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March 1, 2004

Earl L. Deskins, KFP 1A-KST

KINGSTON FOSSIL PLANT (KIF) - ANNUAL ASH POND DIKE STABILITY INSPECTION

Attached is the latest dike stability inspection for your plant. The report was prepared by John Albright and Jeff Gray of our Civil Engineering section and the inspection was performed on December 2, 2003. The report includes recommendations for repairs and corrective actions. I concur with those recommendations.

If you have questions of comments, please call John Albright at Chattanooga extension 3981 or Jeff Gray at Chattanooga extension 7693.

R E Purkey

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

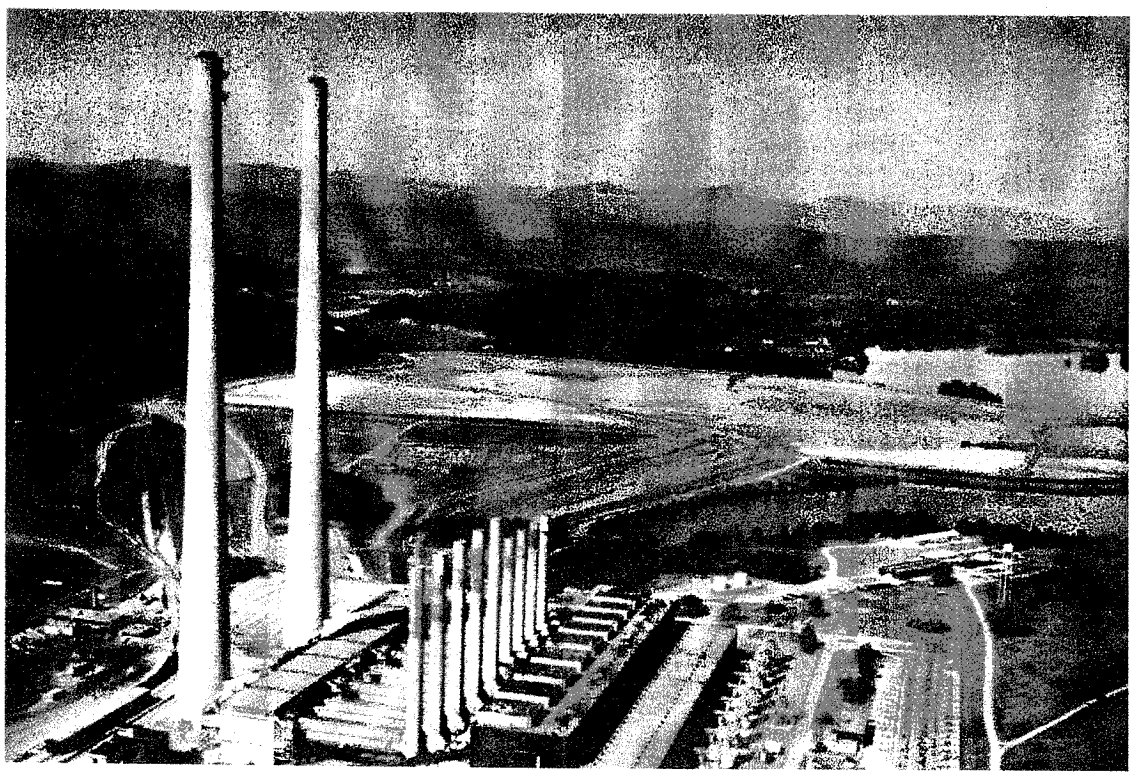
REP:JGA:LMV
Attachment
cc (w/attachment):
L. F. Campbell, KFP 1A-KST
J. H. Catlett, KFP 1A-KST
M. A. Cones, Dam Safety Files, LP 1H-C
M. D. Davis, LP 5E-C
R. E. Johnson, LP 2L-C
G. R. MacDonald, LP 5E-C
B. C. Morris, LP 5E-C
EDMS, WT CA-K

j:/fossil eng/proj eng/civil/kif ash pond insp cover 2002.doc

TENNESSEE VALLEY AUTHORITY

KINGSTON FOSSIL PLANT

ANNUAL ASH POND DIKE STABILITY INSPECTION



Prepared by: John G. Albright
Jeff L. Gray
Date: February 24, 2004

KINGSTON FOSSIL PLANT
ANNUAL ASH POND DIKE STABILITY INSPECTION --2004

General

The waste disposal areas at Kingston Fossil Plant were inspected for dike structural stability on December 2, 2003. The inspection was performed by John Albright and Jeff Gray of TVA Engineering Design Services, Civil Engineering.

The previous annual inspection was performed on October 23, 2002.

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

Active Ash Disposal Area

Plant operations continue to manage this area the same as during the last inspection except as noted. Bottom ash is sluiced into a channel southwest of the disposal area where it settles out and is removed by drag line, approximately once a week, to be used for dike construction. Fly ash is sluiced into a channel northwest of the bottom ash channel. Both channels flow northeast into the active ash pond where the fly ash settles out and accumulates. Prior to November 2003 the fly ash was periodically dredged into one of two raised dredge cells located in the western portion of the disposal area. The dikes of these cells were raised using fly ash and bottom ash to provide more capacity for dredged fly ash as needed.

In November 2003 dredging operations ceased because of a leak in the toe of the dike slope for dredge cells 2/3 (Photos 1 and 2). Presently ash is removed from the pond with track hoes (Photo 5), placed on the edges of the road adjacent to the pond and allowed to dewater before being loaded onto trucks and hauled to the top of the dredge cells where it is unloaded and used to help construct the next lift for dredge cell 1.

The sluice water flows into the stilling pool through two plant constructed spillways. From the stilling pool, the water discharges into the plant intake channel via six standard spillways. Construction on new discharge diffusers was completed November 2003. At the time of the inspection, five of the six discharge diffusers were operating (Photos 6 and 7).

All exterior dike slopes (except dredge cells 2/3) around this area appeared to be in sound condition with excellent vegetative cover. The dikes were in need of mowing. Small trees had grown to a height of 3 to 5 feet (Photo 8) in some places. These trees should be pulled up and the area reseeded. Presently the dikes are mowed only once a year.

The divider dike between the active pond and the stilling pool had some areas of erosion and gullies, but appeared stable otherwise.

All dike roads were in good condition with a good ash or crushed stone surface except the lower dike road along the East side of the pond (Dike C) and the South Stilling Pond lower dike. Several areas of the roads were rutted and held water (over 12 inches deep in some places) making vehicle passage impossible (Photos 10 and 11). These areas should be repaired as soon as possible. The dike slope near one of the road ruts showed signs of erosion (Photo 9). This area should be repaired as soon as possible.

Post Inspection Note: The ash team blitz inspection during the week of January 19th revealed several areas of seepage along the toe of Dike C and below the toe of the dike along the intake channel

Dredge Cells

The top of the dikes elevation is 811 feet. A leak occurred at the toe of the slope on the east side slope of dredge cells 2/3 on November 6, 2003 (Photos 1 and 2). Dredging operations were ceased immediately. Yard Operations personnel began draining dredge cells 2/3. Cell 1 had already been drained. On November 7, 2003 plant personnel with instruction from EDS Civil Engineering (see attached e-mail) began efforts to try to stabilize the leak area. Over 100 tons of riprap was placed on the toe of the slope to help stabilize it (Photo 3). The next day ash and water was observed seeping from the dike approximately 10 feet further up the slope. A filter fabric was placed over the seepage area and twenty feet beyond each side of it. Approximately twelve inches of crush stone was then put on top of the fabric (Photo 4). EDS Civil Engineering and its design partner MACTEC are trying to determine the cause of the leak, the best method of repairing the dike, an alternate location for a new dredge cell if needed and if/when dredging operations can resume.

The dredge cell dike slopes were fully saturated along Swan Pond Road on the day of inspection. Standing water, ash, and cat tails were noted in bench drainage ditches. The cattails should be removed from the drainage ditches. Two additional seepage areas were noted on the slope above the blowout area. These areas should continue to be monitored.

A berm was constructed in the drainage ditch at the toe of the dike slope for dredge cells 2/3 to prevent ash leaking from the dredge cell from getting into the river. Water is pumped from the ditch into the Ash Pond. Several check dams were constructed in the drainage ditch beyond the berm to catch sediment. Sediment fences and bales of hay were also placed in the drainage ditch (Photo 12). Water observed in the drainage ditch adjacent to the bales of hay on the day of the dike inspection appeared to be clear. None of the cells were being dredged into at the time of inspection. Dike slopes with sparse vegetation should continue to be reseeded and mulched until a good vegetative cover is apparent (Photo 13). Add top soil to the slope of the upper lift so a vegetative cover can be established to help control erosion.

Plant operations continue to do a commendable job of mowing the dredge cell slopes (Photo 14). A few small trees are growing on the slopes. They should be pulled or kept mowed to prevent further growth.

Post Inspection Note: An intermediate dredge cell is presently under construction with the first stage scheduled for completion in late March 2004.

Chemical Treatment Ponds

The chemical treatment ponds are located southwest of the active ash pond. Both ponds were excavated and have no exterior slopes. The internal dike slopes are covered with riprap. These slopes were in good condition. Sediment in the ponds were tested earlier this year and found to be non-hazardous.

Coal Yard Drainage Basin

The coal yard drainage basin is located at the southwest corner of the coal pile. This basin was excavated below grade; therefore, there are no exterior dikes (Photo15). The interior slopes appeared to be in satisfactory condition. Normal discharge from this basin is pumped into the fly ash discharge ditch and flows to the active ash disposal area. At the time of inspection, water in the pond was at a low level, about 6" below the first pump start switch and the platform was grounded. The basin was sounded at 4 places and found to have a depth of 1.08 feet average when the water was at elevation 751. This indicates the sediment in the bottom occupies 4.92 feet of the basin's storage capacity. This represents a 1.67 feet increase in sediment depth since the last inspection. The basin was dredged just over two year ago, we recommend dredging the basin annually. The bottom of the pond should be no higher than elevation 745. Elevation 745 allows 2 feet of clearance below the pump intakes to prevent the pumps from pumping solids; the elevations indicate the pumps have been pumping solids for some time. In addition, the "V-shaped" pond extensions added during the summer of 2001 to increase the pond storage volume contained coal yard sediment (Photo16). TVA drawing 10W225-1 shows the pond and its intended bottom contours.

Engineered Redwater Wetland

The engineered wetland along the southwest dike receives seepage that collects in the anoxic limestone drain below the bottom ash trench. The wetland appeared to be functioning, at least partially, though the discharged is still pumped to the ash pond (Photo 17).

Actions on Recommendations of Last Inspection

- Plant personnel have continued the slope mowing program. This has resulted in excellent vegetative cover on the exterior slopes.

Recommendations

- Areas on the dike slopes with sparse vegetation should continue to be reseeded and mulched until a good vegetative cover is present.
- Dredge cell slopes with exposed ash should receive a layer of top soil and be seeded as soon as possible.

Recommendations (Continue)

- Dredge cell drainage ditches should be kept free of cattails. The existing cattails should be cut.
- Remove trees from the slope of the stilling pool dike. At this point, the trees are small enough to be mowed. Mowing at least twice a year is recommended to control the size of the trees. Preventing the trees from getting larger than 1" in diameter at the ground is preferred. Any trees larger than 3" in diameter at the base must be pulled from the dikes, roots and all. Repair and reseed the area the tree was removed from.
- Repair the ruts in the road along the stilling pool and Dike C by filling with soil, compacting it, grading the road to turn water to the outside and covering the repairs with ¾" crushed stone. It is estimated the repairs will require approximately 20 yards of soil to fill the ruts and 70 tons of stone for cover.
- Plant personnel should continue monitoring the limestone drain area and all exterior dike slopes for seepages, soft wet spots, animal burrowing, sloughing, etc., and notify Lynn Petty of FPG Engineering Design Services., 423-751-6704 of any changes.
- Do not close the valves at the spillway outlet. Closing the outlet valves puts the joints in the pipe under pressure they were not intended to withstand. This pressure could cause the pipe joints to leak and wash out a portion of the dike causing the dike to fail. The valves should be removed when possible.
- Dredge the Coal Yard Drainage Basin to restore its design contours and protect the pumps from further damage. There is an estimated 2,800 cubic yards of sediment in the original pond and an extra 3,400 cubic yards in the "V" section that needs to be removed as soon as reasonable. See the attached copy of 10W225-1.

KINGSTON FOSSIL PLANT
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Photo 1. Leak in the toe of the slope of dredge cells 2/3

Photo 2. Leak in toe of the slope of dredge cell 2/3

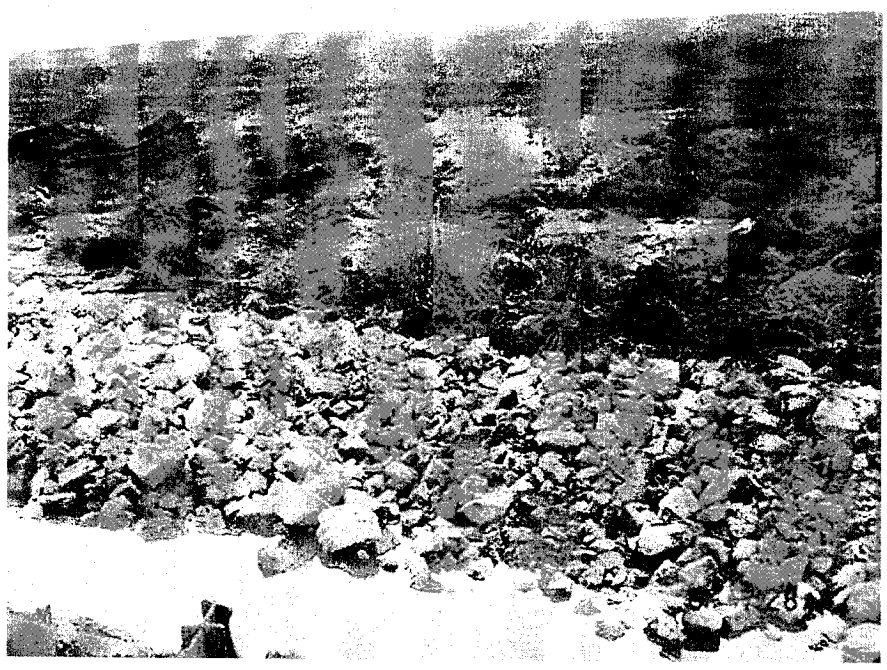

Photo 3. Ripraps put on toe of the slope to stabilize it.

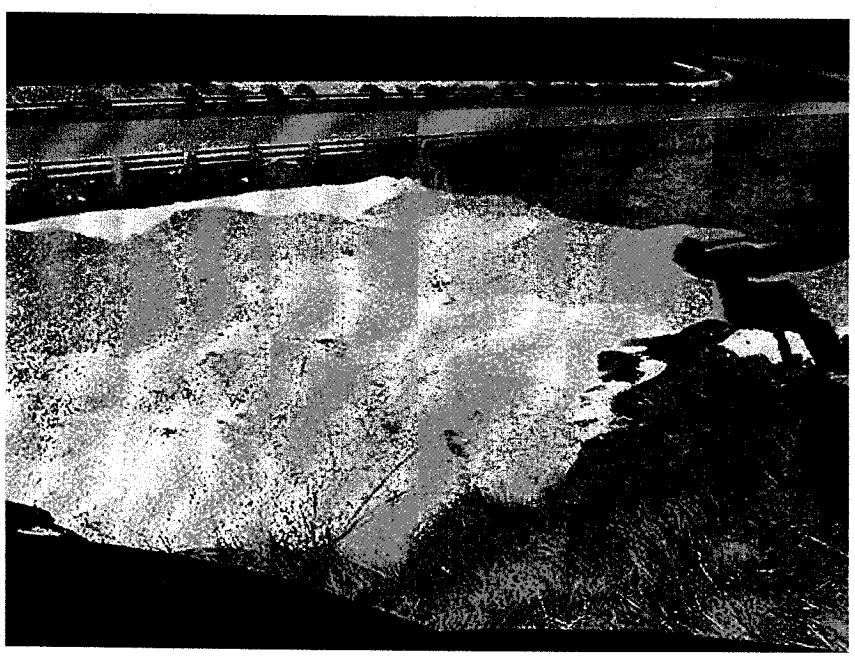

Photo 4. Current dike leak temporary repair.

Photo 5 Ash is transported via truck to the top of Dredge Cell 1

Picture 6. Ash Pond Discharge Diffusers

Photo 7. Ash Pond Discharge Diffusers

Photo 8. Heavy vegetation and small trees growing on the slope.

Photo 9. Dike slope erosion.

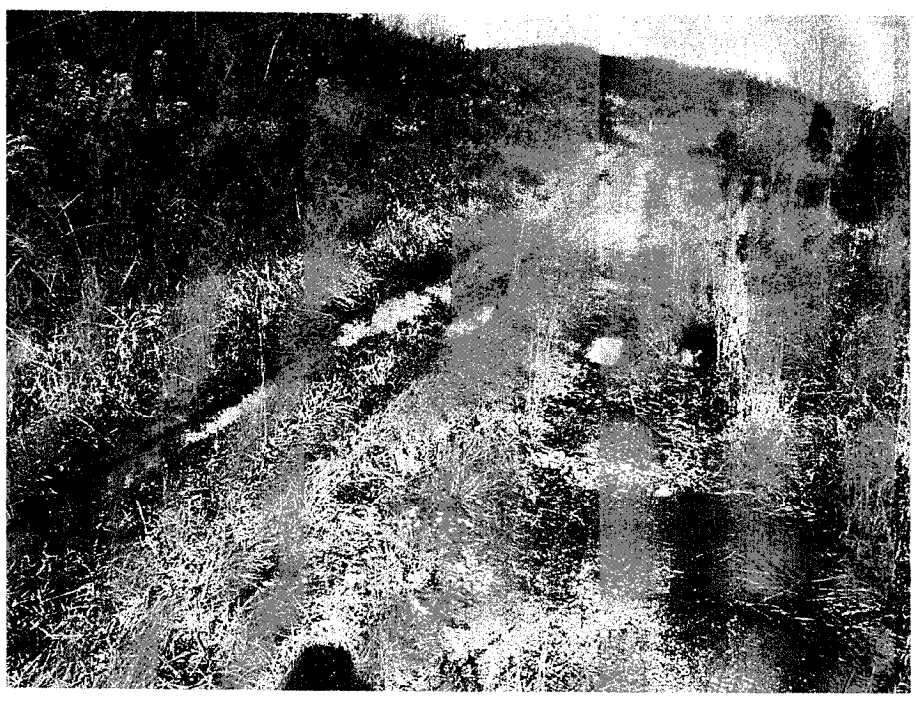

Photo 10. Road ruts. Note slopes needs mowing.

Photo 11. Road ruts

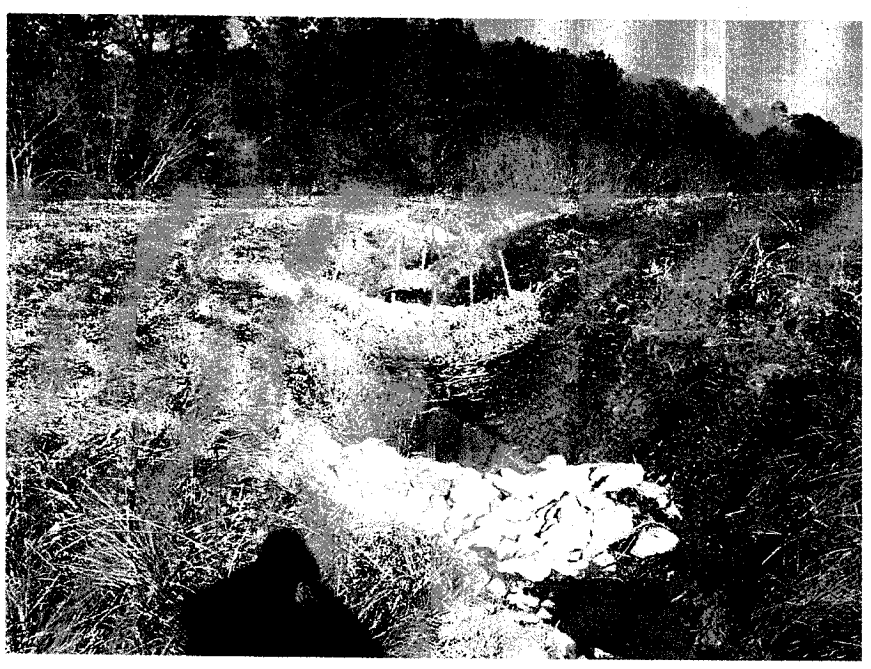

Photo 12. Sediment check dams and hay bales paced in drainage ditch to prevent ash from getting into the river.

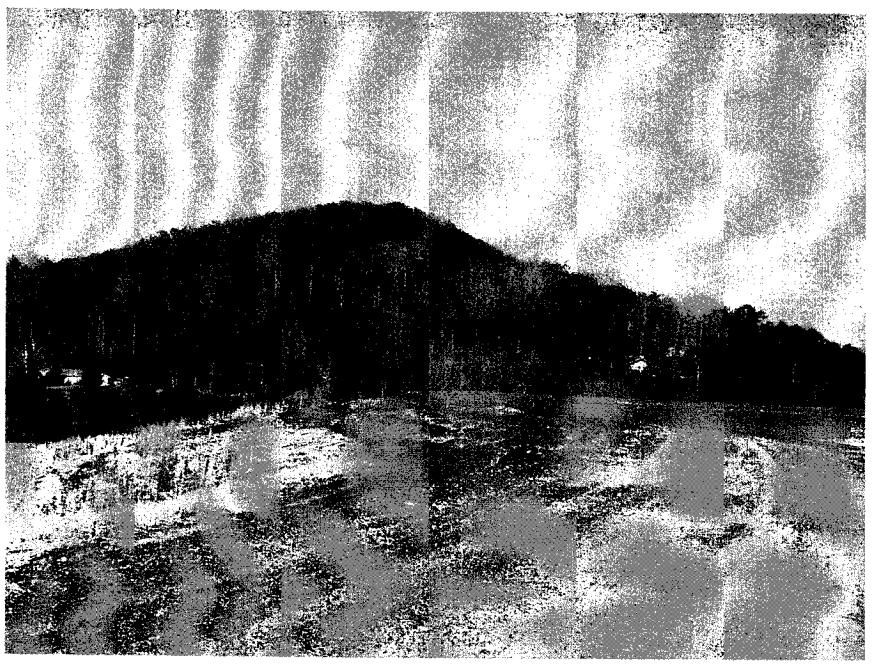

Photo 13. Dike slopes with sparse vegetation shall be reseeded.

Photo 14. Grassy dike slope.

Photo 15. Coal Yard Drainage Basin

Photo 16. Coal Yard Drainage Basin Overflow

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Photo 17. Engineered Wetlands

Gray, Jeff

From: Albright, John G.
Sent: Friday, November 07, 2003 10:57 AM
To: Campbell, Linda F.; Catlett, James H; Deskins, Earl L; Strunk, Michael W.; Davis, Michael D; Adair, James G.
Cc: Petty, Harold L.; Gray, Jeff; Purkey, Ronald E.
Subject: RE: Ash Pond Leak

I talked to Jeff again this morning. Nothing appears to have changed overnight; that's a good sign. The recommended repair, initially, is to place significant quantities of rip-rap in the ditch to begin the stabilization. Then, add crusher run stone as a "filter blanket", a layer of filter fabric, another layer of crusher run and finally cover the area with more rip-rap.

The crusher run is both a filter for the ash and protection for the fabric. All of the rock weights the toe so it will not slide out into the road. The crusher run layers need to be 4 - 6" thick and the rip-rap should be 3 feet thick on top and as much as needed on the bottom to get up to the original ditch bottom or a little higher. The top layer of rip-rap should be extended back to the dike slope and the top kept level. The top layer of rip-rap will likely be above the road elevation. The repair should extend 50 feet in both directions from the "blowout" to ensure another one does not happen.

After the repair is complete we will look at other locations for a new ditch.

We DO NOT recommend any equipment on the slope until the toe is stabilized and the pool of water (the driving force behind all of this) in the dredge cell is completely drained. The vibration from the machines will loosen the slope and cause the whole thing to slide off into the road.

[redacted]s the repair progress, Jeff will monitor the work and may need to change what is done. [redacted]e and I have talked and I have discussed these recommendations with our other Civil Engineers. We are in agreement that this represents an effective emergency repair based on the knowledge we have. Additional work could be required to ensure the dredge cell can be raised to the intended final elevation.

John Albright
(423) 751-3981

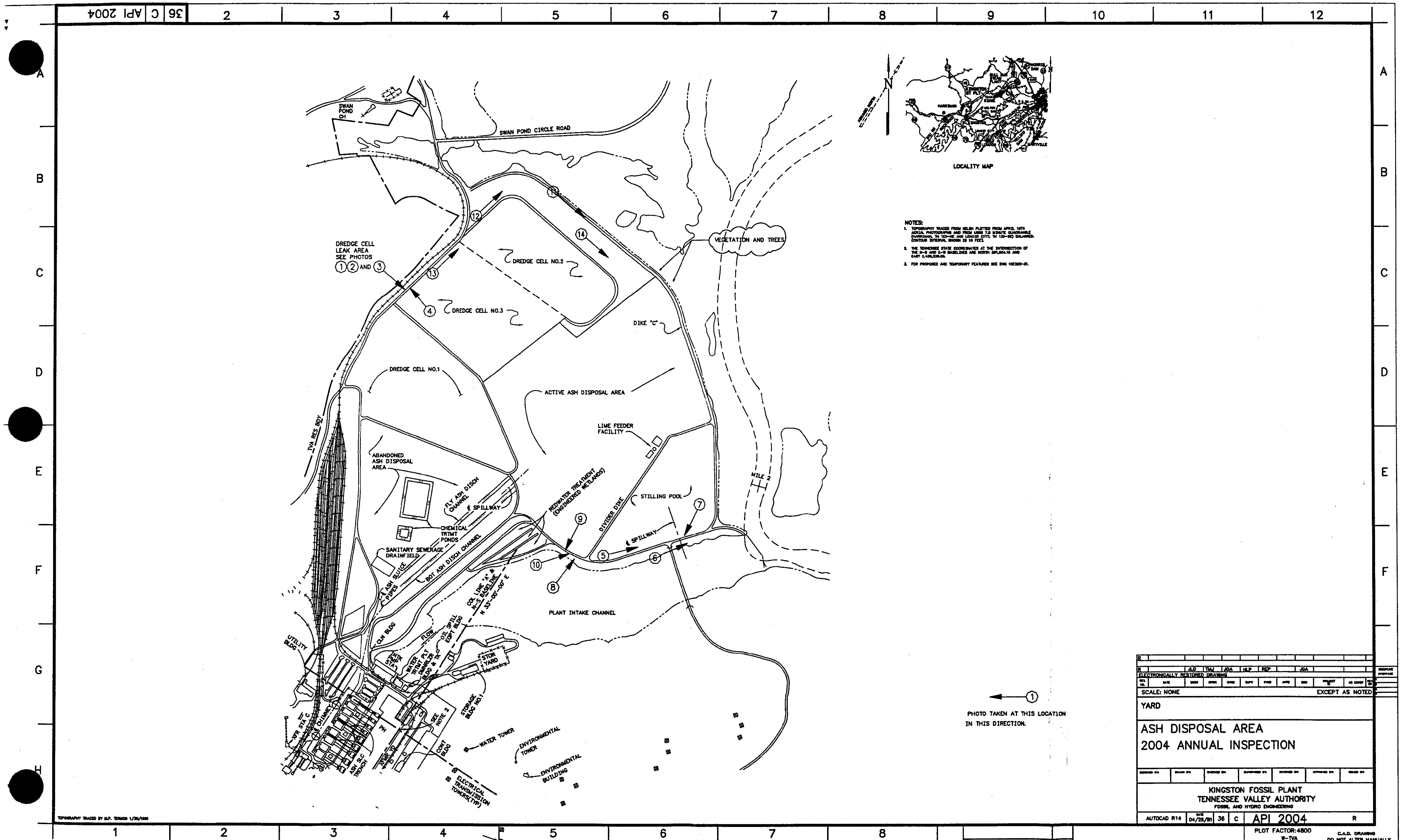
-----Original Message-----
From: Campbell, Linda F.
Sent: Thursday, November 06, 2003 7:23 PM
To: Catlett, James H; Deskins, Earl L; Strunk, Michael W.; Davis, Michael D
Cc: Petty, Harold L.; Gray, Jeff; Albright, John G.
Subject: RE: Ash Pond Leak

This area is under two permits, Solid Waste and NPDES. I think we will need to report this to the state but I need to talk to Environmental Affairs specialist tomorrow. They will report this incident or notify me to report. If you need to talk to me, please call me at (865) 755-5077. Thanks, Linda

-----Original Message-----
From: Catlett, James H
Sent: Thursday, November 06, 2003 7:07 PM
To: Deskins, Earl L; Campbell, Linda F.; Strunk, Michael W.; Davis, Michael D
[redacted]c: Petty, Harold L.; Gray, Jeff; Albright, John G.
Subject: Ash Pond Leak

To All,

Kingston had a problem with a leak on the slope of # 2 dredge cell. The ash did get part of the way onto the road way and we kept pushing back onto our property. Chattanooga sent a Eng. Up to look at problem (Jeff Gray) and he will be back tomorrow also.



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