

# Groundwater Remediation

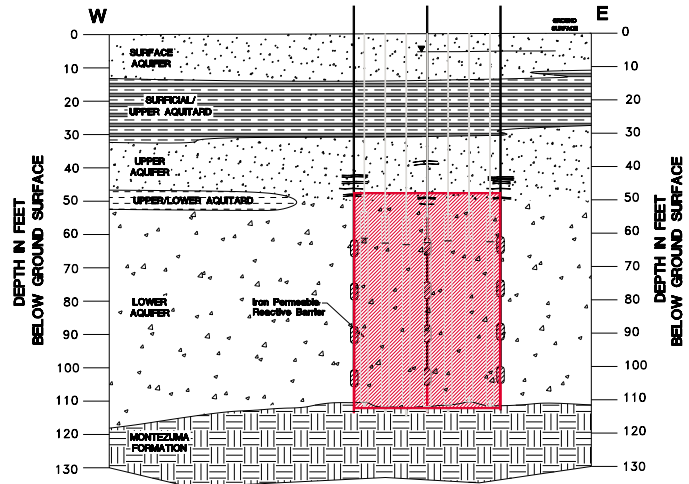
## Iron Reactive Barriers

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Location: Bay Area, California  
Year completed: 2001 (on-going)

A former chemical manufacturing facility in the Bay Area, California was contaminated with volatile organic compounds (VOC's). The existing remedy involved a groundwater pump and treat system which had showed to have minimal impact on groundwater contaminant or site remediation. An *in situ* iron reactive barrier for groundwater remediation was selected to replace the pump and treat system. The reactive barrier was selected over pump and treat due to better remedial performance, minimal operation and maintenance and lower cost. GeoSierra was retained to design and build the iron reactive barrier by the azimuth control vertical hydraulic fracturing technology.

The iron reactive barrier system was constructed to intercept sands and gravel characterized as loose flowing sands with a permeability of approximately 50 Darcy. The iron permeable reactive barrier is 500 feet long installed from a depth of 45 feet down to a total depth of 110 feet below ground surface with an average thickness of 6 inches. The first phase of the barrier being 110' long was installed in January 2001. The reactive barrier was installed by GeoSierra's azimuth control vertical hydraulic fracturing technology with the reactive barrier constructed perpendicular to the groundwater flow direction.



Cross Section of Iron Reactive Barrier

The first phase of the reactive barrier has performed as predicted as determined from sampling of downgradient monitoring wells. The second phase installation is planned for late 2002 or early 2003. The *in situ* reactive barrier has the capacity to degrade extremely high concentrations of volatile organic compounds. Of particular importance in selecting the remedy was that the reactive barrier system is complimentary and enhances the natural attenuation mechanisms active at the site.



Aerial View of Site



Above ground view of completed injected Reactive Barrier