



# QUALIFICATIONS GROUNDWATER EXTRACTION & TREATMENT



## EXPERIENCE

InSitu Remediation Services Ltd. (IRSL) has extensive experience in the design, implementation, operation, and optimization, of a variety of flexible, cost-effective, mobile **water treatment systems**.

WE HAVE DIRECT EXPERIENCE WITH THE FOLLOWING:

GEOLOGY ADDRESSED	TREATMENT TRAINS USED	CONTAMINATES MITIGATED
<ul style="list-style-type: none"> <li>Alluvial Deposits</li> <li>Fill Materials</li> <li>Fluvial Deposits</li> <li>Fractured Carbonate Rock</li> <li>Fractured Igneous &amp; Metamorphic Rock</li> <li>Fractured Shale</li> <li>Glacial Till</li> </ul>	<ul style="list-style-type: none"> <li>Air Stripping</li> <li>Carbon &amp; Chemical Filtration</li> <li>Liquid Separation</li> <li>Organoclay</li> <li>Particle Filtration</li> <li>Sand, Particulate &amp; Green Filters</li> <li>Settlement &amp; Isolation</li> <li>UV and Photochemistry</li> </ul>	<ul style="list-style-type: none"> <li>Fuel Oils</li> <li>Gasoline &amp; Diesel</li> <li>Light Crude</li> <li>Volatile Organic Compounds (VOCs)</li> <li>Chlorinated Ethenes (such as PCE &amp; TCE)</li> <li>Chlorinated Ethanes (such as DCA &amp; TCA)</li> <li>Heavy Metals</li> <li>MtBE &amp; TBA</li> <li>Nutrients (phosphate and nitrate)</li> <li>Organic Lead</li> <li>Polycyclic Aromatic Hydrocarbons (PAHs)</li> <li>Vinyl Chloride</li> </ul>

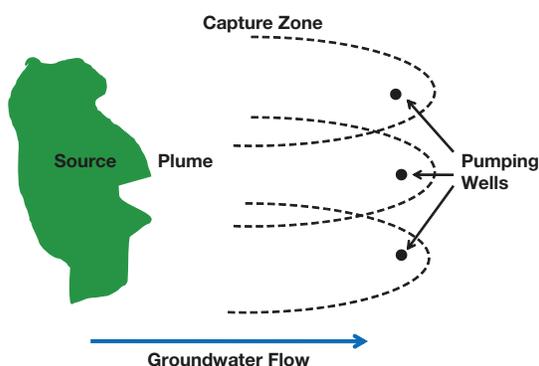
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We've built our solid reputation based on our proven ability to confidently innovate and deliver technically superior, cost-effective solutions that work better—on time and on budget.



## Approach

Most **groundwater treatment approaches**, or “pump and treat” systems, aim to capture the compounds of concern as well as reducing the mass within the subsurface. Treatment can combine several biological, chemical, or physical treatment technologies. The approach is generally modified as contaminant concentrations decrease. IRSL has extensive experience in designing, implementing, and operating pump and treat systems in a wide variety of environments.

## Considerations

### Comprehensive Understanding of Site Hydrogeology, Geology & Geochemistry

Effective groundwater treatment systems require a comprehensive understanding of the constraints of the site’s hydrogeology and geochemistry to enable effective capture of the plume. Geochemical factors, such as the presence of dissolved iron, can cause significant issues for filters in the treatment train, as well as affecting the pH of the effluent due to oxidation reactions.

### Careful Monitoring

Systems that aim to contain impacted groundwater require careful monitoring and optimization to ensure containment. Often, the area of influence is used to determine if the system is containing the impacted groundwater, which can lead to incorrect analysis; instead, capture zone analysis should be completed to ensure capture.

### Continuous Optimization

Pump & treat systems require careful evaluation to ensure that operation of the systems is optimized but not under- or over-utilized. Most pump & treat systems are not effective at completing total site remediation, yet they can be effective at containing and removing contaminant mass.

IRSL has the tools, knowledge, and experience, to complete the analytical, numerical, and field studies, necessary to effectively choose the right approach and optimize remediation throughout the project.



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.