A Department of Ecology Report

Lakewood Plaza Cleaners
February and August 2002
Groundwater Monitoring Sampling Results

Abstract

This progress report is one in a series describing results of long-term groundwater sampling at Lakewood Plaza Cleaners in south Tacoma. Results of volatile organics of samples collected from two municipal wells and four monitoring wells in February and August 2002 are included.

- Monitoring wells MW-20B and MW-16A, as well as municipal wells H1 and H2, continue to have tetrachloroethene (PERC) concentrations exceeding the Model Toxic Control Act (MTCA) cleanup standard of 5.0 ug/L. PERC concentrations in these wells during the past year of sampling were MW-20B (248 and 371 ug/L), MW-16A (22 and 47 ug/L), and H1 and H2 (6.1 and 12 ug/L).

- Trichloroethene (TCE) was detected in MW-20B in August at a concentration of 8.5 ug/L, which exceeds the MTCA cleanup standard for TCE of 5.0 ug/L. TCE was not detected in MW-20B in February due to a high quantitation limit (200 µg/L).

- Cis-1,2-dichloroethene (cis-1,2-DCE) was detected in wells MW-20B (16 ug/L) and MW-16A (0.8 and 2.3 ug/L).

- Well MW-20A, which is part of the long-term monitoring network, was not sampled during either round due to failure of the dedicated pump. The pump will be repaired before the next round of sampling in January 2003.

Overall, concentrations are similar to those reported in previous sampling rounds.

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Waterbody Numbers

WA-12-1115 (Segment No. 05-12-GW)
WA-225274471570GW

Background

In 1981 the U.S. Environmental Protection Agency (EPA) confirmed that the Lakewood Water District production wells H1 and H2 (Pierce County, Washington) were contaminated with tetrachloroethene, trichloroethene, and 1,2-dicloroethene. The source of the contamination was identified as the Lakewood Plaza Cleaners. In 1991 the Washington State Department of Ecology (Ecology) began semi-annual, long-term groundwater monitoring at the site.

The objective of this sampling is to collect groundwater quality data for Ecology's Toxics Cleanup Program in order to evaluate the effectiveness of Lakewood water supply wells H1 and H2 to contain and remove groundwater contaminated by Plaza Cleaners. In 1996 the monitoring program was evaluated. Based on data collected from 1986 to 1996, it was decided to decommission half of the remaining wells and also to reduce the monitoring program to wells in the immediate vicinity of Plaza Cleaners. The monitoring program was evaluated again in August 2002. The current monitoring program was determined to be sufficient to meet project objectives.

Methods

Groundwater Sampling

In February 2002, groundwater samples were collected from one municipal well, H2, as well as three monitoring wells, MW-16A, MW-20B, and MW-27. In August 2002, groundwater samples were collected from one municipal well, H1, as well as four monitoring wells, MW-16A, MW-20B, MW-27, and MW-33 (Figure 1). Well MW-20A, which is part of the long-term monitoring network, was not sampled during either round due to failure of the dedicated pump. All but one of the wells is screened in the Advanced Outwash deposits, which is the primary aquifer for the area. Well MW-20B is screened in the Vashon Till, which forms an aquitard over most of the site.

Sampling methods were consistent with those previously used on this project. Static water levels were recorded prior to well purging. Wells were purged until pH, specific conductance, and temperature readings stabilized, and a minimum of three well volumes had been removed. All monitoring wells, except MW-20B, were purged and sampled using dedicated bladder pumps. Well MW-20B was purged and sampled with a decontaminated Teflon bailer. Municipal wells H1 and H2, which pump continuously, were sampled from taps nearest the well. Sampling procedures are discussed in detail in Appendix A.

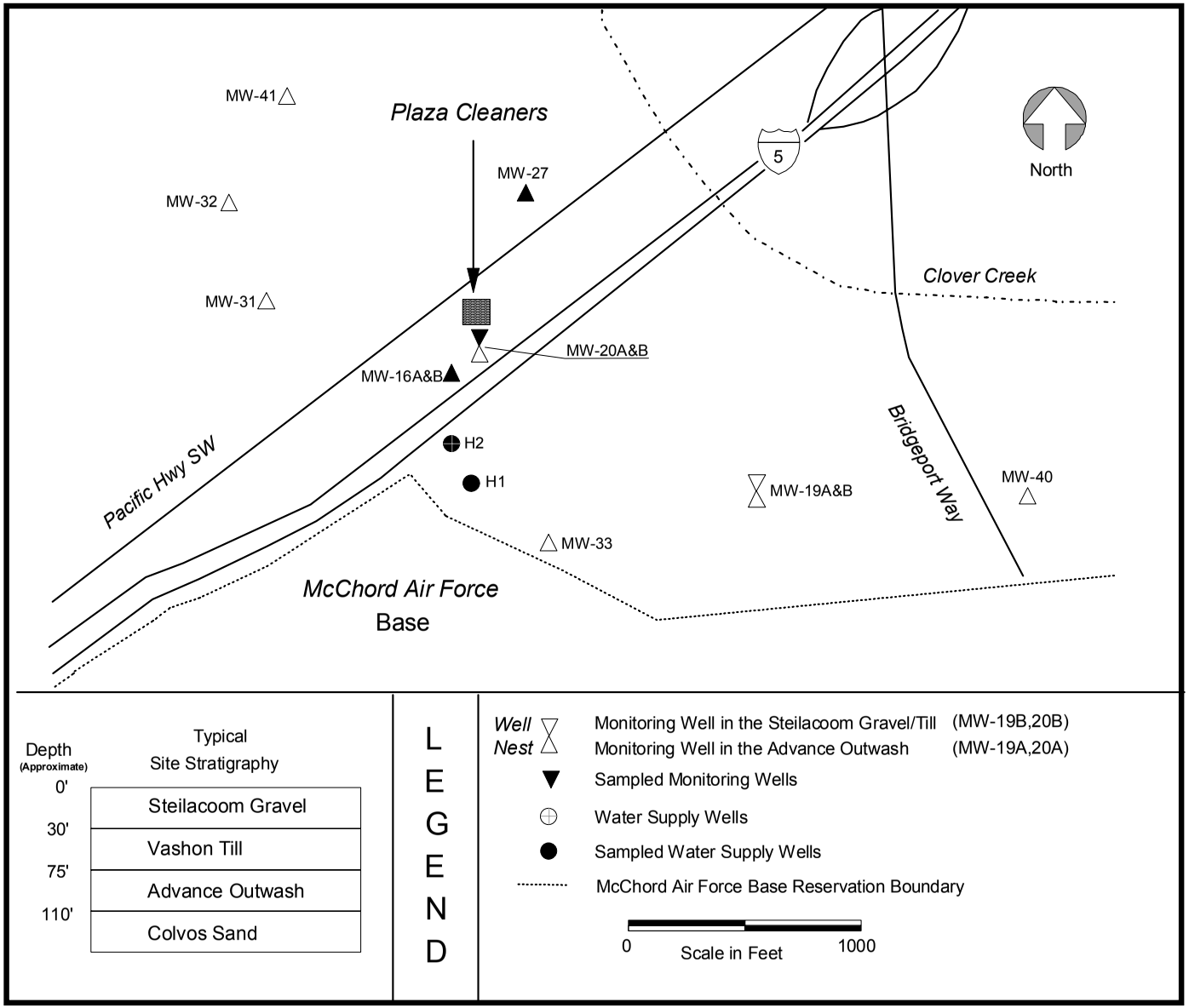

Figure 1: Well Location Map - Lakewood/Plaza Cleaners

Analysis

Analytes, analytical methods, and detection limits for both field and laboratory parameters are listed in Table 1. All groundwater samples were analyzed for volatile organics.

Table 1: Analytical Methods for February and August 2002 Samples

Analytes	Method	Reference	Detection Limit
Field			
Water Level	Solinst Well Probe	NA	0.01 feet
pH	Orion 25A Field Meter	NA	0.1 Std. Units
Temperature	Orion 25A Field Meter	NA	0.1 C
Specific Conductance	Beckman Conductivity Bridge	NA	10 umhos/cm
Laboratory			
VOAs	SW-846 Method 8260	U.S. EPA 1986	1-5 ug/L

In general, the quality of the data is acceptable. Quality control samples collected in the field consisted of blind field duplicate samples, which were obtained from well MW-16A. The numeric comparison of duplicate results is expressed as the relative percent difference (RPD). The RPD for PERC in February and August was 2% and 4%, respectively. In addition to field quality control samples, duplicate matrix spikes and surrogate compound recoveries were performed in the laboratory. Matrix spikes and surrogate recoveries were within acceptable limits for all samples. Further discussion of quality assurance is presented in Appendix B. Laboratory reporting sheets are available upon request.

Results

Field Observations

Depth-to-water measurements and purge volume, as well as pH, specific conductance, and temperature readings, at the time of sampling are listed in Table 2.

All field parameters were within expected ranges. The specific conductance in well MW-20B (415-440 umhos/cm), which is screened in a fine-grained till unit, was approximately two times greater than the other wells. Specific conductance readings are typically higher for water from fine-grained units. The other wells are screened in an advanced outwash unit.

Table 2: Summary of Field Parameters Results for February 6 and August 29, 2002

Monitoring Well	Total Depth (feet)[1]	Depth to Water (feet)[2]	pH (standard units)	Specific Conductance (umhos/cm)	Temperature (°C)	Purge Volume (gallons)
February						
MW-16A	109	40.93	7.2	228	10.6	145
MW-20B	50.4	33.88	6.6	415	11.9	19
MW-27	96.4	++	6.6	190	11.7	30
H2	110	++	6.4	180	10.4	>1000
August						
MW-16A	109	44.46	6.8	224	13.2	150
MW-20B	50.4	37.67	7.2	440	13.8	8
MW-27	96.4	++	6.9	190	12.7	35
MW-33	99.3	++	7.2	212	12.6	30
H1	110	++	6.5	180	13.4	>1000

[1] Measured from top of PVC casing.
[2] Measured from top of casing.
++ Dedicated pump obstructs water-level measurement.

Analytical Results

Analytical results for volatile organics (VOAs) are summarized in Table 3.

In February, the tetrachloroethene (PERC) concentration in well MW-20B was 248 ug/L. Trichloroethene (TCE) and cis-1,2-dichloroethene (cis-1,2-DCE) were not detected in MW-20B in February due to a high quantitation limit (100-200 ug/L). TCE and cis-1,2-DCE are typically detected around 10 ug/L in well MW-20B. PERC, TCE, and cis-1,2-DCE were detected in MW-16A with concentrations of 47 ug/L, 0.79J ug/L, and 2.3 ug/L, respectively. Municipal well H2 had a PERC concentration of 12 ug/L.

In August, the PERC, TCE, and cis-1,2-DCE concentrations in well MW-20B were 371 ug/L, 8.5 ug/L, and 16 ug/L, respectively. PERC, TCE, and cis-1,2-DCE were also detected in MW-16A with concentrations of 22 ug/L, 0.34J ug/L, and 0.82J ug/L, respectively. Municipal well H1 had a PERC concentration of 6.1 ug/L.

Table 3: Summary of Analytical Results (ug/L) for February 6 and August 29, 2002

Monitoring Well	Tetrachloroethene	Trichloroethene	Cis-1,2-Dichloroethene
February			
MW-16A	47	0.79 J	2.3
MW-20B	248	200 U	100 U
MW-27	1 U	2 U	1 U
H2	12	0.19 J	0.20 J
August			
MW-16A	22	0.34 J	0.82 J
MW-20B	371	8.5	16
MW-27	1 U	2 U	1 U
MW-33	1 U	1 U	1 U
H1	6.1	1 U	1 U

U : Analyte was not detected at or above the reported value.
J : Analyte was positively identified. The associated numerical result is an estimate.

Benzene, toluene, ethylbenzene, and xylene (BTEX) were detected below the practical quantitation limits (1-2 ug/L) in well MW-16A in February. BTEX has been detected periodically in the past, always at concentrations below the quantitation limits. There is no consistent pattern or clear explanation as to the occurrence of these chemicals.

Table 4 summarizes PERC, TCE, and cis-1, 2-DCE concentrations for sampling events from January 1991 through August 2002. Table 5 shows PERC and TCE concentrations that have exceeded the MTCA cleanup standard of 5.0 ug/L for the same period.

PERC concentrations continue to be elevated in wells MW-20B and MW-16A. Municipal wells H1 and H2, which were added to the monitoring program in 1995, also have elevated PERC concentrations.

Table 4: Summary of Sample Results (ug/L) from January 1991 to August 2002

Well	January 1991			May 1991			November 1991			May 1992			December 1992			May 1993		
Number	PERC	TCE	cis-1,2-DCE	PERC	TCE	cis-1,2-DCE	PERC	TCE	cis-1,2-DCE	PERC	TCE	cis-1,2-DCE	PERC	TCE	cis-1,2-DCE	PERC	TCE	cis-1,2-DCE
MW-16A	28	1 J	2.4 J	26	0.6 J	2	2.7 J	1 U	0.6 J	7	1 U	1	9 J	0.3 J	0.8 J	44	10 U	2 J
MW-20A	1 U	1 U	1 U	0.4 J	1 U	1 U	0.4 J	1 U	1 U	0.5 J	1 U	1 U	0.8 J	1 UJ	1 UJ	10 U	10 U	10 U
MW-20B	1100 D	18	33	752	16	30	120	2.6 J	6.7	940	13	32	340 J	14 J	20 J	700 D	12	21
MW-21	2.1 J	1 U	1 J	2	1 U	0.7 J	2.2 J	1 U	1.0 J	2	1 U	0.6 J	2	0.2 J	0.3 J	1 J	10 U	10 U
MW-27	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 UJ	1 UJ	10 U	10 U	10 U
MW-28A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-31	1 J	1 U	1.9 J	0.6 J	1 U	2	0.9 J	1 U	2.2 J	0.8 J	1 U	1	0.5 J	1 UJ	0.9 J	10 U	10 U	10 U
MW-32	1 J	1 U	1.1 J	1	1 U	2	0.6 J	1 U	0.6 J	0.7 J	1 U	1	0.7 J	1 UJ	0.5 J	10 U	10 U	10 U
MW-41	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 UJ	1 UJ	10 U	10 U	10 U
MW-19A	--	--	--	--	--	--	1 U	0.5 J	1 U	--	--	--	1 UJ	1 UJ	1 UJ	--	--	--
MW-33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-40	1 U	1 U	1 U	--	--	--	1 U	1 U	1 U	--	--	--	1 UJ	1 UJ	1 UJ	--	--	--
H1/H2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Well	December 1993			April 1994			November 1994			July 1995			January 1996			July 1996		
Number	PERC	TCE	cis-1,2-DCE	PERC	TCE	cis-1,2-DCE	PERC	TCE	cis-1,2-DCE	PERC	TCE	cis-1,2-DCE	PERC	TCE	cis-1,2-DCE	PERC	TCE	cis-1,2-DCE
MW-16A	13	0.3 J	0.7 J	33	0.6	1.4	9.7	0.3 J	0.5 J	27	0.5 J	0.8 J	47 E	0.8 J	1.5	43	0.7 J	1.9
MW-20A	0.3 J	1 U	1 U	0.4	0.2 U	0.2 U	0.3 J	1 U	1 U	0.4 J	1 U	1 U	0.2 J	1 U	1 U	0.4 J	1 U	1 U
MW-20B	187	50 U	8.2 J	472	8.6 J	12.6	86	50 U	3 J	340 D	8.4	17	353	7.2	15	387	7.6	15
MW-21	1.6	1 U	0.4 J	1.5	0.2 J	0.3	1.8	0.2 J	0.3 J	--	--	--	--	--	--	Well Decommissioned		
MW-27	1 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
MW-28A	--	--	--	--	--	--	--	--	--	1 U	1 U	1 U	1 U	1 U	1 U	Well Decommissioned		
MW-31	0.8 J	1 U	1.2 J	0.7	0.2 U	1.0	0.8 J	1 U	1	0.6 J	1 U	0.5 J	0.6 J	1 U	0.7 J	--	--	--
MW-32	0.7 J	1 U	0.6 J	0.7	0.2 U	0.6	0.6 J	1 U	0.5 J	0.7 J	1 U	0.5 J	0.8 J	1 U	0.6 J	--	--	--
MW-41	1 U	1 U	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	--	--	--
MW-19A	1 U	0.4	1 U	0.2 U	0.5	0.2 U	--	--	--	1 U	0.4 J	1 U	--	--	--	--	--	--
MW-33	--	--	--	--	--	--	--	--	--	1 U	1 U	1 U	--	--	--	1 U	1 U	1 U
MW-40	1 U	1 U	1 U	0.2 U	0.2 U	0.2 U	--	--	--	1 U	1 U	1 U	--	--	--	--	--	--
H1/H2	--	--	--	--	--	--	--	--	--	9	0.3 J	1 U	8.4	0.2 J	0.2 J	0.14 J	1 U	1 U

U = The analyte was not detected at or above the reported result.
J = The analyte was positively identified. The associated numerical result is an estimate.
UJ = The analyte was not detected at or above the reported estimated result.
D = Analysis performed at secondary dilution.
E = The concentration of the associated value exceeds the known calibration range.
-- = Not tested
= The analyte was positively identified.

Table 4 continued: Summary of Sample Results (ug/L) from January 1991 to August 2002

Well	January 1997			July 1997			February 1998			July 1998			January 1999			August 1999		
Number	PERC	TCE	cis-1,2-DCE	PERC	TCE	cis-1,2-DCE	PERC	TCE	cis-1,2-DCE	PERC	TCE	cis-1,2-DCE	PERC	TCE	cis-1,2-DCE	PERC	TCE	cis-1,2-DCE
MW-16A	54	1.1	3.1	47	0.7 J	2.5	36	0.7 J	2 J	30	1 U	1.5 J	--	--	--	22	0.4 J	1.1
MW-20A	0.4 J	1 U	1 U	0.3 J	1 U	2 U	0.4 J	1 U	1 U	0.6 J	1 U	1 U	1 U	2 U	1 U	0.8 J	2 U	1 U
MW-20B	373	100 U	6.4 J	222	4	6.4	456	7 J	12	575 D	10	23	708	5.2	12	722	8.4 J	16 J
MW-21																		
MW-27	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	0.05 J	1 U	1 U	1 U	2 U	1 U	1 U	2 U	1 U
MW-28A																		
MW-31	--	--	--	0.9 J	1 U	0.9 J	--	--	--	--	--	--	--	--	--	0.9 J	2 U	0.4 J
MW-32	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-41	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-19A	--	--	--	1 U	0.3 J	2 U	--	--	--	--	--	--	--	--	--	1 U	0.4 J	1 U
MW-33	--	--	--	1 U	1 U	2 U	--	--	--	1 U	1 U	1 U	--	--	--	1 U	2 U	1 U
MW-40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
H1/H2	18	0.4 J	0.4 J	8.8	0.3 J	0.6 J	11	0.4 J	0.3 J	10	1 U	0.1 J	1.5	1 U	1 U	5.2	0.2 J	1 U

Well	January 2000			August 2000			January 2001			August 2001			February 2002			August 2002		
Number	PERC	TCE	cis-1,2-DCE	PERC	TCE	cis-1,2-DCE	PERC	TCE	cis-1,2-DCE	PERC	TCE	cis-1,2-DCE	PERC	TCE	cis-1,2-DCE	PERC	TCE	cis-1,2-DCE
MW-16A	40	0.7 J	1.9	22	0.3 J	0.7	31	0.4 J	1	25	0.3 J	0.7 J	47	0.8 J	2.3	22	0.3 J	0.8 J
MW-20A	0.2 J	2 U	1 U	0.1 J	2 U	1 U	0.2 J	1 U	1 U	1 U	2 U	1 U	--	--	--	--	--	--
MW-20B	184	6	13	648	200 U	100 U	493	6.6 J	12	486	8.2	18	248	200 U	100 U	371	8.5	16
MW-27	1 U	2 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	2 U	1 U	1 U	2 U	1 U
MW-31	--	--	--	--	--	--	--	--	--	0.4 J	2 U	0.3 J	--	--	--	--	--	--
MW-32	--	--	--	0.8 J	2 U	1 U	--	--	--	--	--	--	--	--	--	--	--	--
MW-41	--	--	--	1 U	2 U	1 U	--	--	--	--	--	--	--	--	--	--	--	--
MW-19A	--	--	--	--	--	--	--	--	--	1 U	0.3 J	1 U	--	--	--	--	--	--
MW-33	--	--	--	1 U	2 U	1 U	--	--	--	1 U	2 U	1 U	--	--	--	1 U	1 U	1 U
MW-40	--	--	--	1 U	2 U	1 U	--	--	--	--	--	--	--	--	--	--	--	--
H1/H2	10	1 U	1 U	8.7	0.03 J	1 U	11	0.2 J	1 U	6.8	0.2 J	1 U	12	0.2 J	0.2 J	6.1	1 U	1 U

U = The analyte was not detected at or above the reported result.
J = The analyte was positively identified. The associated numerical result is an estimate.
UJ = The analyte was not detected at or above the reported estimated result.
D = Analysis performed at secondary dilution.
E = The concentration of the associated value exceeds the known calibration range.
-- = Not tested
= The analyte was positively identified.

Table 5: Summary of PERC and TCE Concentrations that Exceeded MTCA Method A Cleanup Standard of 5 ug/L

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
MW-20B												
PERC	120-1100	340J-940	187-700	86-472	340	353-387	222-373	456-575	708-722	184-648	486-493	371-248
TCE	2.6J-18	13-14J	12	8.6J	8.4	7.2-7.6	4	7J-10	5.2-8.4J	6	6.6-8.2	8.5
MW-16A												
PERC	2.7J-28	7-9J	13-44	9.7-33	27	43-47	47-54	30-36	22	22-40	25-31	22-47
H1/H2												
PERC	---	---	---	---	9	0.14J-8.4	8.8-18	10-11	1.5-5.2	8.7-10	6.8-11	6-12

(Model Toxic Control Act Method A cleanup standard for PERC and TCE in groundwater is 5 ug/L)

J = Analyte was positively identified. The associated numerical result is an estimate.
-- = Not tested.

Figure 2 shows PERC concentrations for MW-20B and MW-16A between 1985 and 2002. Since 1984, PERC concentrations in both wells have varied substantially.

- PERC concentrations decreased initially in MW-20B from March 1985 (4800 ppb) to May 1985 (570 ppb). Between May 1985 and November 1994, concentrations have ranged from 86 to 1200 ppb. In 1995 the sample schedule was changed from spring/fall, which corresponded to the high-water/low-water seasons, to a winter/summer schedule. Between July 1995 and July 1997 concentrations leveled off, ranging from 222 to 387 ppb. Since February 1998, overall PERC concentrations have been slightly higher, ranging from 184 to 722 ppb.

- Over the monitoring period, PERC concentrations in MW-16A have varied. Since 1991, PERC concentrations in this well have ranged from 3 to 55 ppb.

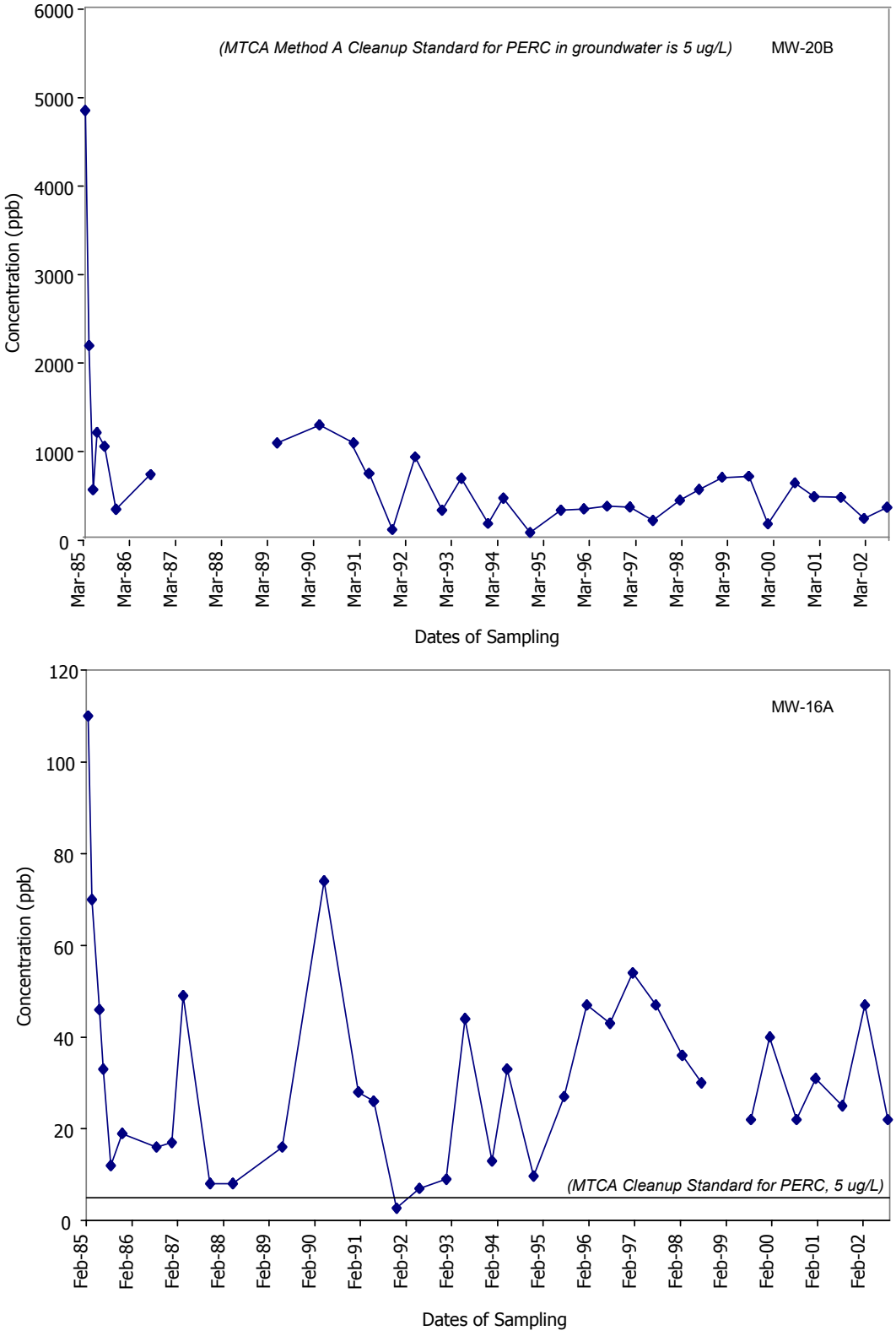

Figure 2

PERC Concentrations for Wells MW-20B and MW-16A from 1985 to 2002

Conclusions

Monitoring was conducted in February and August 2002 at two municipal wells and four monitoring wells to evaluate volatile organics in groundwater at the Lakewood Plaza Cleaners site.

- Monitoring wells MW-20B and MW-16A, as well as municipal wells H1 and H2, continue to have PERC concentrations exceeding the MTCA cleanup standard of 5.0 ug/L.

- TCE continues to exceed the MTCA cleanup standard of 5.0 ug/L in MW-20B.

Overall, concentrations are similar to those reported in previous sampling conducted since 1991. A five-year review of the project was completed in August 2002. The current monitoring program was determined to be sufficient to meet project objectives.

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Appendix A. Groundwater Sampling

On February 6, samples were collected from municipal well H2 and monitoring wells MW-16A, MW-20B, and MW-27. On August 29, samples were collected from municipal well H1 and four monitoring wells: MW-16A, MW-20B, MW-27, and MW-33 (Figure 1). Well MW-20A, which is part of the long-term monitoring network, was not sampled during either round due to failure of the dedicated pump.

Prior to sample collection, static water level measurements were obtained using an electronic water level probe. The probe was rinsed with deionized water after each use. All monitoring wells were purged a minimum of three well volumes and until pH, temperature, and specific conductance readings stabilized. Purge water was discharged to storm drains or to the ground near each well. All monitoring wells, except MW-20B, were purged and sampled using dedicated bladder pumps. Well MW-20B was purged and sampled with a decontaminated teflon bailer. Municipal wells H1 and H2, which pump continuously, were sampled from taps nearest the wells. Samples collected for volatile organics were free of headspace and preserved with two drops of 1:1 hydrochloric acid.

The bailer was pre-cleaned with a Liquinox® wash and sequential rinses of hot tap water, 10% nitric acid, distilled/deionized water, and pesticide-grade acetone. After cleaning, the bailer was air-dried and wrapped in aluminum foil.

Chain-of-custody procedures were followed in accordance with Manchester Laboratory protocol (Ecology, 2000). Manchester Laboratory analyzed all samples.

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Appendix B. Quality Assurance

Manchester Environmental Laboratory

7411 Beach Dr E, Port Orchard, Washington 98366

Case Narrative

February 22, 2002

Subject: Volatiles Data

Sample(s): 02068032, 02068033, 02068034, 02068035, 02068036

Officer(s): Pam Marti

By: John Weakland

Volatiles Analysis

Analytical Method(s)

These samples were analyzed by SW-846 8260 for volatile organic compounds.

Holding Times

All samples were prepared and analyzed within the method holding times.

Instrument Tuning

Calibration against Bromofluorobenzene (BFB) is acceptable for the initial calibration, continuing calibration and all associated sample analyses.

Calibration

The average relative response factors for target analytes were above the minimum and % Relative Standard Deviations were within the maximum of 20% with notable exceptions. For the February 11 calibration, Dichlorodifluoromethane, Vinyl chloride, Chloroethane, Trichlorofluoromethane, Diethyl ether, Freon 113, 1-1-Dichloroethene, Carbon disulfide, 2,2-Dichloropropane, Tetrahydrofuran, Carbon tetrachloride, and 1,1-Dichloropropene exhibited responses below established QC limits and therefore the associated samples and blank are qualified with the flag UJ. For the February 13 calibration, Dichlorodifluoromethane, 1-1-Dichloroethene, and Tetrahydrofuran exhibited responses below established QC limits and therefore the associated samples and blanks are qualified and flagged with a UJ.

Blanks

Both method blanks ODBW2042 and ODBW2044 contained Acetone. The associated samples contained Acetone at a level less than 10 times the method blank and reported at the PQL and therefore no qualification was necessary. The method blank ODBW2044 contained Toluene. This is attributed to the water source for the method blank and diluted samples. Consequently, the reporting limit for the diluted samples was raised and the analyte flagged with a UJ.

Surrogates

The surrogate recoveries were reasonable, acceptable, and within established QC limits. with the following exceptions. The percent recovery of the surrogate 1,2-Dichloroethane-$_{d4}$ for sample MW-27 (MEL #02068033) was slightly above established QC limits. The percent recovery of the surrogate Toluene-$_{d8}$ for LCS2042 was slightly above established QC limits. Since all of the other surrogates for the samples were within QC limits, no further action was required.

Matrix Spikes

Aliquots of sample MW-16A (MEL # 02068034) were analyzed as matrix spikes. The Percent Recovery and Relative Percent Difference precision data are reasonable, acceptable, and within established QC limits with following notable exceptions. For the February 11 analytical run, the percent recoveries of Acetone, Carbon disulfide, 2-Butanone, 4-Methyl-2-Pentanone, and 2-Hexanone were below established QC limits. For the February 13 analytical run, the percent recovery of Tetrachloroethene was slightly above established QC limits. Since the percent recoveries of all of these analytes were acceptable for the respective LCSs no qualification of the data was required.

Laboratory Control Samples

The percent recovery of Dichlorodifluoromethane for LCS2042 and LCS 2044 was below established QC limits. All other recovery data are reasonable, acceptable, and within established QC limits.

Comments

Manchester Environmental Laboratory

7411 Beach Dr E, Port Orchard, Washington 98366

Case Narrative

September 16, 2002

Subject: Lakewood Plaza Cleaners - 35

Samples: 02358030 through 02358035

Officer: Pam Marti

By: John Weakland

Volatiles Analysis

Analytical Method

The water samples were analyzed by SW-846 8260 for volatile organic compounds.

Holding Times

All of the samples were analyzed within the method holding times.

Instrument Tuning

Calibration against bromofluorobenzene (BFB) is acceptable for the initial calibration, continuing calibration and all associated sample analyses.

Calibration

The initial calibration was acceptable and within established QC limits.

The continuing calibration was within established QC limits with the following exceptions. Some of the responses were high, indicating a high bias. Since none of the analytes with high responses were detected in the sample, no qualification of the data is necessary. The responses for chloroethane and carbon disulfide were below established limits. Consequently, the results are qualified UJ.

Blanks

There were no analytes detected in the method blank.

Surrogates

The surrogate recoveries were reasonable, acceptable, and within established QC limits.

Matrix Spikes

The diluted sample 02358035 was utilized for the matrix spike/matrix spike duplicate (MS/MSD). The first analytical run yielded unusable results and used up the entire sample submitted for the MS/MSD analysis. There was insufficient sample volume for another MS/MSD and consequently only the diluted sample could be utilized. The recoveries were reasonable, acceptable, and within established QC limits with the following exceptions. The percent recoveries of chloroethane and carbon disulfide were below established limits. Since the analytes are already qualified no additional qualification of the data was necessary.

Laboratory Control Samples

The percent recoveries of for LCS2241W and LCS2241X were within established QC limits except for chloroethane and carbon disulfide which were below established limits. Since the analytes are already qualified no additional qualification of the data was necessary.

Comments

The percent difference of the internal standard 1,4-dichlorobenzene for sample 02358034 slightly exceeded established QC limits. A subsequent reanalysis yielded similar results and the out of control event is attributed to matrix effects. Since none of the target analytes were affected, no qualification of the data is necessary.

Data Qualifier Codes

U - The analyte was not detected at or above the reported result.

J - The analyte was positively identified. The associated numerical result is an estimate.

UJ - The analyte was not detected at or above the reported estimated result.

REJ - The data are unusable for all purposes.

NAF - Not analyzed for.

N - For organic analytes there is evidence the analyte is present in this sample.

NJ - There is evidence that the analyte is present. The associated numerical result is an estimate.

NC - Not Calculated

E - The concentration exceeds the known calibration range.

Bold - The analyte was present in the sample. (Visual Aid to locate detected compounds on report sheet.)