SUMMARY OF NORTHERN BOND FORFEITURE AMD TREATMENT SITES[1]

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Abstract: The West Virginia Office of Special Reclamation (WVOSR) is funded through section eleven; article three of chapter twenty-two of the Code of West Virginia, one thousand nine hundred thirty-one. Beginning January 1, 2002, section eleven increased the reclamation tax from three cents per ton of coal mined to fourteen cents. Seven cents of which is to be collected for a period not to exceed thirty-nine months. Funds allocated under section eleven are administered by an eight member advisory council created under section seventeen of article one, chapter twenty-two of the state code. The primary purpose of the advisory council is to ensure that the funds are utilized in the most effective, efficient, and financially stable manner.

The WVOSR is mandated to meet technology-based effluent standards at all bond-forfeited sites. To accomplish this task WVOSR has designed treatment facilities that utilize water driven dispensing units (Aqua Fix®) to dispense pebble quicklime (CaO) directly into the AMD, thereby neutralizing the mine drainage and precipitating out pollutant metals. Each treatment facility consists primarily of four components:

1. The dispensing unit, which includes a silo to store the lime, and various mixing mechanisms
2. Settling ponds
3. Sludge cells
4. A pipeline adapted for a portable pump to pump the sludge to the cells for disposal.

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The size of the silo is based on the required amount of CaO. This amount is either derived based on acid load calculations or titration results (to Mn endpoint pH) whichever is available. The use of titration results is the preferred approach since these results are also useful in sizing the settling ponds and sludge disposal cells. The configuration of the settling ponds is an important consideration as well. For pumping purposes it is necessary to have at least two settling ponds with the capability of bypassing one pond to another. Periodic pumping of the settling ponds is required to maintain the design capacity of the ponds. It is highly recommended to pump the sludge from each settling pond before reaching 60% of its holding capacity. This ensures adequate retention time and simplifies pumping procedures. As the sludge accumulates, it forms a hardened mass that may need broken up either by mechanical means and/or hydraulic pressure, forcing the sediment toward the pump.

To date, this approach has been implemented at seven locations throughout northern West Virginia, with four other facilities currently under construction. As with other types of treatment, problems do present themselves. Problems encountered thus far include; extreme fluctuations in flow, leaves and algae clogging the intake lines to the dispenser, undissolved CaO accumulating in ditches or clogging valves, mixers malfunctioning, or a clogged dispenser due to moisture. These problems are easily remedied but do require attention on a continuous basis.

The use of pebble quicklime in this type of application has proven to be an effective method of AMD remediation. Water quality results are promising. Monthly sampling results indicate that the WVOSR is meeting effluent requirements.