



# Department of Ecology Industrial Section

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June 26, 2003

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

Dear Mr. Dirkx,

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 2<sup>nd</sup> quarter of 2003 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

Cal J Tholes

BDR/br

cc: Paul Skyllingstad Dept. of Ecology

Enclosure

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# GROUNDWATER MONITORING AND SAMPLING REPORT FOR THE SECOND QUARTER OF 2003 PUGET SOUND REFINERY SWMU 11

Prepared by

Puget Sound Refinery
Anacortes, Washington

June 2003

Written By:

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

Staff Engineer

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### 1.0 INTRODUCTION

This report summarizes remedial activities completed during the Second quarter of 2003 at Puget Sound Refinery, RCRA/RFI Solid Waste Management Unit 11. This report includes recent groundwater monitoring and sampling data collected during May of 2003.

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.

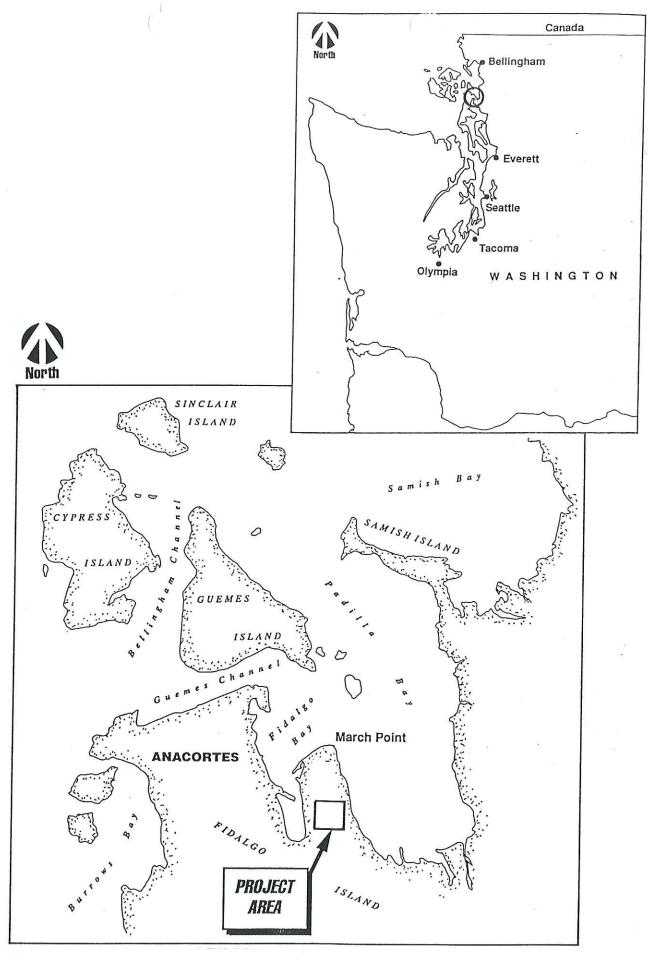
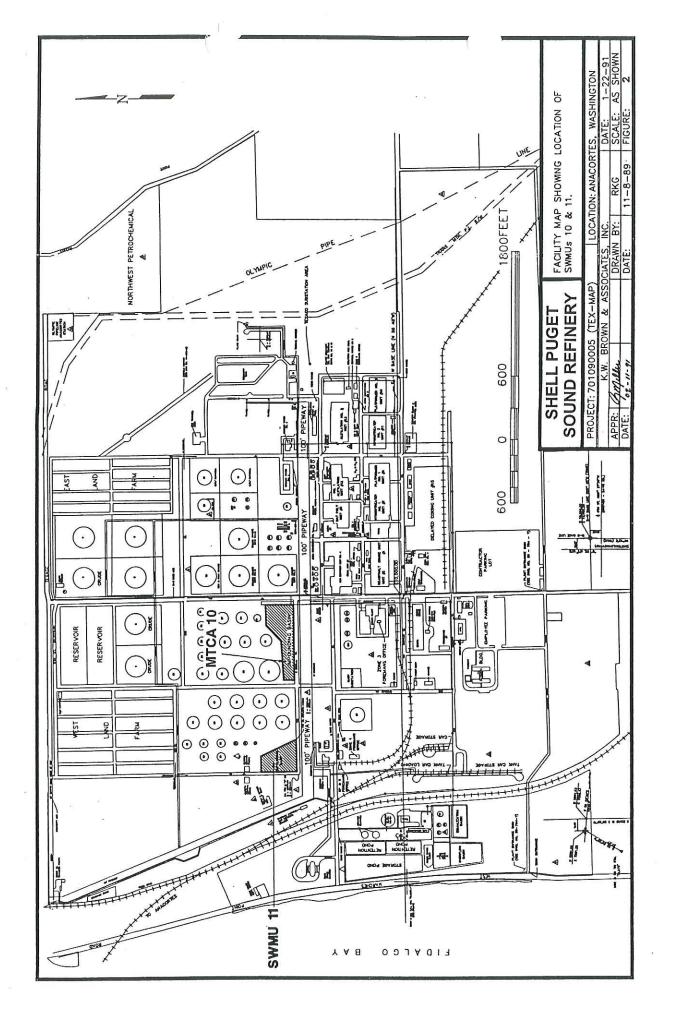


Figure 1. Vicinity map of Shell Puget Sound Refinery



### 2.0 FIELD WORK

### 2.1 GROUNDWATER SURFACE AND FREE PRODUCT MEASUREMENTS

Groundwater surface level measurements were collected from fourteen wells on May 12th, 2003. 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

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

*ALL UNITS I	IN FEET O	R CUBIC FEET	*ALL UNITS IN FEET OR CUBIC FEET UNLESS OTHERWISE LABELLED	WISE LABELL	Ē						
WELL No.	WLQ	DEPTH TO	TOT DEPTH	H20 SURF	APP LNAPL	PVC MARK	WELL DIA	WATER VOLIN	BAILER	No. BAILS	PURGE H20
	Ē	PRODUCT	(FT)	ELEV.	THICKNESS	ELEV.	(FT)	WELL (Gal.)	VOL. (Gal.)	For 3 volumes	VOLUME(Gal.)
	50000000										
MW-59	SN	SN	39.90	N/A	N/A	113.74	0.33	SN	NS	LNAPL	N/A
MW-60	32.60	N/A	54.40	75.37	N/A	107.97	0.33	14.228	1.359	31.41	42.68
MW-61	34.32	A/N	39.42	74.68	N/A	109.00	0.33	3.263	1.359	7.20	9.79
MW-62	ρίς	N/A	25.64	DRY	DRY	108.22	0.33	NS	1.359	DRY	DRY
MW-63	31.54	N/A	40.67	78.24	N/A	109.78	0.33	5.841	1.359	12.90	17.52
MW-64	SN	SN	43.66	N/A	N/A	111.48	0.33	SN	1.359	LNAPL	SN
MW-65	27.00	N/A	41.37	93.41	N/A	120.41	0.33	9.194	1.359	20.30	27.58
MW-91	21.98	N/A	40.77	99.55	A/N	121.53	0.17	3.190	0.254	37.68	9.57
MW-92	30.76	N/A	36.77	87.64	N/A	118.40	0.17	1.020	0.254	12.05	3.06
MW-93	32.54	N/A	41.27	77.99	N/A	110.53	0.17	1.482	0.254	17.51	4.45
MW-94	36.26	N/A	39.60	72.40	N/A	108.66	0.17	0.567	0.254	6.70	1.70
MW-95	33.06	N/A	40.92	76.68	N/A	109.74	0.17	1.335	0.254	15.76	4.00
96-WW	32.26	NA	40.41	79.26	N/A	111.52	0.17	1.384	0.254	16.34	4.15
76-WW	27.20	N/A	40.71	87.64	N/A	114.84	0.17	2.294	0.254	27.09	6.88
MW-98	31.64	N/A	35.54	72.46	N/A	104.10	0.17	0.662	0.254	7.82	1.99
P21	32.78	31.31	36	82.01	1.47	114.79	0.17	0.547	0.254	6.46	1.64
MW-118	31.58	N/A	83	76.44	N/A	108.02	0.17	8.730	0.254	103.12	26.19
											_

# 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 November of 2002 are shown in Figures 4 and 5. To date a total of approximately 233,384 Gallons of groundwater and 20,690 gallons of free product have been recovered at the site.

TABLE 2 - SWMU 11 FREE-PRODUCT THICKN	ESS MEASUREMENTS	S (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
	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
	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
Water Marie Control	12/11/91	26.37	26.38	0.01
	12/03/92	31.18	31.24	0.06**
	5/6/93	30.44	30.44	SHEEN
	5/16/94	31.83	32.60	0.77
	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 ND
	5/12/03	ND	31.54	ND
MW-64	5/22/91	30.34	31.07	0,73
20mm/schild (4) 28	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***
	7/30/01	ND	32.22	ND***

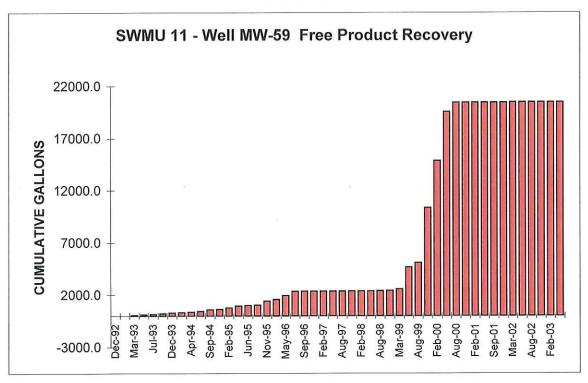
ND = None Detected; \* Measured following free product (LNAPL) bailing event on 6-19-92;

\*\* Measured just prior to installation of passive LNAPL recovery system;

\*\*\* Measured when pumps were temporarily removed from wells

TABI	LE 2 Continued - SW	/NU 11			
FREE	PRODUCT THICKN	ESS MEASUREMENT	S (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

FIGURE 4



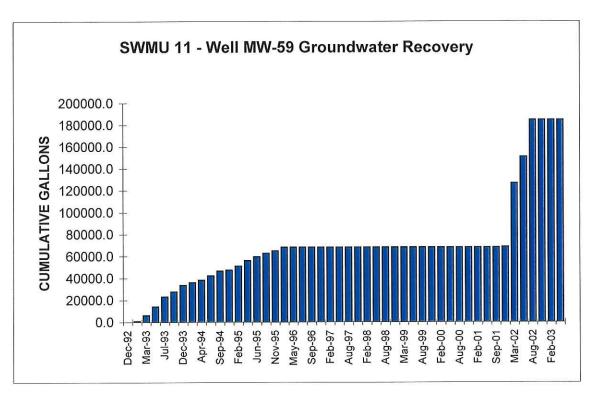
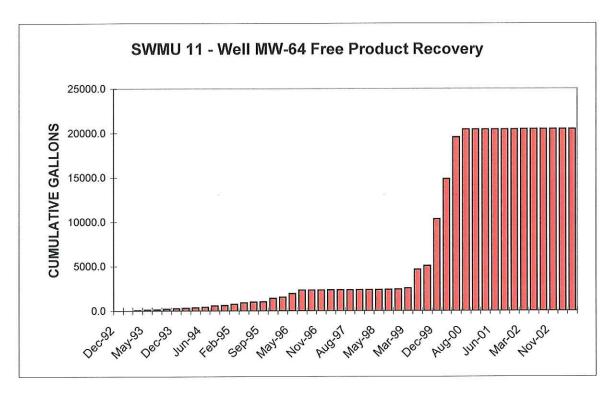
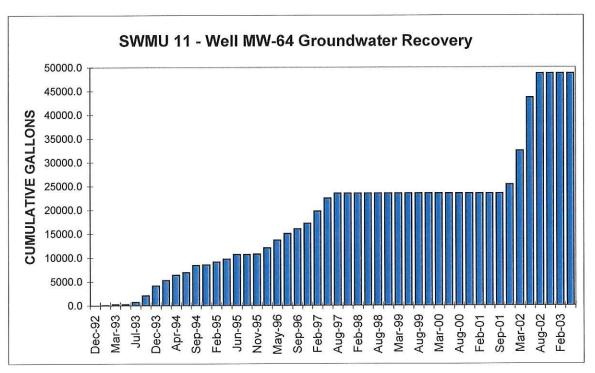


FIGURE 5





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<sup>th</sup>, 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, well MW-59 resumed recovery of free product and groundwater and MW-64 also 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 changed 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 29th, 2003, 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

Zinc

Copper

Vanadium

# 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

\*Not from Skinner list

**O&P** Xylene

# SEMI-VOLATILES ORGANICS (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

SWMU 11 Well Sampling Event	Impling Ev	ent					1	+	+	+	+					+		+			
May-03												1	$\dashv$	$\dashv$		+					
		표	and (	Cond	pH and Conductivity	<u>5</u>				+		+		+							
			1744	- 1								-	-	+	+	+	-				
			Well	well Numbers	ers	1	1	1	7	+	+	+	+	+	-	+	+		0		1
Parameter		29	8	61	62	8	4	92	9		93		4		_	-	P-21	27	001		Comments
pH Mean			7.3	7.4		7.2		7.2	7.1	7.0	7.0	7.3	7.1	7.2	7.1	7.1					
Conductivity			1020	860		840		720	790	820 2	230 8	810 8	810 8	820 7	710 1(	1060					
(mhos 10-3)											$\dashv$				$\dashv$	-					
SWMU 11 Well Sampling Event	umpling Eve	žť																			
May-03																					
	Method 8260B - Skinner Volatiles	8260	B-S	kinn	er Vo	atile	(l/gn) s	(L	)	(TABI	Щ	4)									
			Well	Well Numbers	ers																
Analytes		29	99	61	62	83	2	95	91	92	93	94	95	96	97	98 F	P-21	SB	Dup 60	Reporting	Comments
																				Limit	
Benzene			43	т		Б		P	밀	-	pu	рц	pu	pu	l pu	pu		рц	43	1.0	
1.4-Dioxane			Шu	Eu		Eu		шu	ш	шп	mn	mu	ш	nu L	nn r	ши		mu	mn m	50.0	
2-Butanone (MEK)			P	ם		g		pu	pu	pu	pu	pu	pu	pu	pu	멀		밀	ы	10.0	
Carbon Disulfide			멀	ы		ъ		pu	pu	pu	pu	pu	pu	pu	_ E	ы		p	pu	1.0	
Chlorobenzene			g	Б		힏		рц	pu	pu	pu	pu	pu	pu	- Pu	ы		힏	рu	1.0	
Chloroform			pu	Б		덛		pu	pu	pu	pu	pu	pu	pu Pu	pu	рu		-	nd	1.0	
1,2 Dichloroethane	m		~	ы		Б		27	pu	63	pu	pu	pu	ы	- Pu	ы		힏	-	1.0	
Ethylbenzene			-	ם		16		ם	nd	P	рц	pu	pu	pu	pu	pu		pu	_	1.0	
Styrene			밀	Б		pu		P	pu	pu	pu	pu	pu	pu	pu	pu		멸	pq	1.0	
Toluene			g	ы		P		힏	пd	ъ	pu	pu	pu	pu	pu	pu		ğ	pu	1.0	
1,1,1 - Trichloroethane	hane		nd	ם		P		ם	25	pu	pu	pu	pu	pu	pu	P P		ē	pu	1.0	
Trichloroethene			ם	ЪГ		밀		рu	pu	pu	pu	pu	pu	p D	면	힏		힏	рu	1.0	
Xylenes (total)			рu	pu		56		рц	pu	pu	pu	pu	pu	ьп	pu	pu		힏	ъ	2.0	

May-03 Method 8270C - Skinner Semi-Volati			_	_															
Method 827		4	-												-	+	1		
10 50 1011	0C - SI	kinn	er Ser	ni-Vo	latiles	(l/gn) s	_		<u>A</u>	BLE	2)								
	>	Vell N	Well Numbers																
Analytes	29 60		61 62	83	64	65	91	92	93	94	92	96	97	98 -G	P-21	SB Dup	09 di	Reporting	Comments
																1	-	Limit	
Anthracene	Q		ND	ND ND		ND	ND	QN	QN	QN	Q	Ð	2	Ω Q	2	N Q	QN Q	10	
Benzenethiol	Q.		ND	Q		Q.	Q	Ω	Q	ND	ND	Q	2	ND	2	N ON	Ð.	10	
Benzo(a)anthracene	S		N D	N N	_	S	Q.	Ð	Ð	Q	Ð	QN	Q.	Q	~	N O	Q.	10	
Benzo(b)fluoranthene	Ð		DN O	9		Q.	Q	Q	ND	N	Q.	Q	Ð	ND	_	N Q	Q.	10	
Benzo(k)fluoranthene	S		2	9		2	QN	ND	ND	ND	Q.	ND	Ð	Q.	_	N N	Q.	10	
Benzo(a)pyrene	S		Ð	9		Q	QN	Q	ND	N	S	Q	9	Q	~	N N	ND	9	
Butyl benzyl phthalate	Ω.		QN	2		₽ Q	ND	QN	ND	ND	ND	ND	2	QN Q	_	N ON	N O	10	
Chrysene	ð		ND	S	_	N	QN	Q.	ND	ND	Q	Q	2	Q	_	N N	ND	10	
Dibenz(a,h)anthracene	2		Q.	9	_	2	Ð	Q	ND	ND	N	Q	Q	ND	_	N Q	N O	10	
Di-n-butyl phthalate	S		ND	9	_	Q.	Ð	N	ND	QN	QN	QN	Ω	ND	_	N N	N N	10	
1,2-Dichlorobenzene	Q.		QN QN	Q.	_	N	ND	S	Q.	2	2	N	9	ND	_	N Q	Q	10	
1,3-Dichlorobenzene	QN		ND	9		Q.	Q.	N	Q	N	Q.	N	ð	Q	_	N O	QN Q	10	
1,4 Dichlorobenzene	QN.		ND	Q	_	N	ð	2	Q	Q	Q.	Ω	₽	Q	_	2 Q	₽ Q	10	
Diethyl phthalate	Z	N ON	Q.	Q.	_	ND	ND	QN	ND	N	N N	N	Ð	Q	_	N Q	ND	10	
7,12-Dimethylbenz(a)-				2															
anthracene	z	Q Q	Ð	8		ND	₽ Q	N	N	ND	ΔN	Q.	Ð	ND	_	N N	N N	10	
2,4-Dimethylphenol	m	36	Q.	N O		ND	ND	N	QN	Q	Ω	N <sub>O</sub>	N	Ω	_	ND N	24	10	224
Dimethyl phthalate	z	Q.	2	9	_	ND	ND	QN	Q	Q	R	N	Ð	Ω	_	N ON	Ð	10	
2,4 Dinitrophenol	QN		QN Q	Q.	_	ND	Q	QN	Q	ND	Q	ND	Q.	Ω	_	N O	<del>Q</del>	10	
Di-n-octyl phthalate	Ð		ND	2	_	ND	ND	Q	N	Q	Q	Q.	2	Q		N ON	Q.	10	
Indene	z	2	Q.	2	_	Ð	N	Q	ND	ND	ND	ND	N	Ω	_	N O	Ð	10	
bis(2-ethylhexyl)-				S													1		
phthalate	z	Q.	ND	Q.		ND	ND	ND	2	Q	Ω	45	2	ND		N N	Q.	10	Contamination
1-Methylnaphthalene	z	Q.	ND	20		N	N	Ω	2	Q	Q	Q.	S	ND		N ON	N O	10	
Fluoranthene	Z	QN ON	Q.	ND	•	9	Ω	Q.	2	R	2	Ð	2	Ω		2 Q	Ω	10	
2-Methylnaphthalene	Z	ND ON	ND	14		N N	N	8	9	N N	g	N	9	NΩ	-	2 Q	Q.	10	
2-Methylphenol	Z	QN QN	Q.	2	_	2	9	9	₽	9	2	9	9	9		<u> </u>	9	10	

SWMU 11 Well Sampling Event	vent						1			1										
May-03														$\dashv$	1	1				
Method 8270 - Skinner Semi-Volatiles (ug/l)	270 -	Skin	ner S	-ime	<b>olati</b>	n) sə	(l/b)	5	)	(TABLE		5 Co	Continued)	(per						
												+	1	+	+	+	$\dagger$			
		Wel	Well Numbers	ers	1				+	4	$\dagger$	+	+	+	-	_				
Analytes	22	09	19	62	8	2	65	9	92	83	8	95	96	97	88	P-21	SB	100	Reporting	Comments
									+	+		-	+	+		+	+			
4-Methylphenol		N	Ð		₽		₽	Ð	2	Q.	<sub>S</sub>	9	Q.	2	Ð	1	9	Q.	10	
Naphthalnene		Ω	Q		12		QN	ND ND	Q.	Q	Q.	Q.	N Q	Q.	N Q		Ð	Q.	10	
4-Nitrophenol		Q	Q		9		9	Ð	9	Ð	Q.	Q.	N Q	9	ND		ND	ND	10	
Pyridine		2	2		2		2	Ð.	9	Q.	Ð	Q	ND	ND I	ND		ND	ND	10	22
Quinoline		S	2		9		2	Q.	QN	ND	D	ND	ND	ND	ND		Ω	Q.	10	,
Phenanthrene		Q	9		14		ND	QN	ND	Q.	Q.	Q.	Q.	<u>و</u>	Q.	10	Q.	ΔN	10	
Phenol		Q	2		Q.		ND	ND	N Q	Ð	Ð	Ð	₽ P	2	₽ P		Ð.	ΩN	10	
Pyrene		9	Q		Ð		9	Q.	9	N Q	N	Q.	N		ND		2	ND	10	
Methyl Chrysene		Q	Q		Q.		N	ND	ND	DN	ND	QN	Ω	<u>Q</u>	ND		Q.	ND	10	
												NAME OF		The state of the s						
SWMU 11 Well Sampling Event	vent														-					
May-03																				
NW Total Extractable Hydrocarbons as	ractal	ole H	/droc	arbo	ns as		Diesel (mg/l)	(l/b			IABLE		<u> </u>					1		
														+						
		Wei	Well Numbers	ers							1	1	1	+	+				130	3
Analytes	29	8	61	62	8	49	92	9	35	8	8	95	မ္တ	26	88	P-21	SB	dnO 09	Reporting	Comments
NWTPHdx		2.5	2.8		49.4		0.3	2	8.0	0.7	4.0	Q Q	QN Q	N D	QN		S	8.9	0.3	

# 3.1 'SKINNER LIST' VOLATILE ORGANICS

No volatile organics were detected in groundwater above reporting limits for wells MW-93 through MW-97 and MW-98. Table 4 summarizes the levels of volatile organics above PQL's found in other wells at the site. Additional 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 well MW-60. As this material was never previously reported at the site and was not detected in any other wells upgradient of MW-60, it is believed that this may be an anomalous value. Bis(2-ethylhexyl)phthalate was detected in well MW-96. 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 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 2003/2004. 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 29, 2003 SAMPLING ROUND



425-420-9200 11115 E Montgomery Suite B, Spokane, WA 99206-4776 9405 SW Nimbus Ave, Beaverton, OR 97008-7132 11720 North Creek Pkwy N Suite 400, Bothell, WA 98011-9508 20332 Empire Ave Suite F-1, Bend, OR 99701-5711

FAX 420-9210

OF OF NCA WO ID DATE: 5/32/03 <1 FAX 334-9210 FAX 906-9210 Work Order #: 4550 2376. Turnaround Requests less than standard may incur Rush Charges FAX 924-9290 FAX 382-7588 C. S.C. PAGE ٧. TURNAROUND REQUEST TIME: Petroleum Hydrocarbon Analyses DATE: TIME COMMENTS LOCATION/ Organic & Inorganic Analyses in Business Days \* TEMP: 509-924-9200 907-334-9200 503-906-9200 541-383-9310 т 7 Specify: 4 m なえ # OF ς. 5 OTHER 10-101 0 C 0 0 FIRM: 3209 Denali St, Anchorage, AK 99503-4030 4 it Vt Ft 7 FIRM: (W, S, O) t 2 A B T (1 が存むいい。このよう Wrong Ph NEANEL 竹艺 华太 77.2 せば 传云 3 Ses. Nos 3 Container D Chas Container D has Contrain 1 Continert Contdiner D ContainerD RECEIVED BY: REQUESTED ANGLESTED ANGLES RECEIVED BY: PRINT NAME: PRINT NAME: X  $\geq$ 2  $\geq$ Z 25 X  $\geq$ X 5 PRESERVATIVE CHAIN OF CUSTODY REPORT DATE 5.29.03 P.O. NUMBER. Ø  $\leq$ TIME: ADY 25 25 **2** 3  $\simeq$ 2  $\simeq$ INVOICE TO TIME: DATE: 7494V K 2  $\geq$ 25 > 75 X FEDD-1888 7 HATEN PRINT NAME: ADRIAH KOOLMAN FIRM: WIRS 8 8 Christs 8 8 <u>X</u> 3 S X 25 FIRM: M DATE/TIME SAMPLING 5.39.0 Rhode 8505 S. 1e, ANACOTTES, SAMPLED BY: KOCIM AM PROJECT NAME: SUOM LL REPORT TO: B-14N DENTIFICATION CLIENT SAMPLE PROJECT NUMBER: ADDITIONAL REMARKS: RELEASED BY: 8 0 RELEASED BY: ADDRESS: ひの PRINT NAME: 6 O CLIENT: PHONE: COC REV 1/03



NCA WOLD 6.8° C PAGE 2 OF 2 9 <1 3 DATE: 5/33/83 FAX 420-9210 907-334-9200 FFAX 334-9210 FAX 924-9290 FAX 906-9210 FAX 382-7588 Turnaround Requests less than standard may incur Rush Charges. ۲ Work Order #: 455023 TURNAROUND REQUEST Petroleum Hydrocarbon Analyses TIME DATE: TIME: COMMENTS LOCATION/ Organic & Inorganic Analyses in Business Days \* TEMP: 541-383-9310 503-906-9200 425-420-9200 509-924-9200 3 Specify: 4 WEAVER FIRM: NOW # OF CONT. OTHER 5 20332 Empire AverSuite F-1, Bend, OR 99701-5711 3209 Denali St, Anchorage, AK 99503-4030 11115 E Montgomery Suite B, Spokane, WA 99206-4776 11720 North Creek Pkwy N Suite 400, Bothell, WA 98011-9508 9405 SW Nimbus Ave, Beaverton, OR 97008-7132 2 MATRIX (W, S, O) 3 83E0743 PRINT NAME: COlette RECEIVED BY: RECEIVED BY: PRINT NAME: L 1-1-1 L 51114 L 511011 0988  $\sim$ 25 25 PRESERVATIVE CHAIN OF CUSTODY REPORT DATE: 5,89,03 200 MOIN P.O. NUMBER: X K X INVOICE TO: S TIME: DATE: TIME: MACONTES, WA 98221.06-2 8 X 0 X MATUL A MASS FIRM: 4/10/5 8  $\simeq$ 25 Chests 5.29.03 FIRM: BriAN Khodes SAMPLING DATE/TIME KOLMBA PROJECT NAME: SUM MU SAMPLED BY: KONIMAN 505 8, CLIENT SAMPLE DENTIFICATION PROJECT NUMBER: ADDITIONAL REMARKS: CLENT: She REPORT TO: 3 PRINT NAME: [ RELEASED BY: RELEASED BY: ADDRESS: PRINT NAME: PHONE: COC REV 1/03



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19 June 2003

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

RE: SWMU 11 Sampling

Enclosed are **amended** results of analyses for samples received by the laboratory on 05/30/03 11:05. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jeanne Garthwaite

Jeanne Garthwate

Project Manager



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# CASE NARRATIVE for B3E0743

Client: Shell – Puget Sound Plant Project Manager: Brian Rhodes Project Name: SWMU 11 Sampling

Project Number: 4550237616

### 1.0 DESCRIPTION OF CASE

Fourteen water samples were submitted for the following analyses: Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up); Total Metals by EPA 6000/7000 Series Methods; Volatile Organic Compounds (Modified Skinner List) by EPA Method 8260B; and Semivolatile Organic Compounds (Modified Skinner List) by EPA Method 8270C.

#### 2.0 COMMENTS ON SAMPLE RECEIPT

Samples were received and logged in May 30, 2003, at a temperature of 6.8° C. The following anomalies were noted at sample receipt:

- The sample receipt temperature of 6.8° C was slightly outside the recommended temperature range of 2° to 6° C. Samples were processed as scheduled per the chain of custody document (COC).
- Sample IDs did not match among the sample containers and the COC—in most cases, the sample label IDs included an "MW" designator, but the COC IDs did not. All samples were logged in according to the IDs listed on the COC.

### 3.0 PREPARATIONS AND ANALYSIS

# Semivolatile Petroleum Products by NWTPH-Dx (w/o Acid/Silica Gel Clean-up)

Surrogate recoveries for sample B3E0743-09 were low outside of established control limits of 50-150%. The samples were rerun and the results were confirmed. There was no sample volume remaining to allow re-extraction. The analyte concentrations may be biased low. Other anomalies, discrepancies, and issues associated with sample preparation, analysis and quality control are qualified in the data and described in the Notes and Definitions page at the end of this report.

## Total Metals by EPA 6000/7000 Series Methods

No anomalies were associated with sample preparation and analysis. All criteria for acceptable QC measurements were met.

# Volatile Organic Compounds (Modified Skinner List) by EPA Method 8260B

No anomalies were associated with sample preparation and analysis. All criteria for acceptable QC measurements were met.



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# Semivolatile Organic Compounds (Modified Skinner List) by EPA Method 8270C

No anomalies were associated with sample preparation and analysis. All criteria for acceptable QC measurements were met.

"I certify that this data package is in compliance with the Contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Director or his designee, as verified by the following signature."

Jeanne Garthwaite Project Manager

North Creek Analytical



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Shell - Puget Sound Plant 8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

### **ANALYTICAL REPORT FOR SAMPLES - Amended**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
92	B3E0743-01	Water	05/29/03 12:00	05/30/03 11:05
91	B3E0743-02	Water	05/29/03 12:00	05/30/03 11:05
93	B3E0743-03	Water	05/29/03 12:00	05/30/03 11:05
60	B3E0743-04	Water	05/29/03 12:00	05/30/03 11:05
61	B3E0743-05	Water	05/29/03 12:00	05/30/03 11:05
94	B3E0743-06	Water	05/29/03 12:00	05/30/03 11:05
98	B3E0743-07	Water	05/29/03 12:00	05/30/03 11:05
95	B3E0743-08	Water	05/29/03 12:00	05/30/03 11:05
96	B3E0743-09	Water	05/29/03 12:00	05/30/03 11:05
97	B3E0743-10	Water	05/29/03 12:00	05/30/03 11:05
63	B3E0743-11	Water	05/29/03 12:00	05/30/03 11:05
65	B3E0743-12	Water	05/29/03 12:00	05/30/03 11:05
100	B3E0743-13	Water	05/29/03 12:00	05/30/03 11:05
BLANK	B3E0743-14	Water	05/29/03 12:00	05/30/03 11:05

North Creek Analytical - Bothell

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Project: SWMU 11 Sampling

Project Number: 4550237616

Project Manager: Brian Rhodes

**Amended Report** 

Issued: 06/19/03 10:35

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

		Reporting		E 189 - 10	261 0		(1) (4) 4)		N .
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
92 (B3E0743-01) Water	Sampled: 05/29/03 12:00	Received: 0:	5/30/03 11:05						
Diesel Range Hydrocarbo	ns 0.849	0.250	mg/l	1	3F02012	06/02/03	06/05/03	NWTPH-Dx	
Lube Oil Range Hydrocarb	ons ND	0.500	"	ű			"	"	
Surrogate: 2-FBP	84.7 %	50-150			"	"	"	"	
Surrogate: Octacosane	79.8 %	50-150			"	"	"	<i>u</i>	
91 (B3E0743-02) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:05						
Diesel Range Hydrocarbon	s ND	0.250	mg/l	1	3F02012	06/02/03	06/04/03	NWTPH-Dx	
Lube Oil Range Hydrocarb	ons ND	0.500	30.7			"	"	"	
Surrogate: 2-FBP	83.2 %	50-150			m	n	"	"	**
Surrogate: Octacosane	90.8 %	50-150			"	<b>11</b> 2		"	
93 (B3E0743-03) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:05						
Diesel Range Hydrocarbo	ns 0.655	0.250	mg/l	1	3F02012	06/02/03	06/05/03	NWTPH-Dx	D-06
Lube Oil Range Hydrocarb	ons ND	0.500	*	n,	(tt)	"	"	u	
Surrogate: 2-FBP	83.7 %	50-150			n	30	"	"	
Surrogate: Octacosane	92.3 %	50-150			n	"	"	"	
60 (B3E0743-04) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:05			1824			
Diesel Range Hydrocarbo	ns 2.52	0.250	mg/I	1	3F02012	06/02/03	06/05/03	NWTPH-Dx	
Lube Oil Range Hydrocarb	ons ND	0.500	n	u	Ü	"	11	п	
Surrogate: 2-FBP	93.4 %	50-150			u	"	"	"	
Surrogate: Octacosane	87.5 %	50-150			<i>n</i>	<i>:#</i>	"	"	
61 (B3E0743-05) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:05						
Diesel Range Hydrocarbo	ons 2.75	0.250	mg/l	1	3F02012	06/02/03	06/04/03	NWTPH-Dx	
Lube Oil Range Hydrocarb		0.500	**	žII.	. 11	n	u	II .	
Surrogate: 2-FBP	71.6 %	50-150			"	w	"	u	
Surrogate: Octacosane	58.3 %	50-150			"	"	"	<i>n</i> :	
1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -									

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Shell - Puget Sound Plant

8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes **Amended Report** 

Issued: 06/19/03 10:35

# 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 (B3E0743-06) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:0	5					
Diesel Range Hydrocarbo	ons 0.417	0.250	mg/l	1	3F02012	06/02/03	06/05/03	NWTPH-Dx	
Lube Oil Range Hydrocarb	oons ND	0.500	11	11	11	u u	"		
Surrogate: 2-FBP	83.3 %	50-150			"	"	"	"	
Surrogate: Octacosane	81.9 %	50-150			"	"	"	"	
98 (B3E0743-07) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:0	5					
Diesel Range Hydrocarbor	ns ND	0.250	mg/I	1	3F02012	06/02/03	06/04/03	NWTPH-Dx	
Lube Oil Range Hydrocart	oons ND	0.500	,11	.10	"	ii	"	10	
Surrogate: 2-FBP	71.6 %	50-150			"	11	"	"	
Surrogate: Octacosane	62.1 %	50-150			"	"	"	"	
95 (B3E0743-08) Water	Sampled: 05/29/03 12:00	Received: 0	05/30/03 11:0	5					
Diesel Range Hydrocarbon	ns ND	0.250	mg/l	1	3F02012	06/02/03	06/04/03	NWTPH-Dx	
Lube Oil Range Hydrocarl	bons ND	0.500	"	"	11	TIC.	л	"	
Surrogate: 2-FBP	82.5 %	50-150			"	"	<b>"</b>	. 11	
Surrogate: Octacosane	86.0 %	50-150			u.		"	"	
96 (B3E0743-09) Water	Sampled: 05/29/03 12:00	Received: (	05/30/03 11:0	)5					
Diesel Range Hydrocarbon	ns ND	0.250	mg/l	. 1	3F02012	06/02/03	06/05/03	NWTPH-Dx	
Lube Oil Range Hydrocar	bons ND	0.500	"	11			и	"	
Surrogate: 2-FBP	%	50-150			"	n	"	"	X
Surrogate: Octacosane	%	50-150			11%	""	"	"	X
97 (B3E0743-10) Water	Sampled: 05/29/03 12:00	Received: (	05/30/03 11:0	)5					
Diesel Range Hydrocarbo	ns ND	0.250	mg/l	1	3F02012	06/02/03	06/04/03	NWTPH-Dx	
Lube Oil Range Hydrocar	The second secon	0.500	п	11	"	***	"		
Surrogate: 2-FBP	79.2 %	50-150			"	"	"	n.	
Surrogate: Octacosane	80.5 %	50-150			"	"	n	<i>II</i>	

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8505 South Texas Road Anacortes WA, 98221

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Project Manager: Brian Rhodes

**Amended Report** 

Issued: 06/19/03 10:35

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

Analyte Resu	Reporting lt Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
63 (B3E0743-11) Water Sampled: 05/29/03 12:	00 Received:	05/30/03 11:	05					
Diesel Range Hydrocarbons 49.	4 5.00	mg/l	20	3F02012	06/02/03	06/05/03	NWTPH-Dx	
Lube Oil Range Hydrocarbons N	D 10.0	Ü	11	ü		ű .	II .	
Surrogate: 2-FBP	% 50-150			"	"	"	"	S-01
	% 50-150			<i>11</i> °	"	n :	#B	S-01
65 (B3E0743-12) Water Sampled: 05/29/03 12:	00 Received:	05/30/03 11:	05			27		, <sup>©</sup>
Diesel Range Hydrocarbons 0.32	7 0.250	mg/l	1	3F02012	06/02/03	06/04/03	NWTPH-Dx	
Lube Oil Range Hydrocarbons N	D 0.500	n n	**	. "	311	"	ü	
Surrogate: 2-FBP 72.8	% 50-150			"	. "	"	***	
Surrogate: Octacosane 69.4	% 50-150			"	"	"	u	
100 (B3E0743-13) Water Sampled: 05/29/03 12	:00 Received	: 05/30/03 11	:05					
Diesel Range Hydrocarbons 6.8	30 1.25	mg/l	5	3F02012	06/02/03	06/05/03	NWTPH-Dx	
Lube Oil Range Hydrocarbons N	D 2.50	11	"	, u	2	0	u .	
Surrogate: 2-FBP 68.4	% 50-150			,,	11	"	"	
Surrogate: Octacosane 59.3	% 50-150			"	"	"	"	
BLANK (B3E0743-14) Water Sampled: 05/29/	03 12:00 Rece	eived: 05/30/	03 11:05				(4)	
Diesel Range Hydrocarbons N	D 0.250	mg/l	1	3F02012	06/02/03	06/04/03	NWTPH-Dx	
Lube Oil Range Hydrocarbons N	D 0.500	.11	"	n	ii .	11		
Surrogate: 2-FBP 84.6	% 50-150		·	"	"	"	u.	
Surrogate: Octacosane 92.3	% 50-150			"	"	77	n	

North Creek Analytical - Bothell

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Shell - Puget Sound Plant

Project: SWMU 11 Sampling

8505 South Texas Road Anacortes WA, 98221

Project Number: 4550237616 Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
92 (B3E0743-01) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:05	5					
Silver	ND	0.00100	mg/l	1	3F02032	06/02/03	06/03/03	EPA 6020	
Arsenic	0.0113	0.00100	Ü	**	11	ii.	300	911	
Barium	0.0396	0.0100	"	11	iii	u	11	11	
Beryllium	ND	0.00100	"	10	11	310	600.	n	
Cadmium	0.00233	0.00100	ũ	11	"	n	u	516	
Cobalt	ND	0.00100	u	ж		. 11		<u>u</u> =	
Chromium	ND	0.00100	22	"	u		30	.100	
Copper	0.0116	0.00100	ñ	"		41	"	u,	
Mercury	ND	0.00100	"	ાન	3F04015	06/04/03	06/05/03	EPA 7470A	
Nickel	0.00343	0.00100		"	3F02032	06/02/03	06/03/03	EPA 6020	12
Lead	0.00657	0.00100	,11:	ü	ű	11	n	ü	
Antimony	ND	0.00300		""	n e	300	ш	"	
Selenium	ND	0.00100	"	ü	Ü	11	ÿ -	<u>u</u>	
Vanadium	0.00450	0.00100	п	α		w	n	"	
92 (B3E0743-01RE1) Wa	ater Sampled: 05/29/03 12	2:00 Receive	ed: 05/30/03	11:05					
Zinc	0.0198	0.0100	mg/l	1	3F03032	06/03/03	06/05/03	EPA 6020	
91 (B3E0743-02) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:0:	5					
Silver	ND	0.00100	mg/l	1	3F02032	06/02/03	06/03/03	EPA 6020	
Arsenic	0.00211	0.00100	(11)	в	n	"	Ü	•	
Barium	0.0455	0.0100	"		"	"	u	30/3	
Beryllium	ND	0.00100	11	11"		ĬĬ.	"	11	
Cadmium	ND	0.00100	n	900	(110)	"	11.		
Cobalt	ND	0.00100	**		u.	"	n.	m:	
Chromium	ND	0.00100	:11	0	11	n		11	
Copper	0.00328	0.00100		n	310		30.2	an:	
Mercury	ND	0.00100	11	**	3F04015	06/04/03	06/05/03	EPA 7470A	
Nickel	0.00477	0.00100	int	an:	3F02032	06/02/03	06/03/03	EPA 6020	
Lead	0.0101	0.00100			u	n t	300	aus	
Antimony	ND	0.00300	11	11		11	n	10	
Selenium	ND	0.00100	100	300	311	3115	:10:	11	
SCICIIIIIII	11,20								

North Creek Analytical - Bothell

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Shell - Puget Sound Plant

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

4550227616

Project Number: 4550237616

Project Manager: Brian Rhodes

Amended Report Issued: 06/19/03 10:35

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
91 (B3E0743-02RE1) Water	Sampled: 05/29/03 12	:00 Received	d: 05/30/03 1	1:05					
Zinc	0.0318	0.0100	mg/l	1	3F03032	06/03/03	06/05/03	EPA 6020	
93 (B3E0743-03) Water Sam	pled: 05/29/03 12:00	Received: 05	/30/03 11:05						
Silver	ND	0.00100	mg/l	1	3F02032	06/02/03	06/03/03	EPA 6020	
Arsenic	0.0396	0.00100			11)	11		m:	
Barium	0.0357	0.0100	n .	"	"	ï	**		
Beryllium	ND	0.00100	w	316	316	"	"		
Cadmium	0.00623	0.00100	,u		THE STATE OF THE S			30%	
Cobalt	ND	0.00100	.10	10	41	Ü		11	
Chromium	ND	0.00100			**		ж	"	
Copper	0.00502	0.00100	п		•	•	ii.	m:	
Mercury	ND ND	0.00100	: 10	:10	3F04015	06/04/03	06/05/03	EPA 7470A	
Nickel	0.00221	0.00100	n .	TH.	3F02032	06/02/03	06/03/03	EPA 6020	
Lead	0.00154	0.00100	30	m	11	"	,,,	11	
Antimony	ND	0.00300	w	in:	316	311	au	u	
Selenium	ND	0.00100	ü	300		10		546	
Vanadium	ND	0.00100	н	310	n	) t	n	и	
93 (B3E0743-03RE1) Water	Sampled: 05/29/03 12	2:00 Receive	d: 05/30/03	11:05					
Zinc	0.0748	0.0100	mg/l	1	3F03032	06/03/03	06/05/03	EPA 6020	
60 (B3E0743-04) Water San	npled: 05/29/03 12:00	Received: 05	5/30/03 11:05	5					
Silver	ND	0.00100	mg/l	1	3F02032	06/02/03	06/03/03	EPA 6020	
Arsenic	0.00613	0.00100	"	ii.	ű	.0	"	11	
Barium	0.562	0.0200	"	2	u	.10	06/03/03	u	
Beryllium	ND	0.00100	ñ	1	ij	11	06/03/03	<u>n</u>	
Cadmium	0.00113	0.00100	n 5:	,,	"		Ü	Ü	
Cobalt	ND	0.00100	n.	n n	ü	ar	11	11	
Chromium	0.00158	0.00100	**		ü	"	Ü	n	
Copper	0.00231	0.00100	u	u	11	231	u	n	
Mercury	ND	0.00100		11	3F04015	06/04/03	06/05/03	EPA 7470A	
Nickel	0.00222	0.00100	<b>11</b> 5		3F02032	06/02/03	06/03/03	EPA 6020	
Lead	ND	0.00100	w.	y.	11	- 11	U	.0.:	
Antimony	ND	0.00300	11	,,		u			
Selenium	0.00177	0.00300	ж	11.5	.002	"	ii .	m.	
Vanadium	0.00177 ND	0.00100	'n		11	22	n:	.002	
v anaurum	ND	0.00100							

North Creek Analytical - Bothell

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Page 6 of 54



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Shell - Puget Sound Plant 8505 South Texas Road

Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Note
(0 (D2E0742 04DE1) Wa	nter Sampled: 05/29/03 12	0.00 Receive	a∙ 05/30/03 1	11:05					
Zinc	ND	0.0100	mg/l	1	3F03032	06/03/03	06/05/03	EPA 6020	
61 (B3E0743-05) Water	Sampled: 05/29/03 12:00	Received: 05	5/30/03 11:05	5					
Silver	ND	0.00100	mg/l	1	3F02032	06/02/03	06/03/03	EPA 6020	
Arsenic	0.00561	0.00100			"	311	, n	ű	
Barium	0.0433	0.0100		"		11		"	
Beryllium	ND	0.00100	n .	**	11"	ű.	Ü	n	
Cadmium	0.00211	0.00100	11	"	11	<u>u</u>	"	u.	
Cobalt	ND	0.00100	3113	n	11	"	n	9	
Chromium	ND	0.00100		117	н	n n	u	11	
Copper	0.00329	0.00100		n	n	"	W	310	
Mercury	ND	0.00100		***	3F04015	06/04/03	06/05/03	EPA 7470A	
Nickel	0.0101	0.00100	**	п	3F02032	06/02/03	06/03/03	EPA 6020	
Lead	ND	0.00100	.11		n	ii	11	m.	
Antimony	ND	0.00300	10	3117	317	311	11	11	
Selenium	ND	0.00100	u	,,	n	90%	TO THE	и.	
Vanadium	0.00446	0.00100	11.	(9)	"	11	11	п	
61 (B3E0743-05RE1) W:	ater Sampled: 05/29/03 1	2:00 Receive	ed: 05/30/03	11:05				*	
Zinc	ND	0.0100	mg/l	1	3F03032	06/03/03	06/05/03	EPA 6020	
	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:0	5					
Silver	ND	0.00100	mg/l	1	3F02032	06/02/03	06/03/03	EPA 6020	
Arsenic	0.00506	0.00100	"	ii.	**	Ü	'n	in .	
Barium	0.0444	0.0100	"	ΞŒ	m	***	n	•	
Beryllium	ND	0.00100	u	11	ü	11	ı	200	
Cadmium	0.00214	0.00100	"	110	"	10	"	a	
Cobalt	0.00176	0.00100	ņ	u	<u>n</u>	216	211	u	
Chromium	ND	0.00100		ü	"		9	"	
Copper	0.00266	0.00100	1100	"	11	::O	u		
Mercury	ND	0.00100		Ü	3F04015	06/04/03	06/05/03	EPA 7470A	
Nickel	0.00997	0.00100	41%	11	3F02032	06/02/03	06/03/03	EPA 6020	
Lead	ND	0.00100	200	0	301	11	11	**	
Antimony	ND	0.00300	n		11	Ü	"	n	
Selenium	ND	0.00100	***	10%	u	ii	u		
Vanadium	0.00267	0.00100	u	u	n	"	H.	11	

North Creek Analytical - Bothell

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Shell - Puget Sound Plant

8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
94 (B3E0743-06RE1) Water Sampled: 0	5/29/03 12	:00 Received	d: 05/30/03 1	1:05			#		
Zinc	0.0240	0.0100	mg/l	1	3F03032	06/03/03	06/05/03	EPA 6020	
98 (B3E0743-07) Water Sampled: 05/29	/03 12:00	Received: 05	/30/03 11:05	5	9.			.4	
Silver	ND	0.00100	mg/l	1	3F02032	06/02/03	06/03/03	EPA 6020	
Arsenic	0.00155	0.00100	п	11	11	W		"	
Barium	0.0904	0.0100	n	300	300	a 115	.11		
Beryllium	ND	0.00100	u	11	11	"	"	/HC	
Cadmium	0.0162	0.00100	÷10	:10:	**	10.	311	"	
Cobalt	ND	0.00100	п	н	316	303		11	
Chromium	ND	0.00100	ι <del>š</del>	. "		"	11	Off	
Copper	0.00786	0.00100	"	-11	.11		."		E
Mercury	- ND	0.00100	ŭ		3F04015	06/04/03	06/05/03	EPA 7470A	
Nickel	0.0101	0.00100	"	ü	3F02032	06/02/03	06/03/03	EPA 6020	
Lead	ND	0.00100	Ж	ш	"	303	11	ü	
Antimony	ND	0.00300	ü -	Ü	u.	in.	TI .	n	
Selenium	ND	0.00100	**	п	ü	11	**		
Vanadium	0.00804	0.00100	ü	"	**	210	u	"	
98 (B3E0743-07RE1) Water Sampled: (	5/29/03 12	2:00 Receive	d: 05/30/03	11:05					
Zinc	0.0267	0.0100	mg/l	1	3F03032	06/03/03	06/05/03	EPA 6020	
95 (B3E0743-08) Water Sampled: 05/29	/03 12:00	Received: 05	5/30/03 11:0:	5					
Silver	ND	0.00100	mg/l	1	3F02032	06/02/03	06/03/03	EPA 6020	
Arsenic	0.00264	0.00100		9	307	"	"	"	
Barium	0.0469	0.0100	n		11	Ü	Ü	11	
Beryllium	ND	0.00100	100	311.5	311.5	"	9		
Cadmium	0.00154	0.00100	(11)	11	11	**	n	an:	
Cobalt	0.00348	0.00100	30.5			**	_ "	n	
Chromium	ND	0.00100	u	110	(10)			u	
Copper	0.00326	0.00100	30	100	.00	0	n	300	
Mercury	ND	0.00100	300	311.3	3F04015	06/04/03	06/05/03	EPA 7470A	
Nickel	0.0177	0.00100	(11)	110	3F02032	06/02/03	06/03/03	EPA 6020	
Lead	ND	0.00100	iii.	- 10	n		111	u	
Antimony	ND	0.00300	SHE	au:	an. ::	11	III	n	
Selenium	ND	0.00100	u	**	n	316	H	200	
Vanadium	0.00454	0.00100	20.	n	n	n	111	п	

North Creek Analytical - Bothell

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Shell - Puget Sound Plant 8505 South Texas Road

Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
95 (B3E0743-08RE1) Water	Sampled: 05/29/03 12	:00 Received	d: 05/30/03 1	1:05					5
Zinc	0.0229	0.0100	mg/l	1	3F03032	06/03/03	06/05/03	EPA 6020	
96 (B3E0743-09) Water Sa	mpled: 05/29/03 12:00	Received: 05	5/30/03 11:05						
Silver	ND	0.00100	mg/l	1	3F02032	06/02/03	06/03/03	EPA 6020	
Arsenic	0.0185	0.00100	11	ņ	"	"	"		
Barium	0.0508	0.0100	.00	'n		Ü	"	n.	
Beryllium	ND	0.00100	11	7E/	100		"	n.	
Cadmium	0.00188	0.00100	11		,,	"	n	110	
Cobalt	0.0160	0.00100	11	30 (	,,,	10	n	"	
Chromium	ND	0.00100	.11	**	316	11		u.	
Copper	0.00145	0.00100	11	11				11	
Mercury	ND	0.00100	п	100	3F04015	06/04/03	06/05/03	EPA 7470A	
Nickel	0.0110	0.00100			3F02032	06/02/03	06/03/03	EPA 6020	
Lead	ND	0.00100	.11	***	n	"	n		
Antimony	ND	0.00300	II.	11	311		10.		
Selenium	ND	0.00100	.00	11		u	u	one.	
Vanadium	ND	0.00100	и		300	ii.	II		
96 (B3E0743-09RE1) Water	Sampled: 05/29/03 12	2:00 Receive	d: 05/30/03 1	1:05					
Zinc	0.0161	0.0100	mg/l	1	3F03032	06/03/03	06/05/03	EPA 6020	
97 (B3E0743-10) Water Sa	impled: 05/29/03 12:00	Received: 05	5/30/03 11:05	5					
Silver	ND	0.00100	mg/l	1	3F02032	06/02/03	06/03/03	EPA 6020	
Arsenic	0.00146	0.00100	II	3.00	.0	10	n	u	
Barium	0.0627	0.0100	<u>ū</u>	ü	и	30	3.00	ű	
Beryllium	ND	0.00100	"	ñ	11	11	· ·	ri .	
Cadmium	0.00495	0.00100	"	u	"	u		"	
Cobalt	ND	0.00100	Ü	u		ır	ø		
Chromium	ND	0.00100	21	"		•	"		
Copper	0.00407	0.00100	22	"	**	(311	ı	n	
Mercury	ND	0.00100	Ü		3F04015	06/04/03	06/05/03	EPA 7470A	
Nickel	0.00566	0.00100	900		3F02032	06/02/03	06/03/03	EPA 6020	
Lead	ND	0.00100		ij.	30%	"	н	110	
Antimony	ND	0.00300	u .	•		u	W	n .	
Selenium	ND	0.00100	**	3113	11	"		11	
Vanadium	0.00402	0.00100	u	11	ii.	ij	3113	m:	

North Creek Analytical - Bothell

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Shell - Puget Sound Plant 8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

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

			CAN ZAMAI,						
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
97 (B3E0743-10RE1) Wa	iter Sampled: 05/29/03 12	2:00 Receive	ed: 05/30/03	11:05					
Zinc	ND	0.0100	mg/l	1	3F03032	06/03/03	06/05/03	EPA 6020	
63 (B3E0743-11) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:0	)5					
Silver	ND	0.00100	mg/l	1	3F02032	06/02/03	06/03/03	EPA 6020	
Arsenic	0.00328	0.00100	ıı	n	u u	11	ä	11	
Barium	0.0439	0.0100	"	ñ	ï	11	Ü	n	
Beryllium	ND	0.00100	"	п	"	п	"		
Cadmium	ND	0.00100		"	Ü	u	"	U	
Cobalt	ND	0.00100	n .	"	"	OH - 3	"	"	
Chromium	ND	0.00100	<u>"</u>	ü		ч	7.	W	
Copper	ND	0.00100	ï	ü	Ü	"	n	Ü	
Mercury	ND	0.00100	11	ıı	3F04015	06/04/03	06/05/03	EPA 7470A	
Nickel	0.00270	0.00100	n	ű	3F02032	06/02/03	06/03/03	EPA 6020	
Lead '	ND	0.00100	n	n		11	ü	ï	
Antimony	ND	0.00300	ņ	$= - \underline{\alpha}$	"	11	11	n	
Selenium	ND	0.00100	ņ	ii	"	11	11		
Vanadium	ND	0.00100	0	**	**	·u	u	u	
63 (B3E0743-11RE1) Wa	iter Sampled: 05/29/03 12	2:00 Receive	ed: 05/30/03	11:05					
Zinc	ND	0.0100	mg/l	1	3F03032	06/03/03	06/05/03	EPA 6020	
65 (B3E0743-12) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:0	05					
Silver	ND	0.00100	mg/l	1	3F02032	06/02/03	06/03/03	EPA 6020	
Arsenic	0.00526	0.00100	"	"		u .	ñ	ũ.	
Barium	0.0327	0.0100	u	u u	n n	<u>u</u>	"	u ·	
Beryllium	ND	0.00100	"	ū	Ü	ii	11	11	
Cadmium	ND	0.00100	11.5	"	m :	II .	11	110	
Cobalt	ND	0.00100	11	2	ii	<u>u</u>	II	n .	
Chromium	ND	0.00100	n	"	**	ij	0	u .	
Copper	0.00229	0.00100	n	"	n	"	n .	n	
Mercury	ND	0.00100		11	3F04015	06/04/03	06/05/03	EPA 7470A	
Nickel	0.00306	0.00100	30.5	"	3F02032	06/02/03	06/03/03	EPA 6020	
Lead	ND	0.00100	"	u	n	u	"	п	
Antimony	ND	0.00300	"	v		n	n	n	
Selenium	ND	0.00100	11			"	n		
Vanadium	0.00804	0.00100		u	•	11	n		
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North Creek Analytical - Bothell

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Shell - Puget Sound Plant

8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes **Amended Report** 

Issued: 06/19/03 10:35

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
65 (B3E0743-12RE1) Water	Sampled: 05/29/03 12:	00 Receive	d: 05/30/03	11:05					
Zinc	0.0126	0.0100	mg/l	1	3F03032	06/03/03	06/05/03	EPA 6020	
100 (B3E0743-13) Water Sa	ampled: 05/29/03 12:00	Received: (	05/30/03 11	:05					
Silver	ND	0.00100	mg/l	1	3F02032	06/02/03	06/03/03	EPA 6020	
Arsenic	0.00590	0.00100	"	22	"	n	W :	III)	
Barium	0.568	0.0200	n .	2	"		06/04/03	H.	
Beryllium	ND	0.00100	n	1	117		06/03/03		
Cadmium	0.00123	0.00100	11	"		"	310	115	
Cobalt	ND	0.00100	311	."		H		11	
Chromium	0.00166	0.00100		11	**	30	310	u	
Copper	0.00237	0.00100	"		,,		ii ii	11	
Mercury	ND	0.00100	ш	**	3F04015	06/04/03	06/05/03	EPA 7470A	
Nickel	0.00230	0.00100		п	3F02032	06/02/03	06/03/03	EPA 6020	
Lead	ND	0.00100	11	11	.11	n	"	m ·	
Antimony	ND	0.00300	in .	30%	310	11.	11	"	
Selenium	0.00144	0.00100			"	11		211	
Vanadium	ND	0.00100	310	100	u	n	н	11	
100 (B3E0743-13RE1) Water	Sampled: 05/29/03 12	2:00 Receiv	ved: 05/30/	03 11:05					
Zinc	0.0163	0.0100	mg/l	1	3F03032	06/03/03	06/05/03	EPA 6020	
BLANK (B3E0743-14) Water	r Sampled: 05/29/03 1	2:00 Recei	ved: 05/30/	03 11:05					
Silver	ND	0.00100	mg/l	1	3F02032	06/02/03	06/03/03	EPA 6020	
Arsenic	ND	0.00100		11	11			•	
Barium	ND	0.0100	u	an .	n _	ж	3.00		
Beryllium	ND	0.00100	ű	n	п	11	w.	w	
Cadmium	ND	0.00100	"	201	· m	11	u	U	
Cobalt	ND	0.00100	**	n	11	œ	"	u	
Chromium	ND	0.00100	ii	700	u u		Ü	"	
Copper	ND	0.00100	и	ા	**	200	ñ	ü	
Mercury	ND	0.00100	Ü	i ii	3F04015	06/04/03	06/05/03	EPA 7470A	
Nickel	ND	0.00100	11	ü	3F02032	06/02/03	06/03/03	EPA 6020	
Lead	ND	0.00100	30	"	u	2011	11	***	
Antimony	ND	0.00300	u.	"	n	Ü	Ü	<b>11</b> 00	
Selenium	ND	0.00100	10.5		11	ï	Ü	n	
Vanadium	ND	0.00100		n.	n	"	11	н	

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Jeanne Garthoute



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Shell - Puget Sound Plant

8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616

Project Manager: Brian Rhodes

**Amended Report** 

Issued: 06/19/03 10:35

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

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
BLANK (B3E0743-14RE1) Water	Sampled: 05/29/0	03 12:00 R	eceived: 05	5/30/03 11:0	5				
Zinc	ND	0.0100	mg/l	1	3F03032	06/03/03	06/05/03	EPA 6020	

North Creek Analytical - Bothell

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Shell - Puget Sound Plant

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

Project Number: 4550237616 Project Manager: Brian Rhodes Amended Report Issued: 06/19/03 10:35

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

P2 (B3E0743-01) Water   Sampled: 05/29/03 12:00   Received: 05/30/03 11:05     1,1,1-Trichloroethane   ND   1.00   ug/l   1   3F09016   06/06/03   06/06/05   06/06	06/06/03 EPA 8260B	
1,2,4-Trimethylbenzene		
1,2,4-Trimethylbenzene       ND       1.00       "		
1,2-Dibromoethane       ND       1.00       "	.ii. u	
2-Butanone	" "	
Acetone		
Renzene         1.38         1.00         "         <	ii ii	
Benzene         1.38         1.00           Carbon disulfide         ND         1.00         " " " " " " " " " " " " " " " " " " "	ů "	
Chlorobenzene	ıı ıı	
Chloroform ND 1.00 " " " " " " " " " " " " " " " " " "	ŭ Ü	
Ethylbenzene ND 1.00 " " " " " " " " " " " " " " " " " "	п 0	
Ethylbenzene ND 1.00 " " " " " " " " " " " " " " " " " "	n n	
m,p-Xylene       ND       2.00         n-Butylbenzene       ND       1.00       "       "       "         n-Propylbenzene       ND       1.00       "       "       "         o-Xylene       ND       1.00       "       "       "         p-Isopropyltoluene       ND       1.00       "       "       "         Styrene       ND       1.00       "       "       "         Toluene       ND       1.00       "       "       "         Trichloroethene       ND       1.00       "       "       "         Surrogate: 1,2-DCA-d4       102 %       70-130       "       "       "         Surrogate: Toluene-d8       104 %       70-130       "       "       "	" "	
n-Butylbenzene ND 1.00 " " " " " " " " " " " " " " " " " "	n ns	
o-Xylene ND 1.00 " " " " " " " " " " " " " " " " " "	n n	
o-Xylene         ND         1.00         " <t< td=""><td>n n</td><td></td></t<>	n n	
Styrene	п	
Toluene ND 1.00 " " " " " Trichloroethene ND 1.00 " " " " " " " " " " " " " " " " " "	n n	
Trichloroethene ND 1.00 " " " " " " " " " " " " " " " " " "	11.	
Surrogate: 1,2-DCA-d4         102 %         70-130         "         "           Surrogate: Toluene-d8         104 %         70-130         "         "	11	
Surrogate: 1,2-DCA-d4       102 % 70-130         Surrogate: Toluene-d8       104 % 70-130         " "	п	
Surrogate: Toluene-d8 104 % 70-130 " "	n n	
AND THE PROPERTY OF THE PROPER	m m	
Surrogue, T-DI'D	"	
92 (B3E0743-01RE1) Water Sampled: 05/29/03 12:00 Received: 05/30/03 11:05		
<b>1,2-Dichloroethane 62.9</b> 4.00 ug/l 4 3F09021 06/09/03 06	06/10/03 EPA 8260B	
Surrogate: 1,2-DCA-d4 98.0 % 70-130 " "	п	
Surrogate: Toluene-d8 97.5 % 70-130 " "	. "	
Surrogate: 4-BFB 97.0 % 70-130 " "	n n	

North Creek Analytical - Bothell

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Shell - Puget Sound Plant

8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

## 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
91 (B3E0743-02) Water	Sampled: 05/29/03 12:00	Received: 05	5/30/03 11:05						
1,1,1-Trichloroethane	25.4	1.00	ug/l	1	3F09016	06/06/03	06/06/03	EPA 8260B	
1,2,4-Trimethylbenzene	ND	1.00	11	**	ñ	31	"	"	
1,2-Dibromoethane	ND	1.00	n	11	Ü		ii.	"	
1,2-Dichloroethane	ND	1.00		n	110	340	"	"	
1,3,5-Trimethylbenzene	ND	1.00	11	ii	**	11	ïi.	"	
2-Butanone	ND	10.0	11		11	**	Ü	ï	
Acetone	ND	25.0	,,	n	11	II.	<b>n</b>	u.	
Benzene	ND	1.00	11.	"	11	ü	11	U	
Carbon disulfide	ND	1.00		11	H.S.	n :		u .	
Chlorobenzene	ND	1.00	n		,,	ü	Ü	an I	
Chloroform	ND	1.00	11.	30.		ï	n .	<b>31</b>	
Ethylbenzene	ND	1.00	п	u	11	п	11%	311.0	
m,p-Xylene	. ND	2.00	n	**		Ü	11		
n-Butylbenzene	ND	1.00	III.	300	36	U	11	n	
n-Propylbenzene	ND	1.00	n		11	ņ	11	ж	
o-Xylene	ND	1.00	ж			Ü	"		
p-Isopropyltoluene	ND	1.00	n	11	311	10 (	310	w.	
Styrene	ND	1.00	0	•		11		11	
Toluene	ND	1.00	910	.01	300			n	
Trichloroethene	ND	1.00	**	.0	11	115	.11	an:	
Surrogate: 1,2-DCA-d4	100 %	70-130			"	"	"	n	
Surrogate: Toluene-d8	106 %	70-130			"	"	"	"	
Surrogate: 4-BFB	98.5 %	70-130			"	"	"	"	
93 (B3E0743-03) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:05	5					
1,1,1-Trichloroethane	ND	1.00	ug/l	1	3F09016	06/06/03	06/06/03	EPA 8260B	
1,2,4-Trimethylbenzene	ND	1.00	u	n	11	H.	u	u	
1,2-Dibromoethane	ND	1.00	U	**	211	10	311	300	
1,2-Dichloroethane	ND	1.00	ü	n	***	•	u		
1,3,5-Trimethylbenzene	ND	1.00	"	20	811		u	**	
2-Butanone	ND	10.0	n	, in	u	316	Ξn	:10	
Acetone	ND	25.0		u	u	***	n	п	
Benzene	ND	1.00	"		**	(11	° II.	ű	
Carbon disulfide	ND	1.00	"	ũ	n	Ti.	Nij.	11	
Chlorobenzene	ND	1.00	"	u	ï	u	ĬĬ.	Ü	

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Shell - Puget Sound Plant

Project: SWMU 11 Sampling

8505 South Texas Road Anacortes WA, 98221

Project Number: 4550237616 Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

## 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 (B3E0743-03) Water	Sampled: 05/29/03 12:00	Received: 05	5/30/03 11:05						
Chloroform	ND	1.00	ug/l	1	3F09016	06/06/03	06/06/03	"	
Ethylbenzene	ND	1.00	11	11			žii	11.5	
m,p-Xylene	ND	2.00	п	11.	31	"	"	•	
n-Butylbenzene	ND	1.00		ii.	***	**	#1	**	
n-Propylbenzene	ND	1.00	11		,,	Ü	11	н:	
o-Xylene	ND	1.00	n	:m:	10.	Ü	n	u u	
p-Isopropyltoluene	ND	1.00	n .			u	311	:00:	
Styrene	ND	1.00	111	n	"	"	"	"	
Toluene	ND	1.00	. "	111	3115	310	n		
Trichloroethene	ND	1.00	II .	"	"	11)	II	ir.	
Surrogate: 1,2-DCA-d4	99.5 %	70-130			"	"	**	"	
Surrogate: Toluene-d8	102 %	70-130			. "	,,	n .	"	
Surrogate: 4-BFB	97.5 %	70-130			"	n.	"	n	
60 (B3E0743-04) Water	Sampled: 05/29/03 12:00	Received: 0:	5/30/03 11:05						
1,1,1-Trichloroethane	ND	1.00	ug/l	1	3F09016	06/06/03	06/06/03	EPA 8260B	
1,2,4-Trimethylbenzene	ND	1.00	"	. 11	ा	. <b>U</b> #	п		
1,2-Dibromoethane	ND	1.00	Ü	11	.0		THE STATE OF THE S	:311	
1,2-Dichloroethane	1.17	1.00	11	u	0.5	u	"	· ·	
1,3,5-Trimethylbenzene	ND	1.00	N.	o	11	11	311.	w	
2-Butanone	ND	10.0	v	u	"			en .	
Acetone	29.1	25.0	n	u.	"	W	II .	u.	
Benzene	43.3	1.00	9	"		A16	311	"	
Carbon disulfide	ND	1.00		"	"	11	11	"	
Chlorobenzene	ND	1.00	"	"	**	311.	u		
Chloroform	ND	1.00	10	Ü	Ü	in .	"	n	
Ethylbenzene	1.04	1.00	9000		Ü e	•	Ü	ii .	
m,p-Xylene	ND	2.00	11	n.c	"	11	"		
n-Butylbenzene	ND	1.00	11	•		ñ	<u>II</u>	113	
n-Propylbenzene	ND	1.00	307	300	.0.5	Ü	"	n	
o-Xylene	ND	1.00		"	"		11	ns.	
p-Isopropyltoluene	ND	1.00	11	**	**	11	Ĩ.	11)	
Styrene	ND	1.00	11	n	ж.	"	"		
Toluene	ND	1.00	11	11		"	11	n	
Trichloroethene	ND	1.00	801	H	"	Ü		.11	

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Shell - Puget Sound Plant

8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

## 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
Analyte				N.					
60 (B3E0743-04) Water	Sampled: 05/29/03 12:00	Received: 05	5/30/03 11:05						
Surrogate: 1,2-DCA-d4	99.0 %	70-130			3F09016	06/06/03	06/06/03	"	
Surrogate: Toluene-d8	104 %	70-130			"	"	ir .	,,	
Surrogate: 4-BFB	98.5 %	70-130			<i>n</i> .	" -	".	"	
61 (B3E0743-05) Water	Sampled: 05/29/03 12:00	Received: 05	5/30/03 11:05	i			17		
1,1,1-Trichloroethane	ND	1.00	ug/l	1	3F09016	06/06/03	06/06/03	EPA 8260B	
1,2,4-Trimethylbenzene	ND	1.00	arc	n		ū	"	Ü	
1,2-Dibromoethane	ND	1.00	и .		u	"	"		
1,2-Dichloroethane	ND	1.00	п	11	. "	."	ij	n.	
1,3,5-Trimethylbenzene	ND	1.00	11	n-	300%	u	ш	<b>30</b> T	
2-Butanone	ND	10.0	n	11	n	11	0	W.	
Acetone	ND	25.0	311	11	31.		"	, 0	
Benzene	2.78	1.00	"	30	"	1000	ш	5 302	
Carbon disulfide	ND	1.00	30.	n	317	11	"	W.	
Chlorobenzene	ND	1.00	THE STATE OF THE S	THE STATE OF THE S	31	11%	"	m .	
Chloroform	ND	1.00	n		30	11	in:	310	
Ethylbenzene	ND	1.00	n	.00	III	11	11		
m,p-Xylene	ND	2.00	ir.		110	n	900%	n.	
n-Butylbenzene	ND	1.00	u		"	11	.11	"	
n-Propylbenzene	ND	1.00	100	000	300	**	ii .	10	
o-Xylene	ND	1.00	11	u	ш	315	н	ans.	
p-Isopropyltoluene	ND	1.00	п	**	"	u	TH.	н	
Styrene	ND	1.00	n n	316	.91				
Toluene	ND	1.00	ii	n	u u	u	n .	11:	
Trichloroethene	ND	1.00	11	130.	0	ii.	н	H.	
Surrogate: 1,2-DCA-d4	100 %	70-130			n.	en.	n .	"	
Surrogate: Toluene-d8	104 %	70-130			"	1111	"	"	
Surrogate: 4-BFB	98.5 %	70-130			"	"	<u>"</u>	"	

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North Creek Analytical, Inc. Environmental Laboratory Network Page 16 of 54

Jeanne Garthwaite, Project Manager



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Shell - Puget Sound Plant 8505 South Texas Road

Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

## 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 (B3E0743-06) Water	Sampled: 05/29/03 12:00	Received: 05	5/30/03 11:05						
1,1,1-Trichloroethane	ND	1.00	ug/l	1	3F09016	06/06/03	06/06/03	EPA 8260B	
1,2,4-Trimethylbenzene	ND	1.00	11		u	ü	"	u	
1,2-Dibromoethane	ND	1.00	11	"	u	ii	"	•	
1,2-Dichloroethane	ND	1.00	11	"	310	"	"	"	
1,3,5-Trimethylbenzene	ND	1.00	11	"		"	Ä	n:	
2-Butanone	ND	10.0	n:		11	ï	n	,,	
Acetone	ND	25.0	"	7.	TI.	**	31.0	113	
Benzene	ND	1.00	, i	u	11	n		11	
Carbon disulfide	ND	1.00	и	3H.2	u	u u	11	10	
Chlorobenzene	ND	1.00	n	•		ij	н	ns	
Chloroform	ND	1.00	30	31		ii	11	11	
Ethylbenzene	ND	1.00	11	000	THE STATE OF THE S	101	.00	ii.	
m,p-Xylene	ND	2.00	ii	30	n	10	"	H.	
n-Butylbenzene	ND	1.00	THE STATE OF THE S	311	311	"			
n-Propylbenzene	ND	1.00	**	<u>, 11</u>	"	11	н		
o-Xylene	ND	1.00	:00	u	n	11			
p-Isopropyltoluene	ND	1.00	u	n	316	(11)	, m		
Styrene	ND	1.00	u	"	•	11	,n	n	
Toluene	ND	1.00	500	900	.11		11	in .	
Trichloroethene	ND	1.00	U		//er	11	эн	(III.	
Surrogate: 1,2-DCA-d4	99.0 %	70-130			"	"		"	
Surrogate: Toluene-d8	104 %	70-130			ü	"	"	"	
Surrogate: 4-BFB	98.5 %	70-130			"	"	u	ü	
98 (B3E0743-07) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:05	5					
1,1,1-Trichloroethane	ND	1.00	ug/l	1	3F09016	06/06/03	06/06/03	EPA 8260B	
1,2,4-Trimethylbenzene	ND	1.00	n n	±ű			ũ	•	
1,2-Dibromoethane	ND	1.00	),	u	"	311	u	u	
1,2-Dichloroethane	ND	1.00	ii .	n	Ü	u	ü	n e	
1,3,5-Trimethylbenzene	ND	1.00	n	u	Ü		u	<b>0</b>	
2-Butanone	ND	10.0	и	0	ii.	u	"	"	
Acetone	ND	25.0	in	ij	u	ũ	"	n.	
Benzene	ND	1.00	110	n	311/3	"	Ű.		
Carbon disulfide	ND	1.00	10	ū		ü	110	416	
Chlorobenzene	ND	1.00	30		11	"			
CHIOLOGOLIZOR	ND	1.00							

North Creek Analytical - Bothell

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Jeanne Garthaute



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

Project Number: 4550237616 Project Manager: Brian Rhodes Amended Report Issued: 06/19/03 10:35

## 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
98 (B3E0743-07) Water	Sampled: 05/29/03 12:00	Received: 05	5/30/03 11:05	5					
Chloroform	ND	1.00	ug/l	1	3F09016	06/06/03	06/06/03	3112	
Ethylbenzene	ND	1.00	n	11	11	30	•	311.	
m,p-Xylene	ND	2.00	u	н	10	an:	11	ii .	
n-Butylbenzene	ND	1.00		"	"	n		5 <b>11</b> 0	
n-Propylbenzene	ND	1.00	an.	.11:	п	"	"	n	
o-Xylene	ND	1.00	"	u	п	11	ж	311.	
p-Isopropyltoluene	ND	1.00	u			10	и		
Styrene	ND	1.00	n	1162	(H)	.00	"	11	
Toluene	ND	1.00	•		u	m	311	316	
Trichloroethene	ND	1.00	110	n .	u	11	"	U	
Surrogate: 1,2-DCA-d4	99.5 %	70-130			"	n	, <i>u</i>	ï	
Surrogate: Toluene-d8	104 %	70-130			"	· n	±11	"	
Surrogate: 4-BFB	98.0 %	70-130		Sk.	"	H	н	"	
95 (B3E0743-08) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:0:	5					
1,1,1-Trichloroethane	ND	1.00	ug/l	1	3F09016	06/06/03	06/06/03	EPA 8260B	
1,2,4-Trimethylbenzene	ND	1.00	"	n	ii .	m	n	800	
1,2-Dibromoethane	ND	1.00	"	11	u	10	m .	u	
1,2-Dichloroethane	ND	1.00	"	311	90	800	900	Ű	
1,3,5-Trimethylbenzene	ND	1.00	Ü	ii	ij,	11	u	ű	
2-Butanone	ND	10.0	u	:00	ű	n	ũ		
Acetone	ND	25.0	ii.	0	n	·u	u	u	
Benzene	ND	1.00	Ü	***	11		"	9	
Carbon disulfide	ND	1.00	n	-m		- 30	Ü	ū	
Chlorobenzene	ND	1.00	"	"	u	w	"	"	
Chloroform	ND	1.00		Ü	"	u		0	
Ethylbenzene	ND	1.00	n :	**	11	п	**	n	
m,p-Xylene	ND	2.00	u	"	"	ũ	n .	"	
n-Butylbenzene	ND	1.00	u	п	Ü	ű	Ü	"	
n-Propylbenzene	ND	1.00	u	"	11	11	n n	11	
o-Xylene	ND	1.00	11	**	. "	Ü			
p-Isopropyltoluene	ND	1.00	n	11	H	"	n.	n.	
Styrene	ND	1.00		"		2	30.7	n .	
Toluene	ND	1.00		Ü	"	II	n	"	
Trichloroethene	ND	1.00	"	311%	310	11	11	11.	

North Creek Analytical - Bothell

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

Project Number: 4550237616
Project Manager: Brian Rhodes

Amended Report Issued: 06/19/03 10:35

## 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 (B3E0743-08) Water	Sampled: 05/29/03 12:00	Received: 05	5/30/03 11:05						
Surrogate: 1,2-DCA-d4	99.5 %	70-130			3F09016	06/06/03	06/06/03	"	
Surrogate: Toluene-d8	104 %	70-130			n	"	"	"	
Surrogate: 4-BFB	99.5 %	70-130			"	"	n	n	
96 (B3E0743-09) Water	Sampled: 05/29/03 12:00	Received: 05	5/30/03 11:05						
1,1,1-Trichloroethane	ND	1.00	ug/l	1	3F09016	06/06/03	06/06/03	EPA 8260B	
1,2,4-Trimethylbenzene	ND	1.00	y.	u ·	n	100	u	31.	
1,2-Dibromoethane	ND	1.00	u	11	. "	ű		и	
1,2-Dichloroethane	ND	1.00	an a	0	31	"	n	W.	
1,3,5-Trimethylbenzene	ND	1.00	u	n	n	Ü	н	3113	
2-Butanone	ND	10.0	n	0	W.	Ü	y.		
Acetone	ND	25.0	n .	110	п	"	11	"	
Benzene	ND	1.00	ii ii	"		n		т	
Carbon disulfide	ND	1.00	10.5		ж:	10	11	11	
Chlorobenzene	ND	1.00		n	n	n	(11)	u:	
Chloroform	ND	1.00	"		'n	0	"	n .	
Ethylbenzene	ND	1.00	311	.11	903	u	**	n	
m,p-Xylene	ND	2.00		n	11	n	11	н	
n-Butylbenzene	ND	1.00	300	30.	"		"		
n-Propylbenzene	ND	1.00	***	n	n	10.0	ш	ur. "	
o-Xylene	ND	1.00	п		"		"	"	
p-Isopropyltoluene	ND	1.00	316	311	.0.	n	n	u	
Styrene	ND	1.00	n	n	"	w	n	ж	
Toluene	ND	1.00	n	ii.	**	**		38	
Trichloroethene	ND	1.00	"	u	э и	30	· Hi	u	
Surrogate: 1,2-DCA-d4	97.5 %	70-130			"	"	"	"	
Surrogate: Toluene-d8	103 %	70-130			Ü	"	n	"	
Surrogate: 4-BFB	98.5 %	70-130			a	u	"	"	

North Creek Analytical - Bothell

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Shell - Puget Sound Plant 8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

## 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 (B3E0743-10) Water	Sampled: 05/29/03 12:00	Received: 05	5/30/03 11:05						
1,1,1-Trichloroethane	ND	1.00	ug/l	1	3F09016	06/06/03	06/06/03	EPA 8260B	
1,2,4-Trimethylbenzene	ND	1.00	n .	"	"	i w	"	"	
1,2-Dibromoethane	ND	1.00	n.	II.	Ü	l u	Ü	<i>u</i> .	
1,2-Dichloroethane	ND	1.00	n .	"	11	311	ü	9.	
1,3,5-Trimethylbenzene	ND	1.00	n	ĨĮ	9	ü	**	mes.	
2-Butanone	ND	10.0		Ü	**	ij.			
Acetone	ND	25.0	u	n n		"	"	n	
Benzene	ND	1.00	n	n	11	2	"	10%	
Carbon disulfide	ND	1.00	30.		. 0	n	v	н	
Chlorobenzene	ND	1.00	.0		п	Ĭŧ	THE.	H:	
Chloroform	ND	1.00	u		"		n.		
Ethylbenzene	ND	1.00	THE STATE OF THE S	п	и:	11	n.	n.	
m,p-Xylene	ND	2.00		"	II	ii.	115	are	
n-Butylbenzene	ND	1.00	300		n	11	11		
n-Propylbenzene	ND	1.00		11	300	100	316	311	
o-Xylene	ND	1.00			n		u	III	
p-Isopropyltoluene	ND	1.00	316			n	и	II .	
Styrene	ND	1.00	11	11	n	10	и	SH.	
Toluene	ND	1.00	30.			**			
Trichloroethene	ND	1.00	311	п	SHE	.11:	31.	.11	
Surrogate: 1,2-DCA-d4	97.0 %	70-130			"	"	"	n	
Surrogate: Toluene-d8	104 %	70-130			"	n	"	,,,	
Surrogate: 4-BFB	98.5 %	70-130			"	"	"	, ii	
63 (B3E0743-11) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:05	i					
1,1,1-Trichloroethane	ND	1.00	ug/l	1	3F09016	06/06/03	06/06/03	EPA 8260B	
1,2-Dibromoethane	ND	1.00	n	"	11	u	***	•	
1,2-Dichloroethane	ND	1.00		811	811		"	•	
1,3,5-Trimethylbenzene	6.61	1.00	u	n	**	"	3/86	i n	
2-Butanone	ND	10.0	11	•	u	10	**	W.	
Acetone	ND	25.0	9	THE STATE OF THE S	п	23000	3318.	u	
Benzene	ND	1.00	ü		u	•	u	<u>u</u>	
Carbon disulfide	ND	1.00	"		"	••	ű	u	
Chlorobenzene	ND	1.00	"	"	n.	THE STREET	11	"	
Chloroform	ND	1.00	Ü		Ü	"	ü	ü	
	535								

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Shell - Puget Sound Plant

Project: SWMU 11 Sampling

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

Amended Report Issued: 06/19/03 10:35

## 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 (B3E0743-11) Water	Sampled: 05/29/03 12:00	Received: 05	5/30/03 11:05	5					
Ethylbenzene	6.99	1.00	ug/l	1	3F09016	06/06/03	06/06/03	11	
m,p-Xylene	8.23	2.00	n	110	110	и		11	
n-Butylbenzene	9.08	1.00			11	n	"	ar:	
n-Propylbenzene	6.05	1.00	300			n)	n		
o-Xylene	1.63	1.00			11	30 0	30	п	
p-Isopropyltoluene	2.10	1.00	n		n	ii)		"	
Styrene	ND	1.00	ar	110	u	30.7	**		
Toluene	ND	1.00	n			11	<b>10</b>	9 <b>11</b>	
Trichloroethene	ND	1.00	2.00		n	Ü	11		
Surrogate: 1,2-DCA-d4	97.5 %	70-130			· n	THE .	"	ũ	
Surrogate: Toluene-d8	101 %	70-130			7 m	THE STATE OF THE S	· H	"	
Surrogate: 4-BFB	98.0 %	70-130			."	"	1.00	"	
	ater Sampled: 05/29/03 12	2:00 Receive	ed: 05/30/03	11:05					
1,2,4-Trimethylbenzene	86.9	5.00	ug/l	5	3F09021	06/09/03	06/10/03	EPA 8260B	
Surrogate: 1,2-DCA-d4	99.0 %	70-130			"	u	"	"	
Surrogate: Toluene-d8	97.0 %	70-130			"	"	n	<i>II</i>	
Surrogate: 4-BFB	97.0 %	70-130			"	"	"	n	
65 (B3E0743-12) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:0	5					
1,1,1-Trichloroethane	ND	1.00	ug/I	1	3F09021	06/09/03	06/10/03	EPA 8260B	
1,2,4-Trimethylbenzene	ND	1.00	"		2		ü	n	
1,2-Dibromoethane	ND	1.00	ш	u	ii	"	ű	"	
1,2-Dichloroethane	27.0	1.00	u	2	**	, n	o.	ne:	
1,3,5-Trimethylbenzene	ND	1.00	Ü	"	11	"		n.	
2-Butanone	ND	10.0	11	"	"	TH.	Ü	n	
Acetone	ND	25.0	"	"	9	ā	n		
Benzene	ND	1.00	.00	ü	11	ıı	"		
Carbon disulfide	ND	1.00		"	11/5	"	"	11	
Chlorobenzene	ND	1.00	**	11		ü	"	11	
Chloroform	ND	1.00	300		и	ii	ii .		
Ethylbenzene	ND	1.00	.00	n	n	11	31.7	31	
m,p-Xylene	ND	2.00		u	n.	'n	0	н	
n-Butylbenzene	ND	1.00	u	310	3112	u u		n	
n-Propylbenzene	ND	1.00	N.			11	u	30"	

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Shell - Puget Sound Plant

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

Project Number: 4550237616
Project Manager: Brian Rhodes

Amended Report Issued: 06/19/03 10:35

#### 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
65 (B3E0743-12) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:05	i					
p-Isopropyltoluene	ND	1.00	ug/I	1	3F09021	06/09/03	06/10/03	Ñ.:	
Styrene	- ND	1.00	30	"	#E3	390	"		
Toluene	ND	1.00	"	9	n	u	"	n :	
Trichloroethene	ND	1.00	n.		n.	11		"	
Surrogate: 1,2-DCA-d4	99.5 %	70-130			u	u	n	n	
Surrogate: Toluene-d8	98.0 %	70-130			"	"		<b>"</b>	
Surrogate: 4-BFB	100 %	70-130			"	ii.	n.	ne .	
100 (B3E0743-13) Water	Sampled: 05/29/03 12:00	Received:	05/30/03 11:0	)5		80. 60-			
1,1,1-Trichloroethane	ND	1.00	ug/l	1	3F09016	06/06/03	06/07/03	EPA 8260B	
1,2,4-Trimethylbenzene	ND	1.00			ii.	11	u e	ж	
1,2-Dibromoethane	ND	1.00		"	10	n	II	и	
1,2-Dichloroethane	1.15	1.00	n .	.00	310	**	10	u.	
1,3,5-Trimethylbenzene	ND	1.00	11			u		11	
2-Butanone	ND	10.0	.00	w	"	ñ	"		
Acetone	26.2	25.0			ш	110	310	2115	
Benzene	43.0	1.00	,,,	39	н	11		u	
Carbon disulfide	ND	1.00	3.00	300	300	11.0	11	n	
Chlorobenzene	ND	1.00	u	'n	"	100	300	316	
Chloroform	ND	1.00	u	n	11	11	**		
Ethylbenzene	1.05	1.00		310	:0	10:		10	
m,p-Xylene	ND	2.00	"	"		11	11	и	
n-Butylbenzene	ND	1.00			11	11	11	III	
n-Propylbenzene	ND	1.00	u	11	н	36	TE.	an .	
o-Xylene	ND	1.00		11	n	111	•	п	
p-Isopropyltoluene	ND	1.00	.11	310	:11	311	n	п	
Styrene	ND	1.00	u	ш	n	* "	п	п	
Toluene	ND	1.00		30	п		п	II.	
Trichloroethene	ND	1.00	п	SH.	и	TI.	n		
Surrogate: 1,2-DCA-d4	96.5 %	70-130			"	"	a	"	
Surrogate: Toluene-d8	103 %	70-130			,	"	<i>u</i>	,	
Surrogate: 4-BFB	97.0 %	70-130			"	"	Ü	n.	

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Project: SWMU 11 Sampling

Project Number: 4550237616

Project Manager: Brian Rhodes

**Amended Report** 

Issued: 06/19/03 10:35

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

Analyte	Result	porting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
BLANK (B3E0743-14) Water	Sampled: 05/29/03 12:00	Receiv	ed: 05/30/	03 11:05					
1,1,1-Trichloroethane	ND	1.00	ug/l	1	3F09021	06/09/03	06/09/03	EPA 8260B	
1,2,4-Trimethylbenzene	ND	1.00	Ü		"	ш	a.	39.00	
1,2-Dibromoethane	ND	1.00	ii	ü	"	u	ıı	и	
1,2-Dichloroethane	ND	1.00	"	tt	"		u	"	
1,3,5-Trimethylbenzene	ND	1.00	n	ij	"	· u	u	800	
2-Butanone	ND	10.0	"	ü	"	**	ŭ	<u> </u>	
Acetone	ND	25.0	11	"	"	311		u	
Benzene	ND	1.00	n	ij	11	n	9.	11	
Carbon disulfide	ND	1.00	310			. "	0	"	
Chlorobenzene	ND	1.00	"	n e	n	u	"	ш	
Chloroform	ND	1.00	ji.	ü	"	"		ii.	
Ethylbenzene	ND	1.00	n-	и:	110	"	Ü	"	
m,p-Xylene	ND	2.00	Ü	ii.	11	ii	n	n	
n-Butylbenzene	ND	1.00	300	n.	11	II		11	
n-Propylbenzene	ND	1.00	u	u	н	81	n	ñη	
o-Xylene	ND	1.00	"	"	u	33	n	n ·	
p-Isopropyltoluene	ND	1.00	311		ALC:	ii	11	11	
Styrene	ND	1.00		n		n	п	316	
Toluene	ND	1.00		n		Ü	п	и	
Trichloroethene	ND	1.00	п	910		u .	л	Ü.	
Surrogate: 1,2-DCA-d4	98.0 % 70	-130			"	"	w	s <b>n</b> e	
Surrogate: Toluene-d8	99.5 % 70	-130			"	"	"	"	
Surrogate: 4-BFB	100 % 70	-130			n	"	"	"	

North Creek Analytical - Bothell

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Shell - Puget Sound Plant

8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616

Project Manager: Brian Rhodes

**Amended Report** 

Issued: 06/19/03 10:35

## 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
92 (B3E0743-01) Water Sampl	ed: 05/29/03 12:00	Received: 0	5/30/03 11:	05					
1,2-Dichlorobenzene	ND	10.0	ug/l	1	3F04002	06/04/03	06/10/03	EPA 8270C	
1,3-Dichlorobenzene	ND	10.0	u	"		n I	bits.	31C:	
1,4-Dichlorobenzene	ND	10.0	311/	11	"	"	31	u.	
1-Methylnaphthalene	ND	10.0	100			0.3	II .	ii .	
2,4-Dimethylphenol	ND	10.0	11	11	u	11	16	u	
2,4-Dinitrophenol	ND	10.0	3113	(10)			11		
2-Methylnaphthalene	ND	10.0	н		ar ,	n	ж.		
2-Methylphenol	ND	10.0	n		,11			n.	
3 & 4-Methylphenol	ND	10.0	ž1E	:11	30	w		"	
4-Nitrophenol	ND	10.0	н *	.11	11	11	316	300	
6-Methyl chrysene	ND	10.0		10	•	30	06/11/03	u	
7,12-Dimethylbenz (a) anthracene	ND	10.0	ū	ar	3 <b>1</b> 1	11	06/10/03		
Acenaphthylene	ND	10.0	Ü	10		n	· · · · · · · · · · · · · · · · · · ·	18	
Anthracene	ND	10.0	"	:00	11	"	"		
Benzo (a) anthracene	ND	10.0			n	п	30.		
Benzo (a) pyrene	ND	10.0	ü	·	ü	(10)	и	w .	
Benzo (b) fluoranthene	ND	10.0	"	- 11	11	311.	"	u	
Benzo (ghi) perylene	ND	10.0	"	÷11	n	"	11	эк	
Benzo (k) fluoranthene	ND	10.0	"	iii	ïi.		u	Œ	
Bis(2-ethylhexyl)phthalate	ND	10.0	"	ıı	"	30	u	Ü	
Butyl benzyl phthalate	ND	10.0	ü	ii	"	·	9	n	
Chrysene	ND	10.0	n:	11	n	11	ũ	ű	
Di-n-butyl phthalate	ND	10.0	,,	"	n	10	n .	u	
Di-n-octyl phthalate	ND	10.0		ï.		0	W .	2	
Dibenz (a,h) acridine	ND	10.0	n	11	117	**	06/11/03	u.	
Dibenz (a,h) anthracene	ND	10.0	10		10		06/10/03	1000	
Diethyl phthalate	ND	10.0	113	ũ	11	ñ	ü	10	
Dimethyl phthalate	ND	10.0	10	n.	3118	"	31	10	
Fluoranthene	ND	10.0	31	•	11		. "	10	
Fluorene	ND	10.0	3008	n:	310	ü	iii	п	
Indene	ND	10.0		"	u	"	06/12/03	110	
Indeno (1,2,3-cd) pyrene	ND	10.0	0.	11	"	n	06/10/03	m	
Naphthalene	ND	10.0	11	100	m	31:	iii.	11	
Phenanthrene	ND	10.0		•		n	n	316	
Phenol	ND	10.0	i tr	.11:	11		11	n	

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Jeanne Garthoute



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Shell - Puget Sound Plant

Project: SWMU 11 Sampling

8505 South Texas Road Anacortes WA, 98221

Project Number: 4550237616 Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

#### 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
92 (B3E0743-01) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:05	i					
Pyrene	ND	10.0	ug/l	1	3F04002	06/04/03	06/10/03	n	
Pyridine	ND	10.0		<u>u</u>	81 <b>u</b>	311	**	"	
Quinoline	ND	10.0	n	ũ	"	ii	06/11/03	<u></u>	
Thiophenol	ND	10.0	n	"	51	:0	06/11/03	u	
Surrogate: 2-FP	49.1 %	18-124			"	"	06/10/03	n.	
Surrogate: Phenol-d6	60.2 %	25-122			"	"	n	"	
Surrogate: 2,4,6-TBP	58.3 %	19-132			"	"	"	"	
Surrogate: Nitrobenzene-d.	67.0 %	44-124			ï.	"	"	II.	
Surrogate: p-Terphenyl-d1-	4 68.7 %	10-132			"	"	"	,,	
Surrogate: 2-FBP	70.9 %	41-129			**	"		"	
91 (B3E0743-02) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:05	5					
1,2-Dichlorobenzene	ND	10.0	ug/l	1	3F04002	06/04/03	06/10/03	EPA 8270C	
1,3-Dichlorobenzene	ND	10.0	210	10.5	n	ñ		n	
1,4-Dichlorobenzene	ND	10.0		u	11	n	116	11	
1-Methylnaphthalene	ND	10.0				H	"	11	
2,4-Dimethylphenol	ND	10.0			п	11	п	n.	
2,4-Dinitrophenol	ND	10.0	n	20%	n	ñ.	11	п	
2-Methylnaphthalene	ND	10.0	30.	n	"		"	**	
2-Methylphenol	ND	10.0		11	n	3100	310		
3 & 4-Methylphenol	ND	10.0				"	"	en.	
4-Nitrophenol	ND	10.0	311	.11:	W	11	u	n	
6-Methyl chrysene	ND	10.0	н	**	п	3113	06/11/03	SH.	
7,12-Dimethylbenz (a) anth	nracene ND	10.0		11	w	Ü	06/10/03	10	
Acenaphthylene	ND	10.0	10	200	÷ <b>u</b> c	11	n	п	
Anthracene	ND	10.0		**	п	**	311	816.	
Benzo (a) anthracene	ND	10.0	.00	31	n	10	11	u	
Benzo (a) pyrene	ND	10.0	a w	305	и	11	in.	3H	
Benzo (b) fluoranthene	ND	10.0	(ii	**		••	"	an .	
Benzo (ghi) perylene	ND	10.0	10	S <b>U</b> S	139	**	u	ш	
Benzo (k) fluoranthene	ND	10.0	ű		'n	910	1111	011	
Bis(2-ethylhexyl)phthalate	ND	10.0	ü	11	ï	n	u	u.	
Butyl benzyl phthalate	ND	10.0		i te	11	111	10	ũ <sup>*</sup>	
Chrysene	ND	10.0	ü	11	n.		0	α	
Di-n-butyl phthalate	ND	10.0		ü	ii	u	ii .	ij	
Di-ii-outyi piitiiaiate	ND	10.0							

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Shell - Puget Sound Plant

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

Project Number: 4550237616 Project Manager: Brian Rhodes Amended Report Issued: 06/19/03 10:35

## 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
91 (B3E0743-02) Water	Sampled: 05/29/03 12:00	Received: 05	5/30/03 11:0	5					
Di-n-octyl phthalate	ND	10.0	ug/l	1	3F04002	06/04/03	06/10/03	u ·	
Dibenz (a,h) acridine	ND	10.0	11	"	***	U	06/11/03	11	
Dibenz (a,h) anthracene	ND	10.0	11	Ü	п	. "	06/10/03	ne	
Diethyl phthalate	ND	10.0	10%	"	n	ü	11	III.	
Dimethyl phthalate	ND	10.0	"	'n	10.5	11	10%	.HE	
Fluoranthene	ND	10.0	11	u		u		"	
Fluorene	ND	10.0	TF.	117	M.:	,,,	n.		
Indene	ND	10.0	ü	0	n	9	06/12/03	11%	
Indeno (1,2,3-cd) pyrene	ND	10.0			11	w	06/10/03		
Naphthalene	ND	10.0		n	THE STATE OF THE S	316	ж	TI.	
Phenanthrene	ND	10.0		11	n	11	и	n.	
Phenol	ND	10.0	30	310	.0.:	11	n	n	
Pyrene	ND	10.0		11		11	311	л	
Pyridine	ND	10.0	"	**		"			
Quinoline	ND	10.0	311	305	310	111	06/11/03	11	
Thiophenol	ND	10.0	"	"			06/11/03	ж	
Surrogate: 2-FP	56.4 %	18-124		22	"	"	06/10/03	n	
Surrogate: Phenol-d6	70.3 %	25-122			: 116	"	"	"	
Surrogate: 2,4,6-TBP	59.6 %	19-132			· nc	n	u	"	
Surrogate: Nitrobenzene-d.	88.5 %	44-124	Sax		111	"	ш	"	
Surrogate: p-Terphenyl-d1-		10-132			"	177	n	<sub>7/2</sub> "	
Surrogate: 2-FBP	87.3 %	41-129			"	"	"	"	
93 (B3E0743-03) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:0	5					
1,2-Dichlorobenzene	ND	10.0	ug/l	1	3F04002	06/04/03	06/10/03	EPA 8270C	
1,3-Dichlorobenzene	ND	10.0	ŭ		"	m	200	"	
1,4-Dichlorobenzene	ND	10.0	u		u	.11	11	ü	
1-Methylnaphthalene	ND	10.0		Ħ			: 01	n	
2,4-Dimethylphenol	ND	10.0		"	ű		u	"	
2,4-Dinitrophenol	ND	10.0		.11	**	11	ü	"	
2-Methylnaphthalene	ND	10.0	9	ŢŢ.	"		"	"	
2-Methylphenol	ND	10.0	0	ū	ij	11	"	11	
3 & 4-Methylphenol	ND	10.0	"	**	"	10	n	11	
4-Nitrophenol	ND	10.0	ii .	"	"	ŭ	"	11/3	
6-Methyl chrysene	ND	10.0	u.		Ü	n	06/11/03		

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Shell - Puget Sound Plant 8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

#### 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 (B3E0743-03) Water	Sampled: 05/29/03 12:00	Received: 05	5/30/03 11:05				*****		
7,12-Dimethylbenz (a) ant	hracene ND	10.0	ug/l	1	3F04002	06/04/03	06/10/03	"	
Acenaphthylene	ND	10.0	n	w	ď	30	"	© <b>U</b>	
Anthracene	ND	10.0	ü	n	<u>iii</u>	u	ü	ii.	
Benzo (a) anthracene	ND	10.0	n	ш	"	iu.	u	n	
Benzo (a) pyrene	ND	10.0	Ü	ii	Ü	ar .	"	e un	
Benzo (b) fluoranthene	ND	10.0	n	ii	"	**	"	11	
Benzo (ghi) perylene	ND	10.0		"	"	201	U	ii i	
Benzo (k) fluoranthene	ND	10.0	"	"	Ü	.11	u	HE.	
Bis(2-ethylhexyl)phthalate	ND	10.0	.0.3	u	ñ	ű		ii .	
Butyl benzyl phthalate	ND	10.0			"	II .	В	H3	
Chrysene	ND	10.0		**	Ü	"	9		
Di-n-butyl phthalate	ND	10.0	n	11	11		0	11	
Di-n-octyl phthalate	ND	10.0		ñ	n.	11	11	113	
Dibenz (a,h) acridine	ND	10.0		ñ	"	Ü	06/11/03	***	
Dibenz (a,h) anthracene	ND	10.0	U.	11	31	**	06/10/03	п	
Diethyl phthalate	ND	10.0				11		n	
Dimethyl phthalate	ND	10.0	3113	.00	W.	ii	n.	n	
Fluoranthene	ND	10.0		11	n	"	н	ALS:	
Fluorene	ND	10.0	11	n		10	"		
Indene	ND	10.0	THE .	п	æ	910	06/12/03		
Indeno (1,2,3-cd) pyrene	ND	10.0	u	,,		100	06/10/03	-11	
Naphthalene	ND	10.0	u	11	11	n.	"		
Phenanthrene	ND	10.0		n.	an:	30.5	310	1311	
Phenol	ND	10.0				•	n	"	
Pyrene	ND	10.0	311	311	:00:	•	.11	n	
Pyridine	ND	10.0	u		"	'n	3116	ЭЦ	
Quinoline	ND	10.0	и	n	"	u .	06/11/03	u	
Thiophenol	ND	10.0	11	in:	311	9113	06/11/03	H	
Surrogate: 2-FP	54.0 %	18-124			,,	.,	06/10/03	"	
Surrogate: Phenol-d6	64.7 %	25-122			u	"	"	"	
Surrogate: 2,4,6-TBP	53.4 %	19-132			"	"	"	"	
Surrogate: Nitrobenzene-	d5 83.1 %	44-124			"	"	,,,	"	
Surrogate: p-Terphenyl-d		10-132			"	"	ii.	77	
Surrogate: 2-FBP	75.9 %	41-129			n	: <b>(t</b> )	"	"	

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Shell - Puget Sound Plant 8505 South Texas Road

Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616

Project Manager: Brian Rhodes

**Amended Report** 

Issued: 06/19/03 10:35

## 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
	oled: 05/29/03 12:00	Pacaivad: 0	5/30/03 11:05	<u> </u>		0			
	ND	10.0	ug/l	1	3F04002	06/04/03	06/10/03	EPA 8270C	
1,2-Dichlorobenzene 1,3-Dichlorobenzene	ND ND	10.0	ug/I	11	"	"	**	11.	
1,4-Dichlorobenzene	ND	10.0	10%		Ü	"	u		
73	ND	10.0	"	29	'n	<b>N</b> 11	u u	n	
1-Methylnaphthalene 2,4-Dimethylphenol	36.2	10.0	11			n	11	arc.	
2,4-Dinitrophenol	ND	10.0	n	nc.	#100	ü	ij		
2-Methylnaphthalene	ND	10.0	11	u	11	**	u .	3112	
	ND	10.0	116	,,,			11	**	
2-Methylphenol 3 & 4-Methylphenol	ND	10.0	11	10	11	"			
4-Nitrophenol	ND	10.0		11	11	,,	n	300	
6-Methyl chrysene	ND	10.0		10		Ü	06/11/03		
7,12-Dimethylbenz (a) anthracen		10.0	n.	n	11		06/10/03		
Acenaphthylene	ND ND	10.0	п		"	11	11	THE STATE OF THE S	
Anthracene	ND	10.0	п	n	.00	30.5	n	**	
	ND	10.0	II	11		11	n	· ur	
Benzo (a) anthracene	ND	10.0	э	***		•	iii		
Benzo (a) pyrene Benzo (b) fluoranthene	ND ND	10.0	11	31	310	316	:0.	u	
Benzo (ghi) perylene	ND ND	10.0	11	10	u	00	111	***	
Benzo (k) fluoranthene	ND ND	10.0	эш	310	.0.	W.		· ·	
Bis(2-ethylhexyl)phthalate	ND	10.0	11	"	n	111	20	· u	
Butyl benzyl phthalate	ND	10.0		п		11	H	<b>9</b>	
Chrysene	ND	10.0	u		34	.01	II .	ü	
Di-n-butyl phthalate	ND	10.0	m .	10	u	11	186	n	
Di-n-octyl phthalate	ND	10.0	"	u	ü	•	**	n	
Dibenz (a,h) acridine	ND.	10.0	<u>n</u>	y.	11	111	06/11/03	n	
Dibenz (a,h) anthracene	ND	10.0	ij			n	06/10/03	n:	
Diethyl phthalate	ND	10.0	11			.11	Ü	•	
Dimethyl phthalate	ND	10.0	ÿ		"		"	HC.	
Fluoranthene	ND	10.0	u .	"	11	n n	"		
Fluorene	ND ND	10.0	n	n n		u	Ü	w	
Indene	ND	10.0		"	11	ij.	06/12/03	HE.	
Indeno (1,2,3-cd) pyrene	ND	10.0	.00	10.5	11	ü	06/10/03		
Naphthalene	ND	10.0	10	10	w	"	11	.11	
Phenanthrene	ND	10.0	iii.	30	n	n		ne	
Phenol	ND ND	10.0	311	:00:	30.	ii.	ii.	u	
гнепоі	ND	10.0							

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Seanne Garthaute



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Shell - Puget Sound Plant

8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616

Project Manager: Brian Rhodes

**Amended Report** 

Issued: 06/19/03 10:35

#### 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 (B3E0743-04) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:05	5					
Pyrene	ND	10.0	ug/l	1	3F04002	06/04/03	06/10/03	ű	
Pyridine	ND	10.0	n .	110	n	30	7.10	**	
Quinoline	ND	10.0	Ü	11	ii.	u	06/11/03	2 19	
Thiophenol	ND	10.0	u .	u	"	-0	06/11/03	ü	
Surrogate: 2-FP	58.0 %	18-124			"	н	06/10/03	"	
Surrogate: Phenol-d6	63.7 %	25-122			"	"	"	"	
Surrogate: 2,4,6-TBP	64.5 %	19-132			"	Ü	"	<b>"</b> "	
Surrogate: Nitrobenzene-d.		44-124			"	Ü	<u>u</u>	"	
Surrogate: p-Terphenyl-d1-		10-132			"	"	"	"	
Surrogate: 2-FBP	78.0 %	41-129			"	"	"	,	
61 (B3E0743-05) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:05	5				T	
1,2-Dichlorobenzene	ND	10.0	ug/l	1	3F04002	06/04/03	06/10/03	EPA 8270C	
1,3-Dichlorobenzene	ND	10.0			"		"	"	
1,4-Dichlorobenzene	ND	10.0	11	"	11	3.00	u	н	
1-Methylnaphthalene	ND	10.0	w	"	Ü	11	ñ	ñ.	
2,4-Dimethylphenol	ND	10.0	и	"	ii	u	ü	W	
2,4-Dinitrophenol	ND	10.0	11	"	"	n	11	•	
2-Methylnaphthalene	ND	10.0	,,	"		W	u		
2-Methylphenol	ND	10.0	и	11	31	и	**	200	
3 & 4-Methylphenol	ND	10.0	n	n	"	ii.	2	0.7	
4-Nitrophenol	ND	10.0	11.	11	n.	ű	Ü	n .	
6-Methyl chrysene	ND	10.0	ii	<u>n</u>	n	n	06/11/03	u.	
7,12-Dimethylbenz (a) anth	nracene ND	10.0	n .	"	"	ü	06/10/03	0	
Acenaphthylene	ND ND	10.0	0.0	и	11	11	II.	п	
Anthracene	ND	10.0		"	"		"	an F	
Benzo (a) anthracene	ND	10.0	II.		11	ï	Ü		
Benzo (a) pyrene	ND	10.0	11	HII.	m		n	an :	
Benzo (b) fluoranthene	ND	10.0	"	n.		"	11	n	
Benzo (ghi) perylene	ND	10.0	;H	31.	**	ü		n	
Benzo (k) fluoranthene	ND	10.0	u	w	an:	**	n	w	
Bis(2-ethylhexyl)phthalate	ND	10.0		n	11	"			
Butyl benzyl phthalate	ND	10.0	340;	3113	310	11	II.		
Chrysene	ND	10.0	"					11	
Di-n-butyl phthalate	ND	10.0	n	n	11	ü		(T)	
Julj. Pilliani		2370							

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Shell - Puget Sound Plant 8505 South Texas Road

Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

## 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 (B3E0743-05) Water	Sampled: 05/29/03 12:00	Received: 05	5/30/03 11:05		200				
Di-n-octyl phthalate	ND	10.0	ug/l	1	3F04002	06/04/03	06/10/03	n .	
Dibenz (a,h) acridine	ND	10.0	"	u	ıı	"	06/11/03	"	
Dibenz (a,h) anthracene	ND	10.0	11	ш	"		06/10/03	~ *	
Diethyl phthalate	ND	10.0		9	"	391	"	"	
Dimethyl phthalate	ND	10.0	II .	ü	Ü	11	11	"	
Fluoranthene	ND	10.0	**	"		ü	"	21	
Fluorene	ND	10.0	"	"	. 11	ñ	"	E3	
Indene	ND	10.0	11.	"		n	06/12/03		
Indeno (1,2,3-cd) pyrene	ND	10.0	ii.	"	n	"	06/10/03		
Naphthalene	ND	10.0		'n	11	Ä	11	ms.	
Phenanthrene	ND	10.0	10	11:	11	Ü	"		
Phenol	ND	10.0		"	TI.	11	3000	н	
Pyrene	ND	10.0	art.	11	N.	Ü		10	
Pyridine	ND	10.0	n	n		u	"	TE.	
Quinoline	ND	10.0	11	"		n	06/11/03	3112	
Thiophenol	ND	10.0	200	.00	u	10	06/11/03	.00	
Surrogate: 2-FP	59.2 %	18-124			н	"	06/10/03	"	
Surrogate: Phenol-d6	67.8 %	25-122			"	n	<b>"</b>	"	
Surrogate: 2,4,6-TBP	64.0 %	19-132			"	•	"#	"	
Surrogate: Nitrobenzene-a	82.0 %	44-124			"	"	"	A.11.	
Surrogate: p-Terphenyl-dl		10-132			"	"	"	"	
Surrogate: 2-FBP	81.0 %	41-129				"	"	"	
94 (B3E0743-06) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:05						
1,2-Dichlorobenzene	ND	10.0	ug/l	1	3F04002	06/04/03	06/10/03	EPA 8270C	
1,3-Dichlorobenzene	ND	10.0	"	11	**	**	n	"	
1,4-Dichlorobenzene	ND	10.0	u.	ារ	11	(iii)		и	
1-Methylnaphthalene	ND	10.0	ii .		9	0	п	in .	
2,4-Dimethylphenol	ND	10.0	11	200	•	11	"	u u	
2,4-Dinitrophenol	ND	10.0	ij	n n	"	:0	n	п	
2-Methylnaphthalene	ND	10.0	ü	ñ		u	u u	"	
2-Methylphenol	ND	10.0	n	u	**	, n	Ü	n	
3 & 4-Methylphenol	ND	10.0		"	n	11	11		
4-Nitrophenol	ND	10.0	30.3	u	n	ü	ũ	"	
6-Methyl chrysene	ND	10.0	n	"	41	11	06/11/03	11	

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

Project Number: 4550237616
Project Manager: Brian Rhodes

Amended Report Issued: 06/19/03 10:35

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

Analyte	Resul	Reporting t Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
94 (B3E0743-06) Water	Sampled: 05/29/03 12:0	0 Received: 0	05/30/03 11:	05					
7,12-Dimethylbenz (a) ant	hracene NI	10.0	ug/l	1	3F04002	06/04/03	06/10/03		
Acenaphthylene	NI	10.0	n n	ű e	"	311			
Anthracene	NI	10.0	n	ũ	ij		u	ii.	
Benzo (a) anthracene	NI	10.0	n	"	"	"		u	
Benzo (a) pyrene	NI	10.0	0	11	n	п	n n	11	
Benzo (b) fluoranthene	NI	10.0	.00	11	п		ü		
Benzo (ghi) perylene	NI	10.0	u	11	n	330	"	ü	
Benzo (k) fluoranthene	NI	10.0	**	11	Ü	"	"	и	
Bis(2-ethylhexyl)phthalate	e NI	10.0	300	"	"	11	"	"	
Butyl benzyl phthalate	NI	10.0			ii.	in .	"	"	
Chrysene	NI	10.0	u	11	11	Ű	72	n.	
Di-n-butyl phthalate	NI	10.0	н		11 8	11	"		
Di-n-octyl phthalate	NI	10.0	,,	n	n	u	н	116.7	
Dibenz (a,h) acridine	NI	10.0	30		11	0	06/11/03	"	
Dibenz (a,h) anthracene	NI	10.0	u	n	an :	11	06/10/03	'n	
Diethyl phthalate	NI	10.0		"		u	11	300	
Dimethyl phthalate	NI	10.0	110	300	311.5		II.	"	-
Fluoranthene	NI	10.0		m.	10	11	m.	**	
Fluorene	NI	10.0	.0.		30	0	"		
Indene	, NI	10.0		900	311	u	06/12/03	II.	
Indeno (1,2,3-cd) pyrene	N	10.0	"	"	"	10	06/10/03	3117	
Naphthalene	N	10.0	200		11	n		11	
Phenanthrene	N	10.0			н	n	300	3117	
Phenol	N	10.0	w	Ü	"	11	n	10	
Pyrene	N	10.0	.11	:01	:11	n	ш	TI.	
Pyridine	N	) 10.0	n	.00		11	THE	3 <b>11</b> 2	
Quinoline	N	10.0	ű.			311	06/11/03	11	
Thiophenol	N.	10.0	<u>ii</u>	u	/10	310	06/11/03	11	
Surrogate: 2-FP	51.8	% 18-124			"	"	06/10/03	"	
Surrogate: Phenol-d6	63.1				ü	"	"	"	
Surrogate: 2,4,6-TBP	58.4	% 19-132			"	"	"	"	
Surrogate: Nitrobenzene-	d5 81.4 °	% 44-124			ï	"	Ū	Ü	
Surrogate: p-Terphenyl-d		% 10-132			"	"	"	Ü	
Surrogate: 2-FBP	70.4	% 41-129			"	n	"	"	

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Shell - Puget Sound Plant

8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

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

1.2-Diehlorobenzene	Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
	98 (B3E0743-07) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:05						_
1.3-Dichlorobenzene ND 10.0	1,2-Dichlorobenzene	ND	10.0	ug/l	1	3F04002	06/04/03	06/11/03		
1,4-Dichlorobenzene	1,3-Dichlorobenzene	ND	10.0	11	ii.	"	30.	::n		
-Methylnaphthalene	1,4-Dichlorobenzene	ND	10.0	п	"	ii.	.0	u		
2.4-Dinitrophenol ND 10.0 " " " " " " " " " " " " " " " " " "	1-Methylnaphthalene	ND	10.0	n.	"	"		ü	"	
2.4-Dintiriophenol         ND         10.0         """"""""""""""""""""""""""""""""""""	2,4-Dimethylphenol	ND	10.0	"	ü	ü	in .	7 8 -		
2-Methylnphenol ND 10.0 " " " " " " " " " " " " " " " " " "	2,4-Dinitrophenol	ND	10.0	310: S	"		"	"	"	
2-Methylphenol ND 10.0 " " " " " " " " " " " " " " " " " "	2-Methylnaphthalene	ND	10.0	u	11		an .			
No	2-Methylphenol	ND	10.0	**	Ü		u	"	11	
4-Nitrophenol ND 10.0 " " 06/11/03 " 6-Methyl chrysene ND 10.0 " " 06/11/03 " 6-Methyl chrysene ND 10.0 " 0 06/11/03 " 6-Methyl chrysene ND 10.0 " 0 06/11/03 " 06/11/03 " 06/11/03 " 06/11/03 " 06/11/03 " 06/11/03 " 06/11/03 " 06/11/03 " 06/11/03 " 06/11/03 " 06/11/03 " 06/11/03 " 0 06/11/03	3 & 4-Methylphenol	ND	10.0	11	"	n	ű	"	*	
7,12-Dimethylbenz (a) anthracene ND 10.0 " " " " " " " " " " " " " " " " " "	4-Nitrophenol	ND	10.0	u		11	tt			
Acenaphthylene	6-Methyl chrysene	ND	10.0	n .	**		**	06/11/03	,,,	
Acetaphthylene Anthracene ND 10.0 ND 1	7,12-Dimethylbenz (a) ant	hracene ND	10.0	II .	11	313		06/11/03	11	
Anthracene         ND         10.0         """"""""""""""""""""""""""""""""""""	Acenaphthylene	ND	10.0		п	31	ii.	11	31.0	
Benzo (a) anthracene         ND         10.0           Benzo (a) pyrene         ND         10.0         """"""""""""""""""""""""""""""""""""		ND	10.0	3.00	**	11	"	"	n	
Benzo (a) pyrene         ND         10.0           Benzo (b) fluoranthene         ND         10.0         """"""""""""""""""""""""""""""""""""	Benzo (a) anthracene	ND	10.0	n	н	311	n	11%	n	
Benzo (b) fluoranthene         ND         10.0         """"""""""""""""""""""""""""""""""""	Benzo (a) pyrene	ND	10.0	n	u	n		и	m:	
Benzo (ghi) perylene         ND         10.0         """"""""""""""""""""""""""""""""""""		ND	10.0	€ <b>1</b> 0	:000	11	ü	n		
Benzo (k) fluoranthene         ND         10.0         """"""""""""""""""""""""""""""""""""	Benzo (ghi) perylene	ND	10.0	u	**	11	W.	300	30.5	
Bityl benzyl phthalate ND 10.0 " " " " " " " " " " " " " " " " " "	THE PROPERTY OF THE PROPERTY O	ND	10.0	- 11	.00	. 30		"	u	
Butyl benzyl phthalate         ND         10.0         """"""""""""""""""""""""""""""""""""	Bis(2-ethylhexyl)phthalate	ND	10.0	<b>70</b>	311	11	303	п	11	
Chrysene       ND       10.0       " <t< td=""><td></td><td></td><td>10.0</td><td>•</td><td></td><td></td><td>n</td><td>11</td><td>310</td><td></td></t<>			10.0	•			n	11	310	
Di-n-butyl phthalate         ND         10.0         """"""""""""""""""""""""""""""""""""	Chrysene	ND	10.0	u		11	11	n	u	
Di-n-octyl phthalate Dibenz (a,h) acridine ND 10.0  ND ND 10.0  ND ND 10.0  ND ND 10.0  ND		ND	10.0	9	11	ar.	30%	310	ii .	
Dibenz (a,h) acridine       ND       10.0       "       "       "       06/11/03       "         Dibenz (a,h) anthracene       ND       10.0       "       "       "       "       06/11/03       "         Diethyl phthalate       ND       10.0       "       "       "       "       "       "       "         Dimethyl phthalate       ND       10.0       "	150 150	ND	10.0	Ü	u	**	.00	(0)	310	
Dibenz (a,h) anthracene       ND       10.0       "		ND	10.0	31.	200	100	Ü	06/11/03		
Diethyl phthalate         ND         10.0         "	Dibenz (a,h) anthracene	ND	10.0	"	"	н	11	06/11/03	(F (III)	
Dimethyl phthalate         ND         10.0         "	Diethyl phthalate	ND	10.0		11	u	**		300	
Fluoranthene         ND         10.0         "		ND	10.0	11	906	- u	11	300	н	
Fluorene         ND         10.0           Indene         ND         10.0         " " " " 06/12/03 "           Indeno (1,2,3-cd) pyrene         ND         10.0         " " " " 06/11/03 "           Naphthalene         ND         10.0         " " " " " " " " " "           Phenanthrene         ND         10.0         " " " " " " " " " " "	5 8	ND	10.0	ñ	u	ij.		11	316	
Indene         ND         10.0         "         "         "         06/12/03           Indeno (1,2,3-cd) pyrene         ND         10.0         "         "         "         06/11/03         "           Naphthalene         ND         10.0         "         "         "         "         "         "           Phenanthrene         ND         10.0         "         "         "         "         "         "         "	Fluorene	ND	10.0	n .	u	ű	11		u	
Naphthalene ND 10.0 " " " " " " " " " " " " " " " " " "		ND	10.0	n.	o,	"	A116	06/12/03	"	
Naphthalene         ND         10.0         "	Indeno (1,2,3-cd) pyrene	ND	10.0	TF .	ïï	ï.	u	06/11/03	n	
Phenanthrene ND 10.0 " " " " "		ND	10.0	31	п	"	u	n	ü	
	( <del>**</del> )	ND	10.0		ij.	0	n	u	u	
			10.0		u	11	n	ü	<u>u</u>	

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Shell - Puget Sound Plant

8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes **Amended Report** 

Issued: 06/19/03 10:35

## 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
98 (B3E0743-07) Water Sa	ampled: 05/29/03 12:00	Received: 0	5/30/03 11:05	5					
Pyrene	ND	10.0	ug/l	1	3F04002	06/04/03	06/11/03	u	
Pyridine	ND	10.0	п	**	n	10	31.0	30%	
Quinoline	ND	10.0	306	**		10	06/11/03	n.	
Thiophenol	ND	10.0	u	n	н	100	06/11/03	. 0	
Surrogate: 2-FP	35.2 %	18-124			"	u	06/11/03	n	
Surrogate: Phenol-d6	55.8 %	25-122			"	•	"	***	
Surrogate: 2,4,6-TBP	37.4 %	19-132			"	"	"	"	
Surrogate: Nitrobenzene-d5	67.9 %	44-124			"	"	"	"	
Surrogate: p-Terphenyl-d14	68.7 %	10-132			"	u	"	"	
Surrogate: 2-FBP	67.3 %	41-129			"	"	"	, n	
95 (B3E0743-08) Water S	ampled: 05/29/03 12:00	Received: 0	5/30/03 11:05	5					
1,2-Dichlorobenzene	ND	10.0	ug/l	1	3F04002	06/04/03	06/11/03	EPA 8270C	
1,3-Dichlorobenzene	ND	10.0	"	. <b>11</b>	ш	ж.	n	•	
1,4-Dichlorobenzene	ND	10.0	u.	u	ü	n	116	11 m	
1-Methylnaphthalene	ND	10.0	"	u	"	Ü	"	111	
2,4-Dimethylphenol	ND	10.0	u	ü	11	310	130	"	
2,4-Dinitrophenol	ND	10.0	v	u.	Ü	"	u.	11	
2-Methylnaphthalene	ND	10.0	11		"	"	u	"	
2-Methylphenol	ND	10.0	<b>U</b>		n	300	ø		
3 & 4-Methylphenol	ND	10.0	10.1	"	Ü		ii.	22	
4-Nitrophenol	ND	10.0	m.	11	"	10	u	11	
6-Methyl chrysene	ND	10.0		Ü	"	u	06/11/03	n-c	
7,12-Dimethylbenz (a) anthra	ncene ND	10.0	30%	0.5	n	"	06/11/03		
Acenaphthylene	ND	10.0	11.	n.,	11	n	11	n	
Anthracene	ND	10.0			"	u.	n.	11:1	
Benzo (a) anthracene	ND	10.0	3118	w:	***	ü	**	н	
Benzo (a) pyrene	ND	10.0	•	"	u	"	m.c		
Benzo (b) fluoranthene	ND	10.0	311:	11	u	**	11	n	
Benzo (ghi) perylene	ND	10.0	11	ne	***	н	.00%	n	
Benzo (k) fluoranthene	ND	10.0			u	w		311	
Bis(2-ethylhexyl)phthalate	ND	10.0	11	311	11	"	11	in	
Butyl benzyl phthalate	ND	10.0	II	.11	700	31%	<b>(U</b> )	ar.	
Chrysene	ND	10.0	n		11	"	10.		
Di-n-butyl phthalate	ND	10.0	Sit.	SHE	ane	311.	u	THE	
* :- ·									

North Creek Analytical - Bothell

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Shell - Puget Sound Plant

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

Project Number: 4550237616
Project Manager: Brian Rhodes

Amended Report Issued: 06/19/03 10:35

# 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
95 (B3E0743-08) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:05	<b>i</b>					
Di-n-octyl phthalate	ND	10.0	ug/l	1	3F04002	06/04/03	06/11/03	ü	
Dibenz (a,h) acridine	ND	10.0		"	11		06/11/03	" =	
Dibenz (a,h) anthracene	ND	10.0		"	ij	11	06/11/03	n .	
Diethyl phthalate	ND	10.0	u	"	"	311	"	n	
Dimethyl phthalate	ND	10.0	n	Ü	n	u	ű	n <sub>e</sub>	
Fluoranthene	ND	10.0	316	110	ne	ű	n	n	
Fluorene	ND	10.0	11	11	n	u		.000	
Indene	ND	10.0		ii .	11	"	06/12/03	u	
Indeno (1,2,3-cd) pyrene	ND	10.0	30"	н	n	. "	06/11/03		
Naphthalene	ND	10.0			H	ü	11	90%	
Phenanthrene	ND	10.0	:00	n.	u	n		u	
Phenol	ND	10.0	***	307	w	n	ж	u,	
Pyrene	ND	10.0	n			ÿ	n.	11	
Pyridine	ND	10.0	716	915	.00	ů.	,,	11	
Quinoline	ND	10.0	TI .	п	**	n	06/11/03	11	
Thiophenol	ND	10.0	н	n		11	06/11/03	u	
Surrogate: 2-FP	19.1 %	18-124		-	п	"	06/11/03	•	
Surrogate: Phenol-d6	39.2 %	25-122			n	"	n.	"	
Surrogate: 2,4,6-TBP	43.7 %	19-132			"	n		7.11	
Surrogate: Nitrobenzene-d	5 61.0 %	44-124			"	<i>u</i> .	"	en.	
Surrogate: p-Terphenyl-d1		10-132			ű	"	"	""	
Surrogate: 2-FBP	59.0 %	41-129			"	"	"	"	
96 (B3E0743-09) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:0	5					
1,2-Dichlorobenzene	ND	10.0	ug/l	1	3F04002	06/04/03	06/11/03	EPA 8270C	
1,3-Dichlorobenzene	ND	10.0	"	11	ü	"	II	"	
1,4-Dichlorobenzene	ND	10.0	II	: 11	11	330	н	u	
1-Methylnaphthalene	ND	10.0	ij	u	"	111	0.00	"	
2,4-Dimethylphenol	ND	10.0	11	ii.		**	ü	ü	
2,4-Dinitrophenol	ND	10.0	9	n	"	316	11	n	
2-Methylnaphthalene	ND	10.0	W.	11	"		"	"	
2-Methylphenol	ND	10.0	31102	u	ü	n	ii	"	
3 & 4-Methylphenol	ND	10.0		2	u	α	"	n,	
4-Nitrophenol	ND	10.0	ii)	Ü	10	n	9	n	
6-Methyl chrysene	ND	10.0	HS.	##°	318	"	06/11/03	n	

North Creek Analytical - Bothell

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Shell - Puget Sound Plant

8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616

Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

## 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 (B3E0743-09) Water Sampled: 05/.	29/03 12:00	Received: 05	/30/03 11:05	5					
7,12-Dimethylbenz (a) anthracene	ND	10.0	ug/l	1	3F04002	06/04/03	06/11/03	"	
Acenaphthylene	ND	10.0	n	11	n	ű	"	11.0	
Anthracene	ND	10.0		n	11	"	Ü	11	
Benzo (a) anthracene	ND	10.0	н	n	n	"	U	п	
Benzo (a) pyrene	ND	10.0	II .	))	11	ii	0	m.	
Benzo (b) fluoranthene	ND	10.0	11.2			ij	Ü	"	
Benzo (ghi) perylene	ND	10.0	"	"	"	11	11	11	
Benzo (k) fluoranthene	ND	10.0	n	"	'n	11	n	n	
Bis(2-ethylhexyl)phthalate	44.5	10.0	an:	31	310		n.	11	
Butyl benzyl phthalate	ND	10.0	II .	11		22	n.	H.	
Chrysene	ND	10.0	30.0		ii	W.		"	
Di-n-butyl phthalate	ND	10.0		11	n	ma	300		
Di-n-octyl phthalate	ND	10.0		u		11	11	ar.	
Dibenz (a,h) acridine	ND	10.0	11	311	u.	n.	06/11/03	II .	
Dibenz (a,h) anthracene	ND	10.0		10	n	11	06/11/03	30	
Diethyl phthalate	ND	10.0				**			
Dimethyl phthalate	ND	10.0	in	311	311	n:	302	п	
Fluoranthene	ND	10.0	11	,,		u	п	11	
Fluorene	ND	10.0	300	300				11	
Indene	ND	10.0	II		700	u	06/12/03	att	
Indeno (1,2,3-cd) pyrene	ND	10.0	.11		11		06/11/03		
Naphthalene	ND	10.0	300	310	an.	39.7		n	
Phenanthrene	ND	10.0		11		u	**	in .	
Phenol	ND	10.0	.00	31	11	u	,11	п	
Pyrene	ND	10.0	ш	311	in.	30.	300	n.	
Pyridine	ND	10.0	•	11	"		**	"	
Quinoline	ND	10.0	311	n.	, iii	n.	06/11/03	u	
Thiophenol	ND	10.0	·	11	Tri.	/m	06/11/03	ti.	
	40.2 %	18-124			,,	n	06/11/03	,,	
Surrogate: 2-FP Surrogate: Phenol-d6	57.4 %	25-122			,,	,,	"	,,	
Surrogate: 2,4,6-TBP	47.7 %	19-132			•	ä	"	,,	
Surrogate: Nitrobenzene-d5	59.6 %	44-124			n	u	n	"	
Surrogate: p-Terphenyl-d14	66.5 %	10-132			n	n	"	"	
Surrogate: 2-FBP	72.1 %	41-129		<b>(23</b>	,,	"	"	"	

North Creek Analytical - Bothell

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Shell - Puget Sound Plant

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

Project Number: 4550237616 Project Manager: Brian Rhodes **Amended Report** 

Issued: 06/19/03 10:35

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

	*	Reporting		_ % 3				M. d 1	NT
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
97 (B3E0743-10) Water Sample	ed: 05/29/03 12:00	Received: 05	5/30/03 11:0:	5					
1,2-Dichlorobenzene	ND	10.0	ug/l	1	3F04002	06/04/03	06/11/03	EPA 8270C	
1,3-Dichlorobenzene	ND	10.0	"	"		u	"	ue	
1,4-Dichlorobenzene	ND	10.0	110	"	"	Ü	"	"	
1-Methylnaphthalene	ND	10.0	11	2	300	u	11.		
2,4-Dimethylphenol	ND	10.0	11	Ü		**	11	"	
2,4-Dinitrophenol	ND	10.0	m:		310	n	11	11	
2-Methylnaphthalene	ND	10.0	11		"	<u></u>	н	ж.	
2-Methylphenol	ND	10.0	11	"	"	11	"		
3 & 4-Methylphenol	ND	10.0	11	311	310	11/2	30.	n .	
4-Nitrophenol	ND	10.0	10	11	**	11	u	115	
6-Methyl chrysene	ND	10.0	ж.	300	"	11"	06/11/03	n	
7,12-Dimethylbenz (a) anthracene	ND	10.0			:n:	. 11	06/11/03	.11:	
Acenaphthylene	ND	10.0	,11		u	n			
Anthracene	ND	10.0	11.	310	ш	.00			
Benzo (a) anthracene	ND	10.0	u	,,	11	ii.	Tr.	300	
Benzo (a) pyrene	ND	10.0	31.			30	"		
Benzo (b) fluoranthene	ND	10.0	и	***	3 <b>11</b> 3	au .	п	11	
Benzo (ghi) perylene	ND	10.0	11	.,	"	.00	n	TF.	
Benzo (k) fluoranthene	ND	10.0	310	:10	200	u	u	n	
Bis(2-ethylhexyl)phthalate	ND	10.0	"		п	m	и	311	
Butyl benzyl phthalate	ND	10.0	11	.11	,,,	"	n	"	
Chrysene	ND	10.0	311	310	3006	311	311	"	
Di-n-butyl phthalate	ND	10.0			п	u	u	п	
Di-n-octyl phthalate	ND	10.0	11	11	**	u	"	Œ.	
Dibenz (a,h) acridine	ND	10.0	u	Sin.	1000	316	06/11/03	u.	
Dibenz (a,h) anthracene	ND	10.0			<u>ii</u>	**	06/11/03		
Diethyl phthalate	ND	10.0	n	811	- 11		ű	īi .	
Dimethyl phthalate	ND	10.0	"	n	ü	n	n	u	
Fluoranthene	ND	10.0	Ü	Ü	n	•	Ü	2	
Fluorene	ND	10.0	n .	II.	"	8116	u.	Ü	
Indene	ND	10.0	u u	"	W	0	06/12/03	100	
Indeno (1,2,3-cd) pyrene	ND	10.0	**	ű	11	. 0	06/11/03	v	
Naphthalene	ND	10.0	,	u.	п	п	u	HE:	
Phenanthrene	ND	10.0	n .	"	u	<b>u</b>	0 .		
Phenol	ND	10.0	30.2	n	H.:		11	n	
e companie	5.175	0.000.000							

North Creek Analytical - Bothell

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Shell - Puget Sound Plant

8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

## 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 (B3E0743-10) Water Sa	mpled: 05/29/03 12:00	Received: 0	5/30/03 11:0	)5					
Pyrene	ND	10.0	ug/l	1	3F04002	06/04/03	06/11/03	Ü	
Pyridine	ND	10.0	"	u	ri .	Sur-	n	u	
Quinoline	ND	10.0	n	"	"	NT.	06/11/03	ü	
Thiophenol	ND	10.0	"	THE STATE OF THE S	n	ા	06/11/03	n	
Surrogate: 2-FP	39.5 %	18-124			"	"	06/11/03	n	
Surrogate: Phenol-d6	52.3 %	25-122			"	"	"	"	
Surrogate: 2,4,6-TBP	41.3 %	19-132			"	Ü	"	. "	
Surrogate: Nitrobenzene-d5	59.5 %	44-124			" .	Ü	"	"	
Surrogate: p-Terphenyl-d14	54.6 %	10-132	578	·		"	"	"	
Surrogate: 2-FBP	62.2 %	41-129			u	n:		"	
63 (B3E0743-11) Water Sa	mpled: 05/29/03 12:00	Received: 0	5/30/03 11:0	05					
1,2-Dichlorobenzene	ND	10.0	ug/l	1	3F04002	06/04/03	06/11/03	EPA 8270C	
1,3-Dichlorobenzene	ND	10.0	111		30.0	"	0.0	11	
1,4-Dichlorobenzene	ND	10.0	"	ij	11		in.	10	
1-Methylnaphthalene	20.2	10.0	300	"	11	Ü	"	TI.	
2,4-Dimethylphenol	ND	10.0		11	ш	31 (1	Ü	и:	
2,4-Dinitrophenol	ND	10.0			u	**	ii .	п	
2-Methylnaphthalene	13.8	10.0	THE STATE OF THE S	311	302	ñ.	10.	· ·	
2-Methylphenol	ND	10.0	n	11	.11	Ü	11	316	
3 & 4-Methylphenol	ND	10.0	n	n		**			
4-Nitrophenol	ND	10.0	· ·	110	116	3113	31.	и	
6-Methyl chrysene	ND	10.0	.11		"	in	06/11/03	311	
7,12-Dimethylbenz (a) anthra	cene ND	10.0	:10	310	n	u u	06/11/03	n	
Acenaphthylene	ND	10.0	n	10	316	au		11	
Anthracene	ND	10.0	u	w	n		11	"	
Benzo (a) anthracene	ND	10.0	u	311.	an.	.11		u	
Benzo (a) pyrene	ND	10.0	u			0	n	311	
Benzo (b) fluoranthene	ND	10.0	"		u	n	•	u	
Benzo (ghi) perylene	ND	10.0	ũ	30	эк	:112	311	u	
Benzo (k) fluoranthene	ND ND	10.0	"	"	"		ш	п	
Bis(2-ethylhexyl)phthalate	ND ND	10.0	"	2 20	n ii	u		ū	
그 그 그 이 생기를 가는 것이 되었다.	ND ND	10.0	"	ш		111	310		
Butyl benzyl phthalate	ND ND	10.0	ű	"				u	
Chrysene Dia butal abthalata	ND ND	10.0	11	30.	n	200	u		
Di-n-butyl phthalate	ND	10.0							

North Creek Analytical - Bothell

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Shell - Puget Sound Plant

8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

## 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 (B3E0743-11) Water	Sampled: 05/29/03 12:00	Received: 05	5/30/03 11:05						
Di-n-octyl phthalate	ND	10.0	ug/l	1	3F04002	06/04/03	06/11/03	11	
Dibenz (a,h) acridine	ND	10.0	n.	n		ü	06/11/03	30.8	
Dibenz (a,h) anthracene	ND	10.0	11.	"	,,,	ï	06/11/03	11	
Diethyl phthalate	ND	10.0		"	m.	11	н		
Dimethyl phthalate	ND	10.0	n.		"	11	n	"	
Fluoranthene	ND	10.0	m	11.7		10		11	
Fluorene	ND	10.0	11	н	H	n	311	u ·	
Indene	ND	10.0	n .	и		ù	06/12/03	u	
Indeno (1,2,3-cd) pyrene	ND	10.0	n	n	110	ns	06/11/03	•	
Naphthalene	12.1	10.0	11	n			II .	m.	
Phenanthrene	14.0	10.0		30.2	"	11	"	п	
Phenol	ND	10.0	п	u	Tr.	HS.	200	311.	
Pyrene	ND	10.0	11			11	11		
Pyridine	ND	10.0	ж	3102		11:	**	•	
Quinoline	ND	10.0	n		11	u	06/11/03	311	
Thiophenol	ND	10.0	.11		11	11	06/11/03		
Surrogate: 2-FP	48.0 %	18-124			n	n.	06/11/03	. #	SI SI
Surrogate: Phenol-d6	56.7 %	25-122			"	<i>"</i>	"	"	
Surrogate: 2,4,6-TBP	43.7 %	19-132			"	"	"	"	
Surrogate: Nitrobenzene-a	71.2 %	44-124			"	"	"	"	
Surrogate: p-Terphenyl-dl		10-132			"	"	"	"	
Surrogate: 2-FBP	61.2 %	41-129			"	"	"	"	
65 (B3E0743-12) Water	Sampled: 05/29/03 12:00	Received: 0	5/30/03 11:05					G-1876	
1,2-Dichlorobenzene	ND	10.0	ug/l	1	3F04002	06/04/03	06/11/03	EPA 8270C	
1,3-Dichlorobenzene	ND	10.0	11	11	ü		ũ	"	
1,4-Dichlorobenzene	ND	10.0	II .	TH.	и	SH	u	Ü	
1-Methylnaphthalene	ND	10.0	"	u	"	30	n .	н	
2,4-Dimethylphenol	ND	10.0	n	ü	ü	11	ij	ũ	
2,4-Dinitrophenol	ND	10.0	20	m m	ш	2n	11	**	
2-Methylnaphthalene	ND	10.0		"	Ü	"		"	
2-Methylphenol	ND	10.0	#F %	11	IJ	ű	ŭ	и	
3 & 4-Methylphenol	ND	10.0			"	<u>a</u>	11	3105	
4-Nitrophenol	ND	10.0	w	ü	W.		9	u	
6-Methyl chrysene	ND	10.0	and a	n	31/2	11	06/12/03	n	
0-Mcmyr cmysche	ND	10.0							

North Creek Analytical - Bothell

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Shell - Puget Sound Plant

8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: . Brian Rhodes **Amended Report** 

Issued: 06/19/03 10:35

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

10	·	Reporting					W 20 20		1-11-11
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
65 (B3E0743-12) Water Samp	pled: 05/29/03 12:00	Received: 05	5/30/03 11:05	5					
7,12-Dimethylbenz (a) anthracen		10.0	ug/l	1	3F04002	06/04/03	06/11/03	W.	
Acenaphthylene	ND	10.0	11	11	II .	u	n	30.	
Anthracene	ND	10.0	:00	п	11	"	11	i ii	
Benzo (a) anthracene	ND	10.0	"	w	3113	**	"		
Benzo (a) pyrene	ND	10.0		11	11		11	110	
Benzo (b) fluoranthene	ND	10.0	300	3113		D.	u		
Benzo (ghi) perylene	ND	10.0	н		n	nc	2000	n	
Benzo (k) fluoranthene	ND	10.0	"		. "	11		m.	
Bis(2-ethylhexyl)phthalate	ND	10.0	THE STATE OF THE S	ar.	300	11	ji .	n	
Butyl benzyl phthalate	ND	10.0	er .		11	46	н	306	
Chrysene	ND	10.0	810			11	<b>"</b>	u	
Di-n-butyl phthalate	ND	10.0	10	300	115	æ	,u	n n	
Di-n-octyl phthalate	ND	10.0	ü	10	п		u	· n	
Dibenz (a,h) acridine	ND	10.0	n	200		n.	06/12/03	· ·	
Dibenz (a,h) anthracene	ND	10.0	"	**	u	311	06/11/03		
Diethyl phthalate	ND	10.0	ü		"	W	u	11	
Dimethyl phthalate	ND	10.0	ii .	Э16	310	200	·u	ű	
Fluoranthene	ND	10.0	u u	11	v	u	ंस	"	
Fluorene	ND	10.0	"	"	ű	u	11	u.	
Indene	ND	10.0	20	ū	17	:10	06/12/03	ü	
Indeno (1,2,3-cd) pyrene	ND	10.0	u.	"	11	"	06/11/03	11	
Naphthalene	ND	10.0	30.7	" .		•			
Phenanthrene	ND	10.0	10	: ii		110	11	11	
Phenol	ND	10.0	iii)	ü			9	11.	
Pyrene	ND	10.0	11	11	.u	110	"	**	
Pyridine	ND	10.0	11			6	"	116	
Quinoline	ND	10.0	312	Ü	**	ű	06/12/03	"	
Thiophenol	ND	10.0		11	90%	"	06/11/03	**	
Surrogate: 2-FP	41.6 %	18-124			"	"	06/11/03	n.	
Surrogate: Phenol-d6	51.1 %	25-122			"	"	"	"	
Surrogate: 2,4,6-TBP	43.5 %	19-132			"	,	"	"	
Surrogate: Nitrobenzene-d5	54.8 %	44-124			"	"	"		
Surrogate: p-Terphenyl-d14	47.4 %	10-132			"		"	n	
Surrogate: 2-FBP	52.2 %	41-129			m	***	au.	"	

North Creek Analytical - Bothell

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Shell - Puget Sound Plant

8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes **Amended Report** 

Issued: 06/19/03 10:35

## 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 (B3E0743-13) Water	Sampled: 05/29/03 12:00	Received:	05/30/03 11:0	5					
1,2-Dichlorobenzene	ND	10.0	ug/l	1	3F04002	06/04/03	06/11/03	EPA 8270C	
1,3-Dichlorobenzene	ND	10.0	n	u	n	u	"	u	
1,4-Dichlorobenzene	ND	10.0	316	"	11	ü	Ü	W.	
1-Methylnaphthalene	ND	10.0		11	in s	u.	U	•	
2,4-Dimethylphenol	24.2	10.0	.11	11	**	ü	9	11	
2,4-Dinitrophenol	ND	10.0	**	1113		Ü	ij.	•	
2-Methylnaphthalene	ND	10.0	п	n	II.	"	11%	.003	
2-Methylphenol	ND	10.0	·	ji		11	11	•	
3 & 4-Methylphenol	ND	10.0	н	300	3110				
4-Nitrophenol	ND	10.0	20	n		0	н	m:	
6-Methyl chrysene	ND	10.0	310	10:	"	,,,	06/12/03		
7,12-Dimethylbenz (a) anthr	racene ND	10.0	п		11	300	06/11/03		
Acenaphthylene	ND	10.0	u		- n	"		TF.	
Anthracene	ND	10.0	эк	211	311	**	u.	"	
Benzo (a) anthracene	ND	10.0	ü	11	u	11:	п	311.	
Benzo (a) pyrene	ND	10.0			•	11	"	и	
Benzo (b) fluoranthene	ND	10.0	ü	11	311	u	n	11	
Benzo (ghi) perylene	ND	10.0	u.	10	11	n	11	n	
Benzo (k) fluoranthene	ND	10.0	α	1.00	**	11		111	
Bis(2-ethylhexyl)phthalate	ND	10.0	"	· ·	п	3 <b>H</b> C	30	n.	
Butyl benzyl phthalate	ND	10.0	"	u	ü	111		Si	
Chrysene	ND	10.0	"		11	.11	"	ii	
Di-n-butyl phthalate	ND	10.0		2		11	H	н	
Di-n-octyl phthalate	ND	10.0	U	n	"	"	u	ñ	
Dibenz (a,h) acridine	ND	10.0	20	n "	"	n	06/12/03	ï	
Dibenz (a,h) anthracene	ND	10.0	u .	Ü	"		06/11/03	"	
Diethyl phthalate	ND	10.0	300	u	ŭ	11	Ü	n.	
Dimethyl phthalate	ND	10.0	11			111	"	10 /	
Fluoranthene	ND	10.0	u	Ü		ű	n		
Fluorene	ND	10.0	11	100	303	"	ű	11	
Indene	ND	10.0	u		"	"	06/12/03	HS	
Indeno (1,2,3-cd) pyrene	ND	10.0	(11)	II.	11	Ü	06/11/03		
Naphthalene	ND	10.0	11	11	300	11	307	п	
Phenanthrene	ND	10.0		11		n .	u	**	
Phenol	ND	10.0	311	3113	300	n.		u	

North Creek Analytical - Bothell

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Shell - Puget Sound Plant 8505 South Texas Road

Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes Amended Report Issued: 06/19/03 10:35

## 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 (B3E0743-13) Water Sampled:	05/29/03 12:00	Received: 0	5/30/03 11	:05					
Pyrene	ND	10.0	ug/l	1	3F04002	06/04/03	06/11/03	"	
Pyridine	ND	10.0	11	u		ű	ii	"	
Quinoline	ND	10.0	30%	30.7	310	n	06/12/03	n	
Thiophenol	ND	10.0	"	11	"	"	06/12/03	JF €	
Surrogate: 2-FP	46.8 %	18-124			,,	"	06/11/03	"	
Surrogate: Phenol-d6	46.8 %	25-122			"	"	"	"	
Surrogate: 2,4,6-TBP	47.4 %	19-132			<b></b>	"	"	"	
Surrogate: Nitrobenzene-d5	54.0 %	44-124			n	"	"	· ·	
Surrogate: p-Terphenyl-d14	36.9 %	10-132			"	"	"	"	
Surrogate: 2-FBP	55.7 %	41-129			u	<i>TE</i>	æ	.n.	
BLANK (B3E0743-14) Water Samp	led: 05/29/03 1	2:00 Receiv	ed: 05/30/	03 11:05					
1,2-Dichlorobenzene	ND	10.0	ug/l	1	3F04002	06/04/03	06/11/03	EPA 8270C	
1,3-Dichlorobenzene	ND	10.0		.00	11	are	œ	an:	
1,4-Dichlorobenzene	ND	10.0	31.		11	11	"		
1-Methylnaphthalene	ND	10.0	æ	311	an .	3113	"	11	
2,4-Dimethylphenol	ND	10.0	ıı		11	III	Ti .	n.	
2,4-Dinitrophenol	ND	10.0	311		"	•	11	"	
2-Methylnaphthalene	ND	10.0	"	911	THE .	3113 3113	· m	и	
2-Methylphenol	ND	10.0	n	n				n	83
3 & 4-Methylphenol	ND	10.0	300	311	311		11	9.0	
4-Nitrophenol	ND	10.0	11	ıı	u	in:	ıı	346	
6-Methyl chrysene	ND	10.0		'n	u	**	06/12/03	· ·	
7,12-Dimethylbenz (a) anthracene	ND	10.0		3 n	11	311	06/11/03	, ii	
Acenaphthylene	ND	10.0	<b>u</b> .	n		30	SII.	II .	
Anthracene	ND	10.0	**	30	ü	u	"	e Ü	
Benzo (a) anthracene	ND	10.0	n	ű	n	SH:	88	" "	
Benzo (a) pyrene	ND	10.0	ü		<u>;;</u>		u	- n	
Benzo (b) fluoranthene	ND	10.0	"	"	**		ű	Ü	
Benzo (ghi) perylene	· ND	10.0	u.	п	<u>n</u>	an	11	n	
Benzo (k) fluoranthene	ND	10.0	,,	"		11	ij.		
Bis(2-ethylhexyl)phthalate	ND	10.0	2 10	11		.0.	ш	w.	
Butyl benzyl phthalate	ND	10.0	n	9			"	w:	
Chrysene	ND	10.0	31.3	U		ñ	,	III	
Di-n-butyl phthalate	ND	10.0	0		11	n	u	11:	

North Creek Analytical - Bothell

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Shell - Puget Sound Plant

8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616

Project Manager: Brian Rhodes

**Amended Report** 

Issued: 06/19/03 10:35

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

	Re	porting							season or the season
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
BLANK (B3E0743-14) Water	Sampled: 05/29/03 12:00	Receiv	ved: 05/30/	03 11:05					
Di-n-octyl phthalate	ND	10.0	ug/l	1	3F04002	06/04/03	06/11/03		
Dibenz (a,h) acridine	ND	10.0	ii i	"	11	e e	06/12/03		
Dibenz (a,h) anthracene	ND	10.0	30.7	11	"	u	06/11/03		
Diethyl phthalate	ND	10.0	11	11	11	"			
Dimethyl phthalate	ND	10.0	11	ū	11	11	11	. u	
Fluoranthene	ND	10.0	11	11/3	3163	11	"	и	
Fluorene	ND	10.0	11		31	ü	36	3E2	
Indene	ND	10.0	.000	"	n	0	06/12/03	11	
Indeno (1,2,3-cd) pyrene	ND	10.0		***	311	3103	06/11/03	W.	
Naphthalene	ND	10.0		11		"	TI.	are	
Phenanthrene	ND	10.0	n			11	w		
Phenol	ND	10.0			u	n	ni.	300	
Pyrene	ND	10.0		11	10	11			
Pyridine	ND	10.0	w	n n	310	310	· ·	11	
Ouinoline	ND	10.0	,,,		11	11	06/12/03	300	
Thiophenol	ND	10.0	(11)	**		••	06/12/03	u	
Surrogate: 2-FP	45.8 % 18-	124			u	n	06/11/03	ii .	
Surrogate: Phenol-d6	50.1 % 25-	122			"	"#	SH .	"	
Surrogate: 2,4,6-TBP	39.8 % 19-	132			"	"	"	"	
Surrogate: Nitrobenzene-d5	51.5 % 44-	124			<u>ii</u>	"	"	"	
Surrogate: p-Terphenyl-d14	49.5 % 10-	132			ü	"	"	"	
Surrogate: 2-FBP	55.9 % 41-	129			"	"	"	"	

North Creek Analytical - Bothell

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Shell - Puget Sound Plant

Project: SWMU 11 Sampling

8505 South Texas Road Anacortes WA, 98221

Project Number: 4550237616 Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

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

	]	Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 3F02012: Prepared 06/02/03	Using EP	A 3520C								
Blank (3F02012-BLK1)										
Diesel Range Hydrocarbons	ND	0.250	mg/l							
Lube Oil Range Hydrocarbons	ND	0.500						A-1-1-1-1-1		
Surrogate: 2-FBP	0.274		"	0.320		85.6	50-150			
Surrogate: Octacosane	0.140		u	0.160		87.5	50-150			
LCS (3F02012-BS1)										
Diesel Range Hydrocarbons	1.78	0.250	mg/l	2.00		89.0	63-107			
Surrogate: 2-FBP	0.296		"	0.320		92.5	50-150			
LCS Dup (3F02012-BSD1)				2					32,000	
Diesel Range Hydrocarbons	1.80	0.250	mg/l	2.00		90.0	63-107	1.12	40	
Surrogate: 2-FBP	0.282		"	0.320		88.1	50-150			
COMPANY OF THE PROPERTY OF THE										

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Shell - Puget Sound Plant

8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

## 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 3F02032:	Prepared 06/02/03	Using E	PA 3020A					ti .			
Blank (3F02032-BI	LK1)		7								
Antimony		ND	0.00300	mg/l							
Arsenic		ND	0.00100	u							
Barium		ND	0.0100	"							
Beryllium		ND	0.00100	ii.							
Cadmium		ND	0.00100	"							
Chromium		ND	0.00100	Ü							
Cobalt		ND	0.00100								
Copper		ND	0.00100								
Lead	₩ <u></u>	ND	0.00100	u							
Nickel		ND	0.00100								
Selenium		ND	0.00100	10					· 0		
Silver		ND	0.00100								
Vanadium		ND	0.00100	.00			<b>%</b>				
LCS (3F02032-BS)	1)		· ·								
Antimony		0.0819	0.00300	mg/l	0.0800		102	80-120			
Arsenic		0.0799	0.00100	11	0.0800		99.9	80-120			
Barium		0.0811	0.0100		0.0800		101	80-120			
Beryllium		0.0814	0.00100	н	0.0800		102	80-120			
Cadmium		0.0802	0.00100		0.0800		100	80-120			
Chromium		0.0802	0.00100		0.0800		100	80-120			
Cobalt		0.0797	0.00100	n	0.0800		99.6	80-120			
Copper		0.0788	0.00100	on .	0.0800		98.5	80-120			
Lead		0.0799	0.00100	210	0.0800		99.9	80-120			
Nickel		0.0796	0.00100	H	0.0800		99.5	80-120			
Selenium		0.0808	0.00100	"	0.0800		101	80-120			
Silver		0.0796	0.00100	30	0.0800		99.5	80-120			
Vanadium		0.0812	0.00100		0.0800		102	80-120			

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Shell - Puget Sound Plant

8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616

Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

#### 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 3F02032:	Prepared 06/02/03	Using E	PA 3020A								
LCS Dup (3F02032	-BSD1)										
Antimony		0.0821	0.00300	mg/l	0.0800		103	80-120	0.244	20	
Arsenic	S24	0.0793	0.00100		0.0800		99.1	80-120	0.754	20	
Barium		0.0798	0.0100	11	0.0800		99.8	80-120	1.62	20	
Beryllium		0.0798	0.00100	n	0.0800		99.8	80-120	1.99	20	
Cadmium		0.0793	0.00100	11	0.0800		99.1	80-120	1.13	20	
Chromium		0.0797	0.00100	11	0.0800		99.6	80-120	0.625	20	
Cobalt		0.0793	0.00100	•	0.0800		99.1	80-120	0.503	20	
Copper		0.0781	0.00100	an:	0.0800		97.6	80-120	0.892	20	
Lead		0.0790	0.00100		0.0800		98.8	80-120	1.13	20	
Nickel		0.0788	0.00100	:00:	0.0800		98.5	80-120	1.01	20	
Selenium		0.0801	0.00100		0.0800		100	80-120	0.870	20	
Silver		0.0793	0.00100	n	0.0800		99.1	80-120	0.378	20	
Vanadium		0.0801	0.00100	**	0.0800		100	80-120	1.36	20	
Matrix Spike (3F02	2032-MS1)					Source: B	3E0681-	01	9		
Antimony		0.0873	0.00300	mg/l	0.0800	ND	109	78-125			
Arsenic		0.0827	0.00100	"	0.0800	0.00164	101	75-125			
Barium		0.135	0.0100	n	0.0800	0.0573	97.1	75-125			
Beryllium		0.0845	0.00100	THE STATE OF THE S	0.0800	ND	106	75-125			
Cadmium		0.0792	0.00100	u	0.0800	ND	99.0	75-125			
Chromium		0.0800	0.00100	20.	0.0800	ND	100	75-125			
Cobalt		0.0786	0.00100	u	0.0800	0.000570	97.5	75-125			
Copper		0.0774	0.00100	ũ	0.0800	0.00105	95.4	70-124			
Lead		0.0818	0.00100	u u	0.0800	0.00133	101	75-125			
Nickel		0.0780	0.00100	ü	0.0800	0.000930	96.3	76-125			
Selenium		0.0809	0.00100		0.0800	0.000810	100	76-128		301	
Silver		0.0765	0.00100	u	0.0800	ND	95.6	21-136			
DALIVE			NEED STORY STORY				102	75-129			

North Creek Analytical - Bothell

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North Creek Analytical, Inc. Environmental Laboratory Network

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Shell - Puget Sound Plant

8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616 Project Manager: Brian Rhodes **Amended Report** 

Issued: 06/19/03 10:35

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

			Reporting		Spike	Source		%REC	20100000	RPD	-2000
Analyte		Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 3F02032:	Prepared 06/02/03	Using EP	A 3020A		8			- 6			
Matrix Spike Dup (	(3F02032-MSD1)					Source: B	3E0681-0	)1			
Antimony		0.0854	0.00300	mg/l	0.0800	ND	107	78-125	2.20	20	
Arsenic		0.0809	0.00100	10	0.0800	0.00164	99.1	75-125	2.20	20	
Barium		0.133	0.0100	u	0.0800	0.0573	94.6	75-125	1.49	20	
Beryllium		0.0817	0.00100	n	0.0800	ND	102	75-125	3.37	20	
Cadmium		0.0785	0.00100	n.	0.0800	ND	98.1	75-125	0.888	20	
Chromium		0.0795	0.00100	"	0.0800	ND	99.4	75-125	0.627	20	
Cobalt		0.0774	0.00100	æ	0.0800	0.000570	96.0	75-125	1.54	20	
Copper		0.0762	0.00100	11	0.0800	0.00105	93.9	70-124	1.56	20	
Lead		0.0804	0.00100		0.0800	0.00133	98.8	75-125	1.73	20	
Nickel		0.0767	0.00100	36	0.0800	0.000930	94.7	76-125	1.68	20	
Selenium		0.0803	0.00100		0.0800	0.000810	99.4	76-128	0.744	20	
Silver		0.0768	0.00100	"	0.0800	ND	96.0	21-136	0.391	50	
Vanadium		0.0814	0.00100	OH:	0.0800	0.000300	101	75-129	0.856	20	
Post Spike (3F0203	32-PS1)				9	Source: B	3E0681-	01			
Antimony	30 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -	0.0510	0.00300	mg/l	0.0500	ND	102	75-125			
Arsenic		0.0988	0.00100	11	0.100	0.00164	97.2	75-125			
Barium		0.157	0.0100	310	0.100	0.0573	99.7	75-125			
Beryllium		0.0993	0.00100	п	0.100	ND	99.3	75-125			
Cadmium		0.0965	0.00100	u	0.100	ND	96.5	75-125			
Chromium		0.0980	0.00100	911	0.100	ND	98.0	75-125			
Cobalt		0.0965	0.00100	ű	0.100	0.000570	95.9	75-125			
Copper		0.0956	0.00100	ü	0.100	0.00105	94.6	75-125			
Lead		0.0985	0.00100	n	0.100	0.00133	97.2	75-125			
Nickel		0.0953	0.00100	ü	0.100	0.000930	94.4	75-125			
Selenium		0.0995	0.00100	и	0.100	0.000810	98.7	75-125			
Silver		0.0914	0.00100		0.100	ND	91.4	75-125			

North Creek Analytical - Bothell

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Shell - Puget Sound Plant

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

Project Number: 4550237616 Project Manager: Brian Rhodes **Amended Report** 

Issued: 06/19/03 10:35

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

		Reporting		Spike	Source		%REC		RPD	
	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Prepared 06/03/03	Using E	PA 3020A								
<b>(1)</b>										77
	ND	0.0100	mg/l							
	0.0810	0.0100	mg/l	0.0800		101	80-120			
BSD1)										
•	0.0798	0.0100	mg/l	0.0800		99.8	80-120	1.49	20	
32-MS1)					Source: B	3E0743-0	1RE1			
	0.0916	0.0100	mg/l	0.0800	0.0198	89.8	75-131			
F03032-MSD1)					Source: E	3E0743-0	1RE1			
	0.104	0.0100	mg/l	0.0800	0.0198	105	75-131	12.7	20	
-PS1)					Source: F	3E0743-0	1RE1		£	
	0.118	0.0100	mg/l	0.0800	0.0198	123	75-125			
Droporod 06/04/03	Heing E	DA 7470A								
r repared 00/04/03	Come D	IA /4/UA								
Υ1)	Using E	1A /4/0A								
	ND	0.00100	mg/l							
			mg/l					0		
			mg/l	0.00500		97.2	80-120			
	ND	0.00100		0.00500		97.2	80-120			
3	Prepared 06/03/03 K1) BSD1) BSD32-MS1) -PS1)	Prepared 06/03/03 Using E  K1)  ND  0.0810  BSD1)  0.0798  0.0916  BF03032-MSD1)  0.104  -PS1)	Prepared 06/03/03 Using EPA 3020A  K1)  ND 0.0100  0.0810 0.0100  BSD1)  0.0798 0.0100  0.0916 0.0100  BF03032-MSD1)  0.104 0.0100  -PS1)	Result   Limit   Units	Result   Limit   Units   Level	Result   Limit   Units   Level   Result	Result   Limit   Units   Level   Result   %REC	Result   Limit   Units   Level   Result   %REC   Limits	Result   Limit   Units   Level   Result   %REC   Limits   RPD	Result   Limit   Units   Level   Result   %REC   Limits   RPD   Limit

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Shell - Puget Sound Plant

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

Project Number: 4550237616 Project Manager: Brian Rhodes

Amended Report
Issued: 06/19/03 10:35

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

	- 11	JI UII OI U		,						
		Reporting		Spike	Source		%REC		RPD	
rte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Analyte		Resuit	Limit	Units	Level	Kesuit	///CCC	Lillito	МЪ	Dillit	110103
Batch 3F04015:	Prepared 06/04/03	Using E	PA 7470A								18
Matrix Spike (3F0	4015-MS1)					Source: B	3E0743-	01	C		
Mercury		0.00503	0.00100	mg/l	0.00500	0.000143	97.7	73-121	*		
Matrix Spike Dup	(3F04015-MSD1)					Source: B	3E0743-	01		1993	
Mercury	2	0.00505	0.00100	mg/l	0.00500	0.000143	98.1	73-121	0.397	20	

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Shell - Puget Sound Plant

8505 South Texas Road Anacortes WA, 98221

Project: SWMU 11 Sampling

Project Number: 4550237616

Project Manager: Brian Rhodes

Amended Report

Issued: 06/19/03 10:35

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

			Reporting	** **	Spike	Source	%REC	%REC Limits	RPD	RPD Limit	Notes
Analyte		Result	Limit	Units	Level	Result	%KEC	Lillits	KFD	Linin	140103
Batch 3F09016: P	Prepared 06/06/03	Using E	PA 5030B								
Blank (3F09016-BLK)	1)										
1,1,1-Trichloroethane		ND	1.00	ug/l							
1,2,4-Trimethylbenzene		ND	1.00								
1,2-Dibromoethane		ND	1.00	11							
1,2-Dichloroethane		ND	1.00	u							
1,3,5-Trimethylbenzene		ND	1.00	11							
2-Butanone		ND	10.0	II.							
Acetone		ND	25.0	31.							
Benzene		ND	1.00	"							
Carbon disulfide		ND	1.00								
Chlorobenzene		ND	1.00	10							
Chloroform		ND	1.00								
Ethylbenzene		ND	1.00	.0.							
m,p-Xylene		ND	2.00	w							
n-Butylbenzene		ND	1.00	"							
n-Propylbenzene		ND	1.00	311							
o-Xylene		ND	1.00	"							
p-Isopropyltoluene		ND	1.00	"							
Styrene		ND	1.00	ж	<b>*</b>						
Toluene		ND	1.00								
Trichloroethene		ND	1.00	ű							
Surrogate: 1,2-DCA-d4		20.3		"	20.0		102	70-130			
Surrogate: Toluene-d8		20.8		n	20.0		104	70-130			
Surrogate: 4-BFB		19.4		11	20.0		97.0	70-130			
LCS (3F09016-BS1)											
Benzene		10.5	1.00	ug/l	10.0		105	80-120			
Chlorobenzene		9.92	1.00	11	10.0		99.2	77-120			
Toluene		10.6	1.00	11	10.0		106	80-120			
Surrogate: 1,2-DCA-d4		20.9		"	20.0		104	70-130			
Surrogate: Toluene-d8		21.7		"	20.0		108	70-130			
Surrogate: 4-BFB		19.3		•	20.0		96.5	70-130			

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Shell - Puget Sound Plant

Project: SWMU 11 Sampling

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8505 South Texas Road Anacortes WA, 98221

Project Number: 4550237616 Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

## 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 3F09016:	Prepared 06/06/03	Using EP	A 5030B								
LCS Dup (3F09016	i-BSD1)										
Benzene		9.49	1.00	ug/l	10.0		94.9	80-120	10.1	20	
Chlorobenzene		9.31	1.00	11.	10.0		93.1	77-120	6.34	20	
Toluene		9.82	1.00	11	10.0		98.2	80-120	7.64	20	
Surrogate: 1,2-DCA-d	4	20.6		"	20.0		103	70-130			
Surrogate: Toluene-d8		21.5		11	20.0		108	70-130			
Surrogate: 4-BFB		19.6		"	20.0		98.0	70-130			
Batch 3F09021:	Prepared 06/09/03	Using EF	PA 5030B			M -					
Blank (3F09021-BI		8									
1,1,1-Trichloroethane	JKI)	ND	1.00	ug/l							
1,2,4-Trimethylbenzen	ie.	ND	1.00	"							
1,2-Dibromoethane	-	ND	1.00	**							
1,2-Dichloroethane		ND	1.00	310				194			
1,3,5-Trimethylbenzen	ie	ND	1.00								
2-Butanone		ND	10.0	n .							
Acetone		ND	25.0	т							
Benzene		ND	1.00								
Carbon disulfide		ND	1.00	, in							
Chlorobenzene		ND	1.00	α							
Chloroform		ND	1.00	и							
Ethylbenzene		ND	1.00	an .							
m,p-Xylene		ND	2.00	u							
n-Butylbenzene		ND	1.00	ũ							
n-Propylbenzene		ND	1.00	"							
o-Xylene		ND	1.00	'n							
p-Isopropyltoluene		ND	1.00	u							
Styrene		ND	1.00	- u							
Toluene		ND	1.00	11							
Trichloroethene		ND	1.00	v							
Surrogate: 1,2-DCA-a	14	19.7		"	20.0		98.5	70-130			
Surrogate: Toluene-de		19.9			20.0		99.5	70-130			
Surrogate: 4-BFB		19.6		<b>"</b> .	20.0		98.0	70-130			

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Shell - Puget Sound Plant

Project: SWMU 11 Sampling

8505 South Texas Road Anacortes WA, 98221

Project Number: 4550237616 Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

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

Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
3 Using E	PA 5030B								
	2								
10.2	1.00	ug/l	10.0		102	80-120			
10.1	1.00	ñ	10.0		101	77-120			72
10.1	1.00		10.0		101	80-120			
20.0		"	20.0		100	70-130			
20.1		"	20.0		100	70-130			
19.7		"	20.0		98,5	70-130			
9.69	1.00	ug/l	10.0		96.9	80-120	5.13	20	
9.80	1.00	11	10.0		98.0	77-120	3.02	20	
9.69	1.00	11	10.0		96.9	80-120	4.14	20	
19.9		п	20.0		99.5	70-130			
20.1		100	20.0		100	70-130			
19.5		31E	20.0		97.5	70-130			
	10.2 10.1 10.1 20.0 20.1 19.7 9.69 9.80 9.69 19.9 20.1	Result Limit  3 Using EPA 5030B  10.2 1.00 10.1 1.00 10.1 1.00 20.0 20.1 19.7  9.69 1.00 9.80 1.00 9.69 1.00 19.9 20.1	Result         Limit         Units           3 Using EPA 5030B           10.2 1.00 ug/l 10.1 1.00 "           10.1 1.00 "           20.0 "           20.1 "           19.7 "           9.69 1.00 ug/l 9.80 1.00 "           9.69 1.00 "           19.9 "           20.1 "	Result         Limit         Units         Level           3 Using EPA 5030B           10.2 1.00 ug/l 10.0         10.0 " 10.0           10.1 1.00 " 10.0         10.0 " 20.0           20.0 " 20.0         " 20.0           20.1 " 20.0         " 20.0           9.69 1.00 ug/l 10.0         10.0           9.69 1.00 " 10.0         " 20.0           19.9 " 20.0         20.0           20.1 " 20.0         " 20.0	Result         Limit         Units         Level         Result           3 Using EPA 5030B         10.2         1.00         ug/l         10.0           10.1         1.00         "         10.0           10.1         1.00         "         10.0           20.0         "         20.0           20.1         "         20.0           19.7         "         20.0           9.69         1.00         ug/l         10.0           9.69         1.00         "         10.0           9.69         1.00         "         10.0           19.9         "         20.0           20.1         "         20.0	Result         Limit         Units         Level         Result         %REC           3         Using EPA 5030B         10.2         10.0         10.0         102           10.1         1.00         "         10.0         101           10.1         1.00         "         10.0         101           20.0         "         20.0         100           20.1         "         20.0         100           19.7         "         20.0         98.5           9.69         1.00         ug/l         10.0         96.9           9.80         1.00         "         10.0         96.9           9.69         1.00         "         10.0         96.9           19.9         "         20.0         99.5           20.1         "         20.0         100           19.9         "         20.0         100           19.9         "         20.0         100           19.5         "         20.0         100	Result         Limit         Units         Level         Result         %REC         Limits           3         Using EPA 5030B         10.2         10.0         10.2         80-120           10.1         1.00         "         10.0         101         77-120           10.1         1.00         "         10.0         101         80-120           20.0         "         20.0         100         70-130           20.1         "         20.0         100         70-130           19.7         "         20.0         98.5         70-130           9.69         1.00         ug/l         10.0         96.9         80-120           9.69         1.00         "         10.0         98.0         77-120           9.69         1.00         "         10.0         96.9         80-120           19.9         "         20.0         99.5         70-130           20.1         "         20.0         100         70-130           20.1         "         20.0         10.0         70-130	Result   Limit   Units   Level   Result   %REC   Limits   RPD	Result   Limit   Units   Level   Result   %REC   Limits   RPD   Limit

North Creek Analytical - Bothell

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Shell - Puget Sound Plant

Project: SWMU 11 Sampling

8505 South Texas Road Anacortes WA, 98221

Project Number: 4550237616

**Amended Report** 

Project Manager: Brian Rhodes

Issued: 06/19/03 10:35

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

		Reporting		Spike	Source	200.00000-00000	%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 3F04002: Prepared 06/04/03	Using EP	A 3520C								
Blank (3F04002-BLK1)										
1,2-Dichlorobenzene	ND	10.0	ug/l							
1,3-Dichlorobenzene	ND	10.0	9							
1,4-Dichlorobenzene	ND	10.0	Ü							
1-Methylnaphthalene	ND	10.0	11							
2,4-Dimethylphenol	ND	10.0	n.							
2,4-Dinitrophenol	ND	10.0								
2-Methylnaphthalene	ND	10.0	n.							
2-Methylphenol	ND	10.0	"							
3 & 4-Methylphenol	ND	10.0	313							
4-Nitrophenol	ND	10.0								
6-Methyl chrysene	ND	10.0	u.							
7,12-Dimethylbenz (a) anthracene	ND	10.0	n .							
Acenaphthylene	ND	10.0	"							
Anthracene	ND	10.0	m .							
Benzo (a) anthracene	ND	10.0	11							
Benzo (a) pyrene	ND	10.0	п							
Benzo (b) fluoranthene	ND	10.0	n							
Benzo (ghi) perylene	ND	10.0								
Benzo (k) fluoranthene	ND	10.0	30							
Bis(2-ethylhexyl)phthalate	ND	10.0	п							
Butyl benzyl phthalate	ND	10.0								
Chrysene	ND	10.0	30.2							
Di-n-butyl phthalate	ND	10.0	**							
Di-n-octyl phthalate	ND	10.0	n							
Dibenz (a,h) acridine	ND	10.0	311							
Dibenz (a,h) anthracene	ND	10.0	"							
Diethyl phthalate	ND	10.0	n							
Dimethyl phthalate	ND	10.0	u							
Fluoranthene	ND	10.0	n							
Fluorene	ND	10.0	30							
Indene	ND	10.0	11							
Indeno (1,2,3-cd) pyrene	ND	10.0	11							
Naphthalene	ND	10.0	o me							
Phenanthrene	ND	10.0	,,							

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Shell - Puget Sound Plant

Project: SWMU 11 Sampling

8505 South Texas Road Anacortes WA, 98221

Project Number: 4550237616 Project Manager: Brian Rhodes

**Amended Report** Issued: 06/19/03 10:35

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

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 3F04002: Prepare	ed 06/04/03 Using l	EPA 3520C								
Blank (3F04002-BLK1)										
Phenol	ND	10.0	ug/l							
Pyrene	ND	10.0	ii .							
Pyridine	ND	10.0	и							
Quinoline	ND	10.0	9							
Thiophenol	ND	10.0	"							
Surrogate: 2-FP	33.7		n	50.0		67.4	18-124			
Surrogate: Phenol-d6	40.9		"	50.0		81.8	25-122			
Surrogate: 2,4,6-TBP	30.7		"	50.0		61.4	19-132			
Surrogate: Nitrobenzene-d5	46.8		11	50.0		93.6	44-124			
Surrogate: p-Terphenyl-d14	45.4		"	50.0		90.8	10-132			
Surrogate: 2-FBP	48.3		"	50.0		96.6	41-129			
LCS (3F04002-BS1)										
1,4-Dichlorobenzene	71.6	10.0	ug/l	100		71.6	43-122			
4-Nitrophenol	76.1	10.0	Ü	100		76.1	12-153			
Phenol	61.4	10.0	11	100		61.4	20-124			
Pyrene	81.8	10.0	9	100		81.8	59-134			
Surrogate: 2-FP	28,6		"	50.0		57.2	18-124			
Surrogate: Phenol-d6	32.7		"	50.0		65.4	25-122			
Surrogate: 2,4,6-TBP	32.5		"	50.0		65.0	19-132			
Surrogate: Nitrobenzene-d5	38.4		"	50.0		76.8	44-124			
Surrogate: p-Terphenyl-d14	34.1		"	50.0		68.2	10-132			
Surrogate: 2-FBP	42.3		"	50.0		84.6	41-129			
LCS Dup (3F04002-BSD1)										
1,4-Dichlorobenzene	78.1	10.0	ug/l	100		78.1	43-122	8.68	26	
4-Nitrophenol	91.5	10.0	10	100		91.5	12-153	18.4	37	
Phenol	75.8	10.0	n	100		75.8	20-124	21.0	53	
Pyrene	99.8	10.0	<b>H</b> ()	100		99.8	59-134	19.8	50	
Surrogate: 2-FP	28.6		n	50.0		57.2	18-124			
Surrogate: Phenol-d6	38.5		"	50.0		77.0	25-122			
Surrogate: 2,4,6-TBP	35.1		"	50.0		70.2	19-132			
Surrogate: Nitrobenzene-d5	42.9		"	50.0		85.8	44-124			
Surrogate: p-Terphenyl-d14	44.8		"	50.0		89.6	10-132			
Surrogate: 2-FBP	47.5		n	50.0		95.0	41-129			

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#### **Notes and Definitions**

D-06 The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

S-01 The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or

matrix interferences.

X See case narrative.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

Sample results reported on a dry weight basis dry

**RPD** Relative Percent Difference

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