INSITU

CASE STUDY

TCE

Background

CLIENT: Environmental Consulting Firm, on behalf of the Landowner

DURATION: 17 months

LOCATION: Wallaceburg, Chatham-Kent, Ontario, Canada

PROJECT VALUE: $112,000 CDN

As part of a brownfield redevelopment project in Wallaceburg, Ontario, a property formerly occupied by a manufacturing facility and contaminated with the chlorinated solvent TCE (Trichloroethene) required remediation, in a relatively short period of time, to meet regulatory standards and enable the completion of a real-estate transaction.

Approach

The landowner contracted an environmental consulting firm to characterize the site and complete the assessment sampling. On behalf of their client, the consultant tendered the project for bid to five companies, who submitted recommendations for remediation.

Broad methods were evaluated, including dig and dump. IRSL earned the contract based on their approach, which cost significantly less than the other, more invasive, techniques submitted for consideration.

Enhanced Anaerobic Bioremediation

To mitigate the TCE and its daughter products without disrupting the manufacturing operations on-site, IRSL developed and executed an in-situ anaerobic bioremediation plan that required no infrastructure, ensuring a very small ecological footprint.

For more information, contact:

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GEOLOGY: Clay
PLUME SIZE: Approx. 825 m²

APPLIED TECHNOLOGIES

IRSL used anaerobic bioremediation to mitigate the TCE plume. Using Direct Push Technology (DPT), IRSL injected Emulsified Vegetable Oil (EVO) using a grid of injection points spaced every 3–4 metres.

In this anaerobic bioremediation technique, vegetable oil donates electrons to enhance the reductive dechlorination of the TCE and its daughter products. Vegetable oil is a cost-effective slow-release electron donor with a greater hydrogen release efficiency than other electron donors. Emulsification ensures small, uniform droplet sizes that distribute evenly through the plume.

Injection 1 :

- Completed in 7 days.

Injection 2 Hotspot:

- Completed in 1.5 days.

Challenges

After the initial injection, groundwater sampling identified exceedances in a small 40 m² hotspot at the core of the plume. A second injection of EVO was required to fully remediate the hotspot.

Results

- Despite the need for a second injection, IRSL's inclusion of a contingency injection in the original plan ensured that they completed the project under budget.
- The result met the Ministry of Environment's Table 3 Standards for industrial sites for TCE and its daughter products.
- Four post-injection samplings have confirmed the site remains within Ministry standards.

INSITU | INNOVATIVE TECHNOLOGIES GROUNDED IN EXPERIENCE

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