



QUALIFICATIONS

DUAL-PHASE EXTRACTION

EXPERIENCE



InSitu Remediation Services Ltd (IRSL) is one of Canada's most experienced firm in the design, implementation, operation and optimization of dual-phase extraction (DPE) systems for the treatment of aquifers impacted by a variety of non-aqueous phase liquids including LNAPL and DNAPL.

WE HAVE DIRECT EXPERIENCE WITH THE FOLLOWING:

GEOLOGY ADDRESSED	CONTAMINANTS TREATED
<ul style="list-style-type: none">• Alluvial Deposits• Glacial Fluvial Deposit• Glacial Till Deposits• Fractured Limestone• Fractured Shale• Fractured Igneous & Metamorphic Rock	<ul style="list-style-type: none">• Petroleum Hydrocarbons• Polycyclic Aromatic Hydrocarbons• Chlorinated Ethenes• Chlorinated Ethanes• Vinyl Chloride• PFAS

**For more information,
contact:**

InSitu Remediation Services Limited
St. George, Ontario, Canada

T: 289.208.8832
E: info@irsl.ca

IRSL.CA



Considerations

A variety of factors should be evaluated when considering the use of dual-phase extraction systems at a site, including:

Fluids Being Extracted

Dual-phase extraction systems are typically implemented for the treatment of LNAPL and groundwater or DNAPL and groundwater. Depending on the physical and chemical properties of the NAPL, consideration will need to be given to the type of extraction pump(s) employed. Pumps typically are powered by compressed air or electricity and can be top- or bottom-loading.

Chemical Considerations

The chemical composition of the groundwater and NAPL needs to be considered when designing a dual-phase system. In saline environments, corrosion can be a major issue and result in premature failure of pumps and treatment equipment. Other chemical factors, such as hardness, alkalinity, iron and manganese, also need to be considered as these inorganic compounds can precipitate out of the solution due to oxidization, pressure and temperature changes.

Treatment Train

In most cases, the extracted liquid will require treatment prior to being released into the environment. Depending on the treatment train chosen, air and water treatment may be required. For example, if the influent groundwater is treated using an air stripper then the air is typically treated using activated carbon or a catalytic oxidizer, depending on the vapour concentrations. The fluid effluent is typically treated using physical separation, particle filtration, ion exchange and activated carbon filtration,

Approach

Dual-phase extraction typically uses two pumps which effectively separate fluids within the aquifer and remove them through hydraulic extraction.

Examples of Light Non-Aqueous Phase Liquids (LNAPLs) include gasoline, diesel, jet fuel, etc., whereas Dense Non-Aqueous Phase Liquids (DNAPLs) include trichloroethene, tetrachloroethene, etc.



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.