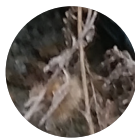


CASE STUDY

PHC REMEDIATION IN GLACIAL TILL USING LIQUID ACTIVATED CARBON (LAC)



Background

CLIENT: Residential

DURATION: 1 Week

LOCATION: Huntsville, Ontario

In Ontario's pristine Muskoka region, the owners of a permanent residence were forced to leave their home when their furnace's fuel tank began leaking oil, creating vapour that endangered their health, as well as risking contaminating their well and the nearby lake. They needed help to remediate the site as quickly as possible so that they could return to their home.

Approach

The landowner hired an environmental consultant who characterized the site and determined that the soil and groundwater was impacted with fuel oil, including the PHC F2 fraction, in the overburden as well as fractured rock. They retained an environmental contractor, who attempted to remove the source of the impacts, along with the residual impacts in the soil and groundwater, using excavation and insitu chemical oxidation. Although this program significantly reduced the impacts, the groundwater overburden remained impacted by dissolved petroleum hydrocarbons, specifically the PHC F2 fraction, above the regulatory standards. IRSL was retained to complete the clean-up based on their record of success and their innovative design and approach to the site.

DIRECT PUSH TECHNOLOGY (DPT) WITH ADSORPTION AND AEROBIC BIOREMEDIATION

To treat the remaining dissolved phase impacts, IRSL designed a Direct Push Technology (DPT) program that used adsorption and aerobic bioremediation technologies to address the impacts.

ANALYSIS

To develop an optimal injection design, IRSL used their proprietary analytical model, which incorporated observed contaminant concentrations, groundwater flow rates, reaction rates, temperature and inorganic parameters, within the subsurface. Through this process, they discovered the required mass and injection pattern that led to the successful remediation of the remaining impacts.

CONSTRUCTION

Based on their analysis, IRSL created and implemented a design that covered the groundwater plume while minimizing the possibility of rebound.

Direct Push Technology: To remediate the contamination in the silty sand, they used Direct Push Technology at various depths and intervals to create a reactive zone.

TREATMENT

IRSL injected a mixture of **PlumeStop®** liquid activated carbon and **Oxygen-Releasing Material (ORM)** in the glacial till aquifer. The ORM stimulated the native aerobic bacteria, whereas the PlumeStop™ allowed for the adsorption of the PHCs from the groundwater. This combination effectively reduced the PHCs within the groundwater to below the regulatory limits. It also created a geochemical environment that enhanced biological degradation reactions that resulted in the re-generation of the activated carbon itself.



GEOLOGY: Glacial Till

PLUME SIZE: Approx. 100 m²

Monitoring

An independent consultant monitored the process and conducted a rigorous Quality Assurance-Quality Control program throughout the project. Subsequent monitoring of the groundwater quality by the independent consultant confirmed that the remedial goals had been reached within the target time frame and budget.

Challenges

- The very short desired remedial time frame required a quick design and implementation.
- Fuel oil contamination in the overburden as well as fractured rock created a very complicated remedial situation with geological and hydrogeological unknowns that required a robust remedial design.

Results

- The PHC plume was treated to below the applicable regulatory standards.
- The remedial program was executed with one injection in two days. The first clean samples were obtained within one month of the injection with additional clean samples after that.



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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