fly ash were still being sluiced into the southwest corner of this area as in years past. The bottom ash was dropping out near the outfall of the pipes and was being worked with bulldozers. The fly ash flowed northeast into the active ash pond as usual, but the flow had been redirected into the inactive scrubber pond adjacent to the active ash pond. This was accomplished by a few modifications. First, a divider dike was constructed from the tip of the present finger dike south through the existing ash pond/ inactive scrubber pond divider dike and into the inactive scrubber pond for a distance of about 300 feet. The existing divider dike was then breached to the east of the new divider dike to allow inflow of fly ash sluice into the inactive scrubber pond. A second breach was made in the existing divider dike west of the new dike to allow effluent from the inactive scrubber pond to flow back into the active ash pond and out the spillways into the stilling pool. Water from the stilling pool is either discharged into Gunter'sville Reservoir or it is pumped back into the wet gypsum system as make up water.

Approximately a month before the inspection, the slide along the southern exterior slope that was noted in previous inspections was noted to have increased in size by plant employees. This area was inspected by Fossil Engineering at that time, and was examined again on this inspection. The area had not grown during that time and does not appear to pose a severe structural threat to dike integrity. Plant personnel are planning to repair and stabilize the area with stone in accordance with the recommendation of Fossil Engineering.

The remainder of the exterior slopes in this region were in good condition with excellent vegetative ground cover. Patches of undesirable trees were present over much of the slopes. Also, a few animal burrows were found on the southeast exterior slope. The areas were marked with flagging. The seeps north of the bridge over Widows Creek that have been noted in previous inspections were still present, but did not appear any worse than from the previous inspection.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE INSPECTION
1997**

The interior dike slopes in this area had excellent vegetative cover. A few patches of small trees were found on the northwest interior slopes. Several animal burrows were found in the slope and were marked with flagging. These burrows could lead to slips or seeps if not properly repaired.

The ditch that drains the runoff and seepage from the toe of the eastern and southern slopes to the containment basin northwest of the area had recently been cleaned and was adequately conveying water.

No water was being discharged through the spillways from the stilling pool into Gunterville Reservoir during the inspection. The discharge pipes were all clear and had an excellent riprap cover around their outlets.

INACTIVE SCRUBBER POND WEST OF WIDOWS CREEK (Dwg 10N7420)

This area has been activated as an extension of the active fly ash pond. As mentioned in the section above, the divider dike between this area and the active ash pond was breached in two places to allow for the ash sluice water to enter and exit this area. The fly ash is settling out in this area and will eventually fill the portion that was once covered in water.

The exterior slopes in this region were in good condition. The slopes needed to be mowed to the lower berm, and the small trees growing on the slopes should be removed. The known seeps along Widows Creek south of the bridge were still present, but had not increased in intensity since the last inspection.

Interior slopes in this area still show signs of erosion. This is most likely due to wave action resulting from the large pool of water in the area. This pool of water will decrease in depth and area as the fly ash fills the pond, and the wave action will be eliminated. Small trees were noted on the interior slopes in a few locations.

The divider dike between this area and the ash pond was in good condition. The two breached areas were stable with tightly compacted material lining them. No signs of erosion or scour were present in either breach. The skimmer structure at the exit breach was functioning normally.

GYPSUM STACKING AREA EAST OF WIDOWS CREEK (Dwg 10E7416-1)

TVA's Heavy Equipment Division (HED) continued to manage this area by beginning implementation of the rim ditch method of stacking. On the day of the inspection, wet gypsum

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE INSPECTION
1997**

was being sluiced into pond 1, routed through pond 2A, and then into pond 3. The discharge water was then routed through pond 2B and into the stilling pool. The wet gypsum can also be sluiced into the southwest corner of pond 3 and then be allowed to settle in pond 3 before the water is discharged through pond 2B to the stilling pool. HED alternates between these two routes as stack management requires. Water from the stilling pool is discharged through a gravity pipe system to a channel southeast of the inactive scrubber pond where it eventually discharges into Guntersville Reservoir.

The development of rim ditches around pond 3 has progressed nicely over the last two years; however, wet gypsum is not being sluiced into pond 2B (the old settlement pond for areas 1 and 2 prior to activation of pond 3) for fear of exceeding NPDES permit limits on suspended solids at the stilling pool discharge. The water level in pond 3 is at least 10 feet higher than the water level in pond 2B. The depth of pond 2B has increased to over 25 feet relative to the top of ponds 2A and 3 as the dikes have been raised to accommodate sluicing into pond 3. Although there were no signs of dike instability at the time of inspection, the depth of pond 2B has reached a point where interior and exterior dike stability is becoming questionable. Pond 2B needs to be filled with gypsum to improve dike stability.

The exterior slopes of the dikes in this area were in good condition and had good vegetative cover. Small trees were beginning to grow on the slopes as they were on the dike slopes of the other ponds. Inactive gypsum slope faces were being covered with earth and seeded to prevent dusting and erosion. The drainage ditch between the stack in pond 1 and the exterior dike was basically free of drainage inhibiting vegetation, but portions of the ditch along the eastern edge of the area were filled with gypsum material due to erosion from the pond 3 area.

The interior slopes of the stilling pool were in good condition but contained small trees that will cause problems if they are not removed.

INACTIVE ASH POND AREA WITHIN THE RAILROAD LOOP (Dwg 10N7400)

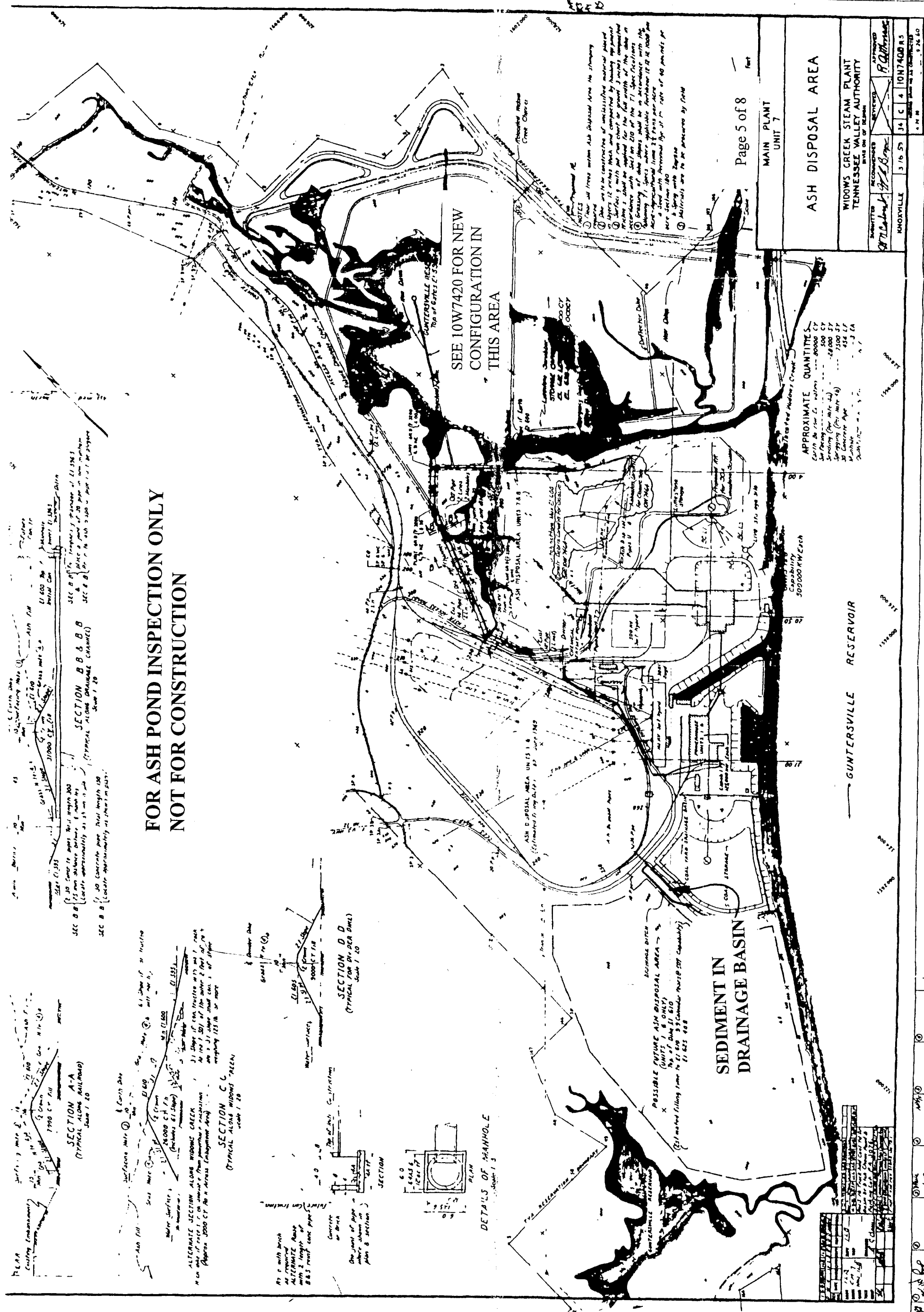
This disposal site is no longer in use. The area is covered in trees and vegetation. All visible slopes were in good condition. No signs of erosion or slippage were noted on the slopes around the railroad loop.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE INSPECTION
1997**

COAL YARD DRAINAGE BASIN (Dwg 10N7400)

This pond is located west of the plant and coal yard. It receives runoff from the coal pile and yard equipment areas. The discharge from this area is pumped back to the active ash pond area.

The exterior slopes in this area were in good condition with nice grass cover. Interior slopes also had a good vegetative cover. A large portion of the pond was filled with sediment from the coal pile area.



**FOR ASH POND INSPECTION ONLY
NOT FOR CONSTRUCTION**

SEE 10W7420 FOR NEW CONFIGURATION IN THIS AREA

SEDIMENT IN DRAINAGE BASIN

APPROXIMATE QUANTITIES

Earth to raise C. walls	40000 CY
Soil Paving (Per Mark 14)	500 CY
Graveling (Per Mark 14)	28000 SF
Graveling (Per Mark 16)	7100 SF
30 Concrete Pipe	454 LF
Manhole	3 EA

Capacity 500,000 KW.EACH

GUNTERSVILLE RESERVOIR

Page 5 of 8

MAIN PLANT UNIT 7

ASH DISPOSAL AREA

WIDOWS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY

APPROVED	DATE	BY
REVISIONS		
NO. 1	3/16/57	C. C. 4
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NO. 99		
NO. 100		

SECTION A-A
(TYPICAL ALONG RAILROAD)
Scale 1/20

SECTION B-B & B-B
(TYPICAL ALONG DRAINAGE CHANNEL)
Scale 1/20

SECTION C-C
(TYPICAL ALONG WIDOWS CREEK)
Scale 1/20

SECTION D-D
(TYPICAL FOR ON-ROAD DRAINAGE)
Scale 1/20

DETAILS OF MANHOLE
Scale 1/3

FOR ASH POND INSPECTION ONLY
NOT FOR CONSTRUCTION

SEE 10W7420 FOR NEW CONFIGURATION IN THIS AREA

SEDIMENT IN DRAINAGE BASIN

POSSIBLE FUTURE ASH DISPOSAL AREA (UNITS 1 & ONLY) (Est. based on filling from Units 1 & 2 Capacity 1,625,408)

WIDOWS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY

APPROXIMATE QUANTITIES

Capacity 500,000 KW.EACH

GUNTERSVILLE RESERVOIR

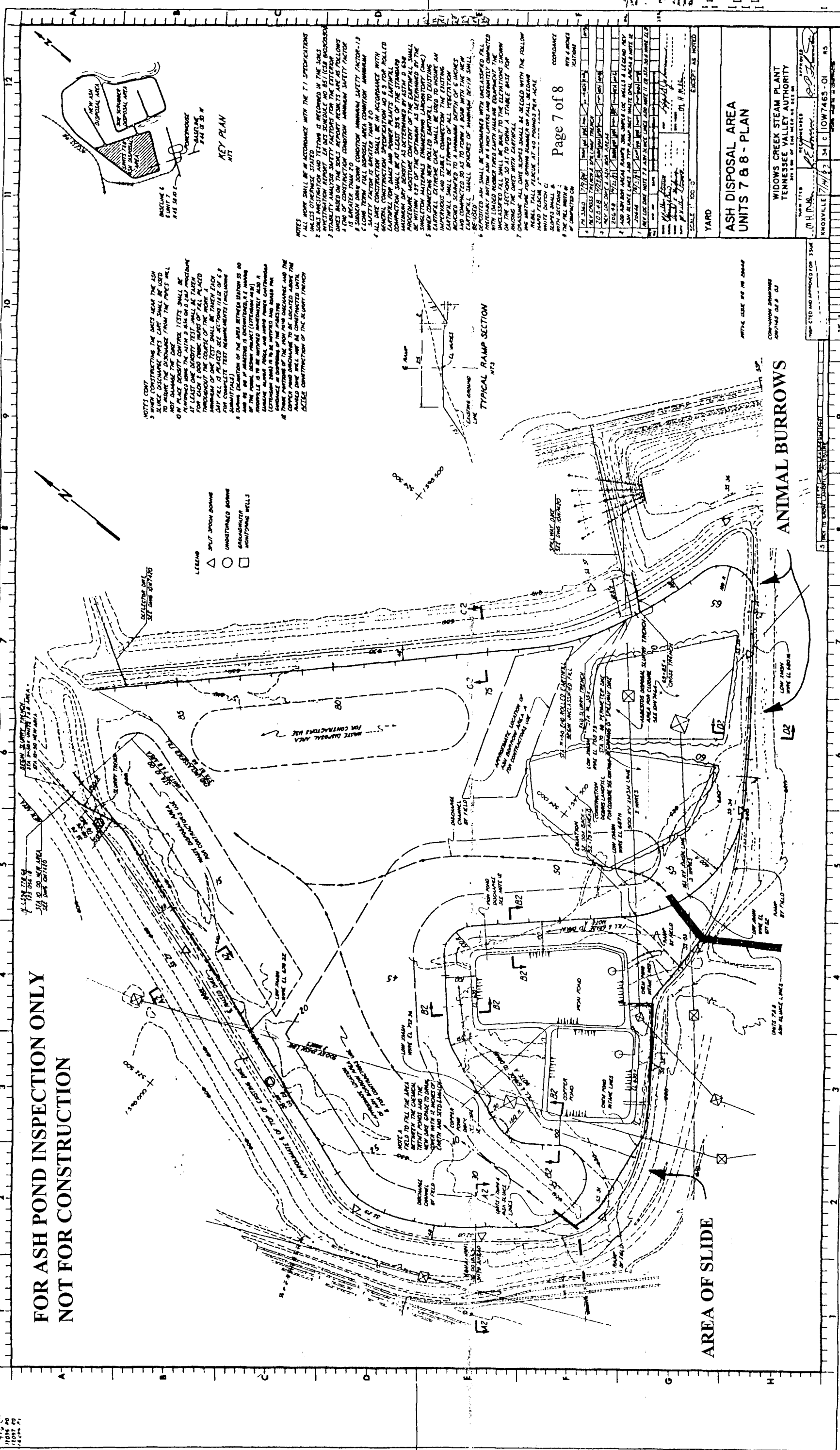
Page 5 of 8

MAIN PLANT UNIT 7

ASH DISPOSAL AREA

10-5974.001 3 81

FOR ASH POND INSPECTION ONLY
NOT FOR CONSTRUCTION



NOTES CONT

3 WHEN CONTRACTING THE DICES NEAR THE ASH SLIDE DISCHARGE POINTS CARE SHALL BE USED TO PROTECT THE DICES FROM THE PILES WILL NOT DAMAGE THE DICE.

4 IN PLACE DENSITY CONTROL TESTS SHALL BE PERFORMED USING THE ASTM D 1556 ON 2'x2' PROCEDURE AT LEAST ONE DENSITY TEST SHALL BE TAKEN THROUGHOUT THE COURSE OF THE PILE PLACED IMMEDIATELY AFTER EACH PILE IS PLACED.

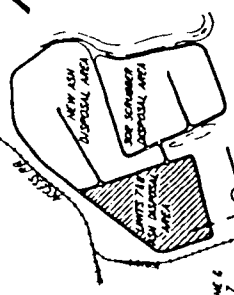
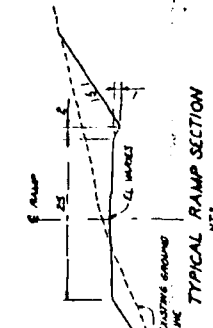
5 THE COMPLETE TEST REQUIREMENTS INCLUDING SOILS (C-1) SHALL BE AS FOLLOWS:

6 AND BE IN ACCORDANCE WITH THE FOLLOWING:

7 THE PILES SHALL BE PLACED IN THE FOLLOWING ORDER:

8 THE PILES SHALL BE PLACED IN THE FOLLOWING ORDER:

9 THE PILES SHALL BE PLACED IN THE FOLLOWING ORDER:



NOTES

1 ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE T.I. SPECIFICATIONS.

2 SOIL INVESTIGATION AND TESTING IS REQUIRED IN THE SOILS INVESTIGATION REPORT IN ITS SCHEDULE NO. 85/1 (SEE BACKGROUND).

3 STABILITY ANALYSIS SAFETY FACTORS FOR THE EXISTING AND NEW DISPOSAL AREAS SHALL BE AS FOLLOWS:

4 THE SAFETY FACTOR FOR THE EXISTING DISPOSAL AREA SHALL BE 1.5.

5 THE SAFETY FACTOR FOR THE NEW DISPOSAL AREA SHALL BE 1.5.

6 THE SAFETY FACTOR FOR THE EXISTING DISPOSAL AREA SHALL BE 1.5.

7 THE SAFETY FACTOR FOR THE NEW DISPOSAL AREA SHALL BE 1.5.

8 THE SAFETY FACTOR FOR THE EXISTING DISPOSAL AREA SHALL BE 1.5.

9 THE SAFETY FACTOR FOR THE NEW DISPOSAL AREA SHALL BE 1.5.

Page 7 of 8

NO.	DESCRIPTION	DATE	BY	CHECKED
1	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS
2	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS
3	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS
4	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS
5	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS
6	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS
7	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS
8	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS
9	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS
10	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS
11	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS
12	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS

YARD

ASH DISPOSAL AREA
UNITS 7 & 8 - PLAN

WIDOWS CREEK STEAM PLANT
TENNESSEE VALLEY AUTHORITY

SCALE: 1" = 50'-0"

EXCEPT AS NOTED

DATE: 1/14/82

BY: J. H. HARRIS

CHECKED: J. H. HARRIS

APP'D: J. H. HARRIS

NO. 1017465-01

KNOWLEDGE: 1/14/82

NO. 1017465-01

NO.	DESCRIPTION	DATE	BY	CHECKED
1	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS
2	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS
3	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS
4	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS
5	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS
6	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS
7	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS
8	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS
9	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS
10	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS
11	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS
12	REVISED THE SHEET TO SHOW THE NEW DISPOSAL AREA	1/14/82	J. H. HARRIS	J. H. HARRIS

AREA OF SLIDE

ANIMAL BURROWS

APPROX. 100 PPM

CONSTRUCTION

APPROVED FOR ISSUE

DATE: 1/14/82

BY: J. H. HARRIS

CHECKED: J. H. HARRIS

APP'D: J. H. HARRIS

NO. 1017465-01

KNOWLEDGE: 1/14/82

NO. 1017465-01

**OTHER AREAS INSPECTED, ACTIONS ON PREVIOUS RECOMMENDATIONS,
AND RECOMMENDATIONS FOR CORRECTIVE ACTION**

CHEMICAL TREATMENT POND (Dwg 10W7465-01)

The chemical treatment ponds are located within the active ash disposal area dikes. Water is pumped into these ponds and treated before it is pumped into the active pond. No external slopes exist for these ponds because they were created by excavation into the existing disposal area. The interior slopes of the ponds were in good condition with riprap cover over all slopes.

ACTIONS SINCE LAST INSPECTION

The divider dike between the active ash pond and the inactive scrubber pond has been modified by breaching. The erosion noted on the slopes of this dike in the last inspection had not worsened, and the dike appeared to be stable.

The bare areas noted on the gypsum stack had been seeded and vegetation had been established.

The temporary access ramp that was blocking the drainage ditch in the gypsum stack area had been removed. The area had also been vegetated.

The damaged drainage structure in the southwest corner of the gypsum stacking area had been repaired.

RECOMMENDATIONS

Fill pond 2B of the Gypsum Stacking Area with scrubber waste. This may be accomplished by either sluicing into the pond or by reclaiming, hauling, and dumping stacked gypsum into pond 2B. If the sluicing method is used, the exterior slope of the dike should be flattened to at least a 2 horizontal to 1 vertical slope and the dike should be monitored daily for interior wave erosion.

Mow the slopes of all exterior dikes to at least the lower berm. This should also include the removal of any trees found growing on the slopes. All trees growing on the interior slopes of the dikes should also be removed.

Repair the slide area on the south exterior slope of the active ash pond dike. Stone should be placed on the area as indicated in the March 12, 1997, memo from Kenneth Burnett to M. D. Davis.

Repair all of the flagged animal burrows by filling with earth material and tamping. Seed and mulch any bare earth areas that remain as a result of the repairs.

**OTHER AREAS INSPECTED, ACTIONS ON PREVIOUS RECOMMENDATIONS,
AND RECOMMENDATIONS FOR CORRECTIVE ACTION**

Clean the gypsum material from the eastern ditch of the gypsum stacking area and place it back in the stack. Best management practices (cover and seeding, silt fences, etc.) should be used to insure that the transport of gypsum into the ditches is minimized.

Remove the sediment and coal from the coal yard drainage basin. This will insure that water does not overtop the dike during a storm event and cause erosion.

Continue to monitor the seeps along the bank of the relocated Widows Creek channel near the gypsum stack access bridge. Notify TVA Fossil Engineering if any material movement is noted.

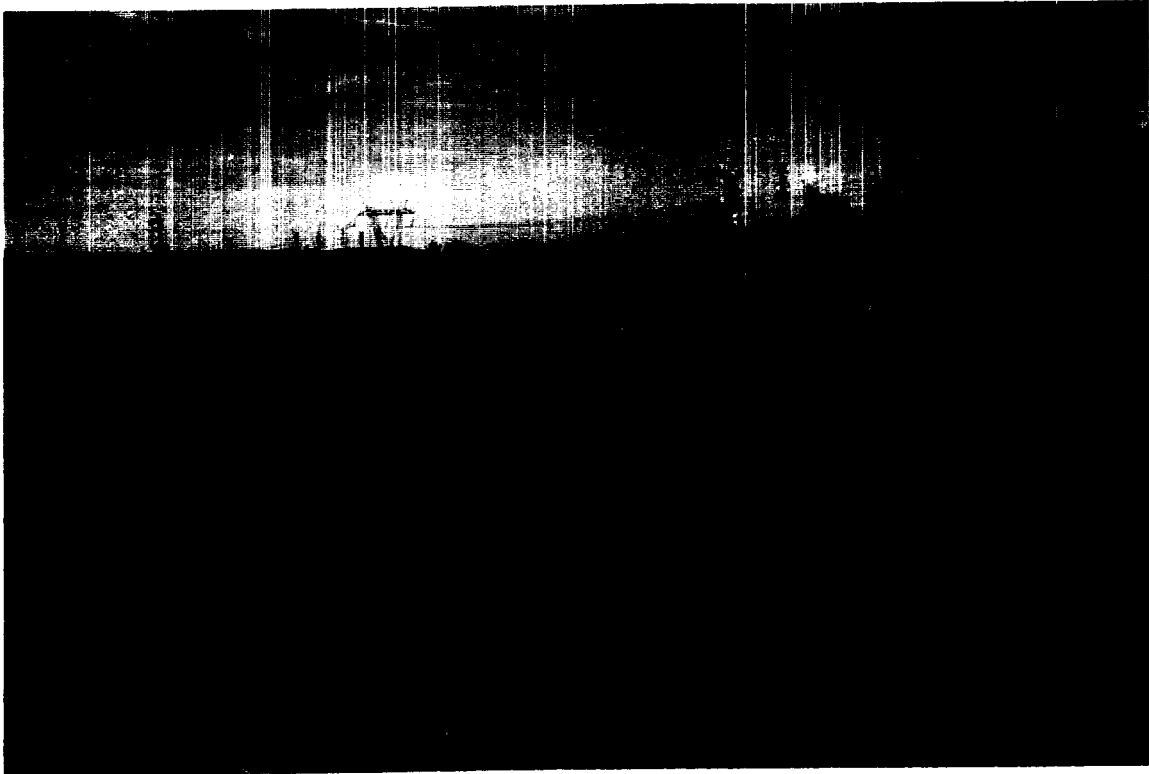


Figure 1. Small trees on the exterior slope of the active ash pond.



Figure 2. Exterior slope slip on the southeastern dike of active ash pond.

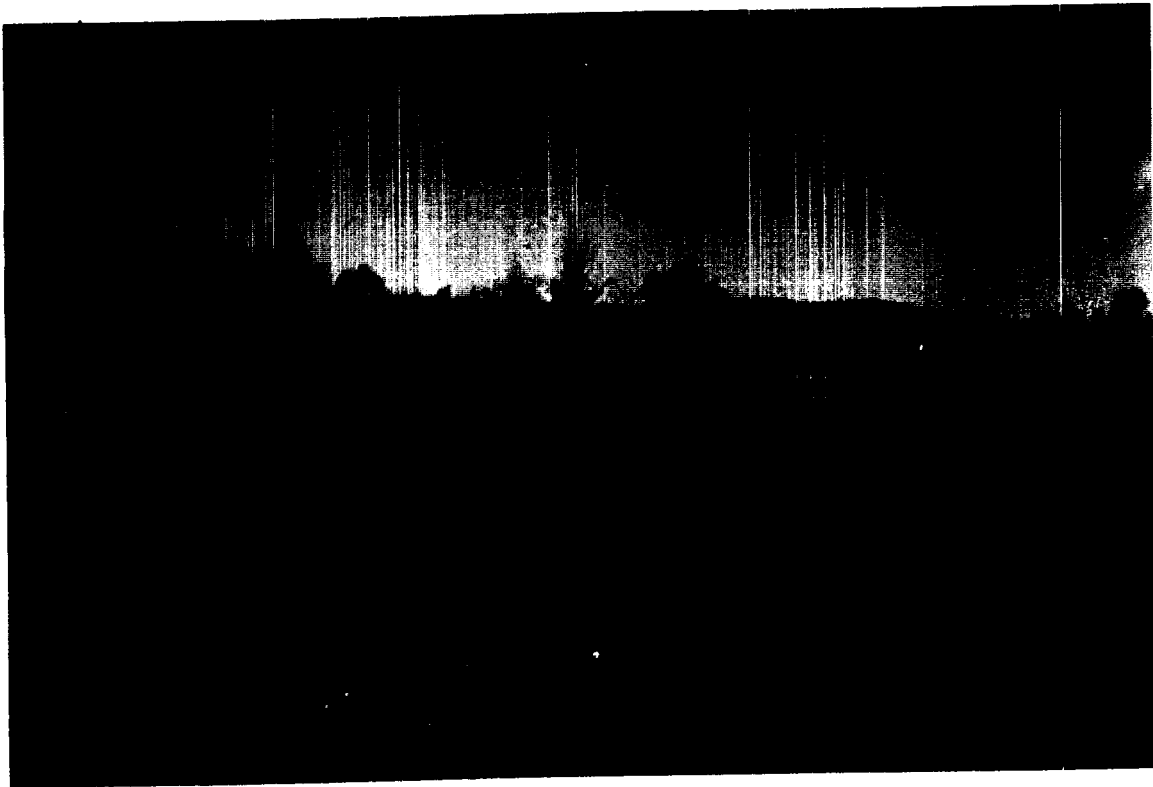


Figure 3. Sedimentation in the coal yard drainage basin.

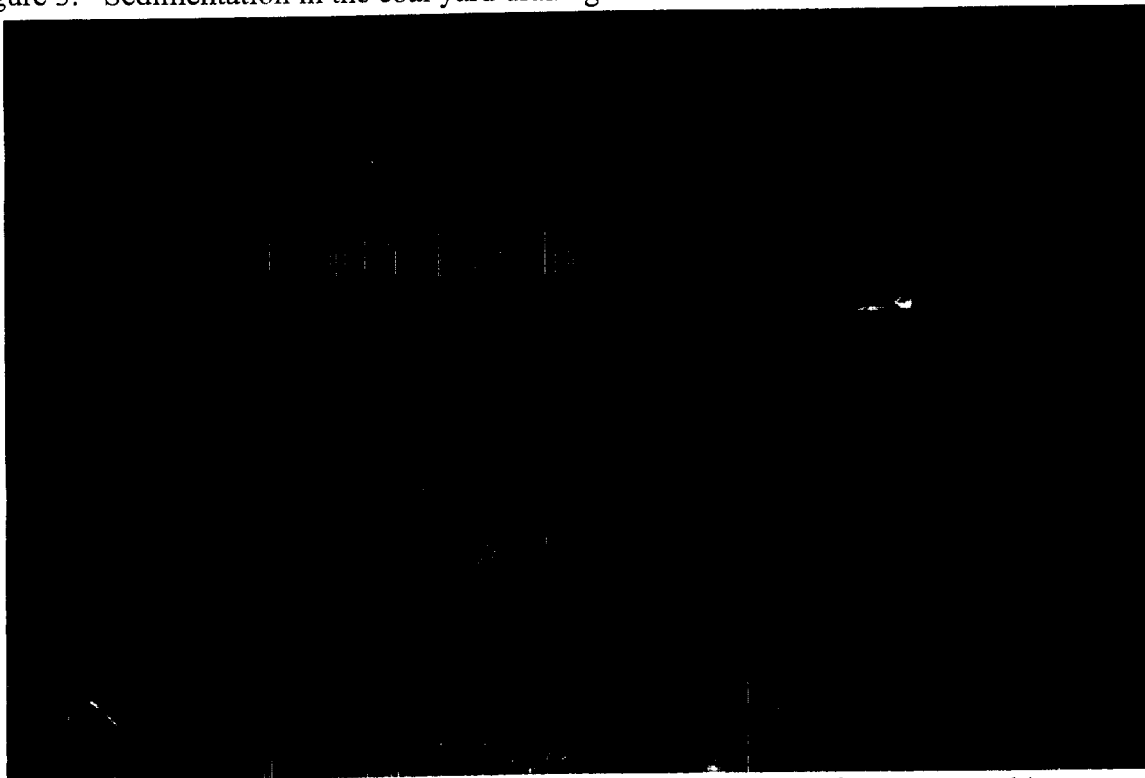


Figure 4. Gypsum material filling the ditch along the eastern dike of gypsum stacking area.

March 12, 1997

M. D. Davis, WCF

INSPECTION OF SLOPE FAILURE ON THE SOUTH DIKE OF THE ACTIVE DISPOSAL AREA - OBSERVATIONS AND RECOMMENDATIONS

On Monday, March 3, Jim Huber of TVA Fossil Fuels and Keith Elder of TVA Fossil Engineering inspected an earth slide which was on the south slope of the active ash disposal area just west of the chemical treatment ponds. The slide was approximately 60 feet in length along the dike and 25 feet in width up from the toe of the dike. The height of the vertical face of the slide averaged about 6 feet. Assuming a 3 to 1 side slope as shown on the design drawings, this slide constitutes a volume of approximately 215 cubic yards. Further information on the location and geometry of the slide can be found on the accompanying attachments.

The integrity of the dike is not being threatened by this slide at this time. However, a noticeable flow of water exists beneath the slide material, which will continue to cause more and more of the dike material to slide into the ditch. Loss of dike material can eventually lead to failure of this dike. Implications of dike failure include blockage of the disposal area access road and costly cleanup of the material. The integrity of the copper chemical pond dike would also be threatened by a dike failure in this area.

Fossil Engineering recommends that corrective measures be taken to prevent further slipping of material in this area. The preferred repair would be to fill the area with crushed stone and riprap. The stone fill should consist of a layer of well graded crusher run rock (less than 2" with all fines less than No. 10 sieve removed). The riprap should consist of stones of which 50% weigh at least 100 lb. The configuration of the fill can be seen in Attachment B. The thickness of the crushed stone and riprap should be determined by the field with a 12" minimum layer of crushed stone and an 18" minimum layer of riprap. This solution would prevent failure by (1) adding weight to the toe of the slope and (2) allowing the existing flow of water to seep to the ditch without carrying material with it. Our calculations indicate that approximately 250 tons of rock will be required to fill this area.

The rock should be placed with a few considerations in mind:

- A layer of crushed stone/ riprap at least 5 feet wide and 3 feet deep should be placed against the vertical face of the slip before any material is removed from the slide area. This will help stabilize the slope from further slipping. After any necessary material removal, the remainder of the crushed stone/ riprap can be placed.

M. D. Davis
March 4, 1997
Page 2

- If the crushed stone/ riprap is placed from the top of the dike, the delivery trucks should dump the rock in an area that is not directly above the slide and should not drive over the area. This will minimize the load above the damaged region and minimize the chance of further slipping.
- The crushed stone/ riprap should be placed at a 2 to 1 slope. This will provide adequate protection while minimizing material.
- The material between the newly placed stone and the road should be carefully watched. The weight of the crushed stone/ riprap will cause the soft material in this area to shift toward the road. Any excess material that is shifted into the ditch or road should be removed and placed inside the dike.

These observations were discussed with Robert Mason at Widows Creek on the day of the inspection. Please review these observations and recommendations and call me at 751-6607 or Keith Elder at 751-6370 if you have any questions or comments.

Kenneth W. Burnett

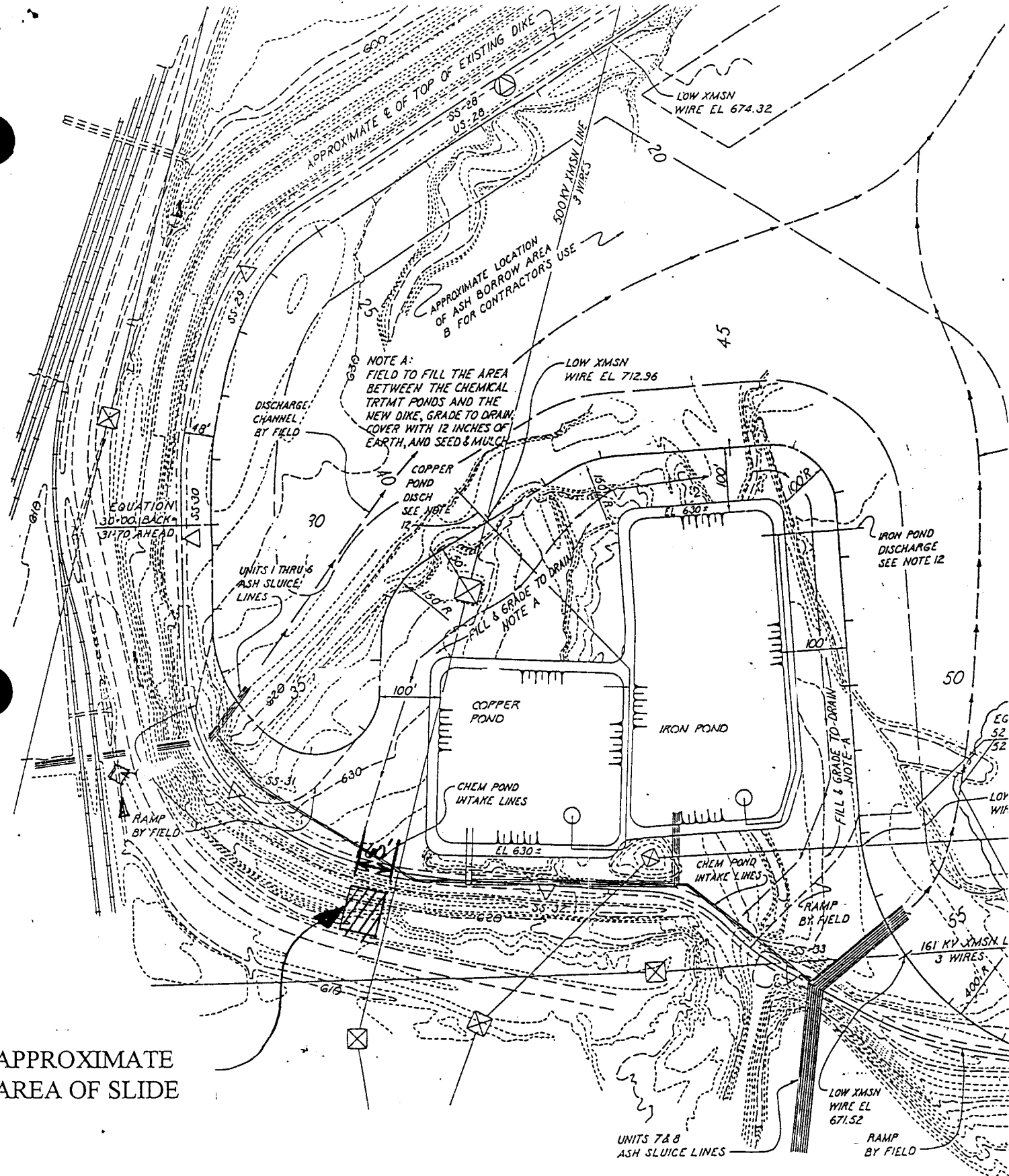
Kenneth W. Burnett
Manager, Fossil Site and Environmental Engineering

KWB:JLG:BKE

cc: J. M. Huber, LP 5H-C
J. A. Okes, LP 5H-C
R. L. Mason, WCF 1A-STA

Attachments

APPROXIMATE
AREA OF SLIDE



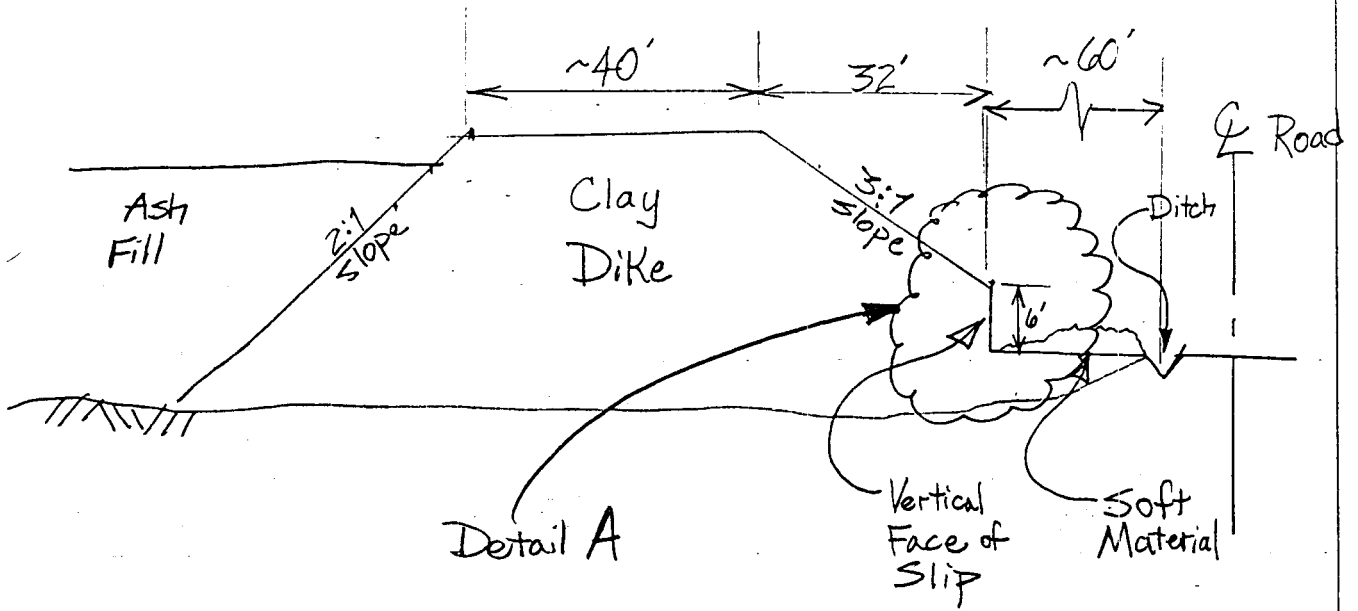
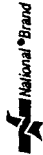
5-4-91

WCF Ash Disposal
Area - Slide

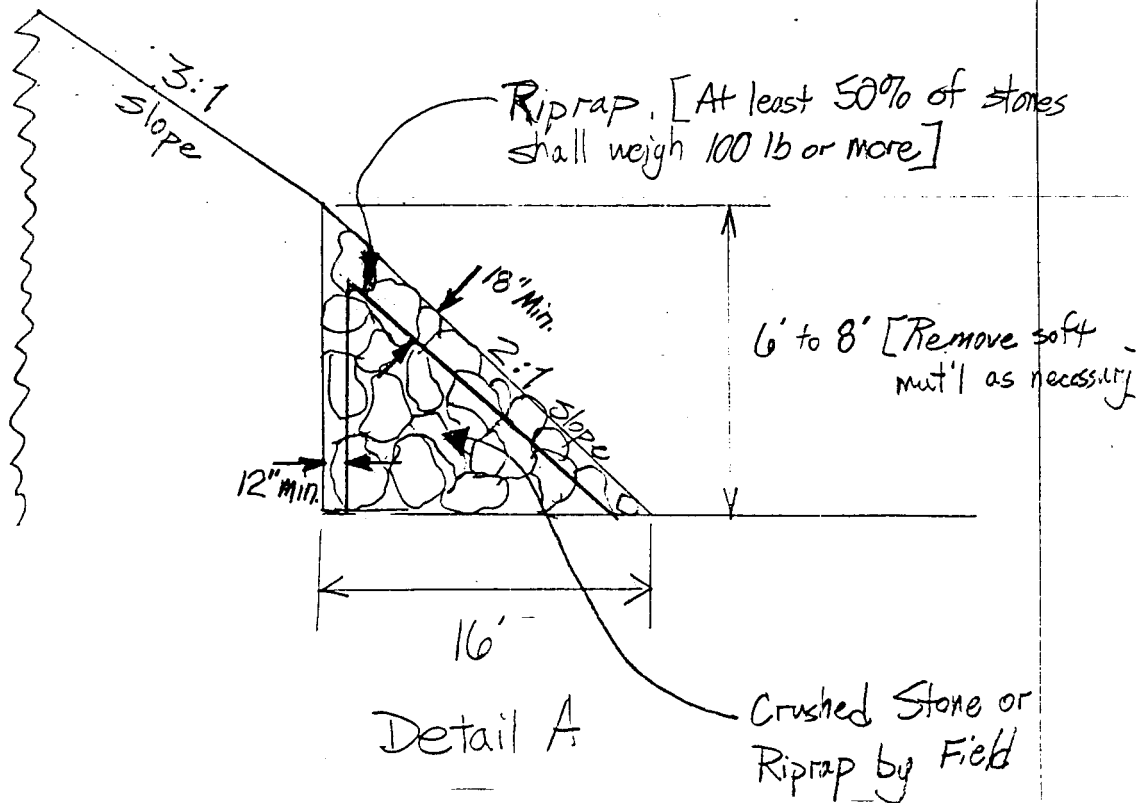
ATTACHMENT B

Drawn by: BKE

42,381 50 SHEETS EYE-FAST™ 5 SQUARE
42,382 100 SHEETS EYE-FAST™ 5 SQUARE
42,383 200 SHEETS EYE-FAST™ 5 SQUARE
42,384 300 SHEETS EYE-FAST™ 5 SQUARE
42,385 400 SHEETS EYE-FAST™ 5 SQUARE
42,386 200 RECYCLED WHITE 5 SQUARE
Made in U.S.A.



Section A-A



B65 980507 250

May 7, 1998

D. H. Finke, WCF 1A-STA

WIDOWS CREEK FOSSIL PLANT (WCF) - ANNUAL INSPECTION OF WASTE
DISPOSAL AREAS

The subject inspection was completed by representatives of Fossil Engineering and Fossil Fuels. The observations from the inspection and recommendations for corrective work are in the attached report.

If you have any questions or need assistance, please contact Keith Elder at Chattanooga extension 6370.



Ralph G. Johnson
Manager, Fossil Engineering
LP 2G-C

KWB:BKE:SRH

Attachment

cc (Attachment):

W. D. Hall, LP 1H-C

G. R. Macdonald, LP 5H-C

J. D. McCarver, WCF 1A-STA

EDMS, WR 4Q-C

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TENNESSEE VALLEY AUTHORITY
WIDOWS CREEK FOSSIL PLANT

*ANNUAL INSPECTION OF
WASTE DISPOSAL AREAS*

Prepared by: Keith Elder
Date: May 6, 1998

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE INSPECTION
1998**

INTRODUCTION

The waste disposal areas at Widows Creek Fossil Plant were inspected for dike structural stability on April 9, 1998. The inspection was performed by Keith Elder of TVA Fossil Engineering. He was accompanied by Melissa Hedgecoth of TVA Fossil Fuels. The previous annual inspection was performed on March 27, 1997.

The results of the annual stability inspection are listed below according to location within the waste disposal area.

ACTIVE ASH POND AREA AND RELATED DIKES

Bottom ash and fly ash continue to be sluiced into the southwest corner of this area. The bottom ash was dropping out near the outfall of the pipes and was being worked with bulldozers. The fly ash flowed northeast into the active ash pond, through a breach in the interior divider dike, and into the inactive scrubber pond adjacent to the active ash pond. Water discharged from the inactive scrubber pond back into the active ash pond via an interior dike breach west of the previously mentioned breach. Water then discharged out the spillways into the stilling pool. Water from the stilling pool is either discharged into Guntersville Reservoir or it is pumped back into the wet gypsum system as make up water.

The exterior slopes of the active pond were in good condition with excellent vegetative ground cover. Patches of undesirable trees were present over much of the slopes. Some minor surface sluffs were noted on the exterior slopes on the western dike. The previously noted seeps in the vicinity of the bridge over Widows Creek were still present, but had not increased in intensity from last year.

The slip on the exterior dike in the southwest corner was still present. The vertical face of the slip was slightly larger than it was during last years inspection. Dike material continues to move down slope toward the ditch.

The interior dike slopes in this area had excellent vegetative cover. Numerous animal burrows were noted in the interior slope along the western slope of this area. The majority of the burrows showed signs current animal activity. Thick patches of reeds were present in the active pond adjacent to these burrows. These plants tend to attract the animals as a source of food and shelter. These burrows could lead to slips or seeps if not properly repaired.

The ditch that drains the southern and western portions of this area to the containment basin to the north was in good condition and was conveying water well.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE INSPECTION
1998**

No water was being discharged through the spillways from the stilling pool into Gunterville Reservoir during the inspection. The discharge pipes were all clear and had an excellent riprap cover around their outlets.

INACTIVE SCRUBBER POND WEST OF WIDOWS CREEK

Fly ash sluice continues to be circulated through this area via two breaches in the divider dike between this region and the active ash pond. Fly ash was being deposited in the northeast corner of the area and the discharge was flowing back into the active pond through the northwest corner.

The exterior slopes were in good condition with thick vegetative cover. No signs of weakness were noted. There is a heavy growth of undesirable trees on the slopes, particularly along the eastern and southern dikes. The historically noted seeps south of the Widows Creek bridge were still present, but had not increased in intensity.

The eastern interior slopes in this area continue to deteriorate due to wave erosion. This has become a serious problem for two reasons--dike stability and maintenance of the gypsum sluice lines. The continued loss of material from erosion decreases the strength of the dike, which is a concern given the pool of water behind the dikes. Figure 6 shows a long stretch of gypsum sluice pipe that is unsupported due to loss of material from the erosion. This pipe could break and cause intense local erosion if the problem is not addressed. Plant personnel have begun to place riprap over the damaged slopes, and these covered areas are stable with no further signs of damage. The remainder of the interior slopes were in good condition.

The divider dike between this pond and the active pond was stable. The two breaches through the dike had stable slopes and no signs of erosion.

FORCED OXIDATION GYPSUM STACKING AREA EAST OF WIDOWS CREEK

TVA Widows Creek Fossil Plant employees are now managing the stacking operations in this area. The perimeter dike was recently completed at the time of inspection. Attainment of this milestone will now allow plant operations to alternate sluicing between the eastern and western portions of Pond 3 and begin raising the stack in this area. The level of material in Pond 2B has been raised to decrease the head difference between Pond 3 and this area, which will provide greater dike stability.

The exterior slopes of the dikes surrounding the gypsum stack were in good condition and had good vegetative cover. The western dike had several small trees growing on the slope that

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE INSPECTION
1998**

should be removed before they grow too large.

The gypsum dike slopes of this area were in good condition. The slopes around Pond 1 and the western side of Pond 3 had earth cover and an excellent stand of vegetation. The eastern and northern dikes still need earth cover and vegetation. A short segment of ditch in the northwest corner of the area was filled with material that needs to be removed. The side slopes on the dike separating Pond 2B from the stilling pool were steep and exhibiting erosion (Figure 3).

The interior slopes of the stilling pool were in good condition but contained small trees that will cause problems if they are not removed.

INACTIVE ASH POND AREA WITHIN THE RAILROAD LOOP

This disposal site is no longer in use. The area is covered in trees and vegetation. The slopes that were visible were stable and in good condition.

COAL YARD DRAINAGE BASIN

This pond is located west of the plant and coal yard. It receives runoff from the coal pile and yard equipment areas. The discharge from this area is pumped back to the active ash pond area.

The exterior slopes of this area were in good condition with vegetative cover. The pond contained a buildup of sediment that should be removed to restore storage capacity and prevent overflow.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE INSPECTION
1998**

**OTHER AREAS INSPECTED, ACTIONS ON PREVIOUS RECOMMENDATIONS,
AND RECOMMENDATIONS FOR CORRECTIVE ACTION**

CHEMICAL TREATMENT POND

The chemical treatment ponds (iron and copper) are located within the active ash disposal area in its southwest corner. Both ponds are below grade and contain only interior slopes. All interior slopes of these ponds were covered with riprap and were in good condition.

ACTIONS SINCE LAST INSPECTION

- Plant personnel have done a commendable job of managing the gypsum stack area by completing the perimeter dike and by filling Pond 2B with material.

RECOMMENDATIONS

- Repair the wave erosion on the interior slopes of the inactive scrubber disposal area. The most effective means would be by dumping riprap on the damaged areas. This repair is working along the northern end of this dike.
- Mow the exterior slopes of all dikes to the lower berm at a minimum. This will eliminate many of the small trees that can become a problem later.
- Repair the slide area on the south exterior slope of the active ash pond dike. Stone should be placed on the area as indicated in the March 12, 1997, memo from Kenneth Burnett to M. D. Davis.
- Repair the animal burrows along the western interior dike slope of the active ash disposal area. This can be accomplished by filling with clay material and compacting with a hand tamper. An attempt should be made to remove the reeds in this area (Figure 2) which will deter the animals from locating in the pond by removing their source of food and shelter.
- Cover the slopes of the gypsum stack along its eastern and northern borders and seed all disturbed areas.
- Clean the material from the perimeter ditch in the northwest corner of the gypsum stack and grade it to drain. Place earth cover and seed all disturbed areas.
- Remove the sediment from the coal yard drainage basin.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE INSPECTION
1998**

**OTHER AREAS INSPECTED, ACTIONS ON PREVIOUS RECOMMENDATIONS,
AND RECOMMENDATIONS FOR CORRECTIVE ACTION**

- Grade the exterior face of the dike between Pond 2B and the stilling pool in the gypsum stack area to a slope of 3 horizontal to 1 vertical. Place earth cover and seed the area.
- Continue to monitor the seeps along the bank of Widows Creek for any material movement. Please notify Fossil Engineering immediately if any change is noted.



Figure 1. Slide on exterior slope in southwest corner of active ash disposal area.



Figure 2. Interior slope of western dike in active disposal area where numerous animal burrows are present. Note growth of reeds adjacent to dike.



Figure 3. Exterior slope of dike separating Pond 2B from stilling pool. Note erosion and steep slopes.



Figure 4. Exterior slope of gypsum stack. Material in ditch should be removed and slope should be covered and seeded.



Figure 5. Exterior slope of inactive scrubber pond area. Dense growth of trees on slope will become a problem if not eliminated.



Figure 6. Erosion on interior slope of inactive scrubber pond area. Note unsupported section of pipe.

B65 990602 702


June 2, 1999

Douglas H. Finke, Plant Manager
WCF 1A-STA

WIDOWS CREEK FOSSIL PLANT - ANNUAL INSPECTION OF WASTE
DISPOSAL AREAS

Attached is the annual inspection report from Civil Engineering on your disposal areas. The report includes a list of recommendations and we concur with those.

If you have questions or need additional information, please contact me at (423) 751-6846 or John Albright at (423) 751-3981.



Victor W. Davis
Manager, Yard Systems
LP2T-C

^{JWK}
VWD:JGA:WGC

Attachments

cc: Roy J. Galyon, LP 5E-C
J. C. Pinnix, WCF 1A-STA
R. D. Powell, LP 2G-C
John Wilson, WCF 1A-STA
EDMS, WR 4Q-C

May 17, 1999

Victor Davis, LP 2T-C

WIDOWS CREEK FOSSIL PLANT (WCF) - ANNUAL INSPECTION OF WASTE
DISPOSAL AREAS

Attached is a report from Ron Powell concerning the inspection of Widows Creek Fossil Plant's ash disposal areas.

This report includes recommendations for corrective work. I concur with these recommendations.

Please make necessary copies and return originals to Ron for filing with other inspection reports.



R. E. Purkey
Manager, Civil Engineering
LP 2G-C

REP:RDP

TENNESSEE VALLEY AUTHORITY
WIDOWS CREEK FOSSIL PLANT

*ANNUAL INSPECTION OF
WASTE DISPOSAL AREAS*

Prepared by: Ronald D. Powell
Date: May 14, 1999

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE INSPECTION
1999**

INTRODUCTION

The waste disposal areas at Widows Creek Fossil Plant were inspected for dike structural stability on March 23, 1999. This inspection was performed by Ron Powell and Ron Purkey of TVA Fossil Engineering. They were accompanied by John Mashburn of the Widows Creek Fossil Plant staff. The previous annual inspection was performed on April 9, 1998.

The results of the annual stability inspection are listed below according to location within the waste disposal area.

ACTIVE ASH POND AREA AND RELATED DIKES

All bottom ash and fly ash continue to be sluiced into the southwest corner of this area. The bottom ash drops out near the outfall of the pipes and is periodically worked with bulldozers. The fly ash flows northeast into the active ash pond, around the deflector dikes, and southeast through a breach in the interior divider dike, and into the inactive scrubber pond adjacent to the active ash pond. Water is discharged from the inactive scrubber pond back into the active ash pond through another breach in the interior divider dike southwest of the previously mentioned breach. Water is then discharged through five standard spillways with skimmers into the stilling pool area. Water is discharged from the stilling pool through another five standard spillways with skimmers into the pumping station pond. From the pumping station pond, water is either discharged into Gunter'sville Reservoir through three overflow pipes or it is pumped into the wet gypsum system as make up water.

The exterior and interior dike slopes of the active ash pond generally appear to be in good condition with no signs of instability. They have an excellent vegetative cover, however, patches of undesirable trees are present over some areas of these slopes. Some minor surface sluffs were noted on the exterior slopes of the northwestern dike, however, none appeared to have been recently active. The previously noted seeps at the toe of the exterior dike slope both north and south of the bridge over Widows Creek are still present, but do not appear to have increased in intensity from previous observations.

Animal burrows were observed in some areas along the northwestern dike of this area. Most of the burrows showed signs of current animal activity. Thick patches of reeds were present in the active pond adjacent to these burrows. These plants tend to attract the animals as a source of food and shelter. These burrows could lead to seeps and/or surface sluffs if not properly repaired.

In accordance with the recommendation of Fossil Engineering, riprap has been placed over the slip on the exterior dike slope in the southwest corner of this area. The slip was first observed

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE INSPECTION
1999**

and reported in March, 1997 after a period of heavy rainfall. There were no signs of any recent movement of earth material in this area, however, additional riprap should be placed over the steep bare area just west of the slip. The previously noted seepage area, also just west of the slip and at the toe of the exterior dike slope, was still present. This area does not appear to have changed since previous observations.

The ditch along the toe of the exterior dike slope that drains surface runoff and seepage from the southern and western portions of this area to the containment basin to the north appeared to be functioning adequately. This is a long ditch with a relatively flat slope and as a result usually contains standing water. Water in the containment basin is pumped across the dike into the active ash pond.

The bottom of the pumping station pond in the south end of the stilling pond was recently excavated and covered with riprap as shown on the design drawings for this area. No water was being discharged through the overflow pipes from the pumping station pond into Gunterville Reservoir at the time of this inspection. A concrete slab was recently constructed at the inlet of the overflow pipes and there is a good riprap cover in the channel at their outlets.

INACTIVE SCRUBBER POND WEST OF WIDOWS CREEK

This area has been incorporated into the active ash pond system by breaching the divider dike between them at two locations and constructing interior deflector dikes to direct the flow of sluice water as described in the previous section of this report. Fly ash is presently being deposited in the northeast portion of this area.

The interior slope of the eastern dike has been repaired and riprap has been placed on it to prevent the wave erosion that had been occurring as noted in previous inspection reports. There were no signs of additional erosion along the riprapped portion of the slope, however, vegetative cover is generally sparse on the remainder of the interior dike slopes and some other areas are showing signs of damage due to erosion, particularly in the northwest corner.

The exterior dike slopes appear to be in good condition with no signs of instability. They have a thick vegetative cover, however, some areas have a heavy growth of undesirable trees.

FORCED OXIDATION GYPSUM STACKING AREA EAST OF WIDOWS CREEK

The development of this area is being managed by Widows Creek Fossil Plant employees. The gypsum material is presently being sluiced into the southwest corner of Pond 3. It flows north and east around an interior deflector dike, constructed of gypsum material, and into the northeast

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE INSPECTION
1999**

portion of Pond 3. The sluice water is discharged from Pond 3 into Pond 2B and from Pond 2B into the stilling pool. Water is discharged from the stilling pool by gravity through a long pipe and into a channel southeast of the inactive scrubber pond and flows into Guntersville Reservoir.

The perimeter dikes surrounding the gypsum stacking area appear to be in good condition with no signs of instability. The exterior slopes of these dikes generally have an excellent vegetative cover, however, some areas had small trees growing on the slope that should be removed before they grow any larger.

The slopes of the gypsum stack in Pond 1 and the western side of Pond 3 have had an earth cover placed over them and have a good stand of vegetation. A small stream of water (pencil size) was flowing from the discharge pipes of the Pond 1 underdrain system, which would seem to indicate that this system is functioning properly. The slope of the gypsum stack on the west side of Pond 2B, just east of the dike separating Pond 2B from the stilling pool, has been flattened as recommended and was being covered with earth and seeded at the time of this inspection.

The interior slopes of the stilling pool dikes are in good condition and have a good vegetative cover.

INACTIVE ASH POND AREA WITHIN THE RAILROAD LOOP

This disposal site is no longer in use. The area is covered in trees and vegetation. The slopes that were visible were stable and in good condition.

COAL YARD DRAINAGE BASIN

The Coal Yard Drainage Basin is located west of the plant adjacent to the northwest side of the coal yard area. It receives rainfall runoff from the coal pile and yard equipment areas. This pond has been dredged to remove sediment and repairs made to the pumping station since the last annual inspection. The discharge from this pond is pumped into the active ash pond area.

Both the exterior and interior dike slopes of this area are in good condition with a good vegetative cover.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE INSPECTION
1999**

**OTHER AREAS INSPECTED, ACTIONS ON PREVIOUS RECOMMENDATIONS,
AND RECOMMENDATIONS FOR CORRECTIVE ACTION**

CHEMICAL TREATMENT PONDS

Both the iron and copper chemical treatment ponds are located within the active ash disposal area in its southwest corner. Effluent from plant chemical cleaning processes is discharged into these ponds and treated before it is pumped into the active ash pond.

Both ponds were excavated below grade and have only interior slopes. All interior slopes of these ponds are covered with riprap and are in good condition.

ACTIONS SINCE LAST INSPECTION

- In accordance with the recommendation of Fossil Engineering, riprap has been placed over the slip on the exterior dike slope in the southwest corner of the active ash disposal area.
- The bottom of the pumping station pond, in the south end of the stilling pond of the active ash disposal area, was recently excavated and covered with riprap as shown on the design drawings for this area.
- A concrete slab has been constructed at the inlet of the overflow pipes which discharge the pumping station pond into Gunter'sville Reservoir.
- The interior slope of the eastern dike of the inactive scrubber disposal area has been repaired and riprap has been placed on it to prevent future wave erosion.
- The slope of the gypsum stack on the west side of Pond 2B, just east of the dike separating Pond 2B from the stilling pool, has been flattened as recommended and was being covered with earth and seeded at the time of this inspection.
- The Coal Yard Drainage Basin has been dredged to remove sediment and repairs made to the pumping station since the last annual inspection.

RECOMMENDATIONS

- Establish a schedule for periodic mowing of the exterior slopes of all dikes to the lower berm at a minimum. This will eliminate many of the small trees that can become a problem if they are allowed to grow larger.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL WASTE DISPOSAL AREA DIKE INSPECTION
1999**

**OTHER AREAS INSPECTED, ACTIONS ON PREVIOUS RECOMMENDATIONS,
AND RECOMMENDATIONS FOR CORRECTIVE ACTION**

- Extend the slide repair area on the exterior slope of the southwest dike of the active ash pond to cover the steep bare area just west of the repaired area. From an aesthetic perspective, I would also recommend that riprap be placed over the seepage area just west of the slip.
- Repair the animal burrows along the western dike of the active ash disposal area. This can be accomplished by filling with clay material and compacting with a hand tamper. An attempt should be made to remove the reeds in this area which will deter the animals from locating in the pond by removing their source of food and shelter.
- Continue to monitor the seeps along the bank of Widows Creek for any material movement. Please notify Fossil Engineering Services immediately if any change is noted.
- Periodically inspect the interior slopes of the inactive scrubber disposal area for areas of damage due to wave erosion. Any areas damaged to the extent that the stability of the interior dike slope is jeopardized should be repaired and covered with riprap.
- Continue to cover the slopes of the gypsum stack as it is raised and seed all covered areas.



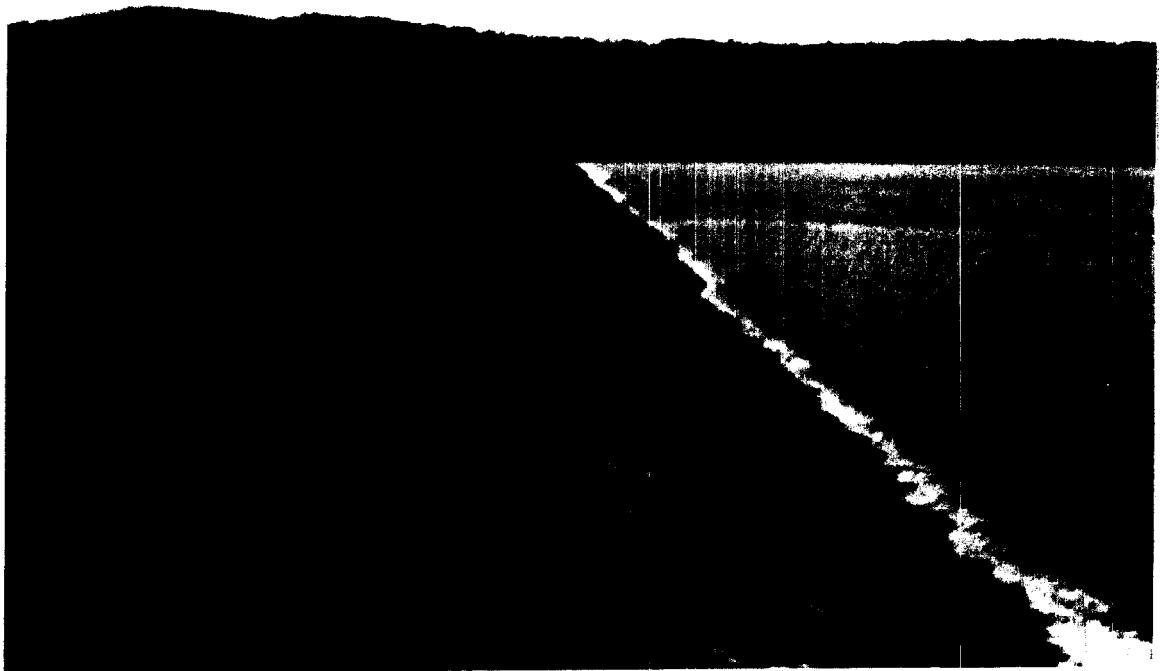
Picture 1. Seepage area at toe of exterior dike slope south of bridge over Widows Creek.



Picture 2. Vicinity of slide on exterior dike slope in southwest corner of active ash pond. Note steep bare area and seepage area just west of riprap.



Picture 3. Concrete slab at inlet of overflow pipes in pumping station pond



Picture 4. Repaired interior slope of eastern dike of inactive scrubber pond. Note riprap cover



Picture 5. Interior dike slope in northwest corner of inactive scrubber pond. Note lack of vegetative cover and erosion.



Picture 6. Flattened slope of gypsum stack on west side of Pond 2B. Note earth cover being placed.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

The waste disposal areas at Widows Creek Fossil Plant (WCF) were inspected for dike structural stability on December 5 and 6, 2007 by Kelly Evans of TVA Fossil Engineering Design Services (EDS) and Robert Knox of TVA Fuel By-products. The previous annual inspection was performed on November 27, 28, and 29, 2006. The results of the inspection of the Coal Yard Drainage Basin, Coal Yard Perimeter Ditch, Limestone Pile Drainage Basin, Wet Gypsum Stacking Area, Stilling Pond for the Wet Gypsum Stacking Area, Active Ash Pond, Stilling Pond for Active Ash Pond, Stilling Pond for the Active Ash Pond, Perimeter Dikes, Red Water Pond, Chemical Treatment Pond, and the Abandoned Ash Disposal Area are listed below. A summary of recommendations is also provided.

COAL YARD DRAINAGE BASIN

- **Location** - West of Powerhouse and Coal Pile (Directions based on Plant North).
- **Effluent** - Pumped to Active Ash Pond.
- **Observations (see sketch API08-1 for photo locations)**
 - Interior Slopes - Satisfactory; sparse vegetation on slopes. No significant erosion. (Photos 1 and 2).
 - Sediment Level - Excellent - Pond was cleaned in 2007
 - ◆ Small retention basin before pond inlet is full of coal fines (Photos 3 and 4).
 - ◆ Wooden weir in retention basin damaged (photo 3).
 - Pump
 - ◆ Platform needs painting and repair to handrail. This is a future potential safety issue.
 - ◆ Last inspection plant personnel stated that float switch not operable. Pump manual switch must be wired opened. Unable to verify if this was corrected. (Photos 5 and 6).



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

COAL YARD DRAINAGE BASIN (continued)

- **Actions Since Previous Inspection**
 - Pond cleaned.

- **Recommendations**
 - Monitor the East interior slope. If erosions starts, place suitable earth material on slope prior to seeding and mulching.
 - ◆ Notify EDS of any changes.
 - Repair pump float switch so that pump can run in automatic mode. If this has been corrected disregard.
 - Repair pump platform handrail. Paint platform within next two to three years.
 - Clean sediment in retention basin and repair weir.



Coal Yard Pond retention basin discharge pipes - damaged weir

Photo 3

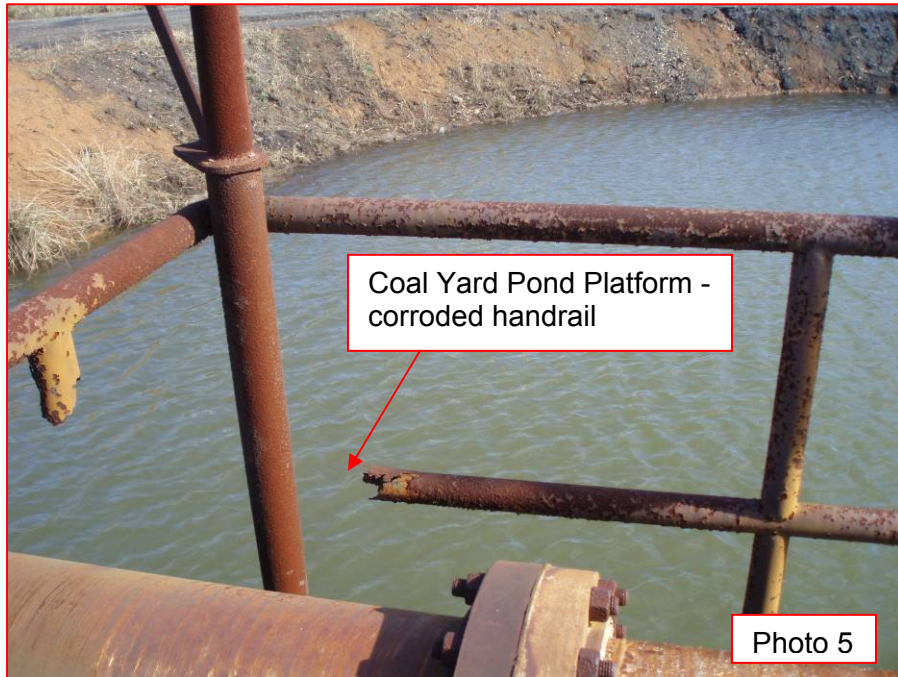


Coal Yard Pond retention basin.

Photo 4

WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008

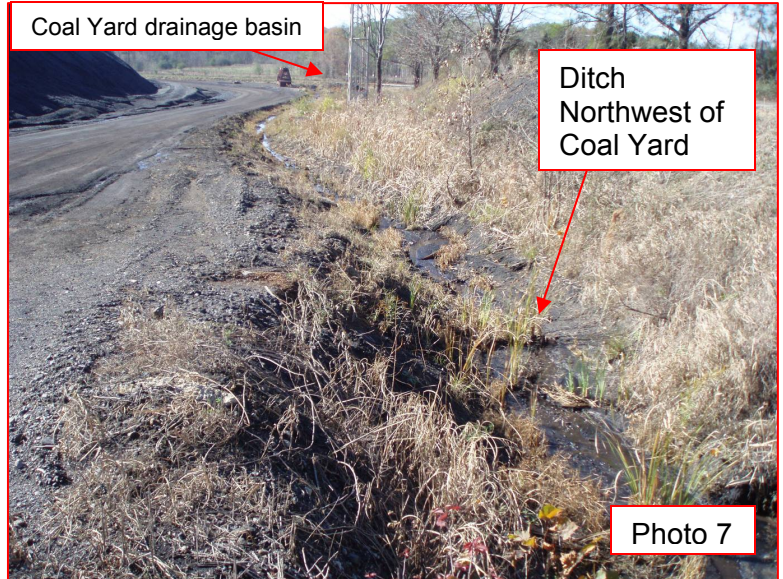
COAL YARD DRAINAGE BASIN - photos continued



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

COAL YARD PERIMETER DITCH

- **Location** - Perimeter of Coal Yard West of the Powerhouse.
- **Effluent** - Drains to the coal yard drainage basin.
- **Observations (see sketch API08-1 for photo locations)**
 - Significant improvement since last inspection.
 - Sediment and coal fines filling ditch in one area on the west side of coal yard and along the length of the south side of the coal yard. (Photos 7-10).



- **Actions Since Previous Inspection**
 - Ditch cleaned as part of routine maintenance.
- **Recommendation**
 - Continue routine cleaning of the perimeter ditch.



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

COAL YARD PERIMETER DITCH - photos continued



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

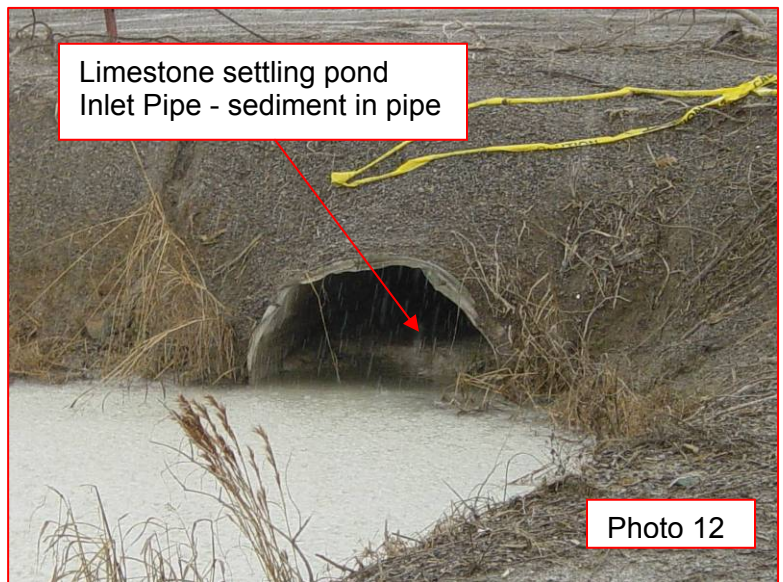
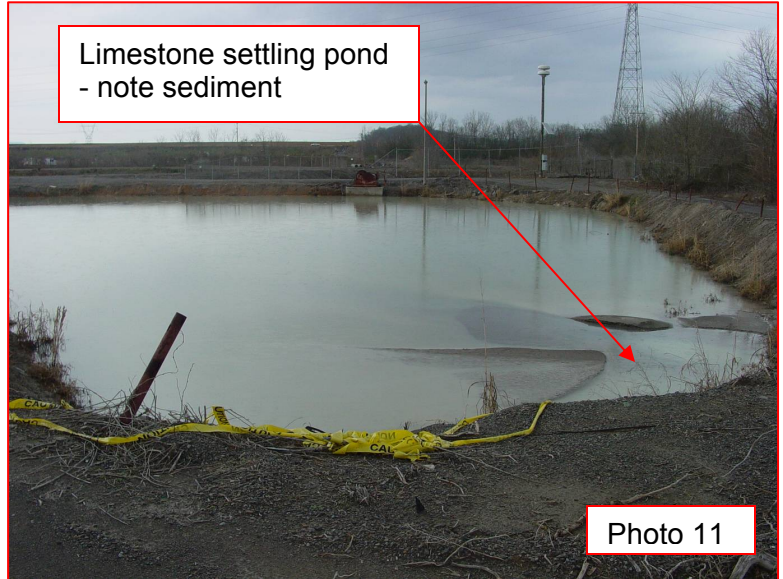
LIMESTONE PILE DRAINAGE BASIN

- **Location** - East of Powerhouse.
- **Effluent**
 - Discharges to a series of stilling ponds.
 - Final stilling pool discharges to Outfall 005 into Gunterville Reservoir.

- **Observations (see sketch API08-1 for photo locations)**
 - Interior Slopes - Satisfactory condition with no vegetation (See Photo 11).
 - ◆ No erosion detected.
 - Sediment Level - Pond appears to be filling up again. (See Photos 11 & 12).
 - Discharge - submerged
 - Final Stilling Pond
 - ◆ Interior slopes - Good condition
 - ◆ Discharge structure - Good condition - replaced on 2005 (See Photo 13)

- **Actions Since Previous Inspection**
 - Pond cleaned December 2006.

- **Recommendations**
 - Continue good management practices utilized in maintaining the Limestone Pile Drainage Basin.
 - Clean sediment around inlet. Monitor and clean-out pond as required.



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

LIMESTONE PILE DRAINAGE BASIN - photos continued



WET GYPSUM STACKING AREA

- **Location** - East side of Widows Creek which borders the East side of the Active Ash Pond.
- **Effluent** - Discharges into Gypsum Stilling Pond.
- **Observations (see sketch API08-2 & 3 for photo locations)**
 - The development of the dry stack area appears to be in general accordance with the stacking plan. See TVA drwgs 10W235-1 thru 16 for details. (Photos 14-20).
 - Lower perimeter dikes were generally in good condition.
 - ◆ General terrain at base of lower perimeter dike is low lying and drains poorly. This is worse on the South and East dikes.



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

WET GYPSUM STACKING AREA - continued

• **Observations - continued**

- Lower perimeter dikes - continued
 - ◆ Bottom 15 feet and toe of slope was saturated for ~80 feet in an area along the southern perimeter dike (see note on attached drawing API08).
 - ◆ Bare spots (4) noted on the previous inspection at the base of the northwest perimeter dike have been corrected and were barely visible.
 - ◆ Woody growth was noted on the southwest slope (see note on attached sketch API08-2).
 - ◆ Overall, slopes were well vegetated and properly maintained.
- Upper slopes have various degrees of erosion; however, there is significant improvement since last inspection.
 - ◆ Soil cover has been placed up to bench elevation 650.
 - ◆ Sparse vegetation existed on soil cover allowing some erosion.
 - ◆ Reels are present on all slopes (Photos 21 & 22).
 - ◆ Toe drains installed at bench elevation 650.
 - ◆ Ruts and sloughing is present along the Northwest slope. Sloughing was worse between toe drain outlets 13 and 12. (Photos 23 & 24).
 - ◆ The far west outlet of the no. 12 toe drain outlet was not flowing (Photo 25).
 - ◆ The east PVC drain inspection well of no.12 toe drain outlets was damaged. A hole in the side will allow sediment to enter (Photos 26 and 27).



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

WET GYPSUM STACKING AREA - continued

• **Observations - continued**

- Upper slopes - continued
 - ◆ Sloughing of the lower portion of the West slope next to the stilling pond was noted. This area does not have toe drains installed yet because the total construction width has not been completed.
 - ◆ Erosion is present at the South discharge outlet (Photo 33).
- Toe drains installed at bench elevation 650.
- Storm run-off is starting to erode access road at the north corner of the stack (Photo 35).
- Toe drain outlet pipes are covered with sediment material at various locations.
- Several bench drain outlet pipes were also covered with sediment.
- Sediment accumulation was noted in the perimeter ditch due to soil erosion (Photo 36).
- Metal sluice lines in contact with bottom ash. This will corrode these lines (Photo 34).



• **Actions Since Previous Inspection**

- Soil cover placed on slopes up to first bench.
- Cleaned and re-graded perimeter ditch to drain.
- Weir installed on west side of gypsum sluicing operations.
- Bench drains installed on west side of stack next to stilling pond.
- Erosion repaired around sluice lines at the base of stack next to stilling pond.
- Continued operations in accordance with existing permit.

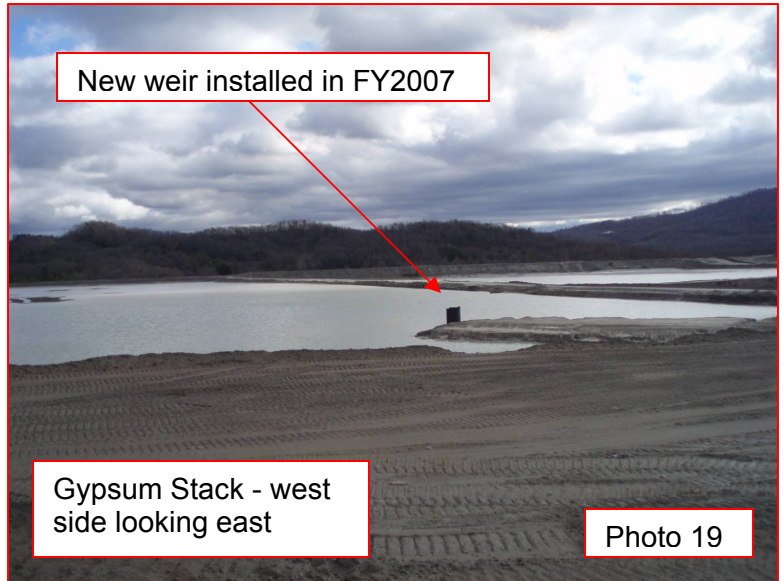


**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

WET GYPSUM STACKING AREA (continued)

• **Recommendations**

- Continue operations in accordance with the existing permit requirements.
- Monitor wet area along the Southern lower perimeter dike.
- Remove trees and woody growth from the Southwest lower perimeter dike.
- Repair erosion along gypsum upper perimeter dike slopes on a continuous basis until vegetation is established.
- Rework a portion of the West slope next to the Stilling Pond. Install toe drains as soon as the construction sequencing will allow. This will reduce saturation of the slope toe and will reduce sloughing in this area.
- Re-grade perimeter road surface and stabilize to prevent erosion. This is at the north corner of the stack as shown on drawing API08-2.
 - ◆ Estimated Area - 50 yd².
- Clean-out all toe drain outlets and verify that there are no obstructions in the lines.
- Uncover bench drain outlets and place rip-rap as required. Several of these outlets were covered.
- Pump the PVC drainage basins/inspection wells for toe drains 11, 12, and 13 toe drains to remove sediment. This may open outlets that were not flowing. This activity must be done in the spring or summer months.
- Engineering Design to develop recommendations to address sloughing along the northwest slope. This will take approximately 80 man-hours (\$5,000). In order to limit degradation of this area, improvement should be implemented before next fall.



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

WET GYPSUM STACKING AREA (continued)

- **Recommendations**

- Remove sediment from perimeter ditch to insure drainage. This will be on a continuous basis until vegetation is established on the upper slopes.
- Continue maintenance of the dike slopes by mowing annually. This will also inhibit woody growth.



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

WET GYPSUM STACKING AREA - photos continued



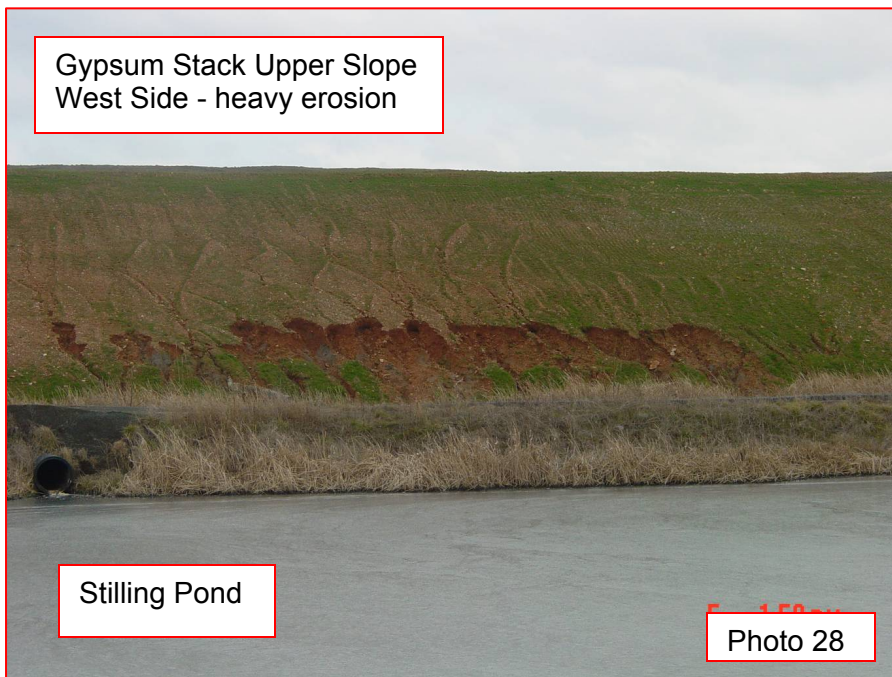
WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008

WET GYPSUM STACKING AREA - photos continued



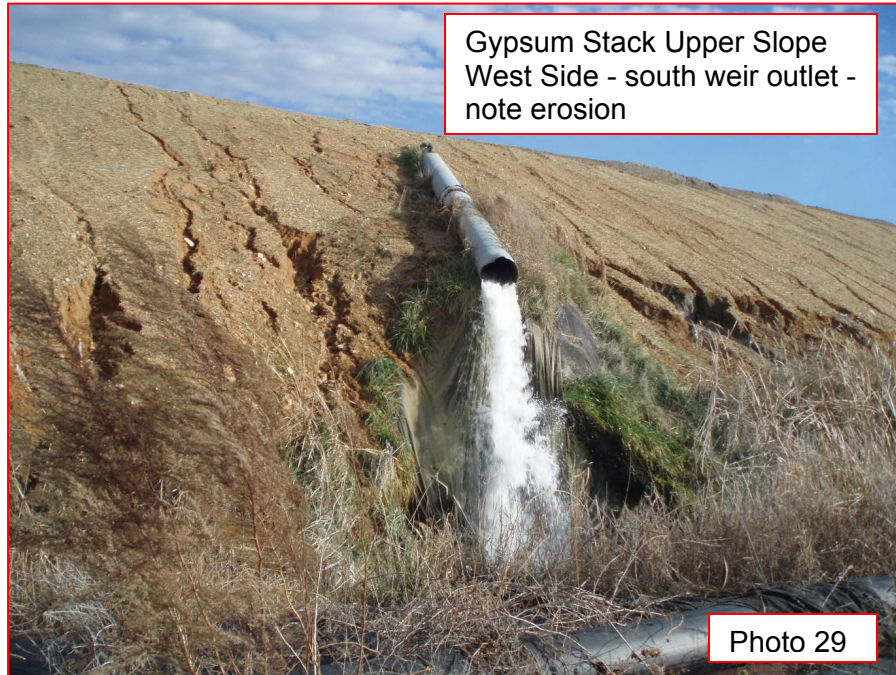
WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008

WET GYPSUM STACKING AREA - photos continued



WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008

WET GYPSUM STACKING AREA - photos continued



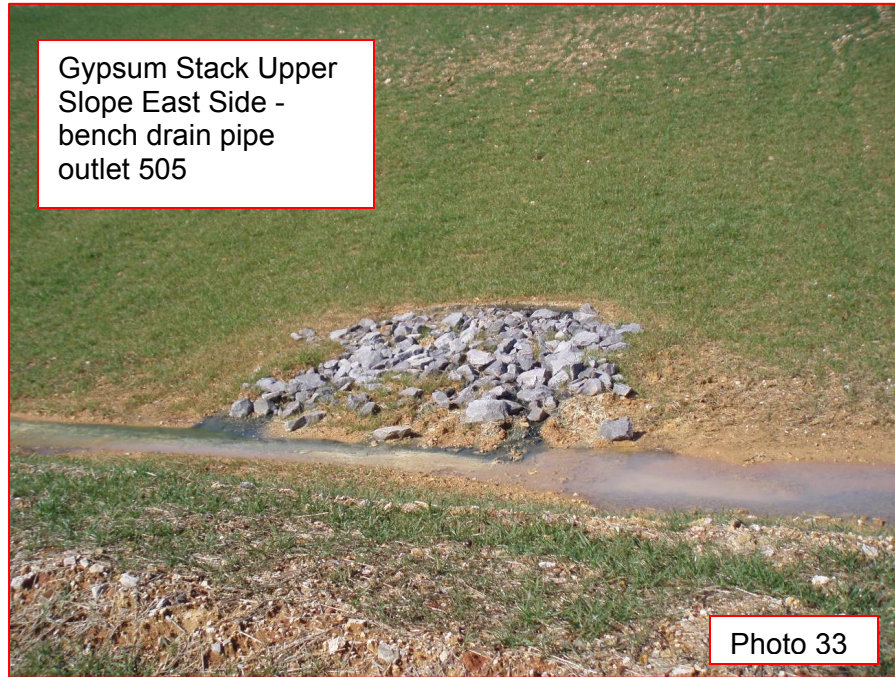
WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008

WET GYPSUM STACKING AREA - photos continued



WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008

WET GYPSUM STACKING AREA - photos continued



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

STILLING POND FOR WET GYPSUM STACKING AREA

- **Location** - West of Wet Gypsum Stacking Area

- **Effluent** - Gravity Drains to Outfall 008 into Gunterville Reservoir (Photo 43).

- **Observations**

- Pond Surface - good no floating debris (Photo 35)
- Discharge pipes into Pond from Gypsum Wet Stack are in good condition (Photos 29, 36 and 37)
 - ◆ Southern Discharge is the existing concrete pipe for old gypsum discharge weir. Hole has been knocked through top of pipe wall so water from perimeter ditch can enter.
- Wooden Discharge Structure - could not be adequately inspected.
 - ◆ Access walkway unstable.
- Interior Slopes - established vegetation.
- Exterior Slopes - established vegetation.

- **Actions Since Previous Inspection**

- Floating ash removed.
- HDPE pipes at North end of pond installed per DCN WCF-04-1016 when construction sequence allowed.
- Vegetation on slopes cut back.
- New discharge pipe installed for weir installed on west side of gypsum sluicing operations (Photo 37).



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

STILLING POND FOR WET GYPSUM STACKING AREA (continued)

- **Recommendations**
 - Continue maintenance of the dike slopes by mowing annually. This will also inhibit woody growth.



ACTIVE ASH POND

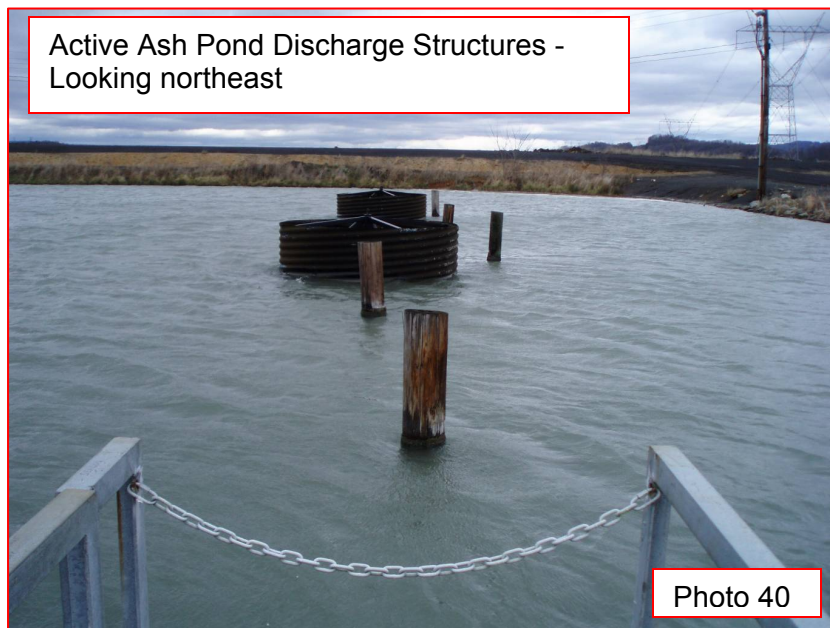
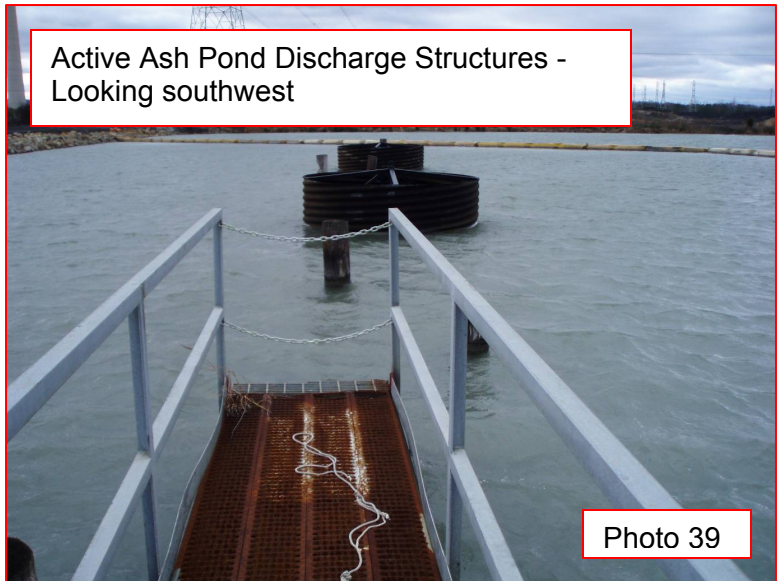
- **Location** - Northeast of Powerhouse
- **Effluent** - Discharges to Active Ash Pond Stilling Pond
- **Observations (photos taken on 2/1/08)**
 - Interior Slopes - Satisfactory (Photo 38).
 - Pond Surface - small amount of floating ash observed
 - Discharge Structures - Good condition (Photos 39 & 40)
 - ◆ Only one of five structures could be inspected.



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

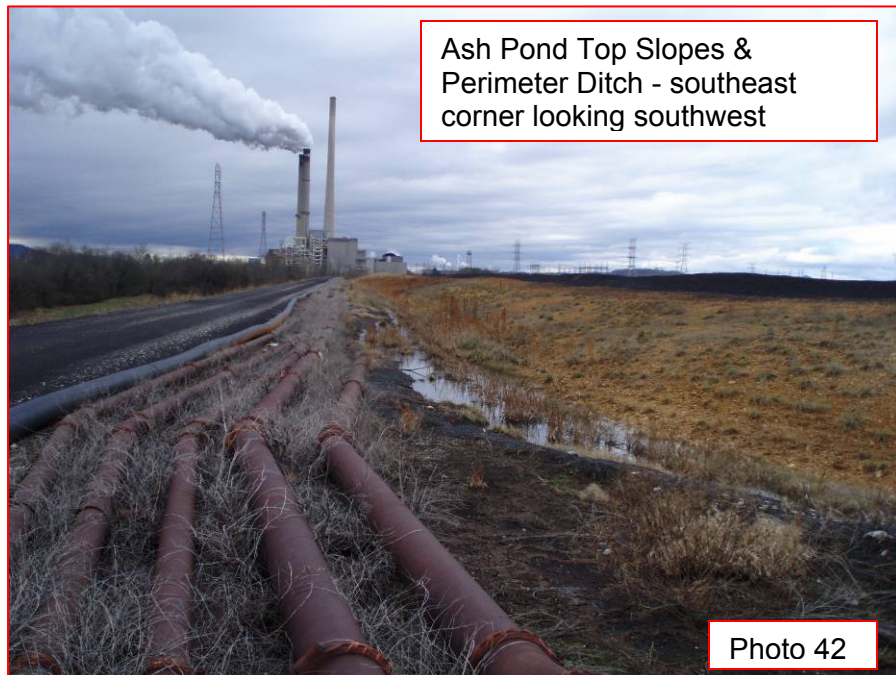
ACTIVE ASH POND (continued)

- **Observations - continued (photos taken on 2/1/08)**
 - Top exterior slopes - little to no vegetation (Photos 41 and 42).
 - ◆ Slopes have been seeded numerous times. Material does not support vegetation.
- **Actions Since Last Inspection**
 - Inactive Scrubber Disposal Area being developed as a dredge cell.
 - Gypsum Sluice Line moved out of perimeter ditch.
 - Upper perimeter ditched cleaned out.
 - Deficiencies on Discharge Structure access walkways addressed by removing section of walkway.
- **Recommendations**
 - Utilize Best Management Practices (BMP's) to prevent erosion on top exterior slopes.
 - Continue good maintenance and BMP's for Active Ash Pond Operations.



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

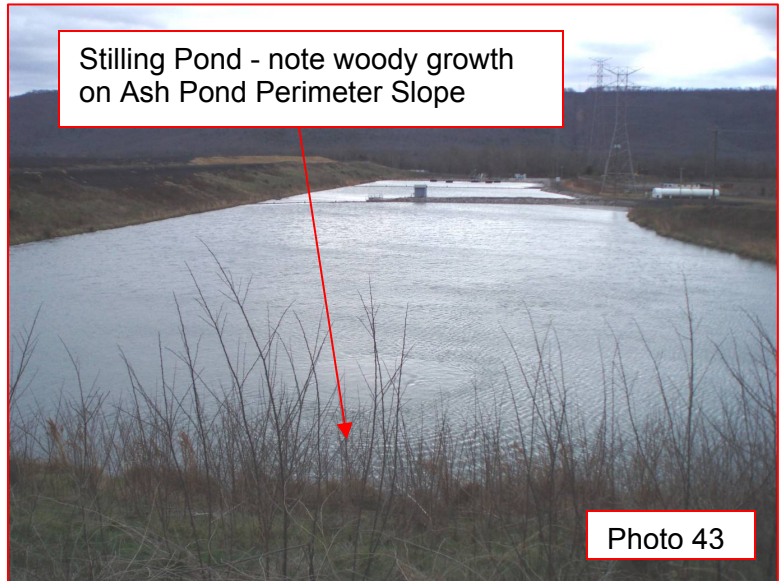
ACTIVE ASH POND - photos continued



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

Active Ash Pond Stilling Pond and Pumping Station Pond

- **Location** - Southeast of Active Ash Pond
- **Effluent**
 - Stilling Pond discharges to Pumping Station Pond
 - Pumping Station Pond - pumped to Condenser Cooling Water (CCW) Intake with a portion pumped to wet gypsum system or overflows into outfall 001 into Guntersville Reservoir.
- **Observations (Photos taken on 2/1/08)**
 - Stilling Pond surface had very little ash accumulation (Photo 43).
 - Interior Slopes - Good condition with vegetation.
 - ◆ Pumping Station Pump just has Riprap.
 - ◆ Seepage observed last inspection at the Pumping Station Pond interior slope was not observed. This primarily due to the higher water level in the pumping station pond (Photo 44).
 - Stilling pond discharge Structures - Good condition (Photos 45 and 46)
 - ◆ Only one structure was accessible.
 - Pump Station Pond
 - ◆ Water level higher than last inspection.
 - ◆ Potential project for discharge pipe modification or replacement.



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

Active Ash Pond Stilling Pond and Pumping Station Pond - continued

- **Actions Since Last Inspection**
 - Floating ash observed from last inspection removed.

- **Recommendations**
 - Continue good maintenance and BMP's for Active Ash Stilling Pond operations.
 - Monitor seep in dike between Stilling Pond and Pumping Station Pond. This can only be done when the water level in the Pumping Station Pond is lower.



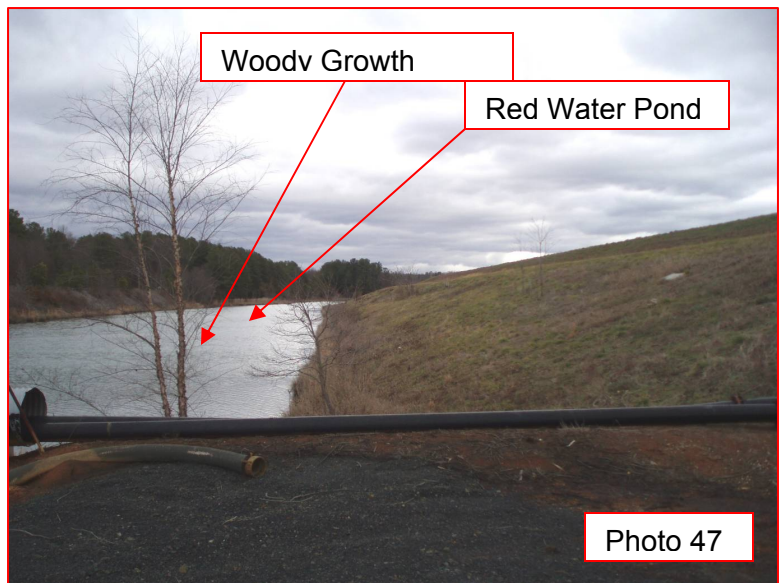
**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND

- **Location**
 - **Perimeter Dikes** - Borders all sides of the Active Ash Pond and encloses the Chemical Ponds. Runs parallel to Widows Creek on along the North and East side.
 - **Red Water Pond** - Located between the railroad tracks and West Active Ash Pond Perimeter Dike.

- **Effluent** - Surface runoff drains to various locations.
 - A portion of the South dike (starting at the Units 7 and 8 ash trench) and the entire Western dike drain into the Red Water Pond. A perimeter ditch receives run-off from the portion of the South dike and diverts water to the Red Water Pond.
 - Dike surface runoff drains into Widows Creek starting near the North corner of the Active Ash Disposal Area and extending to the South corner of the Ash Pond Area. This is essentially the entire Eastern half of the disposal area and a portion of the Southern side.
 - Surface runoff from the perimeter dike that borders the Stilling Pond flows into the Stilling Pond.
 - Surface runoff of the remaining portion of the South dike, starting at the units 7 and 8 ash trench and ending at the Stilling Pond, drain to constructed wetlands and then to a stilling pond before exiting outfall 005. This is accomplished via a perimeter ditch starting at the units 7 and 8 ash trench.

- **Observations (Photos taken on 2/1/08)**
 - Red Water Pond
 - ◆ Interior Slopes in good condition. Riprap and vegetation covers slopes. One area of erosion noted on west slope last inspection was still present but had not worsened. Woody growth noted on the east side next to the active ash pond (Photo 47).
 - ◆ Pump platform was in satisfactory condition (Photo 48).
 - Perimeter Dikes generally have good vegetative cover. Some areas of deficiencies were observed.
 - ◆ Erosion observed on Northeast Dike between the bridge over Widows Creek and the southeast corner. This area is approximately 70 feet along the dike extending an average of 50 feet down the slope from the top. (Photo 49).



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)

- **Observations (Photos taken on 2/1/08)**

- **Perimeter Dikes -continued**

- ◆ Erosion noted last inspection on the northeast dike near southeast corner has been repair but vegetation is sparse. (Photo 50).
- ◆ Animal burrow holes were observed at the northeast corner and North Slope as noted on sketch API2008-1.
- ◆ Damaged manhole for the gypsum stilling pond drain line observed base of the northeast dike (Photo 51).



- ◆ Several wet areas and some rutting was observed on the Northeast perimeter dike slope just south of the bridge accessing the Gypsum disposal area. There is a bench formed in the slope here which the Gypsum Stilling Pond discharge line is buried. The bench flows the slope of the drain line to its discharge point at outfall 008 (Photo 52 & 53). The ruts are most likely due to equipment traffic used for mowing
- ◆ Ruts forming on bench access road on the northwest dike. This serves as the access road to the red water pumping station. Standing water was observed (Photos 54).
- ◆ Mature trees observed on the northwest lower dike to the north and south of the red water pond.
- ◆ Erosion observed at the southwest corner next to the units 1-6 ash pipes. It appears that this was where previous ash pipes were located (Photo 55).



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)

- **Observations (Photos taken on 2/1/08)**

- Perimeter Dikes continued
 - ◆ Erosion noted starting at access road from the Stilling Pond and extending approximately 1400 feet west. Starts at the top of the dike and extends down the slope. The paved plant perimeter access road runs parallel to this area (Photos 56 and 57).
 - ◆ Some erosion was noted at the top of the perimeter dike next to the Stilling Pond (Photo 58).
 - ◆ Woody growth observed on perimeter dike slopes bordering the stilling pond (Photo 58).
- The red water seepage along the southern dike parallel to the paved plant perimeter access road is still present. In comparison with the last inspection report it hasn't worsened.



- **Actions Since Last Inspection**

- Animal burrow holes at the pump discharge line culverts filled in.
- Slopes mowed.

- **Recommendations**

- Monitor erosion at the Red Water Pond interior slope. Notify EDS if erosion worsens. Placement of riprap is the recommended repair but not warranted at this time.
- Continue maintenance of the dike slopes by mowing annually. This will also inhibit woody growth.

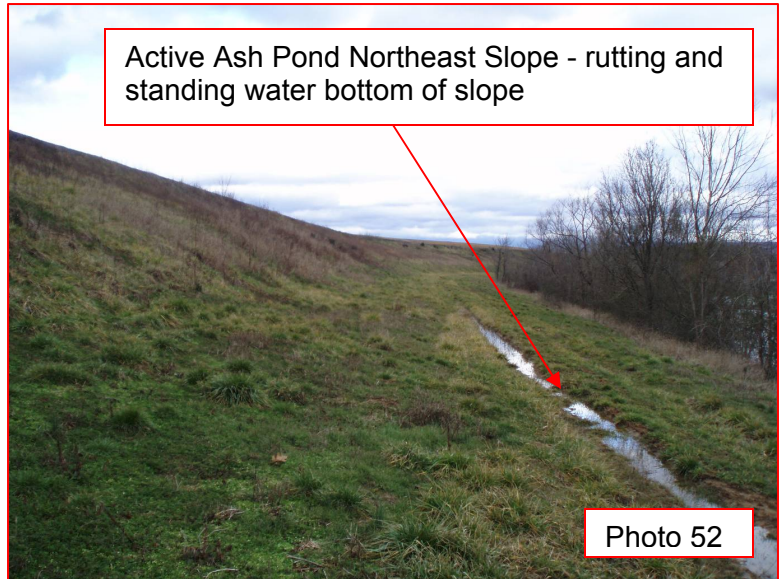


**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)

• **Recommendations - continued**

- Repair erosion observed on Northeast Dike between the bridge over Widows Creek and the southeast corner. Place suitable earth material atop of the existing earth material that is not supporting vegetative cover. This material shall then be seeded and mulched so that vegetative cover can be established. Some type of grass matting is recommended for this area. Estimated area to be covered, graded, and seeded - 300 yd².



- Repair damaged manhole for the gypsum stilling pond gravity drain. This is located at the base of the northeast perimeter dike and shown on drawing API08-1.

- Monitor ruts and wet areas at base of the northeast perimeter dike. This will start at the bridge accessing the gypsum area and extend to where the gypsum stilling pond gravity drain line discharges to the 008 outfall ditch. Area will be assessed next inspection.



- Recommended repairs in out-years is to fill ruts then seed and mulch. Estimated area to be covered is 30,000 square feet (3,333 square yards).

- Eradicate animals and fill burrow holes at locations noted on drawing API08-1 (Estimate 9 ft³ concrete).
- Remove woody growth along the northwest perimeter dike next to the red water pond.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)

Recommendations - continued

- Ruts forming on bench access road on the northwest dike. This serves as the access road to the red water pumping station. Gravel and re-grade to prevent standing water. This is needed on approximately 2000 feet of the access road (Photo 54).
- Repair Erosion observed at the southwest corner next to the units 1-6 ash pipes (Photo 55). Re-grade, seed, and mulch approximately 3,000 square feet (333 square yards).
- Place suitable earth material atop of the existing earth material that is not supporting vegetative cover on the South perimeter dike. This material shall then be seeded and mulched so that vegetative cover can be established (Photo 56 and 57). Some type of grass matting is recommended for this area. Estimated area to be covered, graded, and seeded - 6500 yd². If dirt access road is used in this area surface and gravel. Estimated area is 800 yd².
- Monitor the seepage along the South perimeter dike next to the Plant perimeter road. Notify EDS of any changes.
- Remove woody growth along the perimeter dike next to the stilling pond.



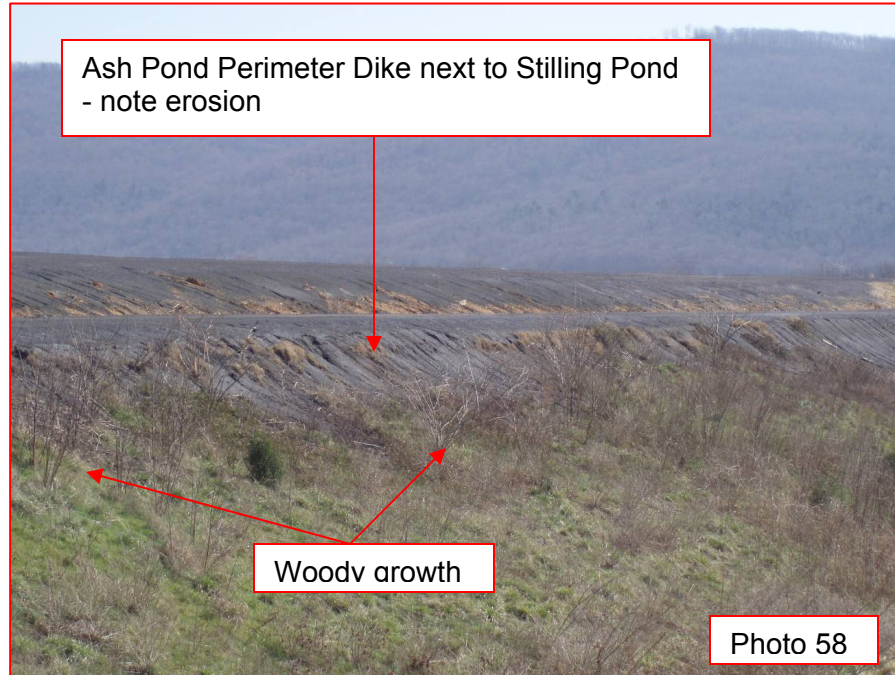
WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008

ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND - photos continued



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND (continued)

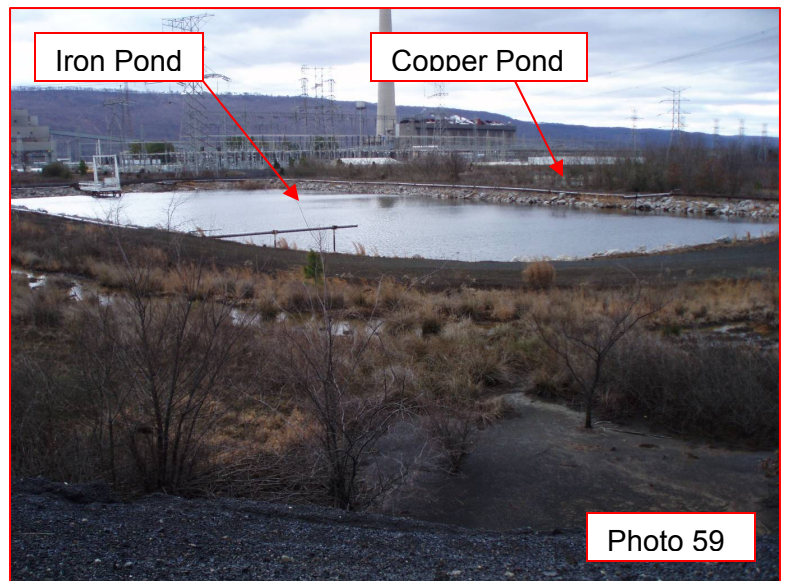


CHEMICAL PONDS

- **Location** - Inside the Ash Pond Perimeter Dikes Northwest of Powerhouse
- **Effluent** - Discharged into Active Ash Pond

• **Observations**

- Interior slopes - Satisfactory with a few small trees and brush present along the edges of the Copper Pond (Photo 59).
 - ◆ Riprap cover in good condition.
- Ponds are enclosed by perimeter dikes forming a basin
 - ◆ Runoff from this area flows through two drainage pipes which penetrate the outside perimeter dike and runs down the slope to the perimeter ditch.
 - ◆ Inlet to these two pipes is partially clogged (Photo 60)

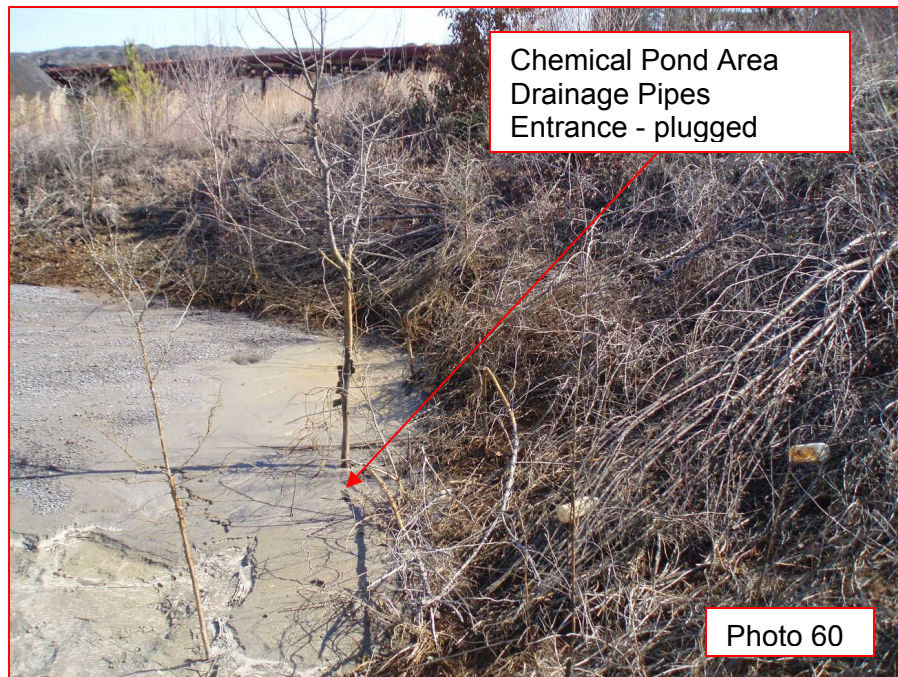


**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

CHEMICAL PONDS (continued)

- **Actions Since Previous Inspection**
 - None that inspector is aware of.

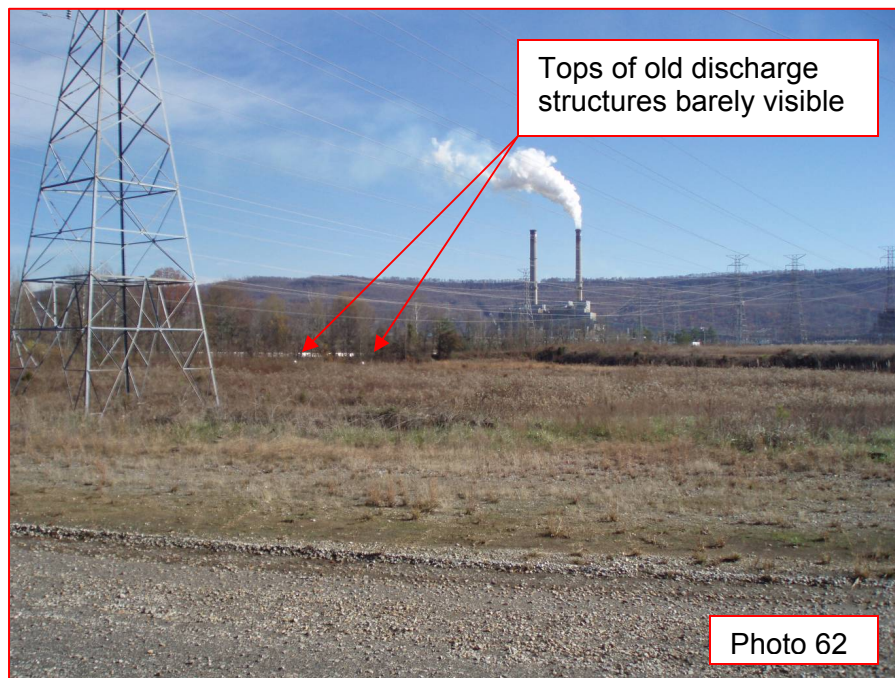
- **Recommendations**
 - Unclog drainage pipes and place filter fabric and riprap check dam at entrance point to catch sediment (2 yd³).
 - Close ponds if they are not used and fill in basin area with bottom ash.



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

ABANDONED ASH DISPOSAL AREA

- **Location** - Inside the Railroad Loop Northwest of Powerhouse
- **Effluent** - Majority of runoff goes to the Red Water Pond
- **Observations**
 - Heavily wooded in areas with thriving vegetation throughout area (Photo 89).
 - Old discharge structures still present (Photos 90)
- **Actions Since Previous Inspection**
 - None that inspector is aware of.
- **Recommendations**
 - None



**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

SUMMARY OF RECOMMENDATIONS

COAL YARD DRAINAGE BASIN

- Monitor the East interior slope. If erosion starts, place suitable earth material on slope prior to seeding and mulching. Notify EDS of any changes.
- Repair pump float switch so that pump can run in automatic mode. If this has been corrected disregard.
- Repair pump platform handrail. Paint platform within next two to three years.
- Clean sediment in retention basin and repair weir.

COAL YARD PERIMETER DITCH

- Continue routine cleaning of the perimeter ditch to allow proper drainage.

LIMESTONE PILE DRAINAGE BASIN

- Continue good management practices utilized in maintaining the Limestone Pile Drainage Basin.
- Clean sediment around inlet. Monitor and clean-out pond as required.

WET GYPSUM STACKING AREA

- Continue operations in accordance with the existing permit requirements.
- Monitor wet area along the Southern lower perimeter dike.
- Remove trees and woody growth from the Southwest lower perimeter dike.
- Repair erosion along gypsum upper perimeter dike slopes on a continuous basis until vegetation is established.
- Rework a portion of the West slope next to the Stilling Pond. Install toe drains as soon as the construction sequencing will allow. This will reduce saturation of the slope toe and will reduce sloughing in this area.
- Re-grade perimeter road surface and stabilize to prevent erosion. This is at the north corner of the stack as shown on drawing API08-2. Estimated Area - 50 yd².
- Clean-out all toe drain outlets and verify that there are no obstructions in the lines.
- Uncover bench drain outlets and place rip-rap as required. Several of these outlets were covered.
- Pump the PVC drainage basins/inspection wells for toe drains 11, 12, and 13 toe drains to remove sediment. This may open outlets that were not flowing. This activity must be done in the spring or summer months.
- Engineering Design to develop recommendations to address sloughing along the northwest slope. This will take approximately 100 man-hours (\$6,000 - Work Order DCN based on FY2008 rates). In order to limit degradation of this area, improvement should be implemented before next fall.

WET GYPSUM STACKING STILLING POND

- Continue maintenance of the dike slopes by mowing annually. This will also inhibit woody growth.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

SUMMARY OF RECOMMENDATIONS (continued)

ACTIVE ASH POND

- Utilize Best Management Practices (BMP's) to prevent erosion on top exterior slopes.
- Continue good maintenance and BMP's for Active Ash Pond Operations.

ACTIVE ASH POND STILLING POND AND PUMPING STATION POND

- Remove floating ash.
- Continue good maintenance and BMP's for Active Ash Stilling Pond operations.
- Monitor seep in dike between Stilling Pond and Pumping Station Pond.

ACTIVE ASH POND PERIMETER DIKES AND RED WATER POND

- Monitor erosion at the Red Water Pond interior slope. Notify EDS if erosion worsens. Placement of riprap is the recommended repair but not warranted at this time.
- Continue maintenance of the dike slopes by mowing annually. This will also inhibit woody growth.
- Repair erosion observed on Northeast Dike between the bridge over Widows Creek and the southeast corner. Place suitable earth material atop of the existing earth material that is not supporting vegetative cover. This material shall then be seeded and mulched so that vegetative cover can be established. Some type of grass matting is recommended for this area. Estimated area to be covered, graded, and seeded - 300 yd².
- Repair damaged manhole for the gypsum stilling pond gravity drain. This is located at the base of the northeast perimeter dike and shown on drawing API08-1.
- Monitor ruts and wet areas at base of the northeast perimeter dike. This will start at the bridge accessing the gypsum area and extend to where the gypsum stilling pond gravity drain line discharges to the 008 outfall ditch. Area will be assessed next inspection. Recommended repairs in out-years is to fill ruts then seed and mulch. Estimated area to be covered is 30,000 square feet (3,333 square yards).
- Eradicate animals and fill burrow holes at locations noted on drawing API08-1 (Estimate 9 ft³ concrete).
- Remove woody growth along the northwest perimeter dike next to the red water pond.
- Ruts forming on bench access road on the northwest dike. This serves as the access road to the red water pumping station. Gravel and re-grade to prevent standing water. This is needed on approximately 2000 feet of the access road (Photo 54).
- Repair Erosion observed at the southwest corner next to the units 1-6 ash pipes (Photo 55). Re-grade, seed, and mulch approximately 3,000 square feet (333 square yards).
- Place suitable earth material atop of the existing earth material that is not supporting vegetative cover on the South perimeter dike. This material shall then be seeded and mulched so that vegetative cover can be established (Photo 56 and 57). Some type of grass matting is recommended for this area. Estimated area to be covered, graded, and seeded - 6500 yd². If dirt access road is used in this area surface and gravel. Estimated area is 800 yd².
- Monitor the seepage along the South perimeter dike next to the Plant perimeter road. Notify EDS of any changes.
- Remove woody growth along the perimeter dike next to the stilling pond.

**WIDOWS CREEK FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION
2008**

SUMMARY OF RECOMMENDATIONS (continued)

CHEMICAL PONDS

- Unclog drainage pipes and place filter fabric and riprap check dam at entrance point to catch sediment (2 yd³).
- Close ponds if they are not used and fill in basin area with bottom ash.

ABANDONED ASH DISPOSAL AREA

- None

TREE REMOVAL PROCEDURE

- Trees growing in the dike should be pulled out by their roots with a chain and a backhoe and the damaged area compacted back in place to repair it. All trees above the toe of the dike should be removed this way. Removing the roots removes a path for water to erode a tunnel through the dike and cause a failure. Cutting trees should be avoided because this leaves the roots in place and will leave a tunnel after the root rots. Trees larger than 3" in diameter at the base should be left in place unless they are in a place critical to dike stability (the toe of the dike and the toe of any slope at a berm). Some species of trees this large have such large root systems removing them would cause more damage than leaving them would. Mowing very small trees while mowing the dikes will not cause future problems and is the best way to control tree growth.

