

Drycleaner Site Profiles

ABC Cleaners, Monroe, MI

Site Description

This was a former PCE drycleaning facility that discontinued operations in 1990. A service station had been located on the property prior to the drycleaning operation. Five USTs with capacities of from 550 to 2,000 gallons. All of these tanks had confirmed release reports.

Site Hydrogeology

Depth to ground water: 13 ft.

Lithology/subsurface geology: surface-11.5 ft. bgs., silty sand and clay with weathered bedrock gravel. A hard to very hard, semi-crystalline fractured limestone underlies the sediments.

Enter Conductivity:NA

Gradient:NA

Groundwater Contamination

DNAPLs Present: No

Contaminants present: PCE, TCE, cis 1,2-DCE, trans 1,2-DCE, vinyl chloride, benzene, xylenes, lead, chloromethane, acrylonitrile, methylene chloride, chloroform

Highest contaminant concentrations: PCE = 226 µg/l, TCE = 48 µg/l, cis 1,2-DCE = 80.3 µg/l, vinyl chloride = 62 µg/l, benzene = 12.9 µg/l, acrylonitrile = 5.5 µg/l

Deepest significant ground-water contamination:> 80 ft. bgs.

Plume size: not yet determined

Soil Contamination

Contaminants present: PCE, TCE, cis 1,2-DCE, methylene chloride, chloroform

Highest contaminant concentrations PCE: 160,000 µg/kg, TCE = 120 µg/kg, methylene chloride = 140 µg/kg; chloroform = 230 µg/kg

Description of Remediation Scenario

Cleanup Goals: Groundwater - 5.0 µg/l (PCE), 5.0 µg/l (TCE), 70 µg/l (cis 1,2-DCE), 2.0 µg/l (vinyl chloride), 5.0 µg/l (benzene), 2.6 µg/l (acrylonitrile)

Technologies Used:

Removal
Soil Vapor Extraction (SVE)

Any other technologies used:

Why was technology or technologies selected: SVE is an effective technology for removal of VOCs from permeable soils

Date Implemented: SVE - March, 1993; removal - October, 2001

Final remediation design: no details

Results

An SVE pilot test was run and failed due to high water levels and shallow bedrock at the site. Five USTs and some contaminated soil were removed.

Costs

Site assessment: No cost data are available

Design and implementation:

O&M:

Total costs (only completed sites):

Lessons Learned

1. SVE is not applicable at sites where there is shallow bedrock and a shallow water table.
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Site Specific References

NA

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This profile last updated: March 10, 2003

Drycleaner Site Profiles

Art's Dry Cleaners, Charlevoix, MI

Site Description

This former PCE drycleaning facility operated from 1958 to 1978. The site is located in a mixed commercial/residential setting. The property is currently used as a primary residence and a pottery store.

The contaminant source area is a floor where sludges were discarded.

Site Hydrogeology

Depth to ground water: 25 ft. bgs.

Lithology/subsurface geology: surface-6 ft. bgs., silica sand; 6-15 ft. bgs., clay

Conductivity: NA

Gradient:NA

Groundwater Contamination

DNAPLs Present: Unknown

Contaminants present: None

Highest contaminant concentrations: NA

Deepest significant ground-water contamination: NA

Plume size: 45-ft radius from the drain

DNAPLs present: DNAPL may be present in soils (unsaturated zone)

Soil Contamination

Contaminants present: PCE, TCE

Highest contaminant concentrations PCE = 1,000,000 µg/kg; TCE = 3,000 µg/kg

Description of Remediation Scenario

Cleanup Goals: Groundwater/surface water interface concentrations: 440 µg/l (PCE and TCE)

Technologies Used:

Soil Vapor Extraction (SVE)

Carbon Adsorption

Any other technologies used:

Why was technology or technologies selected: SVE is an applicable technology for removing VOCs from permeable unsaturated sediments.

Date Implemented: October, 1994

Final remediation design: SVE with vapor treatment using carbon adsorption, no other details available.

Results

PCE in soils has been reduced to 130 µg/kg.

Costs

Site assessment: \$ 2000 (originally)

Design and implementation: \$ 51,600

O&M: NA

Total costs (only completed sites):
\$ 88,776

Lessons Learned

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Site Specific References

NA

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This profile last updated: August 27, 2002

Drycleaner Site Profiles

Cox's One Hour Martinizing, Portland, OR

Site Description

The former Cox's One Hour Martinizing Drycleaner site is located in a mixed residential-commercial zone in Portland, OR. A Cox's One Hour Martinizing Drycleaner operated at this site between 1987 and 1998. Another drycleaner operated at this site for approximately 15 years prior to Cox's. The current operator is Wash World. Nature's Fresh, a specialty grocery store that plans to renovate the property, identified low-level PCE groundwater contamination during a due diligence Phase I and Phase II Environmental Site Assessment. The investigations suggested that prior to 1982, disposal of PCE to the catch basin behind the building may have lead to the contamination. The drycleaner solution released to storm water basins may have then leaked into the soil and groundwater. Additional investigations, however, revealed a second catch basin that had been covered by asphalt. Higher levels of PCE contamination were detected by this catch basin. The former Cox's One Hour Martinizing applied to participate in OR DEQ's Dry Cleaner program, and was accepted.

Site Hydrogeology

Depth to ground water: 150 ft bgs

Lithology/subsurface geology:

Silts, ground surface to about 5 ft bgs;

Sandy silts or silty sands, about 6-14 ft bgs;

The series of sands, silts and clays are underlain by alluvial sands and gravels. The alluvial sediments are underlain by differentially cemented sands and gravels of the Troutdale Formation which occur at about 100 ft bgs.

Conductivity: On the order of 10^{-5} or 10^{-4} .

Gradient: Relatively flat water table; exact figure unavailable.

Groundwater Contamination

DNAPLs Present: Yes

Contaminants present: Perchloroethylene (PCE)

Highest contaminant concentrations: PCE (32.7 $\mu\text{g/L}$)

Deepest significant ground-water contamination:

Plume size: The low-level dissolved phase PCE contaminant plume extends over a fairly

large portion of the site. The vertical and horizontal extent are not fully characterized. The aquifer is unconfined.

Soil Contamination

Contaminants present: PCE

Highest contaminant concentration: 25,000 mg/kg.

Description of Remediation Scenario

Cleanup goals: The OR DEQ seeks to remove the contaminant mass from the source area and protect or mitigate threats to human health or the environment. Project managers will select a final remedy that reduces VOC contamination below site-specific, risk-based concentration levels.

Technologies Used:

Soil Vapor Extraction (SVE)

Any other technologies used: Limited soil removal was conducted prior installation of SVE system, but no other technology was used at this site.

Why technology or technologies selected: The site conditions and contamination were amenable to SVE, which is an unobtrusive and cost effective technology.

Contractors considered other options, such as soil excavation and thermal treatment. High costs would have been associated with soil excavation, given the close proximity of the building. The excavated soil would have been treated according to hazardous waste land disposal restriction standards, and delivered to an incineration facility in Utah. Overall this option would have been too costly, and would have still left contaminated soil at the site that would require SVE treatment.

Date implemented: Summer 1997

Final Remediation Design: The subsurface of the SVE system contains six SVE wells screened at depths ranging from 5-40 ft bgs, and 2-inch PVC piping linking each well to the remediation compound enclosure. Two blowers apply a vacuum to the SVE wells. The recovered air and vapors are discharged to the atmosphere through a stack extended above the existing dry cleaner building.

Results

The SVE system has removed approximately 170 gal. of PCE after 1 year of operation. Most recent sampling results reveal PCE concentrations at about 5 mg/kg. PCE concentrations rebounded within the first few months of SVE operation, but then consistently decreased. SVE system removal rates peaked at approximately 12.4 pounds per day within the first six months of operation. Removal rates have decreased, and are

currently estimated to be at 0.4 pounds per day.

The SVE system will likely continue to operate for an additional 6 to 9 months. Contractors will conduct monthly monitoring visits.

Costs

Site assessment: \$27,522.57 (subsurface characterization
and well installation)

Design and implementation:
SVE Testing & Design \$5,397.56
Construction,
 Pipe Installation,
 Electrical,
 Catch Basin Sediment Removal \$15,994.91
SVE equipment/installation \$9,948.07
SVE set up \$2,418.80
Quarterly Reporting (8 rpts) \$1,943.60
Project Management/Oversight \$9,599.75

O & M: (2 years) \$3,446.25

Total costs (only completed sites):

Lessons Learned

1. It is important to carefully review historic construction diagrams. The contamination source originally could not be identified at this site. Historical records revealed that a sub-grade ramp loading dock had been covered with asphalt and transformed to above-grade.

Site Specific References

none

Contacts

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This profile last updated: March 25, 2003

Drycleaner Site Profiles

Crain Fabric Care Center, Traverse City, MI

Site Description

This is an active PCE coin-operated laundromat/drycleaning facility. A level I environmental assessment found a buried 55- gallon drum that served as a catch basin for accidental spills in the drycleaning room. Although the tank was not found to be leaking, the associated piping was leaking. Additional investigation found multiple hot spots of PCE in the soil.

Site Hydrogeology

Depth to ground water: 22-24 ft. bgs.

Lithology/subsurface geology: 25-90 feet of sand with a few gravel lenses up to 10 feet in thickness; 90 feet of clay underlying the sand; sand underlying the clay layer.

Conductivity: NA

Gradient: 0.005 ft/ft

Groundwater Contamination

DNAPLs Present: Unknown

Contaminants present: PCE, xylenes

Highest contaminant concentrations: PCE = 11 µg/l; xylenes = 13 µg/l

Deepest significant ground-water contamination:NA

Plume size:NA

DNAPLs present: PCE found in 55 gallon drum

Soil Contamination

Contaminants present: PCE

Highest contaminant concentrations: 77 µg/kg

Description of Remediation Scenario

Cleanup Goals: groundwater - 5.0 µg/l PCE

Technologies Used:

Removal

Soil Vapor Extraction (SVE)

Any other technologies used:

Why was technology or technologies selected: SVE is an effective technology for removing VOCs from permeable, unsaturated soils.

Date Implemented: November 4, 1992

Final remediation design: SVE (no details)

Results

Buried 55 gallon drum and associated piping removed. No details available on SVE system operation.

Costs

Site assessment: \$97,000

Design and implementation:

O&M: \$400/mobilization; \$1,140 per visit for laboratory work.

Total costs (only completed sites):

Lessons Learned

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Site Specific References

Not Provided

Contacts

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Drycleaner Site Profiles

Sunshine Laundry, St. Johns, MI

Site Description

This is an active drycleaning/laundry facility located in a shopping mall. During a baseline site assessment, contaminants were discovered to be leaking from an underground storage tank located under the building housing the drycleaning operation. This tank was utilized to contain "spills". Contamination was also found in an area where spent filters were stored.

Site Hydrogeology

Depth to ground water: 12-14 ft.

Lithology/subsurface geology: 0-6 ft. bgs. - sand; 6-18 ft. bgs. - clay till with saturated sand and or sand/silt lenses in the upper 4-8 feet of the till; 18-23 ft. bgs. interbedded sand and silt with some clay; 23-25 ft. bgs. - clay.

Conductivity: NA

Gradient: 0.0083 ft/ft

Groundwater Contamination

DNAPLs Present: No

Contaminants present: PCE, TCE, cis 1,2-DCE, vinyl chloride

Highest contaminant concentrations: PCE = 220 µg/l, TCE = 910 µg/l, cis 1,2-DCE = 2000 µg/l; vinyl chloride = 310 µg/l

Deepest significant ground-water contamination: 12 ft. bgs.

Plume size: 100 ft. x 100 ft.

Soil Contamination

Contaminants present: NA

Highest contaminant concentrations NA

Description of Remediation Scenario

Cleanup Goals: Stop contaminant migration and remove the source of contamination.

Technologies Used:

Cap

Soil Vapor Extraction (SVE)

Any other technologies used: Capping and filling the UST with concrete

Why was technology or technologies selected: SVE was the most practical and the cheapest solution to the contamination. Given the central location of the UST under the facility floor slab, filling the tank with concrete was much simpler than removal.

Date Implemented: NA

Final remediation design: Capping and filling UST with concrete.

Results

PCE levels were reduced to less than 1 µg/l in all monitor wells sampled except one. Groundwater monitoring is continuing.

Costs

Site assessment: No cost data are available.

Design and implementation:

O&M:

Total costs (only completed sites):

Lessons Learned

1. During testing, the soil vapor extraction system kept breaking down due to freezing temperatures.
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Site Specific References

NA

Contacts

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Drycleaner Site Profiles

Wash 'N Dry Cleaners, Spring Arbor, MI

Site Description

Wash N' Dry Cleaners utilized PCE and operated at the site from 1974 to 1978. The contaminant source areas are the area near the former dumpster location where spent filters were allowed to drain and an unlined lagood where contact water was discharged.

Contaminants were detected in nearby water supply wells.

Site Hydrogeology

Depth to ground water: 6 ft.

Lithology/subsurface geology: surface-13 ft. bgs., topsoil, sand or clay fill, clayey silt and gravel; 13-25 ft. bgs., clayey sand to sandy clay underlain by fine to coarse sand with variable amounts of silt and gravel. A fine to medium-grained well sorted quartz sandstone underlies the glacial overburden in the area.

Conductivity: 0.028 - 2.8 ft/day

Gradient:NA

Groundwater Contamination

DNAPLs Present: No

Contaminants present:PCE, TCE, cis 1,2-DCE, trans 1,2-DCE, 1,1,1-TCA

Highest contaminant concentrations: PCE = 550 µg/l, TCE = 180 µg/l, cis 1,2-DCE = 25 µg/l, trans 1,2-DCE = 25 µg/l, 1,1,1-TCA = 3 µg/l

Deepest significant ground-water contamination: NA

Plume size: NA

Soil Contamination

Contaminants present: PCE, TCE, 1,1,1-TCA

Highest contaminant concentrations PCE = 1,150 µg/kg, TCE = 52 µg/kg, TCA = 36 µg/kg

Description of Remediation Scenario

Cleanup Goals: Groundwater - 5.0 µg/l (PCE), 5.0 µg/l (TCE)

Technologies Used:

Soil Vapor Extraction (SVE)

Any other technologies used:

Why was technology or technologies selected: SVE is a proven technology for removal of VOCs from permeable unsaturated soils.

Date Implemented:NA

Final remediation design:

Results

SVE system was abandoned after implementation and operation due to high water levels.

Costs

Site assessment:No cost data are available.

Design and implementation:

O&M:

Total costs (only completed sites):

Lessons Learned

1. SVE is difficult to implement in areas with shallow fluctuating water tables
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Site Specific References

NA

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