EMCON Northwest, Inc.
18912 North Creek Parkway • Suite 100 • Bothell, Washington 98011-8016 • (206) 485-5000 • Fax (206) 486-9766

November 30, 1992
Project 0556-008.09

Mr. Frank Fossati
Shell Oil Company
511 North Brookhurst Street
P. O. Box 4848
Anaheim, California 92803

RCVD 12/9/92
DEPARTMENT OF ECOLOGY
NWRO/TCP TANK UNIT
Inc# 1928
INTERIM CLEANUP REPORT ☒
SITE CHARACTERIZATION ☐
FINAL CLEANUP REPORT ☐
OTHER ☐
AFFECTED MEDIA: SOIL ☐
OTHER GW ☒
INSPECTOR (INIT.) JS DATE 12/15/92

Re: Semiannual Ground Water Sampling Report
Former Shell Station 23714
601 Boren Avenue North
Seattle, Washington 98109
WIC 246-7616-0401

Dear Mr. Fossati:

EMCON Northwest, Inc., is pleased to present this report describing semiannual ground water sampling conducted on September 10, 1992, at the above-referenced site (Figure 1). The previous ground water sampling event was conducted on April 3, 1992. Results were presented to Shell Oil Company in EMCON's May 12, 1992, report.

SITE HISTORY

The site is located in the NE¼ of the SE¼ of Section 30, Township 25 North, Range 4 East. The station is located on the northwest corner of the intersection of Boren Avenue North and Mercer Street in Seattle, Washington. The site is bordered by a retail business and a scrap yard to the north, a retail business to the west, Mercer Street to the south, and Boren Avenue North to the east. According to Washington State Department of Ecology records, there are no water supply wells within a half-mile radius of the site. Lake Union lies approximately 1,000 feet north of the site. An active UNOCAL service station is located about 300 feet west of the site on Mercer Street.

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The site has been an operating service station since at least 1960. In 1984, two 4,000-gallon, one 6,000-gallon, and one 8,000-gallon gasoline underground storage tanks were removed from the site and replaced with three 10,000-gallon fiberglass gasoline underground storage tanks. A 500-gallon waste oil and 500-gallon fuel oil tank were installed at the site in 1964 and removed from the site about 1984. The three fiberglass gasoline tanks passed tightness testing performed by Tanknology Corporation International of Houston, Texas, on August 7, 1990.

PREVIOUS WORK

EMCON Northwest, Inc., conducted an environmental assessment of the site during the period of July to September 1990. The results were presented to Shell Oil Company in EMCON's October 8, 1990, report. Twelve soil borings were drilled and five monitoring wells were installed and sampled. Ground water samples from three wells exceeded the Model Toxics Control Act (MTCA)[1] Method A cleanup levels.

Ground water samples were collected from five on-site monitoring wells in May 1991 as part of the semiannual ground water monitoring program. The results are summarized in EMCON's August 9, 1991, report to Shell Oil Company. Ground water samples collected from two wells exceeded MTCA Method A cleanup levels.

EMCON Northwest, Inc., conducted additional site characterization, remediation, and semiannual ground water sampling work during August and September 1991. The results are summarized in EMCON's January 13, 1992, report to Shell Oil Company. Eight borings were drilled and two ground water monitoring wells, four vapor extraction wells, and two ground water recovery wells were installed at the site. Ground water samples were collected from seven wells. Results from three wells exceeded MTCA Method A cleanup levels for BTEX or TPH as gasoline, and results from two wells exceeded MTCA Method A cleanup criteria for total lead. Ground water recovery and vapor extraction treatment systems were installed at the site in January 1992, and activated on February 12, 1992.

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[1] Chapter 173-340 WAC, "The Model Toxics Control Act Cleanup Regulations, Method A Cleanup Levels." Amended February 1991.

EMCON conducted semiannual ground water sampling at the site in April 1992. Ground water samples were collected from seven wells. The results are reported in EMCON's May 12, 1992, report to Shell Oil Company. Results from one well exceeded MTCA Method A cleanup criteria for BTEX and TPH as gasoline, results from one well exceeded the MTCA Method A cleanup level for benzene, and results from one well exceeded the MTCA Method A cleanup level for TPH as oil. Results from all seven wells exceeded MTCA Method A cleanup levels for total lead.

GROUND WATER SAMPLING

Ground water samples were collected from seven monitoring wells (MW-1, MW-4, MW-10, MW-11, MW-12, MW-13, and MW-14) and two recovery wells (RW-1 and RW-2) on September 10, 1992 (Figure 2). A minimum of three pore volumes were purged from each well prior to collecting samples. Ground water samples were collected using 1.5-inch-diameter disposable bailers. Collected samples were then placed into properly labeled containers, stored in an iced cooler, and transported under standard chain-of-custody procedures to North Creek Analytical Inc., in Bothell, Washington, for analysis.

All ground water samples, including a duplicate sample collected from MW-11, a field blank of laboratory distilled water, and a trip blank, were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Methods 5030/8020 and total petroleum hydrocarbons (TPH) as gasoline by Method WTPH-G. All ground water samples collected from monitoring wells were analyzed for total lead by EPA Method 7421. Ground water samples collected from MW-10 and MW-11 and the duplicate sample collected from MW-11 were analyzed for TPH as diesel and TPH as oil by Method WTPH-D extended. Table 1 presents a summary of the analytical requests.

GROUND WATER ELEVATIONS AND PARAMETERS

Prior to collecting samples, depth to ground water was measured in each well and each well was checked for the presence of free-floating product using a bailer. No free-floating product was detected in any well at the site on September 10, 1992. Depth to water ranged from 14.87 feet in MW-1

to 19.50 feet in RW-2. Depth-to water measurements and well survey information were used to determine the relative ground water elevation at each well (Table 2). Relative ground water elevations ranged from 75.96 feet at RW-2 to 80.79 feet at MW-4. The inferred ground water flow direction, based on the calculated ground water elevations, was variable, flowing toward the west and east on September 10, 1992 (Figure 2).

Ground water parameters (pH, specific conductance, and temperature) were measured with a Corning CheckMate meter during sampling. Ground water samples were not collected until measured parameters stabilized to within 10 percent of preceding measurements. The final (stabilized) pH values ranged from 6.29 at MW-13 to 6.65 at MW-11. The specific conductance ranged from 899 μmhos/cm at MW-14 to 2,300 μmhos/cm in RW-1. Temperature readings ranged from 16.8°C at MW-13 to 19.6°C at MW-12. A summary of the final ground water parameters is presented in Table 2.

The concentration of dissolved oxygen was measured on the final purge sample from each well. Dissolved oxygen concentrations were measured using a Corning CheckMate meter. The measured dissolved oxygen values ranged from 0.2 mg/l at MW-10 to 7.9 mg/l at MW-11 (Table 2).

GROUND WATER SAMPLE ANALYTICAL RESULTS

Ground water quality for the samples collected from MW-11 and RW-2 on September 10, 1992, exceeded the MTCA Method A cleanup levels for benzene. Ground water samples collected from MW-11 and RW-1 exceeded the MTCA Method A cleanup level for total xylenes. The sample collected from MW-11 also exceeded the MTCA Method A cleanup levels for TPH as gasoline and TPH as diesel in ground water. The ground water sample collected from MW-10 exceeded the MTCA Method A cleanup level for TPH as diesel. Ground water samples collected from four wells and the duplicate sample collected from MW-11 exceeded the MTCA Method A cleanup level for total lead in ground water. Table 1 presents a summary of the analytical results. Benzene concentrations measured on September 10, 1992, are shown on Figure 2. Copies of the analytical report and chain-of-custody form are included in Appendix A.

CONCLUSIONS

Ground water samples were collected from nine wells on September 10, 1992. Results from one well (MW-11) exceeded MTCA Method A cleanup levels for benzene, total xylenes, TPH as gasoline, and TPH as diesel in ground water. Results from two additional wells exceeded the MTCA Method A cleanup level for benzene (RW-2) and total xylenes (RW-1) in ground water, and results from one well (MW-10) exceeded the MTCA Method A cleanup level for TPH as diesel in ground water. Results from four wells and the duplicate sample collected from MW-11 exceeded the MTCA Method A cleanup level for total lead in ground water.

Ground water and soil vapor treatment systems were installed in January 1992 and are currently operating at the site. Semiannual ground water monitoring is scheduled to continue at the site.

It has been our pleasure to be of service to Shell Oil Company in conducting this semiannual monitoring effort. If you have any questions or concerns regarding the methods or results presented in this report, please call.

Sincerely,

EMCON Northwest, Inc.

Michael D. Noll, R.G.
Project Manager

David W. Ashcom, P.E.
Director, Hydrocarbons Services

Attachments: Limitations
Figure 1 — Site Vicinity Map
Figure 2 — Site Map — Ground Water Data
Table 1 — Ground Water Sample Chemical Analyses
Table 2 — Ground Water Depth and Parameters
Appendix A — Laboratory Report

cc/enc: Lynn Chun, Texaco Refining and Marketing Inc.
Mark Wells, Texaco Environmental Services

B/SHE/BORE-LR.902/kk:4

LIMITATIONS

The services described in this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, nor the use of segregated portions of this report.

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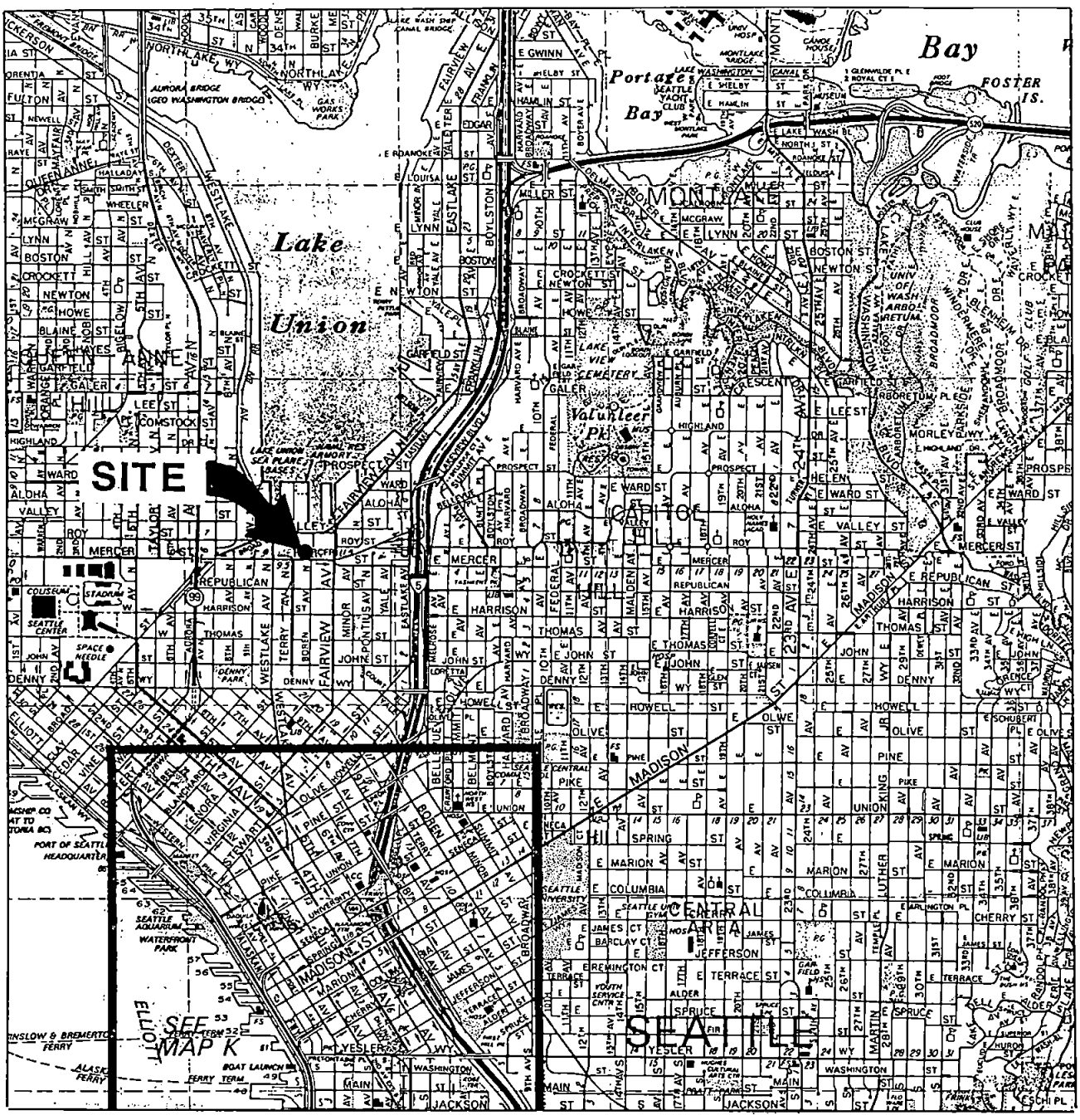
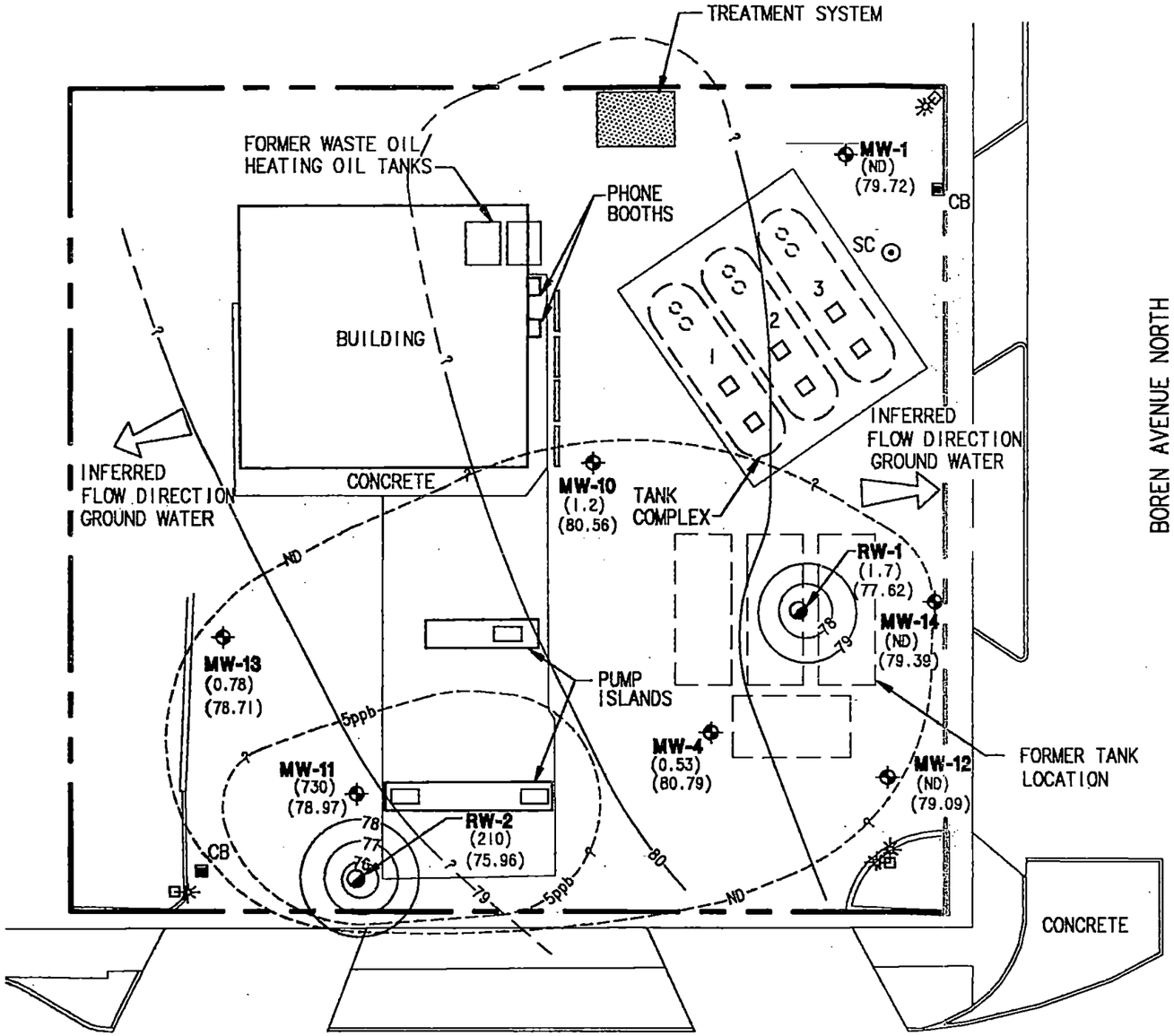


Sweet-Edwards EMCON

DATE 8/90
DWN. KLM
APPR. MDN
REVIS.
PROJECT NO. W5608.05

Figure 1
SHELL SERVICE STATION # 23714
SEATTLE, WASHINGTON

SITE VICINITY MAP



LEGEND:

MW-10	⊕	Monitoring Well
RW-1	⊘	Recovery Well
WM	□	Water Meter
CB	▣	Catch Basin
	✳▣	Area Light

—— 80 --	Ground Water Elevation (feet)
(80.98)	Measured Ground Water Elevation (feet) September 10, 1992
——5ppb——	Benzene Contour (ppb)
(17)	Measured Benzene Concentration in Ground Water (ppb) September 10, 1992
ND	Not Detected
?	Uncertain

N

0 20 40

SCALE (ft)

NOTE:
1. Tank 1 contains 10,000 gallons unleaded.
2. Tank 2 contains 10,000 gallons super unleaded.
3. Tank 3 contains 10,000 gallons regular.

EMCON Northwest, Inc.

DATE	9/92
DWN.	JG
REV.	
APPR.	MDN
PROJECT NO.	0556-008.10

Figure 2
FORMER SHELL SERVICE STATION
601 BOREN AVENUE NORTH
SEATTLE, WASHINGTON
SITE MAP-GROUND WATER DATA

1=20 0556\008\10C01 12-2-92

Table 1

Shell Oil Company
Ground Water Sample Chemical Analyses
601 Boren Avenue North, Seattle
WIC 246-7616-0401

Sample Location	Sample Date	Sample ID	BTEX Compounds[1] (ppb)				Total Petroleum Hydrocarbons (ppm)			Total Lead[4] (ppb)
			Benzene	Toluene	Ethyl-benzene	Total Xylenes	Gasoline[2]	Diesel[3]	Oil[3]	
MTCA[5] Method A Cleanup Levels			5	40	30	20	1	1	1	5
MW-1	09/10/92	MW-1	ND	ND	ND	ND	ND	–	–	5.3
MW-4	09/10/92	MW-4	0.53	0.53	ND	2.1	0.088	–	–	2.2
MW-10	09/10/92	MW-10	1.2	ND	ND	1.3	0.37	1.6	0.98	16
MW-11	09/10/92	MW-11	730	4.9	9.3	32	1.3	2.9	0.93	3.8
MW-11 (dup)	09/10/92	MW-15	840	ND	12	41	0.83	2.2	ND	5.1
MW-12	09/10/92	MW-12	ND	ND	ND	ND	ND	–	–	14
MW-13	09/10/92	MW-13	0.78	0.84	ND	1.5	ND	–	–	6.3
MW-14	09/10/92	MW-14	ND	ND	ND	ND	ND	–	–	ND
RW-1	09/10/92	RW-1	1.7	0.51	2.3	22	0.19	–	–	–
RW-2	09/10/92	RW-2	210	20	ND	10	0.49	–	–	–
Field Blank	09/10/92	MW-7	1.2	2.3	ND	ND	ND	–	–	–
Trip Blank	09/10/92	Trip Blank	ND	ND	ND	ND	ND	–	–	–
MW-1	04/03/92	MW-1	ND	ND	ND	ND	0.12	–	ND	69
MW-4	04/03/92	MW-4	17	0.62	8.0	20	0.38	–	–	16
MW-10	04/03/92	MW-10	3.4	ND	0.88	5.7	0.4	–	1.1	62
MW-10 (dup)	04/03/92	MW-17	3.4	ND	0.84	5.3	0.37	–	ND	31
MW-11	04/03/92	MW-11	1,100	ND	34	95	3.4	–	–	34
MW-12	04/03/92	MW-12	ND	ND	ND	ND	0.08	–	–	6.6
MW-13	04/03/92	MW-13	0.93	0.5	ND	1.1	0.067	–	ND	9.1
MW-14	04/03/92	MW-14	ND	0.98	ND	1.3	0.29	–	–	5.6
Field Blank	04/03/92	MW-16	ND	0.51	ND	ND	ND	–	ND	ND
Trip Blank	04/03/92	Trip Blank	ND	ND	ND	ND	ND	–	–	ND
MW-1	09/05/91	MW-1	1^A,J	2^A,J	ND	ND	ND	–	–	12
MW-4	09/05/91	MW-4	56^A	2^A,J	39^A	35	ND	–	–	ND
MW-10	09/05/91	MW-10	6^A	1^A,J	3^A,J	10	ND	–	–	35
MW-11	09/05/91	MW-11	2,000^A,J	10^A	58^A	288	4^J	–	–	ND
MW-11 (dup)	09/05/91	MW-15	1,500^A	10^A	61^A	328	5	–	–	ND
MW-12	09/05/91	MW-12	1^A,J	1^A,J	1^A,J	ND	ND	–	–	ND
MW-13	09/05/91	MW-13	1^A,J	2^A,J	ND	ND	ND	–	–	ND

Table 1
Shell Oil Company
Ground Water Sample Chemical Analyses
601 Boren Avenue North, Seattle
WIC 246-7616-0401
(Continued)

Sample Location	Sample Date	Sample ID	BTEX Compounds[1] (ppb)				Total Petroleum Hydrocarbons (ppm)			Total Lead[4] (ppb)
			Benzene	Toluene	Ethyl-benzene	Total Xylenes	Gasoline[2]	Diesel[3]	Oil[3]	
MTCA[5] Method A Cleanup Levels			5	40	30	20	1	1	1	5
MW-14	09/05/91	MW-14	1[A,J]	3[A,J]	1[A,J]	ND	ND	–	–	ND
Field Blank	09/05/91	MW-16	1[A,J]	1[A,J]	ND	ND	ND	–	–	ND
Trip Blank	09/05/91	Trip Blank	1[A,J]	1[A,J]	ND	ND	ND	–	–	–

NOTES: ND Not detected
– Not analyzed
dup Duplicate sample
Shading indicates values exceeded MTCA Method A cleanup levels

[A] The analyte indicated was also found in the blank sample
[J] Value indicated was below the practical quantitation limit
[1] Results for analyses of ground water samples for BTEX were obtained using EPA Method 8020 (Purge and Trap) and reported as ng/ml (ppb)
[2] Results for analyses of ground water samples for total petroleum hydrocarbons were obtained using Method WTPH-G (GC/FID) and reported as mg/l (ppm)
[3] Results for analyses of ground water samples for total petroleum hydrocarbons were obtained using Method WTPH-D extended and reported as mg/l (ppm)
[4] Results for analyses of ground water samples for total lead were obtained using EPA Method 7421 and reported as µg/l (ppb)
[5] Chapter 173-340 WAC, "The Model Toxics Control Act Cleanup Regulations, Method A Cleanup Limits." Amended February 1991.

Caution on misusing Method A tables. Method A tables have been developed for specific purposes. They are intended to provide conservative cleanup levels for sites undergoing routine cleanup actions or those sites with relatively few hazardous substances. The tables may not be appropriate for defining cleanup levels at other sites. For these reasons, the values in these tables should not automatically be used to define cleanup levels that must be met for financial, real estate, insurance coverage or placement, or similar transactions or purposes. Exceedances of the values in these tables do not necessarily trigger requirements for cleanup action under this chapter.

Table 2

Shell Oil Company
Ground Water Depth and Parameters
601 Boren Avenue North, Seattle, Washington
WIC 246-7616-0401

Sample Location	Sample Date	Measured Depth to Water (ft)	Ground Water Elevation (ft)	pH	Specific Conductance (μmhos/cm)	Temperature (°C)	Dissolved Oxygen (mg/l)
MW-1	09/10/92	14.87	79.72	6.53	1,159	17.2	0.5
MW-4	09/10/92	15.06	80.79	6.40	1,315	19.4	1.5
MW-10	09/10/92	15.60	80.56	6.60	1,829	18.4	0.2
MW-11	09/10/92	15.92	78.97	6.65	1,611	17.6	7.9
MW-12	09/10/92	17.00	79.09	6.57	1,259	19.6	2.7
MW-13	09/10/92	16.15	78.71	6.29	1,962	16.8	1.3
MW-14	09/10/92	16.04	79.39	6.53	899	19.5	0.7
RW-1	09/10/92	15.76	77.62	6.52	2,300	18.8	0.5
RW-2	09/10/92	19.50	75.96	6.40	1,257	17.0	1.5
MW-1	04/03/92	14.85	79.74	6.57	1122	14.3	--
MW-4	04/03/92	14.87	80.98	6.72	1151	15.3	--
MW-10	04/03/92	15.45	80.71	7.26	1803	15.3	--
MW-11	04/03/92	15.65	79.24	7.06	1662	14.7	--
MW-12	04/03/92	16.69	79.41	6.76	1360	15.3	--
MW-13	04/03/92	16.02	78.84	6.76	1801	14.9	--
MW-14	04/03/92	16.14	79.29	7.10	958	15.0	--
MW-1	09/05/91	14.79	79.80	6.42	976	17.2	--
MW-4	09/05/91	14.90	80.95	6.35	1244	17.5	--
MW-10	09/05/91	14.58	81.58	6.81	1904	18.3	--
MW-11	09/05/91	14.99	79.90	6.65	1812	18.0	--
MW-12	09/05/91	16.49	79.61	6.64	1414	22.0	--
MW-13	09/05/91	15.70	79.16	6.44	1853	18.3	--
MW-14	09/05/91	15.92	79.51	6.48	837	16.9	--

NOTE: Specific conductance measured at 25°C
-- Not analyzed

Appendix A

LABORATORY REPORT

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

EMCON Northwest	Client Project ID:	Shell #246-7616-0401, W56-08.07	Sampled:	Sep 10, 1992
18912 N. Creek Parkway, #210	Matrix Descript:	Water	Received:	Sep 11, 1992
Bothell, WA 98011	Analysis Method:	WTPH-G,EPA 5030/8020	Analyzed:	Sep 18, 1992
Attention: Mike Noll	First Sample #:	209-0479	Reported:	Sep 23, 1992

TOTAL PETROLEUM HYDROCARBONS with BTEX DISTINCTION (WTPH-G/BTEX)

Sample Number	Sample Description	Volatile Hydrocarbons µg/L (ppb)	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)	Surrogate Recovery %
209-0479	RW-2	490	210	20	N.D.	10	103
209-0480	RW-1	190	1.7	0.51	2.3	22	120
209-0481	MW-11	1,300	730	4.9	9.3	32	110
209-0482	MW-13	N.D.	0.78	0.84	N.D.	1.5	106
209-0483	MW-14	N.D.	N.D.	N.D.	N.D.	N.D.	104
209-0484	MW-12	N.D.	N.D.	N.D.	N.D.	N.D.	99
209-0485	MW-10	370	1.2	N.D.	N.D.	1.3	123
209-0486	MW-15 (MW-11 DUP)	830	840	N.D.	12	41	111
209-0487	MW-1	N.D.	N.D.	N.D.	N.D.	N.D.	103
209-0488	MW-4	88	0.53	0.53	N.D.	2.1	115
Detection Limits:		**50**	**0.50**	**0.50**	**0.50**	**1.0**	

Volatile Hydrocarbons are quantitated as Gasoline Range Organics (nC7 - nC12). Surrogate recovery reported is for Bromofluorobenzene.
Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICAL inc

Scot Cocanour
Laboratory Director

Please Note:
The detection limit for Ethyl Benzene in #209-0479 = 8.0 µg/L.
The detection limit for Toluene in #209-0486 = 8.0 µg/L.

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

EMCON Northwest	Client Project ID:	Shell #246-7616-0401, W56-08.07	Sampled:	Sep 10, 1992
18912 N. Creek Parkway, #210	Matrix Descript:	Water	Received:	Sep 11, 1992
Bothell, WA 98011	Analysis Method:	WTPH-G,EPA 5030/8020	Analyzed:	Sep 18, 1992
Attention: Mike Noll	First Sample #:	209-0489	Reported:	Sep 23, 1992

TOTAL PETROLEUM HYDROCARBONS with BTEX DISTINCTION (WTPH-G/BTEX)

Sample Number	Sample Description	Volatile Hydrocarbons µg/L (ppb)	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)	Surrogate Recovery %
209-0489	MW-7 (FIELD BLANK)	N.D.	1.2	2.3	N.D.	N.D.	96
209-0490	Trip Blank 9/9/92	N.D.	N.D.	N.D.	N.D.	N.D.	104
BLK091892	Method Blank	N.D.	N.D.	N.D.	N.D.	N.D.	99
Detection Limits:		**50**	**0.50**	**0.50**	**0.50**	**1.0**	

Volatile Hydrocarbons are quantitated as Gasoline Range Organics (nC7 - nC12). Surrogate recovery reported is for Bromofluorobenzene.
Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICAL inc

Todd Bechtel (for)
Scot Cocanour
Laboratory Director

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

EMCON Northwest	Client Project ID:	Shell #246-7616-0401, W56-08.07	Sampled:	Sep 10, 1992
18912 N. Creek Parkway, #210	Matrix Descript:	Water	Received:	Sep 11, 1992
Bothell, WA 98011	Analysis Method:	WTPH-D	Extracted:	Sep 15, 1992
Attention: Mike Noll	First Sample #:	209-0481	Analyzed:	Sep 22, 1992
			Reported:	Sep 23, 1992

TOTAL PETROLEUM HYDROCARBONS (WTPH-D)

Sample Number	Sample Description	Extractable Hydrocarbons mg/L (ppm)	Surrogate Recovery %
209-0481	MW-11	2.9 D-3	94
209-0485	MW-10	1.6 D-3	89
209-0486	MW-15 (MW-11 Dup)	2.2	94
BLK091592	Method Blank	N.D.	81

Detection Limits:	**0.25**

Extractable Hydrocarbons are quantitated as Diesel Range Organics (nC12 - nC24). Surrogate recovery reported is for 2-Fluorobiphenyl. Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICAL Inc

Scot Cocanour
Laboratory Director

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

EMCON Northwest	Client Project ID:	Shell #246-7616-0401, W56-08.07	Sampled:	Sep 10, 1992
18912 N. Creek Parkway, #210	Matrix Descript:	Water	Received:	Sep 11, 1992
Bothell, WA 98011	Analysis Method:	WTPH-D Extended	Extracted:	Sep 15, 1992
Attention: Mike Noll	First Sample #:	209-0481	Analyzed:	Sep 22, 1992
			Reported:	Sep 23, 1992

TOTAL PETROLEUM HYDROCARBONS - (WTPH-D EXTENDED)

Sample Number	Sample Description	Extractable Hydrocarbons mg/L (ppm)	Surrogate Recovery %
209-0481	MW-11	0.93 D-3	94
209-0485	MW-10	0.98 D-3	89
209-0486	MW-15	N.D.	94
BLK091592	Method Blank	N.D.	81

Detection Limits:	**0.75**

Extractable Hydrocarbons are quantitated as Motor Oil Range Organics (nC24 - nC36). Surrogate recovery reported is for 2-Fluorobiphenyl. Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICAL inc

Scot Cocanour
Laboratory Director

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

HYDROCARBON ANALYSES FOOTNOTES

(8/92)

Code	Description

VOLATILE HYDROCARBONS - Gasoline Range Organics

G 1 This sample appears to contain extractable diesel range organics.

G 2 The chromatogram for this sample is not a typical gasoline fingerprint.

G 3 The total hydrocarbon result in this sample is primarily due to a peak(s) eluting in the volatile hydrocarbon range. Identification and quantitation by EPA 8010, 8021 or 8240 is recommended.

EXTRACTABLE HYDROCARBONS - Diesel Range Organics

D 1 This sample appears to contain volatile gasoline range organics.

D 2 The hydrocarbons present in this sample are primarily due to very heavy, non-resolvable oil range organics. Quantitation by EPA 418.1 is recommended.

D 3 The hydrocarbons present in this sample are a complex mixture of extractable diesel range and non-resolvable motor oil or other heavy oil range organics.

D 4 The hydrocarbon result shown is an estimated (greater than) value due to high concentration. Reanalysis is being performed to yield a quantitative result.

Oils & Lubricants

[----------]

T.R.P.H. (418.1)

Diesel & Fuel Oils

[----------]

Extractables (3550/8015)

Gasoline

[----------]

Volatiles (5030/8015)

HYDROCARBON BOILING POINT RANGE

LOW **LOW TO MEDIUM** **MEDIUM** **MEDIUM TO HIGH** **VERY HIGH**

CARBON RANGE:

5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 +

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

EMCON Northwest	Client Project ID:	Shell #246-7616-0401, W56-08.07	Sampled:	Sep 10, 1992
18912 N. Creek Parkway, #210	Analysis Method:	EPA 7421	Received:	Sep 11, 1992
Bothell, WA 98011	Analysis for:	Lead	Digested:	Sep 18, 1992
Attention: Mike Noll	First Sample #:	209-0481	Analyzed:	Sep 22, 1992
	Matrix:	Water	Reported:	Sep 23, 1992

METALS ANALYSIS FOR: Lead

Sample Number	Sample Description	Detection Limit µg/L (ppb)	Sample Result µg/L (ppb)
209-0481	MW-11	2.0	3.8
209-0482	MW-13	2.0	8.3
209-0483	MW-14	2.0	N.D.
209-0484	MW-12	2.0	14
209-0485	MW-10	2.0	16
209-0486	MW-15	2.0	5.1
209-0487	MW-1	2.0	5.3
209-0488	MW-4	2.0	2.2
BLK091892	Method Blank	2.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICAL Inc

Scot Cocanour
Laboratory Director

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EMCON Northwest
18912 N. Creek Parkway, #210
Bothell, WA 98011
Attention: Mike Noll

Client Project ID: Shell #246-7616-0401, W56-08.07
Sample Matrix : Water
Units: µg/L (ppb)

Analyst: F. Shino

Reported: Sep 23, 1992

METALS QUALITY CONTROL DATA REPORT

ANALYTE	Lead
EPA Method:	7421
Date Analyzed:	Sep 23, 1992

ACCURACY ASSESSMENT

LCS Spike Conc. Added:	60
LCS Spike Result:	58
LCS Spike % Recovery:	97
Upper Control Limit:	136
Lower Control Limit:	67
Matrix Spike Sample #:	209-0483
Matrix Spike % Recovery:	83

PRECISION ASSESSMENT

Sample #:	209-0483
Original:	N.D.
Duplicate:	N.D.
Relative % Difference:	0

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Laboratory Director

Lab Control Sample % Recovery: $\frac{\text{Conc. of L.C.S.}}{\text{L.C.S. Spike Conc. Added}} \times 100$

Relative % Difference: $\frac{\text{Original Result - Duplicate Result}}{(\text{Original Result + Duplicate Result}) / 2} \times 100$

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EMCON Northwest	Client Project ID: Shell #246-7616-0401, W56-08.07	Analyst:	R. Lister
18912 N. Creek Parkway, #210	EPA Method: WTPH-G		S. Stowell
Bothell, WA 98011	Sample Matrix: Water		
Attention: Mike Noll	Units: µg/L (ppb)	Analyzed:	Sep 18, 1992
		Reported:	Sep 23, 1992

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

Gasoline

Spike Conc. Added:	100
Spike Result:	93
% Recovery:	93
Upper Control Limit %:	120
Lower Control Limit %:	80

PRECISION ASSESSMENT
Sample Duplicate

Volatile Hydrocarbons

Sample Number:	209-0759
Original Result:	N.D.
Duplicate Result:	N.D.
Relative % Difference	0
Maximum RPD:	20

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Laboratory Director

% Recovery: $\frac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$

Relative % Difference: $\frac{\text{Original Result - Duplicate Result}}{(\text{Original Result + Duplicate Result}) / 2} \times 100$

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Phone (206) 481-9200 • FAX (206) 485-2992

EMCON Northwest	Client Project ID: Shell #246-7616-0401, W56-08.07	Analyst:	R. Lister
18912 N. Creek Parkway, #210	EPA Method: 5030/8020		S. Stowell
Bothell, WA 98011	Sample Matrix: Water		
Attention: Mike Noll	Units: µg/L (ppb)	Analyzed:	Sep 18, 1992
	QC Sample #: 209-0490	Reported:	Sep 23, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	5.0	5.0	5.0	15.0
Conc. Matrix Spike:	5.2	5.4	5.4	16.6
Matrix Spike % Recovery:	104%	108%(*)	108%	111%(*)
Conc. Matrix Spike Dup.:	5.0	5.2	5.4	16.2
Matrix Spike Duplicate % Recovery:	100%	104%	108%	108%
Upper Control Limit %:	112	105	109	108
Lower Control Limit %:	85	74	87	79
Relative % Difference:	4%	4%	0%	2%
Maximum RPD:	9.9	17	13	17

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Laboratory Director

Please Note:
(*) The Matrix Spike recoveries for Toluene and Xylenes are outside of the NCA established control limits.

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EMCON Northwest	Client Project ID: Shell #246-7616-0401, W56-08.07	Analyst:	L. Dutton
18912 N. Creek Parkway, #210	EPA Method: WTPH-D		
Bothell, WA 98011	Sample Matrix: Water	Extracted:	Sep 15, 1992
Attention: Mike Noll	Units: mg/L (ppm)	Analyzed:	Sep 22, 1992
		Reported:	Sep 23, 1992

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

	Diesel
Spike Conc. Added:	2.0
Spike Result:	1.6
% Recovery:	80
Upper Control Limit %:	120
Lower Control Limit %:	80

PRECISION ASSESSMENT
Sample Duplicate

	Extractable Hydrocarbons
Sample Number:	209-0485
Original Result:	1.6
Duplicate Result:	1.6
Relative % Difference	0
Maximum RPD:	20

NORTH CREEK ANALYTICAL Inc

Scot Cocanour
Laboratory Director

$$\text{\% Recovery:} \quad \frac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$$

$$\text{Relative \% Difference:} \quad \frac{\text{Original Result - Duplicate Result}}{(\text{Original Result + Duplicate Result}) / 2} \times 100$$

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING - WEST

CHAIN OF CUSTODY RECORD
Serial No: [redacted]

Page 1 of 2

Site Address: 601 BOREN AVE N. SEATTLE

WIC#: 246-7616-0401

Shell Engineer: Frank Fossati
Phone No.: (714) 520-3362 Fax #: 520-3313

Consultant Name & Address: EMCON Northwest, Inc.
18912 North Creek Parkway, Ste 100
Bothell, WA 98011

Consultant Contact: Mike Noll WS6-08.07
Phone No.: (206) 485-5000 Fax #: 486-9766

Comments: PLEASE PUT # WS6-08.07 ON LAB REPORT

Sampled by: J. BERTRAND

Printed Name:

LAB: North Creek Analytical

CHECK ONE (1) BOX ONLY	C7/01	TURN AROUND TIME
Quarterly Monitoring	☐ 6441	24 hours ☐
Site Investigation	☒ 6441	48 hours ☐
Soil Closure/Disposal	☐ 6442	15 days ☒ (Normal)
Water Closure/Disposal	☐ 6443	Other ☐
Soil/Air Rem. or Sys. O & M	☐ 6452	NOTE: Notify Lab as soon as Possible of 24/48 hr. TAT.
Water Rem. or Sys. O & M	☐ 6453	
Other	☐	

Analysis Required

Sample ID	Date	Sludge	Soil	Water	Air	No. of conts.	TPH (EPA 8015 Mod. Gas)	TPH (EPA 8015 Mod. Diesel) DIESEL EXTENDED	BTEX (EPA 8020/602)	Volatile Organics (EPA 8240)	Test for Disposal	Combination TPH 8015 & BTEX 8020 TOTAL LEAD	Asbestos	Container Size	Preparation Used	Composite Y/N	MATERIAL DESCRIPTION TIME	SAMPLE CONDITION/ COMMENTS
RW-2	9-10-92			X								X					WATER 1015	2090479
RW-1	"			X								X X					1328	480
MW-11	"			X				X				X X					1025	DO DIESEL EXTENDED
MW-13	"			X								X X					1130	482
MW-14	"			X		4						X X					1508	483
MW-12	"			X		4						X X					1520	484
MW-10	✓			X				X				X X					1255	DO DIESEL 485
MW-15	9-10-92			X								X X					1100	EXTENDED 486

Relinquished By (signature):	Printed Name: J. BERTRAND	Date: 9-10-92 Time: 1715	Received (signature):	Printed Name: BETH NEELY	Date: 9-10-92 Time: 5:15
Relinquished By (signature):	Printed Name:	Date: Time:	Received (signature):	Printed Name:	Date: Time:
Relinquished By (signature):	Printed Name:	Date: Time:	Received (signature):	Printed Name:	Date: Time:

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN-OF-CUSTODY WITH INVOICE AND RESULTS

Shell Co Chn of Custody

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING - WEST

CHAIN OF CUSTODY RECORD

Serial No: _____

Page 2 of 2

Site Address: 601 BOREN AVE N. SEATTLE

WIC#: 246-7616-0401

Shell Engineer: Frank Fossati — Phone No.: (714) 520-3362 Fax #: 520-3313

Consultant Name & Address: EMCON Northwest, Inc., 18912 North Creek Parkway, Ste 100, Bothell, WA 98011

Consultant Contact: Mike Noll WS6-08.07 — Phone No.: (206) 485-5000 Fax #: 486-9766

Comments: PUT # WS6-08-07 ON LAB REPORT

Sampled by: J. BERTRAND

Printed Name: J. BERTRAND

LAB: North Creek Analytical

CHECK ONE (1) BOX ONLY — CT/DT

- Quarterly Monitoring ☐ 6441
- Site Investigation ☒ 6441
- Soil Closure/Disposal ☐ 6442
- Water Closure/Disposal ☐ 6443
- Soil/Air Rem. or Sys. O & M ☐ 6452
- Water Rem. or Sys. O & M ☐ 6453
- Other ☐

TURN AROUND TIME

- 24 hours ☐
- 48 hours ☐
- 15 days ☒ (Normal)
- Other ☐ ____

NOTE: Notify Lab as soon as Possible of 24/48 hr. TAT.

Analysis Required: TPH (EPA 8015 Mod. Gas); TPH (EPA 8015 Mod. Diesel); BTEX (EPA 8020/602); Volatile Organics (EPA 8240); Test for Disposal; Combination TPH 8015 & BTEX 8020; TOTAL LEAD; Asbestos; Container Size; Preparation Used; Composite Y/N

Sample ID	Date	Sludge	Soil	Water	Air	No. of conts.	MATERIAL DESCRIPTION / TIME	SAMPLE CONDITION / COMMENTS
MW-1	9-10			X		4	WATER 1405	2090487
MW-4	9-10			X		4	WATER 1320	488
MW-7	9-10			X		3	WATER 1000	489
TRIP BLANK	9-9			X		2	WATER	490

Relinquished By (signature):	Printed Name: J. BERTRAND	Date: 9-10-92 Time: 1715	Received (signature):	Printed Name: BETH NEELY — Date: 09-10-92 Time: 5:15
Relinquished By (signature):	Printed Name:	Date: Time:	Received (signature):	Printed Name: Date: Time:
Relinquished By (signature):	Printed Name:	Date: Time:	Received (signature):	Printed Name: Date: Time:

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN-OF-CUSTODY WITH INVOICE AND RESULTS