

## CASE STUDY

# CHLORINATED VOLATILE ORGANIC COMPOUNDS (CVOCS) SOURCE AREA PILOT SCALE



## BACKGROUND

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**CLIENT: LANDOWNER**

**DURATION: 4 DAYS**

**LOCATION: TORONTO, ONTARIO**

In Toronto, Ontario a pilot-scale study was carried out on a source area that had chlorinated volatile organic compounds (cVOCs) groundwater concentrations of trichloroethene (TCE), cis & trans 1,2- dichloroethene (cis & trans 1,2-DCE) and vinyl chloride up to 460,000 ug/L, 100,000 ug/L and 12,000 ug/L respectively. In order to get an understanding for what in situ technology would be most effective for this specific site, IRSL conducted a pilot scale study using a variety of reagents including zero valent iron (ZVI), emulsified vegetable oil (EVO) and colloidal activated carbon (CAC).

## APPROACH

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The groundwater impacts within the source area were addressed using a combination of adsorption, chemical reduction, and enhanced anaerobic bioremediation. IRSL injected a combination of colloidal activated carbon (PlumeStop™), hydrogen-releasing materials (HRM), emulsified vegetable oil (EVO) and zero-valent iron (ZVI) to address various source areas. The solutions were injected using both injection wells and direct push technology.



## Construction:

Over the duration of the four-day pilot scale a total of 192 kg of EVO and 225 kg of ZVI was injected using direct push technology, and 149 kg of PlumeStop™ and 15 kg of HRC was injected into injection wells installed in the bedrock.

## Reagents Used:

- PlumeStop™
- Emulsified Vegetable Oil (EOS100™)
- Hydrogen Releasing Compound (HRC™)
- Zero-Valent Iron (Cleanit SI 5™)

## GEOLOGY: Fill, Weathered and Fractured Shale

### Challenges

- Source area concentrations
- Fractured rock
- Heterogeneous Overburden
- Back diffusion issues

### Results

- 98% reduction in TCE concentration within overburden
- 95% reduction in 1,2 CIS DCE concentration within overburden
- 89% reduction in vinyl chloride concentration within overburden
- 98% reduction in TCE concentration within shallow bedrock



InSitu Remediation Services Ltd. (IRSL) is one of Canada's most experienced remediation companies. Our team has designed, implemented, and optimized, soil and groundwater remediation programs in diverse geological environments in North, Central, and South America, Asia, Europe, and the Middle East.

We confidently implement innovative solutions, based on sound knowledge, using seasoned field staff. Our pragmatic, flexible approach reduces effort, cost to our clients, and environmental risk.

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