Effective Strategies for Residual Polymer and Aquatic Toxicity Testing For Dredge Slurry Dewatering

Randy Wilcox, P.E.*, Gregg E. Lebster*, and Bruce Rabe**

ABSTRACT

Chemical conditioning is typically required to facilitate the solids and water separation in the vast majority of dredging and dewatering operations. Even with the best efforts in optimizing the chemical dose, a small fraction of the polymer may be released in the filtrate water after the dewatering operations. Site conditions and regulatory requirements specific to a particular location may dictate that aquatic toxicity testing of the discharge water be completed on individual projects.

After several products and/or combinations of products are tested in bench scale jar tests to determine the most effective products and the associated dose(s), a larger scale dewatering test is completed to determine or verify the suitability of the dewatering technology selected. The example projects discussed for this presentation utilized geotextile containers and the tests were completed accordingly. The geotextile container filtrate collected from the laboratory scale tests was subjected in a series of aquatic toxicity tests based on regulatory agency requirements.

Protocols for aquatic toxicity tests typically require both acute and chronic toxicity test assessments on a representative sample of filtrate water after conditioned with a specified chemical. In some cases, a specific dilution with site water will be included with the procedure to simulate a mixing zone. The species selected for testing will be based on location, salinity, and other factors. It may be necessary to perform the aquatic toxicity testing using more than one chemical conditioning program.

The regulatory agency will typically approve the chemicals at the dose used in the testing. Additional toxicity testing may be required during operations. Some projects have residual polymer testing requirements. Qualitative testing is typically done in the field as a gross determination of polymer present in the water. The quantitative test is a more precise test meant to be conducted in a laboratory setting with controlled conditions.

*WaterSolve, LLC- 4964 Starr Street, SE, Grand Rapids, MI 49546
(randyw@gowatersolve.com) (616)575-8693, Fax (616)575-9031
**Environmental Resources Management (ERM)- 3352 128th Avenue, Holland, MI 49424
(bruce.rabe@erm.com) (616)399-3500