General Information

Site Name and Location:	Schloff Chemicals and Supply Company, Inc.Saint Louis Park, Minnesota, United States
Description: Historical activity that resulted in contamination.	This site is located in a commercial/industrial area. The facility supplied products to the dry cleaning and laundry industries, including cleaning solvents. There were two reported spills of PCE at the site, one in 1988 and one in 1989. The spills occurred at fill pipes accessed by the railroad spur and the truck transport. PCE contamination has been found in the soil, groundwater and surface water surrounding the facility at very high concentrations (……). It appears although there are two aquifers present at the site, only the upper groundwater aquifer is impacted, not the lower. This site was remediated under the Superfund program.

Contaminants:

Contaminants: Contaminants present and the highest amount detected in both soil and groundwater (please avoid giving ranges).	**Contaminant**	**Conc in GW**	**Conc. in Soil**
	Tetrachloroethene (PCE)	7,800 ppb	
	Trichloroethene (TCE)	240 ppb	

Other Contaminants Present: Indicates what other contaminants were found on-site

Deepest Significant Groundwater Contamination:

Plume Size:

Site Hydrology:

Depth to Groundwater:	8 to 12 ft bgs
Lithology and Subsurface Geology:	0-27 ft Fine to coarse grained sand 27-75 ft Bedrock The regions hydrogeololgy consists of Pleistocene epoch (late Wisconsian) Des Moines Lobe Depositios consisting of outwash sands, silty sand and gravel; in places overlain by deposits of silt to clay load two to four feet thick. Minnehaha Cree, which meanders through

the region, is controlled by the Gray''s Bay dam. The stream has likely produced alluvial deposits along its current and former reaches. Shallow groundwater beneath the site is found within unconsolidated glacial outwash deposits. The deposits consist of 27 feet of fine to coarse grained sand. This outwash unit extends to bedrock, which is encountered at about 75 ft below grade. Below approximately 30 ft, the silt content of the outwash increases and the gravel content decreases. This subdued transformation from permeable sands to less conductive silty-sands with depth forms a gradational contact between the aquifer and the underlying lower water bearing sediments. Bedrock is Ordovician Plateville limestone and the Glenwood shale formation. The Plateville Limestone is a gray, fractured and weathered, 10-12 ft thick unit that acts as a regional aquifer. The Glenwood Shale is a soft gray/green unit, usually less than 20 fee thick, which acts as a lower confining unit. The interplay of Minnehaha Creek and the surficial aquifer varies with the water table position. The stream can be either a losing or gaining stream, based upon. No site specific contaminants were present in the samples until where the flow is from the aquifer to the creek and where the plume intersects the creek.

Conductivity: 0.5 to 25.2 ft/day

Gradient: 0.004 to 0.005 ft/ft

Media:

Media: Groundwater

Remediation Scenario:

Cleanup Goals:

Technologies:

Technologies Used: Ex Situ:

Pump and Treat

Other technologies used: UVB -- in situ

Why the technology was selected: These technologies were selected because they had not been used in Minnesota previously.

Date implemented: September 1994

Final remediation design: The UVB technology is an in-situ treatment for groundwater developed in Germany. It uses a combination of physical and biological processes. It creates a circulation cell that transports the dissolved mobile phase and residual mobile phase hydrocarbons to a central well casing for treatment. The treatment is primarily air stripping, secondarily bioremediation, for light and middle range fraction hydrocarbons. Two UVB wells were installed. The groundwater enters the remediation well through the lower screen section. After the GW has been oxygenated and stripped of VOCs, it is released through the upper screen. In the surrounding area of the remediation well, the induced flow will be from top of the aquifer to the bottom of the aquifer. 4 m3/h of water are being pumped into the UVB-200-1 reactor and 2 m3/h are being pumped back into the two UVB-200-2 stripping reactors. Thus, the stripping efficiency is 90 to 99% effective.

Results and Next Steps:

Results to date:

Next Steps:

Costs:

Cost for Assessment:

Cost to Design and Implement:

Cost for Operation and Maintenance:

Total Costs for Cleanup: (as of 1999) $773,716

Lessons Learned:

Lessons Learned:	1. UVB technology had not been used in MN prior to this application. The contractor identified several MN specific modifications that facilitate the well installation. 2. The system was operated intermittently between December 1995 and June 1996 as numerous problems, including scaling, mechanical failures, and rewiring, surfaced. This type of system appears to require quite a bit of maintenance.

Contacts:

Principal Point of Contact:	Lifeng Guo, Staff TAMPCA520 Lafayette Rd.Saint Paul, MN 55155-4194651-296-8112

Site Specific References:

Site Specific References:	

Images:

Images of Site:	

Profile last updated on Dec 15, 2003

General Information

Site Name and Location:	Former Base Laundry & Drycleaning FacilityOrlando, Florida, United States
Description: Historical activity that resulted in contamination.	This is a Department of Defense facility (Orlando Naval Training Center) where laundering and drycleaning were performed using PCE and petroleum solvents from the late 1950s until 1994. As many as five drycleaning machines were utilized in the operations. Solvents were stored in ASTs located outside the facility. Solvent was delivered in drums to a loading dock. Several solvent spills, estimated at from 5 - 55 gallons, were reported to have occurred at the loading dock, at the ASTs and inside the facility. Fuel oil was stored in ASTs and USTs and was used as a boiler fluid. A water well, located 75 feet south of the facility was completed in the Floridan aquifer and supplied water for the boiler and laundry operations. Wastewater from laundry operations was discharged to a surge tank located immediately west of the facility and then to a sanitary sewer. The facility is located approximately 375 feet east of a small lake and groundwater flow is westward from the facility to the lake. PCE and its daughter products have been detected in both water and sediment samples collected from the lake. The contaminant source areas at the facility include the soils beneath the building floor slab in the vicinity of the drycleaning machines, the former solvent delivery and storage areas and the surge tank.
Contaminants:	

Contaminants: Contaminants present and the highest amount detected in both soil and groundwater (please avoid giving ranges).	**Contaminant**	**Conc in GW**	**Conc. in Soil**
	cis-1,2-Dichloroethene	2,000 µ:g/L	
	Tetrachloroethene (PCE)	34,000 µ:g/L	430 µ:g/kg
	Trichloroethene (TCE)	15,000 µ:g/L	27 µ:g/kg

Other Contaminants Present:Indicates what other contaminants were found on-site	
Deepest Significant Groundwater Contamination:	60 ft bgs
Plume Size:	350 ft x 700 ft
Site Hydrology:	

Depth to Groundwater: 3.3 - 10.1 ft bgs

Lithology and Subsurface Geology: (Upper surficial aquifer) Fine-grained sand, surface-17 ft bgs; moderately to well indurated silty, fine-grained sand, 17-20 ft bgs; (lower surficial aquifer) fine-grained sand, 20-54 ft bgs; silty, fine, fine to coarse sand with phosphate nodules and shells, 54-71 ft bgs; silty, clayey sand with clay interbeds, 71-depth of investigation.

Conductivity: upper surficial aquifer - 10 ft/day; lower surficial aquifer - 40 ft/day

Gradient: 0.008 ft/ft

Media:

Media: GroundwaterSoil

Remediation Scenario:

Cleanup Goals: Groundwater (MCLs) PCE = 3 : : g/l; TCE = 3 : : g/l; cis 1,2-DCE = 70 : : g/l

Technologies:

Technologies Used: In Situ:

Recirculating Wells

Other technologies used:

Why the technology was selected: The UVB wells were installed as an interim remedial measure to capture and treat contaminated groundwater and prevent it from migrating to the lake located downgradient of the facility.

Date implemented: December 10, 1997

Final remediation design: Two UVB (Unterdruck Verdampster Brunnen) or "vacuum vaporizing wells" were installed 300 ft downgradient of the facility, approximately 85 ft apart. The design capture zone for the system was 200 ft wide and 45 ft deep. The wells were constructed of 10-inch diameter schedule 80 PVC with two stainless stell screens (0.01-inch slots). Contaminated groundwater was extracted through the upper

screen (3.5-12.5 ft bgs - upper surficial aquifer) utilizing a 1 H.P. Grundfos submersible variable-speed stainless stell pump. The water was treated in an in-well stripping unit (vacuum stripping canister) installed on the top of the wellhead. Treated water was injected through the lower screen interval (39-45 ft bgs - lower surficial aquifer) using a 1/3 H.P. Grundfos KP 250 sump pump. The design flow rate for each submersible pump was 40 gpm. A 5 H.P. Elekror centrifugal blower located at the surface was utilized to generate negative pressure inside the well. Design vacuum was 20 inches of water with a 530 cfm air flow. VOC emissions from the system were estimated to be approximately 2.0 lbs/day and therefore, no emissions treatment system was installed.

Results and Next Steps:

Results to date: Results achieved to date:: The startup pumping rate for the UVB wells was 10 gpm. The sump pumps were almost immediately upgraded to 3/4 H.P. Goulds Submersible pumps (discharge head 60 ft (26 p.s.i.) at 10 gpm. Other early maintenance and operational problems included failed packers, iron precipitation and sand/silt entering the well casings. The effluent injection rate could not be balanced with the influent influent pumping rate (influent pumping rate >effluent injection rate). A holding tank (3 ft x 4 ft) was installed at the surface to receive and hold influent water, until it was injected. However, design pumping rates could not be achieved. In the second year of system operation, a biocide injection system was installed. Groundwater extraction rates were 4-6 gpm and were limited by influent injection rates. The submersible pumps were therefore cycled to operate for 20 minutes of pumping followed by 30 minutes of down time to allow for influent injection (rate ~ 2 gpm). By the fourth quarter of 1999, influent pumping rates were limited to 2 - 2.5 gpm and effective injection rates were approximately 1.5 gpm. Biologic and geochemical fouling was occurring. By May of 2000, injection tests of the lower surficial aquifer revealed that a rate of only 0.46 - 1.0 gpm could be achieved.In the fall of 2000, the UVB wells were shut down and were later converted to a pump & treat system with effluent treated using a shallow tray air stripper. Treated water was discharged to the City of Orlando sewer system.

Next Steps:

Costs:

Cost for Assessment: No costs available from DOD as of this date.

Cost to Design and Implement:

Cost for Operation and Maintenance:

Total Costs for Cleanup:

Lessons Learned:

Lessons Learned: 1. The system never achieved design pumping rates and therefore did not achieve capture of the downgradient portion of the contaminant plume.2. Influent pumping rates were limited by the rate at which effluent could be injected. Although aquifer testing indicated that the lower surficial aquifer (injection zone) had a higher hydraulic conductivity than the upper surfical aquifer (pumping zone), effluent could not be injected at design rates. There may have been a fouling/precipiation problem in the filter pack or the near screen sediments.3. It is doubtful that an effective circulation cell ever develped within the aquifer. The distance between the upper screen interval and the lower screen interval was over 27 ft and the lithology between the two screens was described as a silty, fine-grained sand that is moderately to well indurated. This unit likely limited vertical circulation.4. This system had many operational and maintenance problems including silt/sand entering the well screens, failed packers, biofouling, precipitation, and problems assocated with equalizing influent and effluent pumping rates.

Contacts:

Principal Point of Contact: David Grabka, project manager Bureau of Waste Cleanup (MS 4520)Florida Department of Environmental Protection2600 Blair Stone Road Tallahassee, Florida 32399-2400(850) 245-8999 David.Grabka@DEP.state.fl.usSteve Tsangaris, contractorCH2M Hill4350 West Cypress, Suite 600Tampa, Florida 33607

Site Specific References:

Site Specific References: 1. Remedial Investigation 1/20012. Focused Investigation/ Source Confirmation 5/19973. Quarterly Monitoring Activity & Results 1998-20004. IRA Work Plan Addendum for UVB Well Upgrade 9/2000

Images:

Images of Site:

Profile last updated on Dec 15, 2003