



Passive Reactive Berm (PRBerm) to Provide Low Maintenance Lead Containment

A. Martin (1), S. Larson (1), C. Weiss (1), P. Malone (1), G. Fabian (2), G. O'Connor (3), M. Warminsky (4), and D. Mackie (4)

(1) U.S. Army Corps of Engineers, Engineer Research and Development Center, Vicksburg, Mississippi, USA, andy.martin@ercd.usace.army.mil / FAX +01 601 6343518 (2) Aberdeen Test Center, Aberdeen, Maryland, USA, (3) US Army Armament, Research, Development and Engineering Command Picatinny, New Jersey, USA, (4) AMEC Earth and Environment, Somerset, New Jersey, USA

Mesoscale lysimeter experiments were conducted with sand that had been deposited with metals, such as lead and copper. The lysimeter experiments were conducted to determine the appropriate amendments and sand that could be used in the Passive Reactive Berm (PRBerm) to buffer the sand and react with metals (i.e. lead) as they are produced during the inevitable metals corrosion. Amendments will allow the pH in the berm to be adjusted near neutral conditions, promoting chemical immobilization of the lead. Treatability studies using meso-scale lysimeter cells where the runoff and leachate water were evaluated for their metals concentrations (Pb, Cu), Total Suspended Solids (TSS), pH, and Dissolved Organic Carbon (DOC) using 5,000 ppm lead contaminated sand. During lysimeter studies, soluble Pb and Cu concentrations were observed at significantly less than the study objective limits of 150 and 500 ppb ($\mu\text{g/L}$) for Pb and Cu respectively. A neutral pH range between 6.5 and 8.5 was maintained, minimal TSS and DOC concentrations were also observed in some of the lysimeter study leachate waters. The information gathered from the treatability study was used in the design and construction specifications of the PRBERMs located at a field demonstration site. The benefits of the PRBerm include a reduction in migration of lead either as dissolved lead, colloidal lead, or lead sorbed to soil material suspended in the surface water. In addition, recycling the lead from the PRBerm can be accomplished with the appropriate process and procedures.