

Integrated Remediation Technologies

*There are always emerging solutions,
even for the most difficult problems.*

The Integrated Remediation Technologies (IRT) Group at the Energy & Environmental Research Center (EERC) is a specialized technical group focusing on design and implementation of advanced remediation and treatment systems for cleanup of soil and/or groundwater contamination.

Practicing under the long-standing EERC philosophy of collaboration and an interdisciplinary approach, the IRT Group's success is based on developing effective partnerships with responsible parties, small business, industry, and regulatory agencies.

Innovation

By integrating the most efficient contaminant recovery technologies with engineered in situ degradation processes, the IRT Group finds solutions to considerably reduce the time, labor, and costs required for site cleanup.

Although there are many technologies available for site remediation, often the best ideas are developed while working on-site. For example, a new pressure-monitoring system and integrated telemetric control for the entire recovery and treatment system provide for operational flexibility and considerable labor reduction.

Capabilities

- Full-scale remediation system design and construction
 - Vacuum-enhanced recovery/dual-phase extraction (DPE)
 - Soil vapor extraction, bioventing, and air sparging
 - In situ reactive zones and permeable treatment barriers
 - Engineered bioremediation and monitored natural attenuation
 - Chemically and thermally enhanced technologies
- Feasibility assessment and pilot tests
- Site characterization and regulatory compliance monitoring and permitting
- Emergency response remediation system (ERRS): a mobile, contaminant recovery system with integrated treatment units
- Life-cycle economic evaluation for remedial alternatives
- Field project support and soil, water, and air sampling
- Groundwater resource engineering and aquifer management
- Hydrogeology and hydraulic and geochemical modeling

High-Efficiency Contaminant Recovery and In Situ Degradation

Working closely with all parties involved in the remedial process, the IRT provides cost-effective solutions starting from evaluation of the overall remediation strategy to full scale design and site-specific implementation of the remedial technology selected.

Because the time required for removal of free-phase and highly concentrated dissolved-phase contaminants is critical to the life-cycle design and economics of the subsequent remedial effort, the IRT uses advanced technologies for multiphase contaminant recovery, including mobile systems with integrated treatment for contaminated water and vapor recovered.

Unlike conventional injection, IRT's innovative vacuum-enhanced injectant distribution uses high-vacuum systems to control/support delivery of injected nutrients or reagents to the target zone for in situ contaminant degradation or chemical destruction. The IRT's mobile multipurpose injection systems provide for delivery of oxygen-saturated and nutrient-enriched water and chemical reagents in both liquid and gaseous form.

Apart from technological assets and experience, it is, however, the commitment and dedication of our staff and partners to high professional standards and quality results that have become our trademark.

For More Information Contact

Jaroslav Solc

EERC Senior Research Manager
(701) 777-5217
jsolc@undeerc.org

John A. Harju

EERC Associate Director for Research
(701) 777-5157
jharju@undeerc.org

Energy & Environmental Research Center

15 North 23rd Street, Stop 9018
Grand Forks, ND 58202-9018

www.undeerc.org



Mobile multiphase contaminant recovery and injection systems applied for controlled injection of O₂ and nutrient-enriched water for in situ contaminant treatment in Bismarck, North Dakota.