



Groundwater Remediation For UST Sites

Pump And Treat

P*ump and treat is a technique that brings contaminated groundwater above the ground through the use of extraction wells. The water is then treated, normally using one of three processes: granulated activated carbon, air stripping, or bioremediation.*

This technique is most effective in permeable aquifers. It also can be used with in situ vapor extraction (SVE) to enhance removal of volatile contaminants from the zone of water table fluctuation.

A limitation of pump and treat is that it can take a long time to achieve complete remediation, sometimes as long as seven years even for an ideal site. In addition, this method is subject to fluctuations of the water table that can smear contaminants and complicate cleanups.

Petroleum Types And Constituents

- Dissolved gasoline and diesel, jet fuel, and kerosene
- Dissolved constituents such as benzene, toluene, ethylbenzene, and xylene (BTEX)

Pump And Treat

Advantages	<ul style="list-style-type: none"> • Controls contaminant plume migration and reduces plume concentration
Limitations	<ul style="list-style-type: none"> • Not very effective in aquifers with low permeability • Can require expensive and lengthy long-term pumping and treating • High iron content/hardness can affect water treatment • Requires control of water table fluctuation to minimize smearing contaminants • Might require off-site discharge permits
System Components	<ul style="list-style-type: none"> • Vertical or horizontal extraction wells • Trenches • Water pumps • Aboveground water handling and/or treatment systems
Wastestream Treatment	<ul style="list-style-type: none"> • Wastestream treatment options: <ul style="list-style-type: none"> • <i>Air stripping</i> • <i>Granulated activated carbon</i> • <i>Bioreactors</i>
Parameters to Monitor¹	<ul style="list-style-type: none"> • Constituent concentrations in groundwater • Influent and effluent concentrations from water treatment system • Water discharge rate • Water levels
Cleanup Levels and Timing²	<ul style="list-style-type: none"> • Might not meet cleanup standards or maximum contaminant levels (MCLs) • For an ideal site³, 3 to 7 years • For an average site⁴, 3 to 10 years or longer
Costs⁵	<ul style="list-style-type: none"> • For an ideal site³, \$150,000 to \$200,000 • For an average site⁴, \$250,000 to \$300,000

¹Parameters to monitor are for performance purposes only; compliance monitoring parameters vary by state.

²Cleanup standards are determined by the state.

³An "ideal site" assumes no delays in corrective action and a relatively homogenous, permeable subsurface.

⁴An "average site" assumes minimal delays in corrective action and a moderately heterogeneous and permeable subsurface.

⁵Costs include equipment, and operation and maintenance.