CHRISTINE O. GREGOIRE
Director

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WA-12-1115-GW

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
*7171 Cleanwater Lane, Building 8, LH-14 * Olympia, Washington 98504-6814*

August 30, 1991

TO: Bruce Cochran
Toxics Cleanup Program

FROM: Pam Marti
Toxics, Compliance, and Ground Water Investigations Section

SUBJECT: Lakewood/Plaza Cleaners Longterm Monitoring Round I

SUMMARY

The Toxics, Compliance, and Ground Water Investigations Section collected samples from monitoring wells located near the Lakewood/Plaza Cleaners Site on January 7-9, 1991 (Figure 1). This sampling is part of routine ground water monitoring conducted in compliance with the Record of Decision (ROD). Observed concentrations for PERC, TCE, and 1,2-DCE are consistent with previous sample results. Samples collected for water quality analysis met all state and federal drinking water criteria.

0BJECTIVES

The Toxics, Compliance, and Ground Water Investigations Section was requested by the Toxics Cleanup Program (TCP) to conduct long term monitoring of the ground water at the Lakewood/Plaza Cleaners Site on a semi-annual basis. Monitoring objectives are as follows:

1. Collect ground water quality data that can be used to evaluate the effectiveness of continued operation of wells H1 and H2 to contain and remove contaminated ground water from the aquifer.

2. Monitor the uncaptured portion of the plume.

3. Monitor ground water upgradient of the site to determine if contaminants are migrating toward H1 and H2 from McChord Air Force Base (MAFB).

4. Collect samples for additional water quality analysis during the first year of monitoring to characterize the general ground water quality of the study area.

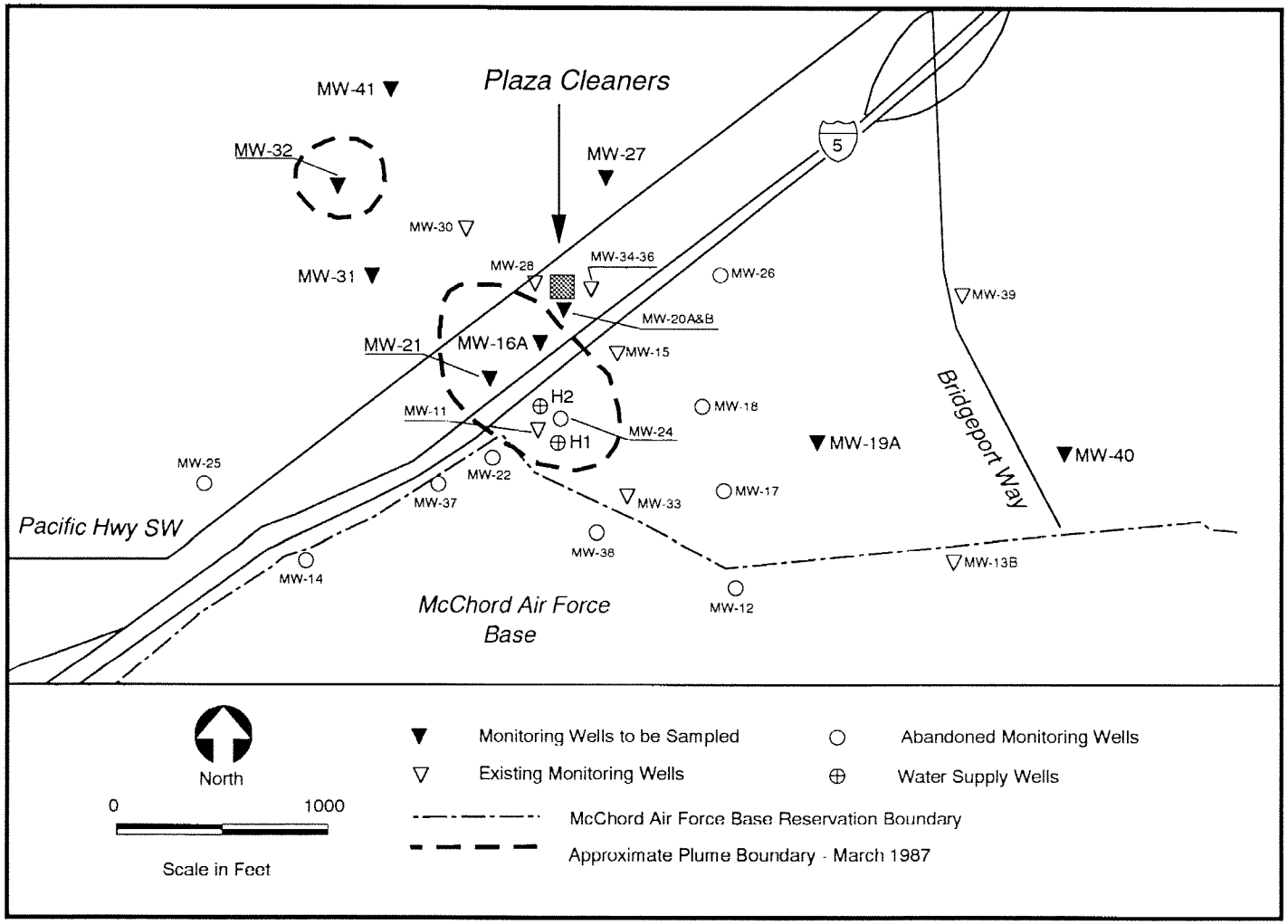

Figure 1: Well Location Map - Lakewood/Plaza Cleaners

SITE BACKGROUND

In 1981, tetrachloroethylene (PERC), trichloroethylene (TCE), and 1,2-dichloroethylene (1,2-DCE) were detected in two Lakewood Water District supply wells, (wells H1 and H2) and are shown in Figure 1. On-site disposal of waste solvents and sludges at Plaza Cleaners, located 800 feet north of the wells, was identified as the source of the contamination. Site remediation consisted of removal of contaminated sludge and soils, soil-vapor extraction, and installation of two air-stripping towers for wells H1 and H2. Soil-vapor extraction was performed intermittently between March 1988 and April 1989. During the operation, it removed several hundred pounds of PERC from the glacial till that overlies the main aquifer in the area.

Results from on-site monitoring wells between 1985 to the present show that the pump and treat system has contained and reduced the level of ground water contamination (CH2M Hill, 1990). A portion of the contaminated plume located northwest of the site is not being captured by remedial pumping. However, contaminant concentrations in the uncaptured plumes are decreasing; possibly due to biodegradation dispersion and/or dilution.

Upgradient monitoring wells were installed to detect possible contaminant migration from the adjacent McChord Air Force Base (MAFB). Previous studies (EPA, 1985) indicated potential contamination sources from MAFB are located within the long-term capture zone of wells H1 and H2. Possible contaminants from McChord AFB include hydrocarbons, pesticides, and heavy metals.

Geology of the study area was defined in the Final Draft Remedial Investigation Report for Ponder's Corner, Washington (1985). Four geologic units; the Steilacoom Gravel, Vashon Till, Advance Outwash, and the Colvos Sands, underlie the site. All are part of glacial deposits known as the Vashon Drift. Much of the study area is covered with fill material that ranges in thickness up to about 15 feet. The fill is underlain by the Steilacoom Gravel which is found throughout most of the study area and ranges in thickness from 1 to 58 feet. This unit is typically composed of clayey, silty, or sandy gravel with cobbles in the unsaturated upper portion and permeable sandy gravels in the middle and lower portions. The Steilacoom Gravel often contains perched water which flows to the northwest near wells H1 and H2, but to the south and southeast near the south end of Plaza Cleaners. The Vashon Till underlies the Steilacoom Gravel and ranges in thickness from 8 to 92 feet. The Vashon Till is an unsorted mixture of clay, silt, sand, and gravel with some cobbles and boulders. Over most of the site, the till mixture forms an aquitard of unsaturated and saturated sediments separating the Steilacoom Gravel above, from the Advance Outwash, below. Effectiveness of the till as a hydrologic barrier to vertical flow may be limited. Advance Outwash deposits underlie the Vashon Till and consist of saturated sands and gravels with thin layers of silt and clay. This unit is the primary aquifer for the area. The predominant horizontal flow in the Advance Outwash is west northwest when production wells H1 and H2 are not in use. When in use, the wells create a large cone of depression. Previous studies showed that drawdowns occur in shallow monitoring wells drilled in the Steilacoom gravel when H1 and H2 are pumping (Remedial Investigation, 1985). This indicates possible hydraulic interconnection between the Steilacoom

gravel and the Advanced Outwash. The Advance Outwash overlies the Colvos Sand. This unit is estimated to be more than 150 feet thick. The Colvos Sand is composed of fine-grained sand, silt and clay and forms the lower confining unit between the Advance Outwash deposits and deeper sand and gravel deposits.

METHODS

Ground Water Sampling

Figure 2 shows the locations of the sampled wells. Prior to sample collection, static water level measurements were obtained from all wells using an electronic water level indicator which was rinsed with deionized water after use at each location. All monitoring wells were purged until a minimum of three well volumes had been removed and pH, temperature, and conductivity readings stabilized. Purge water was discharged to storm drains or to the ground near each monitoring well. All wells but one were purged and sampled using dedicated bladder pumps. Well MW-20B is not equipped with a dedicated pump and was purged and sampled with a decontaminated teflon bailer. Table 1 lists field observation data including well depth, geologic unit, static water level, pH, specific conductance, temperature, and purged volume in order the wells were sampled.

Wells were sampled from the least to most contaminated. Samples collected for volatile organics were free of headspace and preserved with 1+1 hydrochloric acid. Samples for dissolved metals analysis were filtered in the field through a 0.45 μm polycarbonate membrane in-line filter and preserved with 1 mL of nitric acid to a pH$<$2. Chemical analyses, analytical methods, and detection limits are shown in Table 2.

Prior to sample collection, field equipment (i.e., bailers) were precleaned with sequential washes of a Liquinox wash, hot tap water rinse, 10 percent nitric acid, distilled/deionized water, pesticide-grade methylene chloride, and pesticide-grade acetone, then air-dried and wrapped in aluminum until being used in the field. Chain-of-custody procedures were followed in accordance with Manchester Laboratory protocol (Huntamer, 1986).

Quality Assurance Samples

In addition to laboratory calibration standards and method blanks, field quality assurance samples consisted of a blind duplicate, replicate, transfer blank, filtration blank, transport blank, matrix spikes, and matrix spike duplicates.

Blind duplicate samples, labeled MW-16B, were collected for all parameters from well MW-16A. A replicate sample, transfer blank, and filter blank were collected and tested for volatile organics only. A replicate sample was collected from well MW-20A. A transfer blank was collected by pouring organic-free water through a decontaminated bailer. A filter blank was obtained by pumping organic-free water through a peristaltic pump and an in-line filter. A transport blank for volatile organics was carried throughout the sample investigation.

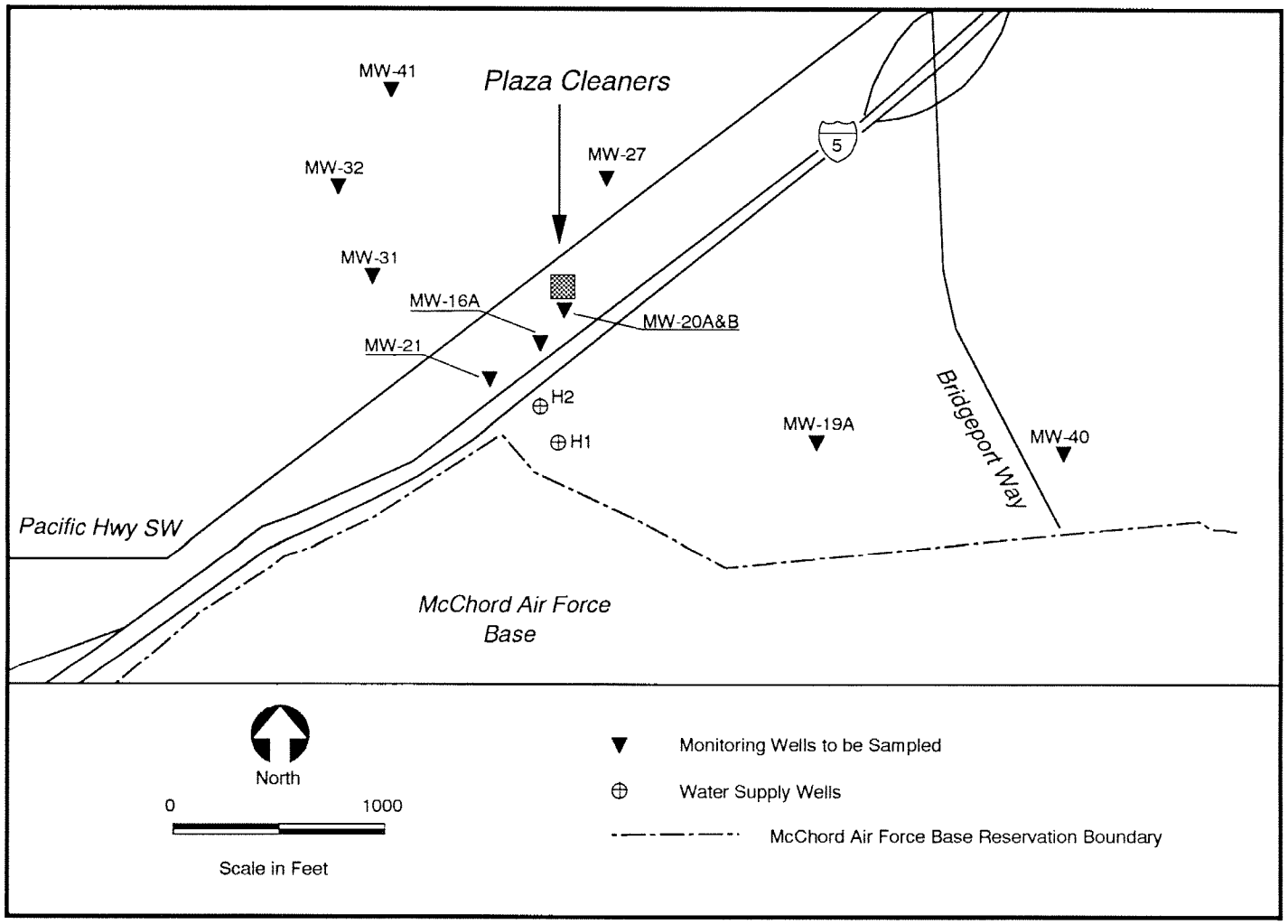

Figure 2: Sample Locations for January 1991

Table 1: Field Parameters for January 1991 Sampling

Monitoring Well	TD From Top of PVC Casing As Measured	Geologic Unit Screened	Depth to Water	pH (st. units)	Specific Conductance (umhos/cm)	Temperature (C)	Purge Volume (gallons)
MW-40	75.1	Advance Outwash	32.76	7.4	250	9.5	40
MW-41	96.8	Advance Outwash	28.45	7.25	251	2.7	34
MW-31	91.5	Advance Outwash	49.71+	7.42	220	4	24
MW-27	96.4	Advance Outwash	49.80+	7.01	231	6.2	24
MW-20A	97.3	Advance Outwash	31.74	9.48	210	12.6	33
MW-21	92.1	Advance Outwash	40.22	7.02	203	11.3	27
MW-32	114.4	Advance Outwash	60.1	6.99	200	10.1	27
MW-16A	109	Advance Outwash	41.32	7.39	222	11.3	132
MW-20B	50.4	Vashon Till	33.94	6.64	525	12.9	9

TD = Total Depth
\+ = Probe hit obstruction above water level.

Table 2: Parameters, Analytical Methods and Detection Limits

Parameters	Analytical Method	Reference	Detection Limit
Field Parameters:			
Water Level	Slope Indicator Well Probe	NA	0.05 ft.
pH	Beckman pH Meter	NA	0.1 Std Units
Specific Conductance	Beckman RC-15C Conductivity Bridge	NA	10 μmhos/cm
Temperature	Precision Thermometer	NA	0.1°C
Volatile Organics:	#624	EPA 1983	1-10μg/L
Major Cations:			
Sodium	#200.7	EPA 1983	10.0μg/L
Calcium	#200.7	EPA 1983	1.0 μg/L
Magnesium	#200.7	EPA 1983	1.0 μg/L
Major Anions:			
Chloride	#429	APHA 1985	0.1 mg/L
Carbonate	#406C	APHA 1985	1.0 mg/L
Bicarbonate	#406C	APHA 1985	1.0 mg/L
Sulfate	#429	APHA 1985	0.05mg/L
Indicator Parameters:			
Hardness	#314B	APHA 1985	1.0 mg/L
Nitrate/Nitrite	#353.2	EPA 1983	0.01mg/L
Total Dissolved Solids	#160.1	EPA 1983	10.0mg/L
Metals (Total Recoverable):			
Arsenic	#206.2	EPA 1983	1.0 μg/L
Barium	#200.7	EPA 1983	2.0 μg/L
Cadmium	#200.7	EPA 1983	2.0 μg/L
Chromium	#200.7	EPA 1983	3.0 μg/L
Copper	#200.7	EPA 1983	3.0 μg/L
Iron	#200.7	EPA 1983	3.0 μg/L
Lead	#239.2	EPA 1983	1.0 μg/L
Manganese	#200.7	EPA 1983	2.0 μg/L
Mercury	#245.1	EPA 1983	0.2 μg/L
Nickel	#200.7	EPA 1983	4.0 μg/L
Selenium	#270.2	EPA 1983	2.0 μg/L
Silver	#200.7	EPA 1983	3.0 μg/L
Zinc	#200.7	EPA 1983	2.0 μg/L

NA = Not Applicable

American Public Health Association, 1985. Standard Methods for the Examination of Water and Wastewater.

U.S. EPA, 1983. Methods for the Chemical Analysis of Water and Wastes. Environmental Monitoring and Support Laboratory, March 1983.

Quality assurance results for volatile organics and metals are discussed in the memos from Stuart Magoon and Steve Twiss (Appendix A), and are summarized below. All data for this project were found acceptable for use with the following caveats. Acetone and methylene chloride were found in the transfer blank at concentrations of 320 μg/L and 120 μg/L, respectively. Numerical values for acetone and methylene chloride were taken from an analysis that was performed at a secondary dilution. Estimated concentrations of acetone and methylene chloride were also detected in the laboratory method blanks, but at concentrations below the detection limit. The presence of these compounds in the method blanks is attributed to decontamination procedures, and to a lesser extent, laboratory contamination.

Trace amounts of calcium, magnesium, and sodium were detected in the metals method blank. Sample results less than ten times the blank value are flagged with a "B". Sodium results are flagged as estimates "E" due to the presence of interferences indicated by the relative percent difference (%RPD) of serial dilution results being greater than 10%. Results flagged with a "J" (Table 3) indicate the observed concentration lies between the instrumental detection limit and the practical quantitation limit.

Overall, precision (sampling and laboratory) calculated from detected values in blind duplicate samples was excellent ($\pm$5%) for all analysis; organics, conventionals, and metals; with the exception of zinc (42%). All matrix spike and spike duplicate recoveries for volatile organics and metals were within the acceptable limits of $\pm$25%.

RESULTS

Sample analytical results are presented in Appendix A. Data were managed using the ENVIS database software package. Tables 3 and 4 are summaries of contaminants found during Sampling Round I conducted on January 7-9, 1991.

Volatile Organics

Volatile organics results are listed in Table 3. Tetrachloroethylene (PERC), trichloroethylene (TCE), and 1,2-dichloroethylene (1,2-DCE) were detected primarily in the main plume. Maximum concentrations of these compounds were detected in wells MW-20B (1100 ppb, 18 ppb, and 33 ppb), and MW-16A (29 ppb, 1 ppb, and 2.4 ppb). Traces of PERC and 1,2-DCE were detected in wells MW-20A, MW-21, MW-31, and MW-32, all of which were at or near the detection limit and reported as estimated values. Trans-1,2-dichloroethene and 1,1,1-trichloroethane were also detected as estimated values below the detection limit in well MW-20B.

Conventional Constituents and Metals

Water quality results for conventionals and metals samples collected from MW-16A and MW-32 are shown in Table 4. Maximum observed concentrations for both conventionals and metals were consistently observed in well MW-16A, and are as follows: total dissolved solids

Table 3: Summary of Analytes Detected in Samples Collected During January 1991

	Main Plume								Uncaptured Plume		MAFB
	MW-16A	MW-16B*	MW-20A	MW-20A**	MW-20B	MW-21	MW-27	MW-31	MW-32	MW-41	MW-40
Volatile Organics: (ug/l)											
Tetrachloroethylene (PERC)	28	29	1.0U	1.8J	1100D	2.1J	1.0U	1J	1J	1.0U	1.0U
Trichloroethylene (TCE)	1J	1J	1.0U	1.0U	18	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U
1,2-Dichloroethylene (1,2-DCE)	2.4J	2.4J	1.0U	1.0U	33	1J	1.0U	1.9J	1.1J	1.0U	1.0U
Trans-1,2-Dichloroethene	1.0U	1.0U	1.0U	1.0U	0.5J	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U
1,1,1-Trichloroethane	1.0U	1.0U	1.0U	1.0U	0.4J	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U

* = Duplicate
** = Replicate
U = Not detected at detection limit shown
D = Analysis performed at secondary dilution
J = Observed concentration between instrumental detection limit and practical quantitation limit

Table 4: Summary of Sampling Results Collected During January 1991

	Main Plume		Uncaptured Plume
	MW-16A	MW-16B*	MW-32
Indicator Parameters: (mg/l)			
TDS	149	143	129
Hardness	94.3	95.8	84.8
NO2-NO3	2.24	2.23	2.06
Major Anions: (mg/l)			
Chloride	6.64	6.43	6.58
Sulfate	12.99	12.7	9.79
Bicarbonate	83.3	82.2	73.6
Carbonate	1U	1U	1U
Trace Metals: (ug/l)			
Arsenic	30U	30U	30U
Barium	5.1J	5.0J	4.0J
Cadmium	2.0U	2.0U	2.0U
Calcium	22.5	22.4	20.4
Chromium	5.0U	5.0U	5.0U
Copper	2.2J	2.0U	2.0U
Iron	6.3J	2.0U	2.0U
Lead	20U	20U	20U
Magnesium	9.39	9.38	8.17B
Manganese	1.0U	1.0U	1.0U
Mercury	0.04U	0.04U	0.04U
Nickel	10U	10U	10U
Selenium	50U	50U	50U
Silver	2.0U	2.0U	2.0U
Sodium	7.95E	8.08E	6.96E
Zinc	14J	9.1J	8.3J

* = Duplicate
U = Not detected at detection limit shown
B = Detected in blank
E = Estimated value
J = Observed concentration between instrumental detection limit and practical quantitation limit

(149 mg/L), hardness (95.8 mg/L), nitrite/nitrate-N (2.24 mg/L), chloride (6.64 mg/L), sulfate (13 mg/L), and bicarbonate (83.3 mg/L), barium (5.1J μg/L), calcium (22.5 μg/L), copper (2.2J μg/L), iron (6.3J μg/L), magnesium (9.39 μg/L), sodium (8.1E μg/L), and zinc (14J μg/L).

DISCUSSION AND CONCLUSIONS

Volatile Organics

Concentrations of volatile organic contaminants found in the main plume are similar to past results. Appendix B presents concentrations of TCE and PERC measured in monitoring wells at the Lakewood site over the history of the project. The highest concentrations of PERC, TCE and 1,2-DCE were found in well MW-20B, with maximum concentrations of 1100 ppb, 18 ppb, and 33 ppb respectively. This well is close to Plaza Cleaners, is centrally located over the main plume, and is screened in the Vashon Till. Low concentrations of PERC, TCE, and 1,2-DCE were also detected in MW-16A with concentrations of 28 ppb, 1 ppb, and 2.4 ppb respectively. MW-16A is screened in the main aquifer below the more highly contaminated Vashon Till.

Although MW-16A is further from the source, the concentration of PERC and 1,2-DCE have consistently been higher in this well than that measured in MW-20A (See Figure 2). This may be due to the location of lenses of higher conductive material in the overlying contaminated Vashon Till that would allow downward migration of contaminants to the main aquifer.

Monitoring wells MW-41 and MW-32 were sampled to assess the quality of ground water in the uncaptured portion of the plume. PERC and 1,2-DCE were detected at low concentrations in MW-32 only.

One monitoring well, MW-40, was sampled to assess the quality of ground water leaving McChord AFB, and showed no detectable quantities of PERC, TCE, or 1,2-DCE. MW-19 was scheduled to be sampled during this round, but was not accessible due to vandalism of the wellhead.

Conventional Constituents and Metals

Water quality samples were collected from wells MW-16A and MW-32. Results for both conventionals and metals tended to be slightly higher in well MW-16A, located in the main plume, but were still well below state and federal drinking water criteria.

Nitrite/nitrate-N, chloride, and TDS results are similar to those found during the Clover/Chambers Creek Study (1985). Of the two wells sampled for metals analysis, barium, calcium, copper, iron, magnesium, sodium, and zinc were detected at low concentrations.

RECOMMENDATIONS

1. Continue to sample the wells in the main plume and the uncaptured plume on a semi-annual basis and the upgradient wells on an annual basis for volatile organics.

2. Sample MW-16A, MW-19A, and MW-32 for conventional and metals analysis during Round II.

REFERENCES

APHA, AWWA, WPCF. Standard Methods for the Examination of Water and Wastewater. 16th ed., Washington, D.C., 1985.

Brown and Caldwell. Clover/Chambers Creek Geohydrologic Study for Tacoma-Pierce County Health Department. July 1985.

CH2M Hill. Sampling and Analysis Plan Remedial Action Lakewood RA. April 1990.

EPA. Final Draft Remedial Investigation Report - Ponder's Corner, Washington. EPA 112-0L22, 1985.

EPA. Methods for Chemical Analysis of Water and Wastes. EMSL Cincinnati, Ohio, EPA 600/4-79-020, 1983.

Huntamer. Department of Ecology Laboratory Users Manual. 1986.

cc: Bill Yake
Nancy Winters

APPENDIX A

Analytical Results
Lakewood/Plaza Cleaners
January 7-9, 1991

State of Washington Department of Ecology
Manchester Environmental Laboratory
7411 Beach Drive East
Port Orchard WA 98366

Data Review
Feburary 1, 1991

Project: **Lakewood Plaza Cleaners**

Samples: 028080 028081 028082 028083 028084 028085 028086
028087 028088 028089 028091 028092 028093 028094

Laboratory: Alden Analytical Laboratories, Inc. 9101006/1

By: Stuart Magoon

Case Summary

These analyses were reviewed for qualitative and quantitative accuracy, validity, and usefulness. Specific methods used and problems incurred during the analysis are detailed in the Case Narrative and will not be addressed here. Specific problems with the QC will be noted and referenced to the Case Narrative.

There is no need to assimilate the "dilution factor" or "sample wt/vol" into the final values reported; these calculations have already been figured into the reported values.

DATA QUALIFIER DEFINITIONS

< - The material was analyzed for but was not detected, this means that the compound is not present in the sample at or above the reported level.

J - The associated numerical value is an estimated quantity.

UJ - The material was analyzed for, but is not present above the reported estimated value.

D - The associated numerical value was taken from an analysis that was performed at a secondary dilution.

Volatile Organic Analysis of water samples

Sample	Date Collect	Date Man Lab Rec'd	Date Cntr Lab Rec'd	Date Extd	Date anlz	#Days Collect to anal
028080	1/7	1/10	1/11	NA	1/15	8 of 14
028081	1/7	1/10	1/11	NA	1/15	8 of 14
028082	1/8	1/10	1/11	NA	1/15	7 of 14
028083	1/8	1/10	1/11	NA	1/15	7 of 14
028084	1/8	1/10	1/11	NA	1/16	7 of 14
028085	1/8	1/10	1/11	NA	1/15	7 of 14
028086	1/9	1/10	1/11	NA	1/16	7 of 14
028087	1/9	1/10	1/11	NA	1/16	7 of 14
028088	1/9	1/10	1/11	NA	1/16	7 of 14
028089	1/9	1/10	1/11	NA	1/16	7 of 14
028090	1/9	1/10	1/11	NA	1/16	7 of 14
028091	1/9	1/10	1/11	NA	1/16	7 of 14
028092	1/9	1/10	1/11	NA	1/15	6 of 14
028093	1/9	1/10	1/11	NA	1/15	6 of 14
028094	1/9	1/10	1/11	NA	*	

All these samples were analyzed within the Recommended SW-846 holding times.
* This sample suffered a laboratory accident, no sample remained for analysis.

Surrogates:

Surrogate recoveries for these samples, the matrix spikes, and the method blanks are reasonable, acceptable, and within laboratory QC limits.

Matrix Spike/Matrix Spike Duplicate (MS/MSD):

Matrix spike/spike duplicate recovery and precision data are acceptable and within QC limits. Note no QC limits were provided for the relative percent difference (RPD) between MS and MSD recoveries.

Sample Data:

This data is acceptable for use with the additional qualifiers were appropriate.
Note that I have changed several "<" results to a new value with a "UJ" qualifier. Compounds that have a "UJ" qualifier were detected at the value given, but are considered not present above the estimated value given. The detection of these ("UJ" qualified) compounds is most likely due to contamination and not native to the samples.
The Transfer blank contained high levels of Acetone and Methylene Chloride. The Transport and laboratory method blanks also contained small amounts of Methylene Chloride and Acetone. Detection of these compounds in the samples may be due mostly to field contamination and/or to a lesser extent laboratory contamination.
None of the samples contained levels of Acetone or Methylene Chloride that indicate the presence of these two analytes is native to the samples.

Rec'd 1/24/91 SM

Alden Analytical
Laboratories, Inc.

January 22, 1991

WA. State Depart. of Ecology
Attn: Stuart Magoon
P.O. Box 307
Manchester, WA 98353

IN RE: ALDEN PROJECT NUMBER 9101006/1

Dear Mr. Magoon:

I have enclosed the analytical results for the water samples submitted to Alden on January 11, 1990. The sample were analyzed for VOAs using Method 8240.

The samples were received in good condition and the analyses were performed with no complications. There were no TICs found.

If you have any questions please feel free to contact me.

Sincerely,

John M. Buerger
Lab Manager

Enclosures

1001 SW Klickitat Way
Seattle, WA 98134
Telephone (206) 623-3660
Facsimile (206) 624-8778

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology
Client Sample Number: N/A
Date of Sample Receipt: N/A
Date of Sample Extraction: N/A
Date of Sample Analysis: 1/15/91

Alden Job Number: 9101006/1
Alden Sample Number: Blank 1
Analysis Method: EPA 8240
Matrix: Water
Reporting Units: ug/L

Compound Name	CAS No.	Reporting Limit	Result
Acetone	67-64-1	10	~~<10~~ 6 J
Benzene	71-43-2	1.0	< 1.0
Bromodichloromethane	75-27-4	1.0	< 1.0
Bromoform	75-25-2	1.0	< 1.0
Bromomethane	74-83-9	1.0	< 1.0
2-Butanone	78-93-3	10	~~<10~~ 2 J
Carbon disulfide	75-15-0	1.0	< 1.0
Carbon tetrachloride	56-23-5	1.0	< 1.0
Chlorobenzene	108-90-7	1.0	< 1.0
Chloroethane	75-00-3	1.0	< 1.0
Chloroform	67-66-3	1.0	< 1.0
Chloromethane	74-87-3	1.0	< 1.0
Dibromochloromethane	124-48-1	1.0	< 1.0
1,2-Dichlorobenzene	95-50-1	1.0	< 1.0
1,3-Dichlorobenzene	541-73-1	1.0	< 1.0
1,4-Dichlorobenzene	106-46-7	1.0	< 1.0
1,1-Dichloroethane	75-34-3	1.0	< 1.0
1,2-Dichloroethane	107-06-2	1.0	< 1.0
1,1-Dichloroethene	75-35-4	1.0	< 1.0
cis-1,2-Dichloroethene	156-60-5	1.0	< 1.0
trans-1,2-Dichloroethene	156-60-5	1.0	< 1.0
1,2-Dichloropropane	78-87-5	1.0	< 1.0
cis-1,3-Dichloropropene	10061-01-5	1.0	< 1.0
trans-1,3-Dichloropropene	10061-02-6	1.0	< 1.0
Ethylbenzene	100-41-4	1.0	< 1.0
2-Hexanone	591-78-6	10	< 10
Methylene chloride	75-09-2	5.0	~~<5.0~~ 2 J
4-Methyl-2-Pentanone	108-10-1	10	~~<10~~ 1 J
Styrene	100-42-5	1.0	< 1.0
1,1,2,2-Tetrachloroethane	79-34-5	1.0	< 1.0
Tetrachlorethene	127-18-4	1.0	< 1.0
Toluene	108-88-3	1.0	< 1.0
1,1,1-Trichloroethane	71-55-6	1.0	< 1.0
1,1,2-Trichloroethane	79-00-5	1.0	< 1.0
Trichloroethene	79-01-6	1.0	< 1.0
Trichlorofluoromethane	75-69-4	10	< 10
Vinyl acetate	108-05-4	10	< 10
Vinyl chloride	75-01-4	1.0	< 1.0
o-Xylene	1330-20-7	1.0	< 1.0
m,p-Xylene*	1330-20-7	1.0	< 1.0

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology	Alden Job Number: 9101006/1
Client Sample Number: N/A	Alden Sample Number: Blank 1
Date of Sample Receipt: N/A	Analysis Method: EPA 8240
Date of Sample Extraction: N/A	Matrix: Water
Date of Sample Analysis: 1/15/91	Reporting Units: ug/L

Surrogate	Amount Added	Percent Recovery	Recovery Limits
1,2-Dichloroethane-d_4	250 ng	110	86-115
Toluene-d_8	250 ng	110	76-114
Bromofluorobenzene	250 ng	95	88-110

* m-Xylene and p-xylene cannot be separated and are reported here as a total of the two isomers.

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology
Client Sample Number: 028080 = mw-40
Date of Sample Receipt: 1/11/91
Date of Sample Extraction: N/A
Date of Sample Analysis: 1/15/91

Alden Job Number: 9101006/1
Alden Sample Number: 6067A
Analysis Method: EPA 8240
Matrix: Water
Reporting Units: ug/L

Compound Name	CAS No.	Reporting Limit	Result
Acetone	67-64-1	10	< 10
Benzene	71-43-2	1.0	< 1.0
Bromodichloromethane	75-27-4	1.0	< 1.0
Bromoform	75-25-2	1.0	< 1.0
Bromomethane	74-83-9	1.0	< 1.0
2-Butanone	78-93-3	10	< 10
Carbon disulfide	75-15-0	1.0	< 1.0
Carbon tetrachloride	56-23-5	1.0	< 1.0
Chlorobenzene	108-90-7	1.0	< 1.0
Chloroethane	75-00-3	1.0	< 1.0
Chloroform	67-66-3	1.0	< 1.0
Chloromethane	74-87-3	1.0	< 1.0
Dibromochloromethane	124-48-1	1.0	< 1.0
1,2-Dichlorobenzene	95-50-1	1.0	< 1.0
1,3-Dichlorobenzene	541-73-1	1.0	< 1.0
1,4-Dichlorobenzene	106-46-7	1.0	< 1.0
1,1-Dichloroethane	75-34-3	1.0	< 1.0
1,2-Dichloroethane	107-06-2	1.0	< 1.0
1,1-Dichloroethene	75-35-4	1.0	< 1.0
cis-1,2-Dichloroethene	156-60-5	1.0	< 1.0
trans-1,2-Dichloroethene	156-60-5	1.0	< 1.0
1,2-Dichloropropane	78-87-5	1.0	< 1.0
cis-1,3-Dichloropropene	10061-01-5	1.0	< 1.0
trans-1,3-Dichloropropene	10061-02-6	1.0	< 1.0
Ethylbenzene	100-41-4	1.0	< 1.0
2-Hexanone	591-78-6	10	< 10
Methylene chloride	75-09-2	5.0	< 5.0
4-Methyl-2-Pentanone	108-10-1	10	< 10
Styrene	100-42-5	1.0	< 1.0
1,1,2,2-Tetrachloroethane	79-34-5	1.0	< 1.0
Tetrachlorethene	127-18-4	1.0	< 1.0
Toluene	108-88-3	1.0	< 1.0
1,1,1-Trichloroethane	71-55-6	1.0	< 1.0
1,1,2-Trichloroethane	79-00-5	1.0	< 1.0
Trichloroethene	79-01-6	1.0	< 1.0
Trichlorofluoromethane	75-69-4	10	< 10
Vinyl acetate	108-05-4	10	< 10
Vinyl chloride	75-01-4	1.0	< 1.0
o-Xylene	1330-20-7	1.0	< 1.0
m,p-Xylene*	1330-20-7	1.0	< 1.0

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology	Alden Job Number: 9101006/1
Client Sample Number: 028080	Alden Sample Number: 6067A
Date of Sample Receipt: 1/11/91	Analysis Method: EPA 8240
Date of Sample Extraction: N/A	Matrix: Water
Date of Sample Analysis: 1/15/91	Reporting Units: ug/L

Surrogate	Amount Added	Percent Recovery	Recovery Limits
1,2-Dichloroethane-d_4	250 ng	~~110~~ 114	86-115
Toluene-d_8	250 ng	~~110~~ 107	76-114
Bromofluorobenzene	250 ng	95	88-110

* m-Xylene and p-xylene cannot be separated and are reported here as a total of the two isomers.

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology
Client Sample Number: 028082 : mw-41
Date of Sample Receipt: 1/11/91
Date of Sample Extraction: N/A
Date of Sample Analysis: 1/15/91

Alden Job Number: 9101006/1
Alden Sample Number: 6068A
Analysis Method: EPA 8240
Matrix: Water
Reporting Units: ug/L

Compound Name	CAS No.	Reporting Limit	Result
Acetone	67-64-1	10	< 10
Benzene	71-43-2	1.0	< 1.0
Bromodichloromethane	75-27-4	1.0	< 1.0
Bromoform	75-25-2	1.0	< 1.0
Bromomethane	74-83-9	1.0	< 1.0
2-Butanone	78-93-3	10	< 10
Carbon disulfide	75-15-0	1.0	< 1.0
Carbon tetrachloride	56-23-5	1.0	< 1.0
Chlorobenzene	108-90-7	1.0	< 1.0
Chloroethane	75-00-3	1.0	< 1.0
Chloroform	67-66-3	1.0	< 1.0
Chloromethane	74-87-3	1.0	< 1.0
Dibromochloromethane	124-48-1	1.0	< 1.0
1,2-Dichlorobenzene	95-50-1	1.0	< 1.0
1,3-Dichlorobenzene	541-73-1	1.0	< 1.0
1,4-Dichlorobenzene	106-46-7	1.0	< 1.0
1,1-Dichloroethane	75-34-3	1.0	< 1.0
1,2-Dichloroethane	107-06-2	1.0	< 1.0
1,1-Dichloroethene	75-35-4	1.0	< 1.0
cis-1,2-Dichloroethene	156-60-5	1.0	< 1.0
trans-1,2-Dichloroethene	156-60-5	1.0	< 1.0
1,2-Dichloropropane	78-87-5	1.0	< 1.0
cis-1,3-Dichloropropene	10061-01-5	1.0	< 1.0
trans-1,3-Dichloropropene	10061-02-6	1.0	< 1.0
Ethylbenzene	100-41-4	1.0	< 1.0
2-Hexanone	591-78-6	10	< 10
Methylene chloride	75-09-2	5.0	< 5.0
4-Methyl-2-Pentanone	108-10-1	10	< 10
Styrene	100-42-5	1.0	< 1.0
1,1,2,2-Tetrachloroethane	79-34-5	1.0	< 1.0
Tetrachlorethene	127-18-4	1.0	< 1.0
Toluene	108-88-3	1.0	< 1.0
1,1,1-Trichloroethane	71-55-6	1.0	< 1.0
1,1,2-Trichloroethane	79-00-5	1.0	< 1.0
Trichloroethene	79-01-6	1.0	< 1.0
Trichlorofluoromethane	75-69-4	10	< 10
Vinyl acetate	108-05-4	10	< 10
Vinyl chloride	75-01-4	1.0	< 1.0
o-Xylene	1330-20-7	1.0	< 1.0
m,p-Xylene*	1330-20-7	1.0	< 1.0

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology	Alden Job Number: 9101006/1
Client Sample Number: 028082	Alden Sample Number: 6068A
Date of Sample Receipt: 1/11/91	Analysis Method: EPA 8240
Date of Sample Extraction: N/A	Matrix: Water
Date of Sample Analysis: 1/15/91	Reporting Units: ug/L

Surrogate	Amount Added	Percent Recovery	Recovery Limits
1,2-Dichloroethane-d_4	250 ng	110	86-115
Toluene-d_8	250 ng	~~100~~ 104	76-114
Bromofluorobenzene	250 ng	93	88-110

* m-Xylene and p-xylene cannot be separated and are reported here as a total of the two isomers.

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology	Alden Job Number: 9101006/1
Client Sample Number: 028083 (mw-31)	Alden Sample Number: 6069A
Date of Sample Receipt: 1/11/91	Analysis Method: EPA 8240
Date of Sample Extraction: N/A	Matrix: Water
Date of Sample Analysis: 1/15/91	Reporting Units: ug/L

Compound Name	CAS No.	Reporting Limit	Result
Acetone	67-64-1	10	11 UJ
Benzene	71-43-2	1.0	< 1.0
Bromodichloromethane	75-27-4	1.0	< 1.0
Bromoform	75-25-2	1.0	< 1.0
Bromomethane	74-83-9	1.0	< 1.0
2-Butanone	78-93-3	10	< 10
Carbon disulfide	75-15-0	1.0	< 1.0
Carbon tetrachloride	56-23-5	1.0	< 1.0
Chlorobenzene	108-90-7	1.0	< 1.0
Chloroethane	75-00-3	1.0	< 1.0
Chloroform	67-66-3	1.0	< 1.0
Chloromethane	74-87-3	1.0	< 1.0
Dibromochloromethane	124-48-1	1.0	< 1.0
1,2-Dichlorobenzene	95-50-1	1.0	< 1.0
1,3-Dichlorobenzene	541-73-1	1.0	< 1.0
1,4-Dichlorobenzene	106-46-7	1.0	< 1.0
1,1-Dichloroethane	75-34-3	1.0	< 1.0
1,2-Dichloroethane	107-06-2	1.0	< 1.0
1,1-Dichloroethene	75-35-4	1.0	< 1.0
cis-1,2-Dichloroethene	156-60-5	1.0	1.9 J
trans-1,2-Dichloroethene	156-60-5	1.0	< 1.0
1,2-Dichloropropane	78-87-5	1.0	< 1.0
cis-1,3-Dichloropropene	10061-01-5	1.0	< 1.0
trans-1,3-Dichloropropene	10061-02-6	1.0	< 1.0
Ethylbenzene	100-41-4	1.0	< 1.0
2-Hexanone	591-78-6	10	< 10
Methylene chloride	75-09-2	5.0	< 5.0
4-Methyl-2-Pentanone	108-10-1	10	< 10
Styrene	100-42-5	1.0	< 1.0
1,1,2,2-Tetrachloroethane	79-34-5	1.0	< 1.0
Tetrachlorethene	127-18-4	1.0	~~< 1.0~~ 1 J
Toluene	108-88-3	1.0	< 1.0
1,1,1-Trichloroethane	71-55-6	1.0	< 1.0
1,1,2-Trichloroethane	79-00-5	1.0	< 1.0
Trichloroethene	79-01-6	1.0	< 1.0
Trichlorofluoromethane	75-69-4	10	< 10
Vinyl acetate	108-05-4	10	< 10
Vinyl chloride	75-01-4	1.0	< 1.0
o-Xylene	1330-20-7	1.0	< 1.0
m,p-Xylene*	1330-20-7	1.0	< 1.0

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology	Alden Job Number: 9101006/1
Client Sample Number: 028083	Alden Sample Number: 6069A
Date of Sample Receipt: 1/11/91	Analysis Method: EPA 8240
Date of Sample Extraction: N/A	Matrix: Water
Date of Sample Analysis: 1/15/91	Reporting Units: ug/L

Surrogate	Amount Added	Percent Recovery	Recovery Limits
1,2-Dichloroethane-d_4	250 ng	~~110~~ 103	86-115
Toluene-d_8	250 ng	~~100~~ 102	76-114
Bromofluorobenzene	250 ng	91	88-110

* m-Xylene and p-xylene cannot be separated and are reported here as a total of the two isomers.

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology
Client Sample Number: 028085 (mw-20A)
Date of Sample Receipt: 1/11/91
Date of Sample Extraction: N/A
Date of Sample Analysis: 1/15/91

Alden Job Number: 9101006/1
Alden Sample Number: 6071A
Analysis Method: EPA 8240
Matrix: Water
Reporting Units: ug/L

Compound Name	CAS No.	Reporting Limit	Result
Acetone	67-64-1	10	< 10
Benzene	71-43-2	1.0	< 1.0
Bromodichloromethane	75-27-4	1.0	< 1.0
Bromoform	75-25-2	1.0	< 1.0
Bromomethane	74-83-9	1.0	< 1.0
2-Butanone	78-93-3	10	< 10
Carbon disulfide	75-15-0	1.0	< 1.0
Carbon tetrachloride	56-23-5	1.0	< 1.0
Chlorobenzene	108-90-7	1.0	< 1.0
Chloroethane	75-00-3	1.0	< 1.0
Chloroform	67-66-3	1.0	< 1.0
Chloromethane	74-87-3	1.0	< 1.0
Dibromochloromethane	124-48-1	1.0	< 1.0
1,2-Dichlorobenzene	95-50-1	1.0	< 1.0
1,3-Dichlorobenzene	541-73-1	1.0	< 1.0
1,4-Dichlorobenzene	106-46-7	1.0	< 1.0
1,1-Dichloroethane	75-34-3	1.0	< 1.0
1,2-Dichloroethane	107-06-2	1.0	< 1.0
1,1-Dichloroethene	75-35-4	1.0	< 1.0
cis-1,2-Dichloroethene	156-60-5	1.0	< 1.0
trans-1,2-Dichloroethene	156-60-5	1.0	< 1.0
1,2-Dichloropropane	78-87-5	1.0	< 1.0
cis-1,3-Dichloropropene	10061-01-5	1.0	< 1.0
trans-1,3-Dichloropropene	10061-02-6	1.0	< 1.0
Ethylbenzene	100-41-4	1.0	< 1.0
2-Hexanone	591-78-6	10	< 10
Methylene chloride	75-09-2	5.0	< 5.0
4-Methyl-2-Pentanone	108-10-1	10	< 10
Styrene	100-42-5	1.0	< 1.0
1,1,2,2-Tetrachloroethane	79-34-5	1.0	< 1.0
Tetrachlorethene	127-18-4	1.0	< 1.0
Toluene	108-88-3	1.0	< 1.0
1,1,1-Trichloroethane	71-55-6	1.0	< 1.0
1,1,2-Trichloroethane	79-00-5	1.0	< 1.0
Trichloroethene	79-01-6	1.0	< 1.0
Trichlorofluoromethane	75-69-4	10	< 10
Vinyl acetate	108-05-4	10	< 10
Vinyl chloride	75-01-4	1.0	< 1.0
o-Xylene	1330-20-7	1.0	< 1.0
m,p-Xylene*	1330-20-7	1.0	< 1.0

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology	Alden Job Number: 9101006/1
Client Sample Number: 028085	Alden Sample Number: 6071A
Date of Sample Receipt: 1/11/91	Analysis Method: EPA 8240
Date of Sample Extraction: N/A	Matrix: Water
Date of Sample Analysis: 1/15/91	Reporting Units: ug/L

Surrogate	Amount Added	Percent Recovery	Recovery Limits
1,2-Dichloroethane-d_4	250 ng	~~110~~ 113	86-115
Toluene-d_8	250 ng	~~110~~ 102	76-114
Bromofluorobenzene	250 ng	96	88-110

* m-Xylene and p-xylene cannot be separated and are reported here as a total of the two isomers.

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology
Client Sample Number: 028092 (TRANSPORT)
Date of Sample Receipt: 1/11/91
Date of Sample Extraction: N/A
Date of Sample Analysis: 1/15/91

Alden Job Number: 9101006/1
Alden Sample Number: 6078A
Analysis Method: EPA 8240
Matrix: Water
Reporting Units: ug/L

Compound Name	CAS No.	Reporting Limit	Result
Acetone	67-64-1	10	< 10
Benzene	71-43-2	1.0	< 1.0
Bromodichloromethane	75-27-4	1.0	< 1.0
Bromoform	75-25-2	1.0	< 1.0
Bromomethane	74-83-9	1.0	< 1.0
2-Butanone	78-93-3	10	< 10
Carbon disulfide	75-15-0	1.0	< 1.0
Carbon tetrachloride	56-23-5	1.0	< 1.0
Chlorobenzene	108-90-7	1.0	< 1.0
Chloroethane	75-00-3	1.0	< 1.0
Chloroform	67-66-3	1.0	< 1.0
Chloromethane	74-87-3	1.0	< 1.0
Dibromochloromethane	124-48-1	1.0	< 1.0
1,2-Dichlorobenzene	95-50-1	1.0	< 1.0
1,3-Dichlorobenzene	541-73-1	1.0	< 1.0
1,4-Dichlorobenzene	106-46-7	1.0	< 1.0
1,1-Dichloroethane	75-34-3	1.0	< 1.0
1,2-Dichloroethane	107-06-2	1.0	< 1.0
1,1-Dichloroethene	75-35-4	1.0	< 1.0
cis-1,2-Dichloroethene	156-60-5	1.0	< 1.0
trans-1,2-Dichloroethene	156-60-5	1.0	< 1.0
1,2-Dichloropropane	78-87-5	1.0	< 1.0
cis-1,3-Dichloropropene	10061-01-5	1.0	< 1.0
trans-1,3-Dichloropropene	10061-02-6	1.0	< 1.0
Ethylbenzene	100-41-4	1.0	< 1.0
2-Hexanone	591-78-6	10	< 10
Methylene chloride	75-09-2	5.0	< 5.0
4-Methyl-2-Pentanone	108-10-1	10	< 10
Styrene	100-42-5	1.0	< 1.0
1,1,2,2-Tetrachloroethane	79-34-5	1.0	< 1.0
Tetrachlorethene	127-18-4	1.0	< 1.0
Toluene	108-88-3	1.0	< 1.0
1,1,1-Trichloroethane	71-55-6	1.0	< 1.0
1,1,2-Trichloroethane	79-00-5	1.0	< 1.0
Trichloroethene	79-01-6	1.0	< 1.0
Trichlorofluoromethane	75-69-4	10	< 10
Vinyl acetate	108-05-4	10	< 10
Vinyl chloride	75-01-4	1.0	< 1.0
o-Xylene	1330-20-7	1.0	< 1.0
m,p-Xylene*	1330-20-7	1.0	< 1.0

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology	Alden Job Number: 9101006/1
Client Sample Number: 028092	Alden Sample Number: 6078A
Date of Sample Receipt: 1/11/91	Analysis Method: EPA 8240
Date of Sample Extraction: N/A	Matrix: Water
Date of Sample Analysis: 1/15/91	Reporting Units: ug/L

Surrogate	Amount Added	Percent Recovery	Recovery Limits
1,2-Dichloroethane-d_4	250 ng	~~110~~ 103	86-115
Toluene-d_8	250 ng	~~100~~ 101	76-114
Bromofluorobenzene	250 ng	91	88-110

* m-Xylene and p-xylene cannot be separated and are reported here as a total of the two isomers.

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology
Client Sample Number: 028092
Date of Sample Receipt: 1/11/91
Date of Sample Extraction: N/A
Date of Sample Analysis: 1/15/91

Alden Job Number: 9101006/1
Alden Sample Number: 6078A
Analysis Method: EPA 8240
Matrix: Water
Reporting Units: ug/L

Surrogate	Amount Added	Percent Recovery	Recovery Limits
1,2-Dichloroethane-d_4	250 ng	~~110~~	86-115
Toluene-d_8	250 ng	~~100~~	76-114
Bromofluorobenzene	250 ng	91	88-110

* m-Xylene and p-xylene cannot be separated and are reported here as a total of the two isomers.

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology
Client Sample Number: 028093 (TRANSFER)
Date of Sample Receipt: 1/11/91
Date of Sample Extraction: N/A
Date of Sample Analysis: 1/15/91 1/13/91

Alden Job Number: 9101006/1
Alden Sample Number: 6079A
Analysis Method: EPA 8240
Matrix: Water
Reporting Units: ug/L

Compound Name	CAS No.	Reporting Limit	Result
Acetone	67-64-1	20	320 D
Benzene	71-43-2	1.0	< 1.0
Bromodichloromethane	75-27-4	1.0	< 1.0
Bromoform	75-25-2	1.0	< 1.0
Bromomethane	74-83-9	1.0	< 1.0
2-Butanone	78-93-3	10	< 10
Carbon disulfide	75-15-0	1.0	< 1.0
Carbon tetrachloride	56-23-5	1.0	< 1.0
Chlorobenzene	108-90-7	1.0	< 1.0
Chloroethane	75-00-3	1.0	< 1.0
Chloroform	67-66-3	1.0	< 1.0
Chloromethane	74-87-3	1.0	< 1.0
Dibromochloromethane	124-48-1	1.0	< 1.0
1,2-Dichlorobenzene	95-50-1	1.0	< 1.0
1,3-Dichlorobenzene	541-73-1	1.0	< 1.0
1,4-Dichlorobenzene	106-46-7	1.0	< 1.0
1,1-Dichloroethane	75-34-3	1.0	< 1.0
1,2-Dichloroethane	107-06-2	1.0	< 1.0
1,1-Dichloroethene	75-35-4	1.0	< 1.0
cis-1,2-Dichloroethene	156-60-5	1.0	< 1.0
trans-1,2-Dichloroethene	156-60-5	1.0	< 1.0
1,2-Dichloropropane	78-87-5	1.0	< 1.0
cis-1,3-Dichloropropene	10061-01-5	1.0	< 1.0
trans-1,3-Dichloropropene	10061-02-6	1.0	< 1.0
Ethylbenzene	100-41-4	1.0	< 1.0
2-Hexanone	591-78-6	10	< 10
Methylene chloride	75-09-2	5.0	120 D
4-Methyl-2-Pentanone	108-10-1	10	< 10
Styrene	100-42-5	1.0	< 1.0
1,1,2,2-Tetrachloroethane	79-34-5	1.0	< 1.0
Tetrachlorethene	127-18-4	1.0	< 1.0
Toluene	108-88-3	1.0	< 1.0
1,1,1-Trichloroethane	71-55-6	1.0	< 1.0
1,1,2-Trichloroethane	79-00-5	1.0	< 1.0
Trichloroethene	79-01-6	1.0	< 1.0
Trichlorofluoromethane	75-69-4	10	< 10
Vinyl acetate	108-05-4	10	< 10
Vinyl chloride	75-01-4	1.0	< 1.0
o-Xylene	1330-20-7	1.0	< 1.0
m,p-Xylene*	1330-20-7	1.0	< 1.0

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology	Alden Job Number: 9101006/1
Client Sample Number: 028093	Alden Sample Number: 6079A
Date of Sample Receipt: 1/11/91	Analysis Method: EPA 8240
Date of Sample Extraction: N/A	Matrix: Water
Date of Sample Analysis: 1/15/91	Reporting Units: ug/L

Surrogate	Amount Added	Percent Recovery	Recovery Limits
1,2-Dichloroethane-d_4	250 ng	110	86-115
Toluene-d_8	250 ng	100	76-114
Bromofluorobenzene	250 ng	90	88-110

* m-Xylene and p-xylene cannot be separated and are reported here as a total of the two isomers.

These surrogate recoveries apply to the "D" qualified analytes only.

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology
Client Sample Number: N/A
Date of Sample Receipt: N/A
Date of Sample Extraction: N/A
Date of Sample Analysis: 1/16/91

Alden Job Number: 9101006/1
Alden Sample Number: Blank 2
Analysis Method: EPA 8240
Matrix: Water
Reporting Units: ug/L

Compound Name	CAS No.	Reporting Limit	Result
Acetone	67-64-1	10	~~<10~~ 5 J
Benzene	71-43-2	1.0	< 1.0
Bromodichloromethane	75-27-4	1.0	< 1.0
Bromoform	75-25-2	1.0	< 1.0
Bromomethane	74-83-9	1.0	< 1.0
2-Butanone	78-93-3	10	~~<10~~ 1 J
Carbon disulfide	75-15-0	1.0	< 1.0
Carbon tetrachloride	56-23-5	1.0	< 1.0
Chlorobenzene	108-90-7	1.0	< 1.0
Chloroethane	75-00-3	1.0	< 1.0
Chloroform	67-66-3	1.0	< 1.0
Chloromethane	74-87-3	1.0	< 1.0
Dibromochloromethane	124-48-1	1.0	< 1.0
1,2-Dichlorobenzene	95-50-1	1.0	< 1.0
1,3-Dichlorobenzene	541-73-1	1.0	< 1.0
1,4-Dichlorobenzene	106-46-7	1.0	< 1.0
1,1-Dichloroethane	75-34-3	1.0	< 1.0
1,2-Dichloroethane	107-06-2	1.0	< 1.0
1,1-Dichloroethene	75-35-4	1.0	< 1.0
cis-1,2-Dichloroethene	156-60-5	1.0	< 1.0
trans-1,2-Dichloroethene	156-60-5	1.0	< 1.0
1,2-Dichloropropane	78-87-5	1.0	< 1.0
cis-1,3-Dichloropropene	10061-01-5	1.0	< 1.0
trans-1,3-Dichloropropene	10061-02-6	1.0	< 1.0
Ethylbenzene	100-41-4	1.0	< 1.0
2-Hexanone	591-78-6	10	< 10
Methylene chloride	75-09-2	5.0	~~<5.0~~ 3 J
4-Methyl-2-Pentanone	108-10-1	10	~~<10~~ 1 J
Styrene	100-42-5	1.0	< 1.0
1,1,2,2-Tetrachloroethane	79-34-5	1.0	< 1.0
Tetrachlorethene	127-18-4	1.0	< 1.0
Toluene	108-88-3	1.0	< 1.0
1,1,1-Trichloroethane	71-55-6	1.0	< 1.0
1,1,2-Trichloroethane	79-00-5	1.0	< 1.0
Trichloroethene	79-01-6	1.0	< 1.0
Trichlorofluoromethane	75-69-4	10	< 10
Vinyl acetate	108-05-4	10	< 10
Vinyl chloride	75-01-4	1.0	< 1.0
o-Xylene	1330-20-7	1.0	< 1.0
m,p-Xylene*	1330-20-7	1.0	< 1.0

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology	Alden Job Number: 9101006/1
Client Sample Number: N/A	Alden Sample Number: Blank 2
Date of Sample Receipt: N/A	Analysis Method: EPA 8240
Date of Sample Extraction: N/A	Matrix: Water
Date of Sample Analysis: 1/16/91	Reporting Units: ug/L

Surrogate	Amount Added	Percent Recovery	Recovery Limits
1,2-Dichloroethane-d_4	250 ng	110	86-115
Toluene-d_8	250 ng	~~100~~ 101	76-114
Bromofluorobenzene	250 ng	89	88-110

* m-Xylene and p-xylene cannot be separated and are reported here as a total of the two isomers.

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology
Client Sample Number: 028084 (mw-27)
Date of Sample Receipt: 1/11/91
Date of Sample Extraction: N/A
Date of Sample Analysis: 1/16/91

Alden Job Number: 9101006/1
Alden Sample Number: 6070A
Analysis Method: EPA 8240
Matrix: Water
Reporting Units: ug/L

Compound Name	CAS No.	Reporting Limit	Result
Acetone	67-64-1	10	< 10
Benzene	71-43-2	1.0	< 1.0
Bromodichloromethane	75-27-4	1.0	< 1.0
Bromoform	75-25-2	1.0	< 1.0
Bromomethane	74-83-9	1.0	< 1.0
2-Butanone	78-93-3	10	< 10
Carbon disulfide	75-15-0	1.0	< 1.0
Carbon tetrachloride	56-23-5	1.0	< 1.0
Chlorobenzene	108-90-7	1.0	< 1.0
Chloroethane	75-00-3	1.0	< 1.0
Chloroform	67-66-3	1.0	< 1.0
Chloromethane	74-87-3	1.0	< 1.0
Dibromochloromethane	124-48-1	1.0	< 1.0
1,2-Dichlorobenzene	95-50-1	1.0	< 1.0
1,3-Dichlorobenzene	541-73-1	1.0	< 1.0
1,4-Dichlorobenzene	106-46-7	1.0	< 1.0
1,1-Dichloroethane	75-34-3	1.0	< 1.0
1,2-Dichloroethane	107-06-2	1.0	< 1.0
1,1-Dichloroethene	75-35-4	1.0	< 1.0
cis-1,2-Dichloroethene	156-60-5	1.0	< 1.0
trans-1,2-Dichloroethene	156-60-5	1.0	< 1.0
1,2-Dichloropropane	78-87-5	1.0	< 1.0
cis-1,3-Dichloropropene	10061-01-5	1.0	< 1.0
trans-1,3-Dichloropropene	10061-02-6	1.0	< 1.0
Ethylbenzene	100-41-4	1.0	< 1.0
2-Hexanone	591-78-6	10	< 10
Methylene chloride	75-09-2	5.0	< 5.0
4-Methyl-2-Pentanone	108-10-1	10	< 10
Styrene	100-42-5	1.0	< 1.0
1,1,2,2-Tetrachloroethane	79-34-5	1.0	< 1.0
Tetrachlorethene	127-18-4	1.0	< 1.0
Toluene	108-88-3	1.0	< 1.0
1,1,1-Trichloroethane	71-55-6	1.0	< 1.0
1,1,2-Trichloroethane	79-00-5	1.0	< 1.0
Trichloroethene	79-01-6	1.0	< 1.0
Trichlorofluoromethane	75-69-4	10	< 10
Vinyl acetate	108-05-4	10	< 10
Vinyl chloride	75-01-4	1.0	< 1.0
o-Xylene	1330-20-7	1.0	< 1.0
m,p-Xylene*	1330-20-7	1.0	< 1.0

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology	Alden Job Number: 9101006/1
Client Sample Number: 028084	Alden Sample Number: 6070A
Date of Sample Receipt: 1/11/91	Analysis Method: EPA 8240
Date of Sample Extraction: N/A	Matrix: Water
Date of Sample Analysis: 1/16/91	*Reporting Units: ug/L*

Surrogate	Amount Added	Percent Recovery	Recovery Limits
1,2-Dichloroethane-d_4	250 ng	~~110~~ 114	86-115
Toluene-d_8	250 ng	110 / 107	76-114
Bromofluorobenzene	250 ng	94	88-110

* m-Xylene and p-xylene cannot be separated and are reported here as a total of the two isomers.

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology
Client Sample Number: 028086 (mw-21)
Date of Sample Receipt: 1/11/91
Date of Sample Extraction: N/A
Date of Sample Analysis: 1/16/91

Alden Job Number: 9101006/1
Alden Sample Number: 6072A
Analysis Method: EPA 8240
Matrix: Water
Reporting Units: ug/L

Compound Name	CAS No.	Reporting Limit	Result
Acetone	67-64-1	10	< 10
Benzene	71-43-2	1.0	< 1.0
Bromodichloromethane	75-27-4	1.0	< 1.0
Bromoform	75-25-2	1.0	< 1.0
Bromomethane	74-83-9	1.0	< 1.0
2-Butanone	78-93-3	10	< 10
Carbon disulfide	75-15-0	1.0	< 1.0
Carbon tetrachloride	56-23-5	1.0	< 1.0
Chlorobenzene	108-90-7	1.0	< 1.0
Chloroethane	75-00-3	1.0	< 1.0
Chloroform	67-66-3	1.0	< 1.0
Chloromethane	74-87-3	1.0	< 1.0
Dibromochloromethane	124-48-1	1.0	< 1.0
1,2-Dichlorobenzene	95-50-1	1.0	< 1.0
1,3-Dichlorobenzene	541-73-1	1.0	< 1.0
1,4-Dichlorobenzene	106-46-7	1.0	< 1.0
1,1-Dichloroethane	75-34-3	1.0	< 1.0
1,2-Dichloroethane	107-06-2	1.0	< 1.0
1,1-Dichloroethene	75-35-4	1.0	< 1.0
cis-1,2-Dichloroethene	156-60-5	1.0	~~< 1.0~~ / J
trans-1,2-Dichloroethene	156-60-5	1.0	< 1.0
1,2-Dichloropropane	78-87-5	1.0	< 1.0
cis-1,3-Dichloropropene	10061-01-5	1.0	< 1.0
trans-1,3-Dichloropropene	10061-02-6	1.0	< 1.0
Ethylbenzene	100-41-4	1.0	< 1.0
2-Hexanone	591-78-6	10	< 10
Methylene chloride	75-09-2	5.0	< 5.0
4-Methyl-2-Pentanone	108-10-1	10	< 10
Styrene	100-42-5	1.0	< 1.0
1,1,2,2-Tetrachloroethane	79-34-5	1.0	< 1.0
Tetrachlorethene	127-18-4	1.0	2.1 J
Toluene	108-88-3	1.0	< 1.0
1,1,1-Trichloroethane	71-55-6	1.0	< 1.0
1,1,2-Trichloroethane	79-00-5	1.0	< 1.0
Trichloroethene	79-01-6	1.0	< 1.0
Trichlorofluoromethane	75-69-4	10	< 10
Vinyl acetate	108-05-4	10	< 10
Vinyl chloride	75-01-4	1.0	< 1.0
o-Xylene	1330-20-7	1.0	< 1.0
m,p-Xylene*	1330-20-7	1.0	< 1.0

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology	Alden Job Number: 9101006/1
Client Sample Number: 028086	Alden Sample Number: 6072A
Date of Sample Receipt: 1/11/91	Analysis Method: EPA 8240
Date of Sample Extraction: N/A	Matrix: Water
Date of Sample Analysis: 1/16/91	Reporting Units: ug/L

Surrogate	Amount Added	Percent Recovery	Recovery Limits
1,2-Dichloroethane-d_4	250 ng	~~110~~ 112	86-115
Toluene-d_8	250 ng	~~100~~ 105	76-114
Bromofluorobenzene	250 ng	94	88-110

* m-Xylene and p-xylene cannot be separated and are reported here as a total of the two isomers.

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology
Client Sample Number: 028087 (mw-32)
Date of Sample Receipt: 1/11/91
Date of Sample Extraction: N/A
Date of Sample Analysis: 1/16/91

Alden Job Number: 9101006/1
Alden Sample Number: 6073A
Analysis Method: EPA 8240
Matrix: Water
Reporting Units: ug/L

Compound Name	CAS No.	Reporting Limit	Result
Acetone	67-64-1	10	< 10
Benzene	71-43-2	1.0	< 1.0
Bromodichloromethane	75-27-4	1.0	< 1.0
Bromoform	75-25-2	1.0	< 1.0
Bromomethane	74-83-9	1.0	< 1.0
2-Butanone	78-93-3	10	< 10
Carbon disulfide	75-15-0	1.0	< 1.0
Carbon tetrachloride	56-23-5	1.0	< 1.0
Chlorobenzene	108-90-7	1.0	< 1.0
Chloroethane	75-00-3	1.0	< 1.0
Chloroform	67-66-3	1.0	< 1.0
Chloromethane	74-87-3	1.0	< 1.0
Dibromochloromethane	124-48-1	1.0	< 1.0
1,2-Dichlorobenzene	95-50-1	1.0	< 1.0
1,3-Dichlorobenzene	541-73-1	1.0	< 1.0
1,4-Dichlorobenzene	106-46-7	1.0	< 1.0
1,1-Dichloroethane	75-34-3	1.0	< 1.0
1,2-Dichloroethane	107-06-2	1.0	< 1.0
1,1-Dichloroethene	75-35-4	1.0	< 1.0
cis-1,2-Dichloroethene	156-60-5	1.0	1.1 J
trans-1,2-Dichloroethene	156-60-5	1.0	< 1.0
1,2-Dichloropropane	78-87-5	1.0	< 1.0
cis-1,3-Dichloropropene	10061-01-5	1.0	< 1.0
trans-1,3-Dichloropropene	10061-02-6	1.0	< 1.0
Ethylbenzene	100-41-4	1.0	< 1.0
2-Hexanone	591-78-6	10	< 10
Methylene chloride	75-09-2	5.0	< 5.0
4-Methyl-2-Pentanone	108-10-1	10	< 10
Styrene	100-42-5	1.0	< 1.0
1,1,2,2-Tetrachloroethane	79-34-5	1.0	< 1.0
Tetrachlorethene	127-18-4	1.0	~~< 1.0~~ 1 J
Toluene	108-88-3	1.0	< 1.0
1,1,1-Trichloroethane	71-55-6	1.0	< 1.0
1,1,2-Trichloroethane	79-00-5	1.0	< 1.0
Trichloroethene	79-01-6	1.0	< 1.0
Trichlorofluoromethane	75-69-4	10	< 10
Vinyl acetate	108-05-4	10	< 10
Vinyl chloride	75-01-4	1.0	< 1.0
o-Xylene	1330-20-7	1.0	< 1.0
m,p-Xylene*	1330-20-7	1.0	< 1.0

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology	Alden Job Number: 9101006/1
Client Sample Number: 028087	Alden Sample Number: 6073A
Date of Sample Receipt: 1/11/91	Analysis Method: EPA 8240
Date of Sample Extraction: N/A	Matrix: Water
Date of Sample Analysis: 1/16/91	Reporting Units: ug/L

Surrogate	Amount Added	Percent Recovery	Recovery Limits
1,2-Dichloroethane-d_4	250 ng	~~110~~ 112	86-115
Toluene-d_8	250 ng	~~110~~ 104	76-114
Bromofluorobenzene	250 ng	96	88-110

* m-Xylene and p-xylene cannot be separated and are reported here as a total of the two isomers.

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology
Client Sample Number: 028088 (mw-16A)
Date of Sample Receipt: 1/11/91
Date of Sample Extraction: N/A
Date of Sample Analysis: 1/16/91

Alden Job Number: 9101006/1
Alden Sample Number: 6074A
Analysis Method: EPA 8240
Matrix: Water
Reporting Units: ug/L

Compound Name	CAS No.	Reporting Limit	Result
Acetone	67-64-1	10	< 10
Benzene	71-43-2	1.0	< 1.0
Bromodichloromethane	75-27-4	1.0	< 1.0
Bromoform	75-25-2	1.0	< 1.0
Bromomethane	74-83-9	1.0	< 1.0
2-Butanone	78-93-3	10	< 10
Carbon disulfide	75-15-0	1.0	< 1.0
Carbon tetrachloride	56-23-5	1.0	< 1.0
Chlorobenzene	108-90-7	1.0	< 1.0
Chloroethane	75-00-3	1.0	< 1.0
Chloroform	67-66-3	1.0	< 1.0
Chloromethane	74-87-3	1.0	< 1.0
Dibromochloromethane	124-48-1	1.0	< 1.0
1,2-Dichlorobenzene	95-50-1	1.0	< 1.0
1,3-Dichlorobenzene	541-73-1	1.0	< 1.0
1,4-Dichlorobenzene	106-46-7	1.0	< 1.0
1,1-Dichloroethane	75-34-3	1.0	< 1.0
1,2-Dichloroethane	107-06-2	1.0	< 1.0
1,1-Dichloroethene	75-35-4	1.0	< 1.0
cis-1,2-Dichloroethene	156-60-5	1.0	2.4 J
trans-1,2-Dichloroethene	156-60-5	1.0	< 1.0
1,2-Dichloropropane	78-87-5	1.0	< 1.0
cis-1,3-Dichloropropene	10061-01-5	1.0	< 1.0
trans-1,3-Dichloropropene	10061-02-6	1.0	< 1.0
Ethylbenzene	100-41-4	1.0	< 1.0
2-Hexanone	591-78-6	10	< 10
Methylene chloride	75-09-2	5.0	< 5.0
4-Methyl-2-Pentanone	108-10-1	10	< 10
Styrene	100-42-5	1.0	< 1.0
1,1,2,2-Tetrachloroethane	79-34-5	1.0	< 1.0
Tetrachlorethene	127-18-4	1.0	28
Toluene	108-88-3	1.0	< 1.0
1,1,1-Trichloroethane	71-55-6	1.0	< 1.0
1,1,2-Trichloroethane	79-00-5	1.0	< 1.0
Trichloroethene	79-01-6	1.0	~~< 1.0~~ 1 J
Trichlorofluoromethane	75-69-4	10	< 10
Vinyl acetate	108-05-4	10	< 10
Vinyl chloride	75-01-4	1.0	< 1.0
o-Xylene	1330-20-7	1.0	< 1.0
m,p-Xylene*	1330-20-7	1.0	< 1.0

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology	Alden Job Number: 9101006/1
Client Sample Number: 028088	Alden Sample Number: 6074A
Date of Sample Receipt: 1/11/91	Analysis Method: EPA 8240
Date of Sample Extraction: N/A	Matrix: Water
Date of Sample Analysis: 1/16/91	Reporting Units: ug/L

Surrogate	Amount Added	Percent Recovery	Recovery Limits
1,2-Dichloroethane-d_4	250 ng	110	86-115
Toluene-d_8	250 ng	~~100~~ 103	76-114
Bromofluorobenzene	250 ng	93	88-110

* m-Xylene and p-xylene cannot be separated and are reported here as a total of the two isomers.

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology
Client Sample Number: 028089 (mw-14B)
Date of Sample Receipt: 1/11/91
Date of Sample Extraction: N/A
Date of Sample Analysis: 1/16/91

Alden Job Number: 9101006/1
Alden Sample Number: 6075A
Analysis Method: EPA 8240
Matrix: Water
Reporting Units: ug/L

Compound Name	CAS No.	Reporting Limit	Result
Acetone	67-64-1	10	10 UJ
Benzene	71-43-2	1.0	< 1.0
Bromodichloromethane	75-27-4	1.0	< 1.0
Bromoform	75-25-2	1.0	< 1.0
Bromomethane	74-83-9	1.0	< 1.0
2-Butanone	78-93-3	10	< 10
Carbon disulfide	75-15-0	1.0	< 1.0
Carbon tetrachloride	56-23-5	1.0	< 1.0
Chlorobenzene	108-90-7	1.0	< 1.0
Chloroethane	75-00-3	1.0	< 1.0
Chloroform	67-66-3	1.0	< 1.0
Chloromethane	74-87-3	1.0	< 1.0
Dibromochloromethane	124-48-1	1.0	< 1.0
1,2-Dichlorobenzene	95-50-1	1.0	< 1.0
1,3-Dichlorobenzene	541-73-1	1.0	< 1.0
1,4-Dichlorobenzene	106-46-7	1.0	< 1.0
1,1-Dichloroethane	75-34-3	1.0	< 1.0
1,2-Dichloroethane	107-06-2	1.0	< 1.0
1,1-Dichloroethene	75-35-4	1.0	< 1.0
cis-1,2-Dichloroethene	156-60-5	1.0	2.4 J
trans-1,2-Dichloroethene	156-60-5	1.0	< 1.0
1,2-Dichloropropane	78-87-5	1.0	< 1.0
cis-1,3-Dichloropropene	10061-01-5	1.0	< 1.0
trans-1,3-Dichloropropene	10061-02-6	1.0	< 1.0
Ethylbenzene	100-41-4	1.0	< 1.0
2-Hexanone	591-78-6	10	< 10
Methylene chloride	75-09-2	5.0	< 5.0
4-Methyl-2-Pentanone	108-10-1	10	< 10
Styrene	100-42-5	1.0	< 1.0
1,1,2,2-Tetrachloroethane	79-34-5	1.0	< 1.0
Tetrachlorethene	127-18-4	1.0	29
Toluene	108-88-3	1.0	< 1.0
1,1,1-Trichloroethane	71-55-6	1.0	< 1.0
1,1,2-Trichloroethane	79-00-5	1.0	< 1.0
Trichloroethene	79-01-6	1.0	~~< 1.0~~ 1 J
Trichlorofluoromethane	75-69-4	1.0	< 1.0
Vinyl acetate	108-05-4	10	< 10
Vinyl chloride	75-01-4	1.0	< 1.0
o-Xylene	1330-20-7	1.0	< 1.0
m,p-Xylene*	1330-20-7	1.0	< 1.0

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology	Alden Job Number: 9101006/1
Client Sample Number: 028089	Alden Sample Number: 6075A
Date of Sample Receipt: 1/11/91	Analysis Method: EPA 8240
Date of Sample Extraction: N/A	Matrix: Water
Date of Sample Analysis: 1/16/91	Reporting Units: ug/L

Surrogate	Amount Added	Percent Recovery	Recovery Limits
1,2-Dichloroethane-d_4	250 ng	110	86-115
Toluene-d_8	250 ng	~~100~~ 103	76-114
Bromofluorobenzene	250 ng	93	88-110

* m-Xylene and p-xylene cannot be separated and are reported here as a total of the two isomers.

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology
Client Sample Number: 028090 (mw-203)
Date of Sample Receipt: 1/11/91
Date of Sample Extraction: N/A
Date of Sample Analysis: 1/16/91

Alden Job Number: 9101006/1
Alden Sample Number: 6076A
Analysis Method: EPA 8240
Matrix: Water
Reporting Units: ug/L

Compound Name	CAS No.	Reporting Limit	Result	
Acetone	67-64-1	10	11 UJ	
Benzene	71-43-2	1.0	< 1.0	
Bromodichloromethane	75-27-4	1.0	< 1.0	
Bromoform	75-25-2	1.0	< 1.0	
Bromomethane	74-83-9	1.0	< 1.0	
2-Butanone	78-93-3	10	< 10	
Carbon disulfide	75-15-0	1.0	< 1.0	
Carbon tetrachloride	56-23-5	1.0	< 1.0	
Chlorobenzene	108-90-7	1.0	< 1.0	
Chloroethane	75-00-3	1.0	< 1.0	
Chloroform	67-66-3	1.0	< 1.0	
Chloromethane	74-87-3	1.0	< 1.0	
Dibromochloromethane	124-48-1	1.0	< 1.0	
1,2-Dichlorobenzene	95-50-1	1.0	< 1.0	
1,3-Dichlorobenzene	541-73-1	1.0	< 1.0	
1,4-Dichlorobenzene	106-46-7	1.0	< 1.0	
1,1-Dichloroethane	75-34-3	1.0	< 1.0	
1,2-Dichloroethane	107-06-2	1.0	< 1.0	
1,1-Dichloroethene	75-35-4	1.0	< 1.0	
cis-1,2-Dichloroethene	156-60-5	1.0	33	
trans-1,2-Dichloroethene	156-60-5	1.0	~~< 1.0~~ 0.5 J	
1,2-Dichloropropane	78-87-5	1.0	< 1.0	
cis-1,3-Dichloropropene	10061-01-5	1.0	< 1.0	
trans-1,3-Dichloropropene	10061-02-6	1.0	< 1.0	
Ethylbenzene	100-41-4	1.0	< 1.0	
2-Hexanone	591-78-6	10	< 10	
Methylene chloride	75-09-2	5.0	12 UJ	
4-Methyl-2-Pentanone	108-10-1	10	< 10	
Styrene	100-42-5	1.0	< 1.0	
1,1,2,2-Tetrachloroethane	79-34-5	1.0	< 1.0	
Tetrachlorethene	127-18-4	1.0	1100 D	
Toluene	108-88-3	1.0	< 1.0	
1,1,1-Trichloroethane	71-55-6	1.0	~~< 1.0~~ 0.4 J	
1,1,2-Trichloroethane	79-00-5	1.0	< 1.0	
Trichloroethene	79-01-6	1.0	18	
Trichlorofluoromethane	75-69-4	10	< 10	
Vinyl acetate	108-05-4	10	< 10	
Vinyl chloride	75-01-4	1.0	< 1.0	
o-Xylene	1330-20-7	1.0	< 1.0	
m,p-Xylene*	1330-20-7	1.0	< 1.0	

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology	Alden Job Number: 9101006/1
Client Sample Number: 028090	Alden Sample Number: 6076A
Date of Sample Receipt: 1/11/91	Analysis Method: EPA 8240
Date of Sample Extraction: N/A	Matrix: Water
Date of Sample Analysis: 1/16/91	Reporting Units: ug/L

Surrogate	Amount Added	D	Percent Recovery	Recovery Limits
1,2-Dichloroethane-d_4	250 ng	110	~~110~~ 112 dm	86-115
Toluene-d_8	250 ng	103	~~100~~ 102 dm	76-114
Bromofluorobenzene	250 ng	89	91	88-110

* m-Xylene and p-xylene cannot be separated and are reported here as a total of the two isomers.

D column heading is Surrogate recovery for the dilution Analysis (Tetrachloroethene Value)

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology
Client Sample Number: 028091 (mw-20A)
Date of Sample Receipt: 1/11/91
Date of Sample Extraction: N/A
Date of Sample Analysis: 1/16/91

Alden Job Number: 9101006/1
Alden Sample Number: 6077A
Analysis Method: EPA 8240
Matrix: Water
Reporting Units: ug/L

Compound Name	CAS No.	Reporting Limit	Result
Acetone	67-64-1	10	< 10
Benzene	71-43-2	1.0	< 1.0
Bromodichloromethane	75-27-4	1.0	< 1.0
Bromoform	75-25-2	1.0	< 1.0
Bromomethane	74-83-9	1.0	< 1.0
2-Butanone	78-93-3	10	< 10
Carbon disulfide	75-15-0	1.0	< 1.0
Carbon tetrachloride	56-23-5	1.0	< 1.0
Chlorobenzene	108-90-7	1.0	< 1.0
Chloroethane	75-00-3	1.0	< 1.0
Chloroform	67-66-3	1.0	< 1.0
Chloromethane	74-87-3	1.0	< 1.0
Dibromochloromethane	124-48-1	1.0	< 1.0
1,2-Dichlorobenzene	95-50-1	1.0	< 1.0
1,3-Dichlorobenzene	541-73-1	1.0	< 1.0
1,4-Dichlorobenzene	106-46-7	1.0	< 1.0
1,1-Dichloroethane	75-34-3	1.0	< 1.0
1,2-Dichloroethane	107-06-2	1.0	< 1.0
1,1-Dichloroethene	75-35-4	1.0	< 1.0
cis-1,2-Dichloroethene	156-60-5	1.0	< 1.0
trans-1,2-Dichloroethene	156-60-5	1.0	< 1.0
1,2-Dichloropropane	78-87-5	1.0	< 1.0
cis-1,3-Dichloropropene	10061-01-5	1.0	< 1.0
trans-1,3-Dichloropropene	10061-02-6	1.0	< 1.0
Ethylbenzene	100-41-4	1.0	< 1.0
2-Hexanone	591-78-6	10	< 10
Methylene chloride	75-09-2	5.0	< 5.0
4-Methyl-2-Pentanone	108-10-1	10	< 10
Styrene	100-42-5	1.0	< 1.0
1,1,2,2-Tetrachloroethane	79-34-5	1.0	< 1.0
Tetrachlorethene	127-18-4	1.0	1.8 J
Toluene	108-88-3	1.0	< 1.0
1,1,1-Trichloroethane	71-55-6	1.0	< 1.0
1,1,2-Trichloroethane	79-00-5	1.0	< 1.0
Trichloroethene	79-01-6	1.0	< 1.0
Trichlorofluoromethane	75-69-4	10	< 10
Vinyl acetate	108-05-4	10	< 10
Vinyl chloride	75-01-4	1.0	< 1.0
o-Xylene	1330-20-7	1.0	< 1.0
m,p-Xylene*	1330-20-7	1.0	< 1.0

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology	Alden Job Number: 9101006/1
Client Sample Number: 028091	Alden Sample Number: 6077A
Date of Sample Receipt: 1/11/91	Analysis Method: EPA 8240
Date of Sample Extraction: N/A	Matrix: Water
Date of Sample Analysis: 1/16/91	Reporting Units: ug/L

Surrogate	Amount Added	Percent Recovery	Recovery Limits
1,2-Dichloroethane-d_4	250 ng	~~110~~ 113	86-115
Toluene-d_8	250 ng	~~110~~ 102	76-114
Bromofluorobenzene	250 ng	95	88-110

* m-Xylene and p-xylene cannot be separated and are reported here as a total of the two isomers.

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology
Client Sample Number: 028091 Matrix Spike
Date of Sample Receipt: 1/11/91
Date of Sample Extraction: N/A
Date of Sample Analysis: 1/16/91

Alden Job Number: 9101006/1
Alden Sample Number: 6077B Matrix Spike
Analysis Method: EPA 8240
Matrix: Water
Reporting Units: ug/L

Compound Name	Sample Amount	Spike Added	Percent Recovery	Recovery QC Limits (%)
1,1-Dichloroethene	< 1.	50 ug/~~kg~~ L	96	61 - 145
Trichloroethene	< 1.	50 ug/~~kg~~ L	96	71 - 120
Benzene	< 1.	50 ug/~~kg~~ L	110	76 - 127
Toluene	< 1.	50 ug/~~kg~~ L	100	76 - 125
Chlorobenzene	< 1.	50 ug/~~kg~~ L	100	75 - 130

Surrogate	Amount Added	Percent Recovery	Recovery Limits
1,2-Dichloroethane-d_4	250 ng	110	86-115
Toluene-d_8	250 ng	100	76-114
Bromofluorobenzene	250 ng	94	88-110

Alden Analytical
Laboratories, Inc.

REPORT OF ANALYTICAL RESULTS

Client: Department of Ecology	Alden Job Number: 9101006/1
Client Sample Number: 028091 Spike Duplicate	Alden Sample Number: 6077B Spike Duplicate
Date of Sample Receipt: 1/11/91	Analysis Method: EPA 8240
Date of Sample Extraction: N/A	Matrix: Water
Date of Sample Analysis: 1/16/91	Reporting Units: ug/L

Compound Name	Sample Amount	Spike Added	Percent Recovery	Recovery QC Limits (%)	RPD
1,1-Dichloroethene	<1.	50 ug/kg	94	61 - 145	2.5
Trichloroethene	<1.	50 ug/kg	100	71 - 120	4.7
Benzene	<1	50 ug/kg	110	76 - 127	3.1
Toluene	<1	50 ug/kg	98	76 - 125	0.9
Chlorobenzene	<1.	50 ug/kg	100	75 - 130	1.0

Surrogate	Amount Added	Percent Recovery	Recovery Limits
1,2-Dichloroethane-d_4	250 ng	110	86-115
Toluene-d_8	250 ng	100	76-114
Bromofluorobenzene	250 ng	92	88-110

WASHINGTON STATE DEPARTMENT OF ECOLOGY
ENVIRONMENTAL INVESTIGATIONS AND LABORATORY SERVICES
MANCHESTER LABORATORY

February 28, 1991

TO: Pam Marti

FROM: Steve Twiss

SUBJECT: QA memo, Lakewood Plaza Cleaners project

SAMPLE RECEIPT:

Samples for the Lakewood Plaza Cleaners project were received by the Manchester Laboratory on 1/10/91 in good condition.

HOLDING TIMES:

All analyses were performed within the specified holding times for metals analysis (180 days).

INSTRUMENT CALIBRATION:

Instrument calibration was performed before each analytical run and checked by initial calibration verification standards and blanks. Continuing calibration standards and blanks were analyzed at a frequency of 10% during the run and again at the end of the analytical run. All initial and continuing calibration verification standards were within the control limits of +/- 10%.

PROCEDURAL BLANKS:

Trace amounts of magnesium were detected in the procedural blanks associated with these samples. Sample results less than ten times the blank value are flagged with a **B**.

SPIKED SAMPLE ANALYSIS:

Spiked sample and duplicate spiked sample analysis were performed on sample number 028089. All spike recoveries were within the acceptable limits of +/- 25% for water sample analysis.

PRECISION DATA:

The duplicate results of the spiked and duplicate spiked sample were used to calculate precision related to the analysis of these samples. The % RPD for all parameters was well within the +/- 20% window for duplicate analysis.

STANDARD REFERENCE MATERIAL:

Standard reference material or external verification standards were all within the windows established for each parameter.

SUMMARY:

Magnesium results less than ten times that found in the blank should be flagged with a **B**. Sodium results should be flagged as estimates due to the presence of interferences indicated by the %RPD of serial dilution results being greater than 10% Results that are flagged with a **J** are flagged to indicate the value lies between the instrumental detection limit and the practical quantition limit.

If you have any questions about the results or the methods used to determine them please call Randy Knox at SCAN 744-4737.

cc Bill Kammin

*** Lab Analysis Report ***

Transaction #: 04161649 Seq #: 01 (30) Metals - Specified
(WE) Ecology, Manchester Lab
ject: (DOE-205Z) LAKEWOOD PLAZA CLEANERS D3P11 PZM
Param: (71890 S) Mercury Hg-Diss ug/l

QA Code: ( ) Normal Data
Instrument: (ACF403) AA Cold Flame (PE403)
Method: (EP1-245.1) Mercury, Cold Vapor, Manual
Chemist: (JEC) Campbell, Jesse DOE Hours Worked:
Lab Prep: ( ) Unspecifed
Matrix: (11) Water-Filtered Date Preprd:
Units: (11) ug/l Date Anlyzd: 910129

Line	Sample #	Result	Sample Location/Description	#Days to Anl
1	91 028087	.04U	MW-32	910109 (20)
2	91 028088	.04U	MW-16A	910109 (20)
3	91 028089	.04U	MW-16B	910109 (20)
4	91 028094	.04U	FILTRATI	910109 (20)

Record Type: TRNIN2 Date Verified: 4/16/91 By:
Transaction Status: New Transaction...First Printing...Unverified.
Processed: 16-APR-91 16:50:48 Status: N Batch: (In CUR DB)

*** Lab Analysis Report ***

==> Transaction #: 03260833 Laboratory: (WE) Ecology, Manchester Lab

Work Group: (38) Metals - ICP Scan

Instrument: (ICP) ICP, Jarrell-Ash AtomComp 1100 (DOE)

Method: (EP1-200.7) Inductively Coupled Plasma Atomic Emissions Analysis

Chemist: (CQJ) Jackson, Carol DOE Hours Worked: _____

Project: DOE-205Z LAKEWOOD PLAZA CLEANERS Prg Ele#: D3P11

Prj Off: Marti, Pam DOE Analysis Due: 910110 Revised Due:

*** Sample Records in Transaction ***

Seq#	Sample #	QA	Date/Time	Description	Alternate Keys		
01	91028087		910109	MW-32			
02	91028088		910109	MW-16A			
03	91028089		910109	MW-16B			
04	91028094		910109	FILTRATI			
05	91028089	LMX1	910109	MW-16B			
06	91028089	LMX2	910109	MW-16B			
07	91028089	LBK1	910109	MW-16B			

Record Type: TRNIN3 Date Verified: 3/28/91 By: Carol D. Jackson

Transaction Status: Edited Transaction...First Printing...Unverified.

Processed: 26-MAR-91 08:45:15 Status: E Batch: (In CUR DB)

*** Lab Analysis Report ***

ransaction #: 03260833 Seq #: 01 (38) Metals - ICP Scan
roj Code : DOE-205Z LAKEWOOD PLAZA CLEANERS PE # : D3P11

ample No.: 91 028087 Alternate Keys:

amp Matrix: (11) Water-Filtered Units: (00) %Slds:
A Code: ( ) Unspecifed Peaks Total:
ate Extracted: Date Analyzed: 910117 # Days to Ext/Anal: 0/ 8

ine	Par #	Parameter Description		Units	Value
1	01000	Arsenic	As-Diss	ug/l	30U
2	01005	Barium	Ba-Diss	ug/l	4.0J
3	01025	Cadmium	Cd-Diss	ug/l	2.0U
4	82036	Calcium	Ca-Diss	ug/l	20.4
5	01030	Chromium	Cr-Diss	ug/l	5.0U
6	01040	Copper	Cu-Diss	ug/l	2.0U
7	01046	Iron	Fe-Diss	ug/l	2.0U
8	01049	Lead	Pb-Diss	ug/l	20U
9	82037	Mgnsium	Mg-Diss	ug/l	8.17B
10	01056	Mangnese	Mn-Diss	ug/l	1.0U
11	01065	Nickel	Ni-Diss	ug/l	10U
12	01145	Selenium	Se-Diss	ug/l	50U
13	01075	Silver	Ag-Diss	ug/l	2.0U
14	82039	Sodium	Na-Diss	ug/l	6.96E
15	01090	Zinc	Zn-Diss	ug/l	8.3J

*** Lab Analysis Report ***

Transaction #: 03260833 Seq #: 02 (38) Metals - ICP Scan
Proj Code : DOE-205Z LAKEWOOD PLAZA CLEANERS PE # : D3P11

Sample No.: 91 028088 Alternate Keys:

Samp Matrix: (11) Water-Filtered Units: (00) %Slds:
QA Code: ( ) Unspecifed Peaks Total:
Date Extracted: Date Analyzed: 910117 # Days to Ext/Anal: 0/ 8

Line	Par #	Parameter Description			Units	Value
1	01000	Arsenic	As-Diss	ug/l		30U
2	01005	Barium	Ba-Diss	ug/l		5.1J
3	01025	Cadmium	Cd-Diss	ug/l		2.0U
4	82036	Calcium	Ca-Diss	ug/l		22.5
5	01030	Chromium	Cr-Diss	ug/l		5.0U
6	01040	Copper	Cu-Diss	ug/l		2.2J
7	01046	Iron	Fe-Diss	ug/l		6.3J
8	01049	Lead	Pb-Diss	ug/l		20U
9	82037	Mgnsium	Mg-Diss	ug/l		9.39
10	01056	Mangnese	Mn-Diss	ug/l		1.0U
11	01065	Nickel	Ni-Diss	ug/l		10U
12	01145	Selenium	Se-Diss	ug/l		50U
13	01075	Silver	Ag-Diss	ug/l		2.0U
14	82039	Sodium	Na-Diss	ug/l		7.95E
15	01090	Zinc	Zn-Diss	ug/l		14J

*** Lab Analysis Report ***

ransaction #: 03260833 Seq #: 03 (38) Metals - ICP Scan
roj Code : DOE-205Z LAKEWOOD PLAZA CLEANERS PE # : D3P11

ample No.: 91 028089[illegible] Alternate Keys:

amp Matrix: (11) Water-Filtered Units: (00) %Slds:
A Code: ( ) Unspecifed Peaks Total:
ate Extracted: Date Analyzed: 910117 # Days to Ext/Anal: 0/ 8

ine	Par #	Parameter Description		Units	Value
1	01000	Arsenic	As-Diss	ug/l	30U
2	01005	Barium	Ba-Diss	ug/l	5.0J
3	01025	Cadmium	Cd-Diss	ug/l	2.0U
4	82036	Calcium	Ca-Diss	ug/l	22.4
5	01030	Chromium	Cr-Diss	ug/l	5.0U
6	01040	Copper	Cu-Diss	ug/l	2.0U
7	01046	Iron	Fe-Diss	ug/l	2.0U
8	01049	Lead	Pb-Diss	ug/l	20U
9	82037	Mgnsium	Mg-Diss	ug/l	9.38
10	01056	Mangnese	Mn-Diss	ug/l	1.0U
11	01065	Nickel	Ni-Diss	ug/l	10U
12	01145	Selenium	Se-Diss	ug/l	50U
13	01075	Silver	Ag-Diss	ug/l	2.0U
14	82039	Sodium	Na-Diss	ug/l	8.08E
15	01090	Zinc	Zn-Diss	ug/l	9.1J

*** Lab Analysis Report ***

Transaction #: 03260833 Seq #: 04 (38) Metals - ICP Scan
Proj Code : DOE-205Z LAKEWOOD PLAZA CLEANERS PE # : D3P11

Sample No.: 91 028094 Alternate Keys:

Samp Matrix: (11) Water-Filtered Units: (00) %Slds:
QA Code: ( ) Unspecifed Peaks Total:
Date Extracted: Date Analyzed: 910117 # Days to Ext/Anal: 0/ 8

Line	Par #	Parameter Description		Units	Value
1	01000	Arsenic	As-Diss	ug/l	30U
2	01005	Barium	Ba-Diss	ug/l	1.0U
3	01025	Cadmium	Cd-Diss	ug/l	2.0U
4	82036	Calcium	Ca-Diss	ug/l	.0278B
5	01030	Chromium	Cr-Diss	ug/l	5.0U
6	01040	Copper	Cu-Diss	ug/l	2.0U
7	01046	Iron	Fe-Diss	ug/l	5.1J
8	01049	Lead	Pb-Diss	ug/l	20U
9	82037	Mgnsium	Mg-Diss	ug/l	.0085JB
10	01056	Mangnese	Mn-Diss	ug/l	1.0U
11	01065	Nickel	Ni-Diss	ug/l	10U
12	01145	Selenium	Se-Diss	ug/l	50U
13	01075	Silver	Ag-Diss	ug/l	2.0U
14	82039	Sodium	Na-Diss	ug/l	.234BE
15	01090	Zinc	Zn-Diss	ug/l	9.3J

*** Lab Analysis Report ***

Transaction #: 03260833 Seq #: 05 (38) Metals - ICP Scan
Proj Code : DOE-205Z LAKEWOOD PLAZA CLEANERS PE # : D3P11

Sample No.: 91 028089 Alternate Keys:

Samp Matrix: (11) Water-Filtered Units: (94) % Recov %Slds:
QA Code: (LMX1) Lab Mtrx Spike #1 (% Rec Peaks Total:
Date Extracted: Date Analyzed: 910117 # Days to Ext/Anal: 0/ 8

Line	Par #	Parameter Description			Units	Value
1	01000	Arsenic	As-Diss	ug/l	% Recov	97
2	01005	Barium	Ba-Diss	ug/l	% Recov	101
3	01025	Cadmium	Cd-Diss	ug/l	% Recov	114
4	82036	Calcium	Ca-Diss	ug/l	% Recov	107
5	01030	Chromium	Cr-Diss	ug/l	% Recov	99
6	01040	Copper	Cu-Diss	ug/l	% Recov	102
7	01046	Iron	Fe-Diss	ug/l	% Recov	105
8	01049	Lead	Pb-Diss	ug/l	% Recov	99
9	82037	Mgnsium	Mg-Diss	ug/l	% Recov	109
10	01056	Mangnese	Mn-Diss	ug/l	% Recov	96
11	01065	Nickel	Ni-Diss	ug/l	% Recov	98
12	01145	Selenium	Se-Diss	ug/l	% Recov	101
13	01075	Silver	Ag-Diss	ug/l	% Recov	95
14	82039	Sodium	Na-Diss	ug/l	% Recov	102
15	01090	Zinc	Zn-Diss	ug/l	% Recov	98

*** Lab Analysis Report ***

ransaction #: 03260833 Seq #: 06 (38) Metals - ICP Scan
roj Code : DOE-205Z LAKEWOOD PLAZA CLEANERS PE # : D3P11

ample No.: 91 028089 Alternate Keys:

amp Matrix: (11) Water-Filtered Units: (94) % Recov %Slds: ____
A Code: (LMX2) Lab Mtrx Spike #2 (% Rec Peaks Total: ____
ate Extracted: Date Analyzed: 910117 # Days to Ext/Anal: 07 8

ine	Par #	Parameter Description			Units	Value
1	01000	Arsenic	As-Diss	ug/l	% Recov	97
2	01005	Barium	Ba-Diss	ug/l	% Recov	101
3	01025	Cadmium	Cd-Diss	ug/l	% Recov	107
4	82036	Calcium	Ca-Diss	ug/l	% Recov	106
5	01030	Chromium	Cr-Diss	ug/l	% Recov	100
6	01040	Copper	Cu-Diss	ug/l	% Recov	102
7	01046	Iron	Fe-Diss	ug/l	% Recov	101
8	01049	Lead	Pb-Diss	ug/l	% Recov	95
9	82037	Mgnsium	Mg-Diss	ug/l	% Recov	107
10	01056	Mangnese	Mn-Diss	ug/l	% Recov	96
11	01065	Nickel	Ni-Diss	ug/l	% Recov	100
12	01145	Selenium	Se-Diss	ug/l	% Recov	99
13	82039	Sodium	Na-Diss	ug/l	% Recov	99
14	01090	Zinc	Zn-Diss	ug/l	% Recov	98

*** Lab Analysis Report ***

Transaction #: 03260833 Seq #: 07 (38) Metals - ICP Scan
Proj Code : DOE-205Z LAKEWOOD PLAZA CLEANERS PE # : D3P11

Blank ID : PB 03.79
Sample No.: 91 028089 Alternate Keys:

Samp Matrix: (11) Water-Filtered Units: (00) %Slds:
QA Code: (LBK1) Lab Blank Sample #1 Peaks Total:
Date Extracted: Date Analyzed: 910117 # Days to Ext/Anal: 0/ 8

Line	Par #	Parameter Description		Units	Value
1	01000	Arsenic	As-Diss	ug/l	30U
2	01005	Barium	Ba-Diss	ug/l	1.0U
3	01025	Cadmium	Cd-Diss	ug/l	2.0U
4	82036	Calcium	Ca-Diss	ug/l	.0098J
5	01030	Chromium	Cr-Diss	ug/l	5.0U
6	01040	Copper	Cu-Diss	ug/l	2.0U
7	01046	Iron	Fe-Diss	ug/l	2.0U
8	01049	Lead	Pb-Diss	ug/l	20U
9	82037	Mgnsium	Mg-Diss	ug/l	.0017J
10	01056	Mangnese	Mn-Diss	ug/l	1.0U
11	01065	Nickel	Ni-Diss	ug/l	10U
12	01145	Selenium	Se-Diss	ug/l	50U
13	01075	Silver	Ag-Diss	ug/l	2.0U
14	82039	Sodium	Na-Diss	ug/l	.052JE
15	01090	Zinc	Zn-Diss	ug/l	4.0U

*** Lab Analysis Report ***

Transaction #: 01160857 Seq #: 01 (10) Gen Inorg/Phys-Specified
(WE) Ecology, Manchester Lab

Project: (DOE-205Z) LAKEWOOD PLAZA CLEANERS D3P11 PZM
am: (900 S) Hard-Tot CaCO3 mg/l

QA Code: ( ) Normal Data
Instrument: (TITRIT) Titrimetric Measurement
Method: (EP1-130.2) Hardness, Total (mg/l as CaCO3), Titrimetric, EDTA
Chemist: (ACS) Smith, Aileen DOE Hours Worked:
Lab Prep: ( ) Unspecifed
Matrix: (10) Water-Total Date Prepid:
Units: (10) mg/l Date Anlyzd: 910111

Line	Sample #	Result	Sample Location/Description	#Days to Anl
1	91 028087	84.8	MW-32	910109 (2)
2	91 028088	94.3	MW-16A	910109 (2)
3	91 028089	95.8	MW-16B	910109 (2)

Record Type: TRNIN2 Date Verified: 1/16/91 By: Cynthia J. Tupper
Transaction Status: New Transaction...First Printing...Unverified
Processed: 16-JAN-91 09:03:47 Status: N Batch: (In CUR DB)

*** Lab Analysis Report ***

Transaction #: 01160838 Seq #: 01 (20) Nutrients - Specified
(WE) Ecology, Manchester Lab

Project: (DOE-205Z) LAKEWOOD PLAZA CLEANERS D3P11 PZM
Param: (630 S) NO2NO3-N Total mg/l

QA Code: ( ) Normal Data
Instrument: (ALPKEM) Auto Analyzer, ALPKEM 303 (DOE)
Method: (EP1-353.2) Nitrogen, (Nitrate-Nitrite), Colorimetric, Automat
Chemist: (DXT) Thomson, Dave DOE Hours Worked:
Lab Prep: ( ) Unknown
Matrix: (10) Water-Total Date Preprd:
Units: (10) mg/l Date Anlyzd: 910111

Line	Sample #	Result	Sample Location/Description	#Days to Anl
1	91 028087	2.06	MW-32	910109 (2)
2	91 028088	2.24	MW-16A	910109 (2)
3	91 028089	2.23	MW-16B	910109 (2)

Record Type: TRNIN2 Date Verified: 1/16/91 By: esma g. tupas
Transaction Status: New Transaction...First Printing...Unverified
Processed: 16-JAN-91 09:03:47 Status: N Batch: (In CUR DB)

*** Lab Analysis Report ***

Transaction #: 01221106 Seq #: 01 (15) Solids - Specified
(WE) Ecology, Manchester Lab

Project: (DOE-205Z) LAKEWOOD PLAZA CLEANERS D3P11 PZM
Param: (70300 S) Solids T-Dissol mg/l

QA Code: ( ) Normal Data
Instrument: (GRAV) Gravimetric Measurement
Method: (EP1-160.1) Residue, Filterable, Gravimetric, Dried at 180 Deg
Chemist: (ACS) Smith, Aileen DOE Hours Worked:
Lab Prep: ( ) Unspecifed
Matrix: (10) Water-Total Date Preprd:
Units: (10) mg/l Date Anlyzd: 910114

Line	Sample #	Result	Sample Location/Description	#Days to Anl
1	91 028087	129 ✓	MW-32	910109 (5)
2	91 028088	149 ✓	MW-16A	910109 (5)
3	91 028089	143 ✓	MW-16B	910109 (5)

Record Type: TRNIN2 Date Verified: 1/22/91 By: [signature]
Transaction Status: New Transaction...First Prihting...Unverified.
Processed: 22-JAN-91 11:14:41 Status: N Batch: (In CUR DB)

*** Lab Analysis Report ***

ransaction #: 01160927 Seq #: 01 (80) Ion Chromatography
(WE) Ecology, Manchester Lab

· ject: (DOE-205Z) LAKEWOOD PLAZA CLEANERS D3P11 PZM
am: (940 S) Chloride mg/l

QA Code: ( ) Normal Data
Instrument: (IC-2020I) Dionex #IC-2020 Ion Chromatograph
Method: (EP1-300.0) Inorganic Anions, Ion Chromatography
Chemist: (MPS) Sankiewicz, Marek DOE Hours Worked:
Lab Prep: ( ) Unspecifed
Matrix: (10) Water-Total Date Prepid:
Units: (10) mg/l Date Anlyzd: 910115

ine	Sample #	Result	Sample Location/Description	#Days to Anl
1	91 028087	6.58 ✓	MW-32	910109 (6)
2	91 028088	6.64 ✓	MW-16A	910109 (6)
3	91 028089	6.43 ✓	MW-16B	910109 (6)

Record Type: TRNIN2 Date Verified: 1-17-91 By: G. Thomas
Transaction Status: New Transaction...First Printing...Unverified.
Processed: 16-JAN-91 09:31:46 Status: N Batch: (In CUR DB)

*** Lab Analysis Report ***

Transaction #: 01160929 Seq #: 01 (80) Ion Chromatography
(WE) Ecology, Manchester Lab

Project: (DOE-205Z) LAKEWOOD PLAZA CLEANERS D3P11 PZM
Anm: (945 S) Sulfate Total mg/l

QA Code: ( ) Normal Data
Instrument: (IC-2020I) Dionex #IC-2020 Ion Chromatograph
Method: (EP1-300.0) Inorganic Anions, Ion Chromatography
Chemist: (MPS) Sankiewicz, Marek DOE Hours Worked:
Lab Prep: ( ) Unspecifed
Matrix: (10) Water-Total Date Prepid:
Units: (10) mg/l Date Anlyzd: 910115

Line	Sample #	Result	Sample Location/Description	#Days to Anl
1	91 028087	9.79 ✓	MW-32	910109 (6)
2	91 028088	12.99 ✓	MW-16A	910109 (6)
3	91 028089	12.70 ✓	MW-16B	910109 (6)

Record Type: TRNIN2 Date Verified: 1-17-91 By: [signature]
Transaction Status: New Transaction...First Printing...Unverified.
Processed: 16-JAN-91 09:31:46 Status: N Batch: (In CUR DB)

*** Lab Analysis Report ***

ansaction #: 01221414 Seq #: 01 (10) Gen Inorg/Phys-Specified
(WE) Ecology, Manchester Lab
oject: (DOE-205Z) LAKEWOOD PLAZA CLEANERS D3P11 PZM
m: (425 S) Alk-HCO3 CaCO3 mg/l

QA Code: ( ) Normal Data
Instrument: (TITRIT) Titrimetric Measurement
Method: (SM16-403) Alkalinity, Titrimetric (pH 8.3, 4.5)
Chemist: (CGT) Tupas, Cyma DOE Hours Worked:
Lab Prep: ( ) Unspecifed
Matrix: (10) Water-Total Date Preprd:
Units: (10) mg/l Date Anlyzd: 910117

ne	Sample #	Result	Sample Location/Description	#Days to Anl
1	91 028087	73.6	MW-32	910109 (8)
2	91 028088	83.3	MW-16A	910109 (8)
3	91 028089	82.2	MW-16B	910109 (8)

Record Type: TRNIN2 Date Verified: 1-29-91 By: [signature]
ansaction Status: Edited Transaction...First Printing...Unverified.
ocessed: 28-JAN-91 08:09:29 Status: E Batch: (In CUR DB)

*** Lab Analysis Report ***

Transaction #: 01221423 Seq #: 01 (10) Gen Inorg/Phys-Specified
(WE) Ecology, Manchester Lab

Project: (DOE-205Z) LAKEWOOD PLAZA CLEANERS D3P11 PZM
am: (430 S) Alk-CO3 CaCO3 mg/l

QA Code: ( ) Normal Data
Instrument: (TITRIT) Titrimetric Measurement
Method: (SM16-403) Alkalinity, Titrimetric (pH 8.3, 4.5)
Chemist: (CGT) Tupas, Cyma DOE Hours Worked:
Lab Prep: ( ) Unspecifed
Matrix: (10) Water-Total Date Preprd:
Units: (10) mg/l Date Anlyzd: 910117

Line	Sample #	Result	Sample Location/Description	#Days to Anl
1	91 028087	1U	MW-32	910109 (8)
2	91 028088	1U	MW-16A	910109 (8)
3	91 028089	1U	MW-16B	910109 (8)

Record Type: TRNIN2 Date Verified: 1-24-91 By:
Transaction Status: New Transaction...First Printing...Unverified.
Processed: 22-JAN-91 14:24:56 Status: N Batch: (In CUR DB)

APPENDIX B

Table B-1
TCE Concentrations Measured in Monitoring Wells
Ponders Corner, Washington

Well No.	2/12/85 Through 2/14/85	3/18/85 Through 3/22/85	4/25/85	5/16/85 Through 5/20/85	6/17/85 Through 6/21/85	8/20/85 Through 8/23/85[a]	11/5/85 Through 11/7/85[a]	8/25/86 Through 8/28/87	12/16/86 Through 12/17/86	3/17/87 Through 3/20/87	7/7/87	10/5/87 Through 10/6/87	1/28/88 Through 1/29/88	4/25/88 Through 4/26/88	10/4/88 Through 11/28/88	5/22/89 Through 5/25/89	4/23/90 Through 4/24/90
11A	ND	ND	NM	ND	ND	D	ND	ND	NM	NM		NM	NM	NM	NM	NM	
11B	NM	NM	NM	NM	NM	ND	NM	NM	NM	NM		NM	NM	NM	NM	NM	
12	ND	ND	ND	ND	ND	ND	ND	1[d]	ND	ND	ND	ND	ND	ND	NM	NM	
13A	NM	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
13B	NM	NM	NM	NM	NM	D	ND	1[d]	1[d]	2	ND	D	J	ND	NM	NM	
14	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
15A	ND	ND	NM	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	
15B	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
16A	6.3	3.9	NM	3.4	2.0	D/D[b]	2[d]	1[d]	1[d]	ND	NM	ND	NM	D	NM	ND	1
16B	NM	ND	NM	ND	ND	NM	NM	ND	NM	NM	NM	NM	NM	NM	NM	NM	
17A	ND	ND	NM	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM	
17B	NM	ND	NM	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM	
18	ND	ND	NM	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM	
19A	ND	ND	NM	ND	ND	ND	ND	ND	NM	ND	ND	ND	J	ND	ND	ND	ND
19B	NM	ND	NM	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	
19C												NM	J	ND	NM	NM	
20A	NM	ND	NM	NM	ND	D	ND	ND	ND	ND	NM	ND	NM	D	NM	ND	ND
20B	NM	103	32	12	ND	D[c]	29	100	NM	NM	NM	ND	NM	NM	NM	29	24/23
21	1.5	ND	NM	ND	ND	D	6	1[d]	1[d]	1[d]	NM	ND	NM	D	NM	ND	0.2J
22	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
24A	ND	ND	NM	ND	ND	1.2	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
24B	NM	ND	NM	ND	ND	D	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	
25	ND	ND	NM	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	
26	ND	ND	NM	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	
27	ND	NM	NM	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	
28A	ND	ND	NM	ND	ND	NM	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	
29	ND	ND	NM	ND	ND	ND	ND	ND	1[d]	ND	NM	ND	NM	D	ND	ND	ND
30	1.6	ND	NM	ND	D	NM	ND	1[d]	ND	ND	NM	ND	NM	D	ND	NM	
31	ND	ND	NM	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	
32	ND	ND	ND	ND	ND	D	ND	1[d]	ND	ND	NM	ND	NM	ND	ND	ND	ND

sea8870/059.51/1
8/29/90

Table B-1
TCE Concentrations Measured in Monitoring Wells
Ponders Corner, Washington

Well No.	2/12/85 Through 2/14/85	3/18/85 Through 3/22/85	4/25/85	5/16/85 Through 5/20/85	6/17/85 Through 6/21/85	8/20/85 Through 8/23/85[a]	11/5/85 Through 11/7/85[a]	8/25/86 Through 8/28/87	12/16/86 Through 12/17/86	3/17/87 Through 3/20/87	7/7/87	10/5/87 Through 10/6/87	1/28/88 Through 1/29/88	4/25/88 Through 4/26/88	10/4/88 Through 11/28/88	5/22/89 Through 5/25/89	4/23/90 Through 4/24/90
33	ND	ND	NM	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	
34	ND	NM	NM	NM	NM	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
35	ND	ND	NM	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	
36	42	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
37[c]										ND	ND	ND	J	ND	ND	ND	ND
38[c]										15	ND	NM	NM	NM	NM	NM	
39A[c]										1	ND	ND	ND	ND	ND	NM	
39B[c]										ND	ND	NM	ND	ND	ND	NM	
39C												NM	NM	ND	NM	NM	
40[c]										ND	ND	ND	ND	ND	ND	ND	ND
41[c]										ND		NM	NM	NM	NM	ND	ND

[a]Exceeded acceptable holding time.
[b]Duplicate analysis.
[c]Detection limit = 100 µg/l.
[d]Estimated value. Compound present but at less than the specified detection limit.
[e]Wells constructed 2/87 through 3/87.

Notes: Units in parts per billion.
NM = Not measured.
ND = Not detected.
D = Detected, not quantified.
J = Estimated value. Value not accurate.

sea8870/059.51

Table B-2
PERC Concentrations Measured in Monitoring Wells
Ponders Corner, Washington

Well No.	2/12/85 Through 2/14/85	3/18/85 Through 3/22/85	4/25/85	5/16/85 Through 5/20/85	6/17/85 Through 6/21/85	8/20/85 Through 8/23/85[a]	11/5/85 Through 11/7/85[a]	8/25/86 Through 8/28/86	12/16/86 Through 12/17/87	3/17/87 Through 3/20/87	7/7/87	10/5/87 Through 10/6/87	1/28/88 Through 1/29/88	4/25/88 Through 4/26/88	10/7/88 Through 11/28/88	5/22/89 Through 5/25/89	4/23/90 Through 4/24/90
11A	6.2	5.6	NM	6.1	2.7	4.3	2	1.4	NM	NM	NM	NM	NM	NM	NM	NM	
11B	NM	NM	NM	NM	NM	2.4	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NM	NM	
13A	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
13B	NM	NM	NM	NM	NM	ND	ND	ND	ND	ND	ND	ND	J	ND	NM	NM	
14	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
15A	NM	0.5	NM	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	
15B	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
16A	110	70	NM	46	33	12/11[b]	19	16	17	49	NM	8	NM	7.3-8.0	NM	5(16)	74
16B	NM	15	NM	13	5	NM	4[c]	4.5	NM	NM	NM	NM	NM	NM	NM	NM	
17A	ND	ND	NM	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM	
17B	NM	ND	NM	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	NM	
18	ND	ND	NM	ND	ND	D	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	
19A	ND	ND	NM	ND	ND	ND	ND	ND	NM	ND	ND	ND	J	ND	ND	ND	ND
19B	NM	ND	NM	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	
19C												NM	J	ND	NM	NM	
20A	NM	5.1	NM	NM	2.8	4.0	ND	2.1	1.5	ND	NM	ND	NM	1.2	NM	ND	0.6J
20B	NM	4,856	2,200	570	1,220	1,060	350	745	NM	NM	NM	ND	NM	NM	NM	1,100 (880)	550 (1,300)
21	27	2.2	NM	13	11	10	ND	ND	4.6	4	NM	6	NM	4.0	NM	2 J	3
22	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
24A	8.5	1.5	NM	7.2	4.4	16	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
24B	NM	9.5	NM	0.9	4.0	4.9	ND	2.9	NM	NM	NM	NM	NM	NM	NM	NM	
25	ND	ND	NM	ND	ND	ND	13	ND	NM	NM	NM	NM	NM	NM	NM	NM	
26	ND	ND	NM	NM	ND	ND	9	ND	NM	NM	NM	NM	NM	NM	NM	NM	
27	ND	NM	NM	NM	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	
28A	ND	0.7	NM	ND	ND	NM	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	
29	5.8	0.9	NM	5.4	1.1	3.4	ND	1.2	2.8	ND	NM	ND	NM	1.8	ND	1J	0.8J
30	38	24.1	NM	17.2	13	NM	10	5.3	2.2	ND	NM	5	NM	3.8-4.7	3J	NM	
31	ND	ND	NM	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	
32	ND	4.3	5	6.9	3.3	3.7	ND	2	1.5	2	NM	ND	NM	D	ND	1J	1

Table B-2
PERC Concentrations Measured in Monitoring Wells
Ponders Corner, Washington

Well No.	2/12/85 Through 2/14/85	3/18/85 Through 3/22/85	4/25/85	5/16/85 Through 5/20/85	6/17/85 Through 6/21/85	8/20/85 Through 8/23/85[a]	11/5/85 Through 11/7/85[a]	8/25/86 Through 8/28/86	12/16/86 Through 12/17/87	3/17/87 Through 3/20/87	7/7/87	10/5/87 Through 10/6/87	1/28/88 Through 1/29/88	4/25/88 Through 4/26/88	10/7/88 Through 11/28/88	5/22/89 Through 5/25/89	4/23/90 Through 4/24/90
33	ND	ND	NM	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	
34	83	NM	NM	NM	NM	1.2	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
35	ND	ND	NM	ND	ND	ND	ND	ND	NM	NM	NM	NM	NM	NM	NM	NM	
36	139	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	
37[d]										ND	ND	ND	J	ND	ND	ND	D
38[d]										ND	ND	NM	NM	NM	NM	NM	
39A[d]										ND	ND	ND	J	D	ND	NM	
39B[d]										ND	ND	NM	NM	J	ND	ND	
39C												NM	NM	ND	NM	NM	
40[d]										ND	ND	ND	J	ND	ND	ND	ND
41[d]										ND	ND	NM	NM	NM	NM	ND	ND

[a]Exceeded acceptable holding time.
[b]Duplicate analysis.
[c]Estimated value. Compound present but at less than the specified detection limit.
[d]Wells constructed 2/87 through 3/87.

Notes: Units in µg/l.
NM = Not measured.
ND = Not detected.
D = Detected, not quantified.
J = Estimated value. Value not accurate.

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