

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

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June 19, 1992

TO: Mike Kuntz

Toxics Cleanup Program

FROM: Pam Marti

Toxics, Compliance, and Ground Water Investigations Section, EILS

SUBJECT: Restover Truck Stop Long-term Monitoring Round VIII

The attached report summarizes the findings from the latest sampling at Restover Truck Stop Round VIII, conducted on February 19 and 21, 1992. Overall, BTEX concentrations in the upper aquifer appear to be decreasing. Concentrations exceeded Model Toxic Control Act (MTCA) cleanup levels in one well, WDOE-6A. I will be conducting Sample Round IX in July 1992. If you have any questions or comments, please call me at 586-8138.

PM:kd Attachment

cc: Lynn Singleton
D.J. Patin
Bill Yake
Kathy Reed, TCP Library
Bob Kievit, EPA
Nancy Winters, Water Quality

RESTOVER TRUCK STOP GROUND WATER MONITORING ROUND VIII FEBRUARY 19 & 21, 1992

by Pamela B. Marti June 19, 1992

Washington State Department of Ecology
Environmental Investigations and Laboratory Services Program
Toxics, Compliance and Ground Water Investigations Section
Olympia, Washington 98504-7710

Water Body No. WA-13-0030GW (Segment No. 06-13-03GW)

SUMMARY

The eighth round of ground water monitoring at the Restover Truck Stop was completed by the Toxics, Compliance, and Ground Water Investigations Section on February 19 and 21, 1992. Two domestic supply and four monitoring wells were sampled for benzene, toluene, ethylbenzene, and total xylenes (BTEX) and dissolved iron. Overall, BTEX concentrations in the upper aquifer appear to be decreasing. Concentrations exceeded Model Toxic Control Act (MTCA) cleanup levels in one well, WDOE-6A.

METHODS

Ground Water Sampling

Four monitoring wells and two domestic wells were sampled (Figure 1). Prior to sample collection, static water level measurements were obtained from 11 on-site wells using an electronic water level indicator. The meter was rinsed with deionized water and wiped clean between measurements. Monitoring wells that were sampled were purged with a centrifugal pump until pH, temperature, and specific conductance readings stabilized, and a minimum of three well volumes had been removed. Purge water was discharged onto the ground near each well, except for well WDOE-6A. Purge water from WDOE-6A was collected and treated by pumping it through a series of activated granulated carbon filters.

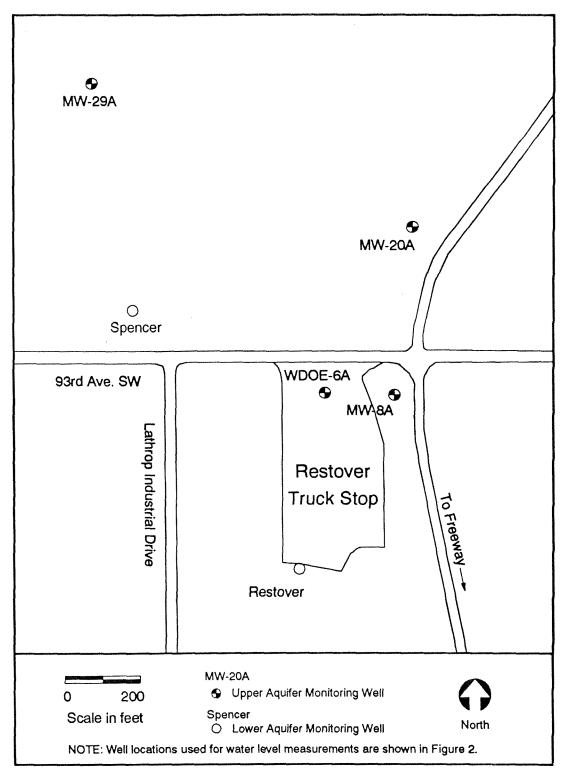


Figure 1: Sampling Locations, Restover Truck Stop

Round VIII - February 1992

Monitoring well samples were collected using decontaminated, bottom-emptying teflon bailers. Supply wells were sampled at the tap nearest the pump. Samples for volatile organics analysis were collected free of headspace and preserved with 1:1 hydrochloric acid. Samples for dissolved metals were field filtered using dedicated, in-line, 0.45 μ m polycarbonate membrane filters and preserved with 1 mL of nitric acid to a pH < 2.

Bailers were pre-cleaned with sequential washes of Liquinox[®], hot tap water, 10% nitric acid, distilled-deionized water and pesticide-grade acetone. After cleaning, bailers were air-dried and wrapped in aluminum foil. Peristaltic pump tubing was rinsed with 500 mL of 10% nitric acid then 500 mL of deionized water between samples. Chain-of-custody procedures were followed in accordance with Manchester Laboratory protocol (Huntamer and Hyre, 1991). The Ecology/EPA Laboratory in Manchester analyzed all samples.

Quality Assurance

Quality control samples collected in the field consisted of a transfer blank, a filter blank, a transport blank, and blind field duplicates. A transfer blank for BTEX was obtained by running organic-free water through a decontaminated bailer and collecting the rinsate in a sample container. The filter blank for dissolved iron analysis was obtained by pumping organic-free water through a peristaltic pump and an in-line filter. Transport blanks for both BTEX and dissolved iron were carried unopened throughout the sampling period. A duplicate sample (labeled MW-8B) was obtained from monitoring well MW-8A. In addition to quality control samples collected in the field, matrix spike, matrix spike duplicates and surrogate compound recoveries were performed in the laboratory.

Dick Huntamer and Bill Kammin of the Manchester Laboratory conducted the quality assurance review, which has been included in Appendix A. All data are considered acceptable for use with the following qualifiers. The transfer and transport blank results showed no laboratory or field contamination by BTEX. These samples were analyzed after the allowable holding time and are qualified with a UJ. BTEX was detected below the quantitation limit in the method blanks. Analytical results for the filter and method blanks showed low levels of iron contamination. Sample results within a factor of five of the concentrations found in the blanks are flagged with a "B". Analytical results labeled with a "P" indicates the analyte was detected above the instrument detection limit, but below the established minimum quantitation limit.

Matrix spike and surrogate recoveries for BTEX and iron were all within acceptable limits. The relative percent differences for duplicate samples collected from MW-8A were 0% for ethylbenzene, 13% for total xylenes, and 1% for dissolved iron.

RESULTS

Field Observations

Depth to water measurements and water level elevations for on-site wells are shown in Table 1. Depth to water ranged from 8.84 to 13.93 feet with an elevation range from 184.83 to 182.45 mean sea level. Table 2 lists stabilized field measured pH, temperature and specific conductance readings. Field measurements ranged as follows: pH from 5.18 to 6.42 standard units, temperature from 9.6 to 13.3 °C, and specific conductance from 57 to 178 umhos/cm. Water purged from monitoring wells MW-8A, MW-20A, and WDOE-6A had a hydrocarbon odor and cloudy appearance. The odor and cloudy appearance were observed at these wells during previous sample events.

Table 1: Water Table Elevations (MSL)

Well ID Upper Aquifer	Depth to Water (Feet)	Elevation (MSL)	
TT A			
WDOE-1	13.81	184.16	
WDOE-6A	11.60	184.47	
MW-8A	13.93	184.06	
MW-17	10.05	183.75	
MW-18A	8.84	184.16	
MW-20A	9.69	183.93	
MW-23A	12.34	183.16	
MW-24A	10.2	184.83	
MW-26A	10.54	182.93	
MW-27A	12.79	184.07	
MW-29A	9.81	182.45	

Table 2: Field Sampling Results (In Order Sampled)

Well ID	pH (standard) units)	Specific Conductance (umhos/cm)	Temp. (°C)	Purge Volume (gals)	Aquifer (Upper/ lower)
Restover	6.28	85	10.3	168	Lower
MW-29A	6.42	78		30	Upper
MW-8A	5.18	96	10 .9	27	Upper
MW-20A	5.65	57	9.6	34	Upper
Spencer	6.10	67	10.4	91	Lower
WDOE-6A		178	13.3	36	Upper

Analytical Results

Analytical results for BTEX and dissolved iron are shown in Table 3. Detectable concentrations of BTEX were found in three of the six wells sampled; WDOE-6A, MW-8A, and MW-20A which are all screened in the upper aquifer. BTEX was not detected in the two domestic supply wells, which tap the lower aquifer. Samples from WDOE-6A had all four BTEX compounds, with a total concentration of 3830 μ g/L. Well WDOE-6A continues to have the highest concentration of the wells sampled. Total BTEX concentrations measured at MW-8A and MW-20A were 9 μ g/L and 11.4 μ g/L, respectively.

Monitoring well MW-29A was sampled this round, because it had not been sampled since July 1989. This well is the farthest downgradient monitoring well from the Restover Truck Stop. No BTEX contamination was detected.

Dissolved iron concentrations in wells WDOE-6A and MW-8A were 4110 μ g/L and 2150 μ g/L, respectively. The remainder of the iron data was either qualified due to blank contamination or non-detect.

Table 3: Analytical Results (µg/L)

Well ID	Benzer	ne	Tolu	iene	Ethylber	nzene	To Xyl		Disso Iro	
	_			**		7 T	1	TT	22	D
Spencer	1	U	l	U	_	U	1	U		
Restover	1	U	1	U	1 1	U	1	U		U
MW-29A	1	U	1	U	1 1	U	1	U	9.4	PB
MW-8A	1	U	1	U	2		7		2150	
MW-8B	1	U	1	U	2		8		2130	
MW-20A	0.4	J	1	U	1		10		9.1	PB
WDOE-6A	430		800		350		2250		4110	
Transfer	1	U	1	U	1	U	1	U	NA	
Transport	1	Ū	1	U	1	U	1	U	5.0	U
Filter	NA	-	NA		NA		NA		6.1	PB

- U: Not Detected at Detection Limit Shown
- B: Analyte Detected in Associated Blanks
- P: Analyte Detected Above Instrument Detection Limit but Below Quantitation Limit
- J: Analyte Positively Identified, Associated Numerical Value is an Estimate.
- NA: Analyte Not Analyzed

DISCUSSION

A water table contour map for the upper aquifer is shown in Figure 2. The map, constructed using water levels measured during this sample round, depicts ground water flow and direction. Ground water moves perpendicular to the contour lines from high to low potential. Based on Figure 2, ground water in the upper aquifer flows toward the west and northwest. This is consistent with the flow pattern observed during previous sample events.

BTEX concentrations for sampling events between May 1987 and February 1992 are shown in Table 4. Overall, BTEX concentrations in the upper aquifer appear to be decreasing.

BTEX concentrations in well MW-20A appear to fluctuate seasonally although a longer record is needed to confirm this. The BTEX concentration in this well decreased from 293 μ g/L in August 1991 to 11 μ g/L in February 1992. BTEX concentrations also fluctuated between August 1990 and February 1991, decreasing from 1400 μ g/L to 5 μ g/L respectively.

Ground water cleanup levels under the Model Toxic Control Act (MTCA) for the BTEX compounds are; benzene (5.0 μ g/L), toluene (40.0 μ g/L), ethylbenzene (30.0 μ g/L), and xylene (20.0 μ g/L). Of the wells sampled during this round, MTCA cleanup levels were exceeded in well WDOE-6A only.

CONCLUSIONS

- 1. BTEX concentrations continue to be elevated in WDOE-6A although concentrations appear to be decreasing over time. MTCA cleanup levels were exceeded in well WDOE-6A only. Overall BTEX concentrations in the upper aquifer appear to be decreasing. Concentration decreases are probably due to combinations of plume spreading, dispersion, biodegradation, reduction of source loading and/or seasonal variability.
- 2. Dissolved iron continues to be detected at high levels where BTEX contamination is present. The highest concentrations occur near the contamination source.
- 3. Ground water flows generally toward the northwest, which is consistent with previous sampling events.

RECOMMENDATIONS

- 1. Monitoring wells WDOE-6A, MW-8A, MW-20A, the Spencer well, and the Restover supply well should continue to be sampled for BTEX and dissolved iron. An additional well west of the source, either MW-23A or MW-26A, should be sampled for dissolved iron and BTEX to assess potential contaminant migration in that direction.
- 2. All of the upper aquifer wells (8 wells) should be sampled for BTEX and dissolved iron to determine the current extent of the contaminant plume. This has not been done since May 1987.



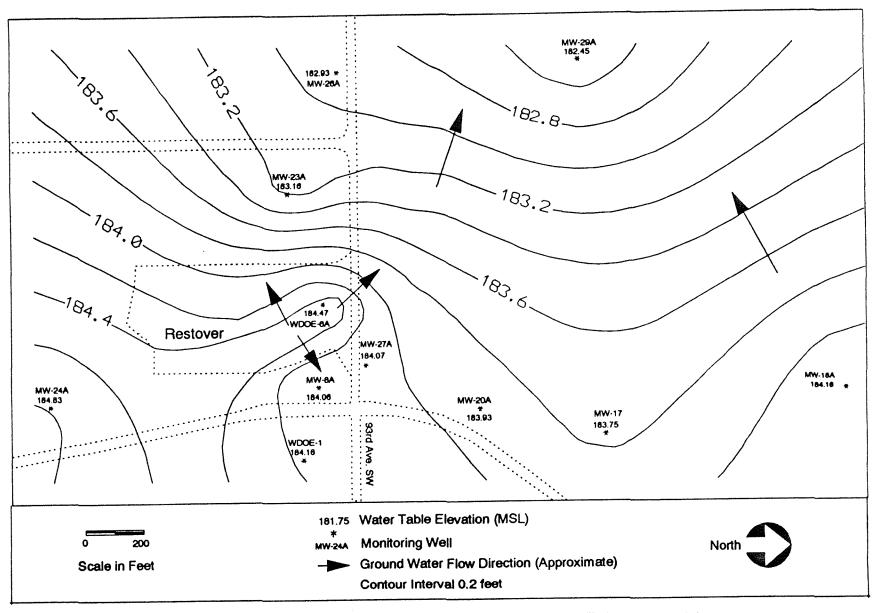


Figure 2: Restover Truck Stop - Water Table Map, February 1992

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Table 4: Historical Restover Truck Stop BTEX Concentrations (ug/L)

Well Number	May 1987	September 1987	October 1988	January 1989	July 1989	January 1990	August 1990	February 1991	August 1991	February 1992
				U¢	per Aquif	er				
WDOE-6A	6950	1180	5300	28000	7490	9870	5190	3460	2840	3830
MW-8A	230	388	479	334	58	14	178	19	20	9
MW-15A	1433	NT	NT	ND	218	NT	285	122	NT	NT
MW-20A	126	NT	NT	NT	NT	20	1400	5	293	11
				ما	wer Aquif	er				
Restover	NT	NT	ND	ND	ND	ND	ND	ND	ND	NE
Spencer	ND	ND	NT	ND	ND	ND	ND	ND	ND	NC
		5	8	ND	4	ND	6	ND	NT	TM

ND: Compound Not Detected NT: Compound Not Tested

REFERENCES

Huntamer, D. and J. Hyre. Manchester Environmental Laboratory - Laboratory Users Manual. July 1991.

PM:krc

cc: Bill Yake

Denis Erickson

APPENDIX A

Analytical Results Restover Truck Stop February 19–21, 1992

MANCHESTER ENVIRONMENTAL LABORATORY

7411 Beach Drive E, Port Orchard Washington 98366

CASE NARRATIVE

April 7, 1992

Subject: Restover Truck Stop - Part A

Samples: 92 - 088050 to 088055

Case No. DOE-450X

Officer: Pam Marti

By: Dickey D. Huntamer

Organics Analysis Unit

VOLATILE ORGANIC ANALYSIS

ANALYTICAL METHODS:

Volatile organic compounds were analyzed using Manchester modification of the EPA CLP and SW 846 Method 8240 purge-trap procedure with capillary GC/MS analysis. Normal CLP QA/QC procedures were performed on the samples.

BLANKS:

Low levels of the common laboratory solvents Acetone and Methylene Chloride were detected in the laboratory blanks. The EPA five times rule was applied to all target compounds which were found in the blank. Compounds that were found in the sample and in the blank were considered real and not the result of contamination if the levels in the sample are greater than or equal to five times the amount of compounds in the associated method blank.

SURROGATES:

Surrogate recoveries were within acceptable limits for water samples.

HOLDING TIMES:

The water samples were analyzed within the recommended 14 day holding time for preserved samples.

MATRIX SPIKE AND MATRIX SPIKE DUPLICATE:

Matrix spikes were within acceptable QC limits for both percent recovery and Relative Percent Differences (RPD).

SPECIAL ANALYTICAL PROBLEMS:

Inadvertently one sample, 088056, Spencer well plus the transfer and transport blanks, 088057 and 088058 were overlooked and not analyzed with the samples above. After discussion with the project officer, it was decided to resample Spencer well on April 9, 1992 and analyze it along with the transfer and transport blanks from the earlier set. The Spencer well resampling and the field blank results will be reported in a separate report.

The results are acceptable for the samples listed above and the data is usable without further qualification.

DATA QUALIFIER CODES:

U	-	The analyte was not detected at or above the reported value.
J	-	The analyte was positively identified. The associated numerical value is an <u>estimate</u> .
UJ	-	The analyte was not detected at or above the reported estimated result.
REJ	-	The data are <u>unusable</u> for all purposes.
EXP	-	The result is equal to the number before EXP times 10 to the power of the number after EXP. As an example 3EXP6 equals 3×10^6 .
NAF	-	Not analyzed for.
N	-	For organic analytes there is evidence the analyte is present in this sample.
NJ	-	There is evidence that the analyte is present. The associated numerical result is an estimate.
Е	-	This qualifier is used when the concentration of the associated value exceeds the known calibration range.
*	-	The analyte was present in the sample. (Visual Aid to locate detected compound on report sheet.)

VOLATILE METHOD BLANK SUMMARY

Lab Name: MANCHESTER LAB Contract: D3K01

lab Code: ____ Case No.: DOE-45 SAS No.: 1011 SDG No.: RESTOV

Lab File ID: IBW2062 Lab Sample ID: LAB BLANK

Date Analyzed: 03/02/92 Time Analyzed: 1202

Matrix: (soll/water) WATER Level:(low/med) LOW

Instrument ID: FINN

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

;	EPA	;	LAB	;	LAB	1	TIME	•
1	SAMPLE NO	. :	SAMPLE ID	1	FILE ID	1	ANALYZED	1
1	========	==		; :	=======================================	= ;	========	: 1
01	192088052Y	' !	MATRIX SPK	;	1088052Y	;	1250	:
02	192088052Z	1	MATRIX SPKDUP	1	1088052Z	1	1334	1
03	IBW2062	1	LAB BLANK	!	1BW2062	;	1202	1
:		1	*****	!		1		i

COMMENTS: IBW2062 - 5MLS - BLANK - 3/2/92

PURGE AND TRAP

4A VOLATILE METHOD BLANK SUMMARY

Lab Name: MANCHESTER LAB Contract: D3K01

Case No.: DOE-45 SAS No.: 1011 SDG No.: RESTOV

Lab File ID: IBW2056 Lab Sample ID: LAB BLANK

Date Analyzed: 02/25/92 Time Analyzed: 1029

Level:(low/med) LOW Matrix: (soil/water) WATER

Instrument ID: FINN

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

¦ EPA	LAB :	LAB	TIME
SAMPLE NO.	SAMPLE ID	FILE ID	ANALYZED ;
==========	- =========		¦ = = = = = = =
01;192088050	SAMPLE	1088050	1115 ;
02 192088051	SAMPLE	1088051	1159 ;
03 192088052	SAMPLE	1088052	1250
04¦192088052A	SAMPLE_REANAL;	1088052A	1340
05 192088053	; SAMPLE ;	1088053	1433
06 192088054	SAMPLE	1088054	1521
07 192088055	SAMPLE	1088055	1608
08¦IBW2056	LAB_BLANK	1BW2056	1029
1	_		l

...MENTS: IBW2056 - 5MLS - BLANK - 2/25/92

PURGE AND TRAP

SAMPLE HOLDING TIMES AND DILUTIONS

Page 1 Laboratory MANCHESTER LAB 04/02/92 Case Number DOE-450X -BNA--------PEST---------VOA-----Shie Anal Hld Dil Anal Hld Dil HId DII Extr Hld Rcvd Extr Hld Ana I ₁ ∍er 192088050 W L 02/25 6 0.200 02/19 02/25 6 0.200 192088051 W L 02/19 02/19 02/25 6 0.200 192088052 W L 02/19 02/25 6 0.200 192088052 W L

192088053 W L

192088054 W L

192088055 W L

192088052 YW L

1920880522W L

02/19

02/19

02/19

02/19

02/19

02/25

02/25

02/25

6 0.200

6 0.200

6 2.00

03/02 12 0.200

03/02 12 0.200

Officer: PZM Account: D3K01

Project: DOE-450X RESTOVER TRUCK STOP

Laboratory: Ecology, Manchester

Sample No: 92 088050

Description: RESTOVER

Begin Date: 92/02/19 :

+					+
-	Metals -	ICP Scan	Water-Fi	1 t	ere
Ì			Result	Ur	nits
+					+
	Iron	Fe-Diss	5.0U	ug	g / 1
+					+
-	VOA - PP	Scan (GCMS)	Water-To	t a	ıl
			Result	Un	nits
+					+
	Benzene		1 U	u g	(/1
	Ethylbenz	ene	1 U	ug	(/1
	Toluene		1 U	ug	1/1
	Total Xyl	enes	1 U	ug	1
	p-Bromofl	uorobenzene	9.5		Recov
	D4-1,2-Di	chlorobenzene	105	%	Recov
	d8-Toluen	e	9.7	%	Recov

d4-1,2-Dichloroethane 110 % Recov

Source: Drinking Water (At tap)

Pay

2

Project: DOE-450X RESTOVER TRUCK STOP

Officer: PZM

Source: Well (Test/Observation)

Account: D3K01

Laboratory: Ecology, Manchester

12:42:47

Sample No: 92 088051 Description: MW-29A

Begin Date: 92/02/19 :

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Project: DOE-450X RESTOVER TRUCK STOP

Officer: PZM

Account: D3K01

Laboratory: Ecology, Manchester

Sample No: 92 088052

Description: MW-8A

Source: Well (Test/Observation)

Begin Date: 92/02/19 :

Metals - ICP Scan	Result	Filtere Units	VOA - PP Scan (GCMS) Duplicate #1	Water-Total Result Units
Iron Fe-Diss	2150	* ug/l	Benzene Ethylbenzene Toluene	1U ug/1 2 * ug/1
VOA - PP Scan (GCMS)	Water-? Result	[otal	Total Xylenes p-Bromofluorobenzene	7 * ug/l 99 % Reco
Benzene Ethylbenzene Toluene Total Xylenes p-Bromofluorobenzene D4-1,2-Dichlorobenzene d8-Toluene d4-1,2-Dichloroethane	94 109 99	ug/1 ug/1 ug/1 ug/1	D4-1,2-Dichlorobenzene d8-Toluene d4-1,2-Dichloroethane	107 % Reco 105 % Reco 101 % Reco
+ VOA - PP Scan (GCMS) Matrix Spike #1	Result	Units		
Benzene Ethylbenzene Toluene Total Xylenes D4-1,2-Dichlorobenzene d8-Toluene d4-1,2-Dichloroethane p-Bromofluorobenzene	9 4 1 1 8 9 0 1 1 8 1 0 2 9 3 9 9	% Recov		
+	Water-T Result	otal Units		
Benzene Ethylbenzene Toluene Total Xylenes D4-1,2-Dichlorobenzene d8-Toluene d4-1,2-Dichloroethane p-Bromofluorobenzene	96 116 95 117 102 96 97	% Recov % Recov % Recov % Recov		

12:42:47

Pa: 4

Project: DOE-450X RESTOVER TRUCK STOP

Officer: PZM

Account: D3K01

Laboratory: Ecology, Manchester

Sample No: 92 088053

Description: MW-8B

Begin Date: 92/02/19 :

+		+
Metals -	ICP Scan	Water-Filtere
		Result Units
+	*	
Iron	Fe-Diss	2130 * ug/1

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	E 1	t	h	y	1	р	e	n	z	e	n	e																			2		*		u	g	/	1				
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	Τo	5	τ	a	1		X	y	1	e	n	е	S																		8		¥		u	g	/	1				
	p.	-	В	Γ	0	m	0	f	1	u	0	r	0	Ъ	е	n	z	е	n	е										9	3				%		R	e	c	۰ c	J	
	D 4										h	1	0	r	0	b	e	n	z	e	n	е							1	1	0				7.		R	e	c	, c	J	
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Source: Well (Test/Observation)

Source: Well (Test/Observation)

Account: D3K01

Project: DOE-450X RESTOVER TRUCK STOP

Laboratory: Ecology, Manchester

Sample No: 92 088054

Description: MW-20A

Begin Date: 92/02/19 :

+			+
Metals -	ICP Scan	Water-Fi	ltere
		Result	Units
+			+
Iron	Fe-Diss	9.1PB*	ug/1

+		+
VOA - PP Scan (GCMS)	Water-Tota	11
	Result Ui	nits
+		+
Benzene	0.4J* uş	g / 1
Ethylbenzene	l * uş	g / 1
Toluene	lU ug	g / l
Total Xylenes	10 * ug	g / 1
p-Bromofluorobenzene	96 %	Recov
D4-1,2-Dichlorobenzene	104 %	Recov
d8-Toluene	99 %	Recov
d4-1,2-Dichloroethane	102 %	Recov

Officer: PZM

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washington State Department of Ecology Sample/Project Analysis $R_{\rm bol} \le t\,s$

12:42:47

Project: DOE-450X RESTOVER TRUCK STOP

Laboratory: Ecology, Manchester

Sample No: 92 088055

Description: WDOE-6A

Begin Date: 92/02/21 :

| Metals - ICP Scan Water-Filtere | Result Units Iron Fe-Diss 4110 * ug/1 +____+ | VOA - PP Scan (GCMS) Water-Total Result Units 430 * ug/l 350 * ug/1Ethylbenzene Toluene 800 * ug/1 Total Xylenes 2250 * ug/1 p-Bromofluorobenzene 95 % Recov 95 % Recov 110 % Recov 99 % Recov 98 % Recov D4-1,2-Dichlorobenzene d8-Toluene d4-1,2-Dichloroethane

(Sample Complete)

Officer: PZM

Account: D3K01

Source: Well (Test/Observation)

Washington State Department of Ecology 12:42:47 Sample/Project Analysis R tts

Pa: 7

Officer: PZM Account: D3K01

Project: DOE-450X RESTOVER TRUCK STOP Officer: PZM

Laboratory: Ecology, Manchester

Sample No: 92 088056

Description: SPENCER

Begin Date: 92/02/21 :

| Metals - ICP Scan Water-Filtere | Result Units | Heads | Water | Water | Heads | Hea

Source: Drinking Water (At tap)

10-111-12 12:42:47

Washington State Department of Ecology Sample/Project Analysis P lts

> Officer: PZM Account: D3K01

Рa

Laboratory: Ecology, Manchester

Sample No: 92 088058

Description: TRANSPOR

Begin Date: 92/02/19 :

Metals - ICP Scan Water-Filtere | Result Units | Iron Fe-Diss 5.0U ug/1

Project: DOE-450X RESTOVER TRUCK STOP

Source: Water (General)

Washington State Department of Ecology Sample/Project Analysis (1ts

Officer: PZM Account: D3K01

Project: DOE-450X RESTOVER TRUCK STOP

Laboratory: Ecology, Manchester

12:42:47

Sample No: 92 088059 Description: FILTER

Begin Date: 92/02/19 :

+----+ | Metals - ICP Scan Water-Filtere | Result Units Iron Fe-Diss 6.1PB* ug/1

Source: Water (General)

Officer: PZM Account: D3K01

Project: DOE-450X RESTOVER TRUCK STOP

Blank ID: BW2056

12:42:47

+		
VOA - PP Scan (GCMS)	Water-To	tal
Blank #1	Result	Units
+		
Benzene	1 U	ug/1
Ethylbenzene	1 U	ug/1
Toluene	0.2J*	ug/1
Total Xylenes	0.2J*	ug/1
p-Bromofluorobenzene	9 7	% Recov
D4-1,2-Dichlorobenzene	108	% Recov
d8-Toluene	102	% Recov
d4-1,2-Dichloroethane	107	% Recov

Officer: PZM Account: D3K01

Project: DOE-450X RESTOVER TRUCK STOP

Blank ID: BW2062

+		+
VOA - PP Scan (GCMS)	Water-To	otal
Blank #2	Result	Units
+		+
Benzene	0.07J*	ug/1
Ethylbenzene	1 U	ug/1
Toluene	0.2J*	ug/l
Total Xylenes	1 U	ug/1
p-Bromofluorobenzene	99	% Recov
D4-1,2-Dichlorobenzene	96	% Recov
d8-Toluene	9 7	% Recov
d4-1,2-Dichloroethane	104	% Recov

Washington State Department of Ecology Sample/Project Analysis F lts

Pа

Account: D3K01

Officer: PZM

1.2

Project: DOE-450X RESTOVER TRUCK STOP

Blank ID: EWPB 09.31

| Metals - ICP Scan Water-Filtere | Blank #1 Result Units |

Iron Fe-Diss 5.6P* ug/l

.

12:42:47

20-APR-92

Washington State Department of Ecology *** Lab Analysis Report ***

Page 1

==> Transaction #: 04209203

Laboratory: (WE) Ecology, Manchester Lab

Work Group:

(51) VOA - PP Scan (GCMS)

Instrument: (INCOS-50) GC/MS INCOS 50

Method: (EP2-624) GC/MS Purge and Trap Scan

Chemist: (LAB) Lab (General R/O) Hours Worked:

Project: DOE-450X RESTOVER TRUCK STOP

Prq Ele#: D3K01

Prj Off: Marti, Pam

DOE Analysis Due: 920221 Revised Due:

*** Sample Records in Transaction ***

Seq#	Sample #	QA	Date/Time	Description	Alternate Keys
01 02 03 04	92088057 92088058 92158060 92158060	LBK1	920219 920219 920409 920409	TRANSFER TRANSPOR SPENCER SPENCER	

Record Type: TRNIN3 Date Verified: Transaction Status: Edited Transaction...First essed: 20-APR-92 13:15:51 Status: E Batch:

Transaction #: 04209203 Seq #: 01
Proj Code: DOE-450X RESTOVER TRUCK STOP (51) VOA - PP Scan (GCMS)

PE # : D3K01

Sample No.: 92 088057 Alternate Keys:

Samp Matrix: (10) Water-Total QA Code: () Unspecifed Date Extracted: Date Ana Units: (11) ug/l %Slds: ____ Unspecifed Peaks Total:
Date Analyzed: 920415 # Days to Ext/Anal: 0/ 56

Line	Par #	Parameter Description	Units	Value
1	74873	Chloromethane	ug/l	1UJ
2	75718	Methane, Dichlorodifluoro-	ug/l	5UJ
3	74839	Bromomethane	ug/l	1UJ
4	75014	Vinyl Chloride	ug/l	1UJ
5	75003	Chloroethane	ug/l	. 1UJ
6	75694	Trichlorofluoromethane	uq/l	1UJ
7	75092	Methylene Chloride	ug/l	1UJ
8	67641	Acetone	ug/l	5UJ
9	75150	Carbon Disulfide	ug/l	5UJ
10	75354	1,1-Dichloroethene	ug/l	1UJ
11	75343	1,1-Dichloroethane	ug/l	1UJ
12	156605	trans-1,2-Dichloroethene	ug/l	10J
13	156592	Cis-1,2-Dichloroethene	ug/l	1UJ
14	590207	2,2-Dichloropropane	ug/l	103 1UJ
15	74975	Bromochloromethane	ug/l	103 1UJ
16	67663	Chloroform	ug/l	
17	107062	1,2-Dichloroethane	ug/l	1UJ
1.^	78933	2-Butanone	ug/l	1UJ
4	71556	1,1,1-Trichloroethane	ug/l	3UJ
20	56235	Carbon Tetrachloride	ug/l	1UJ
21	563586	1,1-Dichloropropene		1UJ
22	75274	Bromodichloromethane	ug/l	1UJ
23	78875	1,2-Dichloropropane	ug/l	luj
24	74953	Dibromomethane	ug/l	1UJ
25	10061026	trans-1,3-Dichloropropene	ug/l	1UJ
26	79016	Ethene, trichloro-	ug/l	1UJ
27	124481		ug/l	1UJ
28	106934	Dibromochloromethane	ug/l	luj
29	79005	1,2-Dibromoethane (EDB)	ug/l	1UJ
30	142289	1,1,2-Trichloroethane	ug/l	1UJ
31	71432	1,3-Dichloropropane	ug/l	1UJ
32	10061015	Benzene	ug/l	1UJ
33	75252	cis-1,3-Dichloropropene	ug/l	1UJ
34		Bromoform	ug/l	1UJ
35	591786	2-Hexanone	ug/l	1UJ
36	108101 127184	4-Methyl-2-Pentanone(MIBK)	ug/l	1UJ
37	79345	Tetrachloroethene	ug/l	1UJ
38		ETHANE, 1,1,2,2-TETRACHLORO-	ug/1	1UJ
39	630206 108883	Ethane, 1,1,1,2-Tetrachloro-		1UJ
40		Toluene	ug/l	1UJ
41	108907 100414	Chlorobenzene	ug/l	1UJ
42		Ethylbenzene	ug/l	1UJ
43	100425	BENZENE, ETHENYL-(STYRENE)	ug/l	1UJ
43 41	108861	Bromobenzene	ug/l	1UJ
	96184	1,2,3-Trichloropropane	ug/l	1UJ
4	95498	2-Chlorotoluene	ug/l	1UJ
46	106434	4-Chlorotoluene	ug/l	1UJ
47	1330207	Total Xylenes	ug/l	1UJ
48	95636	1,2,4-Trimethylbenzene	ug/l	1UJ
49	98066	Tert-Butylbenzene	ug/l	1UJ
50	108678	1,3,5-Trimethylbenzene	ug/l	1UJ
(cont	inued on ne	ext page)		

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Transaction #: 04209203 Seq #: 01

(51) VOA - PP Scan (GCMS)

uple No.: 92 088057 (continued from previous page)

Line	Par #	Parameter Description	Units	Value	
51	135988	Sec-Butylbenzene	ug/l	1UJ	
52	99876	p-Isopropyltoluene	ug/l	1UJ	
53	104518	Butylbenzene	ug/l	1UJ	
54 ⁻	96128	1,2-Dibromo-3-chloropropane	uq/l	5UJ	
55	87616	1,2,3-Trichlorobenzene	ug/l	1UJ	
56	98828	Isopropylbenzene (Cumene)	ug/l	1UJ	
57	103651	BENZENE, PROPYL-	uq/l	1UJ	
58	541731	1,3-Dichlorobenzene	ug/l	1UJ	
59	106467	1,4-Dichlorobenzene	ug/l	1UJ	
60	95501	1,2-Dichlorobenzene	ug/l	lUJ	
61	120821	1,2,4-Trichlorobenzene	uq/l	1UJ	
62	91203	Naphthalene	uq/l	1UJ	
63	87683	Hexachlorobutadiene	ug/l	1UJ	
64	2747582	d8-Toluene	% Recov	97	(Surr) PR
65	-460004	p-Bromofluorobenzene	% Recov	94	(Surr) PR
66	17070070	d4-1,2-Dichloroethane	% Recov	102	(Surr) PR
67	2199691	D4-1,2-Dichlorobenzene	% Recov	96	(Surr) PR

Transaction #: 04209203 Seq #: 02 (51) VOA - PP Scan (GCMS) Proj Code : DOE-450X RESTOVER TRUCK STOP PE # PE # : D3K01

Sample No.: 92 088058 Alternate Keys:

Samp Matrix: (10) Water-Total Units: (11) ug/l %Slds: _____ QA Code: () Unspecifed Peaks Total: _____ Date Extracted: Date Analyzed: 920415 # Days to Ext/Anal: _____ 0/ 56

Line	Par #	Parameter Description	Units	Value
1	74873	Chloromethane	ug/l	1UJ
2	75718	Methane, Dichlorodifluoro-	ug/l	5UJ
3	74839	Bromomethane	ug/l	1UJ
4	75014	Vinyl Chloride	ug/l	1UJ
5	75003	Chloroethane	ug/l	1UJ
6	75694	Trichlorofluoromethane	ug/l	1UJ
7	75092	Methylene Chloride	ug/l	1UJ
8	67641	Acetone	ug/l	5UJ
9	75150	Carbon Disulfide	ug/l	5UJ
10	75354	1,1-Dichloroethene	ug/l	1UJ
11	75343	1,1-Dichloroethane	ug/l	1UJ
12	156605	trans-1,2-Dichloroethene	ug/l	1UJ
13	156592	Cis-1,2-Dichloroethene	ug/l	1UJ
14	590207	2,2-Dichloropropane	ug/l	1UJ
15	74975	Bromochloromethane	ug/l	1UJ
16	67663	Chloroform	ug/l	1UJ
17	107062	1,2-Dichloroethane	ug/l	1UJ
7	78933	2-Butanone	ug/l	2UJ
	71556	1,1,1-Trichloroethane	ug/l	1UJ
20	56235	Carbon Tetrachloride	ug/l	1UJ
21	563586	1,1-Dichloropropene	ug/l	1UJ
22	75274	Bromodichloromethane	ug/l	1UJ
23	78875	1,2-Dichloropropane	ug/l	1UJ
24	74953	Dibromomethane	ug/l	1UJ
25	10061026	trans-1,3-Dichloropropene	ug/l	1UJ
26	79016	Ethene, trichloro-	ug/l	1UJ
27	124481	Dibromochloromethane	ug/l	1UJ
28	106934	1,2-Dibromoethane (EDB)	ug/l	1UJ
29	79005	1,1,2-Trichloroethane	ug/l	1UJ
30	142289	1,3-Dichloropropane	ug/l	1UJ
31	71432	Benzene	ug/l	1UJ
32	10061015	cis-1,3-Dichloropropene	ug/l	1UJ
33	75252	Bromoform	ug/l	1UJ
34	591786	2-Hexanone	ug/l	1UJ
35	108101	4-Methyl-2-Pentanone(MIBK)	ug/l	1UJ
36	127184	Tetrachloroethene	ug/l	1UJ
37	79345	ETHANE, 1,1,2,2-TETRACHLORO-	ug/l	lUJ
38	630206	Ethane, 1,1,1,2-Tetrachloro-	ug/l	lUJ
39	108883	Toluene	ug/l	lUJ
40	108907	Chlorobenzene	ug/l	lUJ
41	100414	Ethylbenzene	ug/l	1UJ
42	100425	BENZENE, ETHENYL-(STYRENE)	ug/l	1UJ
43	108861	Bromobenzene	ug/l	lUJ
<i>A</i> .	96184	1,2,3-Trichloropropane	ug/l	1UJ
	95498	2-Chlorotoluene	ug/l	1UJ
46	106434	4-Chlorotoluene	ug/l	1UJ
47	1330207	Total Xylenes	ug/l	lUJ
48	95636	1,2,4-Trimethylbenzene	ug/l	lUJ
49	98066	Tert-Butylbenzene	ug/l	1UJ
50	108678	1,3,5-Trimethylbenzene	ug/l	1UJ
(conti	inued on ne	ext page)		

5

Transaction #: 04209203

Seq #: 02

(51) VOA - PP Scan (GCMS)

ple No.: 92 088058

(continued from previous page)

Line	Par #	Parameter Description	Units	Value	
51 52 53 54 55 56 57 58 59 61 62 63 64 65 66	135988 99876 104518 96128 87616 98828 103651 541731 106467 95501 120821 91203 87683 2747582 -460004 17070070 2199691	Sec-Butylbenzene p-Isopropyltoluene Butylbenzene 1,2-Dibromo-3-chloropropane 1,2,3-Trichlorobenzene Isopropylbenzene (Cumene) BENZENE, PROPYL- 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene 1,2-Trichlorobenzene Naphthalene Hexachlorobutadiene d8-Toluene p-Bromofluorobenzene d4-1,2-Dichloroethane D4-1,2-Dichlorobenzene	ug/l ug/l ug/l ug/l ug/l ug/l ug/l ug/l	1UJ 1UJ 1UJ 5UJ 1UJ 1UJ 1UJ 1UJ 1UJ 1UJ 1UJ 1UJ 1UJ 1	(Surr) PR (Surr) PR (Surr) PR (Surr) PR

Transaction #: 04209203 Seq #: 03 (51) VOA - PP Scan (GCMS)
Proj Code: DOE-450X RESTOVER TRUCK STOP PE #: D3K01

Sample No.: 92 158060

Alternate Keys:

Samp Matrix: (10		Units:	(11) ug/l	%Slds:		
QA Code: ()	Unspecifed		Peaks	Total:		
Date Extracted:	Date Analyzed:	920415	# Days to Ex	t/Anal: ~	07	6

Line	Par #	Parameter Description	Units	Value
1	74873	Chloromethane		1117
2	75718	Methane, Dichlorodifluoro-	ug/l	1UJ
3	74839	Bromomethane	ug/l	5UJ
4	75014	Vinyl Chloride	ug/l	1UJ
5	75003	Chloroethane	ug/l	1UJ
6	75694	Trichlorofluoromethane	ug/l	luj
7	75092	Methylene Chloride	ug/l	1UJ
8	67641	Acetone	ug/l	1UJ
9	75150	Carbon Disulfide	ug/l	4UJ
10	75354	1,1-Dichloroethene	ug/l ug/l	5UJ
11	75343	1,1-Dichloroethane	ug/l	1UJ
12	156605	trans-1,2-Dichloroethene	ug/l	1UJ
13	156592	Cis-1,2-Dichloroethene	ug/l	1UJ
14	590207	2,2-Dichloropropane	ug/l	1UJ
15	74975	Bromochloromethane	ug/l	1UJ
16	67663	Chloroform		1UJ
17	107062	1,2-Dichloroethane	ug/l	1UJ
17	78933	2-Butanone	ug/l	1UJ
$\overline{1}^{i}$.	71556	1,1,1-Trichloroethane	ug/l	2UJ
20	56235	Carbon Tetrachloride	ug/l	1UJ
21	563586	1,1-Dichloropropene	ug/l	1UJ
22	75274	Bromodichloromethane	ug/l	1UJ
23	78875	1,2-Dichloropropane	ug/l	1UJ
24	74953	Dibromomethane	ug/l	1UJ
25	10061026	trans-1,3-Dichloropropene	ug/l	1UJ
26	79016	Ethene, trichloro-	ug/l	1UJ
27	124481	Dibromochloromethane	ug/l	1UJ
28	106934	1,2-Dibromoethane (EDB)	ug/l	1UJ
29	79005	1,1,2-Trichloroethane	ug/l	1UJ
30	142289	1,3-Dichloropropane	ug/l	1UJ
31	71432	Benzene	ug/l	luj
32	10061015	cis-1,3-Dichloropropene	ug/l	1UJ
33	75252	Bromoform	ug/l	1UJ
34	591786	2-Hexanone	ug/l ug/l	lUJ lUJ
35	108101	4-Methyl-2-Pentanone(MIBK)	ug/l	10J
36	127184	Tetrachloroethene	ug/l	10J
37	79345	ETHANE, 1,1,2,2-TETRACHLORO-	ug/1	10J
38	630206	Ethane, 1,1,1,2-Tetrachloro-	ug/1	10J
39	108883	Toluene	ug/l	10J
40	108907	Chlorobenzene	ug/l	103 1UJ
41	100414	Ethylbenzene	ug/l	1UJ
42	100425	BENZENE, ETHENYL-(STYRENE)	ug/l	10J
43	108861	Bromobenzene (GITKENE)	ug/l	10J
4 ′	96184	1,2,3-Trichloropropane	ug/l	10J
4.	95498	2-Chlorotoluene	ug/l	1UJ
46	106434	4-Chlorotoluene	ug/l	1UJ
47	1330207	Total Xylenes	ug/l	10J
48	95636	1,2,4-Trimethylbenzene	ug/l	1UJ
49	98066	Tert-Butylbenzene	ug/l	1UJ
50	108678	1,3,5-Trimethylbenzene	ug/l	1UJ
(cont	inued on n	ext page)	J	

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Transaction #: 04209203

Seq #: 03

(51) VOA - PP Scan (GCMS)

Sample No.: 92 158060

(continued from previous page)

Line	Par #	Parameter Description	Units	Value
51 52 53 54 55 57 58 59 61 62 63 64 65 66	135988 99876 104518 96128 87616 98828 103651 541731 106467 95501 120821 91203 87683 2747582 -460004 17070070 2199691	Sec-Butylbenzene p-Isopropyltoluene Butylbenzene 1,2-Dibromo-3-chloropropane 1,2,3-Trichlorobenzene Isopropylbenzene (Cumene) BENZENE, PROPYL- 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene 1,2-Trichlorobenzene Naphthalene Hexachlorobutadiene d8-Toluene p-Bromofluorobenzene d4-1,2-Dichloroethane D4-1,2-Dichlorobenzene	ug/l ug/l ug/l ug/l ug/l ug/l ug/l ug/l	1UJ 1UJ 1UJ 5UJ 1UJ 1UJ 1UJ 1UJ 1UJ 1UJ 1UJ 1UJ 1UJ 1

Transaction #: 04209203 Seq #: 04 (51) VOA - PP Scan (GCMS) Proj Code: DOE-450X RESTOVER TRUCK STOP PE #

PE # : D3K01

Blank ID: BW2106 Sample No.: 92 158060

Alternate Keys:

Samp Matrix: (10) Water-Total	Units:	(11) ug/l	%Slds:		
QA Code: (LBK1) Lab Blank Sample #1		Peak	s Total:		
Date Extracted: Date Analyzed:	920415	# Days to E	<pre>Ext/Anal:</pre>	07	6

Dine Par # Parameter Description Units Value			bate inaryzea. 520415	π	Days to Ext/Ai
75718 Methane, Dichlorodifluoro- 3 74839 Bromomethane ug/l 10 4 75014 Vinyl Chloride ug/l 10 5 75003 Chloroethane ug/l 10 6 75694 Trichlorofluoromethane ug/l 10 7 75092 Methylene Chloride ug/l 0.3J 8 67641 Acetone ug/l 0.3J 9 75150 Carbon Disulfide ug/l 50 10 75554 1,1-Dichloroethane ug/l 10 11 75343 1,1-Dichloroethane ug/l 10 12 156605 trans-1,2-Dichloroethene ug/l 10 13 156592 Cis-1,2-Dichloroethene ug/l 10 14 590207 2,2-Dichloropropane ug/l 10 15 74975 Bromochloromethane ug/l 10 16 67663 Chloroform ug/l 10 17 107062 1,2-Dichloroethane ug/l 10 18 10 75354 1,1-Trichloroethane ug/l 10 19 71556 1,1,1-Trichloroethane ug/l 10 20 56235 Carbon Tetrachloride ug/l 10 21 563586 1,1-Dichloropropane ug/l 10 22 75274 Bromodichloromethane ug/l 10 23 78875 1,2-Dichloropropane ug/l 10 24 74953 Dibromomethane ug/l 10 25 10061026 trans-1,3-Dichloropropene ug/l 10 26 79016 trans-1,3-Dichloropropene ug/l 10 27 124481 Dibromomethane ug/l 10 28 106934 1,2-Dibromomethane ug/l 10 29 79005 1,1,2-Trichloroethane ug/l 10 29 79005 1,1,2-Trichloroethane ug/l 10 30 142289 1,3-Dichloropropene ug/l 10 31 71432 Benzene ug/l 10 32 10061015 cis-1,3-Dichloropropene ug/l 10 33 75252 Bromoform ug/l 10 34 591786 2-Hexanone ug/l 10 35 108101 4-Methyl-2-Pentancne(MIBK) ug/l 10 36 127184 Tetrachloroethene ug/l 10 37 79345 EHANE, 1,1,2,2-TETRACHLORO- ug/l 10 38 630206 Ethane, 1,1,1,2-Tetrachloro- ug/l 10 39 108883 Toluene ug/l 10 40 108907 Chlorobenzene ug/l 10 41 100415 Ebane, ETHENYL-(STYRENE) ug/l 10 45 95498 2-Chlorotoluene ug/l 10 46 106434 4-Chlorotoluene ug/l 10 47 1330207 Total Xylenes ug/l 10 48 95636 1,2,4-Trimethylbenzene ug/l 10 49 98066 Tetr-Butylbenzene ug/l 10 49 98066 Tetr-Butylbenzene ug/l 10	Line	Par #	Parameter Description	Units	Value
The state of the	1	74873	Chloromethane	ug/l	111
3	2	75718	Methane, Dichlorodifluoro-		
Type		74839			
5 75003 Chloroethane ug/l 1UJ 6 75594 Trichlorofluoromethane ug/l 0.3J 7 75092 Methylene Chloride ug/l 0.3J 8 67641 Acetone ug/l 5U 10 75354 1,1-Dichloroethene ug/l 1U 11 75354 1,1-Dichloroethane ug/l 1U 12 156605 trans-1,2-Dichloroethane ug/l 1U 13 155692 Cis-1,2-Dichloroethene ug/l 1U 14 590207 2,2-Dichloropropane ug/l 1U 15 74975 Bromochloromethane ug/l 1U 16 6663 Chloroform ug/l 1U 17 107062 1,2-Dichloropethane ug/l 1U 20 56235 Carbon Tetrachloride ug/l 1U 21 75274 Bromodichloromethane ug/l 1U 22 75274 Bromodichloromethane<		75014	Vinyl Chloride		
6 75694 Trichlorofluoromethane ug/l 0.3J 7 75092 Methylene Chloride ug/l 0.3J 8 67641 Acetone ug/l 3J 9 75150 Carbon Disulfide ug/l 1U 10 75354 1,1-Dichloroethene ug/l 1U 11 75343 1,1-Dichloroethane ug/l 1U 12 156605 trans-1,2-Dichloroethene ug/l 1U 13 156592 Cis-1,2-Dichloroethene ug/l 1U 14 590207 2,2-Dichloroethene ug/l 1U 15 74975 Bromochloromethane ug/l 1U 16 67663 Chloroform ug/l 1U 107062 1,2-Dichloropethane ug/l 1U 20 56256 Carbon Tetrachloride ug/l 1U 21 563586 1,1-Dichloropropane ug/l 1U 22 75274 Bromodichloromethane	5	75003		- .	
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49 98066 Tert-Butylbenzene ug/l 1U					
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Transaction #: 04209203

Seq #: 04

(51) VOA - PP Scan (GCMS)

ple No.: 92 158060 (continued from previous page)

Line	Par #	Parameter Description	Units	Value	
51 52 53 54 55 56 57	135988 99876 104518 96128 87616 98828 103651 541731	Sec-Butylbenzene p-Isopropyltoluene Butylbenzene 1,2-Dibromo-3-chloropropane 1,2,3-Trichlorobenzene Isopropylbenzene (Cumene) BENZENE, PROPYL- 1,3-Dichlorobenzene	ug/l ug/l ug/l ug/l ug/l ug/l ug/l ug/l	1U 1U 1U 5UJ 1U 1U	
59 60 61 62 63 64 65 66	106467 95501 120821 91203 87683 2747582 -460004 17070070 2199691	1,4-Dichlorobenzene 1,2-Dichlorobenzene 1,2,4-Trichlorobenzene Naphthalene Hexachlorobutadiene d8-Toluene p-Bromofluorobenzene d4-1,2-Dichloroethane D4-1,2-Dichlorobenzene	ug/l ug/l ug/l ug/l ug/l % Recov % Recov % Recov % Recov	1U 1U 1U 1U 1U 1U 103 95 100	(Surr) PR (Surr) PR (Surr) PR (Surr) PR

WASHINGTON STATE DEPARTMENT OF ECOLOGY ENVIRONMENTAL INVESTIGATIONS AND LABORATORY SERVICES MANCHESTER ENVIRONMENTAL LABORATORY

March 4, 1992

TO:

Pam Marti

FROM:

Bill Kammin, Environmental Lab Director

SUBJECT: Restover Dissolved Iron Data

SAMPLE RECEIPT

The samples from the Restover project were received by the Manchester Laboratory on 2/20/92 in good condition.

HOLDING TIMES

All analyses were performed within the specified holding times for metals analysis (28 days for mercury, 180 days for all other metals).

INSTRUMENT CALIBRATION

Instrument calibration was performed before each analytical run and checked by initial calibration verification standards and blanks. Continuing calibration standards and blanks were analyzed at a frequency of 10% during the run and again at the end of the analytical run. All initial and continuing calibration verification standards were within the relevant CLP control limits.

PROCEDURAL BLANKS

The procedural blank associated with these samples showed ultra-trace levels of iron. Samples containing iron at less than ten times the amount in the blank are flagged with B.

SPIKED SAMPLE ANALYSIS

Spiked sample and duplicate spiked sample analyses were performed on sample number 92088051. All spike recoveries were within the acceptance limits of +/- 25%.

PRECISION DATA

The duplicate results of the spiked and duplicate spiked sample were used to calculate precision related to the analysis of these samples. The % RPD for all parameters was within the +/-20% window for duplicate analysis.

SUMMARY

The data generated by the analysis of the above referenced samples can be used with the above-mentioned qualification.

If you have any questions about the results or the methods used to obtain these results, please call me at SCAN 744-4737.

3-MAR-92

Washington State Department of Ecology *** Lab Analysis Report

1

==> Transaction #: 03030831

Laboratory: (WE) Ecology, Manchester Lab

Work Group:

(38) Metals - ICP Scan

Instrument: (ICP

) ICP, Jarrell-Ash AtomComp 1100 (DOE)

Method: (EP1-200.7) Inductively Coupled Plasma Atomic Emissions Analysis

Chemist:

(AGH) Hedley, Art

DOE

Hours Worked:

Project: DOE-450X RESTOVER TRUCK STOP

Prg Ele#: D3K01

Prj Off: Marti, Pam

DOE

Analysis Due: 920221 Revised Due:

*** Sample Records in Transaction ***

Seq#	Sample #	QA	Date/Time	Description	Alternate Keys
01 02	92088051 92088050	LBK1	3 2 3 2 2	MW-29A	
03	92088051		920219 920219	RESTOVER MW-29A	
04 05	92088051 92088051	LMX1 LMX2	920219 920219	MW-29A MW-29A	
06	92088052	IIIIA Z	920219	MW-8A	
07 (* -	92088053 92088054		920219 920219	MW-8B MW-20A	
10	92088055		920221	WDOE-6A	
10	92088056 92088058		920221 920219	SPENCER TRANSPOR	
12	92088059		920219	FILTER	

Record Type: TRNIN3 Date Verified: By: nsaction Status: New Transaction...First Printing...Unverified. cessed: 3-MAR-92 08:52:29 Status: N Batch: (In CUR DB)

Washington State Department of Ecology 3-MAR-92 *** Lab Analysis Report ***

Page

2

Transaction #: 03030831 Seq #: 01 (38) Metals - ICP Scan Proj Code: DOE-450X RESTOVER TRUCK STOP

PE # : D3K01

Blank ID : EWPB 09.31

Alternate Keys: Sample No.: 92 088051

Samp Matrix: (11) Water-Filtered Units: (00)
QA Code: (LBK1) Lab Blank Sample #1 %Slds: Peaks Total:

Date Extracted: Date Analyzed: 920226 # Days to Ext/Anal: 0/ 7

Par # Parameter Description Units Value Line ____ 01046 Iron Fe-Diss ug/l 5.6P 1

3-MAR-92

Washington State Department of Ecology *** Lab Analysis Report ***

Transaction #: 03030831 Seq #: 02

Proj Code: DOE-450X RESTOVER TRUCK STOP

(38) Metals - ICP Scan

PE # : D3K01

Sample No.: 92 088050 - Alternate Keys:

Samp Matrix: (11) Water-Filtered

Units: (00) %Slds:

QA Code: () Unspecifed Date Extracted: Date

* " ## * p

Peaks Total:

Date Analyzed: 920226 # Days to Ext/Anal: 0/ 7

Par # Parameter Description Units Value Line 1 01046 Iron Fe-Diss ug/l 5.0U

Washington State Department of Ecology
*** Lab Analysis Report *** Page 4 3-MAR-92

Proj Code: DOE-450X RESTOVER TRUCK STOP

PE # : D3K01

Sample No.: 92 088051

%Slds: Units: (00) Samp Matrix: (11) Water-Filtered

Peaks Total: QA Code: () Unspecifed Date Analyzed: 920226 # Days to Ext/Anal: 0/ 7 Date Extracted:

Par # Parameter Description Units Line

1 01046 Iron Fe-Diss ug/l

Washington State Department of Ecology *** Lab Analysis Report ***

Transaction #: 03030831 Seq #: 04 (38) Metals - ICP Scan

Proj Code: DOE-450X RESTOVER TRUCK STOP

PE # : D3K01

Sample No.: 92 088051

Alternate Keys:

Units: (94) % Recov %Slds: Samp Matrix: (11) Water-Filtered

QA Code: (LMX1) Lab Mtrx Spike #1 (% Rec

Peaks Total:

Date Analyzed: 920226 # Days to Ext/Anal: 0/ 7 Date Extracted:

Par # Parameter Description Units Value Line

01046 Iron Fe-Diss ug/l % Recov 1

Washington State Department of Ecology
*** Lab Analysis Report ***

3-MAR-92

P oj Code: DOE-450X RESTOVER TRUCK STOP

Sample No.: 92 088051

Alternate Keys:

Units: (94) % Recov %Slds:

Samp Matrix: (11) Water-Filtered Units: (94) % Recov %Slds:
QA Code: (LMX2) Lab Mtrx Spike #2 (% Rec Peaks Total:
Date Extracted: Date Analyzed: 920226 # Days to Ext/Anal: 0/ 7

Line	Par #	Parame	ter Descrip	tion	Units	Value
1	01046	Iron	Fe-Diss	ug/l	% Recov	99

Washington State Department of Ecology 3-MAR-92 *** Lab Analysis Report ***

Transaction #: 03030831 Seq #: 06 (38) Metals - ICP Scan

Proj Code: DOE-450X RESTOVER TRUCK STOP

PE # : D3K01

Sample No.: 92 088052 - no - + Alternate Keys:

Samp Matrix: (11) Water-Filtered Units: (00) %Slds:
QA Code: () Unspecifed Peaks Total:
Date Extracted: Date Analyzed: 920226 # Days to Ext/Anal: 0/ 7

Line	Par #	Parameter	Descrip	tion	Units	Value
1	01046	Iron	Fe-Diss	ug/l		2150

3-MAR-92

Washington State Department of Ecology
*** Lab Analysis Report ***

Page 8

Transaction #: 03030831 Seq #: 07
Proj Code: DOE-450X RESTOVER TRUCK STOP

(38) Metals - ICP Scan
PE

PE # : D3K01

Sample No.: 92 088053 - 7 Alternate Keys:

Samp Matrix: (11) Water-Filtered Units: (00)

%Slds:

QA Code: () Únspecifed Date Extracted: Dat

Date Analyzed: 920226 # Days to Ext/Anal: 0/ 7

Peaks Total:

Line	Par #	Parameter	Descrip	tion	Units	Value
1	01046	Two				
-	01040	Tron	Fe-Diss	ug/l		2130

Washington State Department of Ecology 3-MAR-92 *** Lab Analysis Report ***

Transaction #: 03030831 Seq #: 08 (38) Metals - ICP Scan PE PE # : D3K01

Sample No.: 92 088054 - 10 2004 Alternate Keys:

Samp Matrix: (11) Water-Filtered Units: (00)

Peaks Total: QA Code: () Unspecifed Date Extracted: Date Analyzed: 920226 # Days to Ext/Anal: 0/ 7

Line Par # Parameter Description Units Value

1 01046 Iron Fe-Diss ug/l 9.1PE 9.1PB 3-MAR-92 Washington State Department of Ecology Page 10
*** Lab Analysis Report ***

Transaction #: 03030831 Seq #: 09 (38) Metals - ICP Scan
Proj Code: DOE-450X RESTOVER TRUCK STOP
PE PE # : D3K01

Sample No.: 92 088055 * Server of Alternate Keys:

Samp Matrix: (11) Water-Filtered Units: (00) %Slds: Peaks Total:

Date Extracted: Date Analyzed: 920226 # Days to Ext/Anal: 0/ 5

Line Par # Parameter Description Units Value

1 01046 Iron Fe-Diss ug/l 4110

Washington State Department of Ecology Page 11 3-MAR-92 *** Lab Analysis Report ***

Transaction #: 03030831 Seq #: 10 (38) Metals - ICP Scan Proj Code: DOE-450X RESTOVER TRUCK STOP

PE # : D3K01

Sample No.: 92 088056 Tolling Alternate Keys:

%Slds: Samp Matrix: (11) Water-Filtered Units: (00)

Peaks Total: QA Code: () Únspecifed

Date Extracted: Date Analyzed: 920226 # Days to Ext/Anal: 0/ 5

Par # Parameter Description Units Value Line 01046 Iron Fe-Diss ug/l 22B 1

Washington State Department of Ecology 3-MAR-92 *** Lab Analysis Report ***

Transaction #: 03030831 Seq #: 11 (38) Metals - ICP Scan P--j Code: DOE-450X RESTOVER TRUCK STOP

PE # : D3K01

Sample No.: 92 088058 - Tarrelar Alternate Keys:

Samp Matrix: (11) Water-Filtered

%Slds: Units: (00)

QA Code: () Unspecifed Date Extracted: Date Analyzed: 920226 # Days to Ext/Anal: 0/ 7

Peaks Total:

Par # Parameter Description Units Value Line 1 01046 Iron Fe-Diss ug/l 5.0U

3-MAR-92

Washington State Department of Ecology *** Lab Analysis Report ***

Transaction #: 03030831 Seq #: 12 (38) Metals - ICP Scan

PE # : D3K01

Proj Code: DOE-450X RESTOVER TRUCK STOP

Sample No.: 92 088059- Alternate Keys:

Samp Matrix: (11) Water-Filtered Units: (00) %Slds: Peaks Total:

QA Code: () Unspecifed Peaks Total:
Date Extracted: Date Analyzed: 920226 # Days to Ext/Anal: 0/ 7

Line Par # Parameter Description Units Value 01046 Iron Fe-Diss ug/l 6.1PB 1