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TENNESSEE VALLEY AUTHORITY

HRB

: Frank D. Stansberry, Head Civil Engineer (Site Development, Highway, Railroad, and Bridge Design), W3A52 C-K

: Ronald D. Powell, Civil Engineer (Site Development, Highway, and Railroad Design), W3B69 C-K

: September 25, 1978

Kingston Ash Disposal

ECT: KINGSTON STEAM PLANT - ANNUAL ASH DISPOSAL AREA INSPECTION

On August 16, 1978, Larry Wall of P PROD and J.P.H. Stivers and I of EN DES inspected the ash disposal areas at Kingston Steam Plant.

The last annual inspection was made on September 15, 1976. The ash disposal areas were not inspected during 1977 due to construction in progress on raising of the dikes and installation of the new spillways.

On the attached print of drawing 10N420, the different areas are designated.

Change in Dikes Since Last Inspection

rolled earthfill, per dwg note

The dikes have been raised to elevation 765 since the last annual inspection. All of the original dikes, with the exception of the west dike of the initial area and the south end of dike C, were built with equipment-compacted earth and widened with ash. The west dike of the initial area and the south end of dike C were built and widened with ash. EN DES issued plans for raising the dikes--the raised portion to have a 16-foot top width with 2:1 side slopes and no riprap. The earthfill was to be compacted to 95-percent-maximum dry density and is founded upon heavy ash which was dumped on the inside of the original dikes.

A stilling pool has been formed in the southeast corner of the ash disposal area by constructing a divider dike with heavy ash in accordance with EN DES plans to satisfy EPA requirements. The divider dike has a flow-through spillway with a floating skimmer located 250± feet from its intersection with dike C. Six new standard spillways with skimmers have been constructed in the stilling pool with outlet pipes through the road dike discharging into the intake channel.

No vegetative cover has been established on either the exterior or interior slopes of the raised portion of the dikes although they were seeded and mulched by CSB upon completion of construction (pictures 1 through 4). Erosion gullies have begun to form in the dike slopes over the entire length of the raised dikes, and wave action within the ash disposal area appears to be eroding the interior dike slope at the elevation of the water surface. The interior slope of the northern portion of dike C in the vicinity of the old spillway outlets has eroded to the point where earthfill material is sluffing off into the ash disposal area (pictures 1 and 2).

Visual inspection of the exterior dike slopes reveals some seepage occurring along the length of the east dike of the initial ash disposal area; however, there are no visible signs of instability due to seepage at this time.

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The tops of all dikes are smooth and sloped to the inside with a good surface. However, the spillway access (detail B on drawing 10N420) is sloped back toward the road dike interior slope and is creating a ponding condition. The crushed stone surfacing has not yet been placed on the road dike, the spillway access, or the east dike of the initial ash disposal area.

The divider dike side slopes have developed erosion gullies, and wave action has eroded the side slope facing the ash disposal area. Being formed of heavy ash and having no vegetative cover, the divider dike will require continuous observation and maintenance for the life of the ash disposal area. The buoyant skimmer in the divider dike flow-through spillway is overflowing and permitting fly ash to enter the stilling pool area (pictures 6 and 7). A fly ash slurry was observed covering at least 75 percent of the stilling pool area surface (pictures 7 through 9). Riprap in the divider dike flow-through spillway is in generally poor condition. There appears to be an excessive amount of fine material in the riprap with most of the larger stones grouped in clusters. Also, there are some bare areas where the bottom ash is not covered (pictures 6 and 7).

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Change in Pond Operation Since Last Inspection

There has been a significant change in pond operation since the last inspection. All ash is still sluiced into the initial ash disposal area where the heavy ash is picked up with a dragline, allowed to drain, and then dry hauled to the ash disposal area adjacent to the north dike where the ash is deposited in stages. As each stage reaches the elevation of the top of the north dike, it is covered with earth and seeded.

The ash water carrying light ash that was not picked up by the dragline flows through two plant-constructed spillways and skimmers located in the east portion of the north dike and around the deflector dike into the ash disposal area where the rest of the ash settles out. The water then flows through the spillway in the divider dike into the stilling pool area from which it discharges into the intake channel through six new standard spillways and skimmers located in the east portion of the road dike.

The chemical treatment ponds have been constructed within the initial ash disposal area since the last inspection.

Condition of Spillways, Skimmers, and Outlets

The plant-constructed spillways, skimmers, and outlets of the initial ash disposal area could not be inspected due to their inaccessible location in the east portion of the north dike.

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The spillways in the northern portion of dike C, which were in use at the time of the last annual inspection, have been plugged with concrete and covered with the raised portion of the dike. The skimmers were removed before covering the spillways. The outlets of these spillways were submerged by Watts Bar Lake and could not be inspected for leakage.

Visual inspection of the new spillways and skimmers in the stilling pool area showed them to be in good condition and operating properly. The spillway outlet pipes appeared to be discharging equally and the concrete end wall is in good condition. The riprap outfall to the intake channel appeared to be in good condition with no visible sign of erosion. All weep holes in the concrete end wall of the spillway outlet pipes were seeping and one was running a steady stream of water (picture 10). However, the dike slope directly behind the end wall appeared to be dry and well compacted. Some fly ash was observed in the intake channel below the spillway outlets. This is probably due to the accumulation of fly ash around the spillway skimmers (picture 9).

Action on Recommendations of Last Inspection

There were no recommendations for corrective work from the last annual inspection.

Recommendations

1. Repair all areas of the dike slopes that have been badly eroded or where sluffing off of earthfill material has occurred.

2. Place heavy ash along the interior dike slopes of the ash disposal area to an elevation of $2\pm$ feet above the existing water elevation to prevent erosion of the dike slopes due to wave action.

3. Establish a vegetative cover on the side slopes of all dikes constructed with earthfill material. Seeding and mulching shall be in accordance with sections 180 and 182 respectively of the T-1 Highway Specifications. It is recommended that type 8 be used as a temporary cover with a permanent cover of type 6, mixture e, to be established in the spring. Seeding and mulching should follow placement of the heavy ash along the dike slopes.

4. Grade the spillway access in accordance with EN DES plans so that it will drain into the stilling pool area.

5. Place crushed stone surfacing on top of dikes where it has not yet been placed and on the spillway access.

6. Repair badly eroded areas of the divider dike slopes and continue to observe the divider dike for future erosion development.

7. Make adjustments to correct the overflowing condition of the buoyant skimmer within the divider dike flow-through spillway to ensure its proper operation in the future. We recommend lowering the channel bottom 2 to 3 feet.

8. Upgrade riprap placement in the divider dike flow-through spillway by covering the existing riprap with larger stones in accordance with note 11 on drawing 10N420. Also, inspect the bottom surface of the spillway for erosion due to high water velocity.

9. Remove the fly ash slurry covering the surface of the stilling pool area.

10. Continue to observe the weep holes in the concrete end wall of the spillway outlet pipes for excessive waterflow and the dike slope behind the end wall for surface wetness.

Ronald D. Powell
Ronald D. Powell

KWB RDP:BLH
Attachments

Concur: Frank D. Stansberry
Frank D. Stansberry

R. E. Davis
for G. L. Buchanan

9/25/78 - FDS:BLH
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9/25/78 - GLB:BLH
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