



PILOT STUDIES AND BIOREMEDIATION

ENVIRONMENTAL SCIENCES DIVISION
“SCIENCE TO SUSTAIN OUR ENVIRONMENT”

ORNL/ESD's Approach to Pilot Studies and Bioremediation

Applied Technologies

- Sodium Lactate and Sulfate
- Vitamin B12
- Whey
- Beer
- Ethanol
- Edible Oils
- Acetate
- Hydrogen Release Compound (HRC)
- Mulch Barrier
- Oxygen Release Compound (ORC)
- Soil Vapor Extraction
- Phase Heating
- Phytoremediation
- Biosparging
- DNAPL Separation
- Bioventing
- Bioaugmentation
- Bioremediation via Electron Donor

To meet the ultimate goal of site closure, DoD customers are in the process of implementing a combination of anaerobic in-situ bioremediation programs to degrade chlorinated solvents along with other contaminants in their groundwater. To successfully biodegrade chlorinated solvents in groundwater, remedial fluids must be introduced to the contaminated media to accelerate the anaerobic biodegradation process and convert the contaminants into innocuous compounds commonly found in nature. Today, there exists a host of technologies and many application methods to “accelerate” the biodegradation process. Several of these technologies have been demonstrated at DoD and DOE sites across the country with varying levels of success based largely on the heterogeneous conditions, existing microorganism colonies, contaminant characteristics, and aquifer

KEYS TO SUCCESS

Efficient and effective project teams are ORNL's most useful tool for project success and has been recognized by clients as an outstanding quality of ORNL, particularly those who have been working on Dover Air Force Base projects.

On several occasions, ORNL mobilized into the field on the

properties.

The results of these technologies emphasize the importance of using pilot scale studies to match the appropriate technology to a site-specific application taking into consideration such factors as remediation goals and objectives, site characteristics, technology effectiveness, schedule and budget. Serving as a resource to our DoD and DOE customers, ESD is prepared to plan, implement, and report on pilot-scale studies to our customers. ESD has no financial interest in any technology and therefore will bring complete objectivity to the task of selecting the technology that matches the environmental strategies and achieves the remedial objectives of the client.

ESD is accustomed to conducting pilot studies aimed at achieving the following:

- Determination of cleanup standards

- Establish critical soil and groundwater parameters
- Calculate initial capital and long-term operation costs
- Selection of optimal treatment technology
- Develop remedial process

ESD brings technical understanding to performing pilot-scale studies. In conducting such studies, ESD has several bioremediation scientists on staff. Our experience in executing such studies has provided a wealth of information to the science community in way of applied research, publications, papers, etc. ESD has a highly qualified team to manage pilot scale studies for DoD and DOE customers. Also, ESD can enhance the customers understanding of the potential effectiveness, applicability, and implementability of several source remediation technologies.

very day that authorization was received when Dover AFB's schedule required an immediate response.

“ESD has done such outstanding work for us over the last 7 years, and so outshines the level of performance of the other service centers that I can only say how extremely grateful I am to have ESD as part of my Project Team. We literally

couldn't maintain the quantity or quality of our environmental work without ESD on our team.” Jo Anne Deramo, Environmental Restoration Manager, Dover Air Force Base, Dover, Delaware

