LUST #

NW U0006893
003320

EMCON Northwest, Inc.

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

DEPARTMENT OF ECOLOGY
NWRO/TCP TANKS UNIT SR 7/18/94 CW

INTERIM CLEANUP REPORT	☑
SITE CHARACTERIZATON	☐
FINAL CLEANUP REPORT	☐
OTHER _____	☐
AFFECTED MEDIA: SOIL	☐
OTHER _____ GW	☑
INSPECTOR (INIT.) JB DATE 7	

May 2, 1994
Project 0556-008.30

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

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

Dear Mr. Fossati:

EMCON Northwest, Inc. (EMCON), is pleased to submit this letter report describing the quarterly groundwater sampling event conducted on March 22, 1994, at the former Shell service station referenced above (Figure 1).

EMCON personnel collected groundwater samples from seven monitoring wells (Figure 2). Before sample collection, depth-to-water readings were measured using an electronic well sounding tape. The depth-to-water readings were used to calculate the volume of water standing in the well casing (pore volume). At least three pore volumes were removed from each well before sample collection.

Field measurements of pH, specific conductance, and temperature were recorded during well purging. Measurements were collected and recorded following the removal of each pore volume. Following stabilization of the field parameters (less than 10 percent change between pore volumes), dissolved oxygen measurements were obtained, and a sample was collected.

B/SHE/SGW08-LR.418-94/sna:4

Each sample was labelled and placed into an iced cooler. The samples were delivered to North Creek Analytical of Bothell, Washington, under standard chain-of-custody protocol for quantitative chemical analyses. A duplicate sample was collected from MW-11. The samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 5030/8020, total petroleum hydrocarbons as gasoline (TPH-G) by Washington Department of Ecology (Ecology) Method WTPH-G, TPH as diesel (TPH-D) and TPH as oil (TPH-O) by Ecology Method WTPH-D extended, and total lead by EPA Method 7421.

Groundwater laboratory results are summarized in Table 1. Benzene concentrations and groundwater elevation data are shown on Figure 2. A summary of the groundwater elevations and stabilized groundwater parameters is included as Table 2. The MW-10 and MW-11 sample concentrations exceeded the Model Toxics Control Act (MTCA)[1] Method A Cleanup Level for diesel-range hydrocarbons (TPH-D). All other results were below MTCA Method A Cleanup Levels. A copy of the laboratory report and a summary of previous groundwater quality data are included in Appendix A.

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

Project 0556-008.30

The next quarterly groundwater sampling event at this site is scheduled for June 1994. If you have any questions regarding the information presented here, please call.

Sincerely,

EMCON Northwest, Inc.

Lisa A. Rutan
Project Manager

Kevin G. Rattue, R.G., C.P.G.
Director, Petroleum Hydrocarbon Services

Attachments:
- Figure 1 – Site Vicinity Map
- Figure 2 – Site Map — Groundwater Data
- Table 1 – Groundwater Sample Chemical Analyses
- Table 2 – Groundwater Depth and Parameters
- Appendix A – Laboratory Report and Groundwater Quality Summary Table

cc/att: Lynn Chun, Texaco Refining and Marketing, Inc.
Tony Palagyi, Texaco Environmental Services

B/SHE/SGW08-LR.418-94/sna:4

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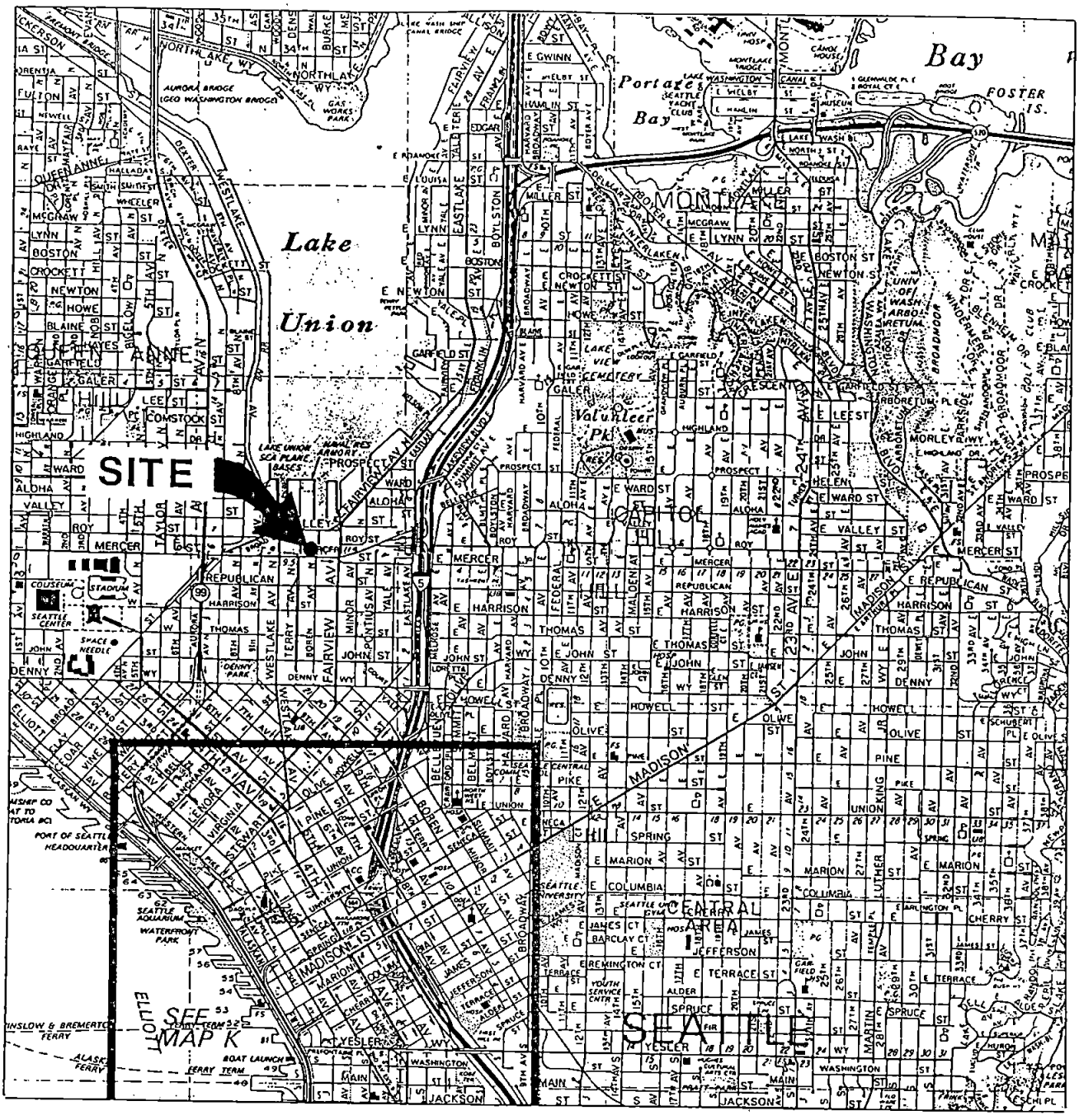

EMCON Northwest, Inc.

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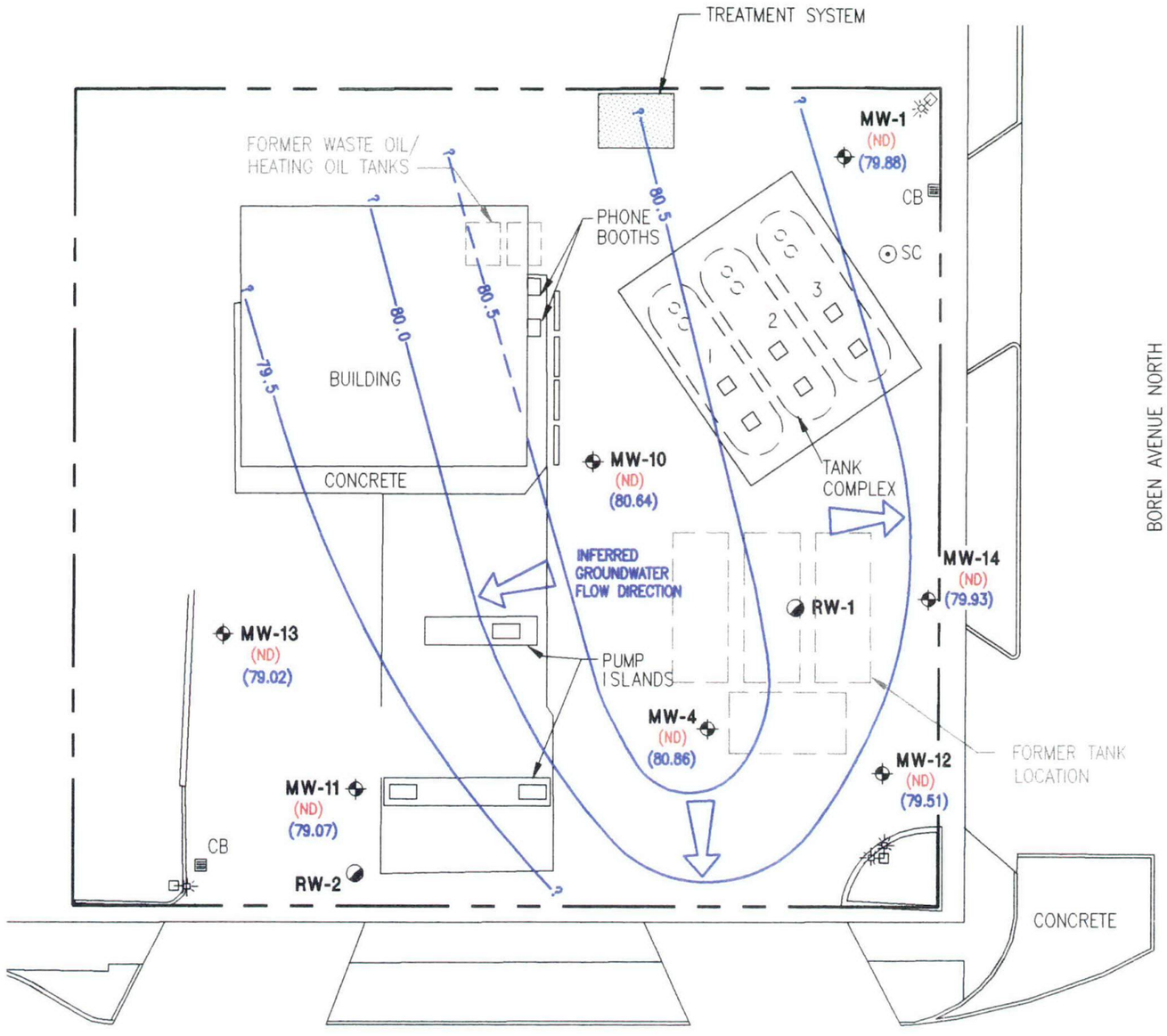
REVIS.
PROJECT NO. 0556-008.20

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 —	Relative Groundwater Elevation Contour (feet)
(80.64)	Measured Groundwater Elevation (feet) March 22, 1994
?	Uncertain
(ND)	Measured Benzene Concentration in Groundwater (ppm) March 22, 1994
ND	Not Detected

N

0 20 40

SCALE (ft)

NOTES:

1. Tank 1 capacity 10,000 gallons unleaded.
2. Tank 2 capacity 10,000 gallons super unleaded.
3. Tank 3 capacity 10,000 gallons regular.

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DATE 4-94
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0556-008.30

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

1=20 0556\008\30C01 4-26-94

Table 1

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

Sample Location	Sample Date	Sample ID	BTEX Compounds[a] (ppm)				TPH as Gasoline[b] (ppm)	TPH as Diesel[c] (ppm)	TPH as Oil[c] (ppm)	Dissolved Oxygen[d] (mg/L)	Total Lead[e] (ppm)
			Benzene	Toluene	Ethyl-benzene	Total Xylenes					
MTCA[f] Method A Cleanup Levels			0.005	0.040	0.030	0.020	1	1	1	—	0.005
MW-1	03/23/94	MW-1-0394	ND	ND	ND	ND	ND	—	—	2.1	ND
MW-4	03/23/94	MW-4-0394	ND	ND	ND	ND	ND	—	—	0.7	ND
MW-10	03/23/94	MW-10-0394	ND	ND	ND	ND	0.063	4	1.1	0.7	ND
MW-11	03/23/94	MW-11-0394	ND	ND	ND	ND	0.13	1.6	0.84	1.0	ND
MW-11(dup)	03/23/94	MW-15-0394	ND	ND	ND	ND	0.14	—	—	—	ND
MW-12	03/23/94	MW-12-0394	ND	ND	ND	ND	ND	—	—	0.9	ND
MW-13	03/23/94	WM-13-0394	ND	ND	ND	ND	ND	—	—	0.9	ND
MW-14	03/23/94	MW-14-0394	ND	ND	ND	ND	ND	—	—	0.7	ND
Field Blank	03/23/94	FB-0394	ND	0.001	ND	ND	ND	—	—	—	—
Trip Blank	03/23/94	Trip Blank	ND	ND	ND	ND	ND	—	—	—	—

NOTE: ND = Not detected.
— = Not analyzed.
dup = Duplicate sample.
Shading indicates value exceeded MTCA Method A Cleanup Levels.

[a] Results for analyses of groundwater samples for BTEX were obtained using EPA Method 5030/8020 (Purge and Trap) and reported as mg/L (ppm).
[b] Results for analyses of groundwater samples for total petroleum hydrocarbons as gasoline were obtained using Washington State Department of Ecology Method WTPH-G and reported as mg/L (ppm).
[c] Results for analyses of groundwater samples for TPH as diesel and oil were obtained using Washington Department of Ecology Method WTPH-D (extended) and reported as mg/L (ppm).
[d] Dissolved oxygen measurements were obtained with a YSI Dissolved Oxygen Meter.
[e] Results for analyses of groundwater samples for total lead were obtained using EPA Method 7421 and reported as mg/L (ppm).
[f] Chapter 173-340 WAC, *The Model Toxics Control Act Cleanup Regulations, Method A Cleanup Levels.* Amended February 1991.

Table 2

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

Sample Location	Sample Date	Measured Depth to Water (ft)	Groundwater Elevation (ft)	pH	Specific Conductance (μmhos/cm)	Temperature (°C)
MW-1	03/22/94	14.72	79.88	6.28	960	11.5
MW-4	03/22/94	14.94	80.86	6.65	1,001	10.9
MW-10	03/22/94	15.52	80.64	6.92	1,380	11.9
MW-11	03/22/94	15.82	79.07	6.79	1,844	11.5
MW-12	03/22/94	16.58	79.51	6.40	748	14.7
MW-13	03/22/94	15.84	79.02	7.11	1,705	9.9
MW-14	03/22/94	15.36	79.93	6.46	760	14.9

NOTE: Specific conductance measured at 25°C.

APPENDIX A

LABORATORY REPORT AND GROUNDWATER QUALITY SUMMARY TABLE

SHELL BOREN GROUNDWATER QUALITY SUMMARY
0556-008.20

WELL #, DATE	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)	TPH-G (PPM)	TPH-D (PPM)	TPH-OIL (PPM)	DISSOLVED OXYGEN (PPM)	DEPTH TO WATER (FT)
MW-1									
08/31/90	ND	ND	ND	ND	—	—	—	—	—
05/03/91	ND	ND	ND	ND	ND	ND	—	—	14.56
09/05/91	0.0010	0.0020	ND	ND	ND	—	—	—	14.79
04/03/92	ND	ND	ND	ND	0.12	—	—	—	14.85
09/10/92	ND	ND	ND	ND	ND	—	—	0.5	14.87
04/13/93	ND	ND	ND	ND	ND	—	—	3.0	14.72
09/29/93	ND	0.00052	ND	ND	ND	—	—	0.4	14.98
03/23/94	ND	ND	ND	ND	ND	—	—	2.1	14.72
MW-4									
08/31/90	0.0550	ND	0.0050	0.0470	ND	—	—	—	—
05/03/91	0.0560	ND	0.0310	0.0370	ND	ND	—	—	14.81
09/05/91	0.0560	0.0020	0.0390	0.0350	ND	—	—	—	14.90
04/03/92	0.0170	0.0006	0.0080	0.0200	0.38	—	—	—	14.87
09/10/92	0.0005	0.0005	ND	0.0021	0.09	—	—	1.5	15.06
04/13/93	ND	ND	ND	0.0019	0.087	—	—	2.5	14.05
09/29/93	0.0012	0.0064	0.0013	0.0085	0.11	—	—	1.3	15.09
03/23/94	ND	ND	ND	ND	ND	—	—	0.7	14.94
MW-10									
09/19/90	0.0240	ND	0.0080	0.0360	—	—	—	—	—
05/03/91	0.0050	ND	0.0030	0.0140	ND	ND	—	—	15.33
09/05/91	0.0060	0.0010	0.0030	0.0100	ND	—	—	—	14.58
04/03/92	0.0034	ND	0.0009	0.0057	0.40	—	—	—	15.45
09/10/92	0.0012	ND	ND	0.0013	0.37	1.6	0.98	0.2	15.60
04/13/93	ND	ND	ND	ND	0.17	2.5	—	1.5	15.50
09/29/93	ND	0.00055	ND	0.001	0.18	1.9	ND	0.4	15.65
03/23/94	ND	ND	ND	ND	0.063	4	1.1	0.7	15.52
MW-11									
09/19/90	1.9000	0.0150	0.0750	0.3770	—	—	—	—	—
05/03/91	1.5000	0.0130	0.0730	0.3280	5.00	ND	—	—	15.29
09/05/91	2.0000	0.0100	0.0580	0.2880	4.00	—	—	—	14.99
04/03/92	1.1000	ND	0.0340	0.0950	3.40	—	—	—	15.65
09/10/92	0.7300	0.0049	0.0093	0.0320	1.30	2.9	0.93	7.9	15.92
04/13/93	0.0800	ND	ND	ND	0.12	1.7	—	4.8	14.55
09/29/93	0.0099	0.00073	ND	0.0016	0.15	1.5	ND	0.2	15.95
03/23/94	ND	ND	ND	ND	0.13	1.6	0.84	1.0	15.82
MW-12									
09/19/90	0.0020	ND	ND	ND	—	—	—	—	—
05/03/91	ND	ND	ND	ND	ND	ND	—	—	16.04
09/05/91	0.0010	0.0010	0.0010	ND	ND	—	—	—	16.49
04/03/92	ND	ND	ND	ND	0.08	—	—	—	16.69
09/10/92	ND	ND	ND	ND	ND	—	—	2.7	17.00
04/13/93	ND	0.0012	ND	ND	ND	—	—	—	10.28
09/29/93	ND	0.0016	0.0006	0.003	ND	—	—	0.8	16.78
03/23/94	ND	ND	ND	ND	ND	—	—	0.9	16.58

SHELL BOREN GROUNDWATER QUALITY SUMMARY
0556-008.20

WELL #, DATE	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)	TPH-G (PPM)	TPH-D (PPM)	TPH-OIL (PPM)	DISSOLVED OXYGEN (PPM)	DEPTH TO WATER (FT)
MW-13									
09/05/91	0.0010	0.0020	ND	ND	ND	--	--	---	15.70
04/03/92	0.0009	0.0005	ND	0.0011	0.07	--	--	---	16.02
09/10/92	0.0008	0.0008	ND	0.0015	ND	--	--	1.3	16.16
04/13/93	0.0005	ND	ND	ND	ND	--	--	0.8	15.71
09/29/93	0.00063	0.00072	ND	0.0016	0.053	--	--	0.4	16.00
03/23/94	ND	ND	ND	ND	ND	--	--	0.9	15.84
MW-14									
09/05/91	0.0010	0.0030	0.0010	ND	ND	--	--	---	15.92
04/03/92	ND	0.0010	ND	0.0013	0.29	--	--	---	16.14
09/10/92	ND	ND	ND	ND	ND	--	--	---	16.04
04/13/93	ND	ND	ND	ND	ND	--	--	5.4	13.92
09/29/93	0.0005	0.0280	ND	0.0029	0.081	--	--	0.5	15.66
03/23/94	ND	ND	ND	ND	ND	--	--	0.7	15.36

NORTH CREEK ANALYTICAL

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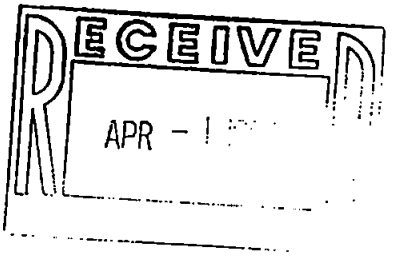
15055 S.W. Sequoia Parkway, Suite 110 • Portland, OR 97224-7155 (503) 624-9800 • FAX 684-3782

EMCON Northwest	Client Project ID:	Shell Seattle, #246-7616-0401	Sampled:	Mar 22, 1994
18912 N. Creek Parkway, #100	Sample Matrix:	Water	Received:	Mar 22, 1994
Bothell, WA 98011	Analysis Method:	WTPH-G	Analyzed:	Mar 23, 1994
Attention: Lisa Rutan	First Sample #:	403-1878	Reported:	Mar 28, 1994

TOTAL PETROLEUM HYDROCARBONS-GASOLINE RANGE



Sample Number	Sample Description	Sample Result mg/L (ppm)	Surrogate Recovery %
403-1878	MW-1-0394	N.D.	109
403-1879	MW-4-0394	N.D.	115
403-1880	MW-10-0394	0.063	106
403-1881	MW-11-0394	0.13	S-2
403-1882	MW-12-0394	N.D.	106
403-1883	MW-13-0394	N.D.	106
403-1884	MW-14-0394	N.D.	97
403-1885	MW-15-0394	0.14	S-2
403-1886	FB-0394	N.D.	87
403-1887	TRIP BLANK	N.D.	83

Reporting Limit:	**0.050**

4-Bromofluorobenzene surrogate recovery control limits are 50 - 150 %.
Volatile Total Petroleum Hydrocarbons are quantitated as Gasoline Range Organics (toluene - dodecane).
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

Please Note:
S-2 = The Surrogate Recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample.

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EMCON Northwest	Client Project ID:	Shell Seattle, #246-7616-0401		
18912 N. Creek Parkway, #100	Sample Matrix:	Method Blank		
Bothell, WA 98011	Analysis Method:	WTPH-G	Analyzed:	Mar 23, 1994
Attention: Lisa Rutan	First Sample #:	BLK032394	Reported:	Mar 28, 1994

TOTAL PETROLEUM HYDROCARBONS-GASOLINE RANGE

Sample Number	Sample Description	Sample Result mg/L (ppm)	Surrogate Recovery %
BLK032394	Method Blank	N.D.	100

Reporting Limit:	0.050

4-Bromofluorobenzene surrogate recovery control limits are 50 - 150 %.
Volatile Total Petroleum Hydrocarbons are quantitated as Gasoline Range Organics (toluene - dodecane).
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

NORTH CREEK ANALYTICAL

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EMCON Northwest	Client Project ID: Shell Seattle, #246-7616-0401	Analyst:	R. Lister
18912 N. Creek Parkway, #100	Sample Matrix: Water		K. Wilke
Bothell, WA 98011	Analysis Method: WTPH-G		
Attention: Lisa Rutan	Units: mg/L (ppm)	Analyzed:	Mar 23, 1994
		Reported:	Mar 28, 1994

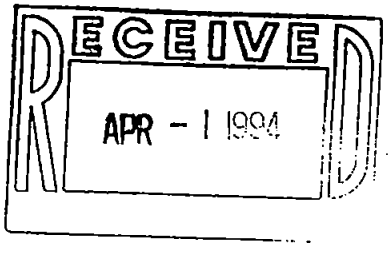
HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

Gasoline	
Spike Conc. Added:	0.10
Spike Result:	0.10
% Recovery:	100
Upper Control Limit %:	114
Lower Control Limit %:	90

PRECISION ASSESSMENT
Sample Duplicate

Gasoline Range Organics	
Sample Number:	403-1878
Original Result:	N.D.
Duplicate Result:	N.D.
Relative % Difference	Relative Percent Difference values are not reported at sample concentration levels less than 10 times the Detection Limit.
Maximum RPD:	31



NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

% 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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EMCON Northwest	Client Project ID:	Shell Seattle, #246-7616-0401	Sampled:	Mar 22, 1994
18912 N. Creek Parkway, #100	Sample Matrix:	Water	Received:	Mar 22, 1994
Bothell, WA 98011	Analysis Method:	EPA 8020	Analyzed:	Mar 23, 1994
Attention: Lisa Rutan	First Sample #:	403-1878	Reported:	Mar 28, 1994

BTEX DISTINCTION

Sample Number	Sample Description	Benzene mg/L (ppm)	Toluene mg/L (ppm)	Ethyl Benzene mg/L (ppm)	Xylenes mg/L (ppm)	Surrogate Recovery %
403-1878	MW-1-0394	N.D.	N.D.	N.D.	N.D.	100
403-1879	MW-4-0394	N.D.	N.D.	N.D.	N.D.	104
403-1880	MW-10-0394	N.D.	N.D.	N.D.	N.D.	101
403-1881	MW-11-0394	N.D.	N.D.	N.D.	N.D.	118
403-1882	MW-12-0394	N.D.	N.D.	N.D.	N.D.	99
403-1883	MW-13-0394	N.D.	N.D.	N.D.	N.D.	102
403-1884	MW-14-0394	N.D.	N.D.	N.D.	N.D.	98
403-1885	MW-15-0394	N.D.	N.D.	N.D.	N.D.	124
403-1886	FB-0394	N.D.	0.0010	N.D.	N.D.	95
403-1887	TRIP BLANK	N.D.	N.D.	N.D.	N.D.	95
Reporting Limits:		**0.00050**	**0.00050**	**0.00050**	**0.0010**	

4-Bromofluorobenzene surrogate recovery control limits are 75 - 124 %.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

RECEIVED
APR - 1 1994

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

NORTH CREEK ANALYTICAL

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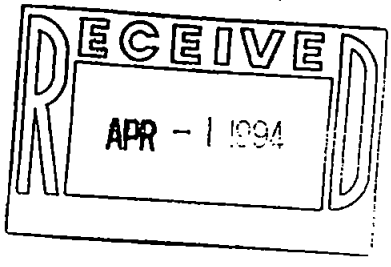
EMCON Northwest	Client Project ID:	Shell Seattle, #246-7616-0401		
18912 N. Creek Parkway, #100	Sample Matrix:	Method Blank		
Bothell, WA 98011	Analysis Method:	EPA 8020	Analyzed:	Mar 23, 1994
Attention: Lisa Rutan	First Sample #:	BLK032394	Reported:	Mar 28, 1994

BTEX DISTINCTION

Sample Number	Sample Description	Benzene mg/L (ppm)	Toluene mg/L (ppm)	Ethyl Benzene mg/L (ppm)	Xylenes mg/L (ppm)	Surrogate Recovery %
BLK032394	Method Blank	N.D.	N.D.	N.D.	N.D.	97



Reporting Limits:	0.00050	0.00050	0.00050	0.0010	

4-Bromofluorobenzene surrogate recovery control limits are 75 - 124 %.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

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EMCON Northwest	Client Project ID: Shell Seattle, #246-7616-0401	Analyst:	R. Lister
18912 N. Creek Parkway, #100	Sample Matrix: Water		K. Wilke
Bothell, WA 98011	Analysis Method: EPA 8020		
Attention: Lisa Rutan	Units: mg/L (ppm)	Analyzed:	Mar 23, 1994
	QC Sample #: 403-1887	Reported:	Mar 28, 1994

MATRIX SPIKE QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Sample Result:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.010	0.010	0.010	0.030
Spike Result:	0.0106	0.0097	0.0101	0.029
Spike % Recovery:	106%	97%	101%	97%
Spike Dup. Result:	0.0108	0.0098	0.0102	0.030
Spike Duplicate % Recovery:	108%	98%	102%	100%
Upper Control Limit %:	115	111	118	120
Lower Control Limit %:	95	91	88	81
Relative % Difference:	1.9%	1.0%	0.99%	3.4%
Maximum RPD:	8.0	8.0	8.0	12

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

% Recovery: $\frac{\text{Spike Result - Sample Result}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\frac{\text{Spike Result - Spike Dup. Result}}{\text{(Spike Result + Spike Dup. Result) / 2}} \times 100$

NORTH CREEK ANALYTICAL

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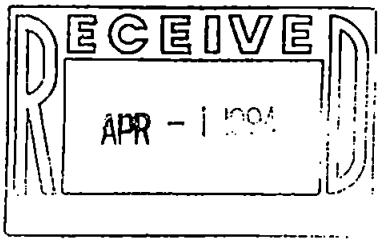
East 11115 Montgomery, Suite B • Spokane, WA 99206-4779 (509) 924-9200 • FAX 924-9290
15055 S.W. Sequoia Parkway, Suite 110 • Portland, OR 97224-7155 (503) 624-9800 • FAX 684-3782

EMCON Northwest	Client Project ID:	Shell Seattle, #246-7616-0401	Sampled:	Mar 22, 1994
18912 N. Creek Parkway, #100	Sample Matrix:	Water	Received:	Mar 22, 1994
Bothell, WA 98011	Analysis Method:	WTPH-D Extended	Extracted:	Mar 23, 1994
Attention: Lisa Rutan	First Sample #:	403-1880	Analyzed:	Mar 24-25, 1994
			Reported:	Mar 28, 1994

TOTAL PETROLEUM HYDROCARBONS - DIESEL RANGE EXTENDED

Sample Number	Sample Description	Diesel Result mg/L (ppm)	Heavy Oil Result mg/L (ppm)	Surrogate Recovery %
403-1880	MW-10-0394	1.4	1.1	98
403-1881	MW-11-0394	1.6	0.84	95
BLK032394	Method Blank	N.D.	N.D.	104



Reporting Limit:	**0.25**	**0.75**

2-Fluorobiphenyl surrogate recovery control limits are 50 - 150%.
Extractable Hydrocarbons are quantitated as Diesel Range Organics (C12 - C24) and Heavy Oil Range Organics (>C24).
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

NORTH CREEK ANALYTICAL

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15055 S.W. Sequoia Parkway, Suite 110 • Portland, OR 97224-7155 (503) 624-9800 • FAX 684-3782

EMCON Northwest	Client Project ID: Shell Seattle, #246-7616-0401	Analyst: D. Anderson
18912 N. Creek Parkway, #100	Sample Matrix: Water	
Bothell, WA 98011	Analysis Method: WTPH-D	Extracted: Mar 23, 1994
Attention: Lisa Rutan	Units: mg/L (ppm)	Analyzed: Mar 24-25, 1994
		Reported: Mar 28, 1994

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

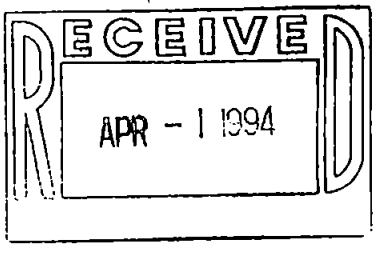
Diesel

Spike Conc. Added:	2.1
Spike Result:	2.0
% Recovery:	95
Upper Control Limit %:	112
Lower Control Limit %:	84

PRECISION ASSESSMENT
Sample Duplicate

Diesel Range Organics

Sample Number:	403-1880
Original Result:	1.4
Duplicate Result:	1.5
Relative % Difference	Relative Percent Difference values are not reported at sample concentration levels less than 10 times the Detection Limit.
Maximum RPD:	31



NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

% 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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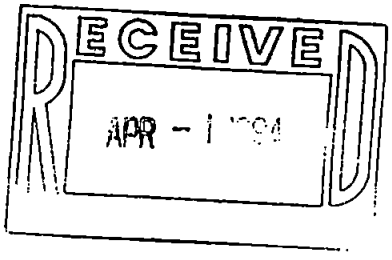
EMCON Northwest	Client Project ID:	Shell Seattle, #246-7616-0401	Sampled:	Mar 22, 1994
18912 N. Creek Parkway, #100	Sample Matrix:	Water	Received:	Mar 22, 1994
Bothell, WA 98011	Analysis Method:	EPA 7421	Digested:	Mar 24, 1994
Attention: Lisa Rutan	First Sample #:	403-1878	Analyzed:	Mar 25, 1994
			Reported:	Mar 30, 1994

METALS ANALYSIS FOR: TOTAL LEAD



Sample Number	Sample Description	Reporting Limit mg/L (ppm)	Sample Result mg/L (ppm)
403-1878	MW-1-0394	0.0020	N.D.
403-1879	MW-4-0394	0.0020	N.D.
403-1880	MW-10-0394	0.0020	N.D.
403-1881	MW-11-0394	0.0020	N.D.
403-1882	MW-12-0394	0.0020	N.D.
403-1883	MW-13-0394	0.0020	N.D.
403-1884	MW-14-0394	0.0020	N.D.
403-1885	MW-15-0394	0.0020	N.D.
BLK032494	Method Blank	0.0020	N.D.

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

NORTH CREEK ANALYTICAL

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EMCON Northwest
18912 N. Creek Parkway, #100
Bothell, WA 98011
Attention: Lisa Rutan

Client Project ID: Shell Seattle, #246-7616-0401
Sample Matrix: Water
Units: mg/L (ppm)

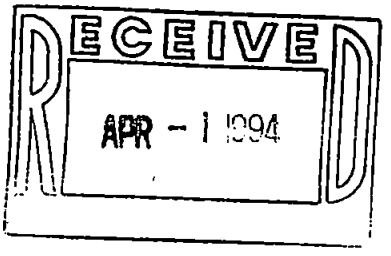
Analyst: T. Fitzgibbon
B. Oaks

Digested: Mar 24, 1994
Reported: Mar 30, 1994

METALS QUALITY CONTROL DATA REPORT

ANALYTE
Lead

EPA Method: 7421
Date Analyzed: Mar 25, 1994



ACCURACY ASSESSMENT

LCS Spike Conc. Added:	0.025
LCS Spike Result:	0.019
LCS Spike % Recovery:	76
Upper Control Limit:	138
Lower Control Limit:	67
Matrix Spike Sample #:	403-1878
Matrix Spike % Recovery:	57

PRECISION ASSESSMENT

Sample #:	403-1878
Original:	N.D.
Duplicate:	N.D.
Relative % Difference:	RPD values are not reported at sample concentration levels < 10 X the Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

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

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

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING - WEST

CHAIN OF CUSTODY RECORD
Serial No: _____

Date: 3-22-94
Page 1 of 2

Site Address: 601 Boren Ave N. Seattle WA

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, #100, Bothell, WA 98011

Consultant Contact: Lisa Rutan
Phone No.: 286-485-5000
Fax #: 486-9766

Comments: Project No.

Sampled by: Michael Paulsen

Printed Name: Michael Paulsen

LAB: North Creek Analytical

RECEIVED
APR - 1 1994

CHECK ONE (1) BOX ONLY	C/T/DT	TURN AROUND TIME
G.W. Monitoring	☒ 4461	24 hours ☐
Site Investigation	☐ 4441	48 hours ☐
Soil Classify/Disposal	☐ 4442	15 days ☒ (Normal)
Water Classify/Disposal	☐ 4443	Other ☐ ____
Soil/Air Rem. or Sys. O & M	☐ 4452	NOTE: Notify Lab as soon as Possible of 24/48 hrs. TAT.
Water Rem. or Sys. O & M	☐ 4453	
Other	☐	

UST AGENCY: _____

Analysis Required

Sample ID	Date	Sludge	Soil	Water	Air	No. of conts.	TPH (EPA 8015 Mod. Gas)	TPH (EPA 8015 Mod. Diesel) extended	BTEX (EPA 8020/602)	Volatile Organics (EPA 8240)	Test for Disposal	Combination TPH 8015 & BTEX 8020	SM5520F (EMCON FOG)	Total Lead	Asbestos	Container Size	Preparation Used	Composite Y/N	MATERIAL DESCRIPTION	SAMPLE CONDITION/ COMMENTS
MW-4-0394	3/22/94			X		3						X		X					403 1674	
MW-4-0394				X		3						X		X					1879	
MW-10-0394				X		4		X				X		X					1880	
MW-11-0394				X		4		X				X		X					1881	
MW-12-0394				X		3						X		X					1882	
MW-13-0394				X		3						X		X					1883	
MW-14-0394				X		3						X		X					1884	
MW-15-0394	↓			X		2						X							1885	

Relinquished By (signature): Michael Paulsen	Printed Name: Michael Paulsen	Date: 3-22-94 Time: 1725	Received (signature):	Printed Name: T. Collins NCA	Date: 3/22/94 Time: 1725
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 Oil Co. Chain of Custody

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING - WEST

CHAIN OF CUSTODY RECORD
Serial No: ____________

Date: 3-22-94
Page 2 of 2

Site Address: 601 Boren Ave N. Seattle WA

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, #100, Bothell, WA 98011

Consultant Contact: Lisa Rutan
Phone No.: 206-485-5000
Fax #: 486-9766

Comments:
Project No.

Sampled by: Michael Paulsen (signature)

Printed Name: Michael Paulsen

LAB: North Creek Analytical

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CHECK ONE (1) BOX ONLY — CT/DT
- [x] G.W. Monitoring 4461
- [ ] Site Investigation 4441
- [ ] Soil Classify/Disposal 4442
- [ ] Water Classify/Disposal 4443
- [ ] Soil/Air Rem. or Sys. O & M 4452
- [ ] Water Rem. or Sys. O & M 4453
- [ ] Other

TURN AROUND TIME
- [ ] 24 hours
- [ ] 48 hours
- [x] 15 days (Normal)
- [ ] Other ____

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

UST AGENCY: ____________

Analysis Required

Sample ID	Date	Sludge	Soil	Water	Air	No. of conts.	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	SM5520F (EMCON FOG)		Asbestos	Container Size	Preparation Used	Composite Y/N	MATERIAL DESCRIPTION	SAMPLE CONDITION/ COMMENTS
FB-0394	3/22/94			X		2	~~X~~		~~X~~			X							1886	
Trip Blank	↓			X		2	~~X~~		~~X~~			X							1887	

Relinquished By (signature):	Printed Name:	Date/Time:	Received (signature):	Printed Name:	Date/Time:
Michael Paulsen (signature)	Michael Paulsen	Date: 3-22-94 Time: 1725	(signature)	T. Collie-Nct	Date: 3/22/94 Time: 1725
		Date: Time:			Date: Time:
		Date: Time:			Date: Time:

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

Shell Oil Chn of Custody