



Department of Ecology Industrial Section

June 17, 2004

Mr. Mark Dirkx WDOE – Industrial Section P.O. Box 47600 Olympia, WA 98504-7600

Dear Mr. Dirkx,

Shell Oil Products US

Puget Sound Refinery
P.O. Box 622
Anacortes, WA 98221
Tel 360.293.0800
Fax 360.293.0808
Email pugetsound@ShellOPUS.com
Web-Plant www.shellpugetsoundrefinery.com
Web-Corporate www.shellus.com

Re: Puget Sound Refinery - RCRA Facility Investigation (RFI) and Interim Measures (SWMU 11) - EPA/Ecology ID# WAD 00927 6197

Please find attached, a Groundwater Monitoring and Sampling Report for the 2nd quarter of 2004 for Puget Sound Refinery (RCRA Facility Permit Number WAD009276197, SWMU 11).

PSR appreciates Ecology's ongoing assistance regarding the remediation of the site. Questions or comments regarding this matter may be directed to Mr. Brian Rhodes at (360) 293-1761.

Sincerely,

Mark J. Koslicki

Manager - Health, Safety and Environment

Marl I Thorland

BDR/br

cc: Paul Skyllingstad Dept. of Ecology

Enclosure

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Facility: Year: Left Right Air Corr Water Reports **NPDES Permit** WET-Tox Enf DW/RCRA Eng Clean Up Sub SW HWP2

GROUNDWATER MONITORING AND SAMPLING REPORT FOR THE SECOND QUARTER OF 2004 PUGET SOUND REFINERY SWMU 11

Prepared by

Puget Sound Refinery
Anacortes, Washington

June 2004

Written By:

Brian D. Rhodes, WA P.G. #2156

Bi D. Ph

Staff Engineer

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1.0 INTRODUCTION

This report summarizes remedial activities completed during the Second quarter of 2004 at Puget Sound Refinery, RCRA/RFI Solid Waste Management Unit 11. This report includes recent groundwater monitoring and sampling data collected during May of 2004.

Puget Sound Refinery is located near the city of Anacortes in Washington State (Figure 1 -Site Vicinity Map). SWMU 11 is a surface impoundment (the West Impounding Basin) located in the southwest corner of the facility tank farm (Figure 2). During the fall of 1990, hydrocarbons which were thought to be associated with the unit were discovered during RFI investigative procedures (see "RFI Workplan Amendment and Project Update" - June 1991).

During April of 1992, a report entitled "Workplan for Conducting SWMU 11 Phase II RFI Activities" was submitted to EPA. The report provided details of the design and proposed installation of a light non-aqueous phase liquid (LNAPL) recovery system. The installation of the LNAPL/groundwater recovery system was recommended by EPA (EPA/Ecology ID# WAD 00927-6197) in a letter dated May 21, 1992. An "Implementation of Interim Measures Report" was submitted to EPA during February of 1993 that described the installation and start up of the LNAPL/groundwater recovery system at the site. Since the start up of the LNAPL/groundwater recovery system, groundwater monitoring has occurred on a quarterly basis and groundwater sampling has been conducted every six months. More recently, EPA has delegated oversite of the SWMU 11 project to the Department of Ecology.

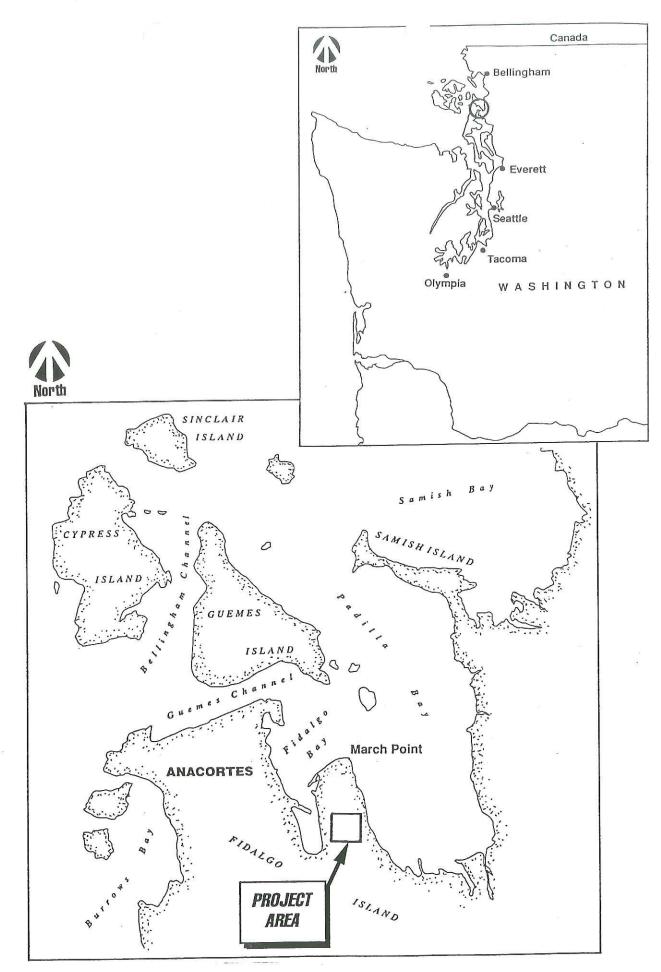
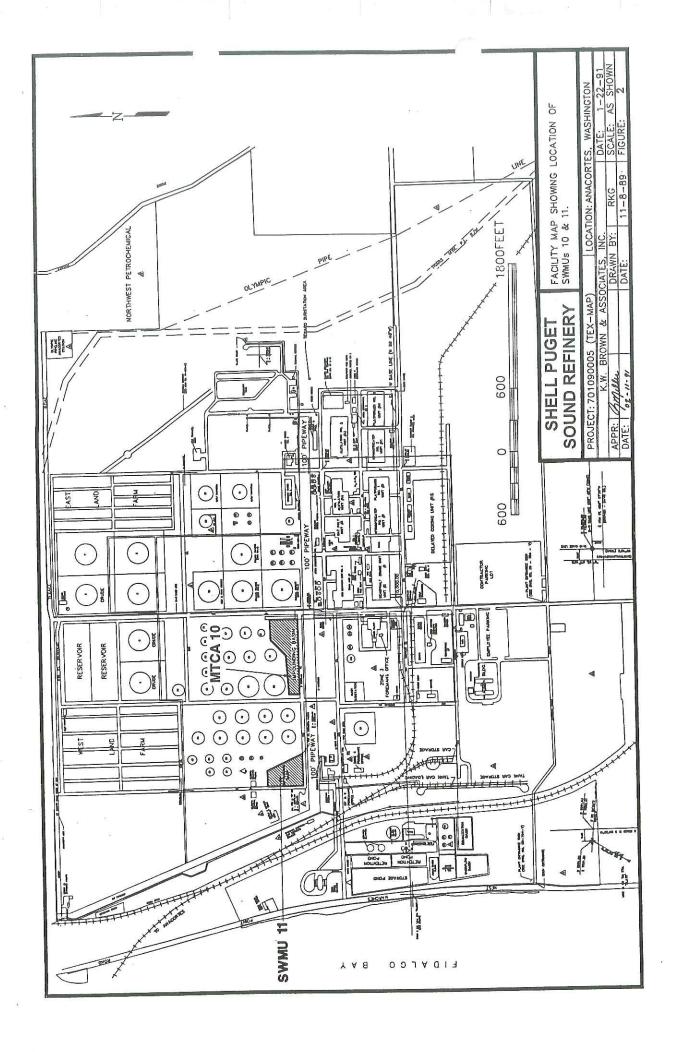


Figure 1. Vicinity map of Shell Puget Sound Refinery



2.0 FIELD WORK

2.1 GROUNDWATER SURFACE AND FREE PRODUCT MEASUREMENTS

Groundwater surface level measurements were collected from fourteen wells on April 8th, 2004. A layer of LNAPL (Light Non-Aqueous Phase Liquid) was observed in potentiometric well P-21. Well MW-62 was dry. Groundwater/product recovery pumps are located in wells MW-59 and MW-64. A summary of field monitoring data is included as Table 1.

Water level surface measurements were conducted using a Solinst Model 101 water level meter with alarm and stainless steel probe. Floating free product thickness measurements were conducted with a Keck Model KIR-89 Oil-Water Interface Meter. In an attempt to minimize the potential for cross-well contamination, the probe and tape for each meter was thoroughly cleaned with alconox (or equivalent) and decontaminated with distilled water following its introduction into each well. Well measurements were generally conducted in sequence from the least to the most contaminated well based on prior sampling data.

2.1.2 GROUNDWATER GRADIENT, DIRECTION AND FLOWRATE

Recent monitoring data indicates that the local groundwater gradient is generally to the west-southwest that is consistent with historic potentiometric surface data (Texaco - "1994 Annual Report").

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	(- 1)	10000									
					V. 14	113 74	0.33	NS	SN	LNAPL	N/A
MW-59	SN	NS	39.90	A/N	¥/Z	r Š	0 0	7	1 359	31.15	42.33
MW-60	32.78	A/N	54.40	75.19	A/N	107.97	0.33	2	0 0 0	707	0 52
	24.46	δ/N	39.42	74.54	N/A	109.00	0.33	3.173	1.359	5.5	1 6
LQ-MIM	04.40		1 0	Vac	DRY	108.22	0.33	SN	1.359	DRY	DRY
MW-62	Dry	N/A	72.04			100 78	0.33	5.803	1.359	LNAPL	17.41
MW-63	31.60	N/A	40.67	78.18	Y/N	0.50	0000	N N	1.359	LNAPL	SN
MW-64	SN	SN	43.66	N/A	NA	111.48	55.0	0	2,270	18.69	25.39
MAYA . A.S.	28 14	ΑX	41.37	92.27	A/N	120.41	0.33	6.404	200	1 0	CH
3		0.114	77 08	99 45	ΑŻ	121.53	0.17	3.173	0.254	37.48	9:05
NW-91	22.08	1		0.00	δ/N	118 40	0.17	0.949	0.254	11.21	2.85
MW-92	31.18	N/A	36.77	77.10	<u> </u>		0.47	1 445	0.254	17.07	4.33
MW-93	32.76	N/A	41.27	77.77	N/A	50.011	- -	2 0	200	80	1.77
MANA OA	36 12	Α'Z	39.60	72.54	N/A	108.66	0.17	LAC.O	107.0	3	200
			40.92	76.84	A/N	109.74	0.17	1.362	0.254	16.08	‡ 0
CG-AAIM	32.30	<u>()</u>	0 0	70.68	A/N	111.52	0.17	1.455	0.254	17.19	4.37
MW-96	31.84	N/A	40.4	00.6		200	0.17	2.212	0.254	26.13	6.64
76-WIM	27.68	A/N	40.71	87.16	Y/Z	40.4	: !	000	0.054	SZ	SN
WW-98	31.5	ΑX	35.54	72.60	A/N	104.10	0.17	0.000	1000		Ø/N
	20.40	34.20	36	80.55	3.04	114.79	0.17	N/A	0.254	T/N	7 7 7
7	34.24		8 8	76.40	A/N	108.02	0.17	8.724	0.254	103.04	70.17
MW-118	31.02	()	3								

2.2 FREE PRODUCT/GROUNDWATER RECOVERY

Table 2 is a compilation of historical floating free product (LNAPL) thickness measurements for wells in which free product has been historically observed (MW-59, MW-63, MW-64 and P-21). Product recovery pump sensors on wells MW-59 and MW-64 are set to remove any LNAPL layer until only a trace remains. In the eighteen months from 5/92 to 7/93, measured LNAPL levels in well MW-59 were reduced from 11.56' to a trace. Since 7/93 the product recovery system continues to remove free product from the recovery wells when it appears. LNAPL was not observed in Well MW-63 during the quarter. Due to the relatively slow apparent velocity of groundwater movement in soils in the vicinity of SWMU 11 (Texaco - 1994 Annual Report), Puget Sound Refinery intends to continue operation of the recovery systems in Wells MW-59 and MW-64 to allow for further slow migration of hydrocarbons into the recovery wells from surrounding soils. No floating free product has been observed to date in any wells around SWMU 11 other than those mentioned above.

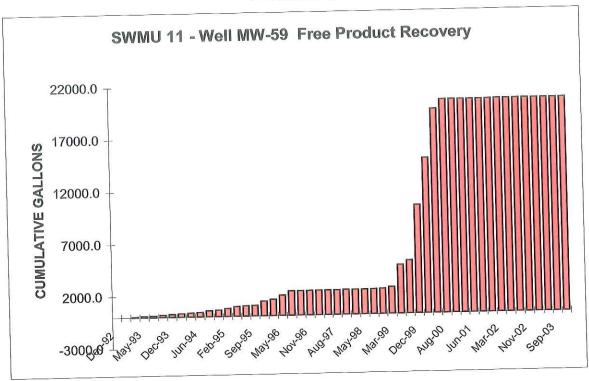
The recovery systems pump groundwater and/or product intermittently based on groundwater recharge rates and the presence of free product in recovery wells as determined by sensors in the wells. Quantities of product and groundwater recovered by the systems through March of 2004 are shown in Figures 4 and 5. To date a total of approximately 233,384 Gallons of groundwater and 20,691 gallons of free product have been recovered at the site.

TABLE 2 - SWMU 11 FREE-PRODUCT THICKNESS MEASUREMENTS (FEET)

WELL No. NUMBER	DATE MEASURED	DEPTH TO PRODUCT (FT)	DEPTH TO WATER (FT)	APPARENT THICKNESS (FT)
MW-59	5/22/91	30.34	39.27	8.93
WWW GG	12/11/91	28.53	39.27	10.74
	5/14/92	28.56	40.12	11.56
	10/01/92	31.09	37.81	6.72
1	10/20/92	31.77	33.28	1.51*
	07/19/93	ND	32.33***	TRACE***
	5/16/94	35.56	35.57	0.01***
	7/22/98	30.30	33.91	3.61***
	7/30/01	35.30	34.65	0.65***
MW-63	5/22/91	29.77	29.87	0.10
1000	12/11/91	26.37	26.38	0.01
	12/03/92	31.18	31.24	0.06**
V	5/6/93	30.44	30.44	SHEEN
	5/16/94	31.83	32.60	0.77
1	5/3/95	ND	32.02	ND
	11/18/96	32.25	32.38	0.13
	5/22/97	29.56	29.41	0.15
	5/15/98	ND	29.43	ND
	5/5/99	ND	29.27	ND
	5/8/00	ND	29.55	ND
	11/6/01	ND	32.21	ND
	10/22/02	ND	31.10	ND
	5/12/03	ND	31.54	ND
A	4/8/04	ND	31.60	ND
MW-64	5/22/91	30.34	31.07	0.73
I III I	12/11/91	29.14	29.63	0.49
	10/01/92	31.62	32.24	0.62
	7/19/93	ND	32.83	TRACE***
	5/16/94	ND	34.61'	ND***
	7/22/98	33.96	34.03	TRACE***
1	7/30/01	ND ving free product (LNA	32.22	ND***

	E 2 Continued - SW				
FREE	-PRODUCT THICKN	ESS MEASUREMENT	rs (FEET)		
	WELL No. NUMBER	DATE MEASURED	DEPTH TO PRODUCT (FT)	DEPTH TO WATER (FT)	APPARENT THICKNESS (FT)
	P-21	5/16/94	33.83	34.12	0.29
		5/3/95	34.20	34.40	0.20
		11/18/96	33.20	36	2.8
		5/22/97	30.25	36	5.75
		5/15/98	29.98	33.48	3.5
		5/5/99	29.66	32.37	2.71
		5/8/00	29.92	34.36	4.44
		7/6/01	31.74	33.84	2.10
		10/22/02	32.50	34.76	2.26
		5/12/03	31.31	32.78	1.47
		4/8/04	31.20	34.24	3.04

FIGURE 4



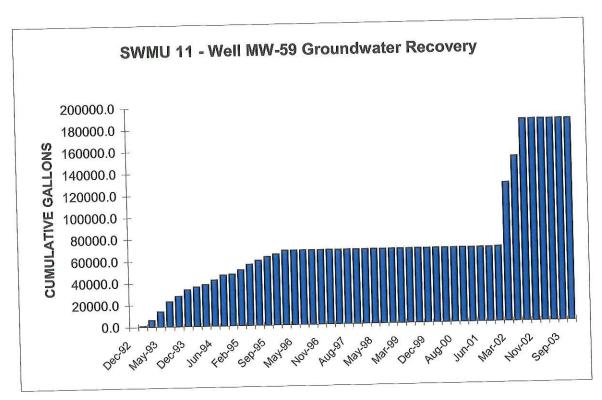
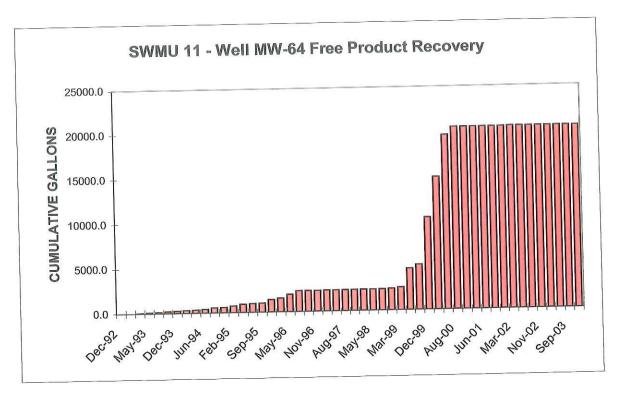
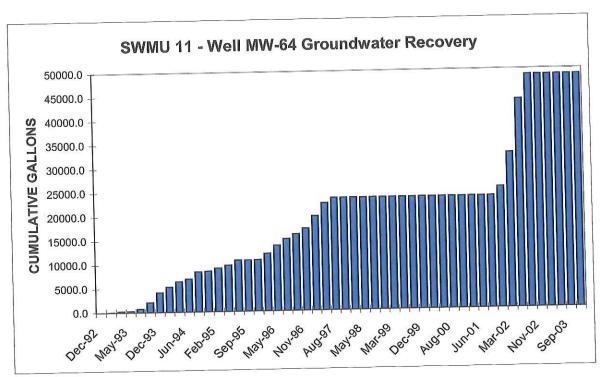


FIGURE 5





In previous reports, It was noted that neither recovery well had shown any activity during the first half of 2001. As a result, both pumps were pulled from the wells on July 30^{th} , 2001 for maintenance and adjustments relative to the groundwater hydrocarbon surface. Once the pumps were removed from the wells, no free product was discovered in well MW-64 and 0.65 feet of free product was discovered in well MW-59. Both pumps were cleaned and new parts ordered to rebuild the pumps. Following maintenance activities, MW-64 recovered significant quantities of groundwater.

In addition to the automated free product/groundwater recovery system, Puget Sound Refinery has also installed a passive, wick type adsorbent pad in well MW-63. Since no hydrocarbon has been found in MW-63 recently, the wick was not utilized during the quarter.

Historically, free product has been detected in Potentiometric Well P-21. The pumping system at well MW-59 appears to have created a capture zone with drawdown which encompasses well P-21 based on potentiometric surface data gathered in November 2001. Historically, the groundwater gradient and flow direction has not varied significantly.

2.3 SAMPLE COLLECTION

On May 18th, 2004, groundwater samples were collected from twelve (12) wells in the vicinity of SWMU 11 including wells MW-60, MW-61, MW-63, MW-65, and MW-91 through MW-98. In addition, two check samples consisting of a travel blank of distilled water and a duplicate of well MW-60 (labeled MW-100) were prepared and analyzed along with groundwater samples for quality control purposes. Well MW-62 was dry or had insufficient recharge after purging and therefore could not be sampled. Wells MW-59 and MW-64 were not sampled due to access limitations as a result of pumping systems in the wells. The original alleged source of hydrocarbons, the shipping basin, was cleaned and lined in early 1992. Each well was purged or bailed dry with a dedicated bailer prior to sampling. The volumes of water contained in each well is shown in Table 1 (Water

Level/LNAPL Field Measurement Data). Conductivity and pH measurements were conducted in conjunction with the well purging procedure. Samples were collected using a disposable (VOSS) bailer that was dedicated to each well. Following collection, samples were placed in an ice chest with blue ice and immediately shipped to a State Certified Laboratory.

3.0 ANALYTICAL RESULTS

The groundwater samples from all twelve (12) of the above mentioned wells plus the sample blank and duplicate were analyzed for 'Skinner List' Volatiles, 'Skinner List' Semi-volatiles, 'Skinner List' Metals and Northwest Total Petroleum Hydrocarbons as diesel (NWTPHd). In addition, 2-methylnaphthalene and 1,1,1-trichloroethane were included as analytes since they were the only constituents which are not on the 'Skinner List' which were detected during historic sampling rounds and were not qualified as laboratory contaminants. Table 3 includes a comprehensive list of skinner analytes (with the exception of TPH) that were submitted for analysis during this sampling event. Tables 4 through 7 are a compilation of the findings from the laboratory analyses. Actual laboratory reports and chain of custody are included in Appendix A.

TABLE 3 - SWMU 11 GROUNDWATER SAMPLING ANALYTES

Based on 2/93 Interim Measures Report

(ie: Skinner List + selected analytes in italics)

METALS

Antimony

Arsenic

Barium

Beryllium

Cadmium

Chromium

Cobalt

Lead

Mercury

Nickel

Selenium

Silver

Vanadium

Zinc

Copper

VOLATILE ORGANICS

EPA Method 8240

Benzene

Carbon Disulfide

Chlorobenzene

Chloroform

1,2-Dibromoethane

1,2-Dichloroethane

1,4-Dioxane

Methyl ethyl ketone

Styrene

Ethyl Benzene

Toluene

1,1,1-trichloroethane*

trichloroethene*

Xylenes

M-Xylene

O&P Xylene

<u>SEMI-VOLATILES ORGANICS</u> (EPA Method 8270)

Anthracene

Benz(a)anthracene

Benzo(b)fluoranthene

Benzenethiol

Benzo(k)fluoranthene

Benzo(a)pyrene

Bis(2-ethylhexyl) phthalate

Butyl benzyl phthalate

Chrysene

Cresols (methylphenols)

O-Cresol

M&P Cresol

Dibenz(a,h)anthracene

2,4-Dimethylphenol

2,4-Dinitrophenol

Di-n-butyl phthalate

Dichlorobenzenes

O-Dichlorobenzene

M-Dichlorobenzene

P-Dichlorobenzene

Diethyl phthalate

7,12-Dimethylbenz(a)anthracene

Dimethyl phthalate

Di-n-octyl phthalate

Fluoranthene

Indene

Methy chrysene

1-Methylnaphthalene

2-Methylnaphthalene*

Naphthalene

4-Nitrophenol

Phenanthrene

Phenol

Pyrene

Pyridine

Quinoline

^{*}Not from skinner list

New Numbers New Numbers New Numbers New Numbers New Numbers New Numbers		
Physic Conductivity		
Well Numbers State		
Well Numbers Well Numbers State		
60B - Skinner Volatiles (ug/l) 1080	o	Comments
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60B - Skinner Volatiles (ug/l) (TABLE 4) Well Numbers Well Se 63 64 65 91 92 93 94 95 96 96 96 96 96 96 97 97 97 97 97 97 97 97 97 97 97 97 97		
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Syridine ND ND ND Quinoline ND ND ND Phenanthrene ND ND ND Pyrene ND ND ND NGethyl Chrysene ND ND ND SWMU 11 Well Sampling Event ND ND ND Avay-04 Total Extractable Hydrocarbons as Well Numbers Well Numbers Analytes 59 61 62 63 NWTPH-Dx 9.4 10.9 23	38 Diesel	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2				0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2 2 2 2				2 2 2 2 2 2			
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	33 64 83.4	2 2 2 2 (I/ba) 59				0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0					8 8 8	9 9 9 9		
	as Diesel 33 64 83.4	2 2 2 (I/ba) 59	000			0 0 0 0 4 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6					9 9 9	2 2 2		
PA	28 Diesel 23 64 83.4	(I/ b w)				ON O			 		9 9	22		
년 <u>-</u>	33 64 63 84 83.4	(I/ 6 m)				ABL 95	- 6				8	Q		
다. ^T	33 64 83.4	(l/gm) 28	2 5			ABL 95			-					
S 11 S	32 Diesel	(mg/l)	5			ABLI								
N T-DX	33 64 83.4	(mg/l)	2			ABL 95	O							
S S	as Diesel 63 64 83.4	(mg/l)	2		\leq	ABL	0							
ا کیا	as Diesel 63 64 83.4	(mg/l)	2			ABL 95	9							
Well Numbers Wall Numbers 63 64 62 63 4WTPH-Dx 9.4 10.9 23.	63 64	92	2		-						1		1	
Well Numbers 59 60 61 62 94 10.9						-								
59 60 61 62			+	+	-				ŀ	-	-	0.0		Comments
9.4 10.9	3.4	+			-			_	88	7-7	000			
9.4 10.9	3.4		ł	-	_	-	2	2	2		S	7.6	0.3	
		0.3	0.3	0.6 0.	0.5 0.4	4. UN 4.	-8	- 8	-			-18		
		88888888888												
SWMU 11 Well Sampling Event								-	1					
May-04 Skinner Metals (mg/l)	(1/8	(TABLE	E E	2					-					
Moll Numbers														

3.1 'SKINNER LIST' VOLATILE ORGANICS

No volatile organics were detected in groundwater above reporting limits for wells MW-93 through MW-98. Table 4 summarizes the levels of selected volatile organics above PQL's found in other wells at the site. Additional full results are also provided in the laboratory analytical reports in Appendix A.

3.2 'SKINNER LIST' SEMI-VOLATILE ORGANICS

2,4-Dimethylphenol was detected in wells MW-60 and MW-61. Bis(2-ethylhexyl)phthalate was detected in wells MW-63, MW-65, MW-91, MW-95 and MW-98. Historic anomalous appearances of Bis (2-ethylhexyl) indicate that they are likely the result of laboratory contamination. Bis (2-ethylhexyl) phthalate is a ubiquitous plasticizer and is a common 'ghost' chemical associated with sample contamination from plastics. Table 5 summarizes the levels of selected semi-volatile organics, which were detected above Practical Quantitative Limits in the vicinity of SWMU 11.

3.3 TOTAL EXTRACTABLE HYDROCARBONS

During this sampling round, a Total Extractable Hydrocarbon as diesel (WTPH-d) analysis was completed for each well where a sample was collected in addition to the analytes listed on Table 3. For petroleum related sites, TPH is useful as a non-specific screening tool which indicates the general nature and location of a hydrocarbon plume. Table 6 depicts the results of the analytical testing for TPH.

3.4 SKINNER METALS

Skinner metals that were detected in the groundwater at SWMU 11 are summarized in Table 7.

4.0 PLANNED ACTIVITIES

A dual pump hydrocarbon recovery system consisting of a water table depression pump and free product recovery pump (Workplan for Conducting SWMU 11 Phase II RFI Activities - April 1992) has been operating in wells MW-59 and MW-64 since December of 1992. A passive product recovery system has been periodically installed in well MW-63 since the middle of 1992. Potentiometric well P-21 is occasionally bailed to remove free product in addition to that recovered by nearby recovery well MW-59. The operation and monitoring of the LNAPL/groundwater recovery systems will continue through 2004/2005. Data regarding the progress of remedial activities at the site will be collected quarterly or as warranted by significant findings at the site.

APPENDIX A LABORATORY REPORTS CHAIN OF CUSTODY FORM May 18, 2004 SAMPLING ROUND



Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588

Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

907.563.9200 fax 907.563.9210

Shell Puget Sound Refinery 8505 South Texas Road

Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
92 (B4E0548-01) Water	Sampled: 05/18/04 12:00	Received: 05	5/21/04 09:25						
Diesel Range Hydrocarbons	0.571	0.250	mg/l	1	4E25012	05/25/04	05/26/04	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	0.500	SH1	n	11	11			
Surrogate: 2-FBP	94.6 %	50-150			"	n	"	ű	
Surrogate: Octacosane	104 %	50-150			"	"	"	n n	
91 (B4E0548-02) Water	Sampled: 05/18/04 12:00	Received: 05	5/21/04 09:25						
Diesel Range Hydrocarbons	0.280	0.250	mg/l	1	4E25012	05/25/04	05/26/04	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND ND	0.500	,,	11	11	n		"	
Surrogate: 2-FBP	86.8 %	50-150			"	"	"	"	
Surrogate: Octacosane	104 %	50-150			n	H.:	n .	<i>n</i>	
93 (B4E0548-03) Water	Sampled: 05/18/04 12:00	Received: 0	5/21/04 09:2:	5					
Diesel Range Hydrocarbons		0.250	mg/l	1	4E25012	05/25/04	05/26/04	NWTPH-Dx	
Lube Oil Range Hydrocarbon	s ND	0.500	11	"	111	11			
Surrogate: 2-FBP	85.5 %	50-150			"	"	"	n	
Surrogate: Octacosane	101 %	50-150			"	"	n	<i>"</i>	
60 (B4E0548-04) Water	Sampled: 05/18/04 12:00	Received: 0	5/21/04 09:2	5					
Diesel Range Hydrocarbons		1.25	mg/l	5	4E25012	05/25/04	05/26/04	NWTPH-Dx	
Lube Oil Range Hydrocarb		0.500	11	1	"		05/26/04		
Surrogate: 2-FBP	94.6 %	50-150			"	Ü	u	H :	
Surrogate: Octacosane	105 %	50-150			11	n,	"	"	
61 (B4E0548-05) Water	Sampled: 05/18/04 12:00	Received: (05/21/04 09:2	5					
Diesel Range Hydrocarbon	52.03657345	1.25	mg/l	5	4E25012	05/25/04	05/26/04	NWTPH-Dx	
Lube Oil Range Hydrocark	11 1212	0.500	u	1.	u	0	05/26/04	n .	
Surrogate: 2-FBP	108 %	50-150				11	и	"	
Surrogate: Octacosane	108 %	50-150			<u>. #</u>	"	n	"	

North Creek Analytical - Bothell

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Jeanne Garthwaite, Project Manager

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Seattle 1172 Creek Pkwy N, Suite 400, Bothell, WA 98011-8244

425,420.9200 fax 425,420.9210

Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302

509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588 Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

907.563.9200 fax 907.563.9210

07 June 2004

Brian Rhodes Shell Puget Sound Refinery 8505 South Texas Road Anacortes, WA 98221

RE: SWMU 11 Sampling

Enclosed are the results of analyses for samples received by the laboratory on 05/21/04 09:25. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jeanne Garthwaite

Jeanne Gothit

Project Manager



"i Creek Pkwy N, Suite 400, Bothell, WA 98011-8244

425.420.9200 fax 425.420.9210

Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 509,924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119 907.563.9200 fax 907.563.9210

CASE NARRATIVE for B4E0548

Client: Shell Puget Sound Refinery Project Manager: Brian Rhodes Project Name: SWMU 11 Project Number: 4550237616

1.0 DESCRIPTION OF CASE

Fourteen water samples were received in a single shipment as documented on the associated chain-ofcustody. The scheduled analyses for these samples included: Diesel Range Hydrocarbons by NWTPH-Dx, Total Metals by EPA 6020/7470A, Volatile Organic Compounds (Texaco Skinner List) by EPA 8260B, Semivolatile Organic Compounds (Texaco Skinner List) by EPA 8270C

2.0 COMMENTS ON SAMPLE RECEIPT

The samples were received in the Bothell laboratory on May 21, 2004. The cooler temperature was documented at 4.8 ° Celsius upon receipt in the laboratory. All sample containers were received in good condition.

3.0 COMMENTS ON PREPARATION AND ANALYSIS

Diesel Range Hydrocarbons by NWTPH-Dx

No anomalies were associated with sample preparation and analysis. All quality control measures were within acceptable ranges.

Total Metals by EPA 6020/7470A

No anomalies were associated with sample preparation and analysis. All quality control measures were within acceptable ranges.

Volatile Organic Compounds (Texaco Skinner List) by EPA 8260B

No additional anomalies, discrepancies, or issues were associated with sample preparation, analysis and quality control other than those already qualified in the data and described in the Notes and Definitions page at the end of this report.

Semivolatile Organic Compounds by EPA 8270C

The sample identified as 98 had low surrogate recovery for three acid surrogates, 2-FP, Phenol-d6 and 2,4,6-TBP. The sample identified as 95 had low surrogate recovery for two acid surrogates, 2-FP and Phenol-d6. The samples were re-analyzed with the same results occurring. We did not receive any extra sample volume for re-extraction.

Jeanne Garthwaite Project Manager

North Creek Analytical

North Creek Analytical, Inc. Environmental Laboratory Network



.ı Creek Pkwy N, Suite 400, Bothell, WA 98011-8244

425.420.9200 fax 425.420.9210 Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302 509.924.9200 fax 509.924.9290 Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

907 563 9200 fax 907 563 9210

Shell Puget Sound Refinery 8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
92	B4E0548-01	Water	05/18/04 12:00	05/21/04 09:25
91	B4E0548-02	Water	05/18/04 12:00	05/21/04 09:25
	B4E0548-03	Water	05/18/04 12:00	05/21/04 09:25
93	B4E0548-04	Water	05/18/04 12:00	05/21/04 09:25
60	B4E0548-05	Water	05/18/04 12:00	05/21/04 09:25
61	B4E0548-06	Water	05/18/04 12:00	05/21/04 09:25
94	B4E0548-07	Water	05/18/04 12:00	05/21/04 09:25
98	B4E0548-08	Water	05/18/04 12:00	05/21/04 09:25
95	B4E0548-09	Water	05/18/04 12:00	05/21/04 09:25
96	B4E0548-10	Water	05/18/04 12:00	05/21/04 09:25
97		Water	05/18/04 12:00	05/21/04 09:25
63	B4E0548-11	Water	05/18/04 12:00	05/21/04 09:25
65	B4E0548-12		05/18/04 12:00	05/21/04 09:25
100	B4E0548-13	Water		05/21/04 09:25
BLANK	B4E0548-14	Water	05/18/04 12:00	05/21/04 09:25
TRIP BLANK	B4E0548-15	Water	05/20/04 12:00	03/21/04 09:23

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Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588 Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

907.563.9200 fax 907.563.9210

Shell Puget Sound Refinery 8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
94 (B4E0548-06) Water 5	Sampled: 05/18/04 12:00	Received: 05	/21/04 09:25					and the second second second second	
Diesel Range Hydrocarbons	0.411	0.250	mg/l	1	4E25012	05/25/04	05/26/04	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	0.500	u	N.			11	11	
Surrogate: 2-FBP	101 %	50-150			"	"	"	"	
Surrogate: Octacosane	102 %	50-150			"	<i>n</i> =	11	"	
95 (B4E0548-08) Water	Sampled: 05/18/04 12:00	Received: 05	5/21/04 09:25						
Diesel Range Hydrocarbons	ND	0.250	mg/l	1	4E25012	05/25/04	05/26/04	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	0.500	Ű	11	.00	910	u	u	
Surrogate: 2-FBP	88.9 %	50-150			n n	"	n	ii .	
Surrogate: Octacosane	102 %	50-150			ü	"	n .	"	
6	Sampled: 05/18/04 12:00	Received: 0	5/21/04 09:25	;					
	ND	0.250	mg/l	1	4E25012	05/25/04	05/26/04	NWTPH-Dx	
Diesel Range Hydrocarbons Lube Oil Range Hydrocarbons		0.500	""	n	0	11	11	ñ	
	86.5 %	50-150			11.	"	n	n	
Surrogate: 2-FBP	86.2 %	50-150			n	"	**	11	
Surrogate: Octacosane			F /21 /0 / 00.2/	=					
	Sampled: 05/18/04 12:00		5/21/04 09:25		4E25012	05/25/04	05/26/04	NWTPH-Dx	31
Diesel Range Hydrocarbons	ND	0.250	mg/l	1	4E23012	U3/23/U4	11	0	
Lube Oil Range Hydrocarbons		0.500						"	
Surrogate: 2-FBP	85.7 %	50-150			"	"	"	,,	
Surrogate: Octacosane	94.9 %	50-150							
63 (B4E0548-11) Water	Sampled: 05/18/04 12:00	Received: (5/21/04 09:2	5					
Diesel Range Hydrocarbons		2.50	mg/l	10	4E25012		05/26/04	NWTPH-Dx	
Lube Oil Range Hydrocarbon		5.00	ii	"	"	u	"	11	
Surrogate: 2-FBP	93.3 %	50-150			11	,,,	W	n.	
Surrogate: Octacosane	81.5 %	50-150			"	"	"	, n	
Paris Sancia Sancia									

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.ı Creek Pkwy N, Suite 400, Bothell, WA 98011-8244

425.420.9200 fax 425.420.9210

Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302 509.924.9200 (ax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverlon, OR 97008-7132 503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119 907-563-9200 (ax 907.563.9210

Shell Puget Sound Refinery 8505 South Texas Road

Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
65 (B4E0548-12) Water S	Sampled: 05/18/04 12:00	Received: 0:	5/21/04 09:2	25					
Diesel Range Hydrocarbons	0.274	0.250	mg/l	1	4E25012	05/25/04	05/26/04	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	0.500	u	30%	11	n	11	316	
	83.4 %	50-150			"	"	**	"	
Surrogate: 2-FBP Surrogate: Octacosane	94.2 %	50-150			"	2 m	"	= 11	
100 (B4E0548-13) Water	Sampled: 05/18/04 12:00	Received:	05/21/04 09	:25					
Diesel Range Hydrocarbons	7.64	0.500	mg/l	2	4E25012	05/25/04	05/26/04	NWTPH-Dx	
Lube Oil Range Hydrocarbon	ıs 1.06	0.500	11	1	u	an.	05/26/04	"	
Surrogate: 2-FBP	101 %	50-150			"	"	"	"	
Surrogate: Octacosane	89.9 %	50-150			"	u	H	n	
BLANK (B4E0548-14) Wa	ater Sampled: 05/18/04	12:00 Recei	ived: 05/21/	04 09:25					
Diesel Range Hydrocarbons	ND	0.250	mg/l	1	4E25012	05/25/04	05/26/04	NWTPH-Dx	
Lube Oil Range Hydrocarbons	ND	0.500	II	"	11	u u	11/2	"	
Surrogate: 2-FBP	75.2 %	50-150			"	"	"	9.77	
Surrogate: Octacosane	90.9 %	50-150			"	"	n	"	

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.ı Creek Pkwy N, Suite 400, Bothell, WA 98011-8244

425.420.9200 fax 425.420.9210

Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302 509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503,906,9200 fax 503,906,9210

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

907 563 9200 fax 907 563 9210

Shell Puget Sound Refinery 8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Total Metals by EPA 6000/7000 Series Methods North Creek Analytical - Bothell

92 (B4E0548-01) Water Sampled: 05/18/04 12:00 Received: 05/21/04 09:25 Silver ND 0.00100 mg/l 1 4E25025 05/25/04 05/26/04 EPA 6020 Arsenic 0.00783 0.00100 " <t< th=""><th></th></t<>	
Silver ND 0.00100 mg/l 1 4E25025 05/25/04 05/26/04 EFA 6020 Arsenic 0.00783 0.00100 "	
Arsenic 0.00783 0.00100 "	
Barium 0.0207 0.0100 "	
Beryllium ND 0.00100 "	
Cadmium ND 0.00100 "	
Cobalt ND 0.00100 " <	
Chromium Copper ND 0.00100 ND 0.00100 ND 0.00100 ND 0.000200 ND 0.000200 ND 0.00524 0.00100 ND 0.00100 ND	
Copper ND 0.00100 " " 4E24045 05/24/04 06/01/04 EPA 7470A Mercury ND 0.000200 " " 4E24045 05/24/04 06/01/04 EPA 6020 Nickel 0.00524 0.00100 " " 4E25025 05/25/04 05/26/04 EPA 6020 Lead ND 0.00100 "	
Mercury ND 0.000200 " 4E24045 05/24/04 06/01/04 EPA /4/0A Nickel 0.00524 0.00100 " 4E25025 05/25/04 05/26/04 EPA 6020 Lead ND 0.00100 "	
Nickel 0.00524 0.00100 " 4E25025 05/25/04 05/26/04 EPA 6020 Lead ND 0.00100 "	
Lead ND 0.00100 " <th< td=""><td></td></th<>	
Antimony ND 0.00300 " " " " " " " " " " " " " " " " "	
Selenium 0.00144 0.00100 "	
Vanadium 0.00271 0.00100 " " " " " " " " " " " " " " " " "	
91 (B4E0548-02) Water Sampled: 05/18/04 12:00 Received: 05/21/04 09:25	
0.00100 # 1 4P25025 05/25/04 05/26/04 EPA 6020	
Silver	
Arsente and a color and a colo	
Bartum	
Defymant a control with the second of the se	
Caumun	
Cobait	
Chroman	
Copper " 4E24045 05/24/04 06/01/04 EPA 7470A	
Mercury 1,000,000 1, 1, 4E55025 05/25/04 05/26/04 EPA 6020	
Nickel 0.00076 O.00100	
Lead III II I	
Antimony	
Selection 0.00100 " " " " " " " "	
Vanadium 0.00969 0.00100 " " "	

North Creek Analytical - Bothell

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Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210 Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

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Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

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Shell Puget Sound Refinery 8505 South Texas Road

Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Total Metals by EPA 6000/7000 Series Methods North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Note
93 (B4E0548-03) Water	Sampled: 05/18/04 12:00	Received: 05/	21/04 09:25						
Silver	ND	0.00100	mg/l	1	4E25025	05/25/04	05/26/04	EPA 6020	
Arsenic	0.0307	0.00100	11.	11	31	!!	40%	30	
Barium	ND	0.0100	11	u	3113	11	30	S(1)	
Beryllium	ND	0.00100	: W	u	, m	ii.	30	u	
Cadmium	ND	0.00100	Ü	311	II	11	n	n.	
Cobalt	ND	0.00100	Ü		all	11	11	"	
Chromium	ND	0.00100	11	11	ü	11.	:11	ï	
Copper	ND	0.00100	U	au .	11	**	ñ	30.0	
Mercury	ND	0.000200	u	ï	4E24045	05/24/04	06/01/04	EPA 7470A	
Nickel	0.00220	0.00100	10	ñ	4E25025	05/25/04	05/26/04	EPA 6020	
Lead	ND	0.00100	n	"	303	ü	11	25 98 3	
	ND	0.00300	, ii	"	10	n	11	11	
Antimony	ND	0.00100	u	11.	11	11	W.	w	
Selenium	ND	0.00100	u	U	30	11	п	ü	8
Vanadium			- 10 4 00 01	_					
60 (B4E0548-04) Water					1705005	05/05/04	05/26/04	EPA 6020	
Silver	ND	0.00100	mg/l	1	4E25025	05/25/04	03/26/04	EI A 0020	
Arsenic	0.00960	0.00100	n	"	¥ 11	o o	05/27/04	11	
Barium	0.540	0.0200	"	2		n		"	
Beryllium	ND	0.00100	n	1		11	05/26/04	11	
Cadmium	ND	0.00100	30.5	u	11	# #	n	11	
Cobalt	ND	0.00100		"	11	n n		u	
Chromium	0.00249	0.00100	11	11	10		10	ū	
Copper	0.00142	0.00100	111	11	и	n.			
Mercury	ND	0.000200	u	306	4E24045	W 5	06/01/04	EPA 7470A	
Nickel	0.00385	0.00100	Ü	iii)	4E25025		05/26/04	EPA 6020	
Lead	ND	0.00100	11	31	11	**	311	т.	
Antimony	ND	0.00300	n	"	11	"	u	11	
		0.00100	**	11	33	200	II.	10	
Selenium	0.00482	0.00100			ŭ	. 0	10	, II	

North Creek Analytical - Bothell

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509.924.9200 fax 509.924.9290 Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210 Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588

Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

907.563.9200 fax 907.563.9210

Shell Puget Sound Refinery 8505 South Texas Road

Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616
Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Total Metals by EPA 6000/7000 Series Methods

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
61 (B4E0548-05) Water	Sampled: 05/18/04 12:00	Received: 05	/21/04 09:2	25					
Silver	ND	0.00100	mg/l	1	4E25025	05/25/04	05/26/04	EPA 6020	
Arsenic	0.00568	0.00100	n		0	911	Ü	II	
Barium	0.0342	0.0100	.11	11	ά	**	U.	и	
Beryllium	ND	0.00100	n	® u	u	n	1)	u.	
Cadmium	0.00140	0.00100	11	ij	11	an.	31	'n	
Cobalt	ND	0.00100	311.0	ã	Ü	u	U	303	
Chromium	ND	0.00100	11	0	"	11	11	n	
Copper	0.00234	0.00100	n.	11	n .	"	H	TI.	
Mercury	ND	0.000200		²⁰ II	4E24045	05/24/04	06/01/04	EPA 7470A	
Nickel	0.00900	0.00100	u	. 11	4E25025	05/25/04	05/26/04	EPA 6020	
Lead	ND	0.00100	211.				u	. 0.	
Antimony	ND	0.00300	711	n	300	11	"	TI .	
Selenium	0.00194	0.00100	n	11	**	**	7.00	TH.	
Vanadium	0.00396	0.00100	"	n	11	w	u	u	
94 (B4E0548-06) Water	Sampled: 05/18/04 12:00	Received: 05	5/21/04 09:	25					
Silver	ND	0.00100	mg/l	1	4E25025	05/25/04	05/26/04	EPA 6020	
Arsenic	0.00268	0.00100	"	ા	ü	u	U	9	
Barium	0.0438	0.0100	ji .	11	u	11.	ñ	D	
Beryllium	ND	0.00100	31	u	ň	11	W.	30%	
Cadmium	ND	0.00100	10	"	**	ū	11	U	
Cobalt	0.00227	0.00100	"	11	n	"	m	n	
Chromium	ND	0.00100	300	n	"	11	U	ATTE	
Copper	ND	0.00100		11	10:	N.	11	III.	
Mercury	ND	0.000200	11	w	4E24045	05/24/04	06/01/04	EPA 7470A	
Nickel	0.0143	0.00100	u	n	4E25025	05/25/04	05/26/04	EPA 6020	
Lead	ND	0.00100	11	11	ш	.11	ü	ĬĬ.	
LCau	ND	0.00300	, u	w	11	**	9.	11	
Antimony									
Antimony Selenium	ND ND	0.00100	"	:#1	:	u	11	Ö	

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503.906.9200 fax 503.906.9210

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588

2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119 Anchorage

907 563 9200 fax 907 563 9210

Shell Puget Sound Refinery 8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Total Metals by EPA 6000/7000 Series Methods North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
98 (B4E0548-07) Water	Sampled: 05/18/04 12:00	Received: 05	/21/04 09:25			50 Water 50		TD 1 6000	
Silver	ND	0.00100	mg/l	1	4E25025	05/25/04	05/26/04	EPA 6020	
Arsenic	0.00142	0.00100	n	u	Ŭ	11	" "	0	
Barium	0.0282	0.0100	Ü	aŭ.	"	u	n n	u°	
Beryllium	ND	0.00100	11	ŭ	"	u -	11	11	
Cadmium	0.00152	0.00100	u	ii.	10	n	11	n	
Cobalt	ND	0.00100	JI.	ņ	300	ti	11	11	
Chromium	0.00101	0.00100	310 5	n	310	11	W.	11	
Copper	0.00230	0.00100	31	11	0	11			
Mercury	ND	0.000200	W.	"	4E24045	05/24/04	06/01/04	EPA 7470A	
Nickel	0.00717	0.00100	200	11	4E25025	05/25/04	05/26/04	EPA 6020	
Lead	ND	0.00100	Ü	CH .	**	u	0		
Antimony	ND	0.00300	n	u	31		"	"	
Selenium	0.00186	0.00100	ji	n	n	"		11	
Vanadium	0.00596	0.00100	Ü	"	are	"	11	1115	
95 (B4E0548-08) Water	Sampled: 05/18/04 12:00	Received: 0	5/21/04 09:2	5				/ / / / / /	
Silver	ND	0.00100	mg/l	1	4E25025	05/25/04	05/26/04	EPA 6020	
Arsenic	0.00522	0.00100	n	11	ч	"		n	
Barium	0.0272	0.0100	11		II.	ж	3115	ш	
Beryllium	ND	0.00100	11	ar.	11	U	u	"	
Cadmium	ND	0.00100	11		ü	311	ü	!! **	
Cobalt	0.00306	0.00100	ä	n	Ü	11	"	U	
Chromium	ND	0.00100	ñ	n	11	11	n	w	
Copper	0.00161	0.00100	Ü	Ü	u	11	11	11	
Mercury	ND	0.000200	n	11	4E24045	05/24/04		EPA 7470A	
Nickel	0.0181	0.00100	n	ü	4E25025	05/25/04		EPA 6020	
Lead	ND	0.00100	110	31		0	TI.	11	
Antimony	ND	0.00300	u	H.	11	11	u	. 11	
Selenium	ND	0.00100	u	11	"	2110	u	ű	
Vanadium	0.00318	0.00100	n	11	ű	111	п	ü	

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Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302 509.924.9200 (ax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210 Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119 907,563,9200 (ax 907,563,9210

Shell Puget Sound Refinery 8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Total Metals by EPA 6000/7000 Series Methods North Creek Analytical - Bothell

Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sampled: 05/18/04 12:00	Received: 05	/21/04 09:25						
ND	0.00100	mg/l	1					
0.0181	0.00100	u .	ū	11				
0.0299	0.0100	n	W	U				
ND	0.00100	N	11	11				
ND	0.00100	n	ñ	ñ.				
0.0143	0.00100	11	10	10				
ND	0.00100	10	MC.	11				
ND	0.00100	n	W	,11				
ND	0.000200	3 1 C	11	4E24045	05/24/04			
0.0118	0.00100	30	и	4E25025	05/25/04			
ND	0.00100	11		10				
ND	0.00300	an:	8115	10				
ND	0.00100	**	u	, ii	11			
ND	0.00100	Ü	10	ø	III	0.00	н	
Sampled: 05/18/04 12:00	Received: 05	5/21/04 09:25	i					
ND	0.00100	mg/l	1	4E25025	05/25/04	05/26/04		
0.00131	0.00100	"	ñ	Ü	11	U		
0.0230	0.0100	n	"	313	ï	11		
ND	0.00100	11	III	"	ñ	uus	u	
ND	0.00100	10	31.	w	11	**	11	
ND	0.00100	11	11	n	111.0	**		
						1994	11	
0.00101	0.00100	11	п	**	п	n		
0.00101 0.00100	0.00100 0.00100	11	"	n	11	11	и	
							" EPA 7470A	
0.00100	0.00100	311	**	u	W.	" 06/01/04 05/26/04	EPA 7470A EPA 6020	
0.00100 ND	0.00100 0.000200	11 11	11	" 4E24045	" 05/24/04	" 06/01/04	" EPA 7470A EPA 6020	
0.00100 ND 0.00386	0.00100 0.000200 0.00100	11 11	11 11	" 4E24045 4E25025	" 05/24/04 05/25/04	" 06/01/04 05/26/04	" EPA 7470A EPA 6020 "	
0.00100 ND 0.00386 ND	0.00100 0.000200 0.00100 0.00100	11 11 11	11 11	" 4E24045 4E25025	" 05/24/04 05/25/04	06/01/04 05/26/04	" EPA 7470A EPA 6020	
	Sampled: 05/18/04 12:00 ND 0.0181 0.0299 ND ND 0.0143 ND	Result Limit Sampled: 05/18/04 12:00 Received: 05/18/05/18/05/18/05 ND 0.00100 0.0181 0.00100 ND 0.00100 0.00131 0.00100 ND 0.00100 ND 0.00100 0.0230 0.0100 ND 0.00100	Result Limit Units Sampled: 05/18/04 12:00 Received: 05/21/04 09:25 ND 0.00100 mg/l 0.0181 0.00100 " ND 0.00100 " Sampled: 05/18/04 12:00 Received: 05/21/04 09:25 ND 0.00100 " 0.0230 0.0100 " ND 0.00100 " <td>Sampled: 05/18/04 12:00 Received: 05/21/04 09:25 ND 0.00100 mg/l 1 0.0181 0.00100 " " ND 0.00100 " " Sampled: 05/18/04 12:00 Received: 05/21/04 09:25 * ND 0.00100 " " 0.0230 0.0100 "</td> <td>Result Limit Units Dilution Batch Sampled: 05/18/04 12:00 Received: 05/21/04 09:25 Secondary Secondary</td> <td>Sampled: 05/18/04 12:00 Received: 05/21/04 09:25 ND 0.00100 mg/l 1 4E25025 05/25/04 0.0181 0.00100 " " " " " ND 0.0299 0.0100 " " " " " ND 0.00100 "</td> <td>Result Limit Units Dilution Batch Prepared Analyzed Sampled: 05/18/04 12:00 Received: 05/21/04 09:25 ND 0.00100 mg/l 1 4E25025 05/25/04 05/26/04 0.0181 0.00100 " <td< td=""><td> Result</td></td<></td>	Sampled: 05/18/04 12:00 Received: 05/21/04 09:25 ND 0.00100 mg/l 1 0.0181 0.00100 " " ND 0.00100 " " Sampled: 05/18/04 12:00 Received: 05/21/04 09:25 * ND 0.00100 " " 0.0230 0.0100 "	Result Limit Units Dilution Batch Sampled: 05/18/04 12:00 Received: 05/21/04 09:25 Secondary Secondary	Sampled: 05/18/04 12:00 Received: 05/21/04 09:25 ND 0.00100 mg/l 1 4E25025 05/25/04 0.0181 0.00100 " " " " " ND 0.0299 0.0100 " " " " " ND 0.00100 "	Result Limit Units Dilution Batch Prepared Analyzed Sampled: 05/18/04 12:00 Received: 05/21/04 09:25 ND 0.00100 mg/l 1 4E25025 05/25/04 05/26/04 0.0181 0.00100 " <td< td=""><td> Result</td></td<>	Result

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Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541,383.9310 fax 541,382.7588 Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119 907,563,9200 fax 907,563,9210

Shell Puget Sound Refinery 8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Total Metals by EPA 6000/7000 Series Methods North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
63 (B4E0548-11) Water	Sampled: 05/18/04 12:00	Received: 05.	/21/04 09:25					TD 1 6000	
Silver	ND	0.00100	mg/l	1	4E25025	05/25/04	05/26/04	EPA 6020	
Arsenic	0.00321	0.00100	11	*11	11	ĨĬ	30)		
Barium	0.0445	0.0100	II.	W.	M.	11 0%	n .		
Beryllium	ND	0.00100	111	n	W	n	8117		
Cadmium	ND	0.00100	W	"	\3 11	11	11	n .	
Cobalt	ND	0.00100	n	**	п	ж	II	u	
Chromium	ND	0.00100	11	n	ű	u	n	u	
Copper	ND	0.00100	ũ	11	"	11	n .		
Mercury	ND	0.000200	11	**	4E24045	05/24/04	06/01/04	EPA 7470A	
Nickel	0.00280	0.00100	"	Œ	4E25025	05/25/04	05/26/04	EPA 6020	
Lead	ND	0.00100	11	u	u	"	Ü	11	
Antimony	ND	0.00300	au:	n	n	11	n ·	u	
Selenium	ND	0.00100	n	11	ii.	n	11	THE	
Vanadium	ND	0.00100	**	u	"	3172	n	u	
		Danis, adv. O	E /21/04 00+24						
Account of the control of the contro	Sampled: 05/18/04 12:00	Received: 0	3/21/04 07.2.	1	4E25025	05/25/04	05/26/04	EPA 6020	
Silver	ND	0.00100	mg/l	"	4EZ30Z3	11	11	"	
Arsenic	0.00618	0.00100		-11	ï	11	n	п	
Barium	0.0338	0.0100		**	"	1311	ij.	D	
Beryllium	ŃD	0.00100	"		11	11	п	"	
Cadmium	ND	0.00100	"	,,	au:	"	ïi	MC:	
Cobalt	ND	0.00100	0			"	11	11	
Chromium	ND	0.00100	11	"	"	 U	"	u	
Copper	ND	0.00100	11	10			06/01/04	EPA 7470A	
Mercury	ND	0.000200	.u.	u	4E24045			EPA 6020	
Nickel	0.00457	0.00100	11	10	4E25025	05/25/04	05/26/04	EPA 6020	
Lead	ND	0.00100	ii.	111			11	u	
Antimony	ND	0.00300	11	. "	ារី			n n	
Selenium	0.00482	0.00100	3.00	.00	11	"	:HI	"	
Vanadium	0.00818	0.00100	***	2100	"	All.	W		

North Creek Analytical - Bothell

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Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302 509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

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Shell Puget Sound Refinery 8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Total Metals by EPA 6000/7000 Series Methods North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
100 (B4E0548-13) Water	Sampled: 05/18/04 12:00	Received: ()5/21/04 09	:25					
Silver	ND	0.00100	mg/l	1	4E25025	05/25/04	05/26/04	EPA 6020	
Arsenic	0.00915	0.00100	Ü	W	W	TI.	300	u.	
Barium	0.513	0.0200	"	2	u	n	05/27/04	"	
Beryllium	ND	0.00100	22	1	u	n	05/26/04	<u>n</u>	
Cadmium	ND	0.00100	ij	11	<u>0</u>	u.	711	"	
Cobalt	ND	0.00100	11	n .	u	11	u	22	
Chromium	0.00240	0.00100	9	ñ	11		11	n.	
Copper	0.00180	0.00100	11	n	Ü	-ii	ű	1100	
Mercury	ND	0.000200	107	.11	4E24045	05/24/04	06/01/04	EPA 7470A	
Nickel	0.00406	0.00100	***	"	4E25025	05/25/04	05/26/04	EPA 6020	
Lead	ND	0.00100	ii.	n	11		***	311 7	
Antimony	ND	0.00300	11.	n	31%	ñ	u	10	
Selenium	0.00482	0.00100	ji	10	11.		11	**	
Vanadium	ND	0.00100	ore:	11	11		W	U	
BLANK (B4E0548-14) W	ater Sampled: 05/18/04 1	2:00 Recei	ved: 05/21/	04 09:25					
Silver	ND	0.00100	mg/l	1	4E25025	05/25/04	05/26/04	EPA 6020	
Arsenic	ND	0.00100	u	30	Ħ	**	11	11	
Barium	ND	0.0100	11	**	.0	AU.	500	II.	
Beryllium	ND	0.00100	ű	u	11	**	n	ï.	
Cadmium	ND	0.00100	11	.11	II.	u	П	Ü	
Cobalt	ND	0.00100	ü	u	11	**	ाम	ñ	
Chromium	ND	0.00100	11	n	ñ	u	u	"	
Copper	0.00105	0.00100	n	n	"	:11	**	11	
Mercury	ND	0.000200		ű	4E24045	05/24/04	06/01/04	EPA 7470A	
Nickel	ND	0.00100	112	11	4E25025	05/25/04	05/26/04	EPA 6020	
Lead	ND	0.00100	u	ū	11			11	
Antimony	ND	0.00300	n	11	11	n	11	:10.5	
Selenium	ND	0.00100	и	"	n	ıı	u	**	
Vanadium	ND	0.00100	n		и	n	31%	u	

North Creek Analytical - Bothell

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425,420.9200 fax 425.420.9210

Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302 509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

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Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

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Shell Puget Sound Refinery 8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Volatile Organic Compounds (Modified Skinner List) by EPA Method 8260B North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
92 (B4E0548-01) Water S	Sampled: 05/18/04 12:00	Received: 05	5/21/04 09:	25					
1,2-Dichloroethane	53.4	2.00	ug/l	2	4E27042	05/27/04	05/27/04	EPA 8260B	
Surrogate: 1,2-DCA-d4	95.0 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	100 %	70-130			***	11	"	,,,	
Surrogate: 4-BFB	101 %	70-130			"	11	"	u	
92 (B4E0548-01RE1) Wate	er Sampled: 05/18/04 12	2:00 Receive	ed: 05/21/0	4 09:25					
Acetone	ND	25.0	ug/l	1	4E28033	05/28/04	05/28/04	EPA 8260B	
Benzene	ND	1.00	11	н	и	300	M	W 	
2-Butanone	ND	10.0	"	u	11		(/)	'n	
n-Butylbenzene	ND	1.00	<u>u</u>	30	11	.11	"	11	
Carbon disulfide	ND	1.00	"	ū	9	11	u	10	
Chlorobenzene	ND	1.00	11	ii	11	11	0	ne	
Chloroform	ND	1.00	. "	ij	, H	u	**	11.	
1,2-Dibromoethane	ND	1.00	11	ïi	u	u	11	(10)	
1,2-Dichloroethane	50.3	1.00	u	110	11	tt	. "	H.	F
Ethylbenzene	ND	1.00	n	**	W	ш	II .	u	
p-Isopropyltoluene	ND	1.00	310	11	"	"	31	u	
n-Propylbenzene	ND	1.00	n	311	H	u	11	11	
Styrene	ND	1.00	n		ш	an o	М	ű	
Toluene	ND	1.00	ા	11	n	11	11	11	
1,1,1-Trichloroethane	ND	1.00	11	11	≥n.	W	11	<u>n</u>	
Trichloroethene	ND	1.00	ű is	ш	ü	11	710	ž.,	
1,2,4-Trimethylbenzene	ND	1.00	"	п	11	**	11	0.5	
1,3,5-Trimethylbenzene	ND	1.00	īī.	Ü	ä	0.00	Ü	н	
o-Xylene	ND	1.00	Ü	II	"	'n	"	u	
m,p-Xylene	ND	2.00	n	"	"	N .	"	п	
Surrogate: 1,2-DCA-d4	84.5 %	70-130			"	ii	"	n	
Surrogate: Toluene-d8	97.5 %	70-130			n	n.	"	n	
Surrogate: 4-BFB	100 %	70-130			11	"	11	"	

North Creek Analytical - Bothell

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Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302
509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 (ax 503.906.9210

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588 Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119 907 563 9200 (ax 907.563.9210

Shell Puget Sound Refinery

Project: SWMU 11 Sampling

8505 South Texas Road Anacortes, WA 98221

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Volatile Organic Compounds (Modified Skinner List) by EPA Method 8260B North Creek Analytical - Bothell

			one rancorj c						
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
91 (B4E0548-02) Water	Sampled: 05/18/04 12:00	Received: 05	/21/04 09:25						
Acetone	ND	25.0	ug/l	1	4E26016	05/26/04	05/26/04	EPA 8260B	
Benzene	ND	1.00	.00	11	n	n	Ų		
2-Butanone	ND	10.0	iii	"	.11	ii	'n	11	
n-Butylbenzene	ND	1.00	n	111	W	ñ	3110	u	
Carbon disulfide	ND	1.00	11	910	10	n	10.	10	
Chlorobenzene	ND	1.00	ü	11.	11.	311/2		11	
Chloroform	ND	1.00	**	u	II	.11	111	u	
1,2-Dibromoethane	ND	1.00	Ü	m	7.31		11		
1,2-Dichloroethane	ND	1.00	Ü	11	11	ans.	u	n	
Ethylbenzene	ND	1.00	n	u	ij	11	u		
p-Isopropyltoluene	ND	1.00	11	u	"	u	Ü	u.	
n-Propylbenzene	ND	1.00		ũ	9	ii.	u	u	
Styrene	ND	1.00	n	"	11	n	21	310	
Toluene	ND	1.00	.11	ñ	11	11	11	**	
1.1.1-Trichloroethane	16.9	1.00	ж	n	u	ñ	***	n .	
Trichloroethene	ND	1.00	11	u	11	n.	11	800	
1,2,4-Trimethylbenzene	ND	1.00	"	n	n	#	n	n	
1,3,5-Trimethylbenzene	ND	1.00	u	11	w	W		ü	
o-Xylene	ND	1.00	"		т	п	n	ü	
m,p-Xylene	ND	2.00	Ħ	.01	11	"	ш	n	
	89.0 %	70-130			n	"	"	"	
Surrogate: 1,2-DCA-d4	100 %				"	"	<u>"</u>	n	
Surrogate: Toluene-d8	99.0 %				11	<i>n</i>	"	,,,	
Surrogate: 4-BFB									
93 (B4E0548-03) Water			5/21/04 09:2		75 C.		05/07/04	EPA 8260B	
Acetone	ND	25.0	ug/l	1	4E26016	05/26/04	05/26/04	EPA 8200B	
Benzene	ND	1.00	(9)	11	n		11	u	
2-Butanone	ND	10.0	n	W	11	at:	u u	ii	
n-Butylbenzene	ND	1.00	211	11		"		"	
Carbon disulfide	ND	1.00	Ű		.11	11	11	7	
Chlorobenzene	ND	1.00	n	in.	11	311			
Chloroform	ND	1.00	"	n	u	u	11	100	
1,2-Dibromoethane	ND	1.00	Ü	11	u	11	u		
1,2-Dichloroethane	ND	1.00	ñ.	111	<u>u</u>	11		n	
Ethylbenzene	ND	1.00	***	II.	11	ũ	Ð		
77: YALE 4 : 3 (7): 7: 75 (7) (1:4) (1:4)									

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Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302 509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906,9210 Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119 907.563.9200 [ax 907.563.9210 Anchorage

Shell Puget Sound Refinery 8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Volatile Organic Compounds (Modified Skinner List) by EPA Method 8260B North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
93 (B4E0548-03) Water	Sampled: 05/18/04 12:00	Received: 05/	21/04 09:25						
p-Isopropyltoluene	ND	1.00	ug/l	1	4E26016	05/26/04	05/26/04	0	
n-Propylbenzene	ND	1.00	Ü	ij	n.	n	ij	D -	
Styrene	ND	1.00	36	n	u		11	н	
Toluene	ND	1.00	<u> </u>	11	TI .	11	11	et :	
1,1,1-Trichloroethane	ND	1.00	11	11	11	"	II.	u	
Trichloroethene	ND	1.00	ıı	n.	11	Ü	311	.00	
1,2,4-Trimethylbenzene	ND	1.00	W.	n	7110	Ü		*HF	
1,3,5-Trimethylbenzene	ND	1.00	3.00	11	XI.	11	n	all.	
o-Xylene	ND	1.00	n	11	n	n	Ħ	ü	
m,p-Xylene	ND	2.00	11	***	311	"	11	<u> </u>	
	90.0 %	70-130			u u	п	n	11	
Surrogate: 1,2-DCA-d4	98.5 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	101 %	70-130			"	ü	11	'n	
Surrogate: 4-BFB			101/01/00/0	=					
60 (B4E0548-04) Water			7.5		4E28033	05/28/04	05/28/04	EPA 8260B	
Acetone	ND	25.0	ug/l	1	4E28033	03/28/04	11	11	
Benzene	39.2	1.00	II.	0	an .	**	"	euc	
2-Butanone	ND	10.0	n	,,		310	11	W	
n-Butylbenzene	ND	1.00	ď		11	N.	au .	ij	
Carbon disulfide	ND	1.00	11			ŭ	ii	n	
Chlorobenzene	ND	1.00	11	11		э.	"	n	
Chloroform	ND	1.00	11	u	"	11	11	и	
1,2-Dibromoethane	ND	1.00		- n		.11	11	u	
1,2-Dichloroethane	ND	1.00	U	n n	11		10		
Ethylbenzene	ND	1.00	311	11	Ü	ü	TI.	an .	
p-Isopropyltoluene	ND	1.00	11	30	311%	n		111	
n-Propylbenzene	ND	1.00	31	0	"			"	
Styrene	ND	1.00	M	11	31	10	11		
Toluene	ND	1.00	100	11	111	"	11		
1,1,1-Trichloroethane	ND	1.00	- 11	.11	и	11	811	11	
Trichloroethene	ND	1.00	ű.	EUC.	, w	11	"	,,	
1,2,4-Trimethylbenzene	ND	1.00	ii	in.	ñ	л	u		
1,3,5-Trimethylbenzene	ND	1.00	н	n	11	п	11	"	
o-Xylene	ND	1.00	100	ij.	**	ű	"		
m,p-Xylene	ND	2.00	11	"	11	11	"		

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Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588

Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

907.563.9200 fax 907.563.9210

Shell Puget Sound Refinery 8505 South Texas Road Anacortes, WA 98221 Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes Reported: 06/07/04 16:03

Volatile Organic Compounds (Modified Skinner List) by EPA Method 8260B North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
60 (B4E0548-04) Water	Sampled: 05/18/04 12:00	Received: 05	/21/04 09:25						
Surrogate: 1,2-DCA-d4	86.5 %	70-130			4E28033	05/28/04	05/28/04	"	
Surrogate: Toluene-d8	100 %	70-130			"	"	"	n n	
Surrogate: 4-BFB	98.0 %	70-130			n	"	"	3550	
61 (B4E0548-05) Water	Sampled: 05/18/04 12:00	Received: 05	/21/04 09:25	i					
Acetone	ND	25.0	ug/l	1	4E28033	05/28/04	05/28/04	EPA 8260B	
Benzene	18.5	1.00	Ĩ	**	u	ME.	11	n	
2-Butanone	ND	10.0	ñ	u	"	u	TAY.	11	
n-Butylbenzene	ND	1.00	n	п	11	n	n	11	
Carbon disulfide	ND	1.00	11	**	"	iı	Ü	U	
Chlorobenzene	ND	1.00		и.	ij os	11	"	n:	
Chloroform	ND	1.00		e #	7 m	9	, ju	n	2
1,2-Dibromoethane	ND	1.00	- n	0	n'	U	10:	м,	
1,2-Dichloroethane	ND	1.00	n	**	n	n	10"	311	
Ethylbenzene	ND	1.00	ш	. 11	u	31	n	- "W	
p-Isopropyltoluene	ND	1.00	u	n	u	"	**	n	
n-Propylbenzene	ND	1.00	ij	n	æ	30	Ж	н	
Styrene	ND	1.00	ii	.11	11	210	u	u	
Toluene	ND	1.00	,,	346	11	D	ii.	ii	
1,1,1-Trichloroethane	ND	1.00	n	U	"	¥.	tt	21	
Trichloroethene	ND	1.00	31%	Ü	n	11	11	n	
1,2,4-Trimethylbenzene	ND	1.00	11	**	n	Ü	Ü	11	
1,3,5-Trimethylbenzene	ND	1.00		u	10	u	Ü	30	
	ND	1.00	:10	ü	Ú	, 11	913	u	
o-Xylene m,p-Xylene	ND	2.00	u	n	310	n	n	äll.	
Surrogate: 1,2-DCA-d4	85.5 %	70-130			"	"	"	"	
Surrogate: 1,2-DCA-04 Surrogate: Toluene-d8	97.0 %				,"	n	, ii	"	
Surrogate: 10tuene-as Surrogate: 4-BFB	100 %				u	- п	"	"	

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Jeanne Garthwaite, Project Manager



i Creek Pkwy N, Suite 400, Bothell, WA 98011-8244 Seattle 1172

425.420.9200 fax 425.420.9210

Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302 509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverlon, OR 97008-7132

503.906.9200 fax 503.906,9210

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119 907.563.9200 (ax 907.563.9210

Shell Puget Sound Refinery 8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Volatile Organic Compounds (Modified Skinner List) by EPA Method 8260B North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
94 (B4E0548-06) Water	Sampled: 05/18/04 12:00	Received: 05	/21/04 09:25			The state of the s		TD 1 00 (0D	
Acetone	ND	25.0	ug/l	1	4E26016	05/26/04	05/26/04	EPA 8260B	
Benzene	ND	1.00	u	11	11	10.	n		
2-Butanone	ND	10.0	u	u	u	315	3115		
n-Butylbenzene	ND	1.00	ij	n	11	11	11	"	
Carbon disulfide	ND	1.00	11	**	u.	22412	ű 	"	
Chlorobenzene	ND	1.00	70	11	11	/11	n 20	11	
Chloroform	ND	1.00	u	W	"	n	"		
1,2-Dibromoethane	ND	1.00	an's	ii i		11	11	11	
1,2-Dichloroethane	ND	1.00	n	311	11	"	"	и	
Ethylbenzene	ND	1.00	11	30.		,11		"	
p-Isopropyltoluene	ND	1.00		ш	11	n	918	11	
n-Propylbenzene	ND	1.00	.00	TO TO	100	11		u u	
Styrene	ND	1.00	11	n	11	111	"	,,	
Toluene	ND	1.00	m .	11	11	.00			
1,1,1-Trichloroethane	ND	1.00	ĬĬ.	11	11	11	0	"	
Trichloroethene	ND	1.00	II	ü	"	11		n	
1,2,4-Trimethylbenzene	ND	1.00	n	11	n	u	n n	0	
1,3,5-Trimethylbenzene	ND	1.00	11	n	<u>an</u> c	ii		11	
o-Xylene	ND	1.00	116	"	11	ű	u u		
m,p-Xylene	ND	2.00	N	ж		"			
Surrogate: 1,2-DCA-d4	93.5 %	70-130			"	***	"		
Surrogate: Toluene-d8	98.5 %	70-130			"	"		"	
Surrogate: 4-BFB	99.0 %	70-130			"	11	n	"	
98 (B4E0548-07) Water	Sampled: 05/18/04 12:00	Received: (5/21/04 09:2	25					
Acetone	ND	25.0	ug/l	1	4E26016			EPA 8260B	
Benzene	ND	1.00	ű	o Ü	Ħ	700	Ü	u	
2-Butanone	ND	10.0	u	u	Ü	n	ï	"	
n-Butylbenzene	ND	1.00	n	n	ж:	n	n	II.	
Carbon disulfide	ND	1.00	n	n	11	11	311%	u	
Chlorobenzene	ND	1.00		110	n	III	11.	. 11	
Chloroform	ND	1.00	u	n	.11.	, U.O	u	, u	
1,2-Dibromoethane	ND	1.00	THE STATE OF THE S	u	"	D.	- 10	M	
1,2-Dichloroethane	ND	1.00	11	10	ı.	11	n	· H	
Ethylbenzene	ND	1.00	n	11	ũ	1117	11	ű	
Larytoonzone									

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Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302 509,924,9200 fax 509,924,9290

Portland 9405 SW Nimbus Avenue, Beaverlon, OR 97008-7132 503.906.9200 fax 503.906.9210

503.900.9200 fax 503.900.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588

Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

907.563.9200 fax 907.563.9210

Shell Puget Sound Refinery 8505 South Texas Road Anacortes, WA 98221 Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes **Reported:** 06/07/04 16:03

Volatile Organic Compounds (Modified Skinner List) by EPA Method 8260B North Creek Analytical - Bothell

		Reporting	Jak I Hallerly C.	2000					
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
98 (B4E0548-07) Water	Sampled: 05/18/04 12:00	Received: 05/	/21/04 09:25						
p-Isopropyltoluene	ND	1.00	ug/l	1	4E26016	05/26/04	05/26/04		
n-Propylbenzene	ND	1.00	30	W.	-11	u	atte.		
Styrene	ND	1.00	11	311	u	11	310	:10	
Toluene	ND	1.00	#	in.	ñ	310	tt	10	
1.1.1-Trichloroethane	ND	1.00	11	11	ij	T. C.	8416	Ü.	
Trichloroethene	ND	1.00	n n	ū	"	11	и	U ∞	
1,2,4-Trimethylbenzene	ND	1.00	n	"	20	11	.11	<u>n</u> sa	
1,3,5-Trimethylbenzene	ND	1.00	11	"	11	u	U		
o-Xylene	ND	1.00	11	ü	m:	Ü n	11	(C)	
m,p-Xylene	ND	2.00	300	u	11	<u>"</u>	.11	" "	
Surrogate: 1,2-DCA-d4	93.5 %	70-130			"	"	"	n	
Surrogate: Toluene-d8	100 %	70-130			"	**	"	n	
Surrogate: 4-BFB	101 %	70-130				n	"	"	
-	a 1 1 05/10/04 13:00	Received: 05	5/21/04 09:24	5					
95 (B4E0548-08) Water	Sampled: 05/18/04 12:00 ND	25.0	ug/l	1	4E26016	05/26/04	05/26/04	EPA 8260B	
Acetone	ND ND	1.00	ug/1	n	"	11	u	11	
Benzene	ND ND	10.0	"	**	u	200	Ü	n	
2-Butanone	ND	1.00	11	**		<u>u</u>	11	ñ	
n-Butylbenzene	ND	1.00	u	u	11	ñ	ij	u	
Carbon disulfide		1.00	11	n	11	11	U	u	
Chlorobenzene	ND ND	1.00	.11	31%	III	Ü	11	2113	
Chloroform	ND ND	1.00		11	10	n.	11	и	
1,2-Dibromoethane	ND ND	1.00	e m	u	n	11	.116	700	
1,2-Dichloroethane	ND ND	1.00	11	n	ű	**	n	911	
Ethylbenzene	ND ND	1.00	u	**	ų	301	n	п	
p-Isopropyltoluene	ND ND	1.00	ži II	11	ñ	n	"	ü	
n-Propylbenzene		1.00	ū	au .	11	**	u	"	
Styrene	ND	1.00	ij	Ü		и	ű	n	
Toluene	ND	1.00	0	"	N.	п	11	âte	
1,1,1-Trichloroethane	ND	1.00	u .	11	ш	ű	ii	**	
Trichloroethene	ND	1.00	11	u	**		11	u	
1,2,4-Trimethylbenzene	ND	1.00	11	п	11	11	0	200	
1,3,5-Trimethylbenzene	ND			11	.00	H:	n	U	
o-Xylene	ND	1.00 2.00	AII.	"	u	ш	11	n	
m,p-Xylene	ND ND	2.00							

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Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302 509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue Reaverton OR 97009-7432

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

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Shell Puget Sound Refinery 8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Volatile Organic Compounds (Modified Skinner List) by EPA Method 8260B North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
95 (B4E0548-08) Water	Sampled: 05/18/04 12:00	Received: 05/	21/04 09:25				New 2 78 W	"	
Surrogate: 1,2-DCA-d4	92.0 %	70-130			4E26016	05/26/04	05/26/04	,,	
Surrogate: Toluene-d8	100 %	70-130			"	"	"	,,	
Surrogate: 4-BFB	100 %	70-130			"	M.			
96 (B4E0548-09) Water	Sampled: 05/18/04 12:00	Received: 05	/21/04 09:25	;			100 200 No. 22 N	1 00 (OD	
Acetone	ND	25.0	ug/l	1	4E26016	05/26/04	05/26/04	EPA 8260B	
Benzene	ND	1.00	n	11	ü	11	200	"	
2-Butanone	ND	10.0	n	11	"	n	ű		
n-Butylbenzene	ND	1.00	n	11	11 11	11	11	"	
Carbon disulfide	ND	1.00	n	w	11	n	"	11	
Chlorobenzene	ND	1.00	11	11	W	n		**	
Chloroform	ND	1.00	***	11	11	n		11	
EST 1	ND	1.00	11	11	90		30	"	
1,2-Dibromoethane	ND	1.00	211	u	.00	ii ar	11	311	
1,2-Dichloroethane	ND	1.00	n	11	Ü	11	S10-	11	
Ethylbenzene	ND	1.00	ñ o	Ü	11	11	W	11	
p-Isopropyltoluene	ND	1,00	11%	Ü	ū	п	u	W	
n-Propylbenzene	ND	1.00	**	at:		11	п	'n	
Styrene	ND	1.00	11	11	М,	n	10	311	
Toluene	ND	1.00	**	n	W	n	W		
1,1,1-Trichloroethane	ND	1.00	11	u	311	n	u	**	
Trichloroethene	ND	1.00	×11	n	, ii	316	II	11	
1,2,4-Trimethylbenzene		1.00	**	"	ü	311.	OR OR	**	
1,3,5-Trimethylbenzene	ND	1.00	"	u	11	11	ų.	ũ	
o-Xylene	ND	2.00	11.2	ū	9	JI .	ŭ	Ü	
m,p-Xylene	ND					<i>n</i>	"	"	
Surrogate: 1,2-DCA-d4	93.5 %				,,	"	n.		
Surrogate: Toluene-d8	100 % 102 %				,,	v.	"	"	
Surrogate: 4-BFB	102 /	,,,,,,,							

North Creek Analytical - Bothell

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Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302 509.924.9200 fax 509.924.9290 Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588 Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

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Shell Puget Sound Refinery 8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Volatile Organic Compounds (Modified Skinner List) by EPA Method 8260B North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
97 (B4E0548-10) Water	Sampled: 05/18/04 12:00	Received: 05.	/21/04 09:25			(1			
Acetone	ND	25.0	ug/l	1	4E26016	05/26/04	05/26/04	EPA 8260B	
Benzene	ND	1.00	11	311	11	ij	11	.00	
2-Butanone	ND	10.0	ū	-11	ચા	Ü	n	n 	
n-Butylbenzene	ND	1.00	ii	11	II.	11	316	11	
Carbon disulfide	ND	1.00	11	×11.	11	0	u	"	
Chlorobenzene	ND	1.00	Ü	11	u.	311%	n	<u>"</u>	
Chloroform	ND	1.00	110	ū)i	11	3 11	"	
1,2-Dibromoethane	ND	1.00	**	"	31.7	30	ũ	"	
1,2-Dichloroethane	ND	1.00	u		10	13 1 E	ii	n .	
Ethylbenzene	ND	1.00	3115	u	w	11	u .	"	
p-Isopropyltoluene	ND	1.00	ii.	**	11	u	"	м	
n-Propylbenzene	ND	1.00	e 300		30	11	TE:	u .	
Styrene	ND	1.00	11	310	30	,	m.	INF	
Toluene	ND	1.00	u		11	и =	•	11	
1.1.1-Trichloroethane	ND	1.00	u u	**	W	11	M	u	
Trichloroethene	ND	1.00	tt -	T.H	u	n	30	· ii	
1,2,4-Trimethylbenzene	ND	1.00	ü	11	"	916	11	11	
1,3,5-Trimethylbenzene	ND	1.00	n .	ii	Ü	u	a	ū	
o-Xylene	ND	1.00	10	9	H	11	ii	n T	
m,p-Xylene	ND	2.00	W.	Ü	U	"	11	u u	
Surrogate: 1,2-DCA-d4	92.5 %	70-130			m .	ii.	"	\boldsymbol{n}	
Surrogate: Toluene-d8	99.5 %	70-130			"	"	"	n.	
Surrogate: 4-BFB	98.0 %	70-130			"	"	"	"	
63 (B4E0548-11) Water	Sampled: 05/18/04 12:00	Received: 0	5/21/04 09:2	5					
Acetone	ND	50.0	ug/l	2	4E28033	05/28/04	05/28/04	EPA 8260B	
Benzene	ND	2.00	n	3316	.00	11	u	ou .	
2-Butanone	ND	20.0	Ü	U	u	n	11	ų.	
n-Butylbenzene	6.10	2.00	u	Ħ	ñ	n	"	Ü	
Carbon disulfide	ND	2.00	ij	ũ	**	u	u	"	
Chlorobenzene	ND	2.00	11	Ü	ü	ji.	II	e Ü	
Chloroform	ND	2.00	ji.	,,	10	"	u u	JICE	
1,2-Dibromoethane	ND	2.00	n		in:	ાપ	"	W	
1,2-Dichloroethane	ND	2.00	"	u	**	8	и	11	
Ethylbenzene	4.58	2.00	и	:11:	11	Ü	10	311	
Zaj isomeono									

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Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588 Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

907.563.9200 fax 907.563.9210

Shell Puget Sound Refinery

Project: SWMU 11 Sampling

8505 South Texas Road Anacortes, WA 98221

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Volatile Organic Compounds (Modified Skinner List) by EPA Method 8260B North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
63 (B4E0548-11) Water	Sampled: 05/18/04 12:00	Received: 05.	/21/04 09:25	S 10					
p-Isopropyltoluene	ND	2.00	ug/l	2	4E28033	05/28/04	05/28/04	n	
n-Propylbenzene	4.28	2.00	11	n	Ü	"	n	11	
Styrene	ND	2.00	11	"	ü		11	U	
Toluene	ND	2.00	DE.	ũ	ũ	u	11	11	
1,1,1-Trichloroethane	ND	2.00	11,	301	11:	u	"	U	
Trichloroethene	ND	2.00	u	n	11	ıı		n	
1,2,4-Trimethylbenzene	63.2	2.00	in.	ı u	TT.	Ü	u	PUC.	
1,3,5-Trimethylbenzene	4.62	2.00	n	11	111	11	***	u	
o-Xylene	ND	2.00	II		11	11	210	II .	
m,p-Xylene	4.40	4.00	11	7112	n	11	.0	MU	
Surrogate: 1,2-DCA-d4	83.0 %	70-130			п	"	"	"	
Surrogate: Toluene-d8	98.5 %	70-130			<u>u</u>	· m	"	"	
Surrogate: 4-BFB	102 %	70-130			"	"	"	ır	
	0 1 1 05/10/04 13:00	Dansiyadı M	5/21/04 00:2	5					
	Sampled: 05/18/04 12:00	25.0	ug/l	1	4E27042	05/27/04	05/27/04	EPA 8260B	
Acetone	ND	1.00	ug/1	1 11	111111111111111111111111111111111111111	11	"	11	
Benzene	ND ND	10.0	11:	ñ	"	**	11	MI I	
2-Butanone		1.00	n		30%	U	.11	30	
n-Butylbenzene	ND	1.00	"	11	и	n	TE.	n	
Carbon disulfide	ND	1.00	n.		11	'n	н	आर	
Chlorobenzene	ND	1.00	u	31	11	30.2	11	u	
Chloroform	ND	1.00	"	11	in .	11	2 u	n	
1,2-Dibromoethane	ND	1.00	u	ar	11	"	11	"	
1,2-Dichloroethane	24.1	1.00	n	11	- 11	× 30°	ä	ū	
Ethylbenzene	ND	1.00	11	11	11	11	n	21	
p-Isopropyltoluene	ND		0	n	**	11	11	9	
n-Propylbenzene	ND	1.00		**	"	u	п	Ü	
Styrene	ND	1.00		11	ñ	11	n	n	
Toluene	ND	1.00	u	n	11	11		n.	856
1,1,1-Trichloroethane	ND	1.00	11	11	11	0	.11	n.	
Trichloroethene	ND	1.00		9103	n	0	11	n	
1,2,4-Trimethylbenzene	ND	1.00	11	11	11	1111	11	n.	
1,3,5-Trimethylbenzene	ND	1.00	311	"		W.	90		
o-Xylene	ND	1.00		200		11	11		
m,p-Xylene	ND	2.00	111			1000			

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Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302 509.924.9200 [ax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210 Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

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907.563.9200 fax 907.563.9210

Shell Puget Sound Refinery 8505 South Texas Road

Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Volatile Organic Compounds (Modified Skinner List) by EPA Method 8260B North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Note
65 (B4E0548-12) Water	Sampled: 05/18/04 12:00	Received: 0	5/21/04 09:2	25					
Surrogate: 1,2-DCA-d4	94.5 %	70-130			4E27042	05/27/04	05/27/04	"	
Surrogate: Toluene-d8	100 %	70-130			.11	"	ii.	n.	
Surrogate: 4-BFB	100 %	70-130			u	, n	"	n l	
100 (B4E0548-13) Water	Sampled: 05/18/04 12:00	Received:	05/21/04 09	:25				- Workeld - Marine Performance	
Acetone	ND	25.0	ug/l	1	4E28033	05/28/04	05/28/04	EPA 8260B	
Benzene	39.9	1.00	M.	ű	ü	Ü	1)	310	
2-Butanone	ND	10.0	"	ü	11	ï	11		
n-Butylbenzene	ND	1.00	u	ij.	n	ñ	M.E.	n	
Carbon disulfide	ND	1.00	7117	n	W	11	,11	8 JH:	
Chlorobenzene	ND	1.00	11	in .	11	11	**	n	
Chloroform	ND	1.00	10	10	**	H.	316	u	
1,2-Dibromoethane	ND	1.00	11	11	D	"	11	n n	
1,2-Dichloroethane	ND	1.00	0	U.	.11	11	11	Ü	
Ethylbenzene	ND	1.00	i tr	11	II.	11	11	II .	
p-Isopropyltoluene	ND	1.00	ŭ	110	20	**	tt	11	
n-Propylbenzene	ND	1.00	n	10	11	an .	u	Ü	
Styrene	ND	1.00	11	tt	ű	11	tt.	п	
Toluene	ND	1.00	u	ď	11	n	ii	n	
1,1,1-Trichloroethane	ND	1.00	11	ï	11	n	11	U	
Trichloroethene	ND	1.00	90	11	ñ	tt.	n	n,	
1,2,4-Trimethylbenzene	ND	1.00	11	ij	11	u	w	.11	
1,3,5-Trimethylbenzene	ND	1.00	Tr.	n	10	11	n	.11	
o-Xylene	ND	1.00	11	11	11	ø	W.	n,	
m,p-Xylene	ND	2.00	n	n		ar a	(11)	W.	Diese de la constant
Surrogate: 1,2-DCA-d4	84.5 %	70-130		-50.00	n	"	"	"	
Surrogate: Toluene-d8	102 %	70-130			"	n n	"	H.	
Surrogate: 4-BFB	101 %	70-130			ŭ	"	"	Ñ.:	

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Spokane 11922 E. fst Avenue, Spokane Valley, WA 99206-5302 509.924.9200 fax 509.924.9200

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588

Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

907.563.9200 fax 907.563.9210

Shell Puget Sound Refinery 8505 South Texas Road

Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Volatile Organic Compounds (Modified Skinner List) by EPA Method 8260B North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
TRIP BLANK (B4E0548-15) Water	Sampled: 05/20	/04 12:00	Received:	05/21/04 09	:25				
Acetone	ND	25.0	ug/l	1	4E27042	05/27/04	05/27/04	EPA 8260B	
Benzene	ND	1.00	ii.	11	11	n	ш	30	
2-Butanone	ND	10.0	11	W		Ħ	11	n,	
n-Butylbenzene	ND	1.00	M.	Ü	u	u	11	au	
Carbon disulfide	ND	1.00	11	11	11	n	, u	ć U .	
Chlorobenzene	ND	1.00	11	U	u	11:	11	n.	
Chloroform	ND	1.00	A10	11	n		411	u	
1,2-Dibromoethane	ND	1.00	u	u	3116	n	u	0	
1,2-Dichloroethane	ND	1.00	Ħ	***	M	"	n	Ü	
Ethylbenzene	ND	1.00	"	n	10	ıı	"	11	
p-Isopropyltoluene	ND	1.00	Ü	н	ा।	u	ij	W.	
n-Propylbenzene	ND	1.00	Ħ	.0	ä	11	п	n	
Styrene	ND	1.00	"	n.	ũ	n	"	at #	
Toluene	ND	1.00	U	"	11	u	11	y <u>u</u>	
1,1,1-Trichloroethane	ND	1.00	11	"	11	n	300	n	
Trichloroethene	ND	1.00	11	n	31.	11		п	
1,2,4-Trimethylbenzene	ND	1.00	u	11	11.	u	11	п	
1,3,5-Trimethylbenzene	ND	1.00	316	11	**	11	ш	2308	
o-Xylene	ND	1.00	п	11	M.	11	11	п	
m,p-Xylene	ND	2.00	U	"		и	:11	11	
Surrogate: 1,2-DCA-d4	95.5 %	70-130			n	"	11	H.	
Surrogate: Toluene-d8	99.0 %	70-130			"	"	0	"	
Surrogate: 4-BFB	98.5 %	70-130			"	Ü	"	"	

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Shell Puget Sound Refinery 8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Semivolatile Organic Compounds (Modified Skinner List) by EPA Method 8270C North Creek Analytical - Bothell

Second Part Sampled: 05/18/04 12:00 Received: 05/21/04 09:25	Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthylene ND 10.0	92 (B4E0548-01) Water	Sampled: 05/18/04 12:00	Received: 05	/21/04 09:2	25				- Se 027 - 820 - 82000	
Authracene ND 10.0 """"""""""""""""""""""""""""""""""""			10.0	ug/l	1	4E24011	05/24/04			
Bernzo (a) anthracene ND 10.0 """"""""""""""""""""""""""""""""""""	A / W	ND	10.0	n	100	SU.	11			
Benzo (a) pyrene ND 10.0 """"""""""""""""""""""""""""""""""""		ND	10.0	11	"	ij	716	Ű		
Bernzo (b) fluoranthene ND 10.0		ND	10.0	n	u	11	TI.			
Bernzo (k) fluoranthene ND 10.0		ND	10.0	10	u	"	ű	n		
Benzo (ghi) perylene ND		ND	10.0	11	ű	"	11.			
Bist Denty phthalate ND 10.0	27 C	ND	10.0	u	u	n	n	u		
Butyl benzyl phthalate		ND	10.0	11	11	TI.	"	n	n	
Chrysene		ND	10.0	(41)	n	111	11	11.		
Di-n-butyl phthalate ND 10.0	(E) (E) (E)	ND	10.0	30	110	11	11			
Dibenz (a,h) acridine ND 10.0	CONT. ACCOUNT MANAGEMENT	ND	10.0	n	n	M	111	10	ŭ.	
Dibenz (a,h) anthracene ND 10.0	j j	ND	10.0	200	W	0	п	11	m.	
1,2-Dichlorobenzene ND 10.0 """"""""""""""""""""""""""""""""""""	1200 NO. 100000 (200)	ND	10.0	9	n	SH	11	W	"	
1,3-Dichlorobenzene ND 10.0 1			10.0	11	11	11	11	U.	Ū	
ND 10.0 10		ND	10.0	11	300	ü	u	ij	H-(
Diethyl phthalate	1018 P. (1019 P. 1010		10.0	Ü	u	11	n	Ü	**	
7,12-Dimethylphenol		ND	10.0	11	11	¥	11	II	u	
ND 10.0 10		cene ND	10.0		u	0	"	"	(110)	
Dimethyl phthalate ND 10.0 """"""""""""""""""""""""""""""""""""	COMMENT CONTROL SECTION AND ADDRESS OF THE SECTION		10.0	n.	ï	n	n	11		
2,4-Dinitrophenol ND 10.0		ND	10.0	9113	"	11	n	30	11	
Fluoranthene ND 10.0 """"""""""""""""""""""""""""""""""""		ND	10.0		ii.	3113	"	11		
Fluorene ND 10.0	130 P. D. 130 - 0x 000 W. 2013 P. 200 1-00 - 00 - 00 - 00 - 00 - 00 - 00		10.0	"	11	11	TIT.	11	Ü	
Indene ND 10.0 """"""""""""""""""""""""""""""""""""		ND	10.0	m	11	.11	11	u	11	
Indeno (1,2,3-cd) pyrene ND 10.0 """"""""""""""""""""""""""""""""""""			10.0	u	**	/940	11	11	<u>u</u>	
6-Methyl chrysene ND 10.0 " " " " " " " " " " " " " " " " " "		ND	10.0	$\bar{\mathbf{u}}$	u	ш	, n	8311	n	
1-Methylnaphthalene ND 10.0 """"""""""""""""""""""""""""""""""""	22 AL AL MARKE	ND	10.0	"	ж	n	n	",		
2-Methylnaphthalene ND 10.0 " <td>S Observation Control Section 20</td> <td>ND</td> <td>10.0</td> <td>ū</td> <td>"</td> <td><u>u</u></td> <td>:11</td> <td>Ü</td> <td></td> <td></td>	S Observation Control Section 20	ND	10.0	ū	"	<u>u</u>	:11	Ü		
2-Methylphenol ND 10.0 "		ND	10.0	11	.11	Ü	Ü	11		
3 & 4-Methylphenol ND 10.0 " " " " " " " " " " " " " " " " " "		ND	10.0	9	10	Ü	Ĭ	11		
Naphthalene ND 10.0 "			10.0	u	Ü	"	11	u		
4-Nitrophenol ND 10.0 " " " " " " " " " " " " " " " " " "		ND	10.0	**	11	n	Ŋ	n		
Di-n-octyl phthalate ND 10.0 " " " " " " " " " " " " " " " " " "	5/ (5/1 -)5	ND	10.0		n	30.	u	n		
Phenanthrene ND 10.0 " " " " " " " " " " " " " " " " " "	No. 2. V. Contractor Victorian Service (Service)	ND	10.0	u	ii .	n	10	11		
i nondimente	175 - 17		10.0	n	n	11	11	n	"	
Phenol ND 10.0 " " " " " "			10.0	11		"	3.00	11	ñ	

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Jeanne Garthwaite, Project Manager



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Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210 Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

907.563.9200 fax 907.563.9210

Shell Puget Sound Refinery

Project: SWMU 11 Sampling

Project Number: 4550237616 8505 South Texas Road Project Manager: Brian Rhodes Anacortes, WA 98221

Reported: 06/07/04 16:03

Semivolatile Organic Compounds (Modified Skinner List) by EPA Method 8270C North Creek Analytical - Bothell

19-132 1	Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Pyridine	92 (B4E0548-01) Water	Sampled: 05/18/04 12:00	Received: 05	/21/04 09:25						
Pyridine ND						4E24011	550000 GON CO			
ND		ND	10.0	u.	**	- 0	11	.11	.11	
Nicontended	Sector of the contract of the	ND	10.0	u	11.	n	n			
Surrogate: 2-FBP		ND	10.0	111	u	-11	11	ш	311	
Surrogate: 2-FP 38.4 18-124 " " " " " " " " " " " " " " " " " "		71.5 %	41-129			n	"			
Surrogate: Nitrobenzene-d5		38.4 %	18-124			"				
Surrogate: Phenol-d6	_	71.7 %	44-124							
Surrogate: p-Terphenyl-d14 St.0 % 10-132		48.2 %	25-122							
19-132 1	Surrogate: p-Terphenyl-d14	52.0 %	10-132							
Acenaphthylene ND 10.0 ug/l 1 4E24011 05/24/04 05/24/04 EPA 8270C Anthracene ND 10.0 " " " " " " " " " " " " " " " " " "	Surrogate: 2,4,6-TBP	58.1 %	19-132			"	W.	н		
Acenaphthylene ND 10.0 ug/l 1 4E24011 05/24/04 05/24/04 EPA 8270C Anthracene ND 10.0 " " " " " " " " " " " " " " " " " "	91 (B4E0548-02) Water	Sampled: 05/18/04 12:00	Received: 05	5/21/04 09:25	5					
Anthracene ND 10.0 """"""""""""""""""""""""""""""""""""				ug/l	1	4E24011				
Benzo (a) anthracene ND 10.0	5 85	ND	10.0	n	n	M.				
Benzo (a) pyrene ND 10.0		ND	10.0	11.	***	.11				
Benzo (b) fluoranthene ND 10.0	rear springers and a support of	ND	10.0	n		200			* 3	
Benzo (k) fluoranthene ND 10.0 """"""""""""""""""""""""""""""""""""		ND	10.0	-ii	10	11				
Benzo (ghi) perylene ND 10.0	12.00	ND	10.0	u	n	ıı				
Bis(2-ethylhexyl)phthalate		ND	10.0	Ü	11	ïi.				
Butyl benzyl phthalate ND 10.0 """"""""""""""""""""""""""""""""""""		46.1	10.0	"	u					
Chrysene ND 10.0 """"""""""""""""""""""""""""""""""""		ND	10.0	9	u	.11				
Di-n-butyl phthalate ND 10.0 """"""""""""""""""""""""""""""""""""	AND A	ND	10.0	11	n					
Dibenz (a,h) acridine ND 10.0 """"""""""""""""""""""""""""""""""""	5	ND	10.0	ii.	•	**	ņ			
Dibenz (a,h) anthracene ND 10.0 """"""""""""""""""""""""""""""""""""	ANTONIA SECTIONAL SECTION AND ANTONIA SECTION	ND	10.0	u	W	11	n			
1,2-Dichlorobenzene ND 10.0 """"""""""""""""""""""""""""""""""""		ND	10.0	31	0		11			
1,3-Dichlorobenzene ND 10.0 """"""""""""""""""""""""""""""""""""	26 27 27	ND	10.0	11.	it.	10	П			
1,4-Dichlorobenzene ND 10.0 " " " " " " " " " " " " " " " " " "		ND	10.0	•	**	m	11			
Diethyl phthalate ND 10.0 "	W. Commission of the Commissio	ND	10.0	200	N	11	***			
7,12-Dimethylbenz (a) anthracene ND 10.0 " " " " " " " " " " " " " " " " " "	1.559	ND	10.0	10	991	ű	***			
2,4-Dimethylphenol ND 10.0 " <td>V20.000.00.00.00.00.00.00.00.00.00.00.00.</td> <td>acene ND</td> <td>10.0</td> <td>ij</td> <td>- n</td> <td>u</td> <td>311</td> <td></td> <td></td> <td></td>	V20.000.00.00.00.00.00.00.00.00.00.00.00.	acene ND	10.0	ij	- n	u	311			
Dimethyl phthalate ND 10.0 """ 2,4-Dinitrophenol ND 10.0 """ """ """ """ """ """ ""			10.0	"	11	Ü				
2,4-Dinitrophenol ND 10.0 " " " " " " " " " " " " " " " " " "	SERIE NAME IN CONT.	ND	10.0	Ü	"	1111				
Fluoranthene ND 10.0 " " " " " " " " " " " " " " " " " "		ND	10.0	11	Ü					
ND 100 " " " " " "		ND	10.0	W.	ñ:	u				
	Fluorene	ND	10.0	W.	"	.11	n	11		

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Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302 509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119 907.563.9200 (ax 907.563.9210

Shell Puget Sound Refinery 8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Semivolatile Organic Compounds (Modified Skinner List) by EPA Method 8270C North Creek Analytical - Bothell

	D 14	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Analyte	Result	Limit	Omts	Dilution	Daten	Tropured			
91 (B4E0548-02) Water	Sampled: 05/18/04 12:00	Received: 05	/21/04 09:25						
Indene	ND	10.0	ug/l	1	4E24011	05/24/04	05/27/04	AC:	
Indeno (1,2,3-cd) pyrene	ND .	10.0	u	ü	30.	"	U	90	
6-Methyl chrysene	ND	10.0	u	n	n	"	1111	11.	
1-Methylnaphthalene	ND	10.0	at.	31	11	11	W.	au:	
2-Methylnaphthalene	ND	10.0	n	u		10%	n	н	
2-Methylphenol	ND	10.0	one.	11	11	11	11	n.	
3 & 4-Methylphenol	ND	10.0	н	(11)	:ne	u.		b	
Naphthalene	ND	10.0	Ħ	0	u	311	11	. 11	
4-Nitrophenol	ND	10.0	SIE.	11	11	11	11	11	
Di-n-octyl phthalate	ND	10.0	11	u	u	.01	u	U	
Phenanthrene	ND	10.0	Ü	01	u.	n	ារ	11	
Phenol	ND	10.0	"	S11	n	7.00	ũ	11	
Pyrene	ND	10.0	n	ü	ņ	u	II	II .	
Pyridine	ND	10.0		n	"	#	n	11	
Quinoline	ND	10.0	n.	**	AUX	ŭ	11	u	
Thiophenol	ND	10.0	11		u.	"	0	n .	Care - Se
Surrogate: 2-FBP	74.8 %	41-129			"	"	"	±11	
Surrogate: 2-FP	39.6 %	18-124			"	n	"	n	
Surrogate: Nitrobenzene-d5	75.3 %	44-124			· n	"	"	w.	
Surrogate: Phenol-d6	48.7 %	25-122			-H	n	11	u .	
Surrogate: p-Terphenyl-d14	69.1 %	10-132			"	"	11	"	
Surrogate: 2,4,6-TBP	56.5 %	19-132			ŭ	n.	"	<i>"</i>	
93 (B4E0548-03) Water	Sampled: 05/18/04 12:00	Received: 0	5/21/04 09:2	5					
Acenaphthylene	ND	10.0	ug/l	1	4E24011	05/24/04	05/27/04	EPA 8270C	
Anthracene	ND	10.0	N.	n	n	. 11	Ũ	n	
Benzo (a) anthracene	ND	10.0	n	"	u	ä	**	n.	
Benzo (a) pyrene	ND	10.0	ži.	п	w	11	N.	(10)	
Benzo (b) fluoranthene	ND	10.0	n	ņ	n	11	Ü		
Benzo (k) fluoranthene	ND	10.0	31 .4	ñ.	u	n	11	STL	
Benzo (ghi) perylene	ND	10.0	m.	107	olt.	11	u	u	
Bis(2-ethylhexyl)phthalate	ND	10.0	11	11	11.	jir.	310	n	
Butyl benzyl phthalate	ND	10.0	310		11	ii.		3311	
Chrysene	ND	10.0	10	п	8300	n	31	<u>u</u>	
Di-n-butyl phthalate	ND	10.0	n	11	11	11	331	îi	
The state of the s									

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Jeanne Garthwaite, Project Manager



a Creek Pkwy N, Suite 400, Bothell, WA 98011-8244

425.420.9200 fax 425.420.9210

Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302

509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383,9310 fax 541.382.7588 Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

907.563.9200 fax 907.563.9210

Shell Puget Sound Refinery 8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Semivolatile Organic Compounds (Modified Skinner List) by EPA Method 8270C North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
93 (B4E0548-03) Water Sa	ampled: 05/18/04 12:00	Received: 05	/21/04 09:	25					
Dibenz (a,h) acridine	ND	10.0	ug/l	1	4E24011	05/24/04	05/27/04	n.	
Dibenz (a,h) anthracene	ND	10.0	11.	100	310	11	u	п	
1,2-Dichlorobenzene	ND	10.0	11	, u	n	110	11	u	
1,3-Dichlorobenzene	ND	10.0	311	11	11	107	"	11	
1,4-Dichlorobenzene	ND	10.0	"	ü	u	11	и	ü	
Diethyl phthalate	ND	10.0	ü	ii.	11	ū	H	u	
7,12-Dimethylbenz (a) anthracen	ne ND	10.0	"	и	и	11	tī.	"	
2,4-Dimethylphenol	ND	10.0	W.	8	n	:11	II	'n	
Dimethyl phthalate	ND	10.0	n	11	11	U	**	U	
2,4-Dinitrophenol	ND	10.0	11	u:	n	11	10	n	
Fluoranthene	ND	10.0	n	11	n	"	н	31.	
Fluorene	ND	10.0	n	W		n	11	300	
Indene	ND	10.0	30	11	3 11 2		и	n	
Indeno (1,2,3-cd) pyrene	ND	10.0	.00	11	11	II.	3115	u	
6-Methyl chrysene	ND	10.0	***	(III)	n	11	11	3 11 7	
1-Methylnaphthalene	ND	10.0	10	n	ja.	311	10	п	
2-Methylnaphthalene	ND	10.0	n		u	11	300	ŭ	
2-Methylphenol	ND	10.0	i i	u	n	11	700	T.	
3 & 4-Methylphenol	ND	10.0	ij	ü	ü	310	ű	Ü	
Naphthalene	ND	10.0	11	Ü	Ü	n	11	ii	
4-Nitrophenol	ND	10.0	ij.	n	11	41	Ü	11	
Di-n-octyl phthalate	ND	10.0	**	11	9	<u>u</u>	n	u	
Phenanthrene	ND	10.0	"	n.	11	ii.	ii.	1100	
Phenol	ND	10.0	0	n	310	ü	ũ	31	
Pyrene	ND	10.0	11	u	u.	ñ	11	u	
Pyridine	ND	10.0	ii.	n	11	11	300	11	
Quinoline	ND	10.0	11		n	atc	0	10	
Thiophenol	ND	10.0	311	u	п		11	Ü	
Surrogate: 2-FBP	81.9 %	41-129			"	"	"	"	
Surrogate: 2-FP	35.9 %	18-124			"	n	ű	īi.	
Surrogate: Nitrobenzene-d5	75.3 %	44-124			"	"	ii .	"	
Surrogate: Phenol-d6	47.4 %	25-122			rr .	::#	"	"	
Surrogate: p-Terphenyl-d14	69.5 %	10-132			"	n	11	n	
Surrogate: 2,4,6-TBP	71.8 %	19-132			"	"	11	n	

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Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302

509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

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Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

907.563.9200 fax 907.563.9210

Shell Puget Sound Refinery 8505 South Texas Road

Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Semivolatile Organic Compounds (Modified Skinner List) by EPA Method 8270C North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
100 - 200 - 2 00	1,000		572						
60 (B4E0548-04) Water Samp	led: 05/18/04 12:00					800 N227 W 822 N20		ED 4 0070C	
Acenaphthylene	ND	10.0	ug/l	1	4E24011	05/24/04	05/27/04	EPA 8270C	
Anthracene	ND	10.0	ű	311	ij.	W.	11	"	
Benzo (a) anthracene	ND	10.0	11	11	ű	.00	u		
Benzo (a) pyrene	ND	10.0	11	п		11		ï.	
Benzo (b) fluoranthene	ND	10.0	Ū	u	ij	u u	:11	10	
Benzo (k) fluoranthene	ND	10.0	11	Ü	u	11	11		
Benzo (ghi) perylene	ND	10.0	10	T.	2 n2	u	ü	"	
Bis(2-ethylhexyl)phthalate	ND	10.0	11	u	11	"	11	u	
Butyl benzyl phthalate	ND	10.0	u	**	n	W	ŭ .	u	
Chrysene	ND	10.0		9		11	11	11	
Di-n-butyl phthalate	ND	10.0	30	11	31	11	11	30.	
Dibenz (a,h) acridine	ND	10.0	10	TI.	911	и	11	n	
Dibenz (a,h) anthracene	ND	10.0	w	n	.01	n	***	au.	
1,2-Dichlorobenzene	ND	10.0	201	11	11		30	© LT	
1,3-Dichlorobenzene	ND	10.0	11	.00	200	11	n	ii.	
1,4-Dichlorobenzene	ND	10.0	Ű		Ü	11	346	ü	
Diethyl phthalate	ND	10.0	-11	(AU)	ii	10	11	"	
7,12-Dimethylbenz (a) anthracene	ND	10.0	ü	11	ü	3115	.11	n n	
2,4-Dimethylphenol	44.5	10.0	n	***	ij	11	W.	n	
Dimethyl phthalate	ND	10.0	"	n	an an	11	ũ	n	
2,4-Dinitrophenol	ND	10.0	11	11	11	"	"	10 .	
Fluoranthene	ND	10.0	3110	ĬĬ	"	ï	9	300	
Fluorene	ND	10.0	u	n	п	Ü	11	11	
Indene	ND	10.0	11	10	11	0	w	u	
Indeno (1,2,3-cd) pyrene	ND	10.0	ju	10%	u	"		11	
6-Methyl chrysene	ND	10.0	**	**	n	30%	W.	100	
1-Methylnaphthalene	ND	10.0	n	W.	n	n	iii.	n	
2-Methylnaphthalene	ND	10.0	n	m	'n	11	***	, ii	
2-Methylphenol	ND	10.0	**	п	.4	30%	200	Ü	
3 & 4-Methylphenol	ND	10.0	u	11	ũ	n	u	n	
Naphthalene	ND	10.0	Ħ	"	"	u	11	9	
4-Nitrophenol	ND	10.0	ā	u	"	п	п	Ü	
Di-n-octyl phthalate	ND	10.0	n	11	ũ	11	n	w	
Phenanthrene	ND	10.0		ü	**	u	11	11	
Phenol	ND	10.0	Ü	Ü	11	<u>n</u>	u	n.	
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425.420.9200 fax 425.420.9210

Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302

509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588 Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

907.563.9200 fax 907.563.9210

Shell Puget Sound Refinery

8505 South Texas Road Anacortes, WA 98221 Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes Reported: 06/07/04 16:03

Semivolatile Organic Compounds (Modified Skinner List) by EPA Method 8270C North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
60 (B4E0548-04) Water	Sampled: 05/18/04 12:00	Received: 05	/21/04 09:2	25					
Pyrene	ND	10.0	ug/l	1	4E24011	05/24/04	05/27/04	ü	
Pyridine	ND	10.0	Ü	THE STATE OF THE S	11	.115	u	Ħ	
Quinoline	ND	10.0	**	- 10	n	u	ш	u	
Thiophenol	ND	10.0	ii	a	u	Ü	Ü	H	
Surrogate: 2-FBP	85.5 %	41-129			"	"	"	"	
Surrogate: 2-FP	50.8 %	18-124			"	"	11	n	
Surrogate: Nitrobenzene-d5	79.6 %	44-124			"	ï.	"	n	
Surrogate: Phenol-d6	65.1 %	25-122			"	n	"	ar.	
Surrogate: p-Terphenyl-d14	75.1 %	10-132			"	"	"	"	
Surrogate: 2,4,6-TBP	95.5 %	19-132			"	n	п	"	
61 (B4E0548-05) Water	Sampled: 05/18/04 12:00	Received: 05	5/21/04 09:	25					
Acenaphthylene	ND	10.0	ug/l	1	4E24011	05/24/04	05/27/04	EPA 8270C	
Anthracene	ND	10.0	11	316	n	n	n	00	
Benzo (a) anthracene	ND	10.0	10	.,	11	#1	iii	11	
Benzo (a) pyrene	ND	10.0	n	11	10	w	11	u est	
Benzo (b) fluoranthene	ND	10.0	- 0	11	31	11	Ü	Ħ.	
Benzo (k) fluoranthene	ND	10.0	ū	Ü	u	310	1111	ü	
Benzo (ghi) perylene	ND	10.0	tt.	W.	it	n	W	n	
Bis(2-ethylhexyl)phthalate	ND	10.0	Ü	0	u	11	Ü	11	
Butyl benzyl phthalate	ND	10.0	Ü	tt	11	11	n	ũ	
Chrysene	ND	10.0	u	"	ü	u	Ü	10	
Di-n-butyl phthalate	ND	10.0	"	n	22	111	Ü	10	
Dibenz (a,h) acridine	ND	10.0	ï	ñ	u	ũ	30)	30.7	
Dibenz (a,h) anthracene	ND	10.0	u	110	11.1	Ü	"	.01	
1,2-Dichlorobenzene	ND	10.0	U	"	11	"	AUE.	11	
1,3-Dichlorobenzene	ND	10.0	8118	n	11	Ü	"	30	
1,4-Dichlorobenzene	ND	10.0	n	u	:#1	n	11	111	
Diethyl phthalate	ND	10.0	"	D	n	u	310	ü	
7,12-Dimethylbenz (a) anthra		10.0	3.00	tt.	**	11	11	n	
2,4-Dimethylphenol	17.5	10.0	11	u	±W.	M	u	u	
Dimethyl phthalate	ND	10.0	n	11	n		'n	ŭ	
	ND ND	10.0	<u>u</u>	90	n	11	ū	**	
2,4-Dinitrophenol	ND ND	10.0	ĨĬ	ū	n	311	ŭ	<u>.</u>	
Fluoranthene	ND ND	10.0	ű	ă	ü	"	"	161	
Fluorene	ND	10.0							

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Jeanne Garthwaite, Project Manager

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1172 Creek Pkwy N, Suite 400, Bothell, WA 98011-8244 425,420,9200 fax 425,420,9210

Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302

509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588 Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

907,563.9200 fax 907,563,9210

Shell Puget Sound Refinery

Project: SWMU 11 Sampling

8505 South Texas Road Anacortes, WA 98221

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Semivolatile Organic Compounds (Modified Skinner List) by EPA Method 8270C North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
61 (B4E0548-05) Water S	Sampled: 05/18/04 12:00	Received: 05	/21/04 09:25						
Indene	ND	10.0	ug/l	1	4E24011	05/24/04	05/27/04		
Indeno (1,2,3-cd) pyrene	ND	10.0	D	u	11	.m.	1100	n	
6-Methyl chrysene	ND	10.0	#FE	n	Ü	n	9	33.22	
1-Methylnaphthalene	ND	10.0	11	11	u	u	ii .	u	
2-Methylnaphthalene	ND	10.0	11	ü	n	ű	11	н	
2-Methylphenol	ND	10.0		u	Ü	ü	<u>ii</u>	SIG	
3 & 4-Methylphenol	ND	10.0	n	11	u	"	11	u	
Naphthalene	ND	10.0	911.		n	"	340	ii	
4-Nitrophenol	ND	10.0	11	#10	.11	11	W	Sill.	
Di-n-octyl phthalate	ND	10.0	•	M.	ш	100	11	ū	
§ 850	ND	10.0	211	u.	11	10	**	ï	
Phenanthrene	ND	10.0	ii.	11	216	11	u	11	
Phenol	ND	10.0	ű:	11	u	п	311	Ü	
Pyrene	ND	10.0	"	.0.	n	11	11	102	
Pyridine	ND	10.0	ï	п	ij.	.11	ij	11	
Quinoline	ND	10.0		ü	ii .	u	11	u	
Thiophenol					"	"	· · · · · · · · · · · · · · · · · · ·	ш	
Surrogate: 2-FBP	85.0 %	41-129			"	,,	,,	"	
Surrogate: 2-FP	56.6 %	18-124			"	,,	"	"	
Surrogate: Nitrobenzene-d5	83.8 %	44-124			"	***	11	"	
Surrogate: Phenol-d6	57.0 %	25-122			"	11	"	ii .	
Surrogate: p-Terphenyl-d14	49.9 %	10-132			11	н	"	a	
Surrogate: 2,4,6-TBP	85.0 %	19-132							
94 (B4E0548-06) Water	Sampled: 05/18/04 12:00					2000		ED 4 02/20/2	
Acenaphthylene	ND	10.0	ug/l	1	4E24011		05/27/04	EPA 8270C	
Anthracene	ND	10.0	n	11	u	āc		u	
Benzo (a) anthracene	ND	10.0	11	10	11	301	ii.		
Benzo (a) pyrene	ND	10.0	11	11	11	ii	"	TU .	
Benzo (b) fluoranthene	ND	10.0	11	11	!!	· (II)	. 11	"	
Benzo (k) fluoranthene	ND	10.0	. "	u	n	ŭ	, ii	т	
Benzo (ghi) perylene	ND	10.0	u	n	n	11	"	u	
Bis(2-ethylhexyl)phthalate	ND	10.0	311	ũ	W.	Ü	"	w	
Butyl benzyl phthalate	ND	10.0	11	u	200	ŭ	u	- W	
Chrysene	ND	10.0	W	n	11	11 2	11	ü	
Di-n-butyl phthalate	ND	10.0	911	11	.11	**	11	п	

North Creek Analytical - Bothell

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North Creek Analytical, Inc. Environmental Laboratory Network Page 29 of 54

Jeanne Garthwaite, Project Manager



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Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210 Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588 Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

907,563,9200 fax 907,563,9210

Shell Puget Sound Refinery

8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Semivolatile Organic Compounds (Modified Skinner List) by EPA Method 8270C North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
94 (B4E0548-06) Water Samp	led: 05/18/04 12:00	Received: 05	/21/04 09:	25					
Dibenz (a,h) acridine	ND	10.0	ug/l	1	4E24011	05/24/04	05/27/04	ū	
Dibenz (a,h) anthracene	ND	10.0	11	u	11	M	"	11	
1,2-Dichlorobenzene	ND	10.0	y.	10	11	.0	Ü	2	
1,3-Dichlorobenzene	ND	10.0	n	Ü	ū	n	11	n	
1,4-Dichlorobenzene	ND	10.0	"	ü	"	**	W	arc:	
Diethyl phthalate	ND	10.0	II.	11	11	ű	11	11	
7,12-Dimethylbenz (a) anthracene	ND	10.0	11	ŭ	19	n	111	31	
2,4-Dimethylphenol	ND	10.0	u	110	11	Ü		н	
Dimethyl phthalate	ND	10.0	.00	11	11	u	10	Sur.	
2,4-Dinitrophenol	ND	10.0	2115	W	11	n	**	п	
Fluoranthene	ND	10.0	.11	n	II.	"	Ü	n	
Fluorene	ND	10.0	ü	***	"	.115	ű	ū.	
Indene	ND	10.0	11	iii.	w	n	11	11	
Indeno (1,2,3-cd) pyrene	ND	10.0	ü	n	u	11	ij	n	
6-Methyl chrysene	ND	10.0	Ü	ű	**	11	u	'n	
1-Methylnaphthalene	ND	10.0	11	u	ii.		11	TI-S	
2-Methylnaphthalene	ND	10.0	W	ņ	ñ.	ा	11	и	,
2-Methylphenol	ND	10.0	11.5	"	Ü	a	ATE:	11.	
3 & 4-Methylphenol	ND	10.0	11.	н	41	Ü	**	u	
Naphthalene	ND	10.0	u	100	10	**	II	III.	
4-Nitrophenol	ND	10.0	311	11	**	Ü	iu.	atu	
Di-n-octyl phthalate	ND	10.0	n	ш	311	n	11	y	
Phenanthrene	ND	10.0	n	n	W	n	S11.	n	
Phenol	ND	10.0	n	316	n	11	u	11	
Pyrene	ND	10.0	u.	ш	"	.00	n	W.	
Pyridine	ND	10.0	U	n	Ü	n	"	ï	
Quinoline	ND	10.0	11 -	211	n	W	ū	'n	
Thiophenol	ND	10.0	9	ũ	11	316	n	10	
Surrogate: 2-FBP	83.9 %	41-129			"	"	и	"	
Surrogate: 2-FP	65.5 %	6 18-124			"	"	"	W	
Surrogate: Nitrobenzene-d5	80.2 %	6 44-124			n	. "	n	n	
Surrogate: Phenol-d6	66.3 %	6 25-122			118	"	"	"	
Surrogate: p-Terphenyl-d14	67.6 %				n	"	n	"	
Surrogate: 2,4,6-TBP	89.8 %	6 19-132			"	н	"	ŭ	

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North Creek Analytical, Inc. Environmental Laboratory Network Page 30 of 54



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425.420.9200 fax 425.420.9210

Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302
509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588 Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

907.563.9200 fax 907.563.9210

Shell Puget Sound Refinery 8505 South Texas Road

Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Semivolatile Organic Compounds (Modified Skinner List) by EPA Method 8270C North Creek Analytical - Bothell

98 (B4E0548-07) Water Sampled: 05/18/04 12:00 Received: 05/18/04 10:00 ug/l 1 4E24011 05/24/04 05/27/04 EPA 8270C Acenaphthylene ND 10.0 "	Notes	Method	Analyzed	Prepared	Batch	Dilution	Units	Reporting Limit	Result	Analyte
Acenaphthylene ND 10.0	X						/21/04 09:25	Received: 05	ampled: 05/18/04 12:00	98 (B4E0548-07) Water
Anthracene ND 10.0 """"""""""""""""""""""""""""""""""""				05/24/04	4E24011	1	ug/l	10.0		
Benzo (a) anthracene ND 10.0 """"""""""""""""""""""""""""""""""""				11	10	11	n .	10.0	ND	253 (5.5)
Benzo (a) pyrene ND 10.0 """"""""""""""""""""""""""""""""""""				.11.3	n	tt	u	10.0	ND	
Benzo (b) fluoranthene ND 10.0				"	311	и	30.	10.0	ND	The state of the s
Benzo (k) fluoranthene ND 10.0 """"""""""""""""""""""""""""""""""""				11	10	n	n	10.0	ND	1908 Tel
Biszic ethylhexyl)phthalate				ALC.	11	u	u	10.0	ND	
Bits(2-ethylhexyl)phthalate				**	Ű	in.	10	10.0	ND	
Butyl benzyl phthalate ND 10.0			11	"	11	11.	u	10.0	12.3	SE(8417) S
Chrysene				n	"	31	ii	10.0	ND	
Di-n-butyl phthalate			11	n	û	.00	"	10.0	ND	
Dibenz (a,h) acridine ND 10.0				11	n.	11	n .	10.0	ND	1254214 5457C
Dibenz (a,h) anthracene ND 10.0			AUT	ïi.	Ü	ii.	n	10.0	ND	
1,2-Dichlorobenzene ND 10.0				11	n	"	N.	10.0	ND	38 CL 50
1,3-Dichlorobenzene ND 10.0 1		lu	11	н	**	ü	n	10.0	ND	SCHOOLSCONGES AND CONTRACTOR
1,4-Dichlorobenzene ND 10.0 1		200	ш	"	W	n	n	10.0	ND	00 6507 5400
Diethyl phthalate ND 10.0 """"""""""""""""""""""""""""""""""""		ш	.11	11	(1)(n	M.	10.0	ND	fit.
7,12-Dimethylbenz (a) anthracene ND 10.0 """"""""""""""""""""""""""""""""""""		Œ	200	u	11	11	Ü	10.0	ND	
2,4-Dimethylphenol ND 10.0 """"""""""""""""""""""""""""""""""""		n	n	n	u	.00	11	10.0	ene ND	35. 35.
Dimethyl phthalate ND 10.0 """"""""""""""""""""""""""""""""""""		9	11	м	n	n.	Ü	10.0		CORC - CES - 17, 19
2,4-Dinitrophenol ND 10.0 """"""""""""""""""""""""""""""""""""		Ü	n n	U	ij.	"	n	10.0	ND	10-14-11 NOVINO MINORIO - CONTINUE
Fluoranthene ND 10.0 """"""""""""""""""""""""""""""""""""			Ü	n	ũ	OIE.	п	10.0	ND	R 18
Fluorene ND 10.0 " <t< td=""><td></td><td>и</td><td>tt</td><td>× III</td><td>22</td><td>n</td><td>ű</td><td>10.0</td><td>ND</td><td></td></t<>		и	tt	× III	22	n	ű	10.0	ND	
Indene ND 10.0 """"""""""""""""""""""""""""""""""""		AL.	ji	Ü	11	"	11	10.0	ND	
Indeno (1,2,3-cd) pyrene ND 10.0 """"""""""""""""""""""""""""""""""""		M.	n	"	HC2	n	11	10.0	ND	
6-Methyl chrysene ND 10.0 " " " " " " " " " " " " " " " " " "		10.	AT S	19		n .	ñ	10.0	ND	
1-Methylnaphthalene ND 10.0 """"""""""""""""""""""""""""""""""""		WD.	III	n	**	ü	11	10.0	ND	
2-Methylnaphthalene ND 10.0 " " " " " " " " " " " " " " " " " " "		Ħ	n	Ü	310	ü	u	10.0	ND	200
2-Methylphenol ND 10.0 " " " " " " " " " " " " " " " " " "			310	II.	n	11	n	10.0	ND	
3 & 4-Methylphenol ND 10.0 " " " " " " " " " " " " " " " " " "		II.		11	***	11	M.	10.0	ND	183 (5
Naphthalene ND 10.0 "		n n	11	7110	m	11	u	10.0		V-0.01 - 0.01 - 0.01 0 0 / 4 0 / 1
4-Nitrophenol ND 10.0 " " " " " "		11	, ii	.00	11	11	att	10.0	ND	
T. T. S.		ñ)II		"	11	и	10.0		
Di-n-octyl phthalate ND 10.0 " " " " " "		n .	11	1110	II.	n	11	10.0	ND	The Control of Brook of Control o
Phenanthrene ND 10.0 " " " " " "		11.	ñ	u	n		1916	10.0		
Phenol ND 10.0 " " " " "		u	Ď	ii	11	u	ij	10.0		

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Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302

509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503,906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383,9310 (ax 541.382.7588

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Shell Puget Sound Refinery

Project: SWMU 11 Sampling

8505 South Texas Road Anacortes, WA 98221

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Semivolatile Organic Compounds (Modified Skinner List) by EPA Method 8270C North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
00 (D 4E0549 07) Water	Sampled: 05/18/04 12:00	Received: 0	5/21/04 09:25						X
	ND	10.0	ug/l	1	4E24011	05/24/04	05/27/04	u .	
Pyrene	ND	10.0	11	n.	11	ŧ	ũ	11	
Pyridine	ND	10.0	ü	m	"	8.11	Ü	n n	
Quinoline	ND	10.0	n	ũ	ij	11	11	Ü	
Thiophenol	75.9 %	41-129			"	"	"	u.	
Surrogate: 2-FBP	75.9 % 16.4 %	41-129 18-124			u	11	"	n	
Surrogate: 2-FP	70.1 %	44-124			,,	"	11	"	
Surrogate: Nitrobenzene-d5	21.2 %	25-122			11	n.	"	"	
Surrogate: Phenol-d6	67.6 %	10-132			11	"	11	"	
Surrogate: p-Terphenyl-d14 Surrogate: 2,4,6-TBP	13.6 %	19-132			•	n	TH.	Ü	
= 0. 30 W			5/21/04 09:25	:					
	Sampled: 05/18/04 12:00	10.0	ug/l	1	4E24011	05/24/04	05/27/04	EPA 8270C	
Acenaphthylene	ND	10.0	ug/I	0	11	11	11	ű	
Anthracene	ND		0	× 11	ä		11	и	
Benzo (a) anthracene	ND	10.0	ű	11	11	11	ū	0	
Benzo (a) pyrene	ND	10.0		"		"	11	и	
Benzo (b) fluoranthene	ND	10.0	JI			i ii	"	11	
Benzo (k) fluoranthene	ND	10.0	"	n 	n:	,,	11	u	
Benzo (ghi) perylene	ND	10.0	Ü	n			10:	m .	
Bis(2-ethylhexyl)phthalate	14.9	10.0	0008	"	11	"	"	м	
Butyl benzyl phthalate	ND	10.0	n	D.	211			TU	
Chrysene	ND	10.0	11	n		,,			
Di-n-butyl phthalate	ND	10.0	311	All	11	"	11	11	
Dibenz (a,h) acridine	ND	10.0	11	0	.11	ш	11		
Dibenz (a,h) anthracene	ND	10.0	31	11	W	n	311	u	
1,2-Dichlorobenzene	ND	10.0	u	30.	"	11	<u>a</u>	U	
1.3-Dichlorobenzene	ND	10.0	11	n	"	3.00	n n	11	
1,4-Dichlorobenzene	ND	10.0	11	11	ñ	11			
Diethyl phthalate	ND	10.0	u	11	"	n	u	u	
7,12-Dimethylbenz (a) anthr	acene ND	10.0	n	Ü	n	11	n	u u	
2,4-Dimethylphenol	ND	10.0	11	ñ	11	ü	n	. m 8	
Dimethyl phthalate	ND	10.0	u	a	п	n	u	11	
2,4-Dinitrophenol	ND	10.0	п	u	n	11	:00:	u	
Fluoranthene	ND	10.0		n.	n	W.	11	TI I	
Fluoranthene	ND	10.0		11		2110	11	TI.	

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Shell Puget Sound Refinery 8505 South Texas Road

Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Semivolatile Organic Compounds (Modified Skinner List) by EPA Method 8270C North Creek Analytical - Bothell

	ľ	vorth Cree	ek Anaryu	icai - D	OUNCH				
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
95 (B4E0548-08) Water	Sampled: 05/18/04 12:00	Received: 05	/21/04 09:25						X
Indene	ND	10.0	ug/l	1	4E24011	05/24/04	05/27/04	Ü	
Indene (1,2,3-cd) pyrene	ND	10.0	11	"	(11)	n	ij		
6-Methyl chrysene	ND	10.0	11	0		**	Œ.	II.	
1-Methylnaphthalene	ND	10.0	300	11		ü	n	0.00	
2-Methylnaphthalene	ND	10.0	11	M.	311	n	**	11	
2-Methylphenol	ND	10.0	11		u	11	2.00%	11	
3 & 4-Methylphenol	ND	10.0	n	386	n	u	311	u	
Naphthalene	ND	10.0	11	11	11	3117	"	"	
4-Nitrophenol	ND	10.0	u	11	ũ	.11	300	n	
Di-n-octyl phthalate	ND	10.0	11	ា	ñ	311	· iii	n	
Phenanthrene	ND	10.0	11	ū	11	n	**	. 11	
	ND	10.0	u	11	u	TI.	22	п	
Phenol	ND ND	10.0	11	n	11%	ű	Ü		
Pyrene	ND	10.0	11	ij	11	n n	118	n	
Pyridine	ND ND	10.0	.00	31/2	.00	ij	"	n:	
Quinoline	ND ND	10.0	11	11	n		и	n	
Thiophenol		NAMES OF THE PARTY	1.00		,,,	n	"	, i	
Surrogate: 2-FBP	56.0 %	41-129			n	"	in.	u	
Surrogate: 2-FP	17.7 %	18-124			n	"	"	n.:	
Surrogate: Nitrobenzene-d5	57.3 %	44-124			,,	,,	n	n .	
Surrogate: Phenol-d6	24.6 %	25-122			,,	"	"	"	
Surrogate: p-Terphenyl-d14	44.2 %	10-132			"	п	u	"	
Surrogate: 2,4,6-TBP	33.3 %	19-132							
96 (B4E0548-09) Water	Sampled: 05/18/04 12:00		5/21/04 09:2	5				777 L 00 F 0 G	
Acenaphthylene	ND	10.0	ug/l	1	4E24011		05/27/04	EPA 8270C	
Anthracene	ND	10.0	11	n,	10/	**	. "	n	
Benzo (a) anthracene	ND	10.0	u	11		u	110	n	
Benzo (a) pyrene	ND	10.0	1111	0	и,	, n	II.	:10	
Benzo (b) fluoranthene	ND	10.0	11	"	316	ii.	11	U	
Benzo (k) fluoranthene	ND	10.0	11	31		W.	w	и.	
Benzo (ghi) perylene	ND	10.0	30	311	11	10	u	"	
Bis(2-ethylhexyl)phthalate	18.7	10.0	11	11	ŭ	m	"	u 	
28 28	ND	10.0	: 11	**	11	.11	·u	n n	
Butyl benzyl phinalate						500		11	
Butyl benzyl phthalate Chrysene	ND	10.0	Ÿ.	- 11	11	III	W	# ·	

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509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

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Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Semivolatile Organic Compounds (Modified Skinner List) by EPA Method 8270C North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
96 (B4E0548-09) Water	Sampled: 05/18/04 12:00	Received: 05	5/21/04 09:25			NAMES ASSESSED	0.0000000000000000000000000000000000000		
Dibenz (a,h) acridine	ND	10.0	ug/l	1	4E24011	05/24/04	05/27/04		
Dibenz (a,h) anthracene	ND	10.0	11	11	.11	n n	н		
1,2-Dichlorobenzene	ND	10.0	au	.11	30	n	и	on.	
1,3-Dichlorobenzene	ND	10.0	TI.	11	и	3002	n	н	
1,4-Dichlorobenzene	ND	10.0	ű	11	u	30	11	u	
Diethyl phthalate	ND	10.0	u	હા	n	11	n	n	
7,12-Dimethylbenz (a) anthrac	cene ND	10.0	u	11	ũ	п	u	u	
2,4-Dimethylphenol	ND	10.0	11	ũ	Ü	**	n	и	
Dimethyl phthalate	ND	10.0	**	n	11	и	11	n	
2,4-Dinitrophenol	ND	10.0	10	W	11	,u	п	u	
Fluoranthene	ND	10.0	3997	Ü	11	11	n	n :	
Fluorene	ND	10.0	11	**	31	u	Ü	n	
Indene	ND	10.0	11	11	30	"	11	u	
Indeno (1,2,3-cd) pyrene	ND	10.0		211	n	ï	11	n	
6-Methyl chrysene	ND	10.0	u	(1)	300	11	u	N	
1-Methylnaphthalene	ND	10.0	8116	n	10	11	n	OR.	
2-Methylnaphthalene	ND	10.0	i ii	.11	216	u	.11	n	
2-Methylphenol	ND	10.0	n	a.		n	300	U	
3 & 4-Methylphenol	ND	10.0	11	Ħ	n	11	***	п	
Naphthalene	ND	10.0	ii .	-0	"	u.	u	11	
4-Nitrophenol	ND	10.0	n	ü	n.	**	111	Ü	
Di-n-octyl phthalate	ND	10.0	ñ	11	ü	31	II.	ü	
Phenanthrene	ND	10.0	"	n	ñ).ne	ü	11	
Phenol	ND	10.0	31.	11	11	11	ņ	Ü	
Pyrene	ND	10.0	n	n	(11)%	ŭ	ij	n	
Pyridine	ND	10.0	**	n	п	11	.0.2	30	
Quinoline	ND	10.0	310	u	**	ü	11	H	
Thiophenol	ND	10.0	11		arc.	Ü	W	.10	
Surrogate: 2-FBP	77.3 %	41-129			"	"	n	ii	
Surrogate: 2-FP	59.6 %				"	n	"	u	
Surrogate: Nitrobenzene-d5	1715				u	"	"	"	
Surrogate: Phenol-d6	64.1 %				ij	"	"	H-I	
Surrogate: p-Terphenyl-d14	68.4 %	6 10-132			"	n	"	"	
Surrogate: 2,4,6-TBP	89.6 %	6 19-132			0	"	Ü	"	

North Creek Analytical - Bothell

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509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588 Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

907.563.9200 fax 907.563.9210

Shell Puget Sound Refinery

8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Semivolatile Organic Compounds (Modified Skinner List) by EPA Method 8270C North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
97 (B4E0548-10) Water San	npled: 05/18/04 12:00	Received: 05	/21/04 09:	25					
Acenaphthylene	ND	10.0	ug/l	1	4E24011	05/24/04	05/27/04	EPA 8270C	
Anthracene	ND	10.0	11	Ŭ	n	M.	n	W	
Benzo (a) anthracene	ND	10.0	11	"	ii i	n	u	10	
Benzo (a) pyrene	ND	10.0	n	н	11	11	ñ	11	
Benzo (b) fluoranthene	ND	10.0	11	11	9	n	11	310.	
Benzo (k) fluoranthene	ND	10.0	u	:#1	310	11	W	"	
Benzo (ghi) perylene	ND	10.0	11	110	n	n	110	ü	
Bis(2-ethylhexyl)phthalate	16.8	10.0	u	n	11	11	, W	Eπ	
Butyl benzyl phthalate	ND	10.0	11	11	340	n	"	u	
Chrysene	ND	10.0	II.	10	11	**	311	11	
Di-n-butyl phthalate	ND	10.0	"	11	11	u	. (0)	n	
Dibenz (a,h) acridine	ND	10.0	. 10	11	n	11	11	Ü	
Dibenz (a,h) anthracene	ND	10.0	n	n		30	sii.	31 .	
1,2-Dichlorobenzene	ND	10.0	11	U	ü	11	11	W)	
1.3-Dichlorobenzene	ND	10.0	11	m m	"	in.	u	n	
1,4-Dichlorobenzene	ND	10.0		u	0	.11	W.	· u	
Diethyl phthalate	ND	10.0	311	11	# ·	11	Ü	п	
7,12-Dimethylbenz (a) anthracene	ND	10.0	.11	"		u	ıı	M.	
2,4-Dimethylphenol	ND	10.0	311	n	n	tt	n	W.	
Dimethyl phthalate	ND	10.0		"	ñ.	и	II.	n	
2,4-Dinitrophenol	ND	10.0	и	11	n	ñ	20	ii.	
Fluoranthene	ND	10.0	11	11	11	ũ	"	п	
Fluorene	ND	10.0	ű	U	U	110	n	TI .	
Indene	ND	10.0	11	11	11	11	**	D .	
Indeno (1,2,3-cd) pyrene	ND	10.0	ñ	310	Э.И.	II.	u	"	
6-Methyl chrysene	ND	10.0	Ü	11	n	11	OH.	Ü	
1-Methylnaphthalene	ND	10.0	**	U	ŭ	11	11	n .	
2-Methylnaphthalene	ND	10.0	11	U	"	n	ü	n	
2-Methylphenol	ND	10.0	11	Ü	u	11	**	n	
3 & 4-Methylphenol	ND	10.0	102	"	Ü	100	ü	u	
Naphthalene	ND	10.0	11	ü	n	31t	n		
4-Nitrophenol	ND	10.0	11	Ü	ū	ij	ñ	111	
Di-n-octyl phthalate	ND	10.0	11	11	31	n	11	u	
Phenanthrene	ND	10.0	.0	W	M	"	310	n	
Phenol	ND	10.0	311	11		Ü	ч	11	

North Creek Analytical - Bothell

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Jeanne Garthwaite, Project Manager



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503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588 Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

Shell Puget Sound Refinery

8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Semivolatile Organic Compounds (Modified Skinner List) by EPA Method 8270C North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
97 (B4E0548-10) Water	Sampled: 05/18/04 12:00	Received: 05	/21/04 09:25						
Pyrene	ND	10.0	ug/l	1	4E24011	05/24/04	05/27/04	u	
Pyridine	ND	10.0		11	9	u	AC	II.	
Quinoline	ND	10.0	311	Ü	n	ü	10	11	
Thiophenol	ND	10.0	"		II ©	"	W.	"	
Surrogate: 2-FBP	83.7 %	41-129			"	"	"	<i>ii</i>	
Surrogate: 2-FP	30.0 %	18-124			"	"	"	11 to	
Surrogate: Nitrobenzene-d5	78.8 %	44-124			n	H	"	11 H	
Surrogate: Phenol-d6	29.6 %	25-122			"	n	"	"	
Surrogate: p-Terphenyl-d14	77.8 %	10-132			"	11	n n	"	
Surrogate: 2,4,6-TBP	53.3 %	19-132			an.	n	"	v ·	
63 (B4E0548-11) Water	Sampled: 05/18/04 12:00	Received: 05	5/21/04 09:25	5					
Acenaphthylene	ND	10.0	ug/l	1	4E24011	05/24/04	05/27/04	EPA 8270C	
Anthracene	ND	10.0	11	130	-11	n	ï	n	
Benzo (a) anthracene	ND	10.0	n	11	ü	и	11	,u	
Benzo (a) pyrene	ND	10.0	310	ũ	ū	n	"	n.	
Benzo (b) fluoranthene	ND	10.0	11	ü	"	aŭ.	n	II	
Benzo (k) fluoranthene	ND	10.0	iii	0	n	"	3000	11	
Benzo (ghi) perylene	ND	10,0	11	11	Ü	ū	n	90	
Bis(2-ethylhexyl)phthalate	30.6	10.0	n	22	n.	11	II	n	
Butyl benzyl phthalate	ND	10.0	11	.0	u	u.	n	žII E	
Chrysene	ND	10.0	u	110	**	n		11	
Di-n-butyl phthalate	ND	10.0	u	0	ш	Ÿ.	**	"	
Dibenz (a,h) acridine	ND	10.0	.10	n	11	11	u	A DE	
Dibenz (a,h) anthracene	ND	10.0	n	-11	30	ú	n	n	
1,2-Dichlorobenzene	ND	10.0	n	н	.11	30	ш	n	
1,3-Dichlorobenzene	ND	10.0	11	11	и	u	ij	ũ.	
1,4-Dichlorobenzene	ND	10.0	11	11	н	11	ū	Ü	
Diethyl phthalate	ND	10.0	"	0	u	11	n-	"	
7,12-Dimethylbenz (a) anthra	acene ND	10.0	11	310	n	0	Ü	n	
2,4-Dimethylphenol	ND	10.0		n	<u>u</u>	\((11))	"	"	
Dimethyl phthalate	ND	10.0	n	n	n	11	10	u:	
2,4-Dinitrophenol	ND	10.0	11	11	"	11	. 11	n	
Fluoranthene	ND	10.0	10/	n	n	ä	41	II.	
Fluorene	17.9	10.0	310	11	ũ.	ŭ	11	11	

North Creek Analytical - Bothell

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Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302 509,924,9200 fax 509,924,9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

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907.563.9200 fax 907.563,9210

Shell Puget Sound Refinery

8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Semivolatile Organic Compounds (Modified Skinner List) by EPA Method 8270C North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
63 (B4E0548-11) Water	Sampled: 05/18/04 12:00	Received: 05	/21/04 09:25						
Indene	ND	10.0	ug/l	1	4E24011	05/24/04	05/27/04	u	
Indeno (1,2,3-cd) pyrene	ND	10.0		n	11	ñ	311	11	
6-Methyl chrysene	ND	10.0	310	11	30.	11	111	₹α	
1-Methylnaphthalene	47.9	10.0	NI.	11	***	102	11	11	
2-Methylnaphthalene	23.3	10.0	II.	11	11	11	THE.	ü	
2-Methylphenol	ND	10.0	m	11	11	II.	11	W.	
3 & 4-Methylphenol	ND	10.0	n	и	u	110	N.	ũ	
Naphthalene	23.9	10.0	n	11	11	п	tt	11	
4-Nitrophenol	ND	10.0	ū	ш	u	11	ũ	V	
Di-n-octyl phthalate	ND	10.0	ű	"	<u>u</u>	11	**	n	
Phenanthrene	35.8	10.0	11	"	II	"	9	in .	
Phenol	ND	10.0	n	11	11	, iii	Ħ	U	
Pyrene	ND	10.0	ŭ	ii	10	0	ш	11	
Pyridine	ND	10.0	117	ï	11	ü	n	0	
Quinoline	ND	10.0	u	W	***	11		11	
Thiophenol	ND	10.0	11	n	11	11	n	100	
Surrogate: 2-FBP	93.5 %	41-129		- All Control	n	n	"	"	
Surrogate: 2-FP	54.5 %	18-124			111	"	"	Ü	
Surrogate: Nitrobenzene-d5	109 %	44-124			"	11	"	"	
Surrogate: Phenol-d6	66.3 %	25-122			"	æ	n	u .	
Surrogate: p-Terphenyl-d14	85.3 %	10-132			"	"	"	"	
Surrogate: 2,4,6-TBP	80.2 %	19-132			, tt	"	"	n.	
65 (B4E0548-12) Water	Sampled: 05/18/04 12:00	Received: 0	5/21/04 09:25	5					
Acenaphthylene	ND	10.0	ug/l	1	4E24011	05/24/04	05/27/04	EPA 8270C	
Anthracene	ND	10.0	ii .	11	ti.	30	***	U	
Benzo (a) anthracene	ND	10.0	n	31	ü	11	ñ	н	
Benzo (a) pyrene	ND	10.0	ü	u	"	7.11.	n	TC.	
Benzo (b) fluoranthene	ND	10.0	n	u	31	11	ñ	9113	
Benzo (k) fluoranthene	ND	10.0	11	11	n	ũ	Ü	u.	
Benzo (ghi) perylene	ND	10.0	D.	u	11	11	n	п	
Bis(2-ethylhexyl)phthalate	44.9	10.0	u	Ü	11	ij	n	euc	
Butyl benzyl phthalate	ND	10.0	10	31	3110	n	**	n	
Chrysene	ND	10.0	**	n	u	11	EHE	n	
Di-n-butyl phthalate	ND	10.0	(10)	11	11	10	**	Œ	

North Creek Analytical - Bothell

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509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

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Shell Puget Sound Refinery 8505 South Texas Road

Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Semivolatile Organic Compounds (Modified Skinner List) by EPA Method 8270C North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
65 (B4E0548-12) Water Sampled: 0	5/18/04 12:00	Received: 05	/21/04 09:	25					
Dibenz (a,h) acridine	ND	10.0	ug/l	1	4E24011	05/24/04	05/27/04	11	
Dibenz (a,h) anthracene	ND	10.0	11	n	n	ü	3116		
1,2-Dichlorobenzene	ND	10.0	n	ne	11	Ü	u	u	
1,3-Dichlorobenzene	ND	10.0	11		11	1111	11	JI	
1,4-Dichlorobenzene	ND	10.0	200	n	11	и	, or	240	
Diethyl phthalate	ND	10.0	n	"	ш	11	n	.0	
7,12-Dimethylbenz (a) anthracene	ND	10.0	n n	n	**	W	811	п	
2,4-Dimethylphenol	ND	10.0	311		u	11	n n	U	
Dimethyl phthalate	ND	10.0	u.	11	n	at.	"	ij	
2,4-Dinitrophenol	ND	10.0	11	u	u	11	II .	ű	
Fluoranthene	ND	10.0		3.0	ű	11	n	<u>u</u>	
Fluorene	ND	10.0	11	"	11	300	Ü	Ü	
Indene	ND	10.0	Ü	Ü	II	"	ñ.:	11%	
Indeno (1,2,3-cd) pyrene	ND	10.0	11	**	11	ũ	u	11	
6-Methyl chrysene	ND	10.0	u	ñ	n.	"	311	D	
1-Methylnaphthalene	ND	10.0	m.	ñ	11	"	11		
2-Methylnaphthalene	ND	10.0	u	"	110	n	n	u	
2-Methylphenol	ND	10.0	n	n	11	**	311	TI .	
3 & 4-Methylphenol	ND	10.0	111	31.0	11	u	ii .	n.	
Naphthalene	ND	10.0		"	п	311.0	11	n	
4-Nitrophenol	ND	10.0	11	11	11	30	u	311	
Di-n-octyl phthalate	ND	10.0	n	305	30	n	n	ũ	
Phenanthrene	ND	10.0	**	11	"	30	u	11	
Phenol	ND	10.0	п	11	11	n	ij	U	
Pyrene	ND	10.0	n,	11	11	11	"	n	
Pyridine	ND	10.0	ü	u	ü	II	n	Ü	
Quinoline	ND	10.0	11	11	ű	Ħ	9	n.	
Thiophenol	ND	10.0	ū	ñ	"	"	n.	11	52.47
Surrogate: 2-FBP	78.6 %	41-129			"	"	"	"	
Surrogate: 2-FP	51.4 %	18-124			"	"	"	u	
Surrogate: Nitrobenzene-d5	74.4 %	44-124			11	"	"	,,,	
Surrogate: Phenol-d6	58.8 %				"	"	"	"	
Surrogate: p-Terphenyl-d14	81.9 %	10-132			n	"	"	"	
Surrogate: 2,4,6-TBP	91.5 %	19-132			n	"	"	"	

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509.924.9200 fax 509.924.9290

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Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Semivolatile Organic Compounds (Modified Skinner List) by EPA Method 8270C North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
100 (B4E0548-13) Water Sample	ed: 05/18/04 12:00	Received: 0	5/21/04 09	:25					
Acenaphthylene	ND	10.0	ug/l	1	4E24011	05/24/04	05/26/04	EPA 8270C	
Anthracene	ND	10.0	Ü	n	ü	8 11 :	"	II	
Benzo (a) anthracene	ND	10.0	11	Ű	"	.00		п	
Benzo (a) pyrene	ND	10.0	ū	u	JI C	11	n	21	
Benzo (b) fluoranthene	ND	10.0	11	ũ	11	ű	.11	н	
Benzo (k) fluoranthene	ND	10.0	300%		.00	<u>ii</u>	U	w.	
Benzo (ghi) perylene	ND	10.0	n	n	31/2	11	11	'n	
Bis(2-ethylhexyl)phthalate	29.1	10.0	11	Ñ			310	TI.	
Butyl benzyl phthalate	ND	10.0	0	4102	D	n	11	U.	
Chrysene	ND	10.0	11	11		310	31	n	
Di-n-butyl phthalate	ND	10.0	30	п	u	n.	u	300	
Dibenz (a,h) acridine	ND	10.0	11	.00	20	11	11	n	
Dibenz (a,h) anthracene	ND	10.0	11	***	ä	w	300	u	
1,2-Dichlorobenzene	ND	10.0	п	n	Ü	n	, tt	U	
1,3-Dichlorobenzene	ND	10.0	19	11	11	11	11	п	
1,4-Dichlorobenzene	ND	10.0	ü	ü	39	u	u	Ü	
Diethyl phthalate	ND	10.0	ņ	11	n	11	n	U	(8
7,12-Dimethylbenz (a) anthracene	ND	10.0	Ü		11	"	u	11	
2,4-Dimethylphenol	46.3	10.0	11%	Ü	n	ï	n	(0.7	
Dimethyl phthalate	ND	10.0	**	ii.	115	11		n	
2,4-Dinitrophenol	ND	10.0	Ü.	11	u	u	300	u	
Fluoranthene	ND	10.0	in:	11	11	n	11	3118	
Fluorene	ND	10.0	W	11	2311	11	11	310	
Indene	ND	10.0	n		11	n	(11)	u	
Indeno (1,2,3-cd) pyrene	ND	10.0	"	3113	11		n	, u	
6-Methyl chrysene	ND	10.0	n	u	ä	900	u	0	
1-Methylnaphthalene	ND	10.0	n.	n	ũ	31	n	II.	
2-Methylnaphthalene	ND	10.0	9	311	"	**	Ü	M.	
2-Methylphenol	ND	10.0	n	ij.	u	10.	ii	ū	
3 & 4-Methylphenol	ND	10.0	11	ñ	"	11	"	11	
Naphthalene	ND	10.0	n	ñ	31	ä	11	11	
4-Nitrophenol	ND	10.0	**	Ü	u	ii.	110	u	
Di-n-octyl phthalate	ND	10.0	11	u	n	Ü	"	н	
Phenanthrene	ND	10.0	n	11	n	31	u	11	
Phenol	ND	10.0	Ħ	II.	u	iii	200		

North Creek Analytical - Bothell

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Jeanne Garthwaite, Project Manager

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425.420.9200 fax 425.420.9210

Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302

509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503,906.9200 fax 503,906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541,383,9310 fax 541,382,7588 Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

907.563.9200 fax 907.563.9210

Shell Puget Sound Refinery

8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Semivolatile Organic Compounds (Modified Skinner List) by EPA Method 8270C North Creek Analytical - Bothell

		WILLIE CEC	CHE I MINESI	y thous I					
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
100 (B4E0548-13) Water 5	Sampled: 05/18/04 12:00	Received: (05/21/04 09	:25					
Pyrene	ND	10.0	ug/l	1	4E24011	05/24/04	05/26/04	II	
Pyridine	ND	10.0	u	ï.	'n	11	II	0	
Quinoline	ND	10.0	u	ñ	11	11	"	u	
Thiophenol	ND	10.0	ш	и	310	n		n	
Surrogate: 2-FBP	93.1 %	41-129			"	\boldsymbol{n}	u	II.	
Surrogate: 2-FP	51.0 %	18-124			"	11	11	u	
Surrogate: Nitrobenzene-d5	90.0 %	44-124			"	11	n	"	
Surrogate: Phenol-d6	69.6 %	25-122			"	"	"	<i>"</i>	
Surrogate: p-Terphenyl-d14	65.9 %	10-132			"	"	"		
Surrogate: 2,4,6-TBP	92.2 %	19-132		16	"	"	rr .	n	
BLANK (B4E0548-14) War	ter Sampled: 05/18/04	12:00 Recei	ved: 05/21	04 09:25					
Acenaphthylene	ND	10.0	ug/l	1	4E24011	05/24/04	05/26/04	EPA 8270C	
Anthracene	ND	10.0	n	"	11	10	ii.	"	
Benzo (a) anthracene	ND	10.0	**	ĬĮ.	'n	111	Ü	20	
Benzo (a) pyrene	ND	10.0	п	u	n	ü	11		
Benzo (b) fluoranthene	ND	10.0	.11	11	**	11	n	n.	
Benzo (k) fluoranthene	ND	10.0	41	Ĭi.	,u	11	n	U.	
Benzo (ghi) perylene	ND	10.0	n.	11	**	n	n	Mc.	
Bis(2-ethylhexyl)phthalate	ND	10.0	**	u	:10	"	n	.0	
Butyl benzyl phthalate	ND	10.0	ш	u	n	u	310	n	
Chrysene	ND	10.0	11.	n		D	91	.11	
Di-n-butyl phthalate	ND	10.0	ū	м	au	8118	"	30	
Dibenz (a,h) acridine	ND	10.0	ñ	11	н	u	311	Ü	
Dibenz (a,h) anthracene	ND	10.0	u	811	ü	11	11	ü	
1.2-Dichlorobenzene	ND	10.0	Ũ	100	0	940	11	U	
1,3-Dichlorobenzene	ND	10.0	31	ũ	n	n	· u	n	
1,4-Dichlorobenzene	ND	10.0	11	u u	u	11	Ü	<u>n</u>	
Diethyl phthalate	ND	10.0	11	n	**	u	H	11	
		10.0	310	ři	11	n	ņ	11	
7,12-Dimethylbenz (a) anthrace	ND ND	10.0			3113	ii.	33	w	
2,4-Dimethylphenol	ND ND	10.0		. 10	"		11	u	
Dimethyl phthalate	ND	10.0		.11	"	n	11	n	
2,4-Dinitrophenol	ND ND	10.0		,u	11	310	11	u	
Fluoranthene		10.0		,,	11	n	11	±0	
Fluorene	ND	10.0							

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Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302 509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588 Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

907.563,9200 fax 907.563,9210

Shell Puget Sound Refinery 8505 South Texas Road

Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Semivolatile Organic Compounds (Modified Skinner List) by EPA Method 8270C North Creek Analytical - Bothell

	Rep	oorting						N f-41 d	Note
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Note
BLANK (B4E0548-14) Water	Sampled: 05/18/04 12:00	Receiv	ed: 05/21/	04 09:25					
Indene	ND	10.0	ug/l	1	4E24011	05/24/04	05/26/04	Ü	
Indeno (1,2,3-cd) pyrene	ND	10.0	"	n		n	ii.	U	
6-Methyl chrysene	ND	10.0	"	II	11	"	tt.	10	
1-Methylnaphthalene	ND	10.0	11	ii ii	77	W	11	,u	
2-Methylnaphthalene	ND	10.0	11	ñ	u		tt.	AC7	
2-Methylphenol	ND	10.0	u	n	u	n	Ü		
3 & 4-Methylphenol	ND	10.0	11	10	11	u	110	Ħ	
Naphthalene	ND	10.0	u	an:	AL.	11	0	u	
4-Nitrophenol	ND	10.0	. "	11	n.	"	11	TI.	
Di-n-octyl phthalate	ND	10.0	10	n	11	<u>u</u>		310	
Phenanthrene	ND	10.0	n	300	(11%)	ũ	300	TI .	
Phenol	ND	10.0	ū	n	n	"	(11)	11	
Pyrene	ND	10.0	n	и	11	11	u	U	
Pyridine	ND	10.0	<u>ū</u>	n	n	n	**	ii.	
Quinoline	ND	10.0	ñ	ū	U	11	SHI.	ũ	
Thiophenol	ND	10.0	"	и	n		ij	Ü	
Surrogate: 2-FBP	84.7 % 41-	-129			"	"	"	11	
Surrogate: 2-FP	44.1 % 18-	-124			"	ıı	"	7	
Surrogate: Nitrobenzene-d5	77.9 % 44	-124			"	"	H.	n	
Surrogate: Phenol-d6	58.3 % 25	-122			"	"	n.	W.	
Surrogate: p-Terphenyl-d14	83.7 % 10	-132			"	"	n	311.	
Surrogate: 2,4,6-TBP	79.4 % 19	-132			"	11	"	,n	

North Creek Analytical - Bothell

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Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302

509.924.9200 fax 509.924.9290 Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210 Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588

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907.563.9200 fax 907.563.9210

Shell Puget Sound Refinery 8505 South Texas Road

Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes Reported: 06/07/04 16:03

Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up) - Quality Control North Creek Analytical - Bothell

	7 11	JA VAN		MARKET CAN						
Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 4E25012: Prepared 05/25/0-	4 Using EF	PA 3520C								
Blank (4E25012-BLK1)										
Diesel Range Hydrocarbons	ND	0.250	mg/l							
Lube Oil Range Hydrocarbons	ND	0.500	11							
	0.293		"	0.320		91.6	50-150			
Surrogate: 2-FBP Surrogate: Octacosane	0.159		ır	0.160		99.4	50-150			
LCS (4E25012-BS1)						965	58-125			
Diesel Range Hydrocarbons	1.73	0.250	mg/l	2.00		86.5	36-123			
Surrogate: 2-FBP	0.308		ø	0.320		96.2	50-150			
LCS Dup (4E25012-BSD1)						0.5.5	50 10F	1.16	40	
Diesel Range Hydrocarbons	1.71	0.250	mg/l	2.00		85.5	58-125	1.16	40	
Surrogate: 2-FBP	0.300		"	0.320		93.8	50-150			

North Creek Analytical - Bothell

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North Creek Analytical, Inc. Environmental Laboratory Network

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Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302 509,924,9200 fax 509,924,9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210 Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588

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907.563.9200 fax 907.563.9210

Shell Puget Sound Refinery 8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Total Metals by EPA 6000/7000 Series Methods - Quality Control North Creek Analytical - Bothell

Analyte Result Limit Units Level Result %REC Limits RPD Limit Notes Batch 4E24045: Prepared 05/24/04 Using EPA 7470A Blank (4E24045-BLK1) Mercury ND 0.000200 mg/l LCS (4E24045-BS1) Mercury 0.00465 0.000200 mg/l 0.00500 93.0 80-120 LCS Dup (4E24045-BSD1)			1,			e 11	0		%REC		RPD	
Blank (4E24045-BLK1	Analyte		Result		Units	Spike Level	Source Result	%REC		RPD		Notes
Mercury ND 0.000200 mg/l 0.00500 mg/l 0.005		Prepared 05/24/04	Using E	PA 7470A								
ND		.K1)										
Mercury		JIER	ND	0.000200	mg/l							
Mercury		n n										
LCS Dup (4E24045-BSD1)		1)	0.00465	0.000200	mg/l	0.00500		93.0	80-120			
Mercury	Mercury		***************************************		325							
Mercury Source: B4E0544-01 Matrix Spike (4E24045-MS1) Source: B4E0544-01 Matrix Spike Dup (4E24045-MSD1) Source: B4E0544-01 Mercury 0.00463 0.000200 mg/l 0.00500 ND 92.6 70-130 4.85 20 Batch 4E25025: Prepared 05/25/04 Using EPA 3020A Prepared 05/25/04 Using EPA 3020A Blank (4E25025-BLK1) Silver ND 0.00100 " Arsenic ND 0.00100 " Barium ND 0.00100 " Cadmium ND 0.00100 " Cadmium ND 0.00100 " Cobalt ND 0.00100 " Chromium ND 0.00100 " Cobalt ND 0.00100 " Lead ND 0.00100 " Cobalt ND 0.00100 " Selenium ND 0.00100 " ND 0.00100 " Sele	LCS Dup (4E2404:	5-BSD1)		0.00000		0.00500		94.8	80-120	1.92	20	
Matrix Spike (4E.24045-MSD1) Source: B4E0544-01 Matrix Spike Dup (4E.24045-MSD1) Mercury 0.00463 0.000200 mg/l 0.00500 ND 92.6 70-130 4.85 20 Batch 4E25025: Prepared 05/25/04 Using EPA 3020A Blank (4E25025-BLK1) Silver ND 0.00100 mg/l Arsenic ND 0.00100 " Arsenic ND 0.00100 " **	Mercury		0.00474	0.000200	mg/I							
Matrix Spike Dup (4E24045-MSD1) Source: B4E0544-01 Mercury 0.00463 0.00200 mg/l 0.00500 ND 92.6 70-130 4.85 20 Batch 4E25025: Prepared 05/25/04 Using EPA 3020A Blank (4E25025-BLK1) Silver ND 0.00100 " Service ND 0.00100 " Barium ND 0.00100 " Beryllium ND 0.00100 " Cadmium ND 0.00100 " Cobalt ND 0.00100 " Chromium ND 0.00100 " Copper ND 0.00100 " Nickel ND 0.00100 " Company ND 0.00100 " Antimony ND 0.00100 " ND 0.00100 " Selenium ND 0.00100 " ND 0.00100 "	Matrix Snike (4E2	4045-MS1)					Source:					
Matrix Spike Dup (4E24045-MSD1) Mercury 0.00463 0.000200 mg/l 0.00500 ND 92.6 70-130 4.85 20		10 10 11==)	0.00486	0.000200	mg/l	0.00500	ND	97.2	70-130			
Matrix Spike Dup (4E/24045-MSD1)							Source:	B4E0544-	-01			
Batch 4E25025: Prepared 05/25/04 Using EPA 3020A		(4E24045-MSD1)	0.00462	0.000200	mg/l	0.00500				4.85	20	
Silver	Mercury		0.00403	0.000200	mgr							
Silver ND 0.00100 mg/l Arsenic ND 0.00100 " Barium ND 0.00100 " Beryllium ND 0.00100 " Cadmium ND 0.00100 " Cobalt ND 0.00100 " Chromium ND 0.00100 " Nickel ND 0.00100 " Lead ND 0.00300 " Antimony ND 0.00100 " Selenium ND 0.00100 "	Batch 4E25025:	Prepared 05/25/04	Using 1	EPA 3020A								
Arsenic ND 0.00100 " Barium ND 0.0100 " Beryllium ND 0.00100 " Cadmium ND 0.00100 " Cobalt ND 0.00100 " Chromium ND 0.00100 " Copper ND 0.00100 " Nickel ND 0.00100 " Lead ND 0.00100 " Antimony ND 0.00100 " Selenium ND 0.00100 " N	Blank (4E25025-B	SLK1)	10									
Arsenic Barium ND 0.0100 Beryllium Cadmium Cobalt Chromium Copper ND 0.00100 ND 0.00100 " Copper ND 0.00100 " ND 0.00100 " Cadmium Copper ND 0.00100 " Copper ND 0.00100 " No No No 0.00100 " No No No No No No No No No	Silver		ND									
Barium ND 0.0100 Beryllium ND 0.00100 " Cadmium ND 0.00100 " Cobalt ND 0.00100 " Chromium ND 0.00100 " Copper ND 0.00100 " Nickel ND 0.00100 " Lead ND 0.00300 " Antimony ND 0.00100 " Selenium ND 0.00100 "	Arsenic		ND									
Beryllium ND 0.00100 Cadmium ND 0.00100 Cobalt ND 0.00100 Chromium ND 0.00100 Copper ND 0.00100 Nickel ND 0.00100 Lead ND 0.00300 Antimony ND 0.00100 Selenium ND 0.00100	Barium		ND				59					
Cadmium ND 0.00100 Cobalt ND 0.00100 " Chromium ND 0.00100 " Copper ND 0.00100 " Nickel ND 0.00100 " Lead ND 0.00300 " Antimony ND 0.00100 " Selenium ND 0.00100 "	Beryllium		ND									
Cobalt ND 0.00100 Chromium ND 0.00100 " Copper ND 0.00100 " Nickel ND 0.00100 " Lead ND 0.00300 " Antimony ND 0.00100 " Selenium ND 0.00100 "	Cadmium		ND									
Chromium ND 0.00100 Copper ND 0.00100 " Nickel ND 0.00100 " Lead ND 0.00300 " Antimony ND 0.00100 " Selenium ND 0.00100 "	Cobalt		ND									
Copper ND 0.00100 Nickel ND 0.00100 Lead ND 0.00300 Antimony ND 0.00100 Selenium ND 0.00100	Chromium		ND									
Nickel ND 0.00100 Lead ND 0.00300 Antimony ND 0.00100 Selenium ND 0.00100	Copper											
Lead ND 0.00100 Antimony ND 0.00300 " Selenium ND 0.00100 "	Nickel											
Antimony ND 0.00300 " Selenium ND 0.00100 "	Lead											
Selenium ND 0.00100	Antimony											
Vanadium ND 0.00100 "	Selenium											
	Vanadium		ND	0.00100	9.11							

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Jeanne Garthwaite, Project Manager



.ı Creek Pkwy N, Suite 400, Bothell, WA 98011-8244 Seattle 1172

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Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302
509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

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Shell Puget Sound Refinery 8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Total Metals by EPA 6000/7000 Series Methods - Quality Control North Creek Analytical - Bothell

			Reporting		Spike	Source		%REC		RPD	
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 4E25025:	Prepared 05/25/04	Using El	PA 3020A		2						
LCS (4E25025-BS)	1)		7-54								_
Silver		0.0749	0.00100	mg/l	0.0800		93.6	80-120			
Arsenic		0.0731	0.00100	'n	0.0800		91.4	80-120			
Barium		0.0762	0.0100	n	0.0800		95.2	80-120			
Beryllium		0.0792	0.00100	40%	0.0800		99.0	80-120			
Cadmium		0.0747	0.00100	U	0.0800		93.4	80-120			
Cobalt		0.0738	0.00100	n	0.0800		92.2	80-120			
Chromium		0.0741	0.00100	, m	0.0800		92.6	80-120			
Copper		0.0742	0.00100	u	0.0800		92.8	80-120			
Nickel		0.0748	0.00100	u	0.0800		93.5	80-120			
Lead		0.0756	0.00100	ü	0.0800		94.5	80-120			
Antimony		0.0744	0.00300	n	0.0800		93.0	80-120			
Selenium		0.0750	0.00100	п	0.0800		93.8	80-120			
Vanadium		0.0745	0.00100	0	0.0800		93.1	80-120			
vanaululii		010111			19						
LCS Dup (4E2502	25-BSD1)				0.0000		94.5	80-120	0.930	20	
Silver		0.0756	0.00100	mg/l	0.0800			80-120	2.03	20	
Arsenic		0.0746	0.00100	n	0.0800		93.3		1.30	20	
Barium		0.0772	0.0100	SHE.	0.0800	9	96.5	80-120	1.38	20	
Beryllium		0.0803	0.00100	11	0.0800		100	80-120		20	
Cadmium		0.0768	0.00100	ű	0.0800		96.0	80-120	2.77		
Cobalt		0.0752	0.00100	ñ	0.0800		94.0	80-120	1.88	20	
Chromium		0.0754	0.00100	"	0.0800		94.2	80-120	1.74	20	
Copper		0.0757	0.00100	11	0.0800		94.6	80-120	2.00	20	
Nickel		0.0764	0.00100	30	0.0800		95.5	80-120	2.12	20	
Lead		0.0772	0.00100	.01	0.0800		96.5	80-120	2.09	20	
Antimony		0.0770	0.00300	111	0.0800		96.2	80-120	3.43	20	
Selenium		0.0770	0.00100	n	0.0800		96.2	80-120	2.63	20	
		0.0756	0.00100	ii.	0.0800		94.5	80-120	1.47	20	
Vanadium		0.0.00	97.5(3)5(5).T. (T. T.)								

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Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

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907 563 9200 fax 907 563 9210

Shell Puget Sound Refinery 8505 South Texas Road

Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Total Metals by EPA 6000/7000 Series Methods - Quality Control North Creek Analytical - Bothell

		Describe-		Spike	Source		%REC		RPD	
		Reporting	T 1 - 14	27.	Result	%REC	Limits	RPD	Limit	Notes
Analyte	Result	Limit	Units	Level	Nosuit	701450				

Batch 4E25025: Prepared 05/25/04	Using EP	A 3020A								
Matrix Spike (4E25025-MS1)				\$	Source: B41					-
Silver	0.0729	0.00100	mg/l	0.0800	0.000430	90.6	21-136			
Arsenic	0.0855	0.00100	311	0.0800	0.00783	97.1	75-125			
Sarium	0.0993	0.0100	u	0.0800	0.0207	98.2	75-125			
Seryllium	0.0803	0.00100	11	0.0800	0.000130	100	75-125			
Cadmium	0.0757	0.00100	11	0.0800	ND	94.6	75-125			
	0.0739	0.00100	n	0.0800	0.000460	91.8	75-125			
Cobalt Chromium	0.0755	0.00100	n	0.0800	0.000710	93.5	75-125			
	0.0750	0.00100	11	0.0800	0.000940	92.6	70-124			
Copper Nickel	0.0796	0.00100	11	0.0800	0.00524	93.0	76-125			
Nickei Lead	0.0785	0.00100	310	0.0800	0.000690	97.3	75-125			
	0.0758	0.00300	,n	0.0800	0.000710	93.9	78-125			
Antimony Selenium	0.0783	0.00100	11	0.0800	0.00144	96.1	76-128			
	0.0793	0.00100	11	0.0800	0.00271	95.7	75-129			
Vanadium					Source: B	4E0548-	01			
Matrix Spike Dup (4E25025-MSD1)		2 221 22		0.0800	0.000430	64.2	21-136	33.8	50	
Silver	0.0518	0.00100	mg/l "	0.0800	0.000430	96.6	75-125	0.469	20	
Arsenic	0.0851	0.00100	11	0.0800	0.0207	97.2	75-125	0.809	20	
Barium	0.0985	0.0100	311	0.0800	0.000130	100	75-125	0.125	20	
Beryllium	0.0802	0.00100			0.000130 ND	95.0	75-125	0.396	20	
Cadmium	0.0760	0.00100	11	0.0800	0.000460	92.1	75-125	0.270	20	
Cobalt	0.0741	0.00100	u	0.0800	0.000400	93.1	75-125	0.398	20	
Chromium	0.0752	0.00100				92.1	70-124	0.535	20	
Copper	0.0746	0.00100		0.0800	0 600	92.1	76-125	0.126	20	
Nickel	0.0795	0.00100		0.0800		96.6	75-125	0.639	20	
Lead	0.0780	0.00100	u u	0.0800		92.9	78-125	1.06	20	
Antimony	0.0750	0.00300		0.0800	N OTENNACE TO	96.0	76-128	0.128	20	
Selenium	0.0782	0.00100		0.0800		95.7	75-129	0.00	20	
Vanadium	0.0793	0.00100	п	0.0800	0.002/1	93.1	13-123	0.00		

North Creek Analytical - Bothell

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North Creek Analytical, Inc. **Environmental Laboratory Network**

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Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503,906.9200 fax 503.906.9210

%REC

Limits

20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

%REC

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Shell Puget Sound Refinery 8505 South Texas Road Anacortes, WA 98221

Vanadium

Project: SWMU 11 Sampling

Level

Source

Result

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

RPD

Limit

RPD

Notes

Total Metals by EPA 6000/7000 Series Methods - Quality Control North Creek Analytical - Bothell

Units

Reporting

Analyte		Result	Limit	Units	Level	Result	%REC	Limits	KrD	Limit	110105
Batch 4E25025:	Prepared 05/25/04	Using EP	A 3020A								
	05 DC1)					Source: B	4E0548-0	01			
Post Spike (4E2502	(5-P31)	0.0927	700	ug/ml	0.100	0.000430	92.3	75-125			
Silver		0.104		"	0.100	0.00783	96.2	75-125			
Arsenic		0.119		ï	0.100	0.0207	98.3	75-125			
Barium				**	0.100	0.000130	99.5	75-125			
Beryllium		0.0996		ji	0.100	ND	97.6	75-125			
Cadmium		0.0976		11	0.100	0.000460	93.2	75-125			
Cobalt		0.0937		311	0.100	0.000710	95.6	75-125			
Chromium		0.0963				0.000710	93.1	75-125			
Copper		0.0940		,11	0.100		93.1	75-125			
Nickel		0.0990		0	0.100	0.00524					
Lead		0.0972		11	0.100	0.000690		75-125			
Antimony		0.0499		ű	0.0500	0.000710		75-125			
Selenium		0.0989		U	0.100	0.00144	97.5	75-125			
Vanadium		0.0988		0	0.100	0.00271	96.1	75-125			
v anadium		. DB(D)0 C									

North Creek Analytical - Bothell

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Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302 509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

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907.563.9200 fax 907.563.9210

Shell Puget Sound Refinery 8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Volatile Organic Compounds (Modified Skinner List) by EPA Method 8260B - Quality Control North Creek Analytical - Bothell RPD

			yı tıı Oı ot		a 4	C		%REC		RPD	
Analyte		Result	Reporting Limit	Units	Spike Level	Source Result	%REC	Limits	RPD	Limit	Notes
Batch 4E26016:	Prepared 05/26/04	Using EI	PA 5030B								
Blank (4E26016-BI											
Acetone	,,,,,,	ND	25.0	ug/l							
Benzene		ND	1.00	ñ							
2-Butanone		ND	10.0	u							0
n-Butylbenzene		ND	1.00	an							
Carbon disulfide		ND	1.00	u							
Chlorobenzene		ND	1.00	10							
Chloroform		ND	1.00	W							
1,2-Dibromoethane		ND	1.00	11							
1,2-Dichloroethane		ND	1.00	11							
Ethylbenzene		ND	1.00	n							
p-Isopropyltoluene		ND	1.00	n							
n-Propylbenzene		ND	1.00	30.5							
Styrene		ND	1.00	m.							
Toluene		ND	1.00	11							
1,1,1-Trichloroethane		ND	1.00	SW.							
Trichloroethene		ND	1.00	· n							
1,2,4-Trimethylbenze	ne	ND	1.00	ű							
		ND	1.00	11							
1,3,5-Trimethylbenze	inc	ND	1.00	ij							
o-Xylene		ND	2.00	310							
m,p-Xylene	SV.	19.2		"	20.0	·	96.0	70-13	0		
Surrogate: 1,2-DCA-		19.2		"	20.0		98.0	70-13			
Surrogate: Toluene-	18	20.0		"	20.0	1	100	70-13	0		
Surrogate: 4-BFB		2010									
LCS (4E26016-B	S1)				10.0		98.2	80-12	.0		
Benzene		9.82	1.00	ug/l	10.0		101	77-12			
Chlorobenzene		10.1	1.00		10.0		100	80-12			
Toluene		10.0	1.00								
Surrogate: 1,2-DCA	-d4	19.6		"	20.		98.0	70-13 70-13			
Surrogate: Toluene-	·d8	20.8		"	20.		104 99.5				
Surrogate: 4-BFB		19.9		n	20.	U	99.3	/0-1.	,,,		

North Creek Analytical - Bothell

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North Creek Analytical, Inc. **Environmental Laboratory Network** Page 47 of 54



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Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302

509.924.9200 fax 509.924.9290

Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711

541.383.9310 fax 541.382.7588 Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119

Shell Puget Sound Refinery 8505 South Texas Road

Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes Reported:

06/07/04 16:03

Volatile Organic Compounds (Modified Skinner List) by EPA Method 8260B - Quality Control North Creek Analytical - Bothell

Analyte		Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
•					200 TO 100 TO 10	(1000) (1000) (1000)	300 00000 0 5550 0 0 0 0				
Batch 4E26016: P	Prepared 05/26/04	Using E	PA 5030B								
LCS Dup (4E26016-B	SD1)								w 7900a		
Benzene		9.86	1.00	ug/l	10.0		98.6	80-120	0.407	20	
Chlorobenzene		10.7	1.00	10	10.0		107	77-120	5.77	20	
Toluene		10.6	1.00	н	10.0		106	80-120	5.83	20	
Surrogate: 1,2-DCA-d4		18.9		"	20.0		94.5	70-130			
Surrogate: Toluene-d8		20.6		n	20.0		103	70-130			
Surrogate: 4-BFB		19.7		"	20.0		98.5	70-130			
Batch 4E27042: I	Prepared 05/27/04	Using E	PA 5030B								
Blank (4E27042-BLK	1)	-									
Acetone		ND	25.0	ug/l							
Benzene		ND	1.00	n							
2-Butanone		ND	10.0	Ð							
n-Butylbenzene		ND	1.00	n							
Carbon disulfide		ND	1.00	III							
Chlorobenzene		ND	1.00	n.							
Chloroform		ND	1.00	11							
1,2-Dibromoethane		ND	1.00	11							
1,2-Dichloroethane		ND	1.00	, tr							
Ethylbenzene		ND	1.00	11							
p-Isopropyltoluene		ND	1.00	310							
n-Propylbenzene		ND	1.00								
Styrene		ND	1.00	31							
Toluene		ND	1.00	200							
1,1,1-Trichloroethane		ND	1.00	н							
Trichloroethene		ND	1.00	.0							
1,2,4-Trimethylbenzene		ND	1.00	ш							
1,3,5-Trimethylbenzene		ND	1.00	Œ							3
o-Xylene		ND	1.00	11							
m,p-Xylene		ND	2.00	н							
Surrogate: 1,2-DCA-d4		18.7	1990	"	20.0		93.5	70-130			
Surrogate: Toluene-d8		19.8		"	20.0		99.0	70-130			
Surrogate: 4-BFB		20.2		"	20.0		101	70-130			

North Creek Analytical - Bothell

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Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

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541.383.9310 fax 541.382.7588

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Shell Puget Sound Refinery 8505 South Texas Road

Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes Reported:

06/07/04 16:03

Volatile Organic Compounds (Modified Skinner List) by EPA Method 8260B - Quality Control North Creek Analytical - Bothell

Ĭ			Reporting	200-200-100	Spike	Source	RESEARCH TRANSPORT	%REC	2000 - 100 to 100	RPD	-
Analyte	к	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 4E27042: 1	Prepared 05/27/04	Using EP	A 5030B								
LCS (4E27042-BS1)											
Benzene		9.12	1.00	ug/l	10.0		91.2	80-120			
Chlorobenzene		9.62	1.00	W	10.0		96.2	77-120			
Toluene		9.33	1.00	THE STATE OF THE S	10.0		93.3	80-120			
Surrogate: 1,2-DCA-d4		18,5		n	20.0		92.5	70-130			
Surrogate: Toluene-d8		20.2		"	20.0		101	70-130			
Surrogate: 4-BFB		19.4		"	20.0		97.0	70-130			
LCS Dup (4E27042-B	BSD1)										
Benzene	(ii)	10.1	1.00	ug/l	10.0		101	80-120	10.2	20	
Chlorobenzene		10.4	1.00	9	10.0		104	77-120	7.79	20	
Toluene		10.2	1.00	ij	10.0		102	80-120	8.91	20	
Surrogate: 1,2-DCA-d4		18.5		"	20.0		92.5	70-130			
Surrogate: Toluene-d8		19.8		"	20.0		99.0	70-130			
Surrogate: 4-BFB		19.7		11	20.0		98.5	70-130			
Batch 4E28033:	Prepared 05/28/04	Using El	PA 5030B								
Blank (4E28033-BLK	-										
Acetone		ND	25.0	ug/l							-
				0							
Benzene		ND	1.00								
		ND ND	1.00 10.0	11							
2-Butanone			1.00 10.0 1.00								
Benzene 2-Butanone n-Butylbenzene Carbon disulfide		ND	10.0	11							
2-Butanone n-Butylbenzene Carbon disulfide		ND ND	10.0 1.00	yr u							
2-Butanone n-Butylbenzene Carbon disulfide Chlorobenzene		ND ND ND	10.0 1.00 1.00	11 11							
2-Butanone n-Butylbenzene Carbon disulfide Chlorobenzene Chloroform		ND ND ND	10.0 1.00 1.00 1.00)) () ()							
2-Butanone n-Butylbenzene Carbon disulfide Chlorobenzene Chloroform 1,2-Dibromoethane		ND ND ND ND	10.0 1.00 1.00 1.00 1.00	11 11 11							
2-Butanone n-Butylbenzene Carbon disulfide Chlorobenzene Chloroform 1,2-Dibromoethane 1,2-Dichloroethane		ND ND ND ND ND	10.0 1.00 1.00 1.00 1.00	11 11 11 11 11 11 11 11 11 11 11 11 11							
2-Butanone n-Butylbenzene Carbon disulfide Chlorobenzene Chloroform 1,2-Dibromoethane 1,2-Dichloroethane Ethylbenzene		ND ND ND ND ND ND ND	10.0 1.00 1.00 1.00 1.00 1.00	H H H H							
2-Butanone n-Butylbenzene Carbon disulfide Chlorobenzene Chloroform 1,2-Dibromoethane 1,2-Dichloroethane Ethylbenzene p-Isopropyltoluene		ND ND ND ND ND ND ND ND	10.0 1.00 1.00 1.00 1.00 1.00 1.00	H H H H H H H H H H H H H H H H H H H							
2-Butanone n-Butylbenzene Carbon disulfide Chlorobenzene Chloroform 1,2-Dibromoethane 1,2-Dichloroethane Ethylbenzene p-Isopropyltoluene n-Propylbenzene		ND	10.0 1.00 1.00 1.00 1.00 1.00 1.00 1.00	H H H H H H H H H H H H H H H H H H H					8		
2-Butanone n-Butylbenzene Carbon disulfide Chlorobenzene Chloroform 1,2-Dibromoethane 1,2-Dichloroethane Ethylbenzene p-Isopropyltoluene		ND N	10.0 1.00 1.00 1.00 1.00 1.00 1.00 1.00	H H H H H H H H H H H H H H H H H H H					ä		
2-Butanone n-Butylbenzene Carbon disulfide Chlorobenzene Chloroform 1,2-Dibromoethane 1,2-Dichloroethane Ethylbenzene p-Isopropyltoluene n-Propylbenzene Styrene Toluene		ND	10.0 1.00 1.00 1.00 1.00 1.00 1.00 1.00	11 11 11 11 11 11 11 11 11 11 11 11 11					8		
2-Butanone n-Butylbenzene Carbon disulfide Chlorobenzene Chloroform 1,2-Dibromoethane 1,2-Dichloroethane Ethylbenzene p-Isopropyltoluene n-Propylbenzene Styrene		ND N	10.0 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	H H H H H H H H H H H H H H H H H H H					Ř		

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Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

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541.383.9310 fax 541.382.7588

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907 563 9200 fax 907 563 9210

Shell Puget Sound Refinery 8505 South Texas Road

Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Volatile Organic Compounds (Modified Skinner List) by EPA Method 8260B - Quality Control North Creek Analytical - Bothell

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 4E28033: Prepared 05/28/04	Using EF	A 5030B								
Blank (4E28033-BLK1)				2						
1,3,5-Trimethylbenzene	ND	1.00	ug/l							
o-Xylene	ND	1.00	и							
m,p-Xylene	ND	2.00	ij							
Surrogate: 1,2-DCA-d4	17.6		и	20.0		88.0	70-130			
Surrogate: Toluene-d8	19.4		n	20.0		97.0	70-130			
Surrogate: 4-BFB	20.2		n	20.0		101	70-130			
LCS (4E28033-BS1)										
Benzene	9.24	1.00	ug/l	10.0		92.4	80-120			
Chlorobenzene	9.97	1.00	10	10.0		99.7	77-120			
Toluene	9.64	1.00	ML	10.0		96.4	80-120			
Surrogate: 1,2-DCA-d4	17.0		"	20.0		85.0	70-130			
Surrogate: Toluene-d8	20.0		"	20.0		100	70-130			
Surrogate: 4-BFB	20.2		"	20.0		101	70-130			
LCS Dup (4E28033-BSD1)										
Benzene	8.82	1.00	ug/l	10.0		88.2	80-120	4.65	20	
Chlorobenzene	9.36	1.00	311)	10.0		93.6	77-120	6.31	20	
Toluene	9.20	1.00	70	10.0		92.0	80-120	4.67	20	
Surrogate: 1,2-DCA-d4	17.2		n	20.0		86.0	70-130			
Surrogate: Toluene-d8	20.1		n	20.0		100	70-130			
Surrogate: 4-BFB	19.7		"	20.0		98.5	70-130			
Matrix Spike (4E28033-MS1)					Source:	B4E0730-	-03			
Benzene	10.3	1,00	ug/l	10.0	ND	103	63-148			
Chlorobenzene	11.2	1.00	n	10.0	ND	112	80-128			
Toluene	11.3	1.00	"	10.0	ND	113	72-127			
Surrogate: 1,2-DCA-d4	16.4		n	20.0		82.0	70-130			
Surrogate: Toluene-d8	20.0		"	20.0		100	70-130			
Surrogate: 4-BFB	19.7		n	20.0		98.5	70-130			

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Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210

Bend 20332 Empire Avenue, Suile F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119 907.563.9200 fax 907.563.9210

Shell Puget Sound Refinery

Project: SWMU 11 Sampling

8505 South Texas Road

Project Number: 4550237616

Reported: 06/07/04 16:03

Anacortes, WA 98221

Project Manager: Brian Rhodes

Volatile Organic Compounds (Modified Skinner List) by EPA Method 8260B - Quality Control North Creek Analytical - Bothell RPD

Analyte		Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	Limit	Notes
Batch 4E28033:	Prepared 05/28/04	Using El	PA 5030B				-8				
						Source: 1	34E0730-	03			-
Matrix Spike Dup ((4E28033-MSD1)		1.00	ug/l	10.0	ND	101	63-148	1.96	20	
Benzene		10.1	1.00	ug/i	10.0	ND	110	80-128	1.80	20	
Chlorobenzene		11.0	1.00	9	10.0	ND	108	72-127	4.52	20	
Toluene		10.8	1.00			IND	7	70.120			
		16.4		11	20.0		82.0	70-130			
Surrogate: 1,2-DCA-a				"	20.0		98.5	70-130			
Surrogate: Toluene-de Surrogate: 4-BFB	8	19.7 19.9		"	20.0		99.5	70-130			

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Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132 503.906.9200 fax 503.906.9210 Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541.383.9310 fax 541.382.7588

2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119 Anchorage

907.563.9200 fax 907.563.9210

Shell Puget Sound Refinery 8505 South Texas Road

Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Semivolatile Organic Compounds (Modified Skinner List) by EPA Method 8270C - Quality Control North Creek Analytical - Bothell RPD %REC

				Spike	Source		%REC		RPD	
Analyte	Result	eporting Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
	Using EPA	3520C								
atch 4E24011: Prepared 05/24/04	Using ETT	1 33200								
Blank (4E24011-BLK1)	ND	10.0	ug/l							
cenaphthylene	ND	10.0	"							
Anthracene	ND	10.0	п							
Benzo (a) anthracene	ND	10.0	u							
Benzo (a) pyrene	ND ND	10.0	11							
Benzo (b) fluoranthene	ND ND	10.0	n							
Benzo (k) fluoranthene		10.0	n		8					
Benzo (ghi) perylene	ND	10.0	n							
Bis(2-ethylhexyl)phthalate	ND	10.0								
Butyl benzyl phthalate	ND	10.0	o.							
Chrysene	ND	10.0	11							
Di-n-butyl phthalate	ND	10.0	11							
Dibenz (a,h) acridine	ND		31							
Dibenz (a,h) anthracene	ND	10.0	**							
1,2-Dichlorobenzene	ND	10.0	11							
1,3-Dichlorobenzene	ND	10.0	ar.							
1,4-Dichlorobenzene	ND	10.0	. 0							
Diethyl phthalate	ND	10.0	11							
7,12-Dimethylbenz (a) anthracene	ND	10.0	u							
2,4-Dimethylphenol	ND	10.0	11							
Dimethyl phthalate	ND	10.0	11							
2,4-Dinitrophenol	ND	10.0	n							
Fluoranthene	ND	10.0	n							
Fluorene	ND	10.0	200							
Indene	ND	10.0	u							
Indeno (1,2,3-cd) pyrene	ND	10.0	"							
6-Methyl chrysene	ND	10.0								
1-Methylnaphthalene	ND	10.0	"							
2-Methylnaphthalene	ND	10.0								
2-Methylphenol	ND	10.0								
3 & 4-Methylphenol	ND	10.0								
Naphthalene	ND	10.0								
4-Nitrophenol	ND	10.0								
Di-n-octyl phthalate	ND	10.0	"							
Phenanthrene	ND	10.0		he results in						

North Creek Analytical - Bothell

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Jeanne Garthwaite, Project Manager

North Creek Analytical, Inc. Environmental Laboratory Network Page 52 of 54



ı Creek Pkwy N, Suite 400, Bothell, WA 98011-8244 425.420.9200 fax 425.420.9210

Spokane 11922 E. 1st Avenue, Spokane Valley, WA 99206-5302

509.924.9200 fax 509.924.9290 Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132

503.906.9200 fax 503.906.9210 Bend 20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 541,383,9310 fax 541.382.7588

Anchorage 2000 W. International Airport Road, Suite A10, Anchorage, AK 99502-1119 907.563,9200 fax 907.563.9210

Shell Puget Sound Refinery 8505 South Texas Road

Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Semivolatile Organic Compounds (Modified Skinner List) by EPA Method 8270C - Quality Control North Creek Analytical - Bothell

					Spike	Source		%REC		RPD	199.00
		Result I	Reporting Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Analyte			134-05404 ASH-1045	1-000/100-0-0							
Batch 4E24011:	Prepared 05/24/04	Using EP	A 3520C								
Blank (4E24011-Bl	LK1)									-	
Phenol		ND	10.0	ug/l							
Pyrene		ND	10.0	.10							
Pyridine		ND	10.0	31						12	
Quinoline		ND	10.0	II							
Thiophenol		ND	10.0	11						-	
		33.1		"	50.0		66.2	41-129			
Surrogate: 2-FBP		18.4		"	50.0		36.8	18-124			
Surrogate: 2-FP Surrogate: Nitrobenz	one-d5	35.0		"	50.0		70.0	44-124			
Surrogate: Nitrobenz Surrogate: Phenol-dt	(26.3		"	50.0		52.6	25-122			
Surrogate: Phenoi-ac Surrogate: p-Terpher	, wl.d14	39.8		"	50.0		79.6	10-132			
Surrogate: p-1erpner Surrogate: 2,4,6-TBF		27.9		"	50.0		55.8	19-132			
LCS (4E24011-BS		81.3	10.0	ug/l	100		81.3	43-122			
1,4-Dichlorobenzene		74.9	10.0	11	100		74.9	12-153			
4-Nitrophenol			10.0	11	100		49.4	20-124			
Phenol		49.4		W.	100		90.7	59-134			
Pyrene		90.7	10.0	"			76.6	41-129			
Surrogate: 2-FBP		38.3		"	50.0 50.0		35.6	18-124			
Surrogate: 2-FP		17.8		"	50.0		76.0	44-124			
Surrogate: Nitroben	zene-d5	38.0		 	50.0		47.8	25-122			
Surrogate: Phenol-c		23.9		11	50.0		74.8	10-132			
Surrogate: p-Terphe	enyl-d14	37.4		,,	50.0		59.8	19-132			
Surrogate: 2,4,6-TB		29.9		3,450	50.0		22.2	v-massel 3039393303			
LCS Dup (4E240)11-BSD1)				100		77.9	43-122	4.27	26	
1,4-Dichlorobenzen		77.9	10.0	ug/l	100			12-153	6.71	37	
4-Nitrophenol		80.1	10.0	Ü	100		80.1		4.55	53	
Phenol		47.2	10.0	3.00	100		47.2	20-124	1.86	50	
Pyrene		92.4	10.0	g.	100	_	92.4	59-134	1.80		_
		38.0		"	50.0		76.0	41-129			
Surrogate: 2-FBP Surrogate: 2-FP		15.9		11	50.0		31.8				
Surrogate: 2-FF Surrogate: Nitrobe	mzana_d5	37.6		11	50.0)	75.2				
		22.5		"	50.0)	45.0				
Surrogate: Phenol- Surrogate: p-Terpl		37.8		n	50.0)	75.6				
		31.4		"	50.0	9	62.8	19-132			
Surrogate: 2,4,6-T	DI										

North Creek Analytical - Bothell

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Jeanne Garthwaite, Project Manager

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Shell Puget Sound Refinery 8505 South Texas Road Anacortes, WA 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

Reported: 06/07/04 16:03

Notes and Definitions

Estimated value. The reported value exceeds the calibration range of the analysis. E

See case narrative. X

Analyte DETECTED DET

Analyte NOT DETECTED at or above the reporting limit ND

Not Reported NR

Sample results reported on a dry weight basis dry

Relative Percent Difference RPD

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North Creek Analytical, Inc. Environmental Laboratory Network Page 54 of 54

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 1720 North Creek Pkwy N Suite 400, Bothell, WA 98011-9508 11115 E Montgomery Suite B, Spokane, WA 99206-4776 9405 SW Nimbus Ave, Beaverton, OR 97008-7132 20332 Empire Ave Suite F-1, Bend, OR 99701-5711 3209 Denali St, Anchorage, AK 99503-4030

FAX 334-9210 FAX 906-9210 FAX 924-9290 FAX 382-7588 907-334-9200 509-924-9200 503-906-9200 541-383-9310

FAX 420-9210 425-420-9200

OF OF 160-1 DATE: 5-21-52 TIME: 0-925 401 50--0¢ 10-89 10% 0 11 NCA WO ID < 1 * Turnaround Requests less than standard may incur Rush Charges. TEMP: 4.8°C PAGE < 1 Work Order #: 455023 F. TIME: DATE: TIME: TURNAROUND REQUEST Petroleum Hydrocarbon Analyses LOCATION / COMMENTS Organic & Inorganic Analyses in Business Days * 3 OTHER Specify: クス # OF CONT. ĸ FIRM: FIRM: STD. MATRIX (W, S, O) Afette Wildows 3 PRINT NAME: COLETTE INFOVER AB. B4E0548 3 3 15/4 RECEIVED BY: RECEIVED BY: PRINT NAME: PRESERVATIVE 0788 10 V2 113/40H DATE: 5,80.04 B 3 9 CHAIN OF CUSTODY REPORT D ~ Som P.O. NUMBER. INVOICE TO: TIME: DATE: TIME: X PRINT NAME: ADRIAN KOOCMANFIRM: 1218 FIRM: 18.04 DATE/TIME SAMPLING SAMPLED BY: KOOLINGA PROJECT NAME: SUM UL FAX: REPORT TO: BriAN CLIENT SAMPLE IDENTIFICATION 8 ADDITIONAL REMARKS: PROJECT NUMBER: 9 クラ 8 70 RELEASED BY: RELEASED BY: PRINT NAME: 92 0 ADDRESS: CLIENT: PHONE:

COC REV 1/03



20F2 DATE: 5-21-04 TIME: 0925 NCA WO ID * Turnaround Requests less than standard may incur Rush Charges. 1 FAX 334-9210 FAX 420-9210 FAX 906-9210 FAX 382-7588 FAX 924-9290 PAGE, Work Order #: 45502376 **∀** TIME: DATE: TURNAROUND REQUEST 4.82 Petroleum Hydrocarbon Analyses LOCATION / COMMENTS TEMP: Organic & Inorganic Analyses in Business Days * 541-383-9310 907-334-9200 m 425-420-9200 509-924-9200 503-906-9200 OTHER Specify: FIRM: NG # OF CONT. w FIRM: 20332 Empire Ave Suite F-1, Bend, OR 99701-5711 3209 Denali St, Anchorage, AK 99503-4030 11720 North Creek Pkwy N Suite 400, Bothell, WA 98011-9508 11115 E Montgomery Suite B, Spokane, WA 99206-4776 9405 SW Nimbus Ave, Beaverton, OR 97008-7132 2 MATRIX (W, S, O) S **3**(E) PRINT NAME: COPHE WEONER Weare DATE: 5.80.0% RECEIVED BY: CHELLE RYED FYX 20168 1217 1217 1217 RECEIVED BY: PRINT NAME: PRESERVATIVE 0768 10 V2 10 V2 10 V2 52 CHAIN OF CUSTODY REPORT P.O. NUMBĘR. INVOICE TO: X 3 TIME DATE: TIME: NAJS SKININE SKININE \leq PRINT NAME: A DRIAM KOOLMIAN FIRM: WAS 18.04 SAMPLING DATE/TIME SUME SAMPLED BY: OCCUMPA カアンなら ADDITIONAL REMARKS: **IDENTIFICATION** CLIENT SAMPLE PROJECT NUMBER: PROJECT NAME: M P, 9 62 SM RELEASED BY: RELEASED BY: PRINT NAME: REPORT TO: COC REV 1/03 ADDRESS: PHONE: CLENT: