



# QUALIFICATIONS ACTIVATED CARBON



## EXPERIENCE

InSitu Remediation Services Ltd (IRSL) is one of Canada’s most experienced firm in the design and implementation of activated carbon injection programs, including colloidal and powdered activated carbon.

### WE HAVE DIRECT EXPERIENCE WITH THE FOLLOWING:

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

For more information,  
contact:

InSitu Remediation Services Limited  
St. George, Ontario, Canada

T: 289.208.8832  
E: info@irsl.ca

IRSL.CA

## Approach

Similar to the use of activated carbon in above-ground treatment systems, activated carbon can now be used to treat a wide variety of compounds below ground, i.e. insitu. The compounds of concern are adsorbed to the activated carbon and removed from the groundwater.

## Considerations

A variety of factors should be evaluated when considering the injection of activated carbon, including:

### Form of Activated Carbon

Injectable activated carbon generally comes in two forms: colloidal and powdered. Each form has its advantages and disadvantages, including injectability of the activated carbon, surface area availability for adsorption reactions, pressures and flow rates required to inject the activated carbon, distribution and lifespan requirements. The need for supplemental reagents should also be considered. To date, IRSL is the only Canadian firm to have applied both forms of activated carbon in Canada.

### Supplemental Reagents

Injectable activated carbon is usually injected with a biological enhancement reagent, such as an electron donor or acceptor. Common reagents include oxygen-releasing materials, hydrogen-releasing materials, zero-valent iron, gypsum and nitrate-based reagents. These reagents aim to stimulate biodegradation reactions, which in turn reduces the mass flux of contaminants onto the activated carbon while potentially consuming any absorbed contaminants, thus increasing the lifespan of the activated carbon.

### Injection Configuration

Injectable activated carbon can be used in a variety of applications, including the treatment of dissolved phase plumes as well as potentially for the treatment of source areas. Other potential applications include horizontal or vertical permeable reactive zones, which allow for the creation of zones in which the compounds of concern flow through the reactive zone, resulting in the removal of the compounds of concern from the groundwater.



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.

