Pond Closure - Case Study[TP1]

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ABSTRACT

One of the options for unlined Coal Combustion Residual (CCR) impoundment facilities under the CCR regulations is the closure of the impoundment. The case study presented herein depicts the progression of the proposed closure in accordance with the design.

Existing Facility

The fly ash reservoir being closed is located approximately 1.5 miles southwest of the power plant. The impoundment was initially created by the installation of a dam in 1973. Subsequent raisings of the dam has resulted on 220-foot high dam at the time of the proposed closure. The reservoir has a surface area of approximately 160 acres at a normal pool elevation of 858 feet, and an overall drainage area of approximately 300 acres. The impoundment has a total permitted storage capacity of approximately 11,160 acre-feet.

Figure 1. Fly Ash Reservoir

Proposed Closure

The closure of the reservoir is to be accomplished through the re-grading of the in-situ fly ash within the impoundment, the placement of a cover soil and vegetative cover, and the excavation of a new outlet channel to the west of the existing facility.

The final grade is defined by a dendritic drainage network of shallow channels with an estimated post-settlement grade of 1-percent channel slopes and 2-percent cross slopes draining towards the channels. The proposed outlet channel, positioned at the base of the drainage network, conveys runoff away from the closed surface to exit through a rock channel excavated in the right abutment below the original emergency spillway of the reservoir. The channel is expected to prevent the impounding of water on the closed surface.

Final grades vary from 45 feet below the existing dam crest at the dam to 15 feet above the existing dam crest in the back fingers of the reservoirs. Achieving these desired grades resulted in cutting as much as 20 feet of fly ash from below the final operating water level in the reservoir and filling as much as 20 feet above this operating water level.

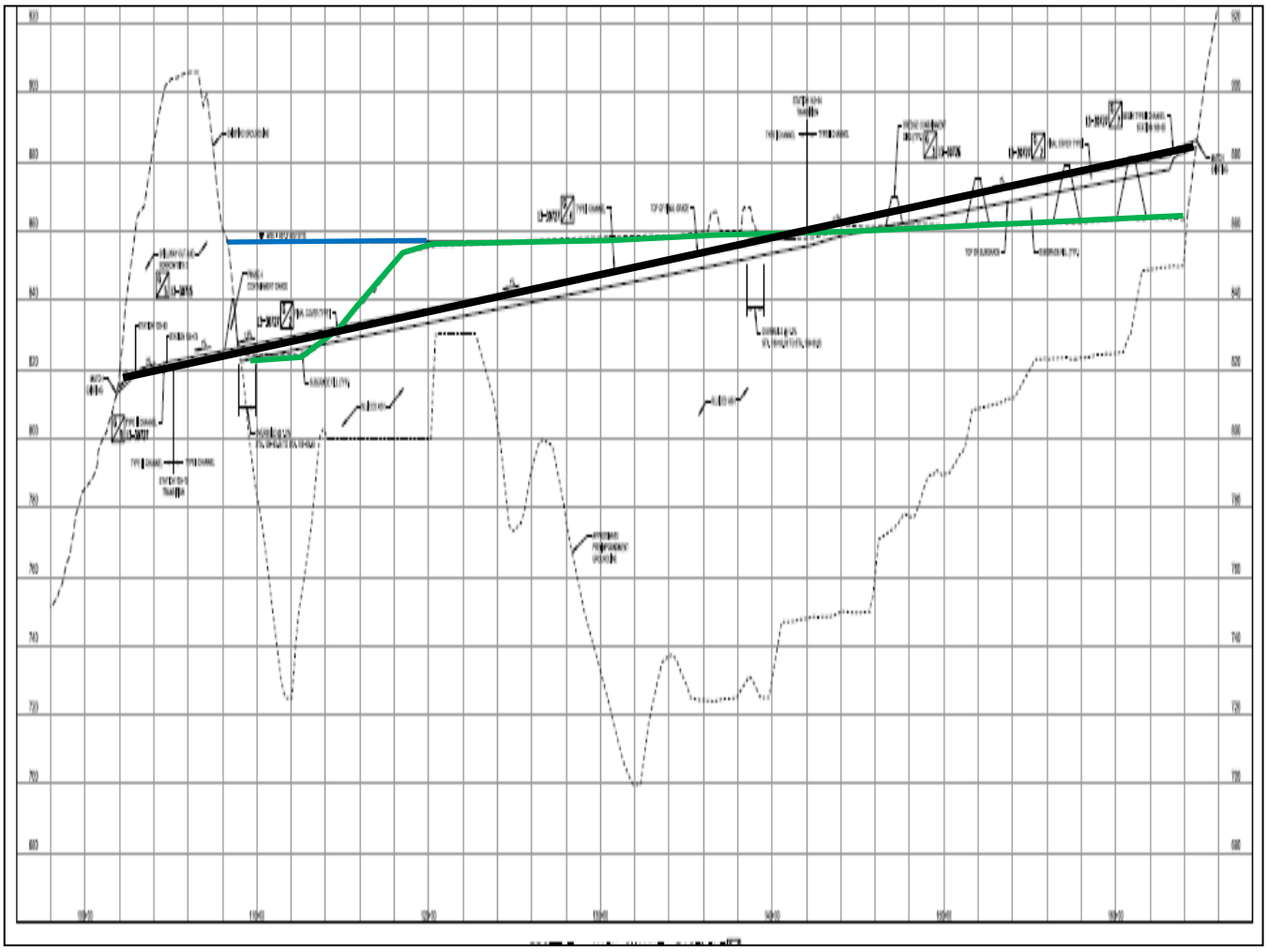

Figure 2. Cross section of the proposed closure along the outlet channel alignment.

Construction

Initial redistribution of the ash from the areas of cut to the areas of fill was accomplished by using wet dredging techniques. The removal of the free water was achieved by pumping the water from near the former outlet works to a power plant basing to be treated and discharged via a NPDES outfall. Floating roads using a cross-section that included geogrid reinforcement were built on top of the exposed fly ash with granular materials.

Figure 3. Initial re-distribution of fly ash.

Figure 4. Installation of floating roads over exposed fly ash subgrade.

Figure 5. Free water drainage and removal.

Figure 6. Floating road network and installation.

Figure 7. Installation of bridge layer over exposed fly ash surface.

Figure 8. Placements of excavated fly ash fill to achieve desired subgrade level.


Figure 9. Liner installation


Figure 10. Installation of liner's protective cover including cushion fabric.


Figure 11. Conveying channel riprap revetment installation.


Figure 12. Vegetative cover of cap system.

Figure 13. Progress of installation of cap system

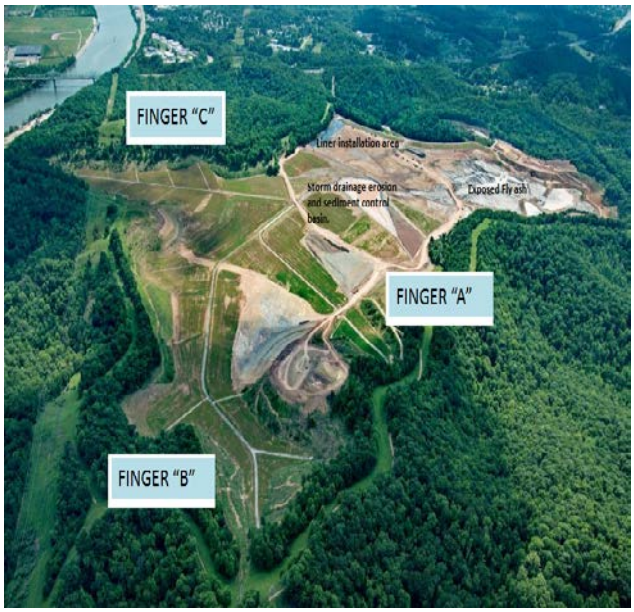

Figure 14. Completed cap system over fingers including erosion and sediment basin for non-contact storm water management, liner installation of middle section, exposed fly ash towards pumping system handling contact storm water.

Figure 16. Work completed as of June 2016.