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

May 27, 1993
Project 0556-008.20

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

Re: Semiannual Groundwater 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 submit this letter report describing the semiannual groundwater sampling event conducted on April 13, 1993, at the former Shell service station referenced above (Figure 1).

EMCON personnel collected groundwater samples from seven monitoring wells (Figure 2). Prior to sample collection, depth-to-water readings were measured with 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). A minimum of three pore volumes were removed from each well prior to collection of samples. Except MW-12 which pumped dry after one pore volume.

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

Each sample was properly labelled and placed into an iced cooler. The samples were delivered under standard chain-of-custody protocol to North Creek Analytical of Bothell, Washington, 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 (TPH) as

gasoline by Washington Department of Ecology (WDOE) Method WTPH-G, TPH as diesel by WDOE Method WTPH-D and total lead by EPA Method 7421.

Groundwater analytical 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 reported concentration of benzene for the samples collected from MW-11 exceeded the Model Toxics Control Act (MTCA)[1] Method A cleanup levels for groundwater. MW-4 and MW-10 exceeded MTCA Method A cleanup levels for lead in groundwater. 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.

The next semiannual groundwater sampling event at this site is scheduled for September 1993. If you have any questions regarding the information presented here, please call.

Sincerely,

EMCON Northwest, Inc.

Lisa A. Rutan
Project Engineer

Patrick Brooks
Project Manager

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.
Mark Wells, Texaco Environmental Services

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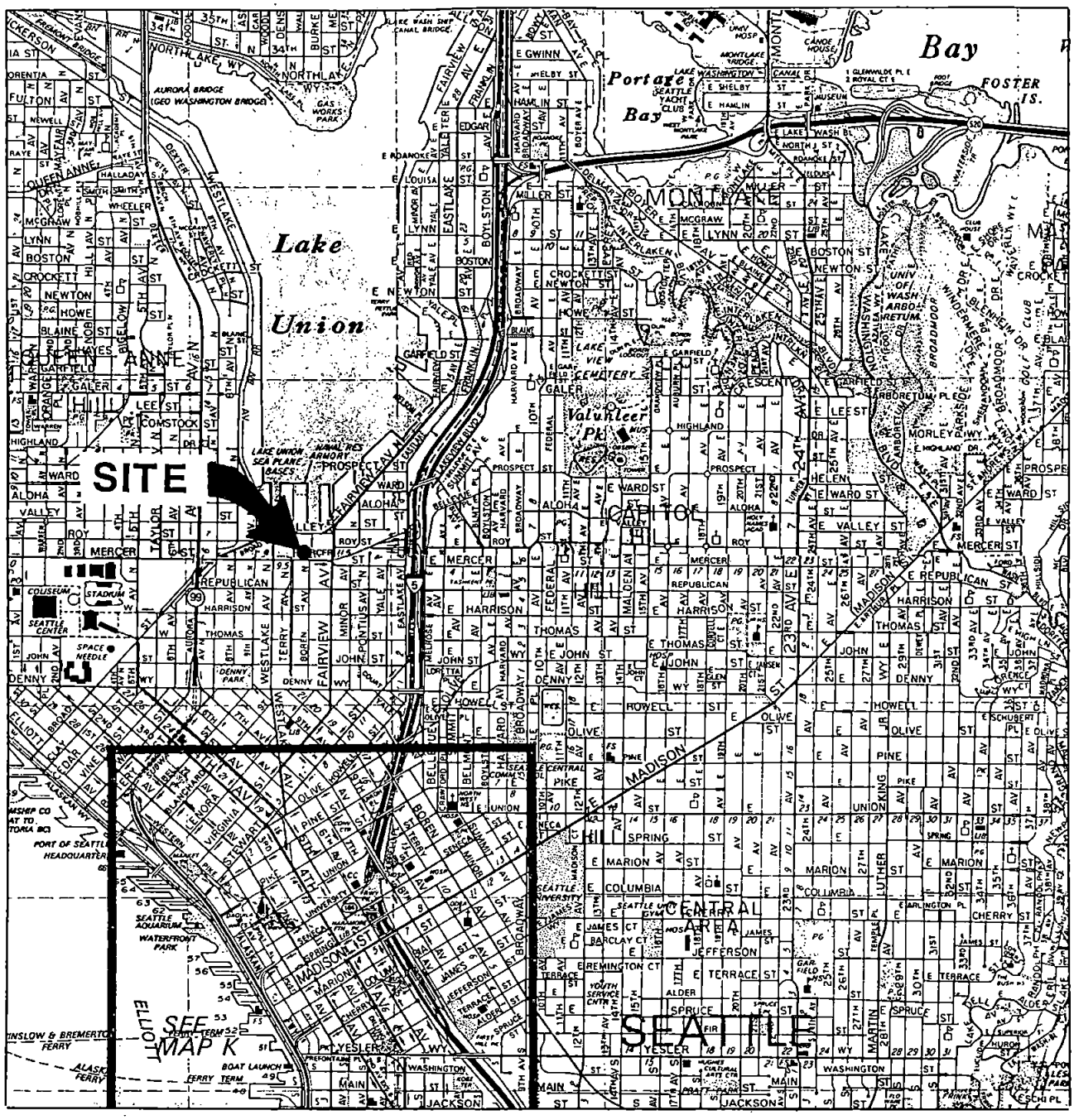
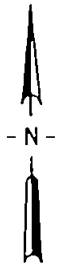
[1] Chapter 173-340 WAC, *The Model Toxics Control Act Cleanup Regulation; Method A Cleanup Levels.* Amended February 1991.

133396



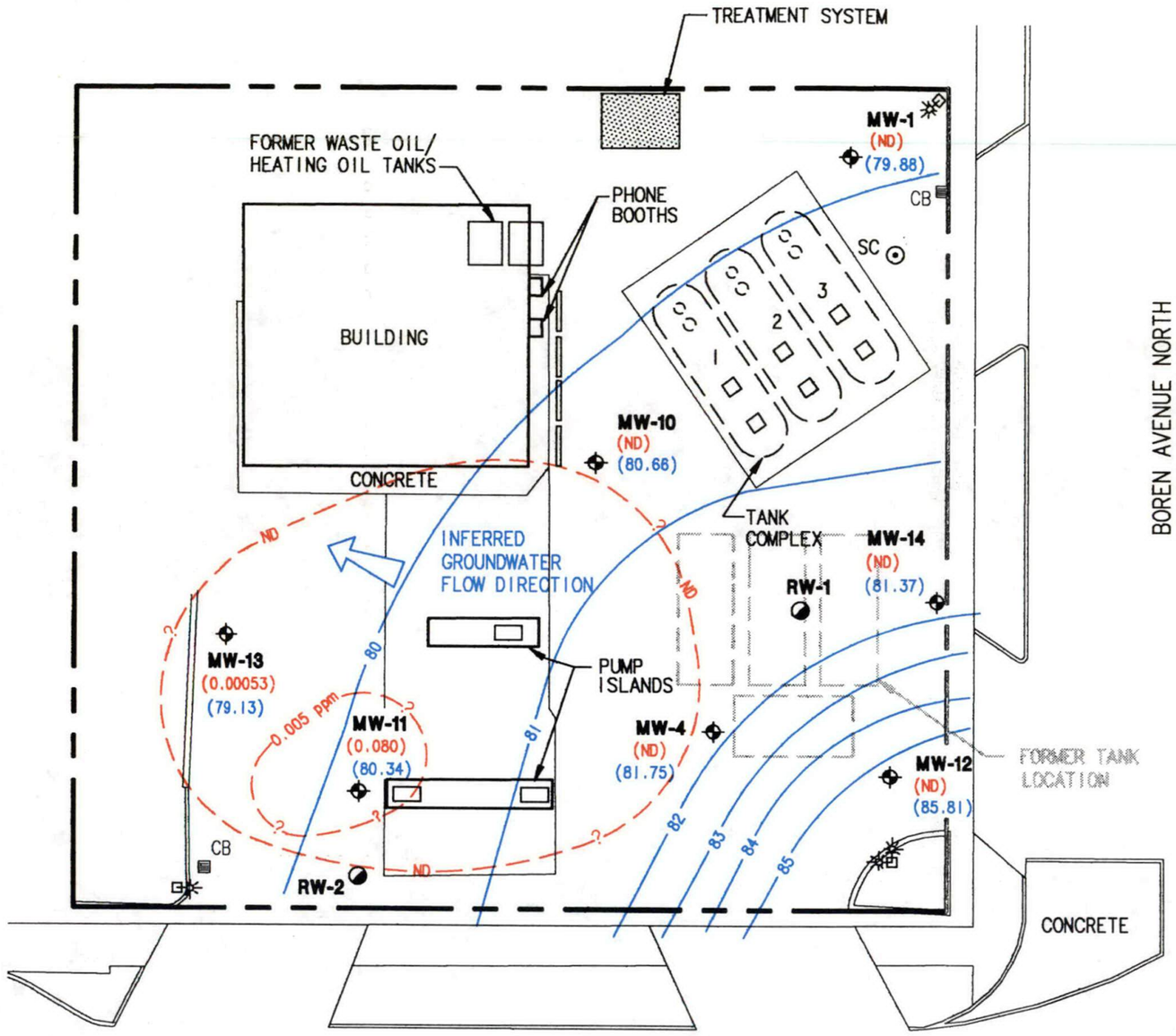


EMCON Northwest, Inc.

DATE 8/90
DWN. KLM
APPR.
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
—— 81 --	Relative Groundwater Elevation Contour (feet)
(85.81)	Measured Groundwater Elevation (feet) April 13, 1993
--0.005 ppm--	Approximate Benzene Concentration Contour
(ND)	Measured Benzene Concentration in Groundwater (ppm) April 13, 1993
ND	Not Detected
?	Uncertain

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.

EMCON Northwest, Inc.

DATE 9/92
DWN. JG
REV.
APPR. PB
PROJECT NO.
0556-008.20

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

I=20 0556\008\20C01 05-26-93

Groundwater Occurrence

Depths to water was measured in each well on September 10, 1999, and were converted into relative groundwater elevations, which were used to estimate the general direction of groundwater movement beneath the site. Table 1 presents well survey and depth to water information. The general direction of groundwater flow beneath the site was to the northwest and northeast September 10, 1999 (Figure 2), which is consistent with previous findings.

Waste Management

All purge water was run through activated carbon and dischaged to the storm sewer. There are no drums on site.

Groundwater Analytical Results

TPH-D was detected in samples collected from wells MW-4, MW-10, MW-11, and MW-13; however, detected concentrations did not exceed the Washington State Department of Ecology (Ecology) Model Toxics Control Act (MTCA) Method A cleanup level. TPH-O was also detected in samples from wells MW-4 and MW-10; however, only the result for the sample collected from MW-10 exceeded the MTCA Method A cleanup level. TPH-D and TPH-O were not detected at or above the method reporting limits in any other sample.

These results show a significant decrease in TPH-D and TPH-O levels in groundwater since the previous sampling event conducted by EMCON in August 1996. A summary of the August 1999 analytical results is presented on Table 3. The NCA laboratory report is included in Attachment B. Results of the EMCON sampling conducted in August 1996 can be found in their letter to Ecology, "Supplemental Sampling and Request for Closure," dated January 23, 1997.

LIMITATIONS

The services described in this report were performed consistent with generally accepted professional consulting principles and practices at the time the work was performed. 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.

Mr. Tony Palagyi
August 1999 Groundwater Monitoring Report
601 Boren Avenue North, Seattle, Washington
October 14, 1999

We appreciate the opportunity to be of service to Equilon/Equiva. If you have any questions or wish to discuss the information presented here, please call at your earliest convenience.

Sincerely,

Howard W. Small, R.G., C.P.G.
Project Manager

HWS/KSV:ksv
c:\\WGRprojects\texaco projects\boren\Aug.99 GW Monitoring Report

Attachments: Table 1 – Groundwater Elevations
Table 2 – Summary of Groundwater Analytical Data
Figure 1 – Vicinity Map
Figure 2 – Site Plan with Groundwater Elevation Contours
Attachment A – Laboratory Report

TABLES

Table 1
Groundwater Elevations

Table 2
Summary of Groundwater Analytical Data

Table 1
Groundwater Elevations
Groundwater Monitoring (August 1999)
Equilon Facility 63-232-0258
601 Boren Avenue North, Seattle, Washington

Well Number	Date of Sample Collection	Depth to Water (bTOC)	LNAPL Thickness (feet)	TOC Elevation (feet)	Relative Water Level Elevation (feet)	Difference from Previous Measurement (feet)
MW-1	9/10/99	15.11	N/A	94.60	79.49	N/A
MW-4	9/10/99	15.02	N/A	95.80	80.78	N/A
MW-10	9/10/99	15.43	N/A	96.16	80.73	N/A
MW-11	9/10/99	15.12	N/A	94.89	79.77	N/A
MW-13	9/10/99	16.12	N/A	94.86	78.74	N/A

Notes:
TOC means Top of PVC Well Casing
Casing and water level are relative to arbitrary site datum.
LNAPL means light, non-aqueous phase liquid (gasoline).
N/A means Not Applicable

Table 2
Summary of Groundwater Analytical Data
Groundwater Monitoring (August 1999)
Equilon Facility 63-232-0258
601 Boren Avenue North, Seattle, Washington

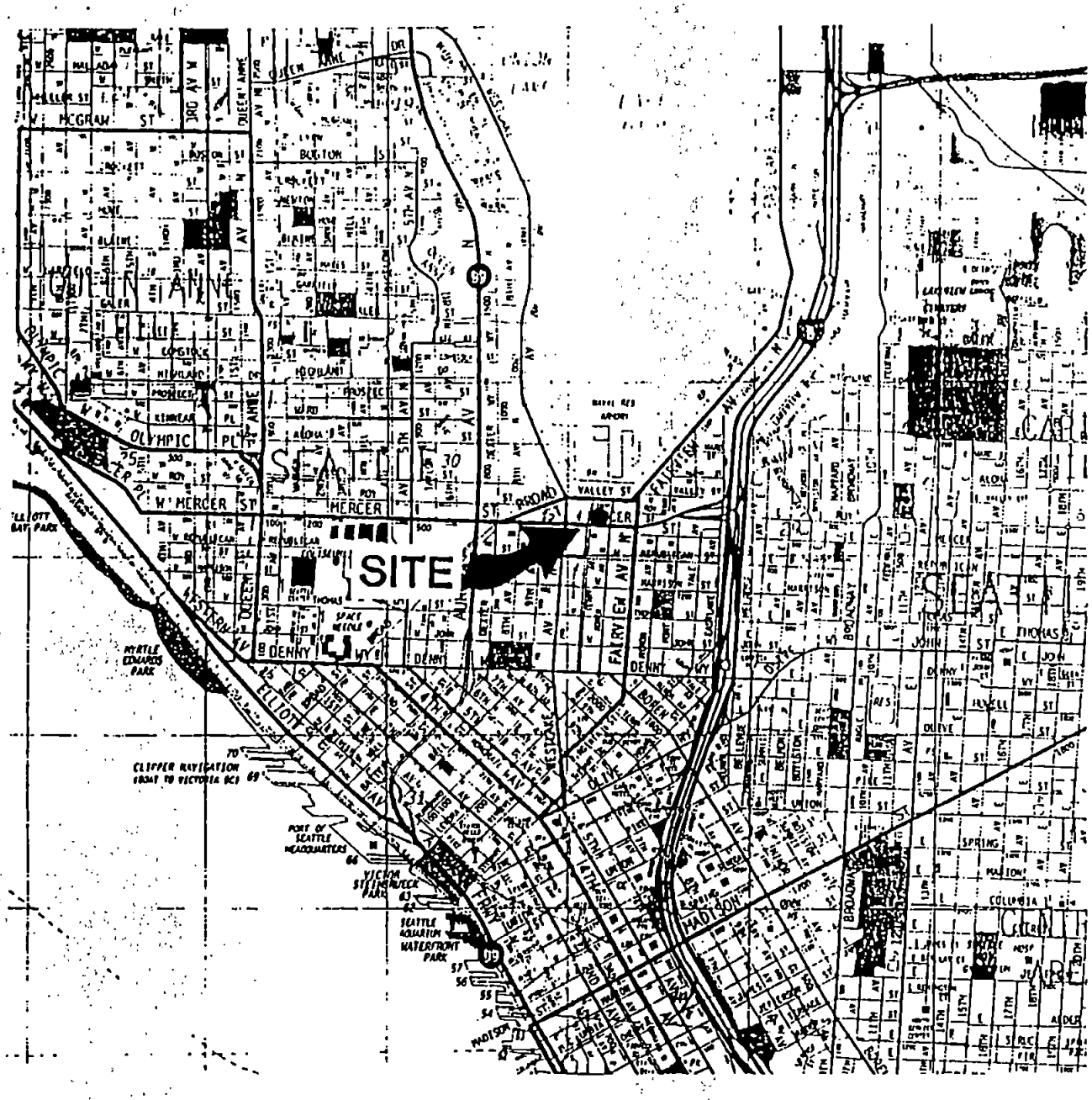
Well Number or Sample Location	Date of Collection	Diesel-Range Hydrocarbons (mg/L)	Oil-Range Hydrocarbons (mg/L)
MW-1	8/17/99	ND(0.250)	ND(0.750)
MW-4	8/17/99	0.635	0.976
MW-10	8/17/99	0.820	**1.08**
MW-11	8/17/99	0.632	ND(0.750)
MW-13	8/17/99	0.766	ND(0.750)
MTCA Method A Cleanup Levels		1	1

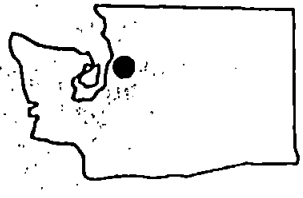
Notes:
ND means Not Detected at the analytical method reporting limit indicated.
Bold denotes sample results that exceed the MTCA Method A Cleanup Level.
TPH-G by WSDOE Method WTPH-G. BTEX by EPA Method 8021B.
All water data reported in ug/l which approximates parts per billion (ppb) concentrations.

FIGURES

Figure 1
Vicinity Map

Figure 2
Site Plan with Groundwater Elevation Contours





WASHINGTON

N

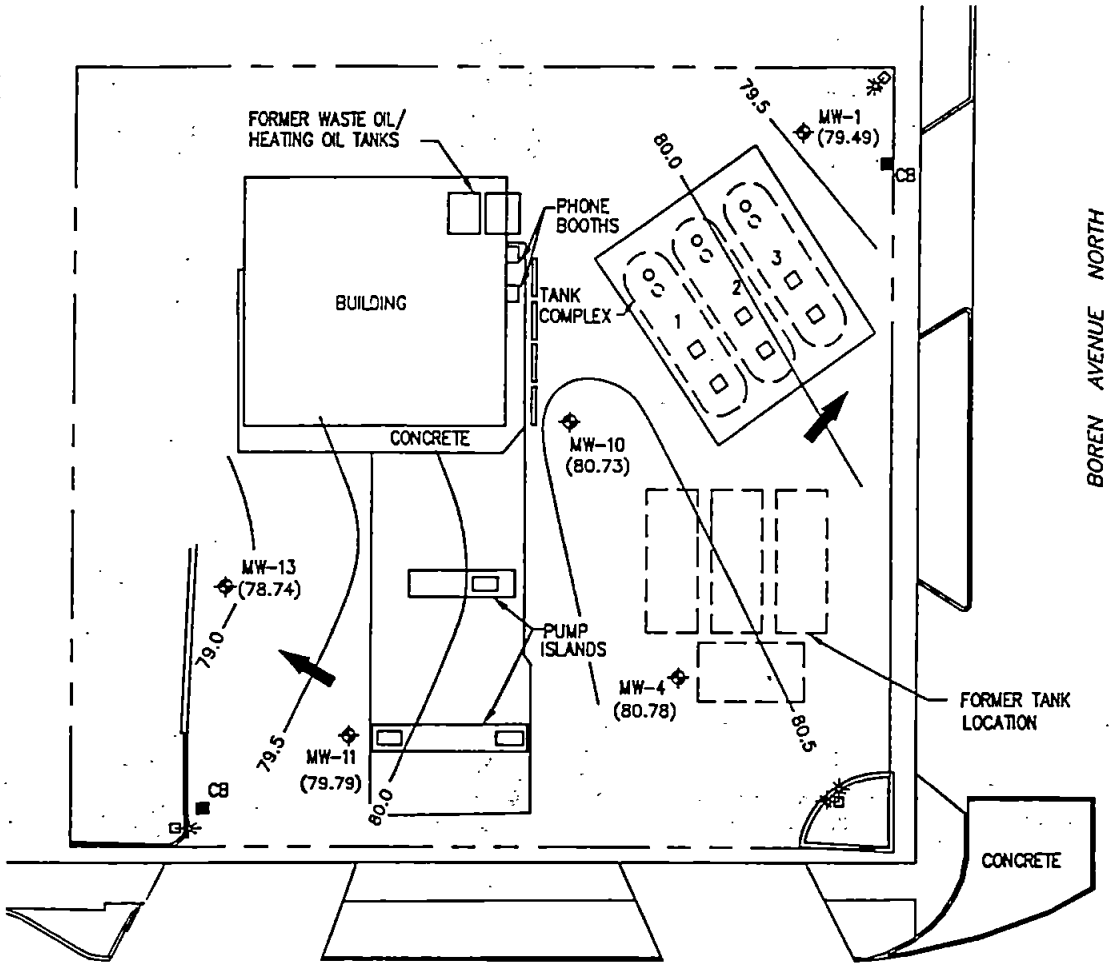
0' 2000 4000

SCALE(ft)

Legend

Base Map from Thomas Brothers Guide

WGR Southwest, Inc. 17612 Bothell Way NE Bothell, Washington 98011	EQUIVA SERVICES LLC			Figure 1
	VICINITY MAP 601 Boren Avenue North, Seattle, WA			
	DATE 8/99	PROJECT NUMBER 251.EQL.99	DWN BY KSV	DWG # 251-1.dwg



LEGEND

MW-1 ⊕	Monitoring Well
(78.74)	Groundwater elevations in feet (measured by WGR-SW 9-10-99)
WM ▫	Water Meter
CB ■	Catch Basin
✳	Area Light

N

0 30 60

SCALE (ft)

NOTES:

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.

Notes

Base map from EMCON figure dated 8-20-95.

WGR
Southwest, Inc.
17612 BOTHELL WAY NORTHEAST
BOTHELL, WA 98021

EQUIVA SERVICES, LLC

SITE PLAN AND GROUNDWATER ELEVATIONS (9/99)
601 BOREN AVENUE NORTH, SEATTLE, WASHINGTON

Figure 2

DATE	PROJECT NUMBER	DWN BY	DWG #
Sept. 1999	251.EQL.99	KSV	251-2.dwg

Attachment A

Laboratory Report

www.ncalabs.com

Seattle 18939 120th Avenue NE Suite 101 [illegible]
425.420.9200 fax 425.420.9210
Spokane East 11115 Montgomery Suite B [illegible]
509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue [illegible]
503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue Suite F-1 [illegible]
541.383.9310 fax 541.382.7588

WGR SW, Inc.- Bothell	Project:	Emcon-601 Boren Ave N	Sampled: 8/17/99
23730 Bothell-Everett Hwy, Suite K	Project Number:	Not Provided	Received: 8/18/99
Bothell, WA 98021	Project Manager:	Howard Small	Reported: 8/26/99 13:49

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
MW-1	B908394-01	Water	8/17/99
MW-4	B908394-02	Water	8/17/99
MW-10	B908394-03	Water	8/17/99
MW-11	B908394-04	Water	8/17/99
MW-13	B908394-05	Water	8/17/99

North Creek Analytical - Bothell

Kirk Gendron, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

North Creek Analytical, Inc.
Environmental Laboratory Network

www.ncalabs.com

Seattle 18939 120th Avenue NE, Suite 101, Bothell, WA 98011
425.420.9200 fax 425.420.9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206
509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008
503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F, Bend, OR 97701
541.383.9310 fax 541.382.7588

WGR SW, Inc.- Bothell	Project:	Emcon-601 Boren Ave N	Sampled: 8/17/99
23730 Bothell-Everett Hwy, Suite K	Project Number:	Not Provided	Received: 8/18/99
Bothell, WA 98021	Project Manager:	Howard Small	Reported: 8/26/99 13:49

Diesel Hydrocarbons (C12-C24) and Heavy Oil (C24-C40) by WTPH-D (extended)
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW-1			B908394-01				Water	
Diesel Range Hydrocarbons	0890733	8/20/99	8/24/99		0.250	ND	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*84.2*	%	
MW-4			B908394-02				Water	
Diesel Range Hydrocarbons	0890733	8/20/99	8/24/99		0.250	0.635	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	0.976	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*73.1*	%	
MW-10			B908394-03				Water	
Diesel Range Hydrocarbons	0890733	8/20/99	8/24/99		0.250	0.820	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	1.08	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*100*	%	
MW-11			B908394-04				Water	
Diesel Range Hydrocarbons	0890733	8/20/99	8/24/99		0.250	0.632	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*97.7*	%	
MW-13			B908394-05				Water	
Diesel Range Hydrocarbons	0890733	8/20/99	8/24/99		0.250	0.766	mg/l	
Heavy Oil Range Hydrocarbons	"	"	"		0.750	ND	"	
Surrogate: 2-FBP	"	"	"	*50.0-150*		*106*	%	

North Creek Analytical - Bothell

**Refer to end of report for text of notes and definitions.*

Kirk Gendron, Project Manager

North Creek Analytical, Inc.
Environmental Laboratory Network

www.ncalabs.com

Seattle 18939 120th Avenue NE, Suite 101, Bothell, WA 98011
425.420.9200 fax 425.420.9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206
509.924.9200 fax 509.924.9290
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503.906.9200 fax 503.906.9210
Bend 20332 Empire Avenue, Suite F, Bend, OR 97701
541.383.9310 fax 541.382.7588

WGR SW, Inc.- Bothell	Project:	Emcon-601 Boren Ave N	Sampled: 8/17/99
23730 Bothell-Everett Hwy, Suite K	Project Number:	Not Provided	Received: 8/18/99
Bothell, WA 98021	Project Manager:	Howard Small	Reported: 8/26/99 13:49

Diesel Hydrocarbons (C12-C24) and Heavy Oil (C24-C40) by WTPH-D (extended)/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0890733	**Date Prepared: 8/20/99**					**Extraction Method: EPA 3510C/600 Series**				
Blank	**0890733-BLK1**									
Diesel Range Hydrocarbons	8/24/99			ND	mg/l	0.250				
Heavy Oil Range Hydrocarbons	"			ND	"	0.750				
Surrogate: 2-FBP	"	*0.321*		*0.290*	"	*50.0-150*	*90.3*			
LCS	**0890733-BS1**									
Diesel Range Hydrocarbons	8/24/99	2.00		1.53	mg/l	60.0-140	76.5			
Surrogate: 2-FBP	"	*0.321*		*0.263*	"	*50.0-150*	*81.9*			
Duplicate	**0890733-DUP1**		**B908396-02**							
Diesel Range Hydrocarbons	8/24/99		0.503	0.533	mg/l			44.0	5.79	
Heavy Oil Range Hydrocarbons	"		ND	ND	"			44.0		
Surrogate: 2-FBP	"	*0.675*		*0.625*	"	*50.0-150*	*92.6*			

North Creek Analytical - Bothell

**Refer to end of report for text of notes and definitions.*

Kirk Gendron, Project Manager

North Creek Analytical, Inc.
Environmental Laboratory Network

www.ncalabs.com

Seattle
Spokane
Portland
Bend

WGR SW, Inc.- Bothell	Project:	Emcon-601 Boren Ave N	Sampled: 8/17/99
23730 Bothell-Everett Hwy, Suite K	Project Number:	Not Provided	Received: 8/18/99
Bothell, WA 98021	Project Manager:	Howard Small	Reported: 8/26/99 13:49

Notes and Definitions

#	Note
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery
RPD	Relative Percent Difference

North Creek Analytical - Bothell

Kirk Gendron, Project Manager

nca™
North Creek Analytical, Inc.
Environmental Laboratory Network
www.ncalabs.com

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508 (425) 420-9200 FAX 420-9210
East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 (509) 924-9200 FAX 924-9290
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 906-9200 FAX 906-9210
20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 (541) 383-9310 FAX 382-7588

CHAIN OF CUSTODY REPORT

Work Order #: B908394

CLIENT: WGR

INVOICE TO: WGR

REPORT TO: Howard Small

ADDRESS: 17512 Bothell Way, NE
Bothell, WA 98011

PHONE: (425) 482-2875 FAX:

P.O. NUMBER:

PROJECT NAME: Encon - 601 Boren Avenue N

PROJECT NUMBER:

SAMPLED BY: Chris Carter

TURNAROUND REQUEST in Business Days*

Organic & Inorganic Analyses: [10] STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1

Petroleum Hydrocarbon Analyses: [5] STD. | 4 | 3 | 2 | 1 | <1

OTHER Please Specify

*Turnaround Requests less than standard may incur Rush Charges.

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	REQUESTED ANALYSES: TPH-D	MATRIX (W, S, O)	# OF CONT.	COMMENTS	NCA W ID
1.	MW-1	8/17/99	X	W	1	B908394-01	
2.	MW-4		X		1	-02	
3.	MW-10		X		1	-03	
4.	MW-11		X		1	-04	
5.	MW-13		X		1	-05	
6.							
7.							
8.							
9.							
10.							
11.							
12.							
13.							
14.							
15.							

RELINQUISHED BY: [signature] DATE: 8/17/99
PRINT NAME: Chris Carter FIRM: WGR TIME:

RECEIVED BY: S. Widen DATE: 8/18/99
PRINT NAME: S. Widen FIRM: NCA TIME: 0955

RELINQUISHED BY: DATE:
PRINT NAME: FIRM: TIME:

RECEIVED BY: DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS:

COC REV 3/99

TEMP: 8.2

PAGE 1 OF 1

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.

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)	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	—	0.005
MW-1	04/13/93	MW-1-0493	ND	ND	ND	ND	ND	—	3.0	ND
MW-4	04/13/93	MW-4-0493	ND	ND	ND	0.0019	0.087	—	2.5	0.011
MW-10	04/13/93	MW-10-0493	ND	ND	ND	ND	0.17	2.5	1.5	0.0094
MW-11	04/13/93	MW-11-0493	0.080	ND	ND	ND	0.12	1.7	4.8	0.0031
MW-11(dup)	04/13/93	MW-9-0493	0.082	ND	ND	ND	0.093	—	—	—
MW-12	04/13/93	MW-12-0493	ND	0.0012	ND	ND	ND	—	—	ND
MW-13	04/13/93	MW-13-0493	0.00053	ND	ND	ND	ND	—	0.8	ND
MW-14	04/13/93	MW-14-0493	ND	ND	ND	ND	ND	—	5.4	ND
Field Blank	04/13/93	FB-1-0493	ND	ND	ND	ND	ND	—	—	—
Trip Blank	04/13/93	Trip Blank	ND	ND	ND	ND	ND	—	—	—

NOTES: 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 were obtained using Washington Department of Ecology Method WTPH-D and reported as mg/l (ppm).
d Dissolved oxygen measurements 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 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
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	04/13/93	14.72	79.88	6.80	890	14.5
MW-4	04/13/93	14.05	81.75	6.55	1150	17.0
MW-10	04/13/93	15.50	80.66	6.46	1520	15.0
MW-11	04/13/93	14.55	80.34	6.83	1270	16.5
MW-12	04/13/93	10.28	85.81	7.22	660	15.0
MW-13	04/13/93	15.71	79.15	6.65	1750	15.0
MW-14	04/13/93	13.92	81.37	6.42	610	14.5

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
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
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
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
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
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
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

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, #0556-008.20	Sampled: Apr 13, 1993
18912 N. Creek Parkway, #100	Matrix Descript:	Water	Received: Apr 14, 1993
Bothell, WA 98011	Analysis Method:	WTPH-G	Analyzed: Apr 16, 1993
Attention: Pat Brooks	First Sample #:	304-0865	Reported: Apr 27, 1993

TOTAL PETROLEUM FUEL HYDROCARBONS (WTPH-G)

Sample Number	Sample Description	Volatile Hydrocarbons mg/L (ppm)	Surrogate Recovery %
304-0865	MW-1-0493	N.D.	106
304-0866	MW-4-0493	0.087	119
304-0867	MW-10-0493	0.17	115
304-0868	MW-11-0493	0.12	123
304-0869	MW-9-0493	0.093	122
304-0870	MW-12-0493	N.D.	101
304-0871	MW-13-0493	N.D.	102
304-0872	MW-14-0493	N.D.	101
304-0873	FB-1-0493	N.D.	97
304-0874	Trip Blank	N.D.	97
Reporting Limits:		**0.050**	

4-Bromofluorobenzene Surrogate Recovery Control Limits are 50 - 150 %.
Volatile 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, #0556-008.20	Sampled:	Apr 13, 1993
18912 N. Creek Parkway, #100	Matrix Descript:	Water	Received:	Apr 14, 1993
Bothell, WA 98011	Analysis Method:	WTPH-G	Analyzed:	Apr 16, 1993
Attention: Pat Brooks	First Sample #:	BLK041693	Reported:	Apr 27, 1993

TOTAL PETROLEUM FUEL HYDROCARBONS (WTPH-G)

Sample Number	Sample Description	Volatile Hydrocarbons mg/L (ppm)	Surrogate Recovery %
BLK041693	Method Blank	N.D.	97

Reporting Limits:	0.050

4-Bromofluorobenzene Surrogate Recovery Control Limits are 50 - 150 %.
Volatile 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

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EMCON Northwest	Client Project ID:	Shell, #0556-008.20	Sampled: Apr 13, 1993
18912 N. Creek Parkway, #100	Matrix Descript:	Water	Received: Apr 14, 1993
Bothell, WA 98011	Analysis Method:	EPA 5030/8020	Analyzed: Apr 16, 1993
Attention: Pat Brooks	First Sample #:	304-0865	Reported: Apr 27, 1993

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 %
304-0865	MW-1-0493	N.D.	N.D.	N.D.	N.D.	100
304-0866	MW-4-0493	N.D.	N.D.	N.D.	0.0019	107
304-0867	MW-10-0493	N.D.	N.D.	N.D.	N.D.	102
304-0868	MW-11-0493	0.080	N.D.	N.D.	N.D.	102
304-0869	MW-9-0493	0.082	N.D.	N.D.	N.D.	104
304-0870	MW-12-0493	N.D.	0.0012	N.D.	N.D.	98
304-0871	MW-13-0493	0.00053	N.D.	N.D.	N.D.	97
304-0872	MW-14-0493	N.D.	N.D.	N.D.	N.D.	97
304-0873	FB-1-0493	N.D.	N.D.	N.D.	N.D.	98
304-0874	Trip Blank	N.D.	N.D.	N.D.	N.D.	98
Reporting Limits:		**0.00050**	**0.00050**	**0.00050**	**0.0010**	

4-Bromofluorobenzene surrogate recovery control limits are 74 - 130 %.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

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Matthew T. Essig
Project Manager

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EMCON Northwest	Client Project ID:	Shell, #0556-008.20	Sampled:	Apr 13, 1993
18912 N. Creek Parkway, #100	Matrix Descript:	Water	Received:	Apr 14, 1993
Bothell, WA 98011	Analysis Method:	EPA 5030/8020	Analyzed:	Apr 16, 1993
Attention: Pat Brooks	First Sample #:	BLK041693	Reported:	Apr 27, 1993

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 %
BLK041693	Method Blank	N.D.	N.D.	N.D.	N.D.	96
Reporting Limits:		0.00050	0.00050	0.00050	0.0010	

4-Bromofluorobenzene surrogate recovery control limits are 74 - 130 %.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

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EMCON Northwest	Client Project ID:	Shell, #0556-008.20	Sampled:	Apr 13, 1993
18912 N. Creek Parkway, #100	Matrix Descript:	Water	Received:	Apr 14, 1993
Bothell, WA 98011	Analysis Method:	WTPH-D	Extracted:	Apr 15, 1993
Attention: Pat Brooks	First Sample #:	304-0867	Analyzed:	Apr 17, 1993
			Reported:	Apr 27, 1993

TOTAL PETROLEUM HYDROCARBONS (WTPH-D)

Sample Number	Sample Description	Extractable Hydrocarbons mg/L (ppm)	Surrogate Recovery %
304-0867	MW-10-0493	2.5	60
304-0868	MW-11-0493	1.7	62
BLK041593	Method Blank	N.D.	61

Reporting Limits:	0.25

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

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EMCON Northwest	Client Project ID:	Shell, #0556-008.20	Sampled:	Apr 13, 1993
18912 N. Creek Parkway, #100	Analysis Method:	EPA 7421	Received:	Apr 14, 1993
Bothell, WA 98011	Analysis for:	Lead	Digested:	Apr 20, 1993
Attention: Pat Brooks	First Sample #:	304-0865	Analyzed:	Apr 22, 1993
	Matrix:	Water	Reported:	Apr 27, 1993

METALS ANALYSIS FOR: Lead

Sample Number	Sample Description	Reporting Limit mg/L (ppm)	Sample Result mg/L (ppm)
304-0865	MW-1-0493	0.0020	N.D.
304-0866	MW-4-0493	0.0020	0.011
304-0867	MW-10-0493	0.0020	0.0094
304-0868	MW-11-0493	0.0020	0.0031
304-0870	MW-12-0493	0.0020	N.D.
304-0871	MW-13-0493	0.0020	N.D.
304-0872	MW-14-0493	0.0020	N.D.
BLK042093	Method Blank	0.0020	N.D.

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

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EMCON Northwest
18912 N. Creek Parkway, #100
Bothell, WA 98011
Attention: Pat Brooks

Client Project ID: Shell, #0556-008.20
EPA Method: 5030/8020
Sample Matrix: Water
Units: mg/L (ppm)
QC Sample #: 304-0865

Analyst: R. Lister, K. Wilke, F. Shino
Analyzed: Apr 16, 1993
Reported: Apr 27, 1993

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:	0.0050	0.0050	0.0050	0.0150
Spike Result:	0.0050	0.0050	0.0050	0.0150
Spike % Recovery:	100%	100%	100%	100%
Spike Dup. Result:	0.0050	0.0048	0.0051	0.0151
Spike Duplicate % Recovery:	100%	96%	102%	101%
Upper Control Limit %:	123	118	126	114
Lower Control Limit %:	87	89	88	92
Relative % Difference:	0%	4%	2%	1%
Maximum RPD:	8.3	7.9	8.0	12

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Matthew T. Essig
Project Manager

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

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

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EMCON Northwest	Client Project ID: Shell, #0556-008.20	Analyst:	R. Lister
18912 N. Creek Parkway, #100	EPA Method: WTPH-G		K. Wilke
Bothell, WA 98011	Sample Matrix: Water		F. Shino
Attention: Pat Brooks	Units: mg/L (ppm)	Analyzed:	Apr 16, 1993
		Reported:	Apr 27, 1993

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

Gasoline

Spike Conc. Added:	0.100
Spike Result:	0.098
% Recovery:	98
Upper Control Limit %:	120
Lower Control Limit %:	80

PRECISION ASSESSMENT
Sample Duplicate

Volatile Hydrocarbons

Sample Number:	304-0865
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:	20

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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, #0556-008.20	Analyst: L. Dutton
18912 N. Creek Parkway, #100	EPA Method: WTPH-D	
Bothell, WA 98011	Sample Matrix: Water	Extracted: Apr 15, 1993
Attention: Pat Brooks	Units: mg/L (ppm)	Analyzed: Apr 16, 1993
		Reported: Apr 27, 1993

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

Diesel

Spike Conc. Added:	2.1
Spike Result:	1.9
% Recovery:	90
Upper Control Limit %:	120
Lower Control Limit %:	80

PRECISION ASSESSMENT
Sample Duplicate

Extractable Hydrocarbons

Sample Number:	304-0868
Original Result:	1.7
Duplicate Result:	1.7
Relative % Difference	Relative Percent Difference values are not reported at sample concentration levels less than 10 times the Detection Limit.
Maximum RPD:	20

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Matthew T. Essig
Project Manager

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

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

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EMCON Northwest
18912 N. Creek Parkway, #100
Bothell, WA 98011
Attention: Pat Brooks

Client Project ID: Shell, #0556-008.20
Sample Matrix : Water
Units: mg/L (ppm)

Analyst: K. Ackerlund

Digested: Apr 20, 1993
Reported: Apr 27, 1993

METALS QUALITY CONTROL DATA REPORT

ANALYTE	Lead
EPA Method:	7421
Date Analyzed:	4/22/93

ACCURACY ASSESSMENT

LCS Spike Conc. Added:	0.025
LCS Spike Result:	0.023
LCS Spike % Recovery:	92
Upper Control Limit:	114
Lower Control Limit:	82
Matrix Spike Sample #:	304-0643
Matrix Spike % Recovery:	101

PRECISION ASSESSMENT

Sample #:	304-0643
Original:	N.D.
Duplicate:	N.D.
Relative % Difference:	RPD values are not reported at sample concentrations <10 X the Reporting Limit.

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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: 4/13/93
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: Pat Brooks
Phone No.: 206-485-5000
Fax #: 486-9766

Comments: Project No. 0556-008.20

Sampled by: Holly Corner

Printed Name: Holly Corner

LAB: North Creek Analytical

UST AGENCY: _____

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)	total Lead	Asbestos	Container Size	Preparation Used	Composite Y/N	MATERIAL DESCRIPTION	SAMPLE CONDITION/ COMMENTS
MW-1-0493	4/13/93			X		3						X		X						3040865
MW-4-0493				X		3						X		X						866
MW-10-0493				X		4		X				X		X						867
MW-11-0493				X		4		X				X		X						868
MW-9-0493				X		2						X								869 R ~~GBT~~
MW-12-0493				X		3						X		X						870
MW-13-0493				X		3						X		X						871
MW-14-0493				X		3						X		X						872

CHECK ONE (1) BOX ONLY — CT/DI — TURN AROUND TIME

	CT/DI	TURN AROUND TIME
G.W. Monitoring	☒ 4461	24 hours ☐
Site Investigation	☐ 4461	48 hours ☐
Soil Classify/Disposal	☐ 4462	10 days ☒ (Normal)
Water Classify/Disposal	☐ 4463	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	☐	

Relinquished By (signature): Holly Corner	Printed Name: Holly Corner	Date: 4/14/93	Received (signature): Dana Heinz NCA	Printed Name: DANA HEINZ	Date: 4/14/93
		Time: 1230			Time: 1230
Relinquished By (signature):	Printed Name:	Date:	Received (signature):	Printed Name:	Date:
		Time:			Time:
Relinquished By (signature):	Printed Name:	Date:	Received (signature):	Printed Name:	Date:
		Time:			Time:

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

Shell Oil Co. 61 Carbon