



Introduction

Environmental Management (EM) Engineering and Technology activities identify and advance technologies, processes, and technical practices that improve the performance of environmental management projects over their entire lifecycle, from planning to disposal. It provides the U.S. Department of Energy (DOE) with development and implementation of engineering concepts, practices, programs and advance technologies for improvement of design, construction, and system/facilities management activities.

Engineering and Technology investments will provide the engineering foundation, technical assistance, new approaches, and new technologies that contribute to significant reductions in risk (both technology and safety and health), cost, and schedule for completion of the DOE mission in cleaning up the legacy waste and environmental contamination brought about from five decades of nuclear weapons development and government-sponsored nuclear energy research.

Engineering and Technology currently focuses on the following three areas: Groundwater and Soil Cleanup; Deactivation and Decommissioning; and Tank Waste and Waste Processing at the largest EM sites: Savannah River, South Carolina; Idaho; Hanford, Washington; Oak Ridge, Tennessee; and Portsmouth/Paducah, Ohio/Kentucky.

This document describes some of the developments funded by the Technology Development and Deployment program to significantly enhance EM's work at these sites.

Groundwater and Soil Cleanup

Monitored Natural and Enhanced Attenuation or Cleanup of Chlorinated Solvents

A national project led by the Savannah River National Laboratory (SRNL) studied nature's own ability to clean harmful chlorinated solvents from the groundwater, and how to apply information gained to expand those abilities. Results of this three-year project are expected to accelerate cleanup by a minimum of 10 years for DOE sites that have groundwater plumes contaminated with chlorinated solvents.

At the Savannah River Site (SRS), the project is expected to make it possible to accelerate chlorinated solvent cleanup by at least 20 years.

Monitored natural attenuation (MNA) involves allowing natural mechanisms, like naturally occurring microorganisms, to break down or isolate contaminants. Through 14 innovative research studies and other related activities, the project fostered the development of tools to measure the progress of MNA and to assist sites in making the decision whether or not to transition a contaminated site from active remediation to a natural process, and also explored three key concepts to support decision-making. The first involves employing a mass balance to evaluate whether a plume is stable or shrinking. The second concept, enhanced attenuation, enables a site owner to transition from an active cleanup technology to a designed technology that gives a "boost" to natural mechanisms, allowing them to become self-sustaining. The third is characterization and monitoring tools and strategies that are based on the concept of sustainability.

A key feature of the project was collaboration with the Interstate Technology and Regulatory Council (ITRC), a coalition of regulators from 46 states whose charter includes increasing the rate at which new environmental technologies are implemented. This collaboration led to the ITRC incorporating the most promising technologies and concepts from the project into a technical-regulatory guidance document and subsequent training programs, thus facilitating acceptance by regulators.

The Mission of Environmental Management Engineering and Technology is to identify and advance technologies, processes, and technical practices that improve the performance of EM projects over their entire life-cycle.

