CASE HISTORY©

Work Summary (Site History) ***CHS-0005 (Perchloroethylene)***

Probable off-site migration of dissolved perchloroethylene was the remedial action driver for this confidential client. Repeated releases of recycled perc over several years from a dry cleaning operation were complicated by the presence of smeared naphtha, along with oil and diesel range hydrocarbons. Action by the State required the property owner to address the problem immediately. It was concluded that chemical oxidation could provide the quickest most effective solution. Permanganate was ruled out because of the presence of hydrocarbons and Fenton peroxide was considered to reactive because much of the plume was located beneath the building. The recently developed Cool-Ox™ Technology was selected because of its effectiveness at treating mixed contaminants and its greater safety. Five weeks after completing injections of the sources, perc levels decreased to below residential levels for soil.

Project at a Glance

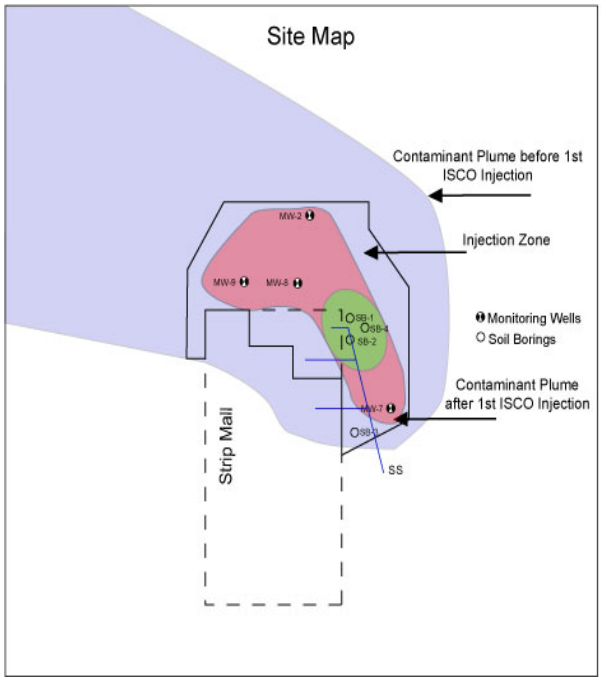
Site 0005 - Site Information

Type of site	Former Drycleaner
Contaminants	Recycled Perchloroethylene
Work Scope	Inject Oxidizer
Media Treated	Soil & Groundwater
Soil Type	Dense Clay over claystone
Groundwater Depth	14 fbgs
Remedial Objective	Locate and mitigate soil sources and reduce perc concentrations in GW

Site 0005 - Application Information

Technology Selected	Chemical Oxidation
Application Method	DPT Probe Rod
Area Treated	9,520 square feet
Vertical Interval	0 to 24 feet bgs = 24 feet
Injection Point (IP) Spacing	6 feet
Media Volume Treated	8,460 cubic yards
Number of Injection Points	265
Oxidizer Volume	29,700 gal
Oxidizer per IP	112 gal

Site Map



The green area on the site map depicts the extent of soil contaminants exceeding MCLs prior to the first Cool-Ox™ injection. During the injection work, free product was observed in several of the injection points in this area. However, post injection sampling data revealed that all soil contaminant concentrations had been reduced to levels below maximum concentrations for site closure. Groundwater (blue area prior to treatment) samples collected 18 months after the Cool-Ox™ injection, revealed that contaminant concentrations exceeding MCL closure levels had been reduced to the area depicted in red. During the injection work high concentrations of hydrocarbons (light oils) were also discovered. These were confined mainly to the green area on the Site Map.

Current Status

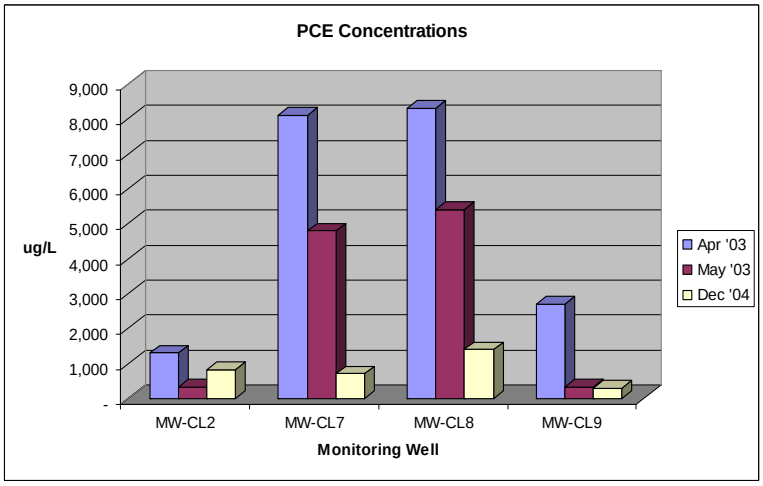
The Cool-Ox™ application successfully located all soil sources and reduced soil levels to less than those required by the state agency for residential standards. Groundwater is currently monitored on a quarterly basis. The site is under evaluation to ascertain future remedial needs if any.

Results

Site 0005- Contaminant Data-GW (PCE)

Groundwater Samples	Pre[1] Injection Samples	30 day Post Injection Samples	18 months Post Injection Samples
MW-CL2	1,300	340	830
MW-CL7	8,100	4,800	710
MW-CL8	8,300	5,400	1,400
MW-CL9	2,700	320	300

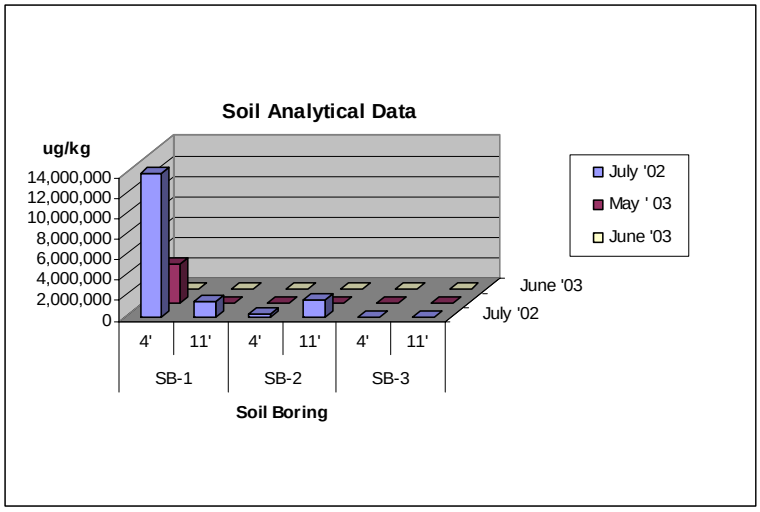
[1] All data reported in µg/L



Site 0005- Contaminant Data-Soil (PCE)

Soil Boring	Depth	07/09/02	05/28/03	06/24/03
SB-1	4'	14,000,000	3,800,000	1,700
	11"	1,500,000	2,900	320
SB-2	4'	280,000	NS	120
	11'	1,700,000	120	110
SB-3	4'	5,000	NS	59
	11'	1,100	0	12

[1] All data reported in µg/Kg



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