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Cleanup Technology for Mine Drainage 1 of 1

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SRNL TECHNOLOGY CLEANS UP MINING WASTE, OTHER WATER CONTAMINATION

AIKEN, S.C. — A newly patented technology developed by the U.S. Department of Energy's Savannah River National Laboratory provides a simple way to clean up wastewater or groundwater that has been contaminated by mine drainage or a variety of other contaminants. The newly patented apparatus applies a method patented by SRNL in 2006 that uses inexpensive oils and waxes to provide nutrition for natural bacteria that treat the contamination.

"This passive system is long lasting, requires infrequent attention, is stable, and only requires intermittent addition of inexpensive, readily available, easy-to-handle biochemical energy sources," according to Patrick McGuire, DOE-Savannah River Assistant Manager for Nuclear Material Stabilization Project. "Like many of SRNL's technologies, this apparatus and method were developed in response to a specific need at DOE's Savannah River Site, but have applicability at a variety of other locations." The concept was developed by SRNL's Mark Phifer, Margaret Millings, Dr. Charles Turick, Pam McKinsey and Frank Sappington, during a study conducted to support remediation of a coal pile runoff basin at SRS.

In this system, the biodegradable oils and waxes float as a separate phase on the water being treated. They degrade slowly, providing a steady source of electron donors and nutrients for a community of naturally selected bacteria. These bacteria remove contaminants from the water, either by directly reducing the contaminant to an insoluble mineral that precipitates out of the water, or by indirect reduction, in which the end product of anaerobic respiration reacts chemically with a contaminant to produce an insoluble mineral.

The newly patented apparatus moves the contaminated water through the treatment zone while containing the floating layer of nutrient sources above the treatment zone and containing the selected bacterial community within the treatment zone. It also provides a means to easily replenish the floating organic material in high quantities, which only needs to be done infrequently, and to remove the precipitates without removing the floating layer of oils.

In addition to mine drainage, the system can remediate wastewater or groundwater contaminated with nitrates, nitrites, redox sensitive metals and radionuclides, and chlorinated solvents.

SRNL is the applied research and development laboratory at SRS, putting science to work to serve DOE and the nation in the fields of environmental management, national and homeland security, and energy security. In addition, SRNL is the DOE-Office of Environmental Management's corporate laboratory, applying its unique technical capabilities to reduce technical uncertainties in order to assist other DOE sites in meeting cleanup requirements. SRNL is operated for DOE by Washington Savannah River Company, a subsidiary of the Washington Division of the URS Corporation.

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