



Restover Truck Stop Ground Water Monitoring February and August 1997

Summary

This progress report is one in a series describing the results of ground water sampling at Restover Truck Stop. This report describes the results of samples collected for benzene, toluene, ethylbenzene, and total xylenes (BTEX), and total petroleum hydrocarbons as gasoline (TPH-G) in February and August 1997. Ecology has conducted ground water sampling at this site from 1987 to the present. To remediate soil and ground water contamination a vapor extraction system (VES) was constructed in the summer of 1993. The VES operated steadily from February 1994 to June 1995. Since the summer of 1995 the system has been operated sporadically.

Since monitoring began in 1987, BTEX concentrations have decreased substantially. Well WDOE-6A (Figure 1) is the only well in which BTEX concentrations continue to be elevated. In February and August, Model Toxic Control Act (MTCA) cleanup levels were exceeded in WDOE-6A for benzene, ethylbenzene, and total xylene; as well as for TPH. Data review and laboratory reporting sheets are presented in Appendix A.

Results

In February 1997 ground water samples were collected from eleven upper aquifer wells and two lower aquifer wells. In August 1997 ground water samples were collected from five upper aquifer wells (Figure 1). The upper aquifer consists of recessional outwash. This unit is underlain by the Vashon Till, which is a regional aquitard, and advance outwash deposits that form a lower aquifer.

Field Observations

Depth-to-water measurements, purge volume, pH, specific conductance, and temperature results for both sample events are listed in Table 1. In February, depth-to-water in the upper aquifer ranged from 2.08 to 7.27 feet below ground surface (bgs). In August, depth-to-water ranged from 8.75 to 12.38 feet bgs.

Water purged from monitoring well WDOE-6A continues to have a strong hydrocarbon odor and cloudy appearance, while MW-30 continues to have a slight hydrocarbon odor.

Analytical Results

Analytical results for BTEX and TPH-G, and MTCA ground water cleanup levels, are shown in Table 2 for both sample events. A duplicate sample (MW-6A) was collected from well WDOE-6A. Results for WDOE-6A listed in this memo represent the average concentration of the analytes detected.

In February, samples were collected from monitoring wells: MW-8A, MW-9A, MW-20A, MW-30, MW-31, WDOE-6A, MW-13A, MW-15A, MW-23A, MW-27A, WDOE-4, MW-12A, and MW-16. All four BTEX compounds were detected in WDOE-6A with an average total concentration of 310 ppb. TPH-G concentrations in wells MW-30, MW-27A and WDOE-6A were 180 µg/L, 340 µg/L and 9,950 µg/L, respectively.

In August, samples were collected from five monitoring wells: MW-8A, MW-20A, MW-30, MW-31, and WDOE-6A. All four BTEX compounds were detected in WDOE-6A with an average total concentration of 212 ppb. Well WDOE-6A continues to show the highest volatile organics concentrations of the wells sampled. Benzene was detected in MW-31 at a concentration of 3.6 µg/L. TPH-G concentrations in wells MW-8A, MW-30, MW-31 and WDOE-6A were 270 µg/L, 160 µg/L, 160 µg/L, and approximately 8,000 µg/L, respectively.

BTEX concentrations for select monitoring wells from May 1987 to August 1997 are listed in Table 3. Figure 2 shows BTEX concentrations for wells WDOE-6A and MW-8A for the same time period. Concentrations were relatively stable for both wells from August 1991 to February 1995. Since February 1995 BTEX concentrations have been gradually decreasing. In April 1996, high BTEX concentrations were detected in WDOE-6A. There is no apparent explanation for this increase. The next sample round is scheduled for January 1998.

Conclusions

1. BTEX concentrations appear to be gradually decreasing.
2. In February and August, Model Toxic Control Act (MTCA) cleanup levels were exceeded in WDOE-6A for benzene, ethylbenzene, total xylene, and TPH.
3. The vapor extraction system operated steadily from February 1994 to June 1995. Since then the VES has operated sporadically due to the high winter water table the last two years, and to system operation problems. The VES operating period and related monitoring have not been long enough to determine whether the VES has improved the ground water quality.

Recommendations

1. Monitoring wells WDOE-6A, MW-8A, MW-20A, MW-30, and MW-31 should continue to be sampled for BTEX and TPH-G.
2. Wells MW-12A, MW-15A and MW-16 should continue to be sampled periodically for as long as property access is granted.

Methods

Ground Water Sampling

Ground water samples were collected from the upper and lower aquifers. The upper aquifer consists of recessional outwash. This unit is underlain by the Vashon Till, which is a regional aquitard, and advance outwash deposits that form a lower aquifer. In February, samples for benzene, toluene, ethylbenzene, and xylene (BTEX) and total petroleum hydrocarbons as gasoline (TPH-G) were collected from eleven upper aquifer and two lower aquifer wells. August samples were collected from five upper aquifer monitoring wells.

Prior to sampling, static water level measurements were obtained from monitoring wells using an electronic water level probe. The probe was rinsed with deionized water and wiped clean between measurements. Based on the purge volume, wells were purged with either a teflon bailer or submersible pump. Wells were purged until pH, specific conductance and temperature 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 this well was collected in a 55-gallon barrel and stored with other vapor

extraction system waste in the enclosed tank area. This waste will be transported and disposed of in accordance with State of Washington regulations (Chapter 173-340-400 WAC).

Monitoring well samples were collected using decontaminated, bottom-emptying teflon bailers. 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. Samples for BTEX and TPH-G analysis were collected free of headspace and preserved with 1:1 hydrochloric acid.

Chain-of-custody procedures were followed in accordance with Manchester Laboratory protocol (Ecology, 1994). All samples were analyzed by the Ecology/EPA Laboratory in Manchester.

Quality Assurance

In general the quality of the data is acceptable for use for both sample rounds. BTEX samples were analyzed using EPA SW-846 Method 8020 (U.S. EPA, 1986) and WTPH-G samples were analyzed using Washington State Method WTPH-G (Ecology, 1994).

Quality control samples collected in the field consisted of a blind field duplicate. Duplicate samples for BTEX and TPH-G were obtained from monitoring well WDOE-6A. Duplicate samples collected at WDOE-6A provide an estimate of combined sampling and laboratory precision. The numeric comparison of duplicate results is expressed as the relative percent difference or RPD. RPDs are the ratio of the difference and the mean of the duplicate results expressed as a percentage. The relative percent difference for the February duplicate samples were within 6%. The RPD for the August BTEX duplicate samples were within 8% and for TPH-G 25%.

In addition to field quality control samples, a matrix spike, a matrix spike duplicate and surrogate compound recoveries were performed in the laboratory. Most surrogate spike recoveries were within the control limits of 50 - 150%. Matrix spikes for BTEX and TPH-G were all within acceptable limits. Myrna McIntosh of the Manchester Laboratory conducted the quality assurance review, which has been included in Appendix A.

References

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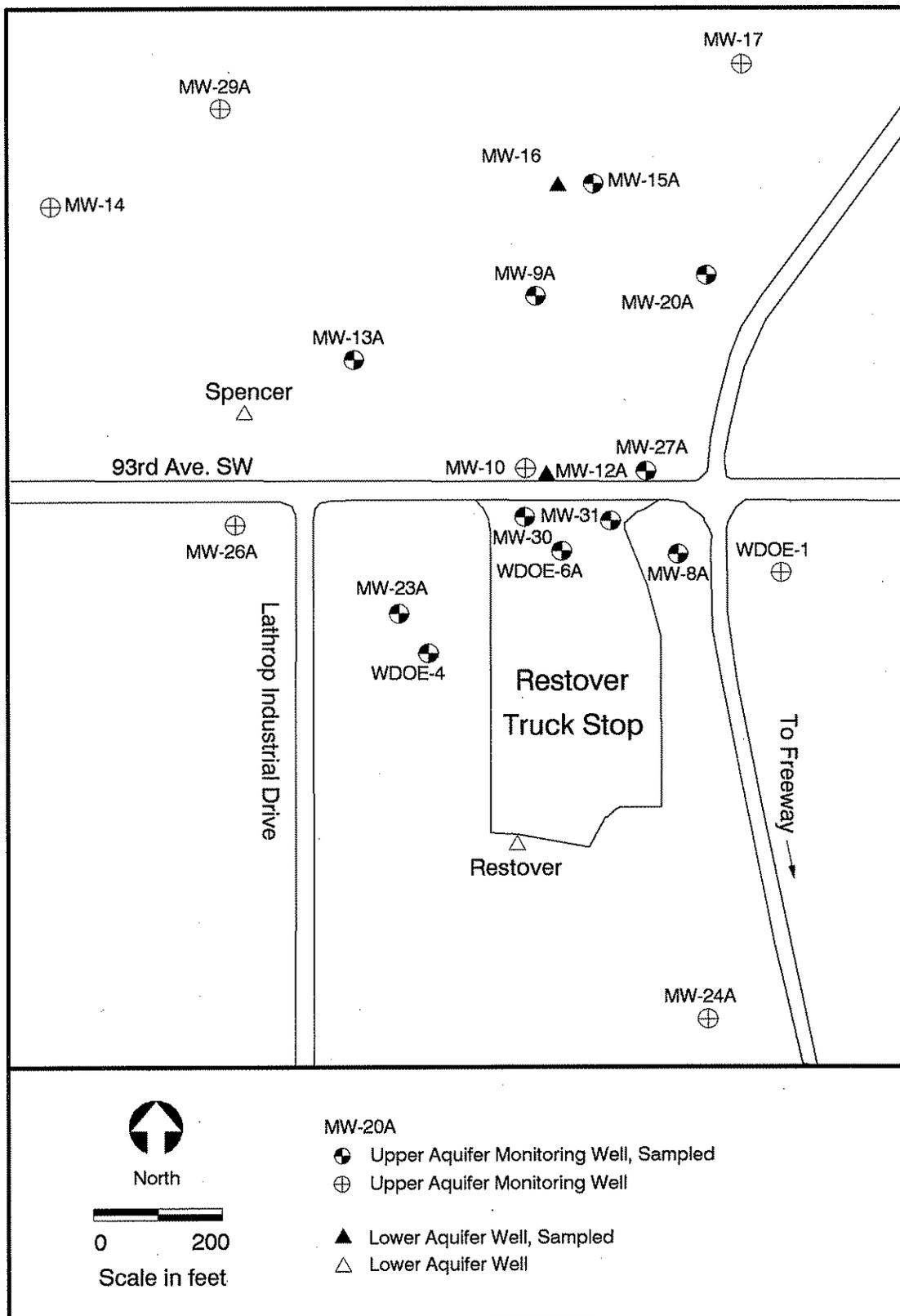


Figure 1: Well Locations, Restover Truck Stop

Table 1: Field Parameter Results for February 12-14 and August 6, 1997

Monitoring Well	Total Depth (Feet)	Aquifer	Depth to Water (Feet)	pH (standard units)	Specific Conductance (umhos/cm)	Temperature (°C)	Purge Volume (gallons)
February 1997							
MW-8A	21.01	Upper	5.6	5.5	71	8.7	8
MW-9A	16.22	Upper	3.75	5.7	94	9.1	7
MW-20A	13.95	Upper	2.46	5.7	60	8.5	8
MW-30	16.78	Upper	4.48	6.7	96	11.1	30
MW-31	13.47	Upper	5.4	5.6	160	10.8	5
WDOE-6A	21.68	Upper	6.09	6.05	158	11.8	9
MW-13A	19.45	Upper	4.5	6.2	210	7.5	8
MW-15A	15.8	Upper	2.08	5.9	85	8.8	9
MW-23A	23.7	Upper	4.7	6.3	57	8.5	10
MW-27A	16.3	Upper	7.27	6.1	88	9.8	35
WDOE-4	25.61	Upper	6.28	6.5	52	5.4	40
MW-12A	50.43	Lower	6.45	6.3	140	11.5	21
MW-16	53.52	Lower	3.13	6.0	82	10.0	25
August 1997							
MW-8A	21.10	Upper	11.88	5.6	115	11.9	5
MW-20A	13.95	Upper	8.75	5.7	56	11.6	3
MW-30	16.78	Upper	10.44	6.2	176	14.9	22
MW-31	13.47	Upper	11.56	5.8	132	14.2	1
WDOE-6A	21.68	Upper	12.38	5.8	210	13.3	5

Table 2: Analytical Results (ug/L) for February 12 - 14, 1997 and August 6, 1997

Well Number	Benzene	Toluene	Ethylbenzene	Total Xylene	Total BTEX	TPH-G (Total TPH)
MTCA Cleanup Levels	5.0	40.0	30.0	20.0		1000.0
February 1997						
MW-8A	1.0 U	1.0 U	1.0 U	3.0 U	ND	130 U
MW-9A	1.0 U	1.0 U	1.0 U	3.0 U	ND	130 U
MW-20A	1.0 U	1.0 U	1.0 U	3.0 U	ND	130 U
MW-30	1.0 U	1.0 U	1.0 U	3.0 U	ND	180
MW-31	1.0 U	1.0 U	1.0 U	3.0 U	ND	130 U
WDOE-6A	16	14	61	219	310	9900
MW-6A(dup)*	15	14	61	219	309	10000
MW-13A	1.0 U	1.0 U	1.0 U	3.0 U	ND	130 U
MW-15A	1.0 U	1.0 U	1.0 U	3.0 U	ND	130 U
MW-23A	1.0 U	1.0 U	1.0 U	3.0 U	ND	130 U
MW-27A	1.0 U	1.0 U	1.0 U	3.0 U	ND	340
WDOE-4	1.0 U	1.0 U	1.0 U	3.0 U	ND	130 U
MW-12A	1.0 U	1.0 U	1.0 U	3.0 U	ND	130 U
MW-16	1.0 U	1.0 U	1.0 U	3.0 U	ND	130 U
August 1997						
MW-8A	1.0 U	1.0 U	1.0 U	3.0 U	ND	270
MW-20A	1.0 U	1.0 U	1.0 U	3.0 U	ND	130 U
MW-30	1.0 U	1.0 U	1.0 U	3.0 U	ND	160
MW-31	3.6	1.0 U	1.0 U	3.0 U	3.6	160
WDOE-6A	8	11	44	156	219	9010
MW-6A(dup)*	8	11	41	144	204	6980

U : Not detected at detection limit shown.

ND: Compounds Not Detected

* : MW-6A is a duplicate sample of WDOE-6A.

Table 3: 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	July 1992	January 1993	July 1993	November 1993
Upper Aquifer														
WDOE-6A	6950	1180	5300	28000	7490	9870	5190	3460	2840	3830	2990	4784	2620	3070
MW-8A	230 ¹	388 ¹	479 ¹	334 ¹	64 ²	20 ²	178 ²	19 ²	20 ²	9 ²	53 ²	47 ²	30 ²	41 ²
MW-15A	1433	NT	NT	ND	218	NT	285	122	NT	NT	NT	NT	NT	NT
MW-17	ND	ND	ND	ND	ND	NT	NT	ND	ND	NT	2.7	ND	NT	NT
MW-20A	126	NT	NT	NT	NT	20	1400	5	293	11	452	NT(Dry)	162	NT(Dry)
MW-30	-	-	-	-	-	-	-	-	-	-	-	-	NT	NT(Dry)
MW-9A	727	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Lower Aquifer														
Restover	NT	NT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	NT
Spencer	ND	ND	NT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NT
MW-12	53	5	8	ND	4	ND	6	ND	NT	NT	NT	NT	1.7	NT
Upper Aquifer														
WDOE-6A	6360	5242	3214	4624	2120	1829	638	646	61	5900	488 ²	664 ²	310 ²	212 ²
MW-8A	36 ²	4 ²	8 ¹	32 ²	ND	ND	ND	ND	ND	ND	ND	5	ND	ND
MW-15A	NT	NT	NT	NT	ND	NT	2	NT	ND	NT	NT	NT	ND	NT
MW-17	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
MW-20A	ND	59	NT(Dry)	ND	ND	ND	18	NT(Dry)	ND	ND	1	6	ND	ND
MW-30	NT(Dry)	2400	NT(Dry)	NT(Dry)	8	8	7	ND	5	19	ND	1	ND	ND
MW-31	-	-	-	-	-	-	NT(Dry)	NT(Dry)	7.1	ND	NT(Dry)	NT(Dry)	ND	3.6
MW-9A	NT(Dry)	366	NT	NT	ND	NT	1	NT	ND	NT	NT	NT	ND	NT
Lower Aquifer														
Restover	ND	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Spencer	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
MW-12	NT	NT	NT	NT	1.1	NT	Well Decommissioned							
MW-12A	-	-	-	-	-	-	0.5	NT	ND	NT	NT	NT	ND	NT

ND: Compound Not Detected

NT: Compound Not Tested

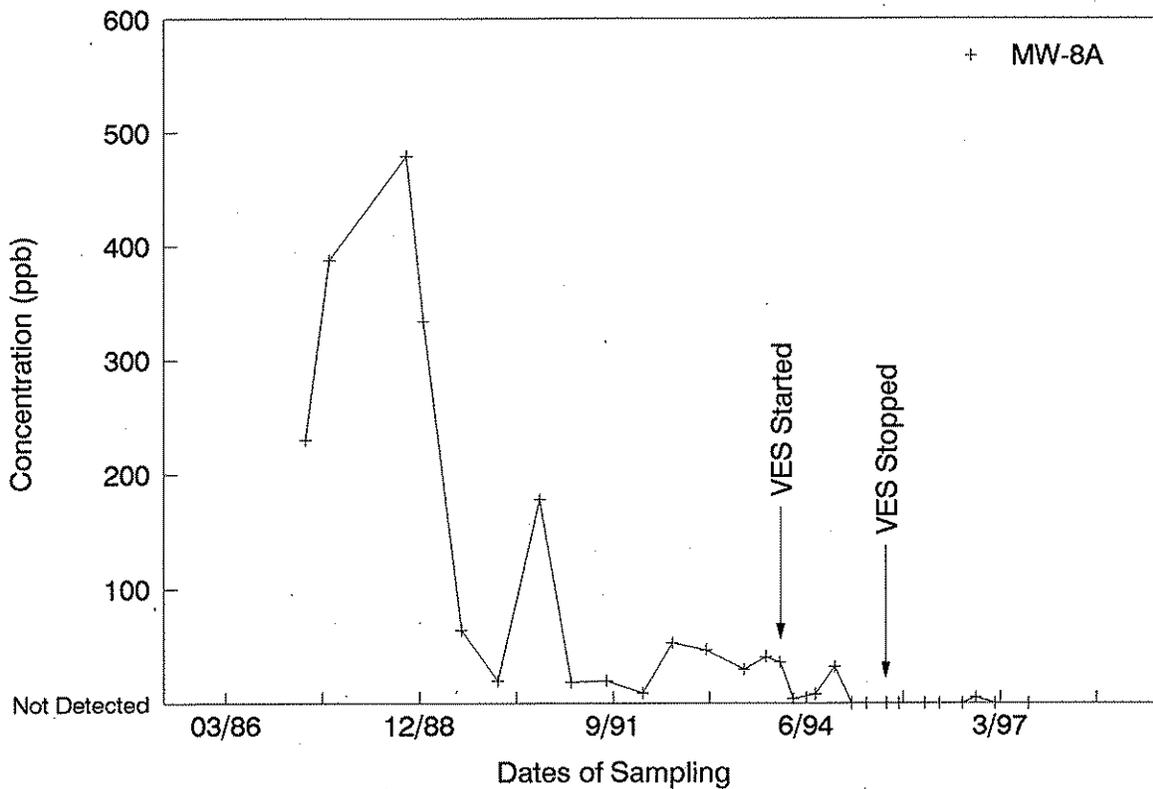
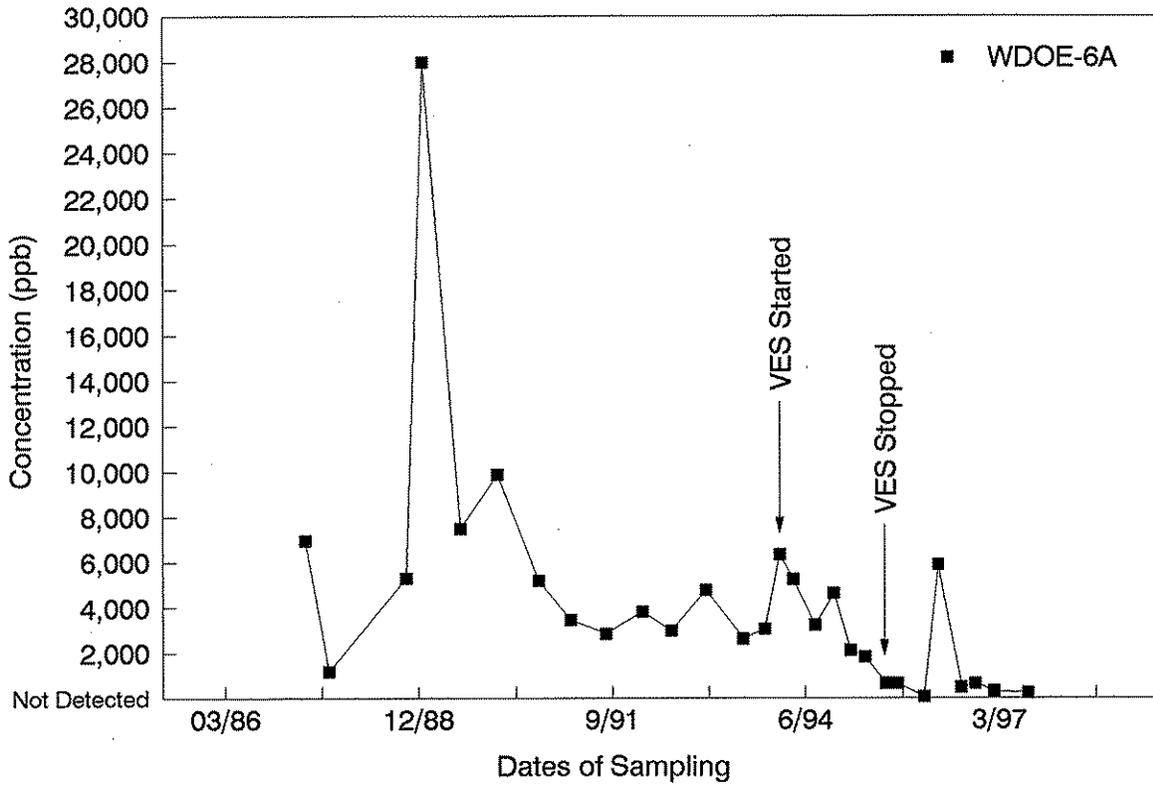
¹: Value is based on one sample.

²: Value represents the mean of duplicate samples.

The upper and lower aquifers consist of recessional outwash and advance outwash, respectively. These units are separated by the Vashon Till, which is a regional aquitard.

Figure 2

BTEX Concentrations in WDOE-6A and MW-8A from May 1987 to August 1997



APPENDIX A

Analytical Results

Restover Truck Stop

February 12-14, 1997 and August 6, 1997

Manchester Environmental Laboratory

7411 Beach DR E, Port Orchard Washington 98366

CASE NARRATIVE

February 28, 1997

Subject: Restover Truck Stop
Samples: 97078060 - 97078073
Case No. 108197
Officer: Pam Marti
By: Myrna McIntosh *MM*
Organics Analysis Unit

BTEX Analysis of Restover Truck Stop

SUMMARY:

Samples 97078060 - 97078073 were analyzed for BTEX. Some of the sample results are reported from dilutions because the concentration of the analytes detected in the original analysis exceed the calibration range.

Use the DIL1 results of samples 97078068 and 97078069 for ethylbenzene and the xylenes.

All data are usable as reported. Use the original analyses for all analytes that are not specifically addressed.

METHODS:

These water samples were analyzed by purge and trap GC-FID.

BLANKS:

No analytes of interest were detected in the blanks.

SURROGATES:

All surrogate recoveries were within the control limits of 50 - 150%.

HOLDING TIMES:

Samples were analyzed within recommended holding times.

SPIKED AND DUPLICATE SPIKED SAMPLES:

Replicates of sample 97078067 were spiked in duplicate. All BTEX recoveries are within the control limits of 50 - 150% recovery. The relative percent differences (RPD) are as follows:

Benzene	2%	p & m xylene	4%
Toluene	3%	o xylene	4%
Ethylbenzene	4%		

LABORATORY CONTROL SAMPLE:

A laboratory control sample (LCS) was analyzed with this set. All analyte results are within +/- 25 % of the true values.

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 estimate.
- UJ - The analyte was not detected at or above the reported estimated result.
- REJ - The data are unusable for all purposes.
- NAF - Not analyzed for.
- N - 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.
- E - This qualifier is used when the concentration of the associated value exceeds the known calibration range.
- bold** - The analyte was present in the sample. (Visual Aid to locate detected compound on report sheet.)

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Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078060

Date Received: 02/14/97

Method: SW8020

Field ID: MW-31

Date Prepared: 02/18/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/18/97

Units: ug/L

Analyte	Result	Qualifier
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Benzene	1.0	U
Toluene	1.0	U
Ethylbenzene	1.0	U
m & p-Xylene	2.0	U
o-Xylene	1.0	U

Surrogate Recoveries

1,4-Difluorobenzene	97	%
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Authorized By: *Karin Zedler*

Release Date: 3/3/97

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Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078061

Date Received: 02/14/97

Method: SW8020

Field ID: MW-13A

Date Prepared: 02/18/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/18/97

Units: ug/L

Analyte	Result	Qualifier
Benzene	1.0	U
Toluene	1.0	U
Ethylbenzene	1.0	U
m & p-Xylene	2.0	U
o-Xylene	1.0	U

Surrogate Recoveries

1,4-Difluorobenzene	97	%
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Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078062

Date Received: 02/14/97

Method: SW8020

Field ID: MW-23A

Date Prepared: 02/18/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/18/97

Units: ug/L

Analyte	Result	Qualifier
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Benzene	1.0	U
Toluene	1.0	U
Ethylbenzene	1.0	U
m & p-Xylene	2.0	U
o-Xylene	1.0	U

Surrogate Recoveries

1,4-Difluorobenzene	98	%
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Authorized By: 

Release Date: 3/3/97

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Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078063

Date Received: 02/14/97

Method: SW8020

Field ID: WDOE-4

Date Prepared: 02/18/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/18/97

Units: ug/L

Analyte	Result	Qualifier
Benzene	1.0	U
Toluene	1.0	U
Ethylbenzene	1.0	U
m & p-Xylene	2.0	U
o-Xylene	1.0	U

Surrogate Recoveries

1,4-Difluorobenzene	99	%
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Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078064

Date Received: 02/14/97

Method: SW8020

Field ID: MW-30

Date Prepared: 02/18/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/18/97

Units: ug/L

Analyte	Result	Qualifier
Benzene	1.0	U
Toluene	1.0	U
Ethylbenzene	1.0	U
m & p-Xylene	2.0	U
o-Xylene	1.0	U

Surrogate Recoveries

1,4-Difluorobenzene	114	%
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Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078065 Date Received: 02/14/97 Method: SW8020

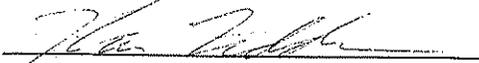
Field ID: MW-27A Date Prepared: 02/19/97 Matrix: Water

Project Officer: Pam Marti Date Analyzed: 02/19/97 Units: ug/L

Analyte	Result	Qualifier
Benzene	1.0	U
Toluene	1.0	U
Ethylbenzene	1.0	U
m & p-Xylene	2.0	U
o-Xylene	1.0	U

Surrogate Recoveries

1,4-Difluorobenzene	95	%
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Authorized By: 

Release Date: 3/13/97

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Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078066

Date Received: 02/14/97

Method: SW8020

Field ID: MW-20A

Date Prepared: 02/19/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/19/97

Units: ug/L

Analyte	Result	Qualifier
Benzene	1.0	U
Toluene	1.0	U
Ethylbenzene	1.0	U
m & p-Xylene	2.0	U
o-Xylene	1.0	U

Surrogate Recoveries

1,4-Difluorobenzene	84	%
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Authorized By: *Pam Marti*

Release Date: 3/3/97

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Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078067 Date Received: 02/14/97 Method: SW8020

Field ID: MW-8A Date Prepared: 02/19/97 Matrix: Water

Project Officer: Pam Marti Date Analyzed: 02/19/97 Units: ug/L

Analyte	Result	Qualifier
Benzene	1.0	U
Toluene	1.0	U
Ethylbenzene	1.0	U
m & p-Xylene	2.0	U
o-Xylene	1.0	U

Surrogate Recoveries

1,4-Difluorobenzene	88	%
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Authorized By: *Karin Fiddell*

Release Date: 3/3/97

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Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078067 (Matrix Spike - LMX1) Date Received: 02/14/97 Method: SW8020
Field ID: MW-8A Date Prepared: 02/19/97 Matrix: Water
Project Officer: Pam Marti Date Analyzed: 02/19/97 Units: % Recovery

Analyte	Result	Qualifier
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Benzene	80	
Toluene	82	
Ethylbenzene	84	
m & p-Xylene	84	
o-Xylene	83	

Surrogate Recoveries

1,4-Difluorobenzene	100	%
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Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078067 (Matrix Spike - LMX2)

Date Received: 02/14/97

Method: SW8020

Field ID: MW-8A

Date Prepared: 02/19/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/19/97

Units: % Recovery

Analyte	Result	Qualifier
---------	--------	-----------

Benzene	82	
---------	----	--

Toluene	85	
---------	----	--

Ethylbenzene	87	
--------------	----	--

m & p-Xylene	88	
--------------	----	--

o-Xylene	87	
----------	----	--

Surrogate Recoveries

1,4-Difluorobenzene	100	%
---------------------	-----	---

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078068

Date Received: 02/14/97

Method: SW8020

Field ID: WDOE-6A

Date Prepared: 02/19/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/19/97

Units: ug/L

Analyte	Result	Qualifier
---------	--------	-----------

Benzene

16

Toluene

14

Ethylbenzene

NC

m & p-Xylene

NC

o-Xylene

NC

Surrogate Recoveries

1,4-Difluorobenzene

NC

Authorized By: *Pam Marti*

Release Date: 3/3/97

Page: 1

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078069

Date Received: 02/14/97

Method: SW8020

Field ID: MW-6A

Date Prepared: 02/19/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/19/97

Units: ug/L

Analyte	Result	Qualifier
---------	--------	-----------

Benzene	15	
Toluene	14	
Ethylbenzene		NC
m & p-Xylene		NC
o-Xylene		NC
Surrogate Recoveries		
1,4-Difluorobenzene		NC

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078068 (Dilution - DIL1)

Date Received: 02/14/97

Method: SW8020

Field ID: WDOE-6A

Date Prepared: 02/19/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/19/97

Units: ug/L

Analyte	Result	Qualifier
Benzene	18	J
Toluene	14	J
Ethylbenzene	61	
m & p-Xylene	160	
o-Xylene	59	

Surrogate Recoveries

1,4-Difluorobenzene	123	%
---------------------	-----	---

Authorized By: 

Release Date: 3/3/97

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078069 (Dilution - DIL1)

Date Received: 02/14/97

Method: SW8020

Field ID: MW-6A

Date Prepared: 02/19/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/19/97

Units: ug/L

Analyte	Result	Qualifier
---------	--------	-----------

Benzene	15	J
Toluene	11	J
Ethylbenzene	61	
m & p-Xylene	160	
o-Xylene	59	

Surrogate Recoveries

1,4-Difluorobenzene	117	%
---------------------	-----	---

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078070

Date Received: 02/18/97

Method: SW8020

Field ID: MW-16

Date Prepared: 02/19/97

Matrix: Water

Project Officer: Pam Marti

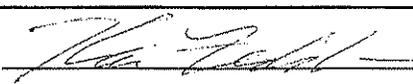
Date Analyzed: 02/19/97

Units: ug/L

Analyte	Result	Qualifier
Benzene	1.0	U
Toluene	1.0	U
Ethylbenzene	1.0	U
m & p-Xylene	2.0	U
o-Xylene	1.0	U

Surrogate Recoveries

1,4-Difluorobenzene	89	%
---------------------	----	---

Authorized By: 

Release Date: 2/3/97

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078071

Date Received: 02/18/97

Method: SW8020

Field ID: MW-15A

Date Prepared: 02/19/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/19/97

Units: ug/L

Analyte	Result	Qualifier
Benzene	1.0	U
Toluene	1.0	U
Ethylbenzene	1.0	U
m & p-Xylene	2.0	U
o-Xylene	1.0	U

Surrogate Recoveries

1,4-Difluorobenzene	96	%
---------------------	----	---

Authorized By: *Pam Marti*

Release Date: 3/13/97

Page: 1

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078072

Date Received: 02/18/97

Method: SW8020

Field ID: MW-9A

Date Prepared: 02/19/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/19/97

Units: ug/L

Analyte	Result	Qualifier
---------	--------	-----------

Benzene	1.0	U
Toluene	1.0	U
Ethylbenzene	1.0	U
m & p-Xylene	2.0	U
o-Xylene	1.0	U

Surrogate Recoveries

1-Bromo-2-Fluoroethane	98	%
Toluene-D8		
p-Bromofluorobenzene		
1,4-Difluorobenzene		

Authorized By: *Pam Marti*

Release Date: 3/4/97

Page: 1

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078073

Date Received: 02/18/97

Method: SW8020

Field ID: MW-12A

Date Prepared: 02/19/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/19/97

Units: ug/L

Analyte	Result	Qualifier
---------	--------	-----------

Benzene	1.0	U
Toluene	1.0	U
Ethylbenzene	1.0	U
m & p-Xylene	2.0	U
o-Xylene	1.0	U

Surrogate Recoveries

1,4-Difluorobenzene	99	%
---------------------	----	---

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: BLN70374

Method: SW8020

Blank ID: OBW7049A1

Date Prepared: 02/18/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/18/97

Units: ug/L

Analyte	Result	Qualifier
---------	--------	-----------

Benzene	1.0	U
Toluene	1.0	U
Ethylbenzene	1.0	U
m & p-Xylene	2.0	U
o-Xylene	1.0	U

Surrogate Recoveries

1,4-Difluorobenzene	86	%
---------------------	----	---

Authorized By: 

Release Date: 3/3/97

Page: 1

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: LCS70375

Method: SW8020

Blank ID: OXW7049A1

Date Prepared: 02/18/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/18/97

Units: ug/L

Analyte	Result	Qualifier
---------	--------	-----------

Benzene	79	
---------	----	--

Toluene	85	
---------	----	--

Ethylbenzene	88	
--------------	----	--

m & p-Xylene	89	
--------------	----	--

o-Xylene	88	
----------	----	--

Surrogate Recoveries

1,4-Difluorobenzene	97	%
---------------------	----	---

Manchester Environmental Laboratory

7411 Beach DR E, Port Orchard Washington 98366

CASE NARRATIVE

March 3, 1997

Subject: Restover Truck Stop
Samples: 97078060 - 97078073
Case No. 108197
Officer: Pam Marti
By: Myrna McIntosh *mm*
Organics Analysis Unit

WTPH-G Analysis of Restover Truck Stop

SUMMARY:

Samples 97078060 - 97078073 were analyzed for WTPH-G. Samples 97078064, 65, 68 & 69 show a chromatogram consistent with weathered gasoline.

All data are usable as reported.

METHODS:

These water samples were analyzed by purge and trap GC-FID.

BLANKS:

No analytes of interest were detected in the blanks.

SURROGATES:

All surrogate recoveries were within the control limits of 50 - 150%.

HOLDING TIMES:

Samples were analyzed within recommended holding times.

DUPLICATE SAMPLES:

Sample number 97078063 was analyzed in duplicate. There was no gasoline present in either sample above the practical quantitation limit (PQL). The relative percent difference between the duplicate and the sample could not be calculated.

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 estimate.
- UJ - The analyte was not detected at or above the reported estimated result.
- REJ - The data are unusable for all purposes.
- NAF - Not analyzed for.
- N - 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.
- E - This qualifier is used when the concentration of the associated value exceeds the known calibration range.
- bold** - The analyte was present in the sample. (Visual Aid to locate detected compound on report sheet.)

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

TPH as Gasoline

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078060

Date Received: 02/14/97

Method: WTPH-G

Field ID: MW-31

Date Prepared: 02/18/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/18/97

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.13	U
----------	------	---

Surrogate Recoveries

1,4-Difluorobenzene	67	%
---------------------	----	---

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

TPH as Gasoline

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078061

Date Received: 02/14/97

Method: WTPH-G

Field ID: MW-13A

Date Prepared: 02/18/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/18/97

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.13	U
----------	------	---

Surrogate Recoveries

1,4-Difluorobenzene	66	%
---------------------	----	---

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

TPH as Gasoline

Project Name: Restover Truck Stop	LIMS Project ID: 1081-97	
Sample: 97078062	Date Received: 02/14/97	Method: WTPH-G
Field ID: MW-23A	Date Prepared: 02/18/97	Matrix: Water
Project Officer: Pam Marti	Date Analyzed: 02/18/97	Units: mg/L

Analyte	Result	Qualifier
Gasoline	0.13	U
Surrogate Recoveries		
1,4-Difluorobenzene	68	%

Authorized By: *Pam Marti*

Release Date: 3/3/97

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

TPH as Gasoline

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078063

Date Received: 02/14/97

Method: WTPH-G

Field ID: WDOE-4

Date Prepared: 02/18/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/18/97

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.13	U
----------	------	---

Surrogate Recoveries

1,4-Difluorobenzene	67	%
---------------------	----	---

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

TPH as Gasoline

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078063 (Duplicate - LDPI)

Date Received: 02/14/97

Method: WTPH-G

Field ID: WDOE-4

Date Prepared: 02/18/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/18/97

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.13	U
----------	------	---

Surrogate Recoveries

1,4-Difluorobenzene	67	%
---------------------	----	---

Authorized By: *Pam Marti*

Release Date: 2/13/97

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

TPH as Gasoline

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078064

Date Received: 02/14/97

Method: WTPH-G

Field ID: MW-30

Date Prepared: 02/18/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/19/97

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.18	
----------	------	--

Surrogate Recoveries

1,4-Difluorobenzene	84	%
---------------------	----	---

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

TPH as Gasoline

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078065

Date Received: 02/14/97

Method: WTPH-G

Field ID: MW-27A

Date Prepared: 02/18/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/19/97

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.34	
----------	------	--

Surrogate Recoveries

1,4-Difluorobenzene	72	%
---------------------	----	---

Authorized By: *Pam Marti*

Release Date: 3/3/97

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

TPH as Gasoline

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078066

Date Received: 02/14/97

Method: WTPH-G

Field ID: MW-20A

Date Prepared: 02/18/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/19/97

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.13	U
----------	------	---

Surrogate Recoveries

1,4-Difluorobenzene	66	%
---------------------	----	---

Authorized By: *Pam Marti*

Release Date: 3/3/97

Page:

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

TPH as Gasoline

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078067

Date Received: 02/14/97

Method: WTPH-G

Field ID: MW-8A

Date Prepared: 02/20/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/21/97

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.13	U
----------	------	---

Surrogate Recoveries

1,4-Difluorobenzene	104	%
---------------------	-----	---

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

TPH as Gasoline

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078068

Date Received: 02/14/97

Method: WTPH-G

Field ID: WDOE-6A

Date Prepared: 02/20/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/21/97

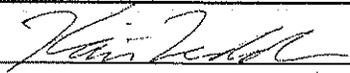
Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	9.9	
----------	-----	--

Surrogate Recoveries

1,4-Difluorobenzene	144	%
---------------------	-----	---

Authorized By: 

Release Date: 3/3/97

Page:

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

TPH as Gasoline

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078069

Date Received: 02/14/97

Method: WTPH-G

Field ID: MW-6A

Date Prepared: 02/20/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/21/97

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	10	
----------	----	--

Surrogate Recoveries

1,4-Difluorobenzene	146	%
---------------------	-----	---

Authorized By: 

Release Date: 3/3/97

Page:

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

TPH as Gasoline

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078070

Date Received: 02/18/97

Method: WTPH-G

Field ID: MW-16

Date Prepared: 02/20/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/20/97

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.13	U
----------	------	---

Surrogate Recoveries

1,4-Difluorobenzene	94	%
---------------------	----	---

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

TPH as Gasoline

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078071

Date Received: 02/18/97

Method: WTPH-G

Field ID: MW-15A

Date Prepared: 02/20/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/20/97

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.13	U
----------	------	---

Surrogate Recoveries

1,4-Difluorobenzene	94	%
---------------------	----	---

Authorized By: 

Release Date: 3/3/97

Page: 1

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

TPH as Gasoline

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078072

Date Received: 02/18/97

Method: WTPH-G

Field ID: MW-9A

Date Prepared: 02/20/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/20/97

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.13	U
----------	------	---

Surrogate Recoveries

1,4-Difluorobenzene	90	%
---------------------	----	---

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

TPH as Gasoline

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: 97078073

Date Received: 02/18/97

Method: WTPH-G

Field ID: MW-12A

Date Prepared: 02/20/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/20/97

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.13	U
----------	------	---

Surrogate Recoveries

L,4-Difluorobenzene	95	%
---------------------	----	---

Authorized By: *Karin Fidd*

Release Date: 3/13/97

Page: 1

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

TPH as Gasoline

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: BLN70376

Method: WTPH-G

Blank ID: OBW7049A1

Date Prepared: 02/18/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/18/97

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.13	U
----------	------	---

Surrogate Recoveries

1,4-Difluorobenzene	67	%
---------------------	----	---

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

TPH as Gasoline

Project Name: Restover Truck Stop

LIMS Project ID: 1081-97

Sample: **BLN70399**

Method: WTPH-G

Blank ID: OBW7051A1

Date Prepared: 02/20/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 02/20/97

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.13	U
----------	------	---

Surrogate Recoveries

1,4-Difluorobenzene	93	%
---------------------	----	---

Authorized By: *Karin Feldt*

Release Date: 3/3/97

Page: 1

Manchester Environmental Laboratory

7411 Beach DR E, Port Orchard Washington 98366

CASE NARRATIVE

August 14, 1997

Subject: Restover Truck Stop
Samples: 97328030 - 97328035
Case No. 145497
Officer: P.Marti
By: Myrna McIntosh *M*
Organics Analysis Unit

BTEX and WTPH-G Analysis of the Restover Truck Stop Project

SUMMARY:

Samples 97328030 - 97328035 were analyzed for WTPH-G. Sample 97328031 was spiked and analyzed in duplicate to provide QA for this project.

Use the ethylbenzene and xylene results from DIL1 for samples 97328034 and 97328035. Use the undiluted analysis of these samples for all other analysis.

All data are usable as reported.

METHODS:

These water samples were analyzed by purge and trap GC-PID and GC-FID. Methods WTPH-Gx and BTEX were used for analysis. These methods are a modification of EPA SW-846 methods 8000 and 5030.

BLANKS:

No analytes of interest were detected in the blank.

SURROGATES:

Most surrogate recoveries were within the control limits of 50 - 150%. High amounts of gasoline interfered with the quantitation of the surrogate in the BTEX analysis of some samples. These surrogate recoveries are not calculated (NC).

DUPLICATE AND SPIKED SAMPLES:

Sample 97328031 was analyzed in duplicate from replicate vials to provide precision data for the gasoline analysis. The relative percent difference (RPD) between the replicates is 78%. These replicates are actually field duplicates. However, the high RPD indicates non homogeneity between the sample vials. The data is not qualified.

Duplicate spiked samples were prepared from sample 97328031 to evaluate the BTEX recoveries. All spike recoveries were within +/- 25 % of the true value. All RPDs between the spikes are less than or equal to 5%. These ranges are acceptable for this analysis.

HOLDING TIMES:

Samples were analyzed within recommended holding times.

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 estimate.
- UJ - The analyte was not detected at or above the reported estimated result.
- REJ - The data are unusable for all purposes.
- NAF - Not analyzed for.
- N - There is evidence the analyte is present in this sample.
- NC - Not calculated
- NJ - There is evidence that the analyte is present. The associated numerical result is an estimate.
- E - This qualifier is used when the concentration of the associated value exceeds the known calibration range.
- bold** - The analyte was present in the sample. (Visual Aid to locate detected compound on report sheet.)

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1454-97

Sample: 97328030

Date Received: 08/07/97

Method: SW8020

Field ID: MW-31

Date Prepared: 08/08/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 08/08/97

Units: ug/L

Analyte	Result	Qualifier
Benzene	3.6	
Toluene	1.0	U
Ethylbenzene	1.0	U
m & p-Xylene	2.0	U
o-Xylene	1.0	U

Surrogate Recoveries

1,4-Difluorobenzene	103	%
---------------------	-----	---

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1454-97

Sample: 97328031

Date Received: 08/07/97

Method: SW8020

Field ID: MW-8A

Date Prepared: 08/08/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 08/08/97

Units: ug/L

Analyte	Result	Qualifier
Benzene	1.0	U
Toluene	1.0	U
Ethylbenzene	1.0	U
m & p-Xylene	2.0	U
o-Xylene	1.0	U

Surrogate Recoveries

1,4-Difluorobenzene	108	%
---------------------	-----	---

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1454-97

Sample: 97328031 (Matrix Spike - LMX1) Date Received: 08/07/97 Method: SW8020

Field ID: MW-8A Date Prepared: 08/08/97 Matrix: Water

Project Officer: Pam Marti Date Analyzed: 08/08/97 Units: % Recovery

Analyte	Result	Qualifier
---------	--------	-----------

Benzene	95	
---------	----	--

Toluene	96	
---------	----	--

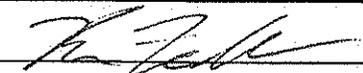
Ethylbenzene	98	
--------------	----	--

m & p-Xylene	99	
--------------	----	--

o-Xylene	97	
----------	----	--

Surrogate Recoveries

1,4-Difluorobenzene	104	%
---------------------	-----	---

Authorized By: 

Release Date: 8/13/97

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1454-97

Sample: 97328031 (Matrix Spike - LMX2) Date Received: 08/07/97 Method: SW8020

Field ID: MW-8A Date Prepared: 08/08/97 Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 08/08/97 Units: % Recovery

Analyte	Result	Qualifier
---------	--------	-----------

Benzene	92	
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Toluene	92	
---------	----	--

Ethylbenzene	96	
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m & p-Xylene	96	
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o-Xylene	94	
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Surrogate Recoveries

1,4-Difluorobenzene	104	%
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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1454-97

Sample: 97328032

Date Received: 08/07/97

Method: SW8020

Field ID: MS-20A

Date Prepared: 08/08/97

Matrix: Water

Project Officer: Pam Marti

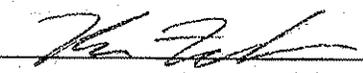
Date Analyzed: 08/08/97

Units: ug/L

Analyte	Result	Qualifier
Benzene	1.0	U
Toluene	1.0	U
Ethylbenzene	1.0	U
m & p-Xylene	2.0	U
o-Xylene	1.0	U

Surrogate Recoveries

1,4-Difluorobenzene	99	%
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Authorized By: 

Release Date: 8/14/97

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1454-97

Sample: 97328033

Date Received: 08/07/97

Method: SW8020

Field ID: MW-30

Date Prepared: 08/08/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 08/08/97

Units: ug/L

Analyte	Result	Qualifier
Benzene	1.0	U
Toluene	1.0	U
Ethylbenzene	1.0	U
m & p-Xylene	2.0	U
o-Xylene	1.0	U

Surrogate Recoveries

1,4-Difluorobenzene	128	%
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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1454-97

Sample: 97328034

Date Received: 08/07/97

Method: SW8020

Field ID: WDOE-6A

Date Prepared: 08/08/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 08/08/97

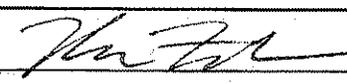
Units: ug/L

Analyte	Result	Qualifier
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Benzene	8.0	
Toluene	11	
Ethylbenzene	43	E
m & p-Xylene	110	E
o-Xylene	35	E

Surrogate Recoveries

1,4-Difluorobenzene	NC
---------------------	----

Authorized By: 

Release Date: 8/14/97

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1454-97

Sample: 97328034 (Dilution - DIL1)

Date Received: 08/07/97

Method: SW8020

Field ID: WDOE-6A

Date Prepared: 08/08/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 08/08/97

Units: ug/L

Analyte	Result	Qualifier
---------	--------	-----------

Benzene	10	U
Toluene	11	
Ethylbenzene	44	
m & p-Xylene	120	
o-Xylene	36	

Surrogate Recoveries

1,4-Difluorobenzene	140	%
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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1454-97

Sample: 97328035

Date Received: 08/07/97

Method: SW8020

Field ID: MW-6A

Date Prepared: 08/11/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 08/11/97

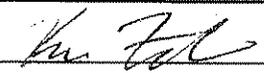
Units: ug/L

Analyte	Result	Qualifier
---------	--------	-----------

Benzene	8.0	
Toluene	11	
Ethylbenzene	44	E
m & p-Xylene	110	E
o-Xylene	36	E

Surrogate Recoveries

1,4-Difluorobenzene	NC
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Authorized By: 

Release Date: 8/14/97

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1454-97

Sample: 97328035 (Dilution - DIL1)

Date Received: 08/07/97

Method: SW8020

Field ID: MW-6A

Date Prepared: 08/11/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 08/11/97

Units: ug/L

Analyte	Result	Qualifier
---------	--------	-----------

Benzene	10	U
Toluene	11	
Ethylbenzene	41	
m & p-Xylene	110	
o-Xylene	34	

Surrogate Recoveries

1,4-Difluorobenzene	144	%
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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1454-97

Sample: BLN72058

Method: SW8020

Blank ID: OBW7220A2

Date Prepared: 08/08/97

Matrix: Water

Project Officer: Pam Marti

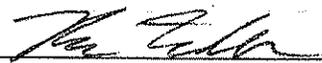
Date Analyzed: 08/08/97

Units: ug/L

Analyte	Result	Qualifier
Benzene	1.0	U
Toluene	1.0	U
Ethylbenzene	1.0	U
m & p-Xylene	2.0	U
o-Xylene	1.0	U

Surrogate Recoveries

1,4-Difluorobenzene	103	%
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Authorized By: 

Release Date: 8/14/97

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Benzene, Ethylbenzene, Toluene, Xylenes

Project Name: Restover Truck Stop

LIMS Project ID: 1454-97

Sample: BLEN72059

Method: SW8020

Blank ID: OBW7223A1

Date Prepared: 08/11/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 08/11/97

Units: ug/L

Analyte	Result	Qualifier
---------	--------	-----------

Benzene	1.0	U
Toluene	1.0	U
Ethylbenzene	1.0	U
m & p-Xylene	2.0	U
o-Xylene	1.0	U

Surrogate Recoveries

1,4-Difluorobenzene	102	%
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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Volatile petroleum products

Project Name: Restover Truck Stop

LIMS Project ID: 1454-97

Sample: 97328030

Date Received: 08/07/97

Method: NWTPH-GX

Field ID: MW-31

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 08/08/97

Units: ug/L

Analyte	Result	Qualifier
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Gasoline	160	
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Surrogate Recoveries

1,4-Difluorobenzene	104	%
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Authorized By: *Karin Fidd*

Release Date: 8/13/97

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Volatile petroleum products

Project Name: Restover Truck Stop

LIMS Project ID: 1454-97

Sample: 97328031

Date Received: 08/07/97

Method: NWTPH-GX

Field ID: MW-8A

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 08/08/97

Units: ug/L

Analyte	Result	Qualifier
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Gasoline	270	
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Surrogate Recoveries

1,4-Difluorobenzene	110	%
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Authorized By: *Pam Marti*

Release Date: 8/13/97

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Volatile petroleum products

Project Name: Restover Truck Stop

LIMS Project ID: 1454-97

Sample: 97328031 (Duplicate - LDPI)

Date Received: 08/07/97

Method: NWTPH-GX

Field ID: MW-8A

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 08/08/97

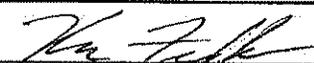
Units: ug/L

Analyte	Result	Qualifier
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Gasoline	610	
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Surrogate Recoveries

1,4-Difluorobenzene	114	%
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Authorized By: 

Release Date: 8/13/97

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Volatile petroleum products

Project Name: Restover Truck Stop

LIMS Project ID: 1454-97

Sample: 97328032

Date Received: 08/07/97

Method: NWTPH-GX

Field ID: MS-20A

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 08/08/97

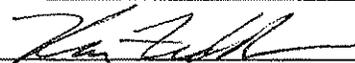
Units: ug/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	130	U
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Surrogate Recoveries

1,4-Difluorobenzene	105	%
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Authorized By: 

Release Date: 8/13/97

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Volatile petroleum products

Project Name: Restover Truck Stop

LIMS Project ID: 1454-97

Sample: 97328033

Date Received: 08/07/97

Method: NWTPH-GX

Field ID: MW-30

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 08/08/97

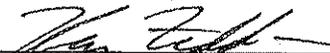
Units: ug/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	160	
----------	-----	--

Surrogate Recoveries

1,4-Difluorobenzene	105	%
---------------------	-----	---

Authorized By: 

Release Date: 8/13/97

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Volatile petroleum products

Project Name: Restover Truck Stop

LIMS Project ID: 1454-97

Sample: 97328034

Date Received: 08/07/97

Method: NWTPH-GX

Field ID: WDOE-6A

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 08/08/97

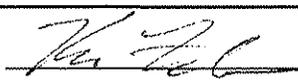
Units: ug/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	9010	
----------	------	--

Surrogate Recoveries

1,4-Difluorobenzene	133	%
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Authorized By: 

Release Date: 8/13/97

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Volatile petroleum products

Project Name: Restover Truck Stop

LIMS Project ID: 1454-97

Sample: 97328035

Date Received: 08/07/97

Method: NWTPH-GX

Field ID: MW-6A

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 08/08/97

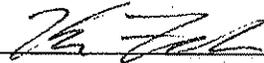
Units: ug/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	6980	
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Surrogate Recoveries

1,4-Difluorobenzene	131	%
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Authorized By: 

Release Date: 8/13/97

Page:

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Volatile petroleum products

Project Name: Restover Truck Stop

LIMS Project ID: 1454-97

Sample: BLN72058

Method: NWTPH-GX

Blank ID: OBW7220A2

Date Prepared: 08/08/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 08/08/97

Units: ug/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	130	U
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Surrogate Recoveries

1,4-Difluorobenzene	103	%
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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Volatile petroleum products

Project Name: Restover Truck Stop

LIMS Project ID: 1454-97

Sample: **BLN72059**

Method: NWTPH-GX

Blank ID: OBW7223A1

Date Prepared: 08/11/97

Matrix: Water

Project Officer: Pam Marti

Date Analyzed: 08/11/97

Units: ug/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	130	U
----------	-----	---

Surrogate Recoveries

1,4-Difluorobenzene	104	%
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Authorized By: *Pam Marti*

Release Date: 8/13/97

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