

WV 213- Improving The Safety of Coal Slurry Impoundments

Objectives:

This project will improve the safety of coal slurry ponds. We will focus on risk reduction for existing ponds and an evaluation of new pond construction and monitoring practices. This project will provide an opportunity to fulfill the National Academy of Sciences' recommendation, as well as provide additional information about the most reliable, feasible, and economical methodologies for addressing coal mine waste impoundment security. A demonstration project would allow the regulatory agencies to determine if and to what extent any additional regulatory actions or monitoring should occur. The study would also clarify and strengthen federal and state responsibilities.

The following summarizes our role under each of these tasks:

Task 1. Inventory and mapping of all active and abandoned waste impoundments.

The project would begin by compiling and updating an inventory and mapping of all active and abandoned coal slurry impoundments in the eastern U.S., especially those located in the Appalachia region, identifying each along with its status. West Virginia DEP and West Virginia University recently completed a GIS platform identifying all active slurry ponds in the state. This information would be compiled from federal and state agencies and would include site visits to confirm the location (using a GPS unit) and status condition of the structures. Active sites are likely to be well documented and require little additional information gathering. Abandoned, high risk sites will require additional data collection. We will collate/collect the following information: site location, coordinates and physical attributes such a dam height, length, volume drainage system freeboard, age and anticipated closure date. A fundamental component of the program would be the involvement of local, country, and state officials along with industry representatives and interested and affected citizens.

Task 2. Emergency management.

Every permitted coal mine has a mine emergency plan. It includes contingencies related to slurry impoundments. NMLRC will collate these plans and summarize them using a common template so that they can be placed on the program web site for public access. Using the same template, we will evaluate hazards from non-active, abandoned slurry ponds and develop emergency plans as needed. Ultimately, a system will be developed that will provide early warning, real time remote sensing, modeling and predictions of impending weather changes. Public service, radio and television announcements would be developed to inform the public of impending situations. The approach would be similar to that used by NOAA in the farm belt states when severe weather (hail, tornadoes) threatens a specific area.

This system would provide timely notification of impending runoff events and would allow monitoring of all impoundments as well as notification of threatened communities and citizens. Monitors, in coordination with industry officials, would assist at the site and would have access to relevant information. The Emergency Warning Plans currently filed by each company would be placed on an Internet site and would also be provided to the local governments, volunteer fire departments, and churches near the impoundment sites. NMLRC will review emergency management plans to representative active operations, generate a report and CET would incorporate the results in its web site using the presently available information as well as information developed by the project, including the inventory and GPS location. Applicable remedial technologies will be highlighted.

Task 3. Risk Assessment

Current design and risk assessment protocols for coal slurry impoundments focus on intrinsic risk factors such as geotechnical stability, drainage system integrity and erosion. Needed is a process for assessing and weighing downstream human risk factors as well as threats to infrastructure. We will begin by evaluating existing downstream risk assessment protocols used in reservoirs and other impoundments and tailor a protocol to fit Appalachian terrain and the special properties of coal slurry so that site specific risk assessments can be developed for each impoundment. NMLRC will develop a downstream risk assessment protocol and apply it initially to the 25 priority impoundments.

Task 4. Pilot Studies

NMLRC will evaluate the geotechnical performance of the 25 high risk impoundment sites. NMLRC will analyse impoundment integrity and recommending drilling or other surveys to locate underground mine voids. Active impoundments will have a large body of information so little additional geotechnical data is likely to be needed. The analysis will include geotechnical stability as determined by foundation conditions, hydrostatic pressures, loadings and strengths. NMLRC will also evaluate erosion potential, maintenance requirements and the risks of classic tailings pond failures: piping, liquefaction etc. Ultimately, we will draft recommendations for improved design, maintenance and stability. Stabilization options will also be developed for impoundments requiring remedial action. For abandoned impoundments, remedial options will include removal and permanent closure.

Task 5. Education outreach.

NMLRC will participate in the program's educational outreach through technical input and participation in public meetings and workshops.

Task 6. Reduce the footprint.

NTTC will identify technology relevant to reducing the volume of coal waste: either in the cleaning phase, through improved mining methods or through tailings reprocessing. NMLRC will develop a strategy for implementing selected

technologies in conjunction with the industry. The objective would be to identify alternatives, which would reduce the amount of mine waste generated, as well as, alternative methods of disposal and reduction of coal waste products. This task would evaluate methods to reduce slurry generation, reduce amounts of water within impoundments and identify various methods for removing coal from the waste stream.

Task 7. Reporting the findings.

The project team will develop quarterly and annual progress reports as well as stand alone tropical reports as each task is completed. The findings will be presented to the public, agencies and the industry through a series of workshops organized by NTTC and the reports will be placed for public access on the finding and information for use by the mining industry and citizens on an impoundment inventory, including mapping appropriate remedial efforts, and results of the pilot project. A forum involving mining officials, interested citizens, and others would be convened to present this information developed during the pilot project as well as the emergency management plan.