GROUNDWATER INVESTIGATION

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (OLD) RIMROCK MAINTENANCE FACILITY JUNCTION OF US ROUTE 12 AND STATE ROUTE 410 RIMROCK, WASHINGTON

GENERAL INFORMATION

SITE NAME: WSDOT (Old) Wilbur Maintenance Facility

LOCATION: Junction of US Route 12 and State Route 410

Yakima County

OWNER: Washington State Department of Transportation

CONTACT: Norm Payton

Washington State Department of Transportation

FOSSC - Environmental Service Branch

PO. Box 47358

Olympia, WA 98504-7358

(360) 705-7848

1.0 Introduction and Background. The Washington State Department of Transportation (WSDOT) Old Rimroc Maintenance Facility is located at the junction of US Route 12 and State Route 410 (see Appendix A). WSDOT utilized the site for storage and maintenance of highway equipment. On May 7, 1991, the Washington State Department of Transportation (WSDOT) and its contractor removed one (1) 500 gallon unleaded underground storage tank (UST) and one (1) 1,500 gallon diesel UST. The unleaded tank had two holes in it's north end. Soil ar groundwater surrounding the tanks were obviously contaminated. Contaminated soil was removed from the excavation on this date and during three ensuing remediation efforts. Results of soil samples obtained during these remediation efforts showed that contamination still remained under the maintenance building (see Appendix B - Rimrock Cleanup Action Report). It was determined that additional excavation would undermine the foundation of the existing building and jeopardize its structural integrity. At the time of the UST removal, a new facility was scheduled for construction. It was decided that this remaining contamination was to be remediated after the maintenance building was vacated and demolished. In a letter dated March 1, 1994, the Department of Ecology informed WSDOT that a hazard ranking of 5 was given to the WSDOT - Rimrock site.

In October 1995 and April 1996, approximately 800 cubic yards of petroleum contaminated soil was excavated from this site. Petroleum floating on top of the groundwater had impacted a greater extent of soil than originally anticipated. Based on laboratory results the soils remaining on site after excavation were below the Model Toxics Control Act (MTCA) method A cleanup levels. The contaminated soil was bioremediated off site and since has be approved for reuse on roadside maintenance projects by the Yakima Health District.

Since groundwater was in contact with contaminated soil, testing for the presence of groundwater contamination would be necessary. This report documents the installation and sampling of four groundwater wells installed at thi site.

2.0 Groundwater Assessment. This phase of work performed by the WSDOT Environmental Service Branch consisted of drilling and installing four groundwater monitoring wells, for the purpose of collecting soil and groundwater samples for analysis, and to provide information on groundwater at the site.

2.1 Subsurface Drilling. Four on-site groundwater monitoring wells were installed on October 7, 1997. The wells were placed in locations believed to be either up and/or down gradient of potential sources. They were also located such that they would be away from both above and below ground utilities, and not be damaged by the weight of heavy equipment. The monitoring well locations are shown on Figure 1.

The wells were drilled by Environmental West Exploration of Spokane, Washington. Drilling was performed using a truck mounted tubex drill rig and 6-inch I.D. casing. Soil samples were generally collected at five foot intervals from the surface of each boring while drilling. All samples were screened in the field with a photoionization detector (PID) for the presence of volatile hydrocarbons.

The augers were steam cleaned prior to drilling each bore hole. Samples were collected using a 140-pound hammer with a 30-inch drop and, oversized split-spoon sampler. The sampler was washed with a Alconox solution and rinsed with tap and distilled water prior to collecting each sample. Soil samples were transferred directly from the sampler to the sample containers using a stainless steel spoon to avoid loss of volatile components. The stainless steel spoon was washed in the same manner as the split-spoon sampler. Samples were stored and transported on ice. These samples were transported under chain of custody procedures to Sound Analytical, Inc., in Tacoma, WA for analysis.

Groundwater monitoring wells were constructed with flush-mount and above ground monuments and consist of threaded, 2-inch Schedule 40 polyvinyl chloride (PVC) casing and screen. The well screen has machined slots with openings of 0.020-inch. The wells have a total depth of 10 feet and are approximately screened between 3 and 10 feet below surface grade. A gravel pack consisting of 10/20 silica sand was placed around and extended above the top of the screen. A bentonite seal was placed at the top of the filter pack. The annulus above the bentonite seal was filled with concrete. The bentonite and concrete were hydrated with potable water. The tops of the wells were sealed with expansion plugs. Monitoring well construction logs and well completion diagrams are presented in Appendix A.

Groundwater level measurements were obtained from the site monitoring wells by Environmental Service Branch personal on prior to removing any water from each well. The measurements were made to the nearest 0.01 foot from the top of well. The depth to groundwater for each quarter is shown in Table 1. All drill cuttings, decontamination water and water generated during monitoring well development were temporarily stored on site.

Monitoring	Ground	Monument	PVC		Groundwa	ater Elevati	on	Groundwater Depth From Top of PVC			
Well ID	Elevation	Elevation	Elevation	10/8/1997	2/4/1998	4/28/1998	8/10/1998	10/8/1997	2/4/1998	4/28/1998	8/10/1998
MW1	94.54	94.7	94.31	92.29	92.3	92.19	92.41	2.02	2.01	2.12	1.9
MW2	93.75	93.96	93.39	90.19	91.3	90.21	90.62	3.2	2.09	3.18	2.77
MW3	90.135	92.79	92.98	85.13	86.68	86.09	85.26	7.85	6.3	6.89	7.72
MW4	90.005	93.15	92.77	86.67	87.37	86.88	86.75	6.1	5.4	5.89	6.02

Table 1.

Groundwater elevation data was subsequently contoured to determine the groundwater gradient at the site. Suspected groundwater flow is generally from northwest to southeast (See Figure 3).

Groundwater samples were obtained by WSDOT - Environmental Service Branch staff on 10/8/97, 2/4/98, 4/28/98, and 8/10/98. Wells were checked for the presence of free product prior to purging. Following measurement of groundwater levels, each monitoring well was purged of approximately three casing volumes or bailed dry. Where possible, the monitoring wells were purged until the parameters including groundwater pH, electrical conductivity, and temperature had stabilized.

After purging groundwater samples were collected for BTEX, TPH, and total lead analysis using a Grundfos Redi-flo 2 submergible pump, and were placed in 40 milliliter Volatile Organic Analysis (VOA) vials, one liter amber containers with Teflon septa, and 500 milliliter plastic containers. The amber containers and plastic containers were acidified with hydrochloric and nitric acid respectively. The samples were transported under chain-of-custody procedures, to Sound Analytical Inc., located in Tacoma, Washington.

All purge waters were containerized in labeled 55 gallon drums until analytical results were received from the laboratory. Based upon these results the decontamination water and purge water was discharged to an oilwater separator connected to sanitary sewer. Soil cuttings were placed with the contaminated soil generated during the removal of underground storage tanks at the WSDOT facility in Electric City.

- **2.2 Subsurface Conditions.** The subsurface soil in the upper 10 feet generally consists of gray gravely sand with cobbles or gravel with cobbles. Water was encountered between 2 and 6 feet below surface in all of the wells.
- 2.3 Monitoring Well Soil Boring Results. Two soil samples were collected from the four monitoring well borings (RMW1 through RMW4). Attempts were made to collect additional soil samples, but soil conditions did not allow recovery. The soil samples collected were analyzed for total petroleum hydrocarbons (TPH) as heavy oil, diesel, and gasoline, along with BTEX. All of the soil samples collected had non-detectable results. A summary of the results is shown in Table 2. Refer to Appendix B for copies of the analytical results as reported by Sound Analytical, Inc.

Summary of Analytical Results -Monitoring Well Soil Borings (Old) WSDOT Rimrock Maintenance Facility

Sample	Date	Matrix	WTPH- [Ext. (mg/kg)	TPH-G	Benzene	Toluene	E-Benzene	Xylene
I.D.	(mo/day/yr)		Diesel	Heavy Oil	(mg/kg	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
RMW1-10	10/7/1997	Soil	ND	ND	ND	ND	ND	ND	ND
RMW2-10	10/7/1997	Soil	ND	ND .	ND	ND	ND	ND	ND
MTCA Method	A Cleanup Le	vels	200	200	100	0.5	40	20	20

ND - Not Detected NA - Not Analyzed

Table 2.

2.4 Monitoring Well Groundwater Results. Samples collected during four quarters of groundwater monitoring were analyzed for TPH as heavy oil, diesel, and gasoline, along with BTEX. Water collected from the first quarter of sampling was also analyzed for total lead. Toluene was detected in RMW1, RMW2, and RMW4 during the 4/28/1998 sampling event, although well below cleanup levels. All other parameters

were below detection levels. A summary of the results is shown in Table 3. Refer to Appendix C for copies of the analytical results as reported by Sound Analytical, Inc.

Summary of Analytical Results - Monitoring Well Groundwater (Old) WSDOT Rimrock Maintenance Facility

Sample	Date	Matrix	WTPH- D E	xt. (mg/L)	TPH-G	Benzene	Toluene	E-Benzene	Xylene	Total Pb
I.D.	(mo/day/yr)		Diesel	Heavy Oil	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
RMW1	10/8/1997	Water	ND	ND	ND	ND	ND	ND	ND	ND
RMW2	10/8/1997	Water	ND	ND	ND	ND	ND	ND	ND	ND .
RMW3	10/8/1997	Water	ND	ND	ND	ND	ND	ND	0.002	ND
RMW4	10/8/1997	Water	ND	ND`	ND	ND	ND	ND	ND	ND
RMW1	2/4/1998	Water	ND	ND	ND	ND	ND	ND	ND	NA
RMW2	2/4/1998	Water	ND	ND	ND	ND	ND	ND	ND	NA
RMW3	2/4/1998	Water	ND	ND	ND	ND	ND	ND	ND	NA
RMW4	2/4/1998	Water	ND	ND	ND	ND	ND	ND	ND	NA
RMW1	4/28/1998	Water	ND	ND	ND	ND	0.00071	ND	ND	NA
RMW2	4/28/1998	Water	ND	ND	ND	ND	0.00057	ND	ND	NA
RMW3	4/28/1998	Water	ND	ND	ND	ND	ND	ND ·	ND	NA
RMW4	4/28/1998	Water	ND	ND	ND	ND	0.00069	ND	ND	NA
RMW1	8/10/1998	Water	ND	ND	ND	ND	ND	ND	ND	NA
RMW2	8/10/1998	Water	0.22	ND	ND	ND	ND	ND	ND	NA
RMW3	8/10/1998	Water	ND	ND	ND	ND	ND	ND	ND	NA
RMW4	8/10/1998	Water	ND	ND	ND	ND	ND	ND	ND	NA
MTCA Me Levels	thod A Clear	ıup	0.5	0.5	0.8/	0.005	0.04	0.03	0:02	0:005 •⇔∠y∽

ND - Not Detected

NA - Not Analyzed

Table 3.

3.0 Conclusions and Recommendations. The results of the four quarters of sampling conducted at this site indicate that petroleum contamination levels in groundwater at this site are below the Model Toxics Control Act method A cleanup levels. No further action is planned for this site.

Prepared by:

Norman Payton

Hazardous Materials Specialist

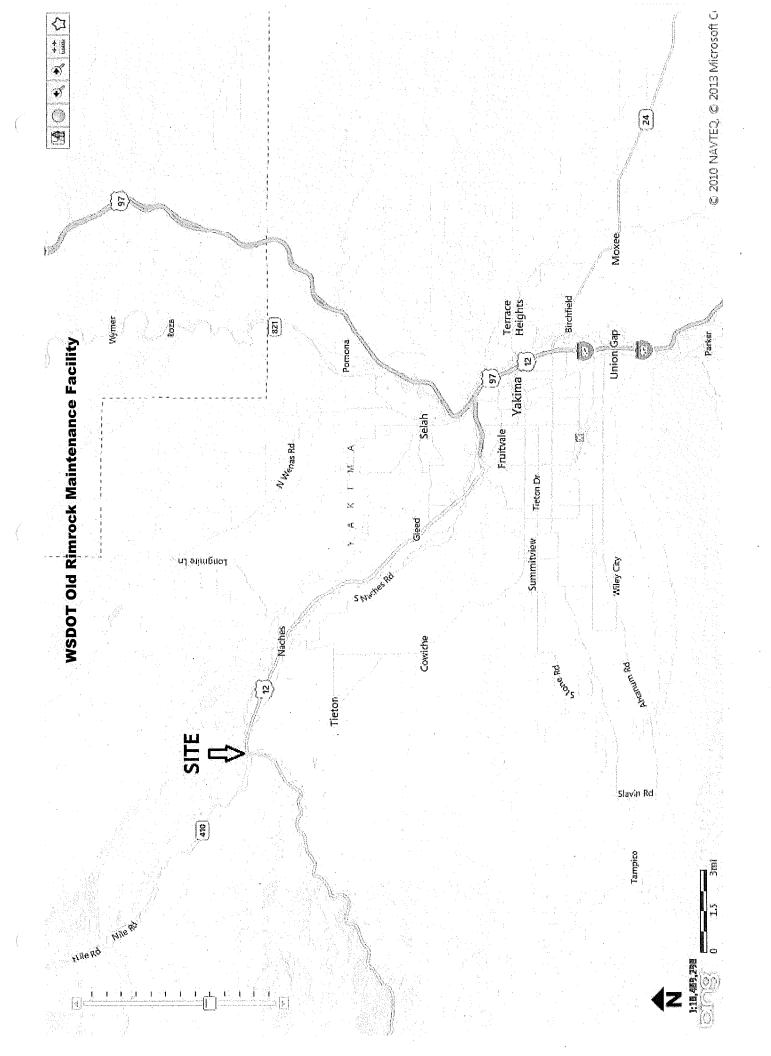
WSDOT - Environmental Service Branch



APPENDIX A

Vicinity Map

Geologic Boring/Well Construction Logs



			•••]	ENV	/IRC	NM	ENTAL BORE					
Date :	Start	ed 1	0/7		Locat	ionsw	/1/4, N	E1/4,		oth Water First	Encount	ered (F	t) 2.15	; ·
Dote (Comple	ted 1	0/7		JUMILLIN	g Com	ıpany⊢.		was was write	ling Method Tube	×	 		
Boreho	Depth			10	Sombr	ng me	v. (Ft	xplore	ATION COLLABORATION	mer Welght (lbs)	140 Elev. (F	+\		
POLEU	וע פוט	114. (II	11) 			ia Ele	V. CF C.	94,54	monument Elev. C	1094.7	T.	⁴⁷ 94.31		
Depth (Ft)	Sample	Number	Interval	Blow Counts/6 in.	Recovery (%)	PID (ppm)	Time	Depth (Ft)	Lithologic Desc		USCS*	Soil Log	Well Log	Depth (Ft)
_		···							Gray, gravelly SAND	with cobbles,	SP			
5 5 5				30, 50 FOR 3'	10%	ND	0858	5.0	Gray, GRAVEL with co	obbles, wet.	GP			2.0 3.0
10	RMW	1–10		50 FOR 5*	25%	ND	0917	10.0	Gray, gravelly SAND Bottom of E		SP			10.0
15 15 20 20 														
25														
Remark	(s) Re	fer t	ᆼ	key 1	for ex	<plano< td=""><td>tion c</td><td>f ter</td><td>rminology and symbols.</td><td>N/A State Bear</td><td>1</td><td>C Table</td><td></td><td>+10:0</td></plano<>	tion c	f ter	rminology and symbols.	N/A State Bear	1	C Table		+10:0
(*US(unle	Soll	de the	escrip erwise	tions note may i	are d. Coi	based ntacts adual,	on v	isual classification, ween soil layers are	WA State Depar Old Rimrock Grou Installation Log of Boring MW-1	ındwater		-	
正 3,	□.D. S	Split-: Split-:	Spa Spa	oon S	ample ample	▼ ▽	. Water	r Lev r Lev	el and Date Measured els at Time of Drilling	101 00 - 1	L			
Logged	1 D.	NP			<u> </u>		viewed	J Dv	NP	WSDOT Environmental Ser	vice Bra	nch Fi	g. C-	1

_	ENVIRONMENTAL BOREHOLE LOG												
ļ	Started :			Locat	tionsv	/1/4, N	E1/4,	00000) 11011) 11100	oth Water Flr		ered (F	t) 2.15	
ľ	Completed			Drillin	g Cor	panyE thod	nvinor xplor e	nmental West Dril	lling Method T	ubex			
1 .	Depth (Ft ole Diam, (1		10			v. (Ft			Ethonog	PVC Elev. (F	+10000		
Boreno	ואטוע אוניייטן	1717			IU LIE	1	7 93.75	Monument Liev.	1 6793,76	I VC L(EV. \(\)	1 23.39		
Depth (Ft)	Sample Number	Interval	Blow Counts/6 In.	Recovery (%)	PID (ppm)	Time	Depth (Ft)	Lithologic Desc		USCS# Symbol	Soll Log	Well Log	Depth (Ft)
							1.0	Gray, gravelly SAND damp.	with cobbles,	SP	************		1.0
							1.0			SP		ATD(Z///) 	3.0
5 5 			50 FOR 5'	0%	NA	1120	5.0	Split spoon was wet, odor.	No petroleum	SP		10/8	
10 10 	RMW2-10		50 FOR 5'	25%	ND	1144	10.0	Gray, SAND, wet. No Bottom of B	,	or, SP			10.0
15	·												A SAME TO THE PARTY OF THE PART
20 20	•												
		,					•						
2*	*USC soil unless o approxima D.D. Split-	the te	escrip rwise and	otions noted may b Li ample	are d. Cor d. Cor e gro GEND	based ntacts adual.	on vi betw	sual classification, yeen soll layers are	WA State De Old Rimrock (Installation Log of Borin MV	Groundwater		•	
III 3'	I.D. Split-	Spc	on S	ample	∇	Vater viewed	Leve	els at Time of Drilling	WSDOT Environmental	Service Bros	nch Fig	g. C-	1
					······································							·	

						 							· · · · ·
								ENTAL BORE					
				1				SEC.35, T15N, R16E De	epth Water First E rilling Method Tubex		ered (f	(t) 4.8	
	Depth (Ft		10	Samol	g cor	panyE	nvinor xplon e	nmental West Dr atlon 3" [].D. Split-Spoon					
	ole Diam. ()			Sumpl	ng m	v. (Ft		3' [].D. Split-Spoon 5 Monument Elev.	(F±)00.70 IPVC	Fley (Ft)92.98		
Jreri	ote bidii. C	1/1/			10 2(6	1	7 90.13°	5 Mondment Elevi	(r 0)92,79 r v c	Liev. (1 092,98	3	
Depth (Ft)	Sample Number	Interval	Blow Counts/6 in.	Recovery (%)	PID (ppm)	Time	Depth (Ft)	Lithologic Des	·	USCS* Symbol	Soil Log	Well Log	Depth (Ft)
						j .		Gray, gravelly SANI damp.	with cobbles,	SP			
			50 FOR 5'	0%	NA	1315	5.0	GRAVEL with cobble	s Wet at 4.8'.	GP			3.0
-10 - - - -15								Bottom of	Boring				10.0
- - -													
- 20 - -			,					·					
-			-			·							·
marF	*USC sol	l d	escri _l erwise	otions note may	are d. Co be gr	based ntact: adual,	on v	rminology and symbols Isual classification, ween soil layers are	Old Rimrock Ground Installation				
П 3'	O.D. Split-	-Spe	oon S	ample	$\sqrt{\Sigma}$	' Wate ' Wate	r Lev	el and Date Measure els at Time of Drillin	9				
gge	By NP				R	evlewe	d By	NP	WSDOT Environmental Serv	ice Bro	anch Fi	g. C-	1

						EN	/IRC	NM	ENTAL BORE	HOLE LOG				
									SEC.35, T15N, R16E Dep		ncount	ered (F	t> 4.8	
7	•		/7	7/97	Drillin	g Cor	panyE	nviror	mental West Dri	lling Method Tubex	28			
	Depth (ole Diam.			10	20mbr	ing me	v. (Ft	10000	3 LIJI SDUT-SDOON	nmer Welght (lbs) 1	4u Elev. (F	' + \	-	
Boreno	JE DIUM.		,, 			IU LIE	V. (1 C.	′ 90.00:	5 Profitament Lievi	93.15	Liev. (i	V92.77		
Depth (Ft)	Sample Number		Interval	Blow Counts/6 in	Recovery (%)	PID (ppm)	Time	Depth (Ft)	Lithologic Desc	·	USCS* Symbol	Soil Log	Well Log	Depth (Ft)
	<u> </u>		٦							face with cobbles,	SP			
90 	S S		III	אַן ספר, ספר,	0%	[d] NA	1342	1.0 5.0	Gray, gravelly SAND damp. GRAVEL with cobbles. Bottom of E	Wet at 8.91'.			. ATD≰:	1.0
_			ı											
-	· ·													
Remark				_					minology and symbols.	WA State Depart	ment of	f Trans	sporta	tion
		ot	he	rwise	note may k	d. Cor se gro	ntacts adual.		sual classification, een soil layers are	Old Rimrock Grour Installation	idwater	Monito	oring W	ell
					L	EGEND				Log of Boring				
III 3*	D.D. Spl	It-S It-S	po	on S	ample ample	▽	Water	Leve	el and Date Measured els at Time of Drilling	MW-4		· · · · · · · · · · · · · · · · · · ·		
Logged	NP NP					Ke	viewed	вÀ	NP	WSDOT Environmental Serv	ice Brai	nch $ \mathbf{Fi} $	g. C-	1

APPENDIX B Rimrock Cleanup Action Reports Soil Boring Sample Results

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION P. O. Box 1709 4200 Main Street

Vancouver, WA 98663 (206) 696-6518

SUPPLEMENT

Cleanup Action for the WSDOT Property at

RIMROCK

Junction U.S. 12 & SR 410 Naches, Washington

Rimrock DOT Facility Junction US 12 & SR 410 Naches, Washington

In June and July 1991, a land farm was created on the DOT property known as Rimrock using the contaminated soil that was excavated from the fuel tank area.

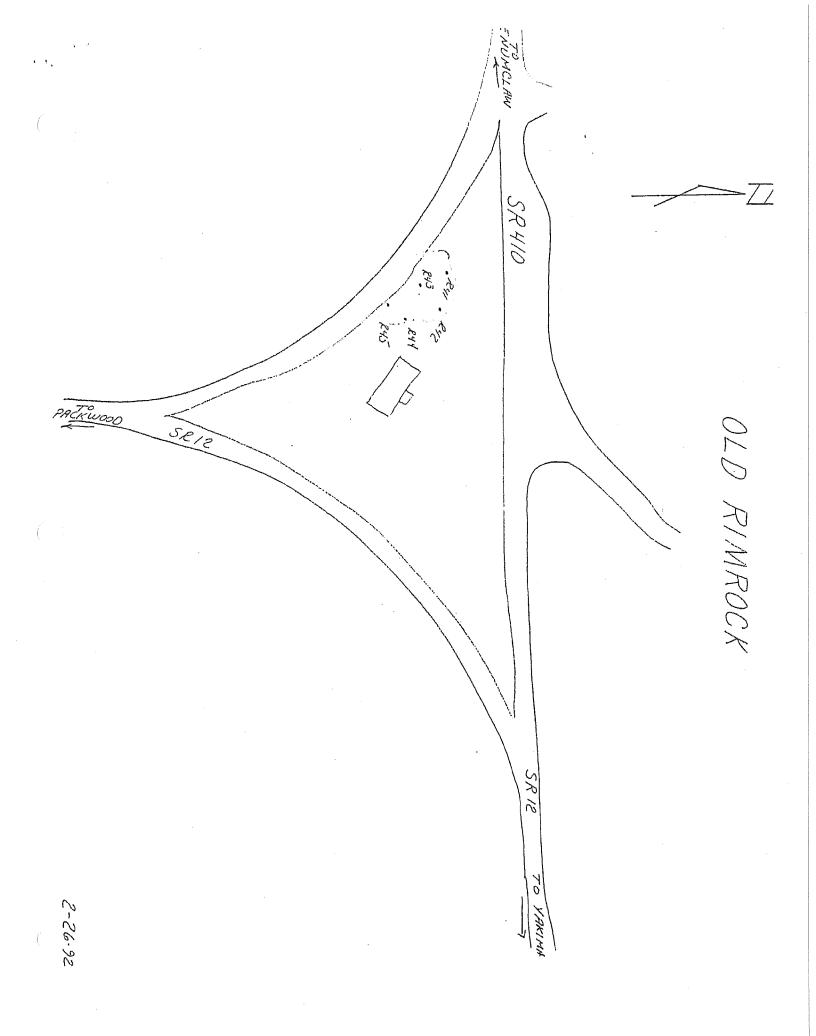
This material was spread out in a layer less than one foot thick. A front end loader was used to rotate and mix the soil.

On February 26, 1992, five soil samples were taken from the land farm. A WRPH-HCID test was performed on all five samples. The gasoline content was less than 20 mg/kg for all five samples. The heavy petroleum oils were less than 100 mg/kg for all five samples. The diesel content was less than 50 mg/kg for samples R-41 and R-42. Sample R-43 was 240 mg/kg, R-44 was 160 mg/kg and R-45 was 58 mg/kg as diesel.

By using Appendix E of Guidance for Remediation of Releases from Underground Storage Tanks, it can be shown that the TPH levels in the land farm are in compliance with cleanup standards. The mean for the five samples of 50, 50, 240, 160, and 58 is 111.6. The standard deviation is 85.6. The results of the formula in Appendix E is 170.3 mg/kg as diesel which is below the cleanup standard of 200 mg/kg.

The material from the land farm was used to fill a low area on site.

APPENDIX



SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS 4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: WA St. Dept. of Transportation

Date: March 17, 1992

Report On: Analysis of Soil

Lab No: 22943 Page 1 of 3

IDENTIFICATION:

Samples received on 02-28-92

Project: Rimrock

ANALYSIS:

			
Lab Sample No.	1	2	3
Client ID	R-41	R-42	R-43
Units	mg/kg	mg/kg	mg/kg
WTPH-HCID Gasoline (C7-C12) Diesel (> C12-C24) Heavy Petroleum Oils (C24+)	< 20 < 50 < 100	< 20 < 50 < 100	< 20 > 50 < 100
SURROGATE RECOVERIES WTPH-HCID 1-Chlorooctane % Perylene %	98 87	92 89	102 99

ND = None detected

< = less than

> = greater than

Results are reported on a dry weight basis.

Continued . .

WA St. Dept. of Transportation

Project: Rimrock

Page 2 of 3 Lab No. 22943 March 17, 1992

Lab Sample No.	4	5 .
Client ID	R-44	R-45
Units	mg/kg	mg/kg
WTPH-HCID Gasoline (C7-C12) Diesel (>C12-C24) Heavy Petroleum Oils (C24+)	< 20 > 50 < 100	< 20 > 50 < 100
SURROGATE RECOVERIES WTPH-HCID 1-Chlorooctane % Perylene %	91 85	101 100

ND = None detected

< = less than

> = greater than

Results are reported on a dry weight basis.

Continued . . .

WA St. Dept. of Transportation Project: Rimrock Page 3 of 3 Lab No. 22943 March 17, 1992

Lab Sample No.	3	4	5
Client Identification	R-43	R-44	R-45
Units	mg/kg	mg/kg	mg/kg
WTPH-D Diesel (> C12 - C24)	240	160	58
SURROGATE RECOVERIES WTPH-D Perylene %	68	66	68

Results are reported on a dry weight basis.

SOUND ANALYTICAL SERVICES

STAN P. PALMOUISIT

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS 4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

ANALYTICAL NARRATIVE

Client:

WA St. Dept. of Transportation Date: March 17, 1992

Project: Rimrock

Lab No.: 22943

Delivered by: Harry Horne

Date Sampled: 02-27-92

Condition of Samples on Receipt:

Samples were received cold and in good condition. Chain-of-custody was in order.

EXTRACTION AND ANALYSIS DATES

Samples were analyzed for diesel range hydrocarbons per WA State DOE method WTPH-D. Samples were extracted on 03-12-92. The extracts were analyzed on 03-16-92 and reported on a dry weight basis.

Samples were qualitatively screened for total petroleum fuel hydrocarbons in accordance with WA State DOE Method WTPH-HCID. Samples were extracted on 03-01-92. The extracts were analyzed on 03-06-92 and reported on a dry weight basis.

All Quality Control was within acceptable limits.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS 4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

QUALITY CONTROL REPORT

Client:

WA St. Dept. of Transportation

Project:

Rimrock

Lab No:

22943

Matrix: Units:

Soil mg/kg

Date:

March 17, 1992

DUPLICATES

Lab No: 22943 (1)		Client ID: R-4	1
Parameter	Sample(S)	Duplicate(D)	RPD
WTPH-HCID Gasoline (C7 - C12) Diesel (>C12 - C24) Heavy Petroleum Oils (>C24)	< 20 < 50 < 100	< 20 < 50 < 100	0.0 0.0 0.0
SURROGATE RECOVERIES WTPH-HCID 1-Chlorooctane % Perylene %	98 87	92 87	

Lab No: 22943 (3)		Client ID: R-4	3
Parameter	Sample(S)	Duplicate(D)	RPD
WTPH-D Diesel (>C12-C24)	240	230	4.3
SURROGATE RECOVERIES WTPH-D Perylene	68	73	

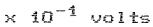
< = less than

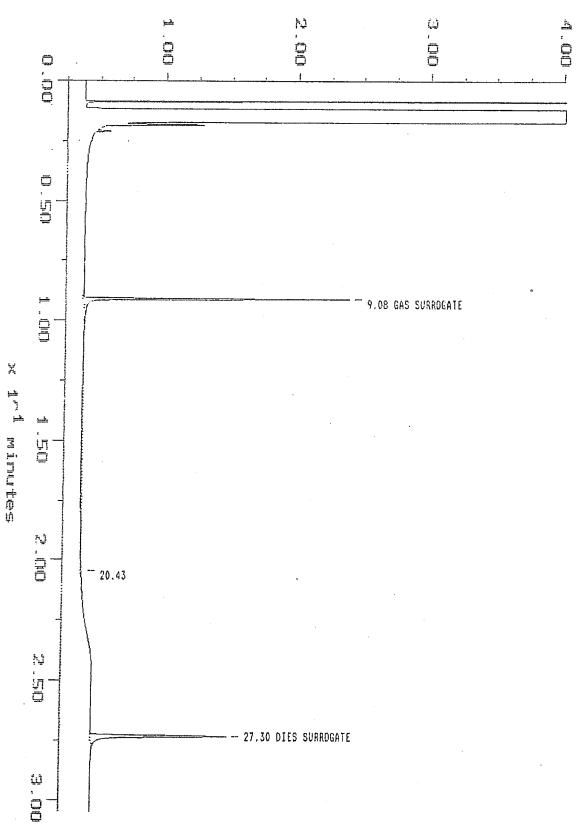
Results reported on a dry weight basis.

*RPD = relative percent difference = [(S - D) /. ((S + D) / 2)] x 100

Sample: 22943-1 Channel: FP 5690-11
Acquired: 07-MAR-92 9:17 Method: C:\MAX\DATA2\B015D
Dilution: 1: 10.000 Amount: 10.657

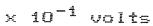
filename: 22943-1 Operator: DAS

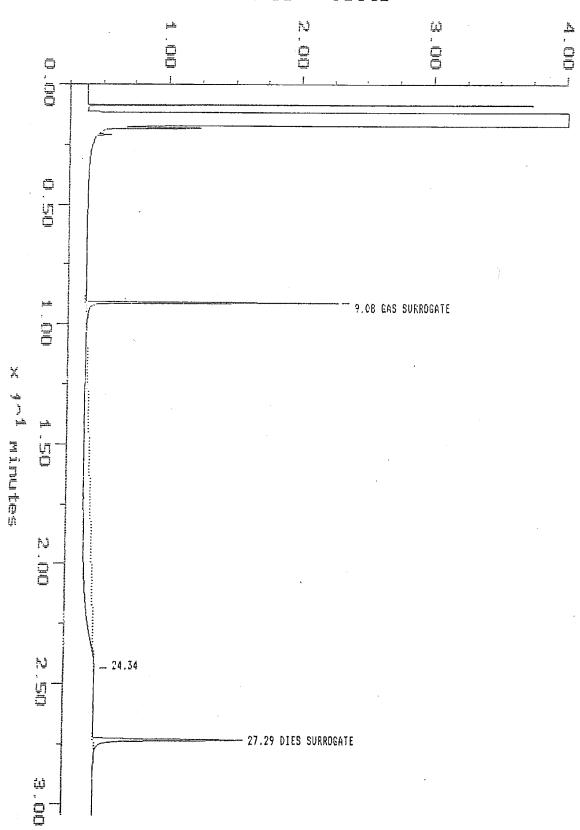




Filename: 22943-1D

Operator: DAS

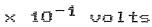


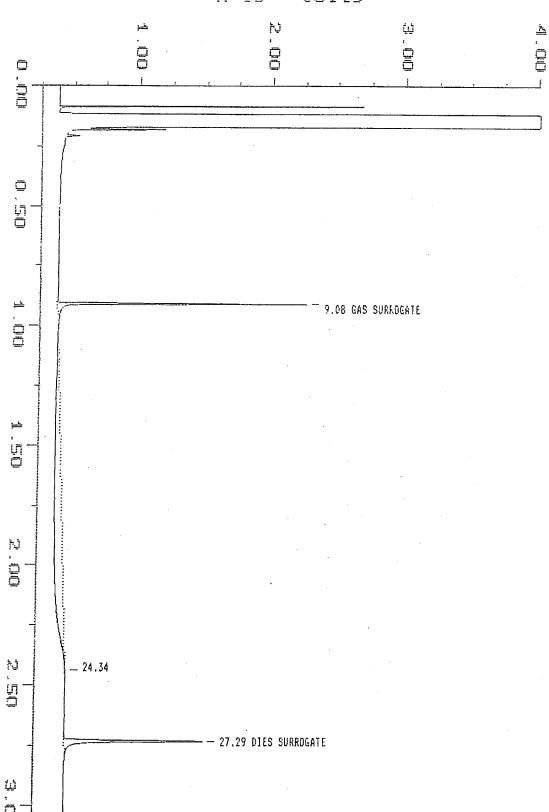


jei ningtes

Sample: 22943-2 Channel: KP 5890-II
Acquired: 07-MAR-92 10:35 Method: C:\MAX\DATA2\B015D
Dilution: 1:10.000 Amount: 10.385

Filename: 22943-2 Operator: DAS



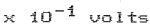


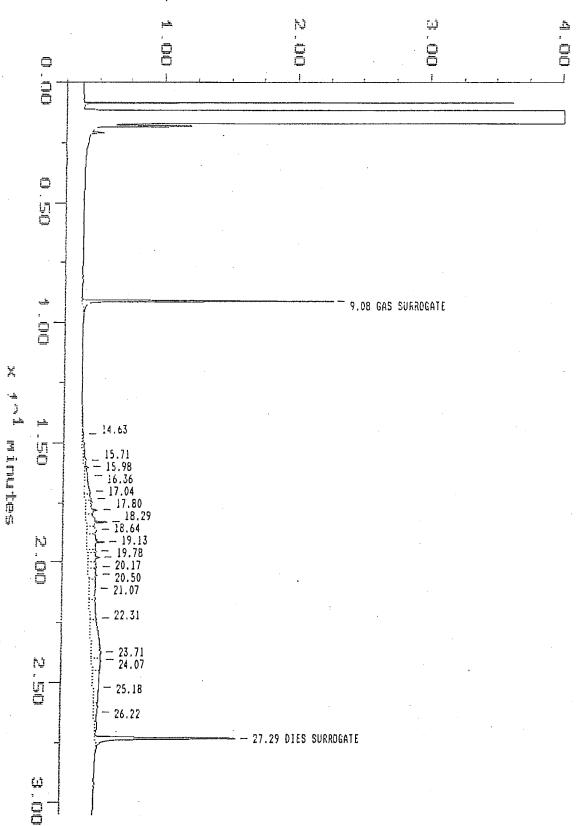
Sample: 22943-4

Channel: HP 5E90-II

Acquired: 07-MAR-92 11:53 Method: C:\MAX\DATA2\8015D Dilution: 1: 10.000 Amount: 10.053

Filename: 22943-4 Operator: DAS





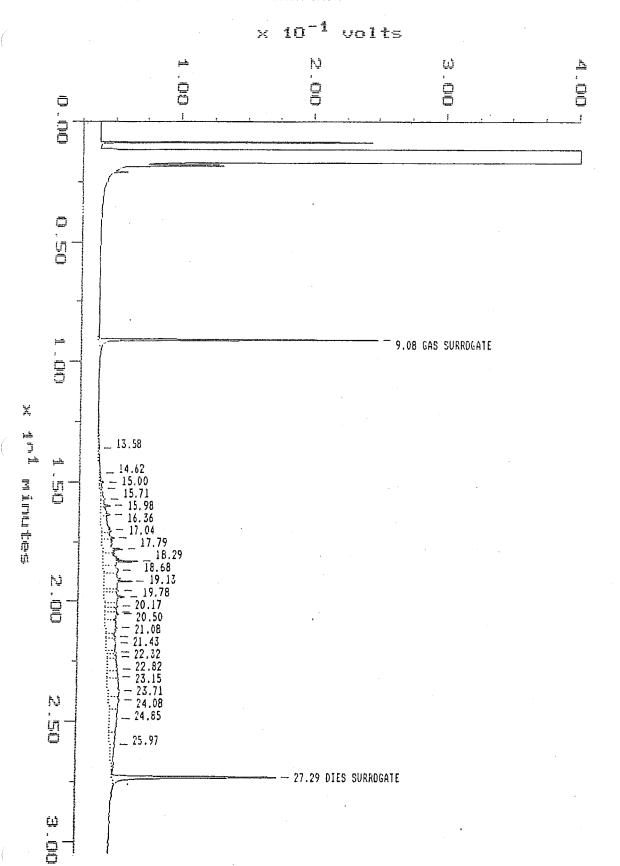
Sample: 22943-3 Acquired: 07-MAR-92 11:14 Dilution: 1 : 10.000

Channel: HP 589C-II

Method: C:\MAX\DATA2\8015D Amount: 10.549

Filename: 22943-3

Operator: DAS



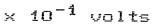
Acquired: 07-MAR-92 12:32 Method: C:\MAX\DATA2\8015D amount: 10.177

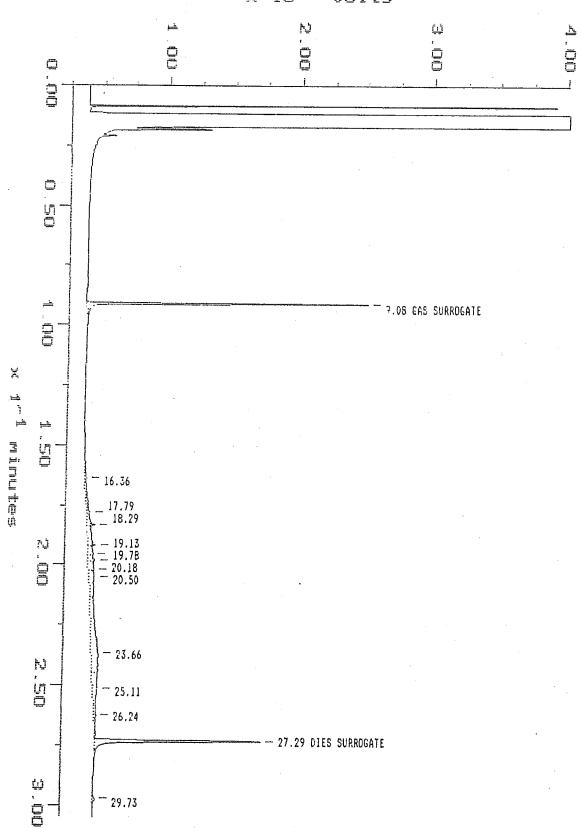
Sample: 22943-5 Channel: EP 5890-11

Filename: 22943-5

Dilution: 1 : 10.000

Operator: DAS

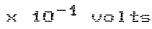


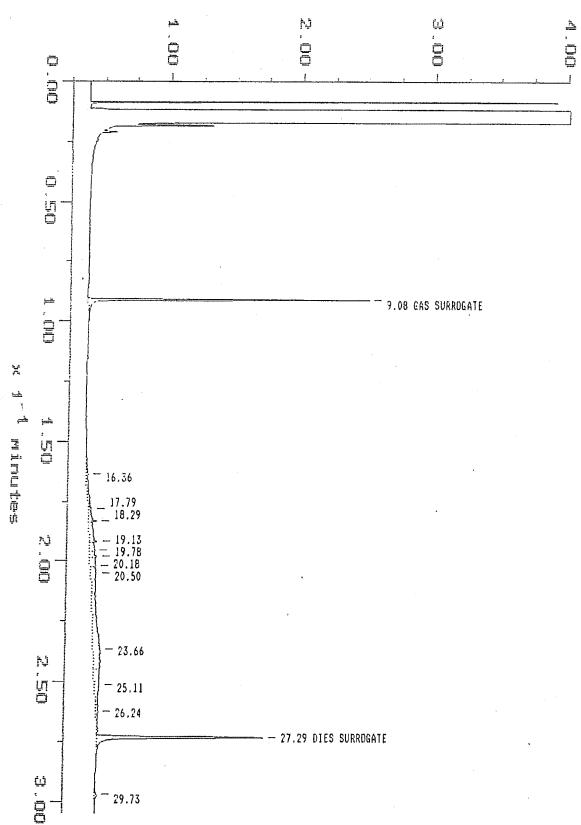


Dilution: 1 : 10.000

Amount: 10.177

Filename: 22943-5 Operator: DAS







UNDERGROUND STORAGE TANK Site Check/Site Assessment Checklist

The purpose of this form is to certify the proper investigation of an UST site for the presence of a release. These activities shall be conducted in accordance with Chapter 173.360 WAC. A description of the various situations requiring a site check or site assessment is provided in the guidance document for UST site checks and site assessments.

This Site Check/Site Assessment Checklist shall be completed and signed by a person registered with the Department of Ecology to perform site assessments.

Two copies of the results of the site check or site assessment should be included with this checklist according to the reporting requirements in the guidance document for UST site checks and site assessments.

For further information about completing this form, please contact the Department of Ecology UST Program.

The completed checklist should be mailed to the following address:

Underground Storage Tank Section Department of Ecology Mail Stop PV-11 Olympia, WA 98504-8711

1. UST SYSTEM OV	VNER AND LOCATION	175万斯亚河 克 拉克		
UST Owner/Operator:	W.S.D.O.	7.	-	
Owners Address;	Transportation	n Blog Ki	C-0/	
	Olympia	CV a State	98504. 219-Code	*
Telephone:	(206) 753-70	162		
Site ID Number (on Invo	ice or available from Ecology if ta	ank is registered):O	12214	
Site/Business Name:	WS00.7- OLO	RIMFOCK	tout enque . Site	
Site Address:	Jet SR 12 É	SR 410	Yakıma	
	Naches	i Clin	County (•
	City	State	ZIP-Code	À, e
2 SITE CHECK/SIT	ASSESSMENT CONDUCT	ED BY:		
Registered Person:	Harry Horn			
Address:	4200 Main 5	T. Carrier	1.709	
	Vancover (206) 696-651	Wa	9.86.68	
Telephone:	(206) 696-651	State	A STATE OF THE STA	•
		:		
	•	x *		

3. TANK INFORMATION			
Tank ID Number (as registered with Ecology):	2. Year installed:		
3. Tank capacity in gallons:	4. Last substance stored;		
4. REASON FOR CONDUCTING SITE CHECK/SITE ASSESSI			
4. REASON FOR CONDUCTING SITE CHECK/SITE ASSESSI	MENT的學習的學習的學習的學習的學習的學習的學習的學習的學習的		
Check one:			
Investigate suspected release due to on-site environmenta	al contamination		
Investigate suspected release due to off-site environmenta	•		
Extend temporary closure of UST system for more than 12			
UST system undergoing change-in-service			
UST system permanently closed-in-place			
UST system permanently closed with tank removed			
Required by Ecology or delegated agency for UST system	n closed before December 22, 1988		
Other (describe):			
5. CHECKLIST			
Each item of the following checklist shall be initialed by the pers	on registered with the Department of Ecology whose		
signature appears below.			
	Yes No		
Has the site check/site assessment been conducted according to ap site check/site assessment guidance issued by the Department of Ec	plicable procedures specified in the UST		
Site check/site assessment guidance issued by the Department of Ed	$\mathcal{H}_{\mathcal{U}}$		
Has a release from the UST system been confirmed?			
NOTE: Owners/operators must report all confirmed releases to the Departme	ent of Ecology or delegated agency within 24		
hours.			
Are the results of the site check/site assessment enclosed with this clear.NOTE: Two copies of the site check/site assessment results must be submitted.			
reporting requirements specified in the UST site check/site assessment guida	ance.		
	Manager 1997		
I hereby certify that I have been in responsible charge of performing			
Persons submitting false information are subject to penalties under	Chapter 173.300 WAC.		
The second secon	२ तरात्र । १ १ १ वस्त्र इस्त्र इस्त्र मुख्यम् केल्स्स्य स्त्रित्ते स्त्रिकेते ।		
2/	1/		
11-6-91 H-6M	The Frederick		
1 1 1 1 1 1 1 1 1 1			
6 OWNER'S SIGNATURE			
11-6-91 Harr	Hom		
Date Signature of Tank Owner or Author	ized Representative		

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION
P. O. Box 1709
4200 Main Street
Vancouver, WA 98663
(206) 696-6518

Cleanup Action for the WSDOT Property at

RIMROCK

Junction U.S. 12 & SR 410 Naches, Washington

Fuel Tank Replacement Phase 3 1990 October 1991

Rimrock DOT Facility Junction US 12 & SR 410 Naches, Washington

On May 7, 1991, Washington State Department of Transportation (DOT) and its contractor, Stokes Construction, Inc. of Seattle, WA removed a 500 gallon unleaded tank and a 1,500 gallon diesel tank. The unleaded tank had two holes in the north end of the tank.

Because of the odors present during tank removal, additional excavation of contaminated soils was done. The contaminated material was stockpiled on site.

Seven soil samples were taken from the excavation and one water sample was taken from the ponding area to the west of the site. The soil samples yielded results up to 4,800 ppm gas and up to 270 ppm as diesel. High levels of BTEX were also present. No contamination was found in the water sample.

On June 14, 1991, additional excavation of contaminated soils was performed using a DOT backhoe and operator. Soil samples 21, 22, and 23 were taken from the excavated area at the end of the day. Sample 22 yielded 8,400 ppm as aged gas/diesel.

On June 25, 1991, excavation was again performed using a DOT backhoe and operator. The excavated material was stockpiled on site. At the end of the day, samples 41 through 49 were taken. The results of these samples showed that high levels of contamination still existed in the center area and the south end of the excavation.

On July 11, 1991, additional excavation was done using a DOT backhoe and operator. At the end of the day, samples 51 through 55 were taken. The results of these samples showed the high levels of contamination had finally been removed. However, sample 51 was 110 ppm as aged gas/diesel and sample 54 was 340 ppm as aged gas/diesel. These samples were taken adjacent to the shop building. Further excavation in the direction of the remaining contamination would damage the building.

The excavated contaminated soil was placed into a land farm on site. The material was spread out into a layer about 12" thick.

The DOT is requesting a conditional closure of this site due to the contamination extending under the shop building. When the shop building is removed or before the property is sold, the contaminated areas will be re-excavated, tested, and treated in accordance with regulations then in place. A copy of this report shall be kept in the DOT facility file at all times.

Soil samples will be taken from the land farm. When the Total Petroleum Hydrocarbons (TPH) results due to diesel contamination are all below 200 ppm and/or due to gasoline contamination are all below 100 ppm, the land farm will be considered closed and a supplemental report will be prepared.

APPENDIX

RIM ROCK	(040)	e de la companya del companya de la companya del companya de la co
A Second of the Last	10 0	
SHOP		
The state of the property of the state of th		
BUILDING		
	10'	
		SAMPLES TAKEN WERE S'-DEEP
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REMOVED:	ويوالوا والمراجوة ووجوال الوجوري الموجور والأراف المستقومة والمحاصرة والمحاصرة والمراجع والمحاصرة والمحاصرة
1-500 gal Unless	ded
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The seminate of the companies of the com

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SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS 4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - 'FELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: WA State Dept. of

Transportation

Date: May 17, 1991

Report On: Analysis of Soil & Water

Lab No.:

17508

IDENTIFICATION:

Samples Received on 05-08-91

Project: Rim Rock

ANALYSIS:

Lab Sample No.	1	2	3	
Client Identification	#1	#2		
Matrix/Units	Soil mg/kg	Soil mg/kg	#3 Soil mg/kg	#4 Soil
Benzene Toluene Ethyl Benzene Kylenes BTEX by EPA SW-846 Method 8020	5.5 130 32 340	< 0.05 < 0.05 < 0.05 < 0.05	< 0.05 0.20 < 0.05 0.62	0.41 2.7 0.73 6.9
otal Petroleum Fuel lydrocarbons by EPA W-846 Modified ethod 8015	1,500	< 10.0	94	270
	Aged Gas		Diesel	Diesel

Note - BTEX and TPH 8015 soil results reported on an as received

Continued . .

WA State Dept. of Transportation Project: Rim Rock Page 2 of 2 Lab No. 17508 May 17, 1991

Lab Sample No.	5	6	7	8
Client Identification	#5	#6	#7	#8
Matrix/Units	soil mg/kg	soil mg/kg	Soil mg/kg	Water mg/l
Benzene Toluene Ethyl Benzene Xylenes BTEX by EPA SW-846 Method 8020	0.44 5.3 1.3 15.	0.51 14 3.1 62	9.0 190 62 420	< 0.001 < 0.001 < 0.001 < 0.001
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	49	380	4,800	< 1.0
TPH as	Aged Gas	Aged Gas	Aged Gas	

Note - BTEX and TPH 8015 soil results reported on an as received basis.

SOUND ANALYTICAL SERVICES

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACTIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: WA State Dept. of

Transportation

Date: June 18, 1991

Report On: Analysis of Soil

Lab No.: 18155

IDENTIFICATION:

Samples Received on 06-14-91

Project: Rim Rock

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, mg/kg
1	社 21	< 10
2	22 22	8,400 as Aged Gas/Diesel
3	红 23	< 10

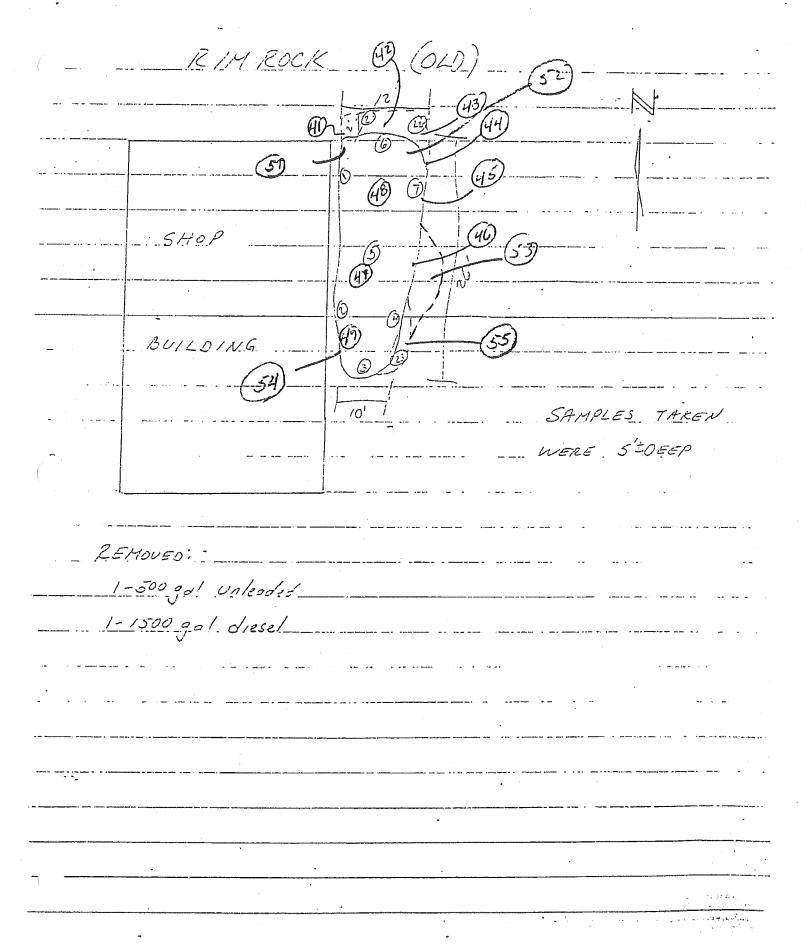
*TPH by EPA SW-846 Modified Method 8015
Note - Results reported on an as received basis.

SURR	OGATE RECO	VERY, %	*
Lab Sample No.	1	2	3
TPH by Mod 8015 1-Chlorooctane Perylene	89 72	249* 76	93 75

^{*}Surrogate recovery invalid due to matrix interference.

SOUND AMALYTICAL SERVICES

C. CLARRY ZURAW



SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS
4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: WA State Dept. of

Transportation

Date: July 3, 1991

Report On: Analysis of Soil

Lab No.: 18422

IDENTIFICATION:

Samples Received on 06-28-91

Project: Rim Rock

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, mg/kg
1	41	< 10.0
2	42	22
3	43	Aged Gas
4	44	Aged Gas/Diesel
5	45	Aged Gas/Diesel
б	46	Aged Gas/Diesel
7	47	7,600 Aged Gas/Diesel
8		7,100 Gas/Diesel
	48	720 Aged Gas/Diesel
9	49	1,200 Aged Gas/Diesel

*TPH by EPA SW-846 Modified Method 8015

Note - Results reported on an as received basis.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS
4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: WA State Dept. of

Transportation

Date: July 15, 1991

Report On: Analysis of Soil

Lab No.: 18642

IDENTIFICATION:

Samples Received on 07-11-91

Project: Rimrock

ANALYSIS:

Lab Sample No.	Client ID	*Total Petroleum Fuel Hydrocarbons, mg/kg
- 1	51	110 * Aged Gas/Diesel
2	52	4.5
3	53	Aged Gas/Diesel
4	54	Aged Gas/Diesel
5	55	340 *\\ Aged Gas/Diesel
·		58 Aged Gas/Diesel

*TPH by EPA SW-846 Modified Method 8015 # N_{ExT} To BLVE, Note - Results reported on an as received basis.

Lab Sample No. 1 2 3 4 5 TPH by Mod 8015 106 86 101 104 84 1-Chlorooctane Perylene 84 72 65 73 75	Top on the second	SUR	ROGATE REC	OVERY, &		
1-Chlorooctane 84 72 101 104 84	Lab Sample No.	1	2		4	5
	1-Chlorooctane			· · · · ·		

SOUND ANALYTICAL SERVICES

C. LARRY ZURAW



STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

Mail Stop PV-11 • Olympia, Washington 98504-8711 • (206) 459-6000

October 27, 1991 OLD RIM ROCK

Dear Underground Storage Tank Owner:

We recently received information on the following site which indicates that tank(s) have been closed:

Site Number: 012216 Tank ID#s: 66E01020 and 66E01021

Site Address: SR12, MP 185-5, SCT With SR 410,

Until we receive documentation that the tank(s) have been permanently closed in accordance with federal and state regulations, we are unable to consider them closed for regulatory and billing purposes. If such closure has been completed, please fill out the enclosed form(s) as marked below and return them to our office as soon as possible. We will then be able to correct our records and resolve any outstanding fee payment issues relating to this site.

For tanks closed before March 1, 1991:

Permanent Closure/Change-in-Service Checklist

For tanks closed after March 1, 1991:

Permanent Closure/Change-in-Service Checklist Sont % Stokes

Site Check/Site Assessment Checklist 7 Sent 11-6-91

Two copies of Site Assessment Report 7 Sent 11-6-91

Please complete the forms and return them to:

Washington State Department of Ecology Underground Storage Tank Section Mail Stop PV-11 Olympia, WA 98504-8711

Thank you for your cooperation. If you have any questions, please call me at (206) 438-7764.

Sincerely,

Joyce M. Smith

Data Management Unit

Joyce M. Smith

Enclosures



UNDERGROUND STORAGE TANK

Permanent Closure/Change-In-Service Checklist

The purpose of this form is to certify the proper closure/change-in-service of underground storage tank (UST) systems. These activities must be conducted in accordance with Chapter 173.360 WAC. Washington State UST rules require the tank owner or operator to notify Ecology in writing 30 days prior to closure or change-in-service of tanks. This must be done by completing the 30 Day Notice form (ECY 010-155).

This Permanent Closure Checklist shall be completed and signed by a Licensed Decommissioning Supervisor. The supervisor shall be on site when all tank permanent closure/change-in-service activities are being conducted. The firm which employs the licensed supervisor shall also be licensed by the Washington State Department of Ecology as a Service Provider. If any of the activities listed below have been supervised by a different licensed supervisor, a separate checklist must be filled out and signed by the licensed supervisor performing those activities.

For further information about completing this form, please contact the Department of Ecology UST Program.

A separate checklist must be completed for each UST system (tank and associated piping), except that UST systems at one site may be reported together by completing page 2 of this form separately for each system. The completed checklist should be mailed to the following address within 30 days of the completion of the closure or change-in-service.

Underground Storage Tank Section Department of Ecology Mail Stop PV-11 Olympia, WA 98504-8711

page 1

1. UST SYSTEM OW	NERIAND LOCATION	的特別的影響的影響		建强国际和国际国际
Site Owner/Operator:	W, S. D.O.T	-	•	
Owners Address:				
1	Street			P,O, Box
Telephone:	City	State		ZIP-Code
Site ID Number (on Invo	ce or avallable from Ecology if tank	is registered): .WAI) 🌣	988-480	-778
Site/Business Name:	W.S. D.O.T.	RIMROCK (orb site	,
Site Address:	Jct USR	12 & SR.	410	
	NAChies	111A		County
	City	State		ZIP-Code
2. STANK PERMANE	TCLOSURE/CHANGE IN SER	RVICE PERFORMED B	Vint-will skill a total	
Firm:	Stokes CONSTA.	iction TNC.	License Number:	Stoker LosoD
Address;	· \	2.01	Box 1	6527
	Street.			P.O. Box
Telephone:	(7.06) 935 -87-7	State ()		ZIP-Code
Icensed Supervisor:	Chris Stoky		Decommissioning License Number:	W00056-1
ECY 010-182 (12/90)				

In-service at the site. For additional tanks you may photocopy this form prior to completing.

3 TANK CLOSURE CHANGE IN SERVICE INFORMATION			國制約平
1. Tank ID Number (as registered with Ecology): 2. Year Installed: 45	603	r •	
3. Tank capacity in gallons: 1-1,500 ; 14 Dicest 4. Date of last use: 5-	6-6	71	
5. Last substance stored: 6. Date of closure/charige-in-st	ervice: _	5-7-	-41
7. Type of closure: Closure with Tank Removal In-place Closure Cha	ange-In-Se	ervice [
8. If In-place closure is used, the tank has been filled with the following substance:			
9. If change-in-service, indicate new substance stored in tank:			····
10. Local permit(s) (if any) obtained from: YAKIMA CO.			
Always contact local authorities regarding permit requirements.	•		
11. Has a site assessment been completed? Yes No			
Unlass an external release detection system is operating at the time of closure or change in service, and a report is p 173-360-390, a site assessment must be conducted. This site assessment must be conducted by a person registere Ecology to perform site assessments. Results of the site assessment must be included with the Site Assessment Ch	d with the L	Departmen	nt of
4. CHECKLIST		MARK!	
Each item of the following checklist shall be initialed by the licensed supervisor whose signature	appears t Yes	elow. No	NA*
Has all Ilquid been removed from product lines?	X		
2. Häs all product piping been capped or removed?	X		
3. Have all non-product lines been capped or removed?	X		
4. Have all liquid and accumulated sludges been removed from the tank?	M		
5. Has the tank been properly purged or inerted?	X:		
6. Have the drop tube, fill pipe, gauge pipe, pumps and other tank fixtures been removed?	X		
7. Have all tank openings been plugged or capped? NOTE: One plug should have 1/8 Inch vent hole.	XI		
8. Have all sludges removed from the tank been designated and disposed of in accordance with the state of Washington's dangerous waste regulations (Chapter 173-303 WAC)? 5/8/9/	X	. ,	
 If removed, was tank properly labeled and disposed of in accordance with all applicable local, state and federal regulations? 	X		
*Ilem not applicable I hereby certify, that I have been the licensed supervisor present on site during the above listed permanent the best of my knowledge they have been conducted in compliance with all applicable state and federal la procedures pertaining to underground storage tanks. Persons submitting false information are subject to penalties under Chapter 173/500 WAC.	closure ac ws, regula	ctivities a tions and	nd to l
5-7-91 / his Alles			
Date Signature of Accensed Supervisor			
5: ADDITIONAL REQUIRED SIGNATURES		THE STATE	體影
5-7-91 Billa K Muman (a	Att	tes) .
Date Signature of Cicegood Service Provider (firm) Owner or Authorized Representative	ga	/	
Date Signature of Tank Owner or Authorized Representative ECY 010-162 (12/80)			

Sound Analytical Services, Inc.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 Pacific Hwy East • Tacoma, WA 98424 (253) 922-2310 • FAX (253) 922-5047 e-mail: SoundL@aol.com



TRANSMITTAL MEMORANDUM

DATE: October 24, 1997

TO: Norm Payton WSDOT - Operations, Olympia P.O. Box 47358

Olympia, WA 98504-7358

PROJECT: Rimrock Monitoring Wells

REPORT NUMBER: 68083

Enclosed are the test results for six samples received at Sound Analytical Services on October 13, 1997.

The report consists of this transmittal memo, analytical results, quality control reports, a copy of the chain-of-custody, a list of data qualifiers and analytical narrative when applicable, and a copy of any requested raw data.

Should there be any questions regarding this report, please contact me at (253) 922-2310.

Sincerely,

Dawn Werner

Project Manager

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW 3

Lab ID: Date Received: 68083-01

Date Prepared:

10/13/97

Date Analyzed: **Dilution Factor**

10/14/97 10/15/97

1

Metals by ICP - USEPA Method 6010

Analyte Lead

Result (mg/L)

PQL

Flags

ND

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW 4

Lab ID: Date Received: 68083-02

Date Prepared:

10/13/97

Date Analyzed:

10/14/97 10/15/97

Dilution Factor

1

Metals by ICP - USEPA Method 6010

Result

Analyte

(mg/L)

PQL

Flags

Lead

ND

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

RMW 2

Date Received:

68083-03

Date Prepared:

10/13/97

Date Analyzed:

10/14/97 10/15/97

Dilution Factor

1

Metals by ICP - USEPA Method 6010

Result

Analyte

(mg/L)

PQL

Flags

Lead

ND

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW 1

Lab ID: Date Received: 68083-04

Date Received: Date Prepared: Date Analyzed: 10/13/97 10/14/97 10/15/97

Dilution Factor

10/15/ 1

Metals by ICP - USEPA Method 6010

Result

(mg/L)

PQL

Flags

Analyte Lead

ND U

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW 3

Lab ID:

68083-01

Date Received: Date Prepared:

10/13/97 10/15/97

Date Analyzed:

% Solids

10/15/97

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene (PID)	111	•	57	153
Trifluorotoluene (FID)	107		50	150

	Result		
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.0005	
Toluene	ND	0.0005	
Ethylbenzene	ND	0.0005	
m,p-Xylene	0.001	0.001	
o-Xylene	0.00094	0.0005	•
Gasoline	ND	0.05	

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW 4

Lab ID:

68083-02 10/13/97

Date Received: Date Prepared:

10/15/97

Date Analyzed:

10/15/97

% Solids

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene (PID)	107		57	153
Trifluorotoluene (FID)	107		50	150

	Result		
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.0005	
Toluene	ND	0.0005	
Ethylbenzene	ND	0.0005	
m,p-Xylene	ND	0.001	
o-Xylene	ND	0.0005	
Gasoline	ND	0.05	

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW 2 68083-03

Lab ID: Date Received:

10/13/97

Date Prepared:

Date Analyzed:

10/15/97

% Solids

10/15/97

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene (PID)	107		57	153
Trifluorotoluene (FID)	108		50	150

	Result		
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.0005	
Toluene	ND	0.0005	
Ethylbenzene	ND	0.0005	
m,p-Xylene	ND	0.001	
o-Xylene	ND	0.0005	
Gasoline	ND	0.05	

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

Date Received:

Date Prepared:

Date Analyzed:

% Solids

RMW 1

68083-04

10/13/97

10/15/97

10/15/97

			Recove	ry Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene (PID)	109		57	153
Trifluorotoluene (FID)	107		50	150

	Result		
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.0005	
Toluene	ND	0.0005	
Ethylbenzene	ND	0.0005	
m,p-Xylene	ND	0.001	
o-Xylene	ND	0.0005	
Gasoline	ND	0.05	

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW 2 - 10 68083-05

Lab ID: Date Received:

Date Prepared:

10/13/97

Date Analyzed:

10/15/97

% Solids

10/19/97

75.39

Combination Gasoline/BTEX Analysis by Method WTPH-G/USEPA Method 8020

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene (PID)	72	•	37	125
Trifluorotoluene (FID)	72		50	150

Sample results are on a dry weight basis.

	Result		
Analyte	(mg/kg)	PQL	Flags
Benzene	ND	0.026	
Toluene	ND	0.026	
Ethylbenzene	ND	0.026	
m,p-Xylene	ND	0.053	
o-Xylene	ND	0.026	
Gasoline	ND	2.6	

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW 1 - 10 68083-06

Lab ID:

Date Received:

10/13/97

Date Prepared: Date Analyzed: 10/15/97

% Solids

10/19/97

77.31

Combination Gasoline/BTEX Analysis by Method WTPH-G/USEPA Method 8020

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene (PID)	71		37	125
Trifluorotoluene (FID)	69		50	150

Sample results are on a dry weight basis.

	Result		
Analyte	(mg/kg)	PQL	Flags
Benzene	ND	0.026	
Toluene	ND	0.026	
Ethylbenzene	ND	0.026	
m,p-Xylene	ND	0.051	
o-Xylene	ND	0.026	
Gasoline	ND	2.6	

Client Name

WSDOT - Operations, Olympia

Client ID: Lab ID: RMW 3

Date Received:

68083-01

Date Prepared:

10/13/97

Date Analyzed:

10/15/97

% Solids

10/16/97

Extended Diesel Range by WTPH-D Modified

Surrogate % Recovery Flags Low High o-Terphenyl 67 50 150

 Result

 Analyte
 (mg/L)
 PQL
 Flags

 Diesel (>nC12-nC24)
 ND
 0.26

 Heavy Oil (>nC24-nC32)
 ND
 0.64

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW 4

Lab ID:

68083-02

Date Received:

10/13/97

Date Prepared:

10/15/97

Date Analyzed:

% Solids

10/16/97

Extended Diesel Range by WTPH-D Modified

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
o-Terphenyl	64		50	150

	Result		
Analyte	(mg/L)	PQL	Flags
Diesel (>nC12-nC24)	ND	0.25	
Heavy Oil (>nC24-nC32)	ND	0.63	

Client Name

WSDOT - Operations, Olympia

Client ID: Lab ID:

RMW 2

Date Received:

68083-03

Date Prepared:

10/13/97

Date Analyzed:

10/15/97

% Solids

10/16/97

Extended Diesel Range by WTPH-D Modified

Surrogate o-Terphenyl % Recovery 64

Flags

Recovery Limits

Low 50

High 150

Analyte Diesel (>nC12-nC24) Heavy Oil (>nC24-nC32)

Result (mg/L) ND

ND

PQL 0.26 **Flags**

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW 1

Lab ID:

68083-04

Date Received: Date Prepared: 10/13/97

Date Analyzed:

10/15/97

% Solids

10/17/97

Extended Diesel Range by WTPH-D Modified

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
o-Terphenyl	68		50	150

Analyte	Result (mg/L)	PQL	Flags
Diesel (>nC12-nC24)	ND	0.26	
Heavy Oil (>nC24-nC32)	ND	0.64	

Client Name

WSDOT - Operations, Olympia

Client ID: Lab ID:

RMW 2 - 10

68083-05

Date Received:

10/13/97

Date Prepared: Date Analyzed:

10/14/97

% Solids

10/18/97 75.39

Extended Diesel Range by WTPH-D Modified

			Recove	ery Limits
Surrogate o-Terphenyl	% Recovery 71	Flags	Low 50	High 150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Diesel (>nC12-nC24)	ND ND	16	_
Heavy Oil (>nC24-nC32)	ND	41	

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW 1 - 10

Lab ID:

68083-06

Date Received:

10/13/97

Date Prepared: Date Analyzed:

10/14/97

% Solids

10/18/97 77.31

Extended Diesel Range by WTPH-D Modified

Surrogate % Recovery Flags Low High o-Terphenyl 82 50 150

Sample results are on a dry weight basis.

 Result

 Analyte
 (mg/kg)
 PQL
 Flags

 Diesel (>nC12-nC24)
 ND
 15

 Heavy Oil (>nC24-nC32)
 ND
 37

Lab ID:

Method Blank - T213

Date Received:

Date Prepared:

Date Analyzed:

Dilution Factor

Analyte

10/14/97

10/15/97

1

Metals by ICP - USEPA Method 6010

Result

(mg/L)

PQL

Flags

Duplicate Report

 Client Sample ID:
 RMW 3

 Lab ID:
 68083-01

 Date Prepared:
 10/14/97

 Date Analyzed:
 10/15/97

Date Analyzed: 10/15/9
QC Batch ID: T213

Metals by ICP - USEPA Method 6010

Sample Duplicate
Result Result RPD

Parameter Name (mg/L) (mg/L) % Flag
Lead 0 0 NC

Matrix Spike Report

 Client Sample ID:
 RMW 3

 Lab ID:
 68083-01

 Date Prepared:
 10/14/97

 Date Analyzed:
 10/15/97

 QC Batch ID:
 T213

Metals by ICP - USEPA Method 6010

Sample Spike MS Result **Amount** Result MS % Rec. **Parameter Name** (mg/L) (mg/L) (mg/L) Flag 0 1 1.01 101 Lead

Lab ID:

Method Blank - GB1274

Date Received:

Date Prepared:

Date Analyzed:

% Solids

10/15/97

10/15/97

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene (PID)	107		57	153
Trifluorotoluene (FID)	105		50	150

	Result		
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.0005	
Toluene	ND	0.0005	
Ethylbenzene	ND	0.0005	
m,p-Xylene	ND	0.001	
o-Xylene	ND	0.0005	
Gasoline	ND	0.05	•

Blank Spike/Blank Spike Duplicate Report

Lab ID:

GB1274

Date Prepared:

10/15/97

Date Analyzed:

10/15/97

QC Batch ID:

GB1274

	Blank	Spike	BS		BSD			
•	Result	Amount	Result	BS	Result	BSD		
Compound Name	(mg/L)	(mg/L)	(mg/L)	% Rec.	(mg/L)	% Rec.	RPD	Flag
Benzene	ND	0.025	0.0227	91	0.0237	94.8	4.1	
Toluene	ND	0.025	0.0241	96.4	0.0246	98.2	1.8	
Ethylbenzene	ND	0.025	0.0236	94.5	0.0245	98.1	3.7	
m,p-Xylene	ND	0.05	0.0478	95.7	0.0495	98.9	3.3	
o-Xylene	ND	0.025	0.0239	95.5	0.0244	97.7	2.3	
Gasoline	ND	0.668	0.707	106	0.726	109	2.8	

Lab ID:

Method Blank - GB1275

Date Received:

Date Prepared:

Date Analyzed:

ate Analyzed % Solids 10/15/97

10/18/97

Combination Gasoline/BTEX Analysis by Method WTPH-G/USEPA Method 8020

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene (PID)	80		37	125
Trifluorotoluene (FID)	81		50	150

Sample results are on an as received basis.

Analyte	Result (mg/kg)	PQL	Flags
Benzene	ND	0.02	
Toluene	ND	0.02	
Ethylbenzene	ND	0.02	
m,p-Xylene	ND	0.04	
o-Xylene	ND	0.02	•
Gasoline	ND	2	

Duplicate Report

 Client Sample ID:
 RMW 2 - 10

 Lab ID:
 68083-05

 Date Prepared:
 10/15/97

 Date Analyzed:
 10/19/97

 QC Batch ID:
 GB1275

	Sample Result	Duplicate Result	RPD	
Parameter Name	(mg/kg)	(mg/kg)	%	Flag
Benzene	ND	ND	NC	
Toluene	ND	ND	NC	
Ethylbenzene	ND	ND	NC	
m,p-Xylene	ND	ND	NC	
o-Xylene	ND	ND	NC	
Gasoline	ND	ND	NC	

Matrix Spike/Matrix Spike Duplicate Report

Client Sample ID:

RMW 2 - 10

Lab ID:

68083-05

Date Prepared:

10/15/97

Date Analyzed:

10/19/97

QC Batch ID:

GB1275

·	Sample	Spike	MS		MSD			
	Result	Amount	Result	MS	Result	MSD		
Compound Name	(mg/kg)	(mg/kg)	(mg/kg)	% Rec.	(mg/kg)	% Rec.	RPD	Flag
Gasoline	ND	35.3	30.4	86.1	31.1	88.1	2.3	

Matrix Spike/Matrix Spike Duplicate Report

Client Sample ID:

RMW 2 - 10

Lab ID:

68083-05

Date Prepared:

10/15/97

Date Analyzed:

10/19/97

QC Batch ID:

GB1275

Compound Name	Sample Result (mg/kg)	Spike Amount (mg/kg)	MS Result (mg/kg)	MS % Rec.	MSD Result (mg/kg)	MSD % Rec.	RPD	Flag
Benzene	ND	1.32	0.846	63.9	0.905	68.4	6.8	
Toluene	ND	1.32	0.972	73.4	0.959	72.5	1.2	
Ethylbenzene	ND	1.32	1	75.9	0.985	74.4	2	
m,p-Xylene	ND	2.65	2.08	78.5	2.04	77	1.9	
o-Xylene	ND	1.32	1.01	76.2	0.977	73.8	3.2	

Lab ID:

Method Blank - DI1359

Date Received:

Date Prepared:
Date Analyzed:
% Solids

10/15/97 10/16/97

Extended Diesel Range by WTPH-D Modified

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
o-Terphenyl	65		50	150

	Result		
Analyte	(mg/L)	PQL	Flags
Diesel (>nC12-nC24)	ND	0.25	
Heavy Oil (>nC24-nC32)	ND	0.63	

Blank Spike/Blank Spike Duplicate Report

Lab ID:

Date Prepared:

Date Analyzed:

QC Batch ID:

DI1359

10/15/97

10/16/97

DI1359

	Blank Result	Spike Amount	BS Result	BS	BSD Result	BSD		
Compound Name	(mg/L)	(mg/L)	(mg/L)	% Rec.	(mg/L)	% Rec.	RPD	Flag
Diesel (>nC12-nC24)	0	5.01	4.37	87.3	4.11	82.1	6.1	
Heavy Oil (>nC24-nC32)	0	5	5.04	101	4.79	95.7	5.4	

Lab ID:

Method Blank - DI1357

Date Received:

Date Prepared: Date Analyzed:

10/14/97 10/17/97

% Solids

Extended Diesel Range by WTPH-D Modified

			Recove	ry Limits
Surrogate o-Terphenyl	% Recovery 86	Flags	Low 50	High 150

Sample results are on an as received basis.

	Result		
Analyte	(mg/kg)	PQL	Flags
Diesel (>nC12-nC24)	ND	13	
Heavy Oil (>nC24-nC32)	ND	31	

Blank Spike Report

 Lab ID:
 DI1357

 Date Prepared:
 10/14/97

 Date Analyzed:
 10/17/97

 QC Batch ID:
 DI1357

	Blank Result	Spike Amount	BS Result	BS	
Parameter Name	(mg/kg)	(mg/kg)	(mg/kg)	% Rec.	Flag
Diesel (>nC12-nC24)	0	250	220	89	
Heavy Oil (>nC24-nC32)	0	250	240	95	

Duplicate Report

 Client Sample ID:
 WB1-45'

 Lab ID:
 68084-05

 Date Prepared:
 10/14/97

 Date Analyzed:
 10/17/97

 QC Batch ID:
 DI1357

	Sample Result	Duplicate Result	RPD	
Parameter Name	(mg/kg)	(mg/kg)	%	Flag
Diesel (>nC12-nC24)	42	33	24.0	X4a
Heavy Oil (>nC24-nC32)	55	43	24.0	X4a

Matrix Spike/Matrix Spike Duplicate Report

Client Sample ID:

Lab ID:

Date Prepared:

Date Analyzed:

QC Batch ID:

WB1-45'

68084-05

10/14/97

10/17/97

DI1357

	Sample	Spike	MS		MSD			
	Result	Amount	Result	MS	Result	MSD		
Compound Name	(mg/kg)	(mg/kg)	(mg/kg)	% Rec.	(mg/kg)	% Rec.	RPD	Flag
Diesel (>nC12-nC24)	42	252	230	74.8	225	71.2	4.9	

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE: (253) 922-2310 - FAX: (253) 922-5047

DATA QUALIFIERS AND ABBREVIATIONS

- **B**1: This analyte was detected in the associated method blank. The analyte concentration was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank). This analyte was detected in the associated method blank. The analyte concentration in the sample was determined **B2**: to be significantly higher than the method blank (greater than ten times the concentration reported in the blank). Additional confirmation performed. C: D: The reported result for this analyte is calculated based on a secondary dilution factor. E: The concentration of this analyte exceeded the instrument calibration range. J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity. MCL: Maximum Contaminant Level MDL: Method Detection Limit N: See analytical narrative. Not Detected PQL: **Practical Quantitation Limit X**1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be X2: Contaminant does not appear to be "typical" product. Further testing is suggested for identification. Identification and quantification of peaks was complicated by matrix interference; GC/MS confirmation is **X**3: recommended. **X4**: RPD for duplicates outside advisory QC limits. Sample was re-analyzed with similar results. X4a: RPD for duplicates outside advisory QC limits due to analyte concentration near the method practical quantitation limit/detection limit. X5: Matrix spike was diluted out during analysis. **X6**: Recovery of matrix spike was outside advisory QC limits. Sample was re-analyzed with similar results. X7: Recovery of matrix spike outside advisory QC limits. Matrix interference is indicated by blank spike recovery data.
- X7a: Recovery and/or RPD values for MS/MSD outside advisory QC limits due to high contaminant levels.

33

X9: Surrogate recovery outside advisory QC limits due to matrix composition.

Surrogate was diluted out during analysis.

Λó:

ANALYTICAL & ENVIRONMENTAL CHEMISTS

108 (253) 922 (253) 922

الالكامير 4813 Pacific Hwy. East كالالكامير Washington 9 (253) 922-2310 • FAX (كيري) 922.

CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSISOAD

These samples will be disposed of 45 days after receipt Check this box to have samples returned 10 40 SPECIAL INSTRUCTIONS/COMMENTS: Pesticides & Herbicides TCLP Extraction Semi-volatiles Volatiles 8 Metals 18-61-81 Total Metals (Specify below) Time / Date <u>88</u>17 , 180 EPA625/8270 (GC/MS) Volatile Organics EPA 624/8240 (GC/MS) WSPST ANALYSIS REQUESTED: SA Firm e'HA9 Chlorinated Pest., PCB's EPA 608/8080 Aromatic Volatiles 0208\co Aq3 Norman E Ratha Halogenated Volatiles EPA 601/8010 Printed Name # of Containers WATER WATER WATER PROJECT NAME: RIMARDEL: MONITORING MATRIX $\bar{\bar{\aleph}}$ بق WSPOT-Oper. Oly TIME 600 1625 8917 方が === HSI Hago PAYTON PHONE NO: (\$60) 705-7848 10/8/4 16/8/01 DATE 18/8/J 44/4/01 17/47 Signature CONTACT: NORM Marrian 0 0 SAMPLE I.D. RINKI RAE 21 RICE KMW アスと スプス Relinquished By Relinquished By Relinquished GLIENT: Received By Received By Received By LAB#

SOUND ANALYTICAL SERVICES, INC.

4813 Pacific Highway East • Tacoma, Washington 98424 • (253) 922-2310

. OE8089 ## 3010ANI

WA DOT Operations Dept-Olympia F.O. Box 47358 Olympia, WA 98504-7358

REFERENCE: Contract 94-2 Rimrock Monitor Wells (Norm Payton)

FURCHASE ORDER:

QUANTITY 6 4 4	ACCT #:
DESCRIPTION BTEX/TPHG TPH-D Sample Digestion Or Filtering Metals By ICP	TERMS: Net 30
UNIT PRICE 75.00 65.00 8.00 6.00	DATE 10/30/97
EXTENDED PRICE \$450.00 \$390.00 \$32.00 \$24.00	PAGE:

SUBTOTAL: \$896.00 SALES TAX: \$.00 TOTAL DUE: \$896.00

APPENDIX C

Groundwater Sample Results

Sound Analytical Services, Inc.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 Pacific Hwy East • Tacoma, WA 98424 (253) 922-2310 • FAX (253) 922-5047 e-mail: SoundL@aol.com



TRANSMITTAL MEMORANDUM

DATE: October 24, 1997

TO: Norm Payton

WSDOT - Operations, Olympia

P.O. Box 47358

Olympia, WA 98504-7358

PROJECT: Rimrock Monitoring Wells

Verner

REPORT NUMBER: 68083

Enclosed are the test results for six samples received at Sound Analytical Services on October 13, 1997.

The report consists of this transmittal memo, analytical results, quality control reports, a copy of the chain-of-custody, a list of data qualifiers and analytical narrative when applicable, and a copy of any requested raw data.

Should there be any questions regarding this report, please contact me at (253) 922-2310.

Sincerely,

Dawn Werner Project Manager

Client Name
Client ID:
Lab ID:
Cate Received:
Date Received:
Date Prepared:
Date Analyzed:
Dilution Factor

WSDOT - Operations, Olympia
RMW 3
68083-01
10/13/97
10/13/97
10/14/97
10/15/97

Metals by ICP - USEPA Method 6010

Result

Analyte (mg/L) PQL Flags

Lead ND 0.15

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW 4

Lab ID:

68083-02

Date Received: Date Prepared:

10/13/97

Date Analyzed:

10/14/97 10/15/97

Dilution Factor

1

Metals by ICP - USEPA Method 6010

Result

Analyte Lead (mg/L)

PQL 0.15

Flags

Client Name WSDOT - Operations, Olympia
Client ID: RMW 2
Lab ID: 68083-03
Date Received: 10/13/97

Date Prepared: 10/14/97
Date Analyzed: 10/15/97
Dilution Factor 1

Metals by ICP - USEPA Method 6010

 Result

 Analyte
 (mg/L)
 PQL
 Flags

 Lead
 ND
 0.15

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW 1

Lab ID:

68083-04

Date Received:

10/13/97

Date Prepared:

10/14/97

Date Analyzed: Dilution Factor

10/15/97 1

Metals by ICP - USEPA Method 6010

Result

Analyte Lead (mg/L)

PQL

Flags

ND

0.15

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

Date Received:

Date Prepared:

Date Analyzed:

% Solids

RMW 3

68083-01

10/13/97

10/15/97

10/15/97

		*	Recove	ry Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene (PID)	111		57	153
Trifluorotoluene (FID)	107		50	150

	Result		
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.0005	
Toluene	ND	0.0005	
Ethylbenzene	ND .	0.0005	
m,p-Xylene	0.001	0.001	
o-Xylene	0.00094	0.0005	
Gasoline	ND	0.05	

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

Date Received:

Date Prepared:

Date Analyzed:

% Solids

RMW 4

68083-02

10/13/97

10/15/97

10/15/97

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene (PID)	107		57	153
Trifluorotoluene (FID)	107		50	150

	Result		
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.0005	
Toluene	ND	0.0005	
Ethylbenzene	ND	0.0005	
m,p-Xylene	ND	0.001	
o-Xylene	ND	0.0005	
Gasoline	ND	0.05	

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

Date Received:

Date Prepared:

Date Analyzed:

% Solids

RMW 2

68083-03

10/13/97

10/15/97

10/15/97

	,		Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene (PID)	107		57	153
Trifluorotoluene (FID)	108		50	150

	Result		
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.0005	
Toluene	ND	0.0005	
Ethylbenzene	ND	0.0005	
m,p-Xylene	ND	0.001	
o-Xylene	ND	0.0005	
Gasoline	ND	0.05	

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

Date Received:

Date Prepared:

Date Analyzed:

% Solids

RMW 1

68083-04

10/13/97

10/15/97

10/15/97

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene (PID)	109		57	153
Trifluorotoluene (FID)	107		50	150

	Result		
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.0005	
Toluene	ND	0.0005	
Ethylbenzene	ND	0.0005	
m,p-Xylene	ND	0.001	•
o-Xylene	ND	0.0005	
Gasoline	ND	0.05	

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW 2 - 10

Lab ID:

68083-05

Date Received: Date Prepared:

10/13/97

Date Analyzed:

10/15/97 10/19/97

% Solids

75.39

Combination Gasoline/BTEX Analysis by Method WTPH-G/USEPA Method 8020

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene (PID)	72		37	125
Trifluorotoluene (FID)	72		50	150

Sample results are on a dry weight basis.

	Result		
Analyte	(mg/kg)	PQL	Flags
Benzene	ND	0.026	
Toluene	ND	0.026	
Ethylbenzene	ND	0.026	
m,p-Xylene	ND	0.053	
o-Xylene	ND	0.026	
Gasoline	ND	2.6	

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW 1 - 10 68083-06

Lab ID: Date Received:

Date Prepared:

10/13/97

Date Analyzed:

10/15/97 10/19/97

% Solids

77.31

Combination Gasoline/BTEX Analysis by Method WTPH-G/USEPA Method 8020

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene (PID)	71		37	125
Trifluorotoluene (FID)	69		50	150

Sample results are on a dry weight basis.

	Result		
Analyte	(mg/kg)	PQL	Flags
Benzene	ND	0.026	
Toluene	ND	0. 026 .	
Ethylbenzene	ND	0.026	
m,p-Xylene	ND	0.051	
o-Xylene	ND	0.026	
Gasoline	ND	2.6	

Client Name

WSDOT - Operations, Olympia

Client ID: Lab ID:

RMW 3

68083-01

Date Received:

10/13/97

Date Prepared:

10/15/97

Date Analyzed:

% Solids

10/16/97

Extended Diesel Range by WTPH-D Modified

Surrogate o-Terphenyl

% Recovery 67

Flags

Recovery Limits Low High

50

150

Result

Analyte Diesel (>nC12-nC24) Heavy Oil (>nC24-nC32) (mg/L)

PQL 0.26 **Flags**

ND ND

0.64

Client Name

WSDOT - Operations, Olympia

Client ID: Lab ID:

RMW 4

Date Received:

68083-02

Date Prepared:

10/13/97 10/15/97

Date Analyzed:

% Solids

10/16/97

Extended Diesel Range by WTPH-D Modified

Surrogate o-Terphenyl

% Recovery 64

Flags

Recovery Limits High Low

50

150

Result

Analyte Diesel (>nC12-nC24) (mg/L)

PQL 0.25

Flags

Heavy Oil (>nC24-nC32)

ND ND

0.63

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW 2

Lab ID:

68083-03

Date Received:

10/13/97

Date Prepared:

10/15/97

Date Analyzed: % Solids

Analyte

Diesel (>nC12-nC24)

Heavy Oil (>nC24-nC32)

10/16/97

Extended Diesel Range by WTPH-D Modified

Surrogate % Recovery Flags Low High o-Terphenyl 64 50 150

 Result
 (mg/L)
 PQL
 Flags

 ND
 0.26

 ND
 0.64

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW₁

Lab ID:

68083-04

Date Received:

10/13/97

Date Prepared:

10/15/97

Date Analyzed:

% Solids

10/17/97

Extended Diesel Range by WTPH-D Modified

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
o-Terphenyl	68		50	150

Result

Analyte Diesel (>nC12-nC24) (mg/L)

PQL 0.26 **Flags**

Heavy Oil (>nC24-nC32)

ND ND

0.64

Client Name

WSDOT - Operations, Olympia

Client ID: Lab ID: RMW 2 - 10 68083-05

Date Received:

10/13/97

Date Prepared:

10/13/97 10/14/97

Date Analyzed:

10/14/97 10/18/97

% Solids

75.39

Extended Diesel Range by WTPH-D Modified

Surrogate o-Terphenyl % Recovery 71

Flags

Recovery Limits Low High

50

150

Sample results are on a dry weight basis.

Analyte
Diesel (>nC12-nC24)
Heavy Oil (>nC24-nC32)

Result (mg/kg)

PQL 16

Flags

ND ND

41

Client Name

WSDOT - Operations, Olympia RMW 1 - 10

Client ID:

Lab ID:

Date Received:

Date Prepared:

% Solids

Date Analyzed:

68083-06

10/13/97

10/14/97

10/18/97

77.31

Extended Diesel Range by WTPH-D Modified

Surrogate o-Terphenyl

% Recovery 82

Flags

Recovery Limits Low

50

High 150

Sample results are on a dry weight basis.

Analyte Diesel (>nC12-nC24) Heavy Oil (>nC24-nC32)

Result (mg/kg)

ND ND **PQL**

Flags

15 37

Lab ID:

Method Blank - T213

Date Received:

Date Prepared:

Date Analyzed:

Dilution Factor

10/14/97 10/15/97

1

Metals by ICP - USEPA Method 6010

R

Analyte

Result (mg/L)

PQL

Flags

Duplicate Report

 Client Sample ID:
 RMW 3

 Lab ID:
 68083-01

 Date Prepared:
 10/14/97

 Date Applied:
 10/15/07

Date Analyzed: 10/15/97 QC Batch ID: T213

Metals by ICP - USEPA Method 6010

Sample Duplicate
Result Result RPD

Parameter Name (mg/L) (mg/L) % Flag
Lead 0 0 NC

Matrix Spike Report

 Client Sample ID:
 RMW 3

 Lab ID:
 68083-01

 Date Prepared:
 10/14/97

 Date Analyzed:
 10/15/97

 QC Batch ID:
 T213

Metals by ICP - USEPA Method 6010

	Sample	Spike	MS	•	
	Result	Amount	Result	MS	
Parameter Name	(mg/L)	(mg/L)	(mg/L)	% Rec.	Flag
Lead	0	1	1.01	101	

Lab ID:

Method Blank - GB1274

Date Received:

Date Prepared:

10/15/97 10/15/97

Date Analyzed: % Solids

			Recove	ry Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene (PID)	107		57	153
Trifluorotoluene (FID)	105		50	150

	Result		
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.0005	
Toluene	ND	0.0005	
Ethylbenzene	ND	0.0005	
m,p-Xylene	ND	0.001	
o-Xylene	ND	0.0005	
Gasoline	ND	0.05	

Blank Spike/Blank Spike Duplicate Report

Lab ID:

GB1274

Date Prepared:

10/15/97

Date Analyzed:

10/15/97

QC Batch ID:

GB1274

Compound Name	Blank Result (mg/L)	Spike Amount (mg/L)	BS Result (mg/L)	BS % Rec.	BSD Result (mg/L)	BSD % Rec.	RPD	Flag
Benzene	ND	0.025	0.0227	91	0.0237	94.8	4.1	
Toluene	ND	0.025	0.0241	96.4	0.0246	98.2	1.8	
Ethylbenzene	ND	0.025	0.0236	94.5	0.0245	98.1	3.7	
m,p-Xylene	ND	0.05	0.0478	95.7	0.0495	98.9	3.3	
o-Xylene	ND	0.025	0.0239	95.5	0.0244	97.7	2.3	
Gasoline	ND	0.668	0.707	106	0.726	109	2.8	

Lab ID:

Method Blank - GB1275

Date Received:

Date Prepared: Date Analyzed: 10/15/97

% Solids

10/18/97

Combination Gasoline/BTEX Analysis by Method WTPH-G/USEPA Method 8020

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene (PID)	80		37	125
Trifluorotoluene (FID)	81		50	150

Sample results are on an as received basis.

	Result		
Analyte	(mg/kg)	PQL	Flags
Benzene	ND	0.02	
Toluene	ND -	0.02	
Ethylbenzene	ND	0.02	
m,p-Xylene	ND	0.04	
o-Xylene	ND	0.02	
Gasoline	ND	2	

Duplicate Report

 Client Sample ID:
 RMW 2 - 10

 Lab ID:
 68083-05

 Date Prepared:
 10/15/97

 Date Analyzed:
 10/19/97

 QC Batch ID:
 GB1275

Day and Albania	Sample Result	Duplicate Result	RPD	Floor
Parameter Name	(mg/kg)	(mg/kg)	%	Flag
Benzene	ND	ND	NC	
Toluene	ND	ND	NC	
Ethylbenzene	ND	ND	NC	
m,p-Xylene	ND	ND -	NC	
o-Xylene	ND	ND	NC	
Gasoline	ND	ND	NC	

Matrix Spike/Matrix Spike Duplicate Report

Client Sample ID:

RMW 2 - 10

Lab ID:

68083-05

Date Prepared:

10/15/97

Date Analyzed:

10/19/97

QC Batch ID:

GB1275

	Sample	Spike	MS		MSD			
	Result	Amount	Result	MS	Result	MSD		
Compound Name	(mg/kg)	(mg/kg)	(mg/kg)	% Rec.	(mg/kg)	% Rec.	RPD	Flag
Gasoline	ND	35.3	30.4	86.1	31.1	88.1	2.3	

Matrix Spike/Matrix Spike Duplicate Report

Client Sample ID:

RMW 2 - 10

Lab ID:

68083-05

Date Prepared:

10/15/97

Date Analyzed:

10/19/97

QC Batch ID:

GB1275

Compound Name	Sample Result (mg/kg)	Spike Amount (mg/kg)	MS Result (mg/kg)	MS % Rec.	MSD Result (mg/kg)	MSD % Rec.	RPD	Flag
Benzene	ND ND	1.32	0.846	63.9	0.905	68.4	6.8	_
Toluene	ND	1.32	0.972	73.4	0.959	72.5	1.2	
Ethylbenzene	ND	1.32	1	75.9	0.985	74.4	2	
m,p-Xylene	ND	2.65	2.08	78.5	2.04	77	1.9	
o-Xylene	ND	1.32	1.01	76.2	0.977	73.8	3.2	

Lab ID:

Method Blank - DI1359

Date Received:

Date Prepared:

Date Analyzed: % Solids

10/15/97

10/16/97

Extended Diesel Range by WTPH-D Modified

			Recove	ery Limits
Surrogate o-Terphenyl	% Recovery 65	Flags	Low 50	High 150

 Result

 Analyte
 (mg/L)
 PQL
 Flags

 Diesel (>nC12-nC24)
 ND
 0.25

 Heavy Oil (>nC24-nC32)
 ND
 0.63

Blank Spike/Blank Spike Duplicate Report

Lab ID: Date Prepared: Date Analyzed: QC Batch ID: DI1359 10/15/97 10/16/97 DI1359

	Blank	Spike	BS		BSD			
	Result	Amount	Result	BS	Result	BSD		
Compound Name	(mg/L)	(mg/L)	(mg/L)	% Rec.	(mg/L)	% Rec.	RPD	Flag
Diesel (>nC12-nC24)	0	5.01	4.37	87.3	4.11	82.1	6.1	
Heavy Oil (>nC24-nC32)	0	5	5.04	101	4.79	95.7	5.4	

Lab ID:

Method Blank - DI1357

Date Received:

Date Prepared:

Date Analyzed:

10/14/97

10/17/97

% Solids

Extended Diesel Range by WTPH-D Modified

			Recove	ry Limits
Surrogate	% Recovery	Flags	Low	High
o-Terphenyl	86		50	150

Sample results are on an as received basis.

	Result		
Analyte	(mg/kg)	PQL	Flags
Diesel (>nC12-nC24)	NĎ	13	
Heavy Oil (>nC24-nC32)	ND	31	

Blank Spike Report

 Lab ID:
 DI1357

 Date Prepared:
 10/14/97

 Date Analyzed:
 10/17/97

 QC Batch ID:
 DI1357

	Blank	Spike	BS		
	Result	Amount	Result	BS	
Parameter Name	(mg/kg)	(mg/kg)	(mg/kg)	% Rec.	Flag
Diesel (>nC12-nC24)	0	250	220	89	
Heavy Oil (>nC24-nC32)	0	250	240	95	

Duplicate Report

 Client Sample ID:
 WB1-45'

 Lab ID:
 68084-05

 Date Prepared:
 10/14/97

 Date Analyzed:
 10/17/97

 QC Batch ID:
 DI1357

	Sample Result	Duplicate Result	RPD	
Parameter Name	(mg/kg)	(mg/kg)	%	Flag
Diesel (>nC12-nC24)	42	33	24.0	X4a
Heavy Oil (>nC24-nC32)	55	43	24.0	X4a

Matrix Spike/Matrix Spike Duplicate Report

Client Sample ID:

Lab ID:

Date Prepared: Date Analyzed:

QC Batch ID:

WB1-45'

68084-05

10/14/97

10/17/97

DI1357

	Sample	Spike	MS		MSD			
	Result	Amount	Result	MS	Result	MSD		
Compound Name	(mg/kg)	(mg/kg)	(mg/kg)	% Rec.	(mg/kg)	% Rec.	RPD	Flag
Diesel (>nC12-nC24)	42	252	230	74.8	225	71.2	4.9	

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE: (253) 922-2310 - FAX: (253) 922-5047

DATA QUALIFIERS AND ABBREVIATIONS

B1: This analyte was detected in the associated method blank. The analyte concentration was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank). **B2**: This analyte was detected in the associated method blank. The analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank). C: Additional confirmation performed. D: The reported result for this analyte is calculated based on a secondary dilution factor. E: The concentration of this analyte exceeded the instrument calibration range. The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity. J: MCL: Maximum Contaminant Level MDL: Method Detection Limit N: See analytical narrative. ID: Not Detected PQL: **Practical Quantitation Limit X**1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be X2: Contaminant does not appear to be "typical" product. Further testing is suggested for identification. Identification and quantification of peaks was complicated by matrix interference; GC/MS confirmation is X3: recommended. X4: RPD for duplicates outside advisory QC limits. Sample was re-analyzed with similar results. X4a: RPD for duplicates outside advisory QC limits due to analyte concentration near the method practical quantitation limit/detection limit. X5: Matrix spike was diluted out during analysis. X6: Recovery of matrix spike was outside advisory QC limits. Sample was re-analyzed with similar results. **X**7: Recovery of matrix spike outside advisory QC limits. Matrix interference is indicated by blank spike recovery data. Recovery and/or RPD values for MS/MSD outside advisory QC limits due to high contaminant levels. **X7a**:

33

:8*Y*

X9:

Surrogate was diluted out during analysis.

Surrogate recovery outside advisory QC limits due to matrix composition.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 Pacific Hwy. East Tacoma, Washington 98.

(253) 922-2310 • FAX (253) 922-5047 CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSISAN

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4813 Pacific Highway East • Tacoma, Washington 98424 • (253) 922-2310

INVOICE #: 680830

WA DOT Operations Dept-Olympia F.O. Box 47358 Olympia, WA 98504-7358

REFERENCE:
Contract 94-2 Rimrock Monitor
Wells (Norm Payton)

PURCHASE ORDER:

QUANTITY 6 6 4 4	ACCT #:
DESCRIPTION BTEX/TPHG TPH-D Sample Digestion Or Filtering Metals By ICP	TERMS: Net 30
UNIT FRICE 75.00 65.00 8.00 6.00	DATE 10/30/97
EXTENDED PRICE \$450.00 \$390.00 \$32.00 \$24.00	FAGE:

White - Original, Canary - Remittance, Pink - File, Goldenrod - Accounting

TOTAL DUE:

00.968\$ 00.968\$

SUBTOTAL:

Sound Analytical Services, Inc.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 Pacific Hwy East • Tacoma, WA 98424 (253) 922-2310 • FAX (253) 922-5047 e-mail: SoundL@aol.com



TRANSMITTAL MEMORANDUM

DATE: February 19, 1998

TO: Norm Payton
WSDOT - Operations, Olympia
P.O. Box 47358
Olympia, WA 98504-7358

PROJECT: Rimrock Monitoring Wells

REPORT NUMBER: 70473

Enclosed are the test results for four samples received at Sound Analytical Services on February 6, 1998.

The report consists of this transmittal memo, analytical results, quality control reports, a copy of the chain-of-custody, a list of data qualifiers and analytical narrative when applicable, and a copy of any requested raw data.

Should there be any questions regarding this report, please contact me at (253) 922-2310.

Elynn

Sincerely,

Dawn Werner Project Manager

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

R1

Date Received:

70473-01

2/6/98

Date Prepared:

2/10/98

Date Analyzed:

% Solids

2/12/98

Gasoline Range Organic Compounds by WSDOE Method WTPH-G Modified

			Recove	ery Limits
Surrogate Trifluorotoluene	% Recovery 102	Flags	Low 50	High 150
Timuorotojucije	102		50	

Result **Analyte PQL** (mg/L) **Flags** Gasoline Range Organics ND 0.05

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

Date Received:

Date Prepared: Date Analyzed:

% Solids

R2

70473-02

2/6/98

2/10/98

2/12/98

Gasoline Range Organic Compounds by WSDOE Method WTPH-G Modified

	•		Recove	ery Limits
Surrogate	% Recovery	Flags	Low	Hìgh
Trifluorotoluene	104		50	150

Result

Analyte

Gasoline Range Organics

(mg/L)

ND

PQL

0.05

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

R3

Date Received:

70473-03

Date Prepared:

2/6/98

2/10/98

Date Analyzed:

2/12/98

% Solids

Gasoline Range Organic Compounds by WSDOE Method WTPH-G Modified

Surrogate Trifluorotoluene

% Recovery 101

Flags

Recovery Limits Low High

150

50

Result

Analyte

(mg/L)

PQL

Flags

Gasoline Range Organics

ND

0.05

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

Date Received:

Date Prepared:

Date Analyzed: % Solids

R4

70473-04

2/6/98

2/10/98

2/12/98

Gasoline Range Organic Compounds by WSDOE Method WTPH-G Modified

			Recove	ry Limits
Surrogate Trifluorotoluene	% Recovery 100	Flags	Low 50	High 150

Result

Analyte

Gasoline Range Organics

(mg/L)

ND

PQL

Flags

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

R1

Date Received:

70473-01

2/6/98

Date Prepared:

2/10/98

Date Analyzed:

2/12/98

% Solids

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene	91		57	153

	Result		
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.0005	
Toluene	ND	0.0005	
Ethylbenzene	ND	0.0005	
m,p-Xylenes	ND	0.001	
o-Xylene	ND .	0.0005	

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

Date Received:

Date Prepared:

Date Analyzed:

70473-02

R2

2/6/98

2/10/98

2/12/98

% Solids

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene	97		57	153

	Result		
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.0005	
Toluene	ND .	0.0005	
Ethylbenzene	ND	0.0005	
m,p-Xylenes	ND	0.001	
o-Xylene	ND	0.0005	

Client Name

WSDOT - Operations, Olympia

Client ID:

R3

Lab ID:

70473-03

Date Received:

2/6/98

Date Prepared:

2/10/98

Date Analyzed:

2/12/98

% Solids

,

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene	99		57	153

	Result		
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.0005	_
Toluene	ND	0.0005	
Ethylbenzene ·	ND	0.0005	
m,p-Xylenes	ND	0.001	•
o-Xylene	ND	0.0005	

Client Name

WSDOT - Operations, Olympia

Client ID:

R4

Lab ID:

70473-04

Date Received:

Date Prepared:

2/6/98

2/10/98

Date Analyzed:

2/12/98

% Solids

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene	97		57	153

	Result		•
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.0005	
Toluene	ND	0.0005	
Ethylbenzene	ND	0.0005	
m,p-Xylenes	ND	0.001	
o-Xylene	ND	0.0005	

Client Name

WSDOT - Operations, Olympia

Client ID:

R1

Lab ID:

70473-01

Date Received:

2/6/98

Date Prepared: Date Analyzed: 2/11/98

% Solids

2/16/98

Extended Diesel Range by WTPH-D Modified

Recovery Limits Surrogate % Recovery High **Flags** Low o-Terphenyl 104 50 .150

Result

Analyte

(mg/L)

PQL

Flags

Diesel (>nC12-nC24) Heavy Oil (>nC24-nC32) ND ND 0.26

0.64

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

Date Received:

Date Prepared: Date Analyzed:

% Solids

R2

70473-02

2/6/98

2/11/98

2/16/98

Extended Diesel Range by WTPH-D Modified

Recovery Limits High Surrogate % Recovery Low **Flags** o-Terphenyl 124 50 150

Result

Analyte Diesel (>nC12-nC24) Heavy Oil (>nC24-nC32) (mg/L)

ND ND **PQL** 0.25

0.63

Flags

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

R3

Date Received:

70473-03

Date Prepared:

2/6/98

Date Analyzed:

2/11/98

% Solids

2/16/98

Extended Diesel Range by WTPH-D Modified

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
o-Terphenyl	112		50	150

Result

Analyte
Diesel (>nC12-nC24)

(mg/L)

PQL 0.26 Flags

Heavy Oil (>nC24-nC32)

ND ND

0.20

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

Date Received: Date Prepared: Date Analyzed:

% Solids

R4

70473-04

2/6/98

2/11/98

2/16/98

Extended Diesel Range by WTPH-D Modified

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
o-Terphenyl	121		50	150

Result Analyte **PQL** (mg/L) Flags Diesel (>nC12-nC24) 0.26 ND Heavy Oil (>nC24-nC32) ND 0.64

Lab ID:

Method Blank - GB1370

Date Received:

Date Prepared:

Date Analyzed:

% Solids

_

2/10/98 2/11/98

Gasoline Range Organic Compounds by WSDOE Method WTPH-G Modified

Surrogate % Recovery Flags Low High
Trifluorotoluene 102 50 150

Result

Analyte

Gasoline Range Organics

(mg/L)

ND

PQL 0.05

Flags

Blank Spike/Blank Spike Duplicate Report

Lab ID:

GB1370

Date Prepared:

2/10/98 2/11/98

Date Analyzed: QC Batch ID:

GB1370

Gasoline Range Organic Compounds by WSDOE Method WTPH-G Modified

	Blank	Spike	BS		BSD			
	Result	Amount	Result	BS	Result	BSD		
Compound Name	(mg/L)	(mg/L)	(mg/L)	% Rec.	(mg/L)	% Rec.	RPD	Flag
Gasoline Range Organics	0	1.25	1.1	88.3	1.1	88.3	0	

Lab ID:

Method Blank - GB1370

Date Received:

Date Prepared:

Date Analyzed:
% Solids

2/10/98

2/11/98

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene	145	,	57	153

	Result		
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.0005	_
Toluene	ND	0.0005	
Ethylbenzene	ND	0.0005	
m,p-Xylenes	ND	0.001	
o-Xylene	ND	0.0005	

Blank Spike/Blank Spike Duplicate Report

 Lab ID:
 GB1370

 Date Prepared:
 2/10/98

 Date Analyzed:
 2/11/98

 QC Batch ID:
 GB1370

	Blank	Spike Amount	BS Result		BSD Result	BSD		
	Result			BS				
Compound Name	(mg/L)	(mg/L)	(mg/L)	% Rec.	(mg/L)	% Rec.	RPD	Flag
Benzene	0 .	0.02 5	0.0208	83.2	0.0255	102	20	
Toluene	0	0.025	0. 0186	74.4	0.0234	93.6	23	
Ethylbenzene	0	0.02 5	0.0212	84.8	0.0261	104	20	
m,p-Xylenes	0	0.05	0.0435	87	0.0533	107	21	
o-Xylene	0	0.025	0.0211	84.4	0.0258	103	20	

Lab ID:

Method Blank - DI1465

Date Received:

Date Prepared:

Date Analyzed:

% Solids

2/11/98

2/16/98

PQL

Extended Diesel Range by WTPH-D Modified

Recovery Limits Surrogate % Recovery High Flags Low o-Terphenyl 124 150 50

Result

Analyte (mg/L)Diesel (>nC12-nC24) ND

Heavy Oil (>nC24-nC32)

0.25 0.63 ND

Flags

Blank Spike/Blank Spike Duplicate Report

Lab ID:

Date Prepared: Date Analyzed:

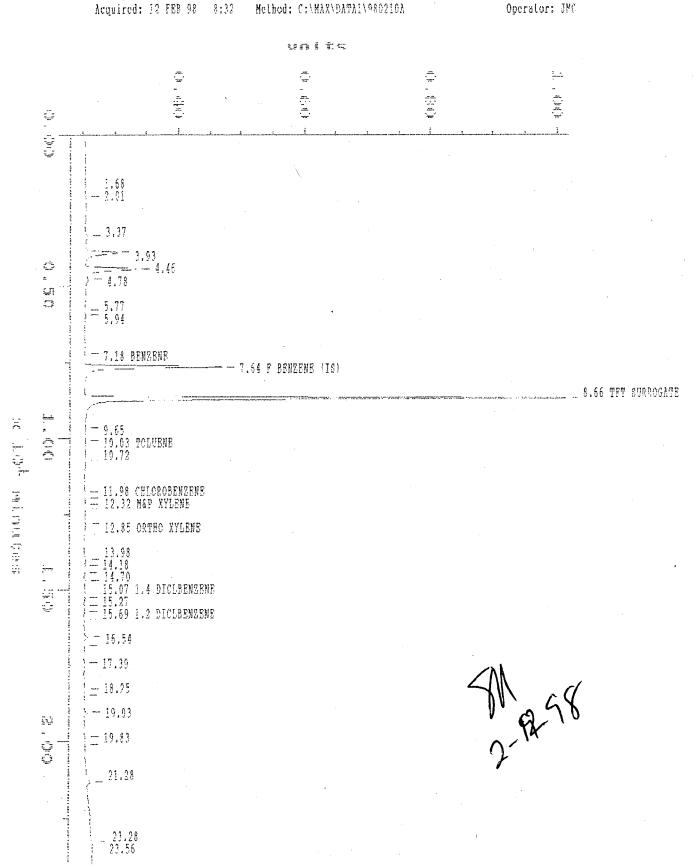
DI1465 2/11/98

2/16/98 DI1465

QC Batch ID:

	Blank Result	Spike Amount	BS Result	BS	BSD Result	BSD		
Compound Name	(mg/L)	(mg/L)	(mg/L)	% Rec.	(mg/L)	% Rec.	RPD	Flag
Diesel (>nC12-nC24)	. 0	5.01	5.49	110	5.62	112	1.8	
Heavy Oil (>nC24-nC32)	0	5	4.85	97	4.67	93.3	3.9	

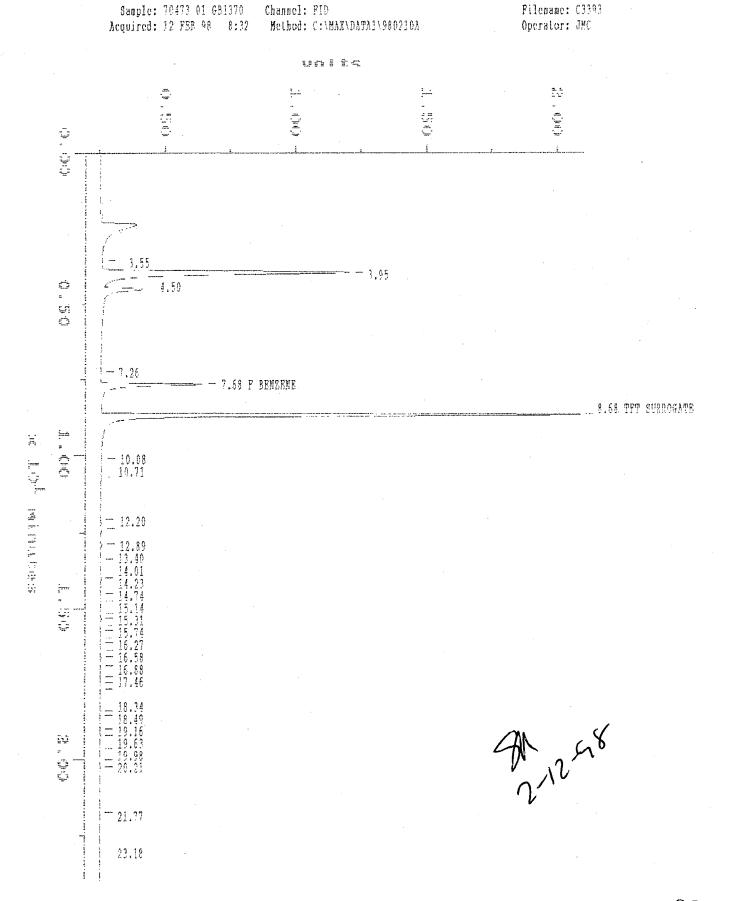
TPH-G DATA PACKAGE

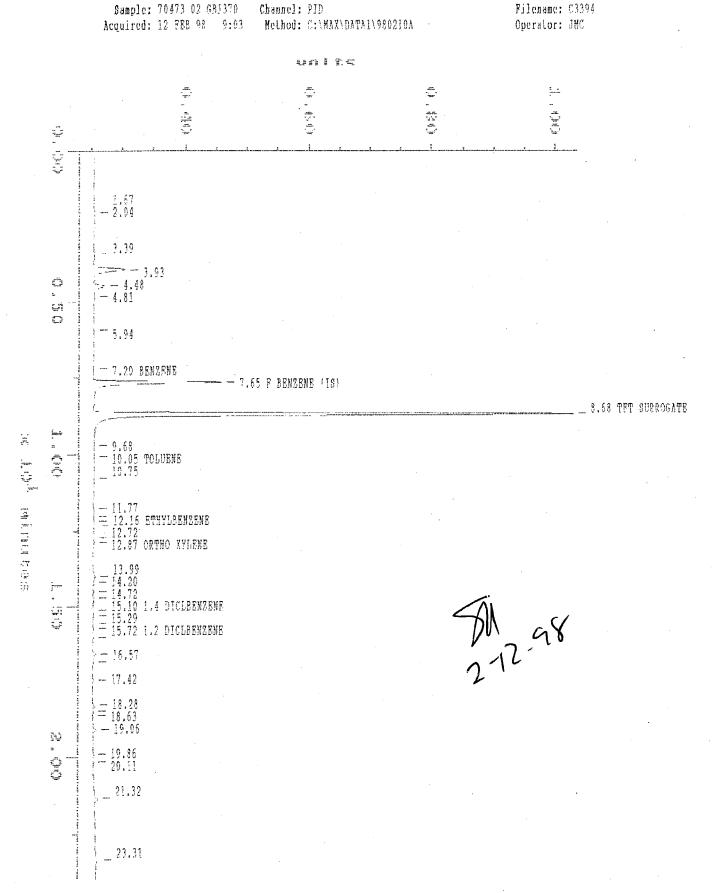


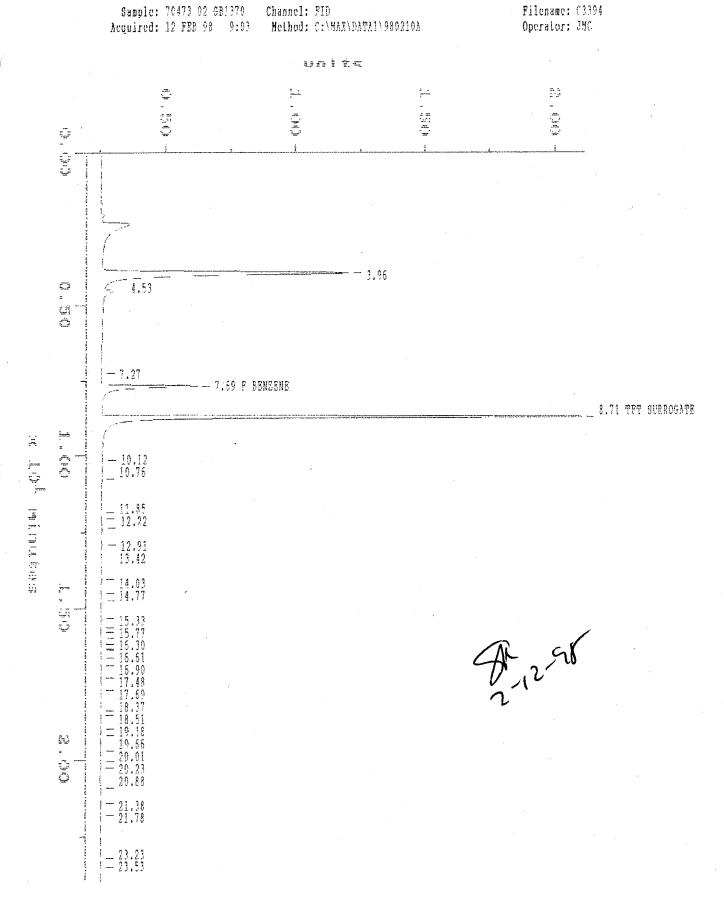
Sample: 70473 01 GB1370

Channel: PID

Filename: C3393







unite 4) . #\$4j (1) (1) (1) -2.03__ 3.39 =-3.920.20 - 5.97 - 7.21 BENZENE - 7.65 F BENZENE (IS) _ 8.68 TPT SURROGATE - 9.68 - 10.06 TOLUENE - 10.74 - 11.78 - 12.17 ETHYLBENZENR - 12.71 - 12.88 ORTHO XYLENE 14.00 - 14.22 - 14.73 - 15.11 1.4 DICLBENZENE - 15.30 - 15.73 1.2 DICLBENZENE - 15.58 - 15.86 - 17.43 _ 18.29 -19.08 $=\frac{19.86}{20.12}$ 21.31 21.81 22.37 __ 23.31

Sample: 70473 03 GB1370

Acquired: 12 FBB 98 9:34

Channel: PID

Method: C:\MAX\DATA1\980210A

- Filename: 03395

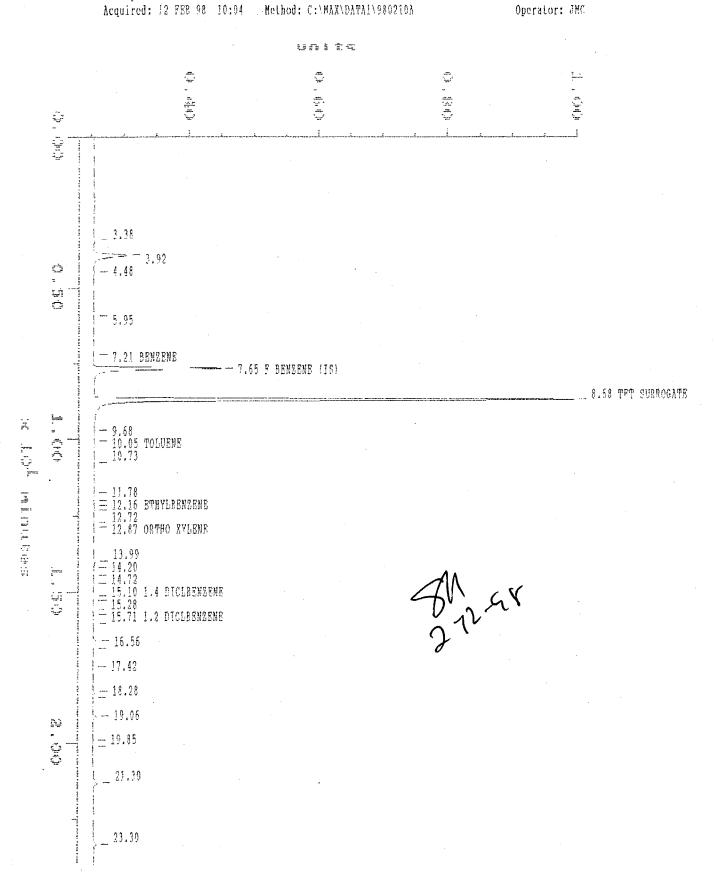
Operator: JMC

units 12 - EM) 7.47 -7.297.69 P BENZENE 12.39 12.93 13.42 $\frac{-14.04}{-14.78}$ - 15.35 - 15.36 - 16.62 - 16.49 - 17.72 - 18.35 - 18.35 - 19.20 H. OH 20.04 - 20.26 - 20.88 -21.83- 23.38

Channel: PID Method: C:\MAX\DATA1\980210A

Sample: 70473 03 GB1370 Acquired: 12 FEB 98 9:34 Filename: 03395

Operator: JMC



Sample: 70473 04 GB1370

Channel: PID

Filename: 03396

unite 3.94 0.40 4.59 -7.287.69 F BENZENE 1.04 - 10.12 - 10.72 11.83 12.38 12.91 13.42 - 14.03 - 14.77 - 15.33 - 15.76 - 16.28 - 16.60 - 16.88 - 17.48 - 18.35 - 18.52 - 19.18 12 ° 00 $=\frac{20.00}{20.24}$

Sample: 70473 94 GB1370

Acquired: 12 PBB 98 10:04

 $-\frac{21.31}{21.78}$

_ 23.64

Channel: FID

Method: C:\KAX\DATA1\980210A

Filename: 03396

Operator: JMC

TPH-D DATA PACKAGE

Quantitation Report

Inst : HP 5890-I Multiplr: 1.00 Vial: 15 Operator: C:\HPCHEM\1\DATA\021598_A\ASJ195,.D 16 Feb 1998 7:14 am 7:14 am 70473-1 Lata File IntFile Acq On Sample Misc

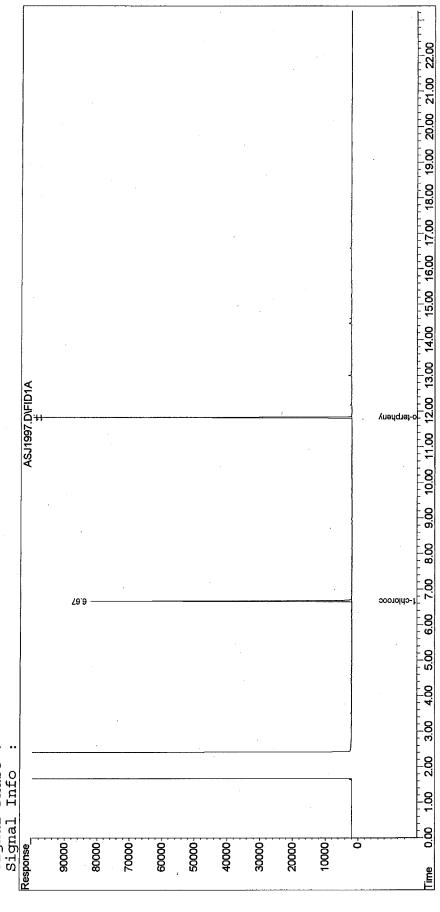
Quant Results File: WDXF0115.RES 9:19 1998 WTPH-D.E Feb 17 9 Quant Time:

C:\HPCHEM\1\METHODS\WDXF0115.M (Chemstation Integrator)
WTPH-D (nC12-nC24) Sun Feb 15 22:25:15 1998 Quant Method Last Update Title

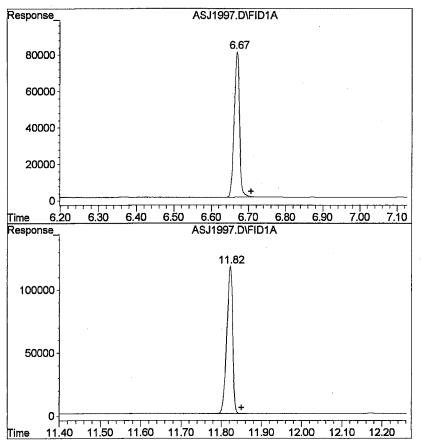
Multiple Level Calibration FACQ.M Response via

DataAcq Meth

Volume Inj. Signal Phase Signal Signal



ASC 997.D WDXF0115.M



#1 1-chlorooctane (surrogate

R.T.: 6.669 min
Delta R.T.: -0.038 min
Response: 779289
Conc: 213.60 ng/ul

#2 o-terphenyl (surrogate)

R.T.: 11.821 min
Delta R.T.: -0.029 min
Response: 1178516
Conc: 207.09 ng/ul

Quantitation Report

Vial: 16 Operator: Inst C:\HPCHEM\1\DATA\021598_A\ASJ1998.D 16 Feb 1998 7:45 am Jata File Acq On Sample

70473-2

WTPH-D.E Quant Time: IntFile

Multiplr: 1.00 Quant Results File: WDXF0115.RES Feb 17 9:20 1998 C:\HPCHEM\1\METHODS\WDXF0115.M (Chemstation Integrator)

HP 5890-I

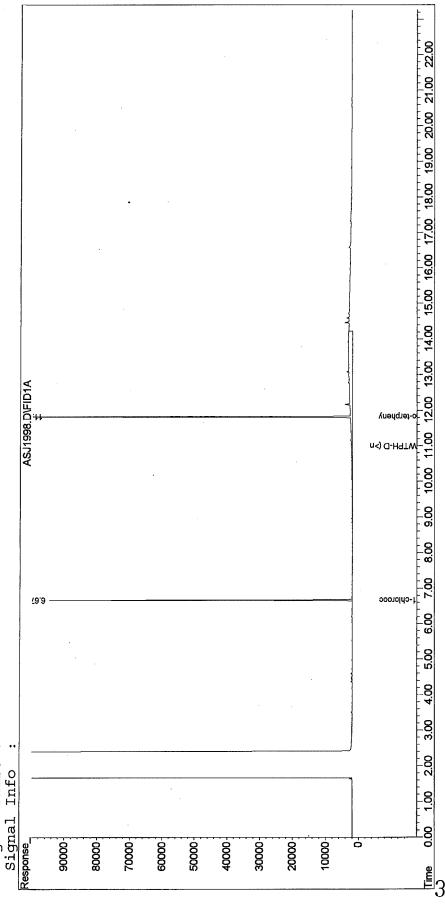
Sun Feb 15 22:25:15 1998 WTPH-D (nC12-nC24) Last Update Title

Quant Method

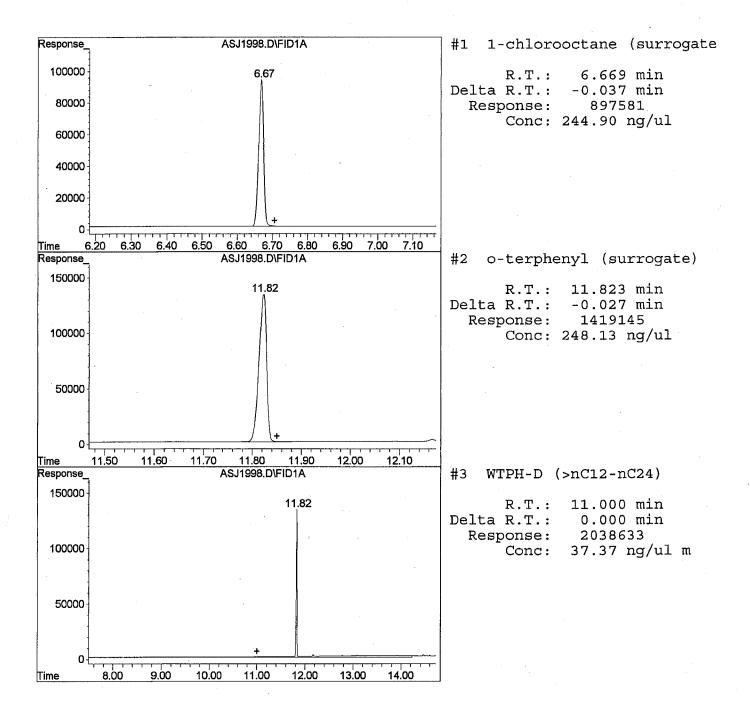
Multiple Level Calibration FACQ.M Response via

DataAcq Meth

Volume Inj. Signal Phase Signal



AS&\$998.D WDXF0115.M



Tue Feb 17 09:20:39 1998

WDXF0115.M

Quantitation Report

Vial: 17 Operator: Inst C:\HPCHEM\1\DATA\021598_A\ASJ1999.D 16 Feb 1998 8:16 am 70473-3 Data File Sample Acq On

HP 5890-I

Quant Time: IntFile

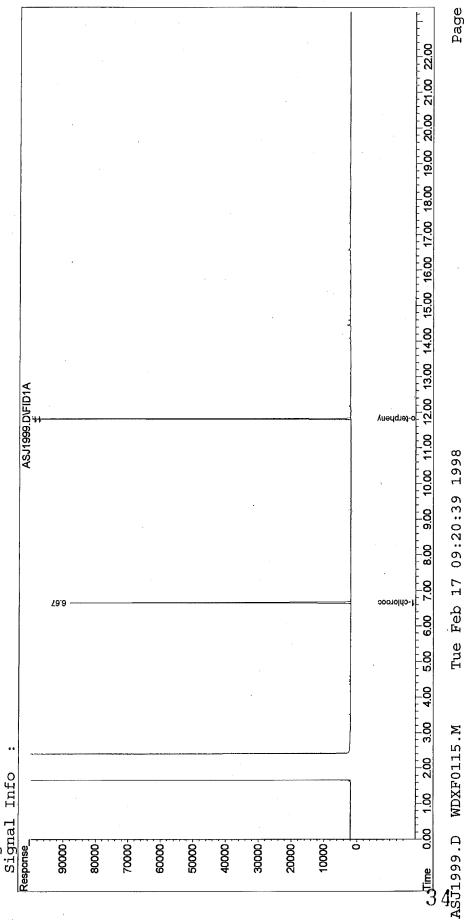
Multiplr: 1.00 Quant Results File: WDXF0115.RES 9:20 1998 WTPH-D.E Feb 17 9 C:\HPCHEM\1\METHODS\WDXF0115.M (Chemstation Integrator)
WTPH-D (nC12-nC24) Sun Feb 15 22:25:15 1998 Last Update Title

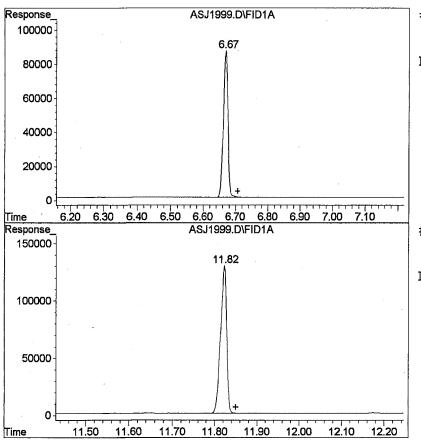
Quant Method

Multiple Level Calibration Response via DataAcq Meth

FACQ.M

Phase Signal Phase Signal Info Volume Inj.





#1 1-chlorooctane (surrogate

R.T.: 6.669 min
Delta R.T.: -0.037 min
Response: 822661
Conc: 225.07 ng/ul

#2 o-terphenyl (surrogate)

R.T.: 11.822 min
Delta R.T.: -0.028 min
Response: 1272119
Conc: 223.05 ng/ul

Quantitation Report

HP 5890-I Multiplr: 1.00 Vial: 18 Operator: Inst C:\HPCHEM\1\DATA\021598_A\ASJ2000.D 16 Feb 1998 8:47 am WTPH-D.E 70473-4 Data File IntFile Acq On Sample

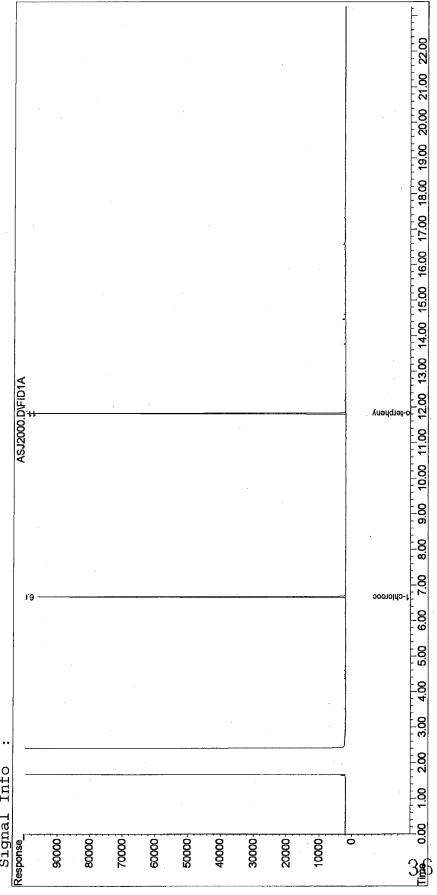
C:\HPCHEM\1\METHODS\WDXF0115.M (Chemstation Integrator) Quant Results File: WDXF0115.RES 9:20 1998 Quant Time: Feb 17 Quant Method

Multiple Level Calibration Sun Feb 15 22:25:15 1998 WTPH-D (nC12-nC24) Response via Last Update

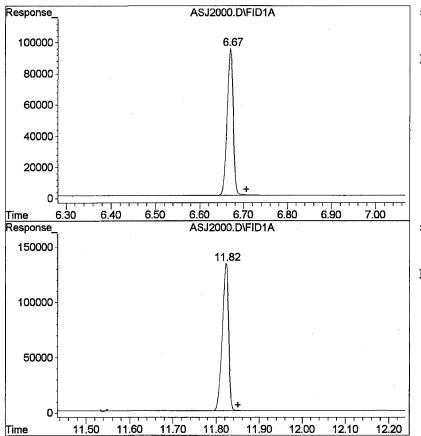
Title

FACQ.M DataAcq Meth

Volume Inj. Signal Phase Signal Info Signal



ASJ2000.D WDXF0115.M



#1 1-chlorooctane (surrogate

R.T.: 6.670 min
Delta R.T.: -0.037 min
Response: 904722
Conc: 246.79 ng/ul

#2 o-terphenyl (surrogate)

R.T.: 11.822 min
Delta R.T.: -0.028 min
Response: 1378893
Conc: 241.26 ng/ul

Page 3

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE: (253) 922-2310 - FAX: (253) 922-5047

DATA QUALIFIERS AND ABBREVIATIONS

- B1: This analyte was detected in the associated method blank. The analyte concentration was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).
- B2: This analyte was detected in the associated method blank. The analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).
- C1: Second column confirmation was performed. The relative percent difference value (RPD) between the results on the two columns was evaluated and determined to be < 40%.
- C2: Second column confirmation was performed. The RPD between the results on the two columns was evaluated and determined to be > 40%. The higher result was reported unless anomalies were noted.
- M: GC/MS confirmation was performed. The result derived from the original analysis was reported.
- D: The reported result for this analyte was calculated based on a secondary dilution factor.
- E: The concentration of this analyte exceeded the instrument calibration range and should be considered an estimated quantity.
- J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.
- MCL: Maximum Contaminant Level
- MDL: Method Detection Limit
- N: See analytical narrative.
- ND: Not Detected
- PQL: Practical Quantitation Limit
- X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be
- X2: Contaminant does not appear to be "typical" product.
- X3: Identification and quantitation of the analyte or surrogate was complicated by matrix interference.
- X4: RPD for duplicates was outside advisory QC limits. The sample was re-analyzed with similar results. The sample matrix may be nonhomogeneous.
- X4a: RPD for duplicates outside advisory QC limits due to analyte concentration near the method practical quantitation limit/detection limit.
- X5: Matrix spike recovery was not determined due to the required dilution.
- X6: Recovery and/or RPD values for matrix spike(/matrix spike duplicate) outside advisory QC limits. Sample was reanalyzed with similar results.
- X7: Recovery and/or RPD values for matrix spike(/matrix spike duplicate) outside advisory QC limits. Matrix interference may be indicated based on acceptable blank spike recovery and/or RPD.
- X7a: Recovery and/or RPD values for this spiked analyte outside advisory QC limits due to high concentration of the analyte in the original sample.
- X8: Surrogate recovery was not determined due to the required dilution.
- X9: Surrogate recovery outside advisory QC limits due to matrix interference.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

70473 July

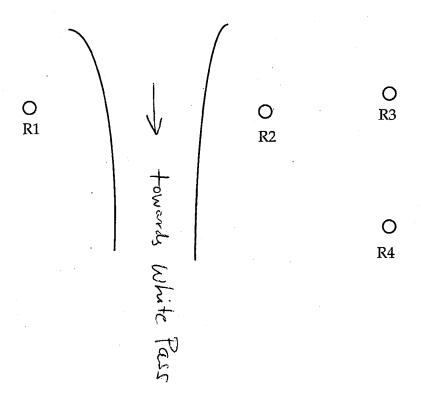
4813 Pacific Hwy. East

Tacoma, Washington 98/
(253) 922-2310 • FAX (253) 922-5047

CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

These samples will be disposed of 45 days after receipt Check this box to have samples returned SPECIAL INSTRUCTIONS/COMMENTS: Pesticides & Herbicides TCLP Extraction Semi-volatiles Volatiles 8 Metals Total Metals (Specify below) Time / Date Oil & Grease 8:10/ EPA625/8270 (GC/MS) Volatile Organics EPA 624/8240 (GC/MS) ANALYSIS REQUESTED: Firm 556t e'HA9 Chlorinated Pest., EPA 608/8080 Aromatic Volatiles EPA 602/8020 Halogenated Volatiles FPA 601/8010 Printed Name # of Containers MM 3 M PROJECT NAME: Rimlar Monibury TIME MATRIX 100 PHONE NO: 360-705-784 8 WSDat - open CONTACT: Norm Panghan 2-4-2 ÷ Signature 82 Relinquished By Relinquished By Relinquished By CLIENT: Received By Received By Received By

Page of



R1 - Water level 2.12', 12:00am sample taken.

R2 - Water level 3.18', 12:27pm sample taken.

R3 - Water level 5.89', 1:00pm sample taken.

R4 - Water level 6.89', 1:15pm sample taken.

Approximately 7 gallons of water was purged from each well before samples were obtained. A groundwater pump was used to obtain all samples. The samples were analyzed using Diesel extended test and the Gasoline with BTEX test.

SOUND ANALYTICAL SERVICES, INC. ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 Pacific Hwy. East Tacoma, Washington 98424 (253) 922-2310 • FAX (253) 922-5047

CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

Received By	Relinquished By	Received By	Relinquished By	Received By	Relinquished By																	LAB#	PHONE NO:	CONTACT:	PROJE	CLIEN I:
-	d By		d By	<u>*</u>	ву]											200	23	Ø	20	SAMPLE	NO:	CT:	CTNA	100
					18	Signature																²LE I.D.	360-T	Norm	PROJECT NAME: Himeu	NOOT
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				<u></u>	30																		letals			
			,	F	These samples will be disposed of 45 days. Check this box to have samples returned [SPECIAL																Vol	atiles			TCLP E
					These samples will be disposed of 45 days after receipt. Check this box to have samples returned	CIAL INSTRUCTIONS/COMMENTS:																	ni-vola			P Extraction
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Рапе

Sound Analytical Services, Inc.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 Pacific Hwy East • Tacoma, WA 98424 (253) 922-2310 • FAX (253) 922-5047

e-mail: SoundL@aol.com



TRANSMITTAL MEMORANDUM

DATE: May 6, 1998

TO: Norm Payton

WSDOT - Operations, Olympia

P.O. Box 47358

Olympia, WA 98504-7358

PROJECT: Rimrock Monitoring Wells

(I Ilesker

REPORT NUMBER: 72409

Enclosed are the test results for four samples received at Sound Analytical Services on April 30, 1998.

The report consists of this transmittal memo, analytical results, quality control reports, a copy of the chain-of-custody, a list of data qualifiers and analytical narrative when applicable, and a copy of any requested raw data.

Analytical Narrative: N flag: The percent recoveries of the blank spike and blank spike duplicate were outside the acceptance limits. No action was taken because there was no additional sample volume to reextract.

Should there be any questions regarding this report, please contact me at (253) 922-2310.

Sincerely,

Dawn Werner **Project Manager**

Client Name

WSDOT - Operations, Olympia

Client ID:

R1

Lab ID: Date Received: 72409-01

Date Received: Date Prepared:

4/30/98 5/4/98

Date Analyzed:

5/5/98

% Solids

-

Total Petroleum Hydrocarbons as Gasoline by WSDOE Method WTPH-G Modified

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene	89		50	150

Result

Analyte

(mg/L)

PQL

Flags

Gasoline Range Organics

ND

0.05

2

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

Date Received:

Date Prepared:

Date Analyzed:

% Solids

R2

72409-02

4/30/98

5/4/98

5/5/98

Total Petroleum Hydrocarbons as Gasoline by WSDOE Method WTPH-G Modified

Recovery Limits Surrogate % Recovery High **Flags** Low Trifluorotoluene 89 50 150

Result

Analyte

Gasoline Range Organics

(mg/L)

ND

PQL

Flags

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

Date Received:

Date Prepared:

Date Analyzed:

R3

72409-03

4/30/98

5/4/98

5/5/98

% Solids

Total Petroleum Hydrocarbons as Gasoline by WSDOE Method WTPH-G Modified

Surrogate

Trifluorotoluene

% Recovery 89 Flags

Recovery Limits Low High

Low 50

150

A.i. 1...4.

Analyte
Gasoline Range Organics

Result

(mg/L)

ND

PQL

Flags

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

R4 72409-04

Date Received:

Date Prepared:

4/30/98

Date Analyzed:

5/4/98

% Solids

5/5/98

Total Petroleum Hydrocarbons as Gasoline by WSDOE Method WTPH-G Modified

	•		Recove	ry Limits
Surrogate Trifluorotoluene	% Recovery	Flags	Low 50	High 150
Timadiotolacile	.			

Result

Analyte

(mg/L)

PQL

Flags

Gasoline Range Organics

ND

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID: Date Received:

Date Prepared: Date Analyzed:

% Solids

Ŕ1

72409-01

4/30/98

5/4/98

5/5/98

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene	92		57	153

	Result		
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.001	
Toluene	ND	0.001	
Ethylbenzene	ND	0.001	
m,p-Xylenes	ND	0.002	
o-Xylene	ND	0.001	

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

Date Received:

Date Prepared:

Date Analyzed:

% Solids

R2

72409-02

4/30/98

5/4/98

5/5/98

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene	91		57	153

	Result		
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.001	
Toluene	ND	0.001	
Ethylbenzene	ND ·	0.001	
m,p-Xylenes	ND	0.002	
o-Xylene	ND	0.001	

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

R3

72409-03

Date Received:

4/30/98

Date Prepared:

5/4/98

Date Analyzed:

% Solids

5/5/98

	•		Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene	89		57	153

	Result		
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.001	
Toluene	ND	0.001	
Ethylbenzene	ND	0.001	
m,p-Xylenes	ND	0.002	
o-Xylene	ND	0.001	

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

R4

Date Received:

72409-04

4/30/98

Date Prepared:

5/4/98

Date Analyzed:

% Solids

5/5/98

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene	92		57	153

	Result		
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.001	
Toluene	ND	0.001	
Ethylbenzene	ND	0.001	
m,p-Xylenes	ND	0.002	
o-Xylene	ND	0.001	

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

R1

Date Received:

72409-01

Date Prepared:

4/30/98

Date Prepared: Date Analyzed:

5/4/98

% Solids

5/4/98

Extended Diesel Range by WTPH-D Modified

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
o-Terphenyl	95		50	150

	Result		
Analyte	(mg/L)	PQL	Flags
Diesel (>nC12-nC24)	ND	0.25	
Heavy Oil (>nC24-nC32)	ND	0.51	

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

Date Received:

Date Prepared: Date Analyzed:

% Solids

R2

72409-02 4/30/98

5/4/98

5/4/98

Extended Diesel Range by WTPH-D Modified

		Recove	ery Limits
% Recovery 73	Flags	Low 50	High 150
		•	% Recovery Flags Low

Result

PQL Analyte (mg/L) **Flags** Diesel (>nC12-nC24) 0.22 0.25 J 0.51 Heavy Oil (>nC24-nC32) ND

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

Date Received:

Date Prepared: Date Analyzed:

% Solids

R3

72409-03

4/30/98

5/4/98

5/4/98

Extended Diesel Range by WTPH-D Modified

Recovery Limits High % Recovery Flags Low Surrogate 50 150 o-Terphenyl 84

Result

Analyte Diesel (>nC12-nC24)

Heavy Oil (>nC24-nC32)

(mg/L)

ND ND **PQL**

0.26 0.51 **Flags**

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

R4

Date Received:

72409-04

4/30/98

Date Prepared: Date Analyzed: 5/4/98

% Solids

5/4/98

Extended Diesel Range by WTPH-D Modified

			Recove	ry Limits
Surrogate	% Recovery	Flags	Low	High
o-Terphenyl	98		50	150

Analyte	Result (mg/L)	PQL	Flags
Diesel (>nC12-nC24)	ND	0.26	
Heavy Oil (>nC24-nC32)	ND	0.52	

Lab ID:

Method Blank - GB1424

Date Received:

Date Prepared:

Date Analyzed:

% Solids

5/4/98

5/5/98

Total Petroleum Hydrocarbons as Gasoline by WSDOE Method WTPH-G Modified

Surrogate % Recovery Flags Low High
Trifluorotoluene 77 50 150

Result

Analyte

Gasoline Range Organics

(mg/L)

ND (IIIg/L

PQL

Flags

Blank Spike/Blank Spike Duplicate Report

Lab ID:

GB1424

Date Prepared:

5/4/98

Date Analyzed:

5/5/98

QC Batch ID:

GB1424

Total Petroleum Hydrocarbons as Gasoline by WSDOE Method WTPH-G Modified

	Blank	Spike	BS		BSD			
	Result	Amount	Result	BS	Result	BSD		
Compound Name	(mg/L)	(mg/L)	(mg/L)	% Rec.	(mg/L)	% Rec.	RPD	Flag
Gasoline Range Organics	0	1.25	1.08	86.5	1.12	89.8	3.7	

Lab ID:

Method Blank - GB1424

Date Received:

Date Prepared:

5/4/98

Date Analyzed:

5/5/98

% Solids

			Recove	ry Limits
Surrogate	% Recovery	Flags	Low	High
Trifluorotoluene	72		57	153

•	Result		
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.001	_
Toluene	ND	0.001	
Ethylbenzene	ND	0.001	
m,p-Xylenes	ND	0.002	
o-Xylene	ND	0.001	

Blank Spike/Blank Spike Duplicate Report

Lab ID: Date Prepared: Date Analyzed:

QC Batch ID:

GB1424 5/4/98 5/5/98 GB1424

	Blank	Spike	BS		BSD			
	Result	Amount	Result	BS	Result	BSD		
Compound Name	(mg/L)	(mg/L)	(mg/L)	% Rec.	(mg/L)	% Rec.	RPD	Flag
Benzene	0	0.025	0.0244	97.6	0.0268	107	9.2	
Toluene	0	0.025	0.0251	100	0.0265	106	5.8	
Ethylbenzene	0	0.025	0.0267	107	0.024	96	11	
m,p-Xylenes	0	0.05	0.0467	93.4	0.0515	103	9.8	
o-Xylene	0	0.025	0.0262	105	0.0247	98.8	6.1	

Lab ID:

Method Blank - DI1536

Date Received:

Date Prepared:

Date Analyzed:

5/4/98

5/4/98

% Solids

Extended Diesel Range by WTPH-D Modified

% Recovery

82

Flags

Recovery Limits High

Low

50 150

Result

Analyte Diesel (>nC12-nC24)

Surrogate

o-Terphenyl

Heavy Oil (>nC24-nC32)

(mg/L)

ND ND PQL

0.25 0.5 **Flags**

Blank Spike/Blank Spike Duplicate Report

Lab ID: Date Prepared:

Date Prepared:
Date Analyzed:
QC Batch ID:

DI1536

5/4/98 5/4/98 DI1536

Extended Diesel Range by WTPH-D Modified

	Blank	Spike	BS		BSD			
	Result	Amount	Result	BS	Result	BSD		
Compound Name	(mg/L)	(mg/L)	(mg/L)	% Rec.	(mg/L)	% Rec.	RPD	Flag
Diesel (>nC12-nC24)	0	5.01	3.47	69.4	3.02	60.2	14	N
Heavy Oil (>nC24-nC32)	0	5.01	3.71	74.2	3.5	69.9	6	N

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE: (253) 922-2310 - FAX: (253) 922-5047

DATA QUALIFIERS AND ABBREVIATIONS

- B1: This analyte was detected in the associated method blank. The analyte concentration was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).
- B2: This analyte was detected in the associated method blank. The analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).
- C1: Second column confirmation was performed. The relative percent difference value (RPD) between the results on the two columns was evaluated and determined to be < 40%.
- C2: Second column confirmation was performed. The RPD between the results on the two columns was evaluated and determined to be > 40%. The higher result was reported unless anomalies were noted.
- M: GC/MS confirmation was performed. The result derived from the original analysis was reported.
- D: The reported result for this analyte was calculated based on a secondary dilution factor.
- E: The concentration of this analyte exceeded the instrument calibration range and should be considered an estimated quantity.
- J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.
- MCL: Maximum Contaminant Level
- MDL: Method Detection Limit
- V: See analytical narrative.
- ND: Not Detected
- PQL: Practical Quantitation Limit
- X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be
- X2: Contaminant does not appear to be "typical" product.
- X3: Identification and quantitation of the analyte or surrogate was complicated by matrix interference.
- X4: RPD for duplicates was outside advisory QC limits. The sample was re-analyzed with similar results. The sample matrix may be nonhomogeneous.
- X4a: RPD for duplicates outside advisory QC limits due to analyte concentration near the method practical quantitation limit/detection limit.
- X5: Matrix spike recovery was not determined due to the required dilution.
- X6: Recovery and/or RPD values for matrix spike(/matrix spike duplicate) outside advisory QC limits. Sample was reanalyzed with similar results.
- X7: Recovery and/or RPD values for matrix spike(/matrix spike duplicate) outside advisory QC limits. Matrix interference may be indicated based on acceptable blank spike recovery and/or RPD.
- X7a: Recovery and/or RPD values for this spiked analyte outside advisory QC limits due to high concentration of the analyte in the original sample.
- X8: Surrogate recovery was not determined due to the required dilution.
- X9: Surrogate recovery outside advisory QC limits due to matrix interference.

TPH-G DATA PACKAGE

Quantitation Report

Data File : C:\HPCHEM\1\DATA\050498 A.SEC\3GB879.D

Vial: 5

Acq On : 5 May 1998 9:24 am

Operator: SJL Inst : 3400 3

Sample : 72409-1 GB1424

Multiplr: 1.00

Misc : IntFile : events.e

Quant Time: May 5 10:44 1998 Quant Results File: GAS0501.RES

Quant Method: C:\HPCHEM\1\METHODS\GAS0501.M (Chemstation Integrator)

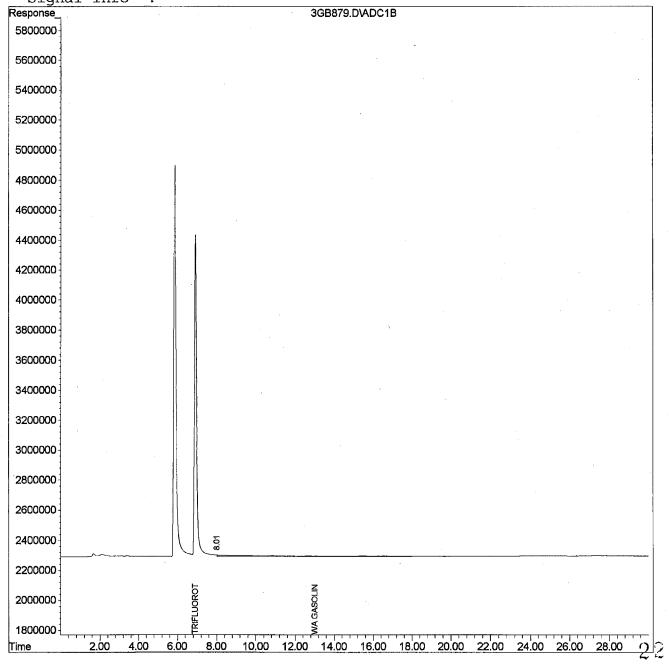
Title

: Mon Mar 04 00.E0.20 1

Last Update : Mon May 04 09:58:28 1998 Response via : Single Level Calibration

DataAcq Meth : GAS.M

Volume Inj. : Signal Phase : Signal Info :



Quantitation Report

Data File : C:\HPCHEM\1\DATA\050498 A.SEC\3GB881.D Acq On : 5 May 1998 9:58 am

Vial: 6 Operator: SJL

Sample

: 3400 3 Inst

: 72409-2 GB1424 Misc

Multiplr: 1.00

: events.e IntFile

Quant Time: May 5 10:45 1998 Quant Results File: GAS0501.RES

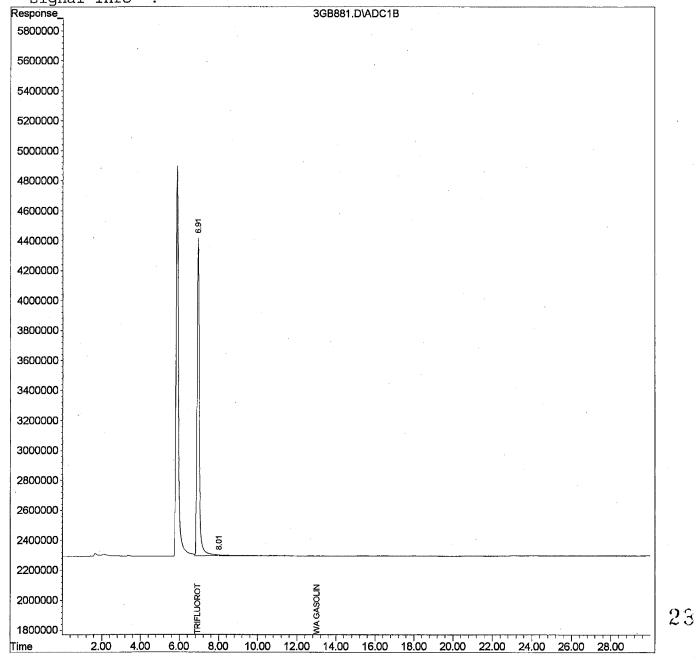
Quant Method: C:\HPCHEM\1\METHODS\GAS0501.M (Chemstation Integrator)

Title

Last Update : Mon May 04 09:58:28 1998 Response via : Single Level Calibration

DataAcq Meth : GAS.M

Volume Inj. : Signal Phase : Signal Info :



Data File: C:\HPCHEM\1\DATA\050498 A.SEC\3GB883.D Vial: 7 Acq On

: 5 May 1998 10:32 am Operator: SJL : 72409-3 GB1424 : 3400 3 Sample Inst

Misc

Multiplr: 1.00

IntFile : events.e

Quant Time: May 5 11:42 1998 Quant Results File: GAS0501.RES

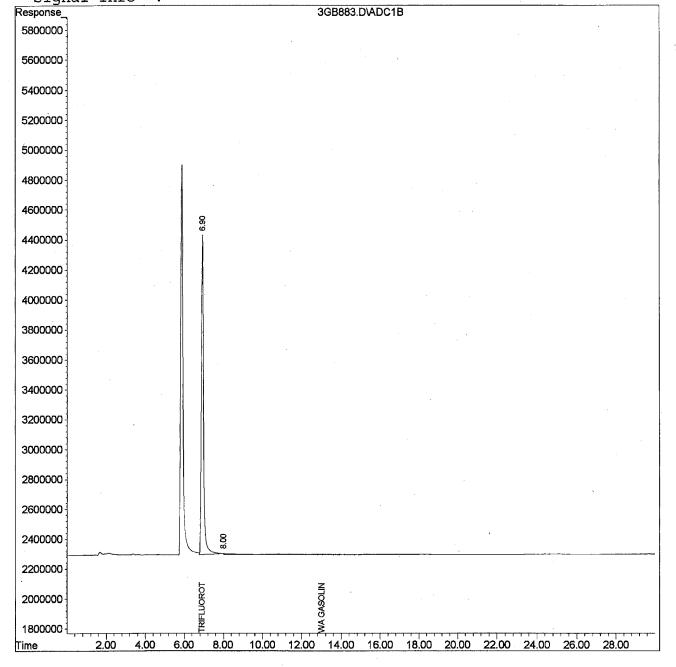
Quant Method: C:\HPCHEM\1\METHODS\GAS0501.M (Chemstation Integrator)

Title

Last Update : Mon May 04 09:58:28 1998 Response via : Single Level Calibration

DataAcq Meth : GAS.M

Volume Inj. : Signal Phase : Signal Info



IntFile : events.e

Quant Time: May 5 11:43 1998 Quant Results File: GAS0501.RES

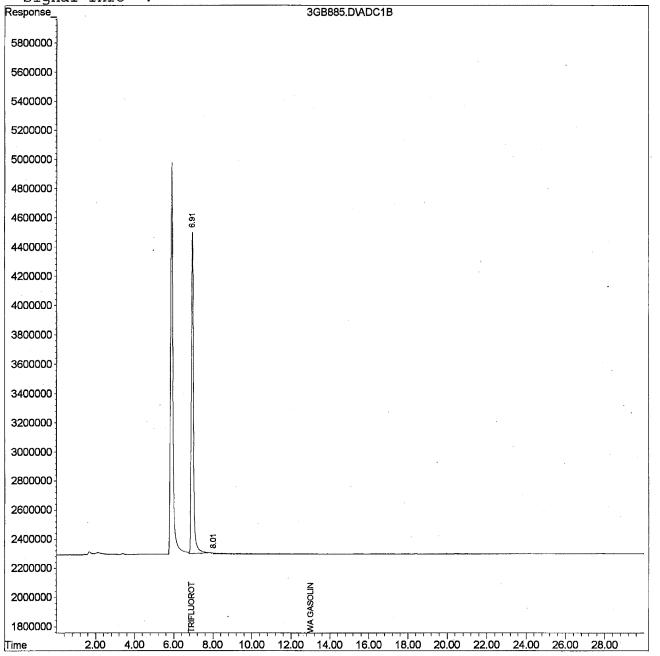
Quant Method: C:\HPCHEM\1\METHODS\GAS0501.M (Chemstation Integrator)

Title

Last Update : Mon May 04 09:58:28 1998 Response via : Single Level Calibration

DataAcq Meth : GAS.M

Volume Inj. : Signal Phase : Signal Info :



TPH-D DATA PACKAGE

HP 5890-I Vial: 24 Multiplr: Operator: Inst : C:\HPCHEM\1\DATA\050498_A\ASJ29'...D 9:20 pm WTPH-D.E May 5 14:41 1998 4 May 1998 72409-1 Jata File IntFile Acq On Sample Misc

Quant Results File: WDXF0429.RES Quant Time: May

C:\HPCHEM\1\METHODS\WDXF0429.M (Chemstation Integrator)
WTPH-D (nC12-nC24) Quant Method Title Last Update

Thu Apr 30 10:40:26 1998 Multiple Level Calibration FACQ.M Response via

DataAcq Meth

Volume Inj.

19,00 18.00 17.00 16.00 12.74 15.00 x∃ Q-H9TW 14.00 13.00 12.00 ASJ2979.DIFID1A n<) Q-H9TW 10,00 9.00 8.00 7.00 6.24 6.00 20. 9. - 8 - 8 28 Phase Info 8 Signal Signal 10000 ò 80000 70000 60000 50000 40000 30000 20000 00006 Response

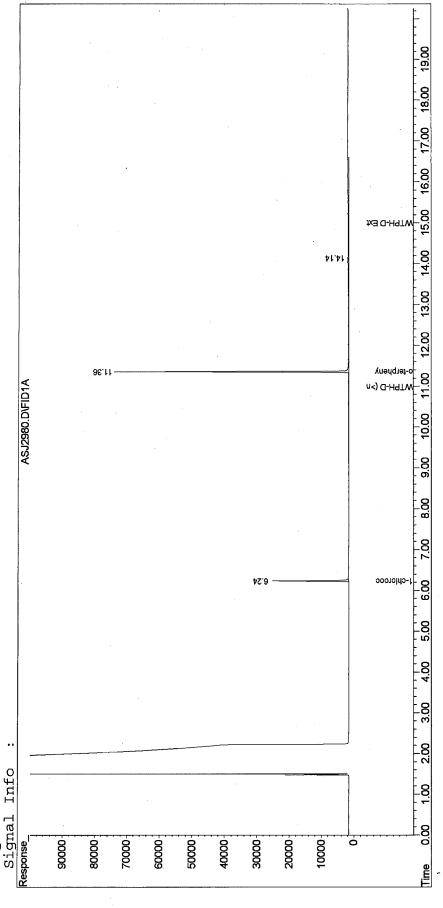
ASU2979.D WDXF0429.M

Tue May 05 14:41:16 1998

HP 5890-I C:\HPCHEM\1\METHODS\WDXF0429.M (Chemstation Integrator) Multiplr: 1.00 Vial: 25 Quant Results File: WDXF0429.RES Operator: Inst C:\HPCHEM\1\DATA\050498_A\ASJ298u.D 4 May 1998 9:48 pm Thu Apr 30 10:40:26 1998 WTPH-D (nC12-nC24) WTPH-D.E May 5 14:41 1998 72409-2 Quant Time: May Quant Method Last Update uata File IntFile Acq On Sample Title Misc

Response via : Multiple Level Calibration DataAcq Meth : FACQ.M

Volume Inj. : Signal Phase : Signal Info :



ASJ2980.D WDXF0429.M

Tue May 05 14:41:51 1998

HP 5890-I Multiplr: 1.00 Vial: 26 Operator: Inst C:\HPCHEM\1\DATA\050498_A\ASJ298I.D 4 May 1998 10:16 pm 72409-3 WTPH-D.E May 5 14:42 1998 Jata File IntFile Acg On Sample Misc

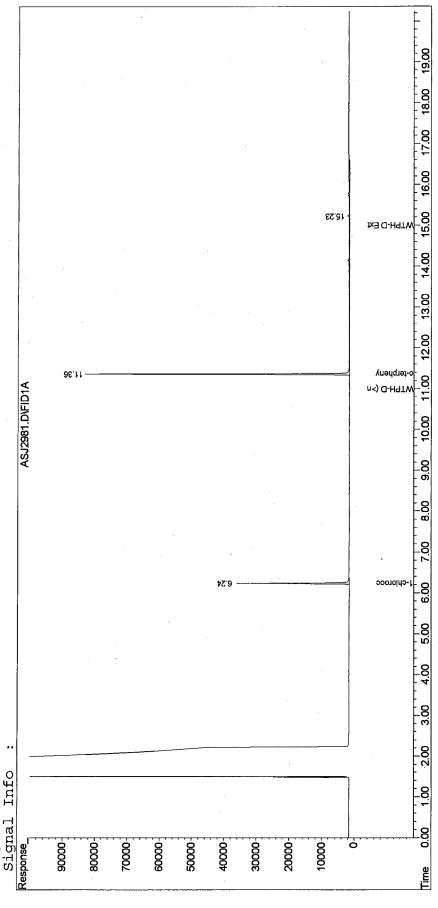
Quant Results File: WDXF0429.RES Quant Time: May C:\HPCHEM\1\METHODS\WDXF0429.M (Chemstation Integrator)
WTPH-D (nC12-nC24) Thu Apr 30 10:40:26 1998 Last Update Title

Quant Method

Multiple Level Calibration Response via

FACQ.M DataAcq Meth

Phase Volume Inj. Signal



ASJ29& D.D WDXF0429.M

Tue May 05 14:42:45 1998

HP 5890-I 1.00 Vial: 29 Quant Results File: WDXF0429.RES Multiplr: Operator: Inst C:\HPCHEM\1\DATA\050498_A\ASJ298_.D 4 May 1998 11:46 pm 72409-4 WTPH-D.E Jata File IntFile Acq On Sample Misc

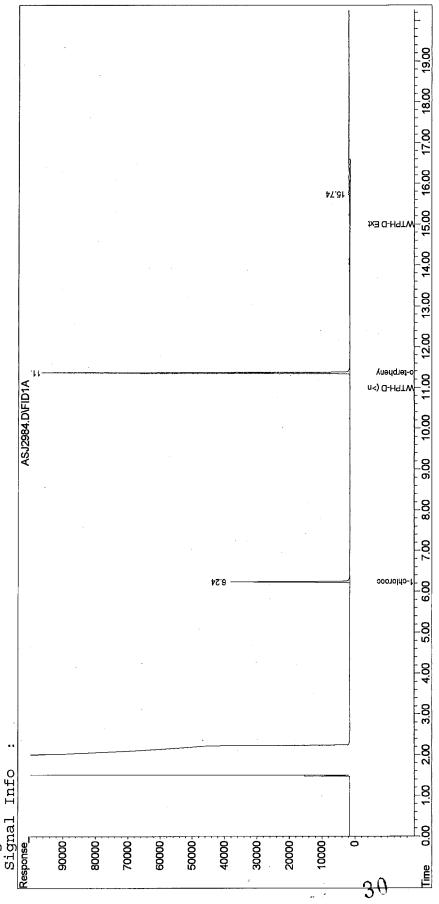
5 14:44 1998 Quant Time: May C:\HPCHEM\1\METHODS\WDXF0429.M (Chemstation Integrator) Quant Method Title

Thu Apr 30 10:40:26 1998 WTPH-D (nC12-nC24) Last Update

Multiple Level Calibration FACQ.M Response via

DataAcq Meth

Phase Inj. Volume Signal



ASJ2984.D WDXF0429.M



ANALYTICAL & ENVIRONMENTAL CHEMISTS

(253) 922-2310 • FAX (253) 922-5047 Tacoma, Washington 9842 4813 Pacific Hwy. East

CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

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4813 Pacific Highway East • Tacoma, Washington 98424 • (253) 922-2310

INVOICE #: 724090

WA DOT Operations Dept-Olympia F.O. Box 47358 Olympia, WA 98504-7358 REFERENCE: Contract 94-2 Rimreock Monitor Wells (Norm Payton)

PURCHASE ORDER:

C ANTITY DESCRIPT 4 TPH-D 4 BTEX/TPH	UNIT PRICE 65.00 75.00	EXTENDED PRICE \$260.00 \$300.00

SUBTOTAL: \$560.00 SALES TAX: \$.00 TOTAL DUE: \$560.00

Sound Analytical Services, Inc.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 Pacific Hwy East • Tacoma, WA 98424 (253) 922-2310 • FAX (253) 922-5047 e-mail: SoundL@aol.com



TRANSMITTAL MEMORANDUM

DATE: August 21, 1998

TO: Norm Payton

WSDOT - Operations, Olympia

P.O. Box 47358

Olympia, WA 98504-7358

PROJECT: Rimrock Groundwater Monitoring Wells

Werner

REPORT NUMBER: 74874

Enclosed are the test results for four samples received at Sound Analytical Services on August 12, 1998.

The report consists of this transmittal memo, analytical results, quality control reports, a copy of the chain-of-custody, a list of data qualifiers and analytical narrative when applicable, and a copy of any requested raw data.

Should there be any questions regarding this report, please contact me at (253) 922-2310.

Sincerely,

Dawn Werner Project Manager

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW1

Lab ID:

74874-01

Date Received:

8/12/98

Date Prepared:

8/18/98

Date Analyzed:

% Solids

8/19/98

			Recove	ry Limits
Surrogate Bromofluorobenzene	% Recovery 106	Flags	Low 63	High 141
Dioinonaciono il mante			•	

	Result		
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.001	
Toluene	0.00071	0.001	J
Ethylbenzene	ND	0.001	
m,p-Xylenes	ND	0.002	
o-Xylene	ND	0.001	

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW2

Lab ID:

74874-02

Date Received:

8/12/98

Date Prepared:

Date Analyzed:

8/18/98

8/19/98

% Solids

			Recove	ery Limits
Surrogate	 % Recovery	Flags	Low	High 141
Bromofluorobenzene	105	•	63	141

	Result		
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.001	
Toluene	0.00057	0.001	J
Ethylbenzene	ND	0.001	
m,p-Xylenes	ND	0.002	•
o-Xylene	ND	0.001	

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW3 74874-03

Lab ID: Date Received:

8/12/98

Date Prepared:

Date Analyzed:

8/18/98

% Solids

8/19/98

	`		Recove	ry Limits	
Surrogate	% Recovery	Flags	Low	High	
Bromofluorobenzene	115		63	141	

	Result		
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.001	
Toluene	ND	0.001	
Ethylbenzene	ND	0.001	
m,p-Xylenes	ND	0.002	
o-Xylene	ND	0.001	

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW4

Lab ID:

74874-04

Date Received:

8/12/98

Date Prepared:

Date Analyzed:

8/18/98

% Solids

8/19/98

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
Bromofluorobenzene	111		63	141

Result		
(mg/L)	PQL	Flags
ND	0.001	
0.00069	0.001	J
ND	0.001	
ND	0.002	
ND	0.001	
	(mg/L) ND 0.00069 ND ND	(mg/L)PQLND0.0010.000690.001ND0.001ND0.002

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW1

Lab ID:

74874-01

Date Received:

8/12/98

Date Prepared: Date Analyzed: 8/18/98

% Solids

8/19/98

Total Petroleum Hydrocarbons as Gasoline by WSDOE Method WTPH-G Modified

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High.
Bromofluorobenzene	107		50	150

Result

Analyte (mg/L) PQL Flags

Gasoline Range Organics ND 0.05

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

Date Received:

Date Prepared:

Date Analyzed:

% Solids

RMW2

74874-02

8/12/98

8/18/98

8/19/98

Total Petroleum Hydrocarbons as Gasoline by WSDOE Method WTPH-G Modified

Recovery Limits

Surrogate

Bromofluorobenzene

% Recovery

106

Flags

Low

High

50 150

Analyte

Gasoline Range Organics

Result

(mg/L) ND

PQL 0.05 **Flags**

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW3

Lab ID:

74874-03

Date Received:

8/12/98

Date Prepared: Date Analyzed: 8/18/98

% Solids

8/19/98

Total Petroleum Hydrocarbons as Gasoline by WSDOE Method WTPH-G Modified

			Recove	ry Limits
Surrogate	% Recovery	Flags	Low	High
Bromofluorobenzene	104		50	150

Result

Analyte

(mg/L)

PQL

Flags

Gasoline Range Organics

ND.

0.05

Q

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

Date Received:

Date Prepared: Date Analyzed:

% Solids

RMW4

74874-04 8/12/98

8/18/98

8/19/98

Total Petroleum Hydrocarbons as Gasoline by WSDOE Method WTPH-G Modified

Surrogate

Bromofluorobenzene

% Recovery 103

Flags

Recovery Limits Low High

50 150

Result

Analyte

Gasoline Range Organics

(mg/L) ND

PQL

Flags

0.05

Client Name

WSDOT - Operations, Olympia RMW1

Client ID:

Lab ID:

Date Received:

74874-01 8/12/98

Date Prepared:

Date Analyzed:

8/14/98

8/18/98

% Solids

Extended Diesel Range by WTPH-D Modified

			Recove	ery Limits
Surrogate	% Recovery	Flags	Low	High
o-terphenyl	100		50	150

	Result		
Analyte	(mg/L)	PQL	Flags
Diesel (>nC12-nC24)	ND	0.23	
Motor Oil (>nC24-nC32)	ND	0.47	•

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW2 74874-02

Lab ID: Date Received:

8/12/98

Date Prepared: Date Analyzed: 8/14/98

% Solids

8/18/98

Extended Diesel Range by WTPH-D Modified

Surrogate o-terphenyl

% Recovery 90

Flags

Recovery Limits High Low

150 50

Result

Analyte

(mg/L)

PQL

Diesel (>nC12-nC24) Motor Oil (>nC24-nC32) ND ND 0.25 0.5 **Flags**

Client Name

WSDOT - Operations, Olympia

Client ID:

Lab ID:

RMW3

Date Received:

74874-03

Date Prepared:

8/12/98

Date Analyzed:

8/14/98

% Solids

8/18/98

Extended Diesel Range by WTPH-D Modified

Recovery Limits % Recovery Low High **Flags** Surrogate 150 50 o-terphenyl 78

Result

Analyte Diesel (>nC12-nC24) (mg/L)

PQL

Flags

Motor Oil (>nC24-nC32)

ND ND

0.25 0.5

12

Client Name

WSDOT - Operations, Olympia

Client ID:

RMW4

Lab ID:

74874-04

Date Received:

8/12/98

Date Prepared: Date Analyzed:

8/14/98

% Solids

8/18/98

Extended Diesel Range by WTPH-D Modified

Surrogate % Recovery Flags Low High o-terphenyl 68 50 150

Result

Analyte
Diesel (>nC12-nC24)

(mg/L)

PQL 0.25

0.5

Flags

Motor Oil (>nC24-nC32)

ND ND

Lab ID:

Method Blank - GB1506

Date Received:

Date Prepared:

8/18/98

Date Analyzed:

8/19/98

% Solids

			Recove	ry Limits
Surrogate	% Recovery	Flags	Low	High
Bromofluorobenzene	63		63	141

	Result		
Analyte	(mg/L)	PQL	Flags
Benzene	ND	0.001	_
Toluene	ND	0.001	
Ethylbenzene	ND	0.001	
m,p-Xylenes	ND	0.002	
o-Xylene	ND	0.001	

Blank Spike/Blank Spike Duplicate Report

Lab ID: Date Prepared: Date Analyzed: QC Batch ID: GB1506 8/18/98 8/19/98 GB1506

Blank	Spike	BS		BSD			
Result	Amount	Result	BS	Result	BSD		
(mg/L)	(mg/L)	(mg/L)	% Rec.	(mg/L)	% Rec.	RPD .	Flag
0	0.025	0.0267	107	0.0267	107	0	
0	0.025	0.0235	94	0.0235	94	0	
0	0.025	0.0221	88.4	0.0229	91.6	3.6	
0	0.05	0.0427	85.4	0.0452	90.4	5.7	
0	0.025	0.0201	80.4	0.0213	85.2	5.8	
	Result (mg/L) 0 0 0 0	Result Amount (mg/L) (mg/L) 0 0.025 0 0.025 0 0.025 0 0.05	Result (mg/L) Amount (mg/L) Result (mg/L) 0 0.025 0.0267 0 0.025 0.0235 0 0.025 0.0221 0 0.05 0.0427	Result (mg/L) Amount (mg/L) Result (mg/L) BS 0 0.025 0.0267 107 0 0.025 0.0235 94 0 0.025 0.0221 88.4 0 0.05 0.0427 85.4	Result (mg/L) Amount (mg/L) Result (mg/L) BS (mg/L) Result (mg/L) 0 0.025 0.0267 107 0.0267 0 0.025 0.0235 94 0.0235 0 0.025 0.0221 88.4 0.0229 0 0.05 0.0427 85.4 0.0452	Result (mg/L) Amount (mg/L) Result (mg/L) BS (mg/L) Result (mg/L) BSD (mg/L) % Rec. (mg/L) % Rec. 0 0.025 0.0267 107 0.0267 107 0 0.025 0.0235 94 0.0235 94 0 0.025 0.0221 88.4 0.0229 91.6 0 0.05 0.0427 85.4 0.0452 90.4	Result (mg/L) Amount (mg/L) Result (mg/L) BS (mg/L) Result (mg/L) BSD (mg/L) Rec. (mg/L) % Rec. RPD (mg/L) % Rec. RPD (mg/L) 0 Rec. RPD (mg/L) 0<

Lab ID:

Method Blank - GB1506

Date Received:

Date Prepared:

Date Analyzed:

% Solids

-

8/18/98 8/19/98

0, 10

Total Petroleum Hydrocarbons as Gasoline by WSDOE Method WTPH-G Modified

Surrogate % Recovery Flags Low High
Bromofluorobenzene 62 50 150

Result

Analyte

Gasoline Range Organics

(mg/L)

ND

PQL 0.05 Flags

Blank Spike/Blank Spike Duplicate Report

Lab ID:

GB1506

Date Prepared:

8/18/98 8/19/98

Date Analyzed: QC Batch ID:

GB1506

Total Petroleum Hydrocarbons as Gasoline by WSDOE Method WTPH-G Modified

•	Blank	Spike	BS		BSD			•
	Result	Amount	Result	BS	Result	BSD		
Compound Name	(mg/L)	(mg/L)	(mg/L)	% Rec.	(mg/L)	% Rec.	RPD	Flag
Gasoline Range Organics	0	1	0.811	81.1	0.787	78.7	-3	

Lab ID:

Method Blank - DI1661

Date Received:

Date Prepared:

Date Analyzed: % Solids 8/14/98

8/18/98

Extended Diesel Range by WTPH-D Modified

Surrogate % Recovery Flags Low High o-terphenyl 97 50 150

Result

Analyte
Diesel (>nC12-nC24)

(mg/L) ND

PQL

Flags

Motor Oil (>nC24-nC32)

ND

0.25 0.5

18

Blank Spike/Blank Spike Duplicate Report

Lab ID:
Date Prepared:
Date Analyzed:
QC Batch ID:

DI1661 8/14/98 8/18/98 DI1661

Extended Diesel Range by WTPH-D Modified

	Blank Result	Spike Amount	BS Result	BS	BSD Result	BSD		
Compound Name	(mg/L)	(mg/L)	(mg/L)	% Rec.	(mg/L)	% Rec.	RPD	Flag
Diesel (>nC12-nC24)	0	5.01	5.23	104	5.29	106	1.9	
Motor Oil (>nC24-nC32)	0	5.01	5.04	101	5.18	104	2.9	

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE: (253) 922-2310 - FAX: (253) 922-5047

DATA QUALIFIERS AND ABBREVIATIONS

- B1: This analyte was detected in the associated method blank. The analyte concentration was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).
- B2: This analyte was detected in the associated method blank. The analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).
- C1: Second column confirmation was performed. The relative percent difference value (RPD) between the results on the two columns was evaluated and determined to be $\leq 40\%$.
- C2: Second column confirmation was performed. The RPD between the results on the two columns was evaluated and determined to be > 40%. The higher result was reported unless anomalies were noted.
- M: GC/MS confirmation was performed. The result derived from the original analysis was reported.
- D: The reported result for this analyte was calculated based on a secondary dilution factor.
- E: The concentration of this analyte exceeded the instrument calibration range and should be considered an estimated quantity.
- J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.
- MCL: Maximum Contaminant Level
- MDL: Method Detection Limit
- N: See analytical narrative.
- ND: Not Detected
- PQL: Practical Quantitation Limit
- X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be ______
- X2: Contaminant does not appear to be "typical" product.
- X3: Identification and quantitation of the analyte or surrogate was complicated by matrix interference.
- X4: RPD for duplicates was outside advisory QC limits. The sample was re-analyzed with similar results. The sample matrix may be nonhomogeneous.
- X4a: RPD for duplicates outside advisory QC limits due to analyte concentration near the method practical quantitation limit/detection limit.
- X5: Matrix spike recovery was not determined due to the required dilution.
- X6: Recovery and/or RPD values for matrix spike(/matrix spike duplicate) outside advisory QC limits. Sample was reanalyzed with similar results.
- X7: Recovery and/or RPD values for matrix spike(/matrix spike duplicate) outside advisory QC limits. Matrix interference may be indicated based on acceptable blank spike recovery and/or RPD.
- X7a: Recovery and/or RPD values for this spiked analyte outside advisory QC limits due to high concentration of the analyte in the original sample.
- X8: Surrogate recovery was not determined due to the required dilution.
- X9: Surrogate recovery outside advisory QC limits due to matrix interference.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

74874 4/3,001 Ta

4813 Pacific Hwy. East Tacoma, Washington 98..., (253) 922-2310 • FAX (253) 922-5047

CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

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CONTA	CONTACT: Doin Pay you	٠٠ ١٩٥٠			sıəui	010	020	080	ganics 240 (Gr			s	(MOI		sə	,8	छ/ १	0		·			
PHONE	PHONE NO: 362-705-7848	S - 78;	\$		Contai	genate 8/109 /	V Silism 8\S08 / Sinaled		riile Org	ijslov-ir 625/82	1.814	S Greas	etals etals	səliti	litslov-i	icides oicides	- 41	- Hd					
LAB #	SAMPLE 1.D.	DATE	TIME	TIME MATRIX		Eb∀	∀d∃	443 	BloV		нат	stoT	edg)		məs		M	UM.		·			
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	KHN3	8-10-8	12:55	14:0	M															-			
	RHWY	8-10-98 2:25	12:25		3			-						<u> </u>				>		-			
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4813 Pacific Highway East • Tacoma, Washington 98424 • (253) 922-2310

WA DOT Operations Dept-Olympia P.O. Box 47358 Olympia, WA 98504-7358

INVOICE #: 748740

REFERENCE: Contract 94-2 Rimrock Ground Water Wells (Norm Payton)

PURCHASE ORDER:

ACCT ## 0052

TERMS:

Met 30

QUANTITY

DESCRIPTION

44

BTEX/TPHG

TPH-D

DATE

08/24/98

PAGE :

1.

UNIT PRICE

25,00 65.00 EXTENDED PRICE

\$300.00

\$260.00

SUBTOTAL: SALES TAX:

\$560.00 \$.00

TOTAL DUE:

\$560.00

White - Original, Canary - Remittance, Pink - File, Goldenrod - Accounting