GEOTECHNICAL DESIGN CONSIDERATIONS FOR LANDFILL CONSTRUCTION OVER AN ASH POND

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Abstract

John Seymour (MS 1980, University of Michigan) provides the technical considerations for design of a new landfill to be constructed on top of an existing valley fill coal ash pond. The ash pond covers approximately 100 acres and the maximum depth of ash is 110 ft. The ash is primarily fly ash that had been placed as a slurry over a 40-year period. The ash pond is contained by an earthen dam that is approximately 120 ft high. The new landfill would be required to contain approximately 15,000,000 cuyd of flue gas desulfurization (FGD) coal combustion product (CCP). The final landfill would be up to 300 ft high which would create compressive loads of up to 13 tsf. Further, 1/4th of the plan area of the new landfill would be constructed over an existing mine spoil fill area.

The new landfill would require an extensive bottom liner system. The bottom liner system included, from the bottom up: 1) an underdrain system, 2) recompacted soil liner, 3) polyvinyl chloride (PVC) liner, and 4) a leachate collection system.

The most significant geotechnical design challenges will be discussed, including addressing potentially significant differential settlements between the landfill over the mine spoil area and the maximum depth of the ash in the pond and liquefaction. The ash is a loose, uniformly fine grained, compressible material that could experience an estimated 5 ft of total settlement. This large amount of settlement could create distress in the liner system, subsurface drainage pipes, and leachate drainage pipes such that flow of liquids through the pipes could be disrupted and the liner system could be placed into an unacceptable amount of tension.

****** Everyone is invited – refreshments will be served ******