



EMCON

18912 North Creek Parkway • Suite 200 • Bothell, Washington 98011-8016 • (425) 485-5000 • Fax (425) 486-9766

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'98 APR 20 09:44

March 30, 1998

Project 40556-033.098

RECEIVED

APR 03 1998

DEPT. OF ECOLOGY

Mr. John Bails
Washington State Department of Ecology
3190 160th Avenue SE
Bellevue, Washington 98008-5452

Re: 1998 Annual Groundwater Sampling Report
Former Shell Station 49
Tacoma, Washington
WIC 246-8330-2202

File Name Texaco 63-232-0351

County Pierce

File Type Geo

Your Name HL

Dear Mr. Bails:

EMCON, on behalf of Shell Oil Products Company, is submitting the attached *1998 Annual Groundwater Sampling Report* for the above-referenced site. The report summarizes the results of the groundwater sampling event conducted during January 1998.

If you have any questions or comments, please call me at (425) 485-5000.

Sincerely,

EMCON

Y. Nicholas Garson

Y. Nicholas Garson
Project Manager

Attachment

cc: Brad Boschetto, Shell Oil Products Company
Tony Palagyi, Texaco Refining and Marketing
Robin Lane, Texaco Refining and Marketing

DEPARTMENT OF ECOLOGY	
KENT TOP TANKS UNIT	
INTERIM CLEANUP REPORT	☐
SITE CHARACTERIZATION	☐
FINAL CLEANUP REPORT	☐
OTHER _____	☐
AFFECTED MEDIA: SOIL	☐
OTHER _____ GW	☐
INSPECTOR (INIT.) _____	DATE _____



**EMCON**

18912 North Creek Parkway • Suite 200 • Bothell, Washington 98011-8016 • (425) 485-5000 • Fax (425) 486-9766

RECEIVED
APR 03 1998
DEPT. OF ECOLOGYMarch 23, 1998
Project 40556-033.098

Mr. Brad Boschetto
Shell Oil Products Company
3611 South Harbor Boulevard, Suite 160
Santa Ana, California 92704

Re: 1998 Groundwater Sampling Report
Former Shell Station 49
Tacoma, Washington
WIC 246-8330-2202

DEPARTMENT OF ECOLOGY NWRO/TCP TANKS UNIT	
INTERIM CLEANUP REPORT	☐
SITE CHARACTERIZATION	☐
FINAL CLEANUP REPORT	☐
OTHER _____	☐
AFFECTED MEDIA: SOIL	☐
OTHER _____ GW	☐
INSPECTOR (INIT.) _____ DATE _____	

Dear Mr. Boschetto:

EMCON is pleased to submit this annual groundwater sampling report for the above-referenced site. The site is located at 2523 Pacific Avenue in Tacoma, Washington (Figure 1).

On January 15, 1998, EMCON personnel collected groundwater samples from monitoring wells MW-1 through MW-9. The locations of the wells are shown on Figure 2. Prior to sample collection, depths to groundwater were measured with an electronic water level probe. On January 14, 1998, the depths to groundwater in the deep wells ranged from 29.21 to 43.61 feet below the tops of the flush grade well casings. The depth to groundwater in perched well MW-9 was 16.80 feet. The depth to groundwater and groundwater elevation data are presented on Table 1. The general groundwater flow direction beneath the site was to the north-northwest (Figure 2).

Before sample collection, at least three pore volumes were removed from each well using a peristaltic pump. Field parameters of pH, specific conductance, and temperature were measured following the removal of each pore volume. Following stabilization of the field parameters (less than 10 percent difference between pore volumes), a dissolved oxygen measurement was obtained and a sample was collected. The final field parameter measurements for each sampling event are presented on Table 1.

Each sample was properly labeled and placed into an iced cooler. The samples were delivered under standard chain-of-custody protocol to North Creek Analytical of Bothell, Washington, for analyses. The samples were analyzed for benzene, toluene, ethylbenzene,



Mr. Brad Boschetto
March 23, 1998
Page 2

Project 40556-033.098

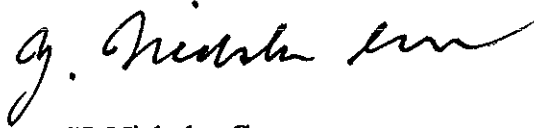
and total xylenes (BTEX), and methyl tert-butyl ether (MTBE) by EPA Method 8020A; and for total petroleum hydrocarbons as gasoline (TPH-G) by Ecology Method WTPH-G.

The groundwater sample analytical results are summarized in Table 2. The analytical results showed that the groundwater samples collected from MW-1, MW-7, and perched well MW-9 exceeded the Model Toxics Control Act¹ Method A cleanup levels for TPH-G and at least three of the BTEX constituents. The samples collected from MW-3 and MW-6 contained benzene concentrations that exceeded the Method A cleanup level. The sample from MW-1 contained an MTBE concentration of 29 parts per billion (ppb). The samples from MW-2, MW-4, MW-5, and MW-8 did not contain volatile hydrocarbon concentrations above Method A cleanup levels. The benzene concentrations in the samples are shown on Figure 2. Copies of the laboratory reports are attached.

We appreciate the opportunity to provide environmental services to Shell Oil Products Company. If you have any questions or comments, please call Nick Garson at (425) 485-5000.

Sincerely,

EMCON



Y. Nicholas Garson
Project Manager



Michael D. Staton, R.G.
Project Director

Attachments: Limitations

- Figure 1 - Site Vicinity Map
- Figure 2 - Groundwater Data - January 1998
- Table 1 - Groundwater Monitoring Results
- Table 2 - Groundwater Sample Analytical Results
- Copy of Laboratory Report

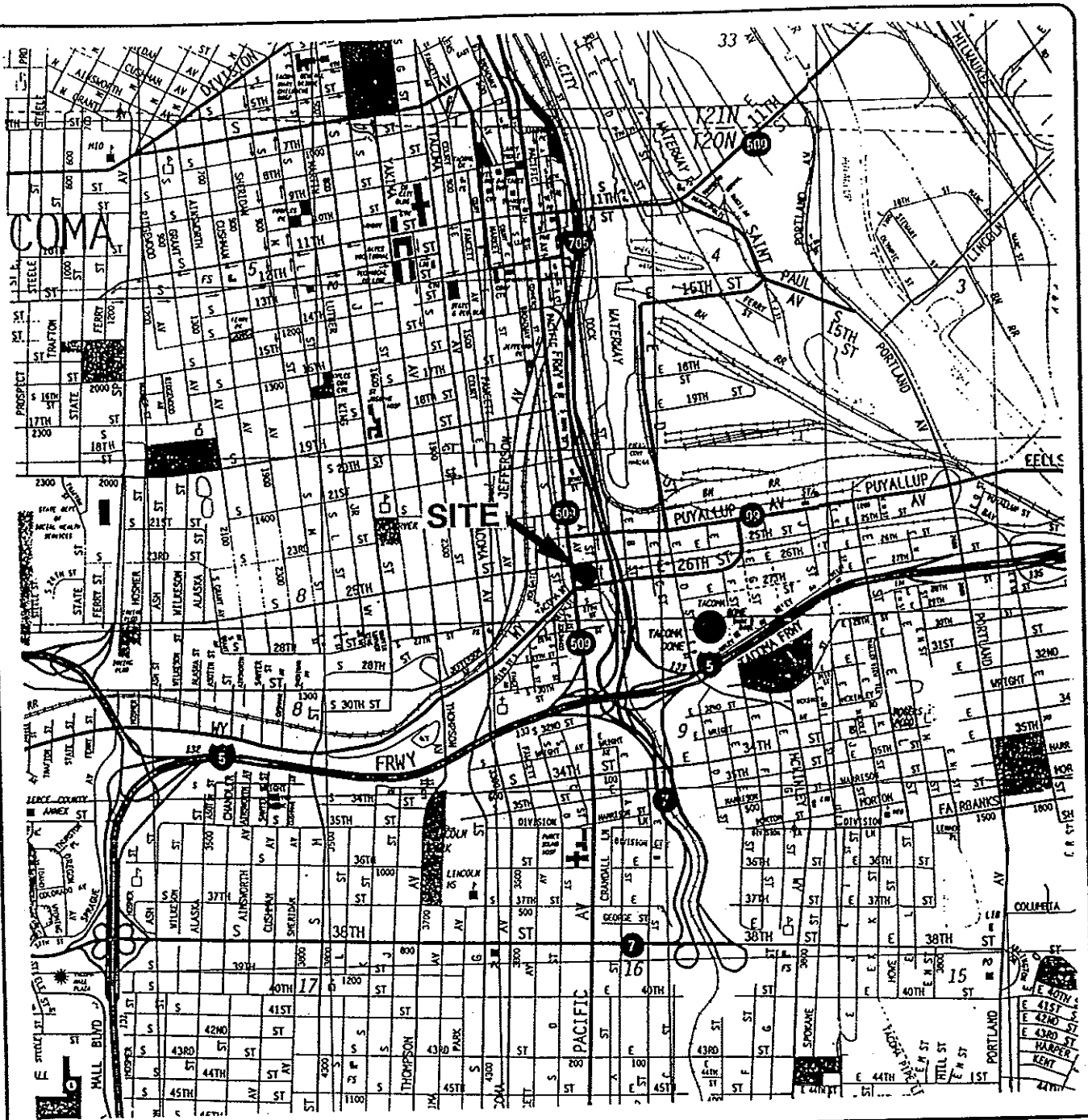
cc: Robin Lane, Texaco Refining and Marketing
Tony Palagyi, Texaco Refining and Marketing

¹ Chapter 173-340 WAC, "The Model Toxics Control Act Cleanup Regulation; Method A Cleanup Levels." Amended January 1996.

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.



SOURCE: THOMAS BROTHERS GUIDE



WASHINGTON

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copy or reproduce all or any part thereof, whether for personal
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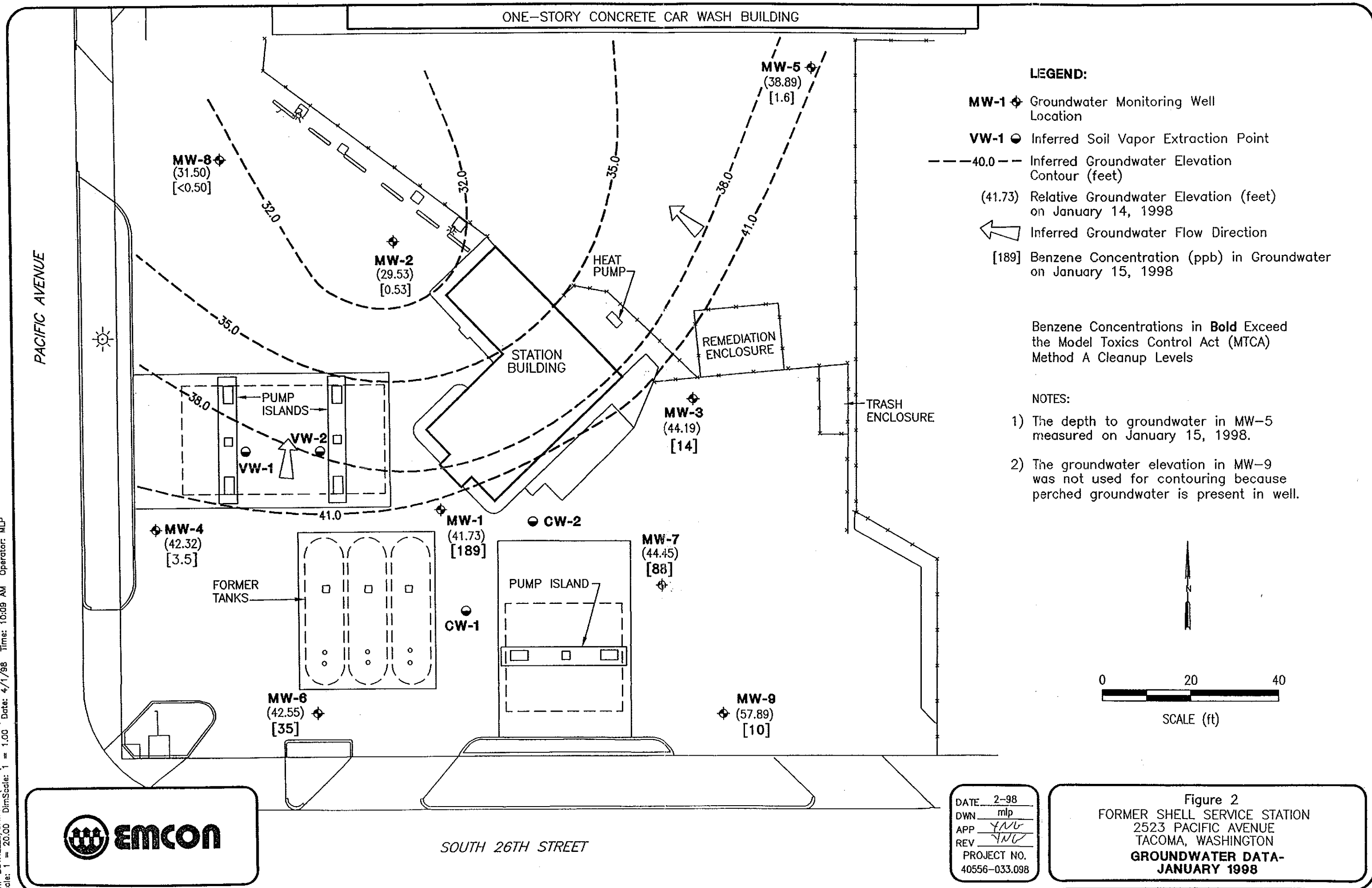
0 2000 4000
SCALE (ft)



DATE 5-97
DWN. MLP
REV.
APPR. MDS
PROJECT NO.
40556-033.097

Figure 1
FORMER SHELL SERVICE STATION
2523 PACIFIC AVENUE
TACOMA, WASHINGTON
SITE VICINITY MAP

ENW-BOTHELL2/DATA: G:\DWG\40556033\B0098R02.dwg Xrefs: <NONE> Operator: MLP
 Scale: 1" = 20.00' DimScale: 1" = 1.00' Date: 4/1/98 Time: 10:09 AM



DATE: 2-98
 DWN: mlp
 APP: YNV
 REV: YNV
 PROJECT NO.
 40556-033.098

Figure 2
 FORMER SHELL SERVICE STATION
 2523 PACIFIC AVENUE
 TACOMA, WASHINGTON
**GROUNDWATER DATA-
 JANUARY 1998**

Table 1

**Groundwater Monitoring Results
Former Shell Service Station 49
Tacoma, Washington
WIC 246-8330-2202**

Sample Location	Sample Date	Well Elevation ^a (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft)	pH	Specific Conductance (umhos/cm)	Temperature (°C)	Dissolved Oxygen (mg/L)
MW-1	01/14/98	75.00	33.27	41.73	6.78	353	15.0	0.28
MW-2	01/14/98	73.14	43.61	29.53	7.10	277	14.5	0.36
MW-3	01/14/98	74.71	30.52	44.19	6.54	279	15.5	0.25
MW-4	01/14/98	73.98	31.66	42.32	6.83	282	15.0	0.45
MW-5	01/15/98	68.10	29.21	38.89	7.61	301	11.5	2.30
MW-6	01/14/98	76.56	34.01	42.55	6.64	285	15.5	0.35
MW-7	01/14/98	74.53	30.08	44.45	6.65	348	16.0	0.25
MW-8	01/14/98	71.53	40.03	31.50	7.30	149	13.5	0.25
MW-9	01/14/98	74.69	16.80	57.89	6.72	304	16.5	2.48

^a Well elevations based on vertical control survey performed by Environmental Science and Engineering, Inc.

Table 2
Groundwater Sample Analytical Data
Former Shell Service Station 49
Tacoma, Washington
WIC 246-8330-2202

Well	Date Collected	Analytical Results (µg/L)					
		Ecology Method	EPA Method 8020A				
		WTPH-G	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
MTCA Method A Cleanup Levels ^a		TPH-G	5	40	30	20	NL
MW-1	04/23/91	24,000	940	1,300	500	3,600	
MW-1	10/01/91	15,000	280	220	390	2,390	
MW-1	04/20/92	11,000	150	9.6	ND	2,000	
MW-1	10/22/92	6,300	64	59	61	70	
MW-1	05/05/93	1,400	11	6.7	6	140	
MW-1	11/02/93	9,100	39	37	46	1,100	
MW-1	02/08/94	37,000	170	190	270	5,100	
MW-1	11/15/94	4,700	120	130	190	730	
MW-1	05/03/95	3,600	15	11	43	360	
MW-1	11/08/95	11,000	47	20	79	750	
MW-1	02/13/96	12,000	540	ND	79	660	
MW-1	08/08/96	8,650	37	13	64	462	
MW-1	01/23/97	10,300	33	12	65	519	
MW-1	01/15/98	8,880	189	19	76	528	29
MW-2	04/23/91	ND	2	ND	ND	1	
MW-2	10/01/91	ND	ND	ND	ND	2	
MW-2	04/20/92	ND	ND	ND	ND	ND	
MW-2	10/22/92	960	57	ND	ND	100	
MW-2	05/05/93	54	ND	ND	ND	ND	
MW-2	11/02/93	530	5.9	ND	1.3	ND	
MW-2	02/08/94	99	ND	ND	ND	ND	
MW-2	11/15/94	100	ND	ND	ND	ND	
MW-2	05/03/95	72	0.8	0.5	ND	3	
MW-2	11/08/95	ND	ND	ND	ND	ND	
MW-2	02/13/96	ND	ND	ND	ND	ND	
MW-2	08/07/96	ND	ND	ND	ND	ND	
MW-2	01/23/97	139	2.9	3.6	2.4	3.6	
MW-2	01/15/98	54	0.53	ND	ND	ND	ND
MW-3	04/23/91	21,000	310	620	840	6,400	
MW-3	10/01/91	6,000	87	110	160	417	
MW-3	04/20/92	6,000	240	70	700	720	
MW-3	10/22/92	22,000	350	460	690	2,900	
MW-3	05/05/93	7,300	12	19	44	630	
MW-3	11/02/93	160	ND	13	49	670	
MW-3	02/08/94	740	ND	1.7	5	10	
MW-3	11/15/94	8,200	10	8.5	67	290	
MW-3	05/03/95	1,100	1.4	1.6	6.2	3.2	
MW-3	11/08/95	1,200	5.9	2.6	11	3.9	
MW-3	02/14/96	940	2.1	1.3	3.0	2.5	
MW-3	08/08/96	415	3.4	2.0	1.5	5.4	

Table 2
Groundwater Sample Analytical Data
Former Shell Service Station 49
Tacoma, Washington
WIC 246-8330-2202

Well	Date Collected	Analytical Results (µg/L)					
		Ecology Method	EPA Method 8020A				
		WTPH-G	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
MTCA Method A Cleanup Levels ^a		1,000	5	40	30	20	NL
MW-3, cont.	01/23/97	473	1.4	1.3	1.6	18	—
MW-3	01/15/98	806	14	1.4	2.2	14	ND
MW-4	04/23/91	ND	ND	2	3	12	—
MW-4	10/01/91	ND	ND	20	6	22	—
MW-4	04/20/92	390	1.5	ND	ND	4.1	—
MW-4	10/22/92	260	ND	ND	0.6	1.1	—
MW-4	05/05/93	290	ND	ND	ND	ND	—
MW-4	02/08/94	130	ND	ND	ND	ND	—
MW-4	11/15/94	110	ND	ND	0.6	ND	—
MW-4	05/03/95	51	ND	ND	ND	ND	—
MW-4	11/08/95	ND	ND	ND	ND	ND	—
MW-4	02/14/96	ND	ND	ND	ND	ND	—
MW-4	08/07/96	ND	ND	ND	ND	ND	—
MW-4	01/23/97	ND	ND	ND	ND	ND	—
MW-4	01/15/98	139	3.5	ND	ND	ND	ND
MW-5	04/23/91	ND	ND	ND	ND	ND	—
MW-5	10/01/91	ND	ND	ND	ND	ND	—
MW-5	04/20/92	120	2.9	ND	ND	ND	—
MW-5	10/22/92	4,800	14	9.2	260	380	—
MW-5	05/05/93	ND	ND	ND	ND	ND	—
MW-5	02/14/96	57	ND	ND	ND	ND	—
MW-5	08/07/96	ND	ND	ND	ND	ND	—
MW-5	01/23/97	156	ND	ND	ND	ND	—
MW-5	01/15/98	112	1.6	ND	ND	2.1	ND
MW-6	10/01/91	ND	ND	2	ND	1	—
MW-6	04/20/92	ND	ND	ND	ND	ND	—
MW-6	10/22/92	ND	ND	ND	ND	ND	—
MW-6	05/05/93	ND	ND	ND	ND	ND	—
MW-6	02/14/96	ND	0.94	ND	ND	ND	—
MW-6	08/07/96	52	ND	1.8	0.65	5.8	—
MW-6	01/23/97	ND	ND	ND	ND	ND	—
MW-6	01/15/98	66	35	ND	ND	ND	ND
MW-7	10/01/91	16,000	320	280	540	1,920	—
MW-7	04/20/92	13,000	320	250	500	1,500	—
MW-7	05/05/93	25,000	79	210	240	3,100	—
MW-7	11/02/93	22,000	37	98	150	2,000	—
MW-7	02/08/94	20,000	71	45	190	1,000	—
MW-7	05/03/95	8,000	5.5	7.6	52	380	—
MW-7	11/08/95	4,100	21	7.1	100	91	—
MW-7	02/14/96	10,000	25	22	160	310	—

Table 2
Groundwater Sample Analytical Data
Former Shell Service Station 49
Tacoma, Washington
WIC 246-8330-2202

Well	Date Collected	Analytical Results (µg/L)					
		Ecology Method WTPH-G	EPA Method 8020A				
		TPH-G	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
MTCA Method A Cleanup Levels ^a		1,000	5	40	30	20	NL
MW-7, cont.	08/08/96	3,180	18	7.9	78	92	—
MW-7	01/23/97	7,860	16	14	113	308	—
MW-7	01/15/98	5,170	88	12	101	271	ND
MW-8	10/01/91	ND	2	11	2	14	—
MW-8	04/20/92	ND	ND	ND	ND	ND	—
MW-8	10/22/92	90	1.6	ND	ND	1	—
MW-8	05/05/93	ND	ND	ND	ND	ND	—
MW-8	11/15/94	ND	ND	ND	ND	ND	—
MW-8	05/03/95	ND	ND	ND	ND	ND	—
MW-8	11/08/95	ND	0.7	ND	ND	ND	—
MW-8	02/14/96	ND	1.0	ND	ND	ND	—
MW-8	08/07/96	ND	1.1	ND	ND	ND	—
MW-8	01/23/97	ND	0.91	ND	ND	ND	—
MW-8	01/15/98	68	ND	ND	0.73	ND	ND
MW-9	10/01/91	23,000	270	560	740	3,880	—
MW-9	04/20/92	20,000	310	250	450	2,300	—
MW-9	10/22/92	25,000	87	310	420	1,600	—
MW-9	05/05/93	10,000	72	200	200	1,300	—
MW-9	11/02/93	4,900	ND	89	120	620	—
MW-9	02/08/94	14,000	46	290	520	1,800	—
MW-9	11/15/94	14,000	66	44	200	1,600	—
MW-9	05/03/95	3,900	9.5	23	58	410	—
MW-9	11/08/95	6,200	31	79	100	94	—
MW-9	02/14/96	3,700	14	23	46	190	—
MW-9	08/07/96	8,620	35	67	251	755	—
MW-9	01/23/97	2,870	ND	14	31	174	—
MW-9	01/15/98	2,050	10	10	80	271	ND

NOTE:
µg/L = micrograms per liter (ppb).
NL = there is no established MTBE cleanup level for Washington state.
— = Not analyzed.
MTBE = Methyl tert-butyl ether.
Shaded values exceed MTCA Method A Cleanup Levels.
TPH-G = Total petroleum hydrocarbons as gasoline.

^a Chapter 173-340 WAC, *The Model Toxics Control Act Cleanup Regulations, Method A Cleanup Levels*. Amended January 1996.



NORTH CREEK ANALYTICAL

Environmental Laboratory Services

BOTHELL ■ (425) 481-9200 ■ FAX 485-2992
SPOKANE ■ (509) 924-9200 ■ FAX 924-9290
PORTLAND ■ (503) 643-9200 ■ FAX 644-2202

EMCON Northwest, Inc.-Bothell
18912 North Creek Pkwy, Ste 100
Bothell, WA 98011

Project: Shell #246-8330-2202
Project Number: 40556-033.098
Project Manager: Nick Garson

Sampled: 1/15/98
Received: 1/16/98
Reported: 1/28/98 10:46

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
MW-1-0198	B801189-01	Water	1/15/98
MW-2-0198	B801189-02	Water	1/15/98
MW-3-0198	B801189-03	Water	1/15/98
MW-4-0198	B801189-04	Water	1/15/98
MW-5-0198	B801189-05	Water	1/15/98
MW-6-0198	B801189-06	Water	1/15/98
MW-7-0198	B801189-07	Water	1/15/98
MW-8-0198	B801189-08	Water	1/15/98
MW-9-0198	B801189-09	Water	1/15/98

ORIGINAL IS
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North Creek Analytical, Inc.

*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.*


David Vandel, Project Manager

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508
East 11115 Montanero Suite B Spokane WA 99206-4776



NORTH CREEK ANALYTICAL

Environmental Laboratory Services

BOTHELL ■ (425) 481-9200 ■ FAX 485-2992
SPOKANE ■ (509) 924-9200 ■ FAX 924-9290
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EMCON Northwest, Inc.-Bothell
18912 North Creek Pkwy, Ste 100
Bothell, WA 98011

Project: Shell #246-8330-2202
Project Number: 40556-033.098
Project Manager: Nick Garson

Sampled: 1/15/98
Received: 1/16/98
Reported: 1/28/98 10:46

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8020A North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
B801189-01								
MW-1-0198							<u>Water</u>	
Methyl tert-butyl ether	0180432	1/20/98	1/20/98		25.0	28.5	ug/l	
Gasoline Range Hydrocarbons	"	"	"		250	8880	"	
Benzene	"	"	"		2.50	189	"	
Toluene	"	"	"		2.50	18.7	"	
Ethylbenzene	"	"	"		2.50	76.0	"	
Xylenes (total)	"	"	"		5.00	528	"	
Surrogate: 4-BFB (FID)	"	"	"	50.0-150		139	%	
Surrogate: 4-BFB (PID)	"	"	"	50.0-150		139	"	
B801189-02								
MW-2-0198							<u>Water</u>	
Methyl tert-butyl ether	0180432	1/20/98	1/20/98		5.00	ND	ug/l	
Gasoline Range Hydrocarbons	"	"	"		50.0	53.8	"	
Benzene	"	"	"		0.500	0.532	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	50.0-150		107	%	
Surrogate: 4-BFB (PID)	"	"	"	50.0-150		114	"	
B801189-03								
MW-3-0198							<u>Water</u>	
Methyl tert-butyl ether	0180432	1/20/98	1/20/98		5.00	ND	ug/l	
Gasoline Range Hydrocarbons	"	"	"		50.0	806	"	
Benzene	"	"	"		0.500	13.9	"	
Toluene	"	"	"		0.500	1.35	"	
Ethylbenzene	"	"	"		0.500	2.17	"	
Xylenes (total)	"	"	"		1.00	14.2	"	
Surrogate: 4-BFB (FID)	"	"	"	50.0-150		156	%	1
Surrogate: 4-BFB (PID)	"	"	"	50.0-150		129	"	
B801189-04								
MW-4-0198							<u>Water</u>	
Methyl tert-butyl ether	0180432	1/20/98	1/20/98		5.00	ND	ug/l	
Gasoline Range Hydrocarbons	"	"	"		50.0	139	"	
Benzene	"	"	"		0.500	3.45	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	50.0-150		116	%	
Surrogate: 4-BFB (PID)	"	"	"	50.0-150		117	"	

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

North Creek Analytical, Inc.


David Vandell, Project Manager

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508
East 11115 Montgomery, Suite B, Spokane, WA 99206-4776



NORTH CREEK ANALYTICAL

Environmental Laboratory Services

BOTHELL ■ (425) 481-9200 ■ FAX 485-2992
SPOKANE ■ (509) 924-9200 ■ FAX 924-9290
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EMCON Northwest, Inc.-Bothell
18912 North Creek Pkwy, Ste 100
Bothell, WA 98011

Project: Shell #246-8330-2202
Project Number: 40556-033.098
Project Manager: Nick Garson

Sampled: 1/15/98
Received: 1/16/98
Reported: 1/28/98 10:46

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8020A North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW-5-0198								
				B801189-05			Water	
Methyl tert-butyl ether	0180432	1/20/98	1/20/98		5.00	ND	ug/l	
Gasoline Range Hydrocarbons	"	"	"		50.0	112	"	
Benzene	"	"	"		0.500	1.63	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	2.08	"	
Surrogate: 4-BFB (FID)	"	"	"	50.0-150		104	%	
Surrogate: 4-BFB (PID)	"	"	"	50.0-150		115	"	
MW-6-0198								
				B801189-06			Water	
Methyl tert-butyl ether	0180432	1/20/98	1/20/98		5.00	ND	ug/l	
Gasoline Range Hydrocarbons	"	"	"		50.0	66.2	"	
Benzene	"	"	"		0.500	35.3	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	50.0-150		104	%	
Surrogate: 4-BFB (PID)	"	"	"	50.0-150		110	"	
MW-7-0198								
				B801189-07			Water	
Methyl tert-butyl ether	0180432	1/20/98	1/20/98		25.0	ND	ug/l	
Gasoline Range Hydrocarbons	"	"	"		250	5170	"	
Benzene	"	"	"		2.50	87.7	"	
Toluene	"	"	"		2.50	12.2	"	
Ethylbenzene	"	"	"		2.50	101	"	
Xylenes (total)	"	"	"		5.00	271	"	
Surrogate: 4-BFB (FID)	"	"	"	50.0-150		131	%	
Surrogate: 4-BFB (PID)	"	"	"	50.0-150		127	"	
MW-8-0198								
				B801189-08			Water	
Methyl tert-butyl ether	0180432	1/20/98	1/20/98		5.00	ND	ug/l	
Gasoline Range Hydrocarbons	"	"	"		50.0	68.2	"	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	0.728	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	50.0-150		107	%	
Surrogate: 4-BFB (PID)	"	"	"	50.0-150		118	"	

North Creek Analytical, Inc.

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

David Vandel

David Vandel, Project Manager

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508
East 11115 Montgomery, Suite B, Spokane, WA 99206-4776



NORTH CREEK ANALYTICAL

Environmental Laboratory Services

BOTHELL ■ (425) 481-9200 ■ FAX 485-2992
SPOKANE ■ (509) 924-9200 ■ FAX 924-9290
PORTLAND ■ (503) 643-9200 ■ FAX 644-2202

EMCON Northwest, Inc.-Bothell
18912 North Creek Pkwy, Ste 100
Bothell, WA 98011

Project: Shell #246-8330-2202
Project Number: 40556-033.098
Project Manager: Nick Garson

Sampled: 1/15/98
Received: 1/16/98
Reported: 1/28/98 10:46

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8020A North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
				<u>B801189-09</u>			<u>Water</u>	
MW-9-0198					25.0	ND	ug/l	
Methyl tert-butyl ether	0180432	1/20/98	1/20/98		250	2050	"	
Gasoline Range Hydrocarbons	"	"	"		2.50	9.96	"	
Benzene	"	"	"		2.50	10.4	"	
Toluene	"	"	"		2.50	80.0	"	
Ethylbenzene	"	"	"		5.00	271	"	
Xylenes (total)	"	"	"	50.0-150		120	%	
Surrogate: 4-BFB (FID)	"	"	"	50.0-150		138	"	
Surrogate: 4-BFB (PID)	"	"	"					



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18912 North Creek Pkwy, Ste 100
Bothell, WA 98011

Project: Shell #246-8330-2202
Project Number: 40556-033.098
Project Manager: Nick Garson

Sampled: 1/15/98
Received: 1/16/98
Reported: 1/28/98 10:46

MTBE Confirmation by EPA Method 8260A North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW-1-0198				B801189-01			Water	
Methyl tert-butyl ether	0180553	1/23/98	1/23/98		15.0	ND	ug/l	
Surrogate: 2-Bromopropene	"	"	"	80.0-120		85.5	%	
Surrogate: 1,2-DCA-d4	"	"	"	80.0-120		109	"	
Surrogate: Toluene-d8	"	"	"	80.0-120		100	"	
Surrogate: 4-BFB	"	"	"	80.0-120		108	"	

DSV



NORTH CREEK ANALYTICAL

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EMCON Northwest, Inc.-Bothell
18912 North Creek Pkwy, Ste 100
Bothell, WA 98011

Project: Shell #246-8330-2202
Project Number: 40556-033.098
Project Manager: Nick Garson

Sampled: 1/15/98
Received: 1/16/98
Reported: 1/28/98 10:46

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8020A/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: 0180432										
Blank										
Date Prepared: 1/20/98			Extraction Method: EPA 5030 (P/T)							
0180432-BLK1										
Methyl tert-butyl ether	1/20/98			ND	ug/l	5.00				
Gasoline Range Hydrocarbons	"			ND	"	50.0				
Benzene	"			ND	"	0.500				
Toluene	"			ND	"	0.500				
Ethylbenzene	"			ND	"	0.500				
Xylenes (total)	"			ND	"	1.00				
Surrogate: 4-BFB (FID)	"	48.0		50.3	"	50.0-150	105			
Surrogate: 4-BFB (PID)	"	48.0		54.3	"	50.0-150	113			
LCS										
0180432-BS1										
Gasoline Range Hydrocarbons	1/20/98	500		503	ug/l	75.0-125	101			
Surrogate: 4-BFB (FID)	"	48.0		60.3	"	50.0-150	126			
Duplicate										
0180432-DUP1			B801222-02							
Gasoline Range Hydrocarbons	1/20/98		6460	5430	ug/l			25.0	17.3	
Surrogate: 4-BFB (FID)	"	48.0		53.9	"	50.0-150	112			
Duplicate										
0180432-DUP2			B801189-07							
Gasoline Range Hydrocarbons	1/20/98		5170	5600	ug/l			25.0	7.99	
Surrogate: 4-BFB (FID)	"	48.0		55.3	"	50.0-150	115			
Matrix Spike										
0180432-MS1			B801189-02							
Benzene	1/20/98	10.0	0.532	11.1	ug/l	70.0-130	106			
Toluene	"	10.0	ND	10.7	"	70.0-130	107			
Ethylbenzene	"	10.0	ND	10.2	"	70.0-130	102			
Xylenes (total)	"	30.0	ND	31.0	"	70.0-130	103			
Surrogate: 4-BFB (PID)	"	48.0		55.4	"	50.0-150	115			
Matrix Spike Dup										
0180432-MSD1			B801189-02							
Benzene	1/20/98	10.0	0.532	11.2	ug/l	70.0-130	107	15.0	0.939	
Toluene	"	10.0	ND	10.8	"	70.0-130	108	15.0	0.930	
Ethylbenzene	"	10.0	ND	10.3	"	70.0-130	103	15.0	0.976	
Xylenes (total)	"	30.0	ND	30.4	"	70.0-130	101	15.0	1.96	
Surrogate: 4-BFB (PID)	"	48.0		54.4	"	50.0-150	113			

North Creek Analytical, Inc.

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

David Vandel

David Vandel, Project Manager

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NORTH CREEK ANALYTICAL

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EMCON Northwest, Inc.-Bothell
18912 North Creek Pkwy, Ste 100
Bothell, WA 98011

Project: Shell #246-8330-2202
Project Number: 40556-033.098
Project Manager: Nick Garson

Sampled: 1/15/98
Received: 1/16/98
Reported: 1/28/98 10:46

MTBE Confirmation by EPA Method 8260A/Quality Control North Creek Analytical - Bothell

Analyte	Date	Spike	Sample	QC	Reporting Limit		Recov.	RPD	RPD	Notes*
	Analyzed	Level	Result	Result	Units	Recov. Limits	%	Limit	%	
<u>Batch: 0180553</u>		<u>Date Prepared: 1/23/98</u>			<u>Extraction Method: EPA 5030 [P/T]</u>					
<u>Blank</u>		<u>0180553-BLK1</u>								
Methyl tert-butyl ether	1/23/98			ND	ug/l	5.00				
Surrogate: 2-Bromopropene	"	20.0		22.5	"	80.0-120	113			
Surrogate: 1,2-DCA-d4	"	20.0		18.2	"	80.0-120	91.0			
Surrogate: Toluene-d8	"	20.0		19.9	"	80.0-120	99.5			
Surrogate: 4-BFB	"	20.0		19.3	"	80.0-120	96.5			



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EMCON Northwest, Inc.-Bothell
18912 North Creek Pkwy, Ste 100
Bothell, WA 98011

Project: Shell #246-8330-2202
Project Number: 40556-033.098
Project Manager: Nick Garson

Sampled: 1/15/98
Received: 1/16/98
Reported: 1/28/98 10:46

Notes and Definitions

#	Note
1	The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample.
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, Inc.

David Vandell

David Vandell, Project Manager

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9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132

8801189

SHELL OIL COMPANY

RETAIL ENVIRONMENTAL ENGINEERING - WEST

CHAIN OF CUSTODY RECORD

Date: 1/16/98

Page 1 of 2

Serial No:

Site Address: 2523 Pacific Avenue, Tacoma, WA

WIC#: 246-8330-2202

Shell Engineer:

Brad Boschetto

Phone No: 714

427-3431

Fax #: 427-3469

Consultant Name & Address:

EMCON-Bothell

Consultant Contact:

Nick Carson

Phone No: 425

485-5000

Fax #: 485-9766

Comments:

40556-033.098

Sampled by: Peter Murphy

Printed Name: Peter Murphy

Sample ID	Date	Sludge	Soil	Water	Air	No. of conis.
mw-1-0198	1/15			X		2
mw-2-0198						
mw-3-0198						
mw-4-0198						
mw-5-0198						
mw-6-0198						
mw-7-0198						
mw-8-0198						

Sample ID	Date	Sludge	Soil	Water	Air	No. of conis.
mw-1-0198	1/15			X		2
mw-2-0198						
mw-3-0198						
mw-4-0198						
mw-5-0198						
mw-6-0198						
mw-7-0198						
mw-8-0198						

Sample ID	Date	Sludge	Soil	Water	Air	No. of conis.
mw-1-0198	1/15			X		2
mw-2-0198						
mw-3-0198						
mw-4-0198						
mw-5-0198						
mw-6-0198						
mw-7-0198						
mw-8-0198						

Sample ID	Date	Sludge	Soil	Water	Air	No. of conis.
mw-1-0198	1/15			X		2
mw-2-0198						
mw-3-0198						
mw-4-0198						
mw-5-0198						
mw-6-0198						
mw-7-0198						
mw-8-0198						

Sample ID	Date	Sludge	Soil	Water	Air	No. of conis.
mw-1-0198	1/15			X		2
mw-2-0198						
mw-3-0198						
mw-4-0198						
mw-5-0198						
mw-6-0198						
mw-7-0198						
mw-8-0198						

Sample ID	Date	Sludge	Soil	Water	Air	No. of conis.
mw-1-0198	1/15			X		2
mw-2-0198						
mw-3-0198						
mw-4-0198						
mw-5-0198						
mw-6-0198						
mw-7-0198						
mw-8-0198						

Sample ID	Date	Sludge	Soil	Water	Air	No. of conis.
mw-1-0198	1/15			X		2
mw-2-0198						
mw-3-0198						
mw-4-0198						
mw-5-0198						
mw-6-0198						
mw-7-0198						
mw-8-0198						

Sample ID	Date	Sludge	Soil	Water	Air	No. of conis.
mw-1-0198	1/15			X		2
mw-2-0198						
mw-3-0198						
mw-4-0198						
mw-5-0198						
mw-6-0198						
mw-7-0198						
mw-8-0198						

Sample ID	Date	Sludge	Soil	Water	Air	No. of conis.
mw-1-0198	1/15			X		2
mw-2-0198						
mw-3-0198						
mw-4-0198						
mw-5-0198						
mw-6-0198						
mw-7-0198						
mw-8-0198						

Sample ID	Date	Sludge	Soil	Water	Air	No. of conis.
mw-1-0198	1/15			X		2
mw-2-0198						
mw-3-0198						
mw-4-0198						
mw-5-0198						
mw-6-0198						
mw-7-0198						
mw-8-0198						

Sample ID	Date	Sludge	Soil	Water	Air	No. of conis.
mw-1-0198	1/15			X		2
mw-2-0198						
mw-3-0198						
mw-4-0198						
mw-5-0198						
mw-6-0198						
mw-7-0198						
mw-8-0198						

Sample ID	Date	Sludge	Soil	Water	Air	No. of conis.
mw-1-0198	1/15			X		2
mw-2-0198						
mw-3-0198						
mw-4-0198						
mw-5-0198						
mw-6-0198						
mw-7-0198						
mw-8-0198						

Sample ID	Date	Sludge	Soil	Water	Air	No. of conis.
mw-1-0198	1/15			X		2
mw-2-0198						
mw-3-0198						
mw-4-0198						
mw-5-0198						
mw-6-0198						
mw-7-0198						
mw-8-0198						

Sample ID	Date	Sludge	Soil	Water	Air	No. of conis.
mw-1-0198	1/15			X		2
mw-2-0198						
mw-3-0198						
mw-4-0198						
mw-5-0198						
mw-6-0198						
mw-7-0198						
mw-8-0198						

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	MTBE	Asbestos	Container Size	Preparation Used	Composite Y/N
X	X	X	X	X	X	X				
X	X	X	X	X	X	X				
X	X	X	X	X	X	X				
X	X	X	X	X	X	X				
X	X	X	X	X	X	X				
X	X	X	X	X	X	X				
X	X	X	X	X	X	X				
X	X	X	X	X	X	X				
X	X	X	X	X	X	X				
X	X	X	X	X	X	X				

LAB: North Creek

CHECK ONE (1) BOX ONLY	CT/DI	TURN AROUND TIME
G.W. Monitoring ☒ 4441		24 hours []
Site Investigation ☐ 4441		48 hours []
Soil Classify/Disposal ☐ 4442		15 days ☒ (Normal)
Water Classify/Disposal ☐ 4443		Other []
Soil/Air Rem. or Sys. ☐ 4452		
Water Rem. or Sys. ☐ 4453		
Other ☐ []		

NOTE: Helly Lab as soon as possible of 24/48 hrs. TAT

UST AGENCY:

MATERIAL DESCRIPTION	SAMPLE CONDITION/ COMMENTS
	B801189-01
	02
	03
	04
	05
	06
	07
	08

Date: 1/16/98

Time: 8:47

Date: 1/16/98

Time: 08:47

Printed Name:

Lisa Hurler

Printed Name:

Printed Name:

Printed Name:

Printed Name:

Printed Name:

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

4.4.18/00

B801189



SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING - WEST

CHAIN OF CUSTODY RECORD

Date: 1/16/98
Page 2 of 2

Serial No:

Site Address: 2523 Pacific Avenue, Tacoma, WA

WIC#: 246-8336-2202

Shell Engineer: Brad Baschert

Phone No.:
Fax #:

Consultant Name & Address:

EMCON

Consultant Contact:

Nick Carlson

Phone No.:
Fax #:

Comments:

40556-033.0A8

Sampled by:

Printed Name:

Sample ID

mw-9-0198

Date

1/15

Sludge

Soil

Water

Air

No. of
conts.

2

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

Asbestos

Container Size

Preparation Used

Composite Y/N

LAB: North Creek

CHECK ONE (1) BOX ONLY	CI/DI	TURN AROUND TIME
C W. Monitoring ☐ 4441		24 hours ☐
Site Investigation ☐ 4441		48 hours ☐
Soil Clarity/Disposal ☐ 4442		15 days ☐ (Normal)
Water Clarity/Disposal ☐ 4443		Other ☐
Soil/Air Rem. or Sys. O & M ☐ 4452		
Water Rem. or Sys. O & M ☐ 4453		
Other ☐		

NOTE: Holly Lab as soon as Possible of 24/48 hrs 1AT

UST AGENCY:

MATERIAL DESCRIPTION

SAMPLE CONDITION/ COMMENTS

B801189-09

Relinquished By (signature):

Printed Name:

Peter May 11/09

Date: 1/16/98

Time: 5:47

Received (signature):

Printed Name:

USA Haver

Date: 1/16/98

Time: 08:47

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

2nd Edition 4/9/97

15710793

4.4 w/o CS