



STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

7171 Cleanwater Lane, Building 8, LH-14 • Olympia, Washington 98504

June 5, 1991

TO: Mike Kuntz  
FROM: Pam Marti and Dave Serdar  
SUBJECT: Restover Truck Stop Ground Water Monitoring Round Six.

INTRODUCTION

The sixth round of ground water monitoring at the Restover Truck Stop was completed by the Toxics Investigations and Ground Water Monitoring Section on February 11-13, 1991. Two domestic supply and six monitoring wells were sampled for benzene, toluene, ethylbenzene, and total xylenes (BTEX) and dissolved iron. Figure 1 shows the locations of the wells sampled. Monitoring well MW-17 was sampled to assess the possibility that the contaminant plume had spread northward. Monitoring well 12A, a lower aquifer well previously showing detectable quantities of BTEX, was not sampled because the well casing had recently been destroyed. Monitoring well MW-16 was sampled in it's place.

METHODS

Ground Water Sampling

Prior to sample collection, static water level measurements were obtained from 13 onsite wells using an electronic water level indicator which was rinsed with deionized water and wiped clean between measurements. Prior to sampling, monitoring wells (Figure 1) were purged with either a centrifugal pump or decontaminated teflon bailer until pH, temperature, and conductivity readings stabilized, and a minimum of three well volumes had been removed (Table 1). Purge water for all wells, except WDOE-6A, were discharged onto the ground near each well. Purge water for WDOE-6A was collected and treated with a series of activated granulated carbon filters.

Wells were sampled in order of increasing contamination, based on previous data. Monitoring well samples were collected using decontaminated, bottom-emptying teflon bailers. Supply wells

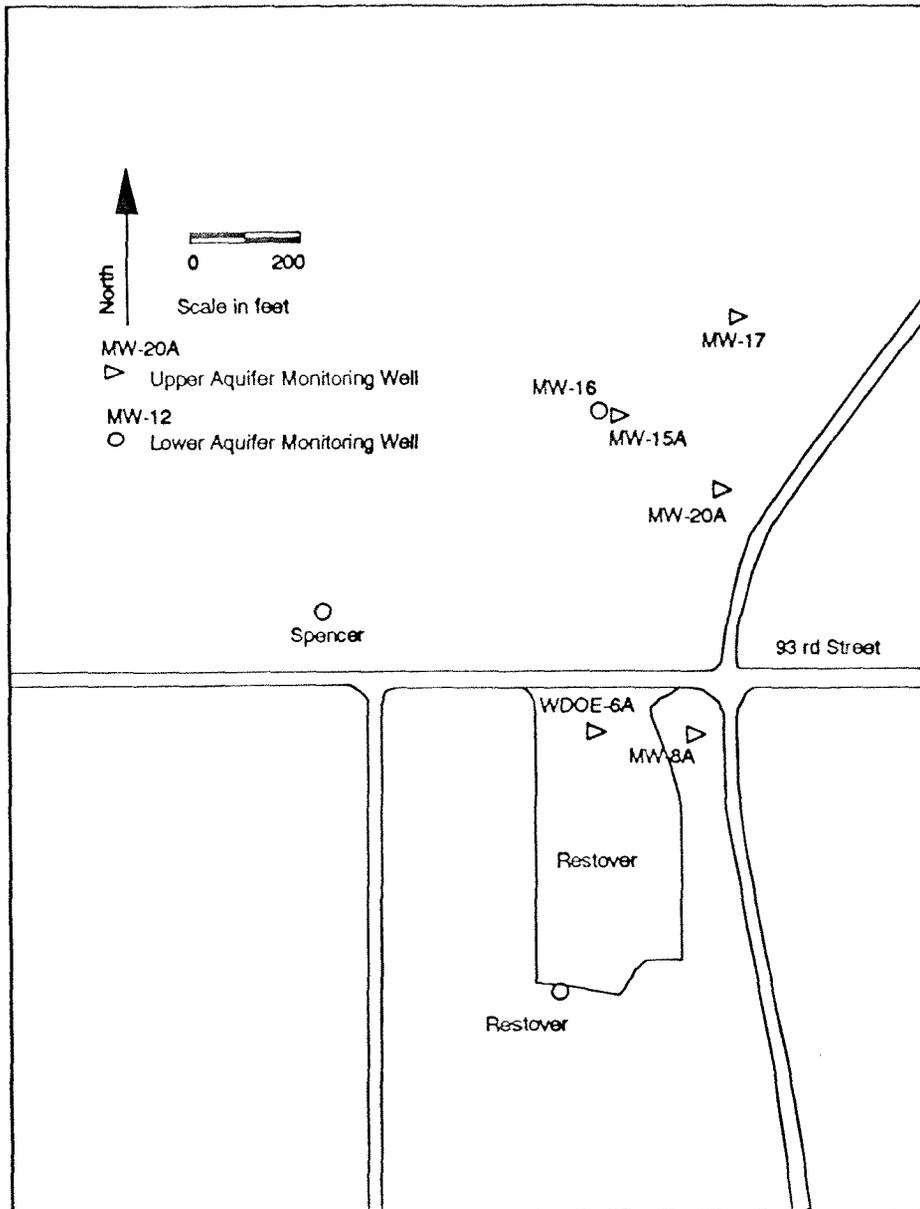


Figure 1: Sampling Locations, Restover Truck Stop

Round VI - February 1991

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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 determinations were filtered in the field through a dedicated, in-line, 0.45 um polycarbonate membrane filter and preserved with 1 ml of nitric acid to a pH < 2.

Prior to sample collection, field equipment (i.e., bailers) were pre-cleaned with sequential washes of Liquinox wash, hot tap water rinse, 10 percent nitric acid/distilled-deionized water, and pesticide-grade acetone, then air-dried and wrapped in aluminum foil until being used in the field. The peristaltic pump and tubing used for filtration of dissolved iron samples was rinsed between samples using 500 ml of a 10 percent nitric acid followed by 500 ml of deionized water. Chain-of-custody procedures were followed in accordance with Manchester Laboratory protocol (Huntamer 1986).

#### Quality Assurance

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

Quality assurance review for volatile organics was performed by Stuart Magoon and metals by Steve Twiss. All data are considered acceptable for use. The transfer, transport, and method blank results showed no field or laboratory contamination of samples by BTEX. Both the transport and filter blank analytical results showed a trace of iron contamination. However, the method blank analyses performed by the laboratory showed trace contamination. Samples containing iron concentrations within a factor of five of the concentrations found in the blanks were flagged with a "B". Matrix spike and surrogate recoveries for BTEX and iron were all within acceptable QC limits.

Duplicate samples were obtained to estimate overall precision (sampling and laboratory variability). However, benzene, toluene, and ethylbenzene were not detected in the field duplicates at a detection level of 10 ug/L. Xylenes and iron were detected in both of the field duplicate samples yielding relative percent differences (range as a percent of the mean) of 11% and 3%, respectively.

Field Observations

Water purged from monitoring wells MW-20A and WDOE-6A had a distinct gasoline odor and cloudy appearance, as in previous observations. MW-18A, the well situated farthest north, was dry. MW-27A, which had been dry in the past, had a measurable water elevation. Well casings from MW-12 had been severed at ground level and is no longer suitable for static water level measurements or sampling.

Table 1 shows the water level elevations in onsite wells. Figure 2 shows the potentiometric surface in the upper aquifer. Table 2 lists pH, temperature and specific conductance results.

Table 1: Water Table Elevations (MSL)

<u>Well ID</u>	<u>Elevation (MSL)</u>
Upper Aquifer	
WDOE-1	186.99
WDOE-6A	187.37
MW-7A	INACCESSIBLE
MW-8A	186.99
MW-15A	<b>186.51</b>
MW-17	186.30
MW-18A	DRY
MW-20A	186.76
MW-23A	185.72
MW-24A	187.39
MW-26A	185.54
MW-27A	186.91
MW-29A	185.16
Lower Aquifer	
MW-12	CASING SEVERED
MW-16	<b>185.79</b>

Note: Values in bold print indicate elevations measured 2/12/91. Other measurements were made 2/8/91.

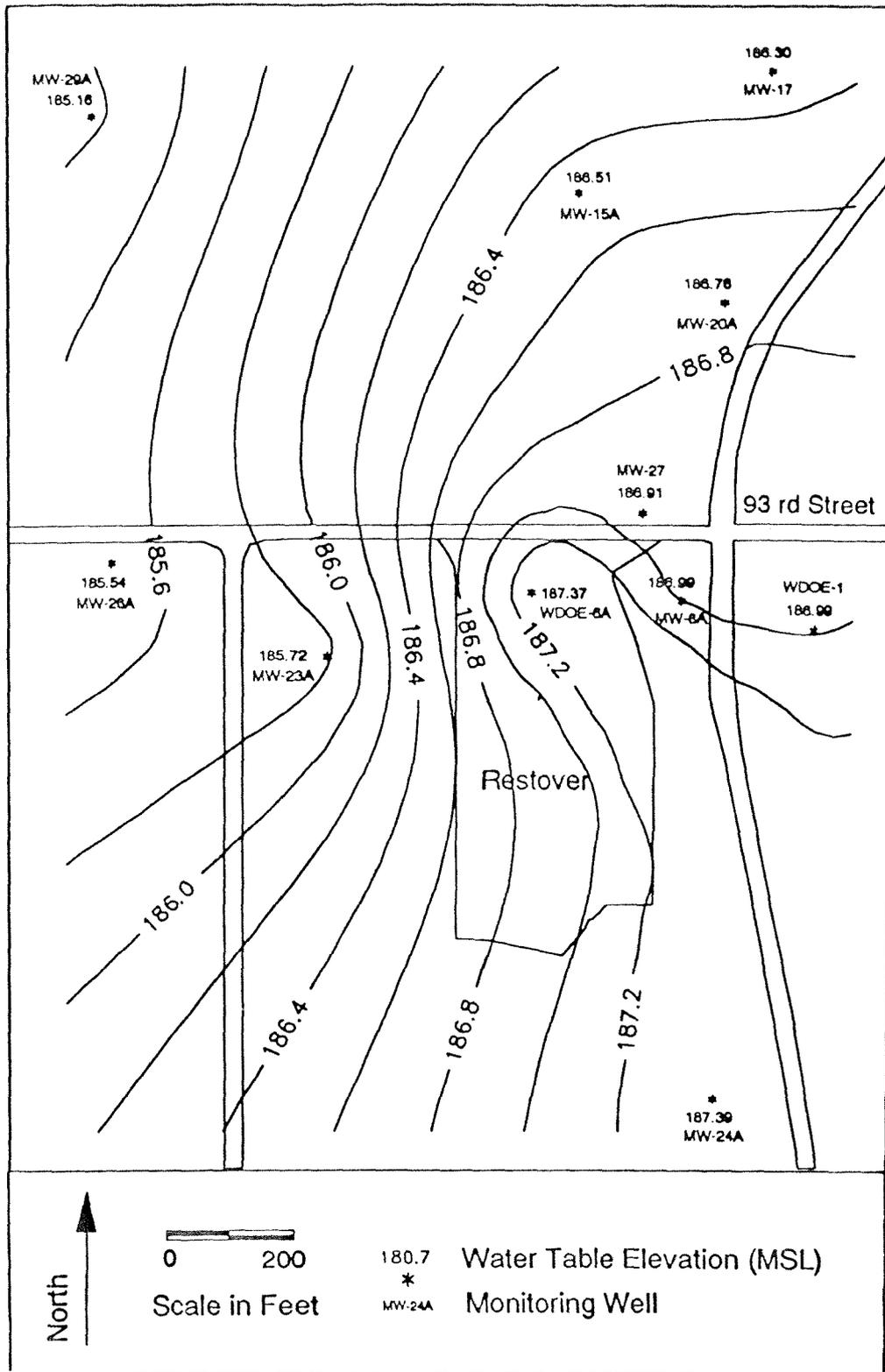


Figure 2: Restover Truck Stop  
Water Table Map, February 1991

Table 2: Field Sampling Results (In Order Sampled)

Well ID	pH (standard units)	Specific Conductance (umhos/cm)	Temperature (degrees C)	Purge Volume (gals)	Aquifer (Upper/ Lower)
Spencer	6.51	70	9.8	300	L
MW-17	6.17	53	9.4	9	U
Restover	6.48	105	10.3	125	L
MW-8A	6.25	94	10.3	6	U
MW-16	6.30	65	12.5	36	L
MW-15A	6.31	142	11.4	15	U
MW-20A	6.31	66	11.4	12	U
WDOE-6A	6.44	160	13.9	45	U

#### ANALYTICAL RESULTS

Analytical results for BTEX and dissolved iron are presented in Table 3. Table 4 shows BTEX concentrations for sampling events between May 1987 and May 1991. BTEX analyses were performed by Analytical Resources, Inc., in Seattle. Dissolved iron analyses were performed by the Ecology/EPA Laboratory in Manchester.

Table 3: Analytical Results (ug/L)

Well ID	Benzene	Toluene	Ethylbenzene	Total Xylenes	Dissolved Iron
Spencer	1.0u	1.0u	1.0u	2.0u	16 B,J
MW-17	1.0u	1.0u	1.0u	2.0u	15 B,J
Restover	1.0u	1.0u	1.0u	2.0u	16 B,J
MW-8A	10u	10u	10u	18 J	3030
MW-8B	10u	10u	10u	20	3120
MW-16	1.0u	1.0u	1.0u	2.0u	10 B,J
MW-15A	51	10	23	38	29 B,J
MW-20A	1.0u	1.0u	1.4	3.2	10 B,J
MW-6A	340	900	420	1800	3320
Transfer	1.0u	1.0u	1.0u	2.0u	NA
Transport	10u	10u	10u	20u	4.8 B,J
Filter	NA	NA	NA	NA	10 B,J

B: Analyte also Detected in Associated Blanks

J: Concentration is Estimated

u: Not Detected at Detection Limit Shown

NA: Analyte Not Analyzed

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

Well ID	5/87	9/87	10/88	1/89	7/89	1/90	8/90	2/91
Upper Aquifer								
WDOE-6A	6950	1180	5300	28000	7490	9870	5190	3460
MW-8A	230	388	479	334	58	14	178	19
MW-15A	1433	NT	NT	ND	218	NT	285	122
MW-20A	126	NT	NT	NT	NT	20	1400	5
Lower Aquifer								
Restover	NT	NT	ND	ND	ND	ND	ND	ND
Spencer	ND	NT	NT	ND	ND	ND	ND	ND
MW-12	53	5	8	ND	4	ND	6	NT

ND: Compound Not Detected  
 NT: Compound Not Tested

#### DISCUSSION

Groundwater flow in the upper aquifer appears to be northwesterly as it has been in the past. The degree of hydrocarbon contamination in the upper aquifer appears to be stable.

Detectable concentrations of BTEX were found in four of the eight wells sampled. Wells which contained BTEX (WDOE-6A, MW-8A, MW-15A, and MW-20A) are located in the upper aquifer. None of the three lower aquifer wells, including two domestic supply wells, had measurable quantities of BTEX. Samples from WDOE-6A had all four BTEX compounds, with a total concentration of 3460 ug/L. Well WDOE-6A continues to have the highest concentration of any of the wells sampled. Total BTEX concentrations measured at MW-8A and MW-15A were 19 ug/L and 122 ug/L, respectively. Xylenes were the only BTEX constituent found in MW-8A while MW-15A had detectable concentrations of all four BTEX components. MW-20A showed the greatest change in BTEX concentrations (5 ug/L), down from 1400 ug/L in August 1990. This is the lowest concentration measured at MW-20A yet similar to concentrations measured the previous winter. Xylenes and ethylbenzene were detected in MW-20A. Overall, BTEX concentrations appear to be decreasing compared to historical data.

Dissolved iron was found at appreciable concentrations in wells WDOE-6A and MW-8A. Other wells had detectable levels of iron but all were within five times the concentration in the method blank. As previously stated, dissolved iron concentrations within a factor of five of the method blank cannot be considered real but rather the result of contamination of that blank.

One of the sampling wells was inaccessible and the casing of another was destroyed. MW-7A was used to measure water table elevations in the upper aquifer but has recently been covered over with gravel fill. MW-12 was a lower aquifer well in which BTEX contamination had been detected in the past. The casing was found severed at ground level and it can no longer function as a monitoring well in its present state.

#### CONCLUSIONS

1. BTEX concentration continues to be elevated in WDOE-6A, although concentrations appear to be decreasing.
2. All four wells in which BTEX was detected had low concentrations compared to historical data. Contaminant migration, reduction in quantity of contaminants, or seasonal fluctuations may account for the low concentrations.
3. Concentrations of dissolved iron also appeared to have decreased compared to previous sampling rounds.

#### RECOMMENDATIONS

1. Monitoring wells WDOE-6A, MW-8A, MW-15A, MW-16, 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, perhaps MW-23A or MW-26A, should be sampled for dissolved iron and BTEX to assess contaminant migration in that direction.
2. All of the upper aquifer wells should be sampled for BTEX and dissolved iron to determine the current extent of the contamination plume. This has not been done since September 1987.

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3. Monitoring wells MW-7A and MW-12A should be either recovered or abandoned. Wells should be abandoned in accordance with WAC 173-160-560 of Minimum Standards for Construction and Maintenance of Wells.

PM/DS:krc

cc: Bill Yake

State of Washington Department of Ecology  
Manchester Environmental Laboratory  
7411 Beach Dr. East Port Orchard WA. 98366

Data Review  
March 22, 1991

Project: Restover Truck Stop

Samples: 078080 078081 078082 078083 078084 078085  
078086 078087 078088 078089 078090

Laboratory: Analytical Resources Inc. 7764

By: Stuart Magoon *SM*

### Case Summary

All samples were received in good condition on February 12 and 13, 1991. The samples were then transported to Analytical Resources Inc. for analysis, and arrived in good condition on February 14, 1991.

These analyses were reviewed for qualitative and quantitative accuracy, validity, and usefulness.

All eleven samples were analyzed by EPA method 8020 for Benzene, Ethylbenzene, Toluene, and Total Xylenes.

## BETX

Sample	Date Collect	Date Extd	Date Anlz	#Days Collect to anal
078080	2/11	NA	2/21	10 of 14
078081	2/11	NA	2/21	10 of 14
078082	2/11	NA	2/21	10 of 14
078083	2/12	NA	2/21	9 of 14
078084	2/11	NA	2/21	10 of 14
078085	2/11	NA	2/21	10 of 14
078086	2/12	NA	2/21	9 of 14
078087	2/13	NA	2/21	8 of 14
078088	2/13	NA	2/21	8 of 14
078089	NA	NA	2/21	NA
078090	NA	NA	2/21	NA

NA = Not applicable

These samples were analyzed within the SW-846 recommended holding time.

### Surrogates:

Surrogate recoveries for all these samples, and the associated method blank are reasonable, acceptable and within the advisory QC limits.

### Sample Data:

This data is acceptable for use without the need for additional data qualifiers.







**ANALYTICAL  
RESOURCES  
INCORPORATED**

Analytical  
Chemists &  
Consultants  
333 Ninth Ave. North  
Seattle, WA 98109-5187  
(206) 621-6490  
(206) 621-7523 (FAX)

**ORGANICS ANALYSIS DATA SHEET - Method 602/8020  
BETX by GC-PID**

QC Report No: 7764 -WDOE

Matrix: Water  
Level: Low

Project: Restover  
Date Received: 02/14/91

Data Release Authorized: David N. Rife  
Report prepared: 03/01/91 - MAC:D jv

		SPENCER	RESOVER	MW-17	MW-16	MW-2A
Sample No.	Method Blk	#078080	#078081	#078082	#078083	#078084
ARI ID	MB 2/21	7764 A	7764 B	7764 C	7764 D	7764 E
Date Analyzed	02/21/91	02/21/91	02/21/91	02/21/91	02/21/91	02/21/91
Amt Analyzed	5.00 mls	5.00 mls	5.00 mls	5.00 mls	5.00 mls	0.50 mls
CAS Number	Units	µg/L	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene	1.0 U	1.0 U	1.0 U	1.0 U	10 U
108-88-3	Toluene	1.0 U	1.0 U	1.0 U	1.0 U	10 U
100-41-4	Ethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U	10 U
1330-20-7	Total Xylenes	2.0 U	2.0 U	2.0 U	2.0 U	<del>18.19 U</del>
	Trifluorotoluene	98.7%	100%	101%	97.2%	96.9%
	Bromobenzene	99.1%	98.6%	101%	97.0%	96.7%

		MW-8B	MW-15A	MW-20A	MW-6A	TRANSPER	TRANSPORT
Sample No.	Method Blk	#078085	#078086	#078087	#078088	#078089	#078090
ARI ID	7764 F	7764 G	7764 H	7764 I	7764 J	7764 K	7764 L
Date Analyzed	02/21/91	02/21/91	02/21/91	02/21/91	02/21/91	02/21/91	02/21/91
Amt Analyzed	0.50 mls	5.00 mls	5.00 mls	0.50 mls	5.00 mls	0.50 mls	0.50 mls
CAS Number	Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
71-43-2	Benzene	10 U	51	1.0 U	340	1.0 U	10.0 U
108-88-3	Toluene	10 U	10	1.0 U	900	1.0 U	10.0 U
100-41-4	Ethylbenzene	10 U	23	1.4	420	1.0 U	10.0 U
1330-20-7	Total Xylenes	20	38	3.2	1800	2.0 U	20.0 U
	Trifluorotoluene	97.6%	99.5%	94.0%	97.9%	94.4%	92.1%
	Bromobenzene	97.0%	97.5%	95.8%	98.7%	95.9%	93.6%

Value If the result is a value greater than or equal to the detection limit, report the value.

U Indicates compound was analyzed for but not detected at the given detection limit.

J Indicates an estimated value when result is less than specified detection limit.

B This flag is used when the analyte is found in the blank as well as a sample. Indicates possible/probable blank contamination.

K This flag is used when quantitated value falls above the limit of the calibration curve and dilution should be run.

NR Analysis not required.

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

April 3, 1991

TO: Pam Marti  
FROM: Steve Twiss  
SUBJECT: QA memo, Restover Truckstop project

**SAMPLE RECEIPT:**

The samples from the Restover Truckstop project were received by the Manchester Laboratory on 2/12/91 in good condition.

**HOLDING TIMES:**

All analyses were performed within the specified holding times for metals analysis (180 days).

**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 control limits of +/- 10%.

**PROCEDURAL BLANKS:**

A trace amount of iron (9.6 ppb) was detected in the procedural blanks associated with these samples.

**SPIKED SAMPLE ANALYSIS:**

Spiked sample and duplicate spiked sample analysis were performed on sample number 078080. All spike recoveries were within the acceptable limits of +/- 25% for water sample analysis.

**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 well

within the +/- 20% window for duplicate analysis.

**STANDARD REFERENCE MATERIAL:**

Standard reference material or external verification standards were all within the windows established for each parameter.

**ICP SERIAL DILUTION ANALYSIS:**

The Relative Percent Difference (RPD) between sample results and the results for a serial dilution of the same sample were less than 10%.

**SUMMARY:**

The data generated by the analysis of the above referenced samples can be used without qualification.

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

cc Bill Kammin

Transaction #: 04040804                      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:                      (CQJ) Jackson, Carol            DOE            Hours Worked:  
 Project: DOE-024Y RESTOVER TRUCKSTOP                      Prg Ele#: D3K01  
 Prj Off: Marti, Pam                      DOE            Analysis Due: 910212    Revised Due:

## \*\*\* Sample Records in Transaction \*\*\*

Parameter Form File: ICP381101    Title: ICP Scan, Water Dissolved

Seq#	Sample #	QA	Date/Time	Description	Alternate Keys
01	91078080		910211	SPENCER	
02	91078080	LMX1	910211	SPENCER	
03	91078080	LMX2	910211	SPENCER	
04	91078081		910211	RESTOVER	
05	91078082		910211	MW-17	
06	91078083		910212	MW-16	
07	91078084		910211	MW-8A	
08	91078085		910211	MW-8B	
09	91078086		910212	MW-15A	
10	91078087		910213	MW-20A	
11	91078088		910213	MW-6A	
12	91078090		910211	TRANSPOR	
13	91078091		910211	FILTER	
14	91078080	LBK1	910211	SPENCER	

Record Type: TRNIN1                      Date Verified: 4/10/91                      By: [Signature]  
 Transaction Status: New Transaction...First Printing...Unverified.  
 Processed: 4-APR-91 08:10:18                      Status: N    Batch:                      (In CUR DB)

Transaction #: 04040804

(38) Metals - ICP Scan

Proj Code : DOE-024Y RESTOVER TRUCKSTOP

PE # : D3K01

Sample Number:	91078080	91078080	91078080	91078081	91078082
Sample Description:	SPENCER	SPENCER	SPENCER	RESTOVER	MW-17
Matrix:	Water-Fil	Water-Fil	Water-Fil	Water-Fil	Water-Fil
Units:		% Recov	% Recov		
% Slds:					
QA Code:		LMX1	LMX2		
Date Extract:					
Date Analyzsd:	910228	910228	910228	910228	910228
1 Aluminum Al-Diss	ug/l				
2 Antimony Sb-Diss	ug/l				
3 Arsenic As-Diss	ug/l				
4 Barium Ba-Diss	ug/l				
5 Beryllium Be-Diss	ug/l				
6 Boron B -Diss	ug/l				
7 Cadmium Cd-Diss	ug/l				
8 Calcium Ca-Diss	ug/l				
9 Chromium Cr-Diss	ug/l				
10 HexChrom Cr6Diss	ug/l				
11 Cobalt Co-Diss	ug/l				
12 Copper Cu-Diss	ug/l				
13 Iron Fe-Diss	ug/l	16JB	104	104	16JB 15JB
14 Lead Pb-Diss	ug/l				
15 Mngsium Mg-Diss	ug/l				
16 Mangnese Mn-Diss	ug/l				
17 Molybdnm Mo-Diss	ug/l				
18 Nickel Ni-Diss	ug/l				
19 PotassiumK -Diss	ug/l				
20 Selenium Se-Diss	ug/l				
21 Silicon Si-Diss	ug/l				
22 Silver Ag-Diss	ug/l				
23 Sodium Na-Diss	ug/l				
24 Strntium Sr-Diss	ug/l				
25 Thallium Tl-Diss	ug/l				
26 Tin Sn-Diss	ug/l				
27 Titanium Ti-Diss	ug/l				
28 Tungsten W -Diss	ug/l				
29 Vanadium V -Diss	ug/l				
30 Zinc Zn-Diss	ug/l				

Transaction #: 04040804 (38) Metals - ICP Scan  
roj Code : DOE-024Y RESTOVER TRUCKSTOP PE # : D3K01

Sample Number: 91078083 91078084 91078085 91078086 91078087  
Sample Description: MW-16 MW-8A MW-8B MW-15A MW-20A  
Matrix: Water-Fil Water-Fil Water-Fil Water-Fil Water-Fil  
Units:

Slits:

Slits:

Slits:

Sample Extract: 910228 910228 910228 910228 910228  
Sample Analyzed: 910228 910228 910228 910228 910228

Element	Al-Diss	Sb-Diss	As-Diss	Ba-Diss	Be-Diss	B -Diss	Cd-Diss	Ca-Diss	Cr-Diss	Cr6Diss	Co-Diss	Cu-Diss	Fe-Diss	Mg-Diss	Mn-Diss	Mo-Diss	Ni-Diss	PotassiumK -Diss	Se-Diss	Si-Diss	Ag-Diss	Na-Diss	Sr-Diss	Tl-Diss	Sn-Diss	Ti-Diss	W -Diss	V -Diss	Zn-Diss	
1 Aluminum	ug/l																													
2 Antimony	ug/l																													
3 Arsenic	ug/l																													
4 Barium	ug/l																													
5 Beryllium	ug/l																													
6 Boron	ug/l																													
7 Cadmium	ug/l																													
8 Calcium	ug/l																													
9 Chromium	ug/l																													
10 HexChrom	ug/l																													
11 Cobalt	ug/l																													
12 Copper	ug/l																													
13 Iron	ug/l										10JB																			
14 Lead	ug/l																													
15 Manganese	ug/l																													
16 Manganese	ug/l																													
17 Molybdenum	ug/l																													
18 Nickel	ug/l																													
19 PotassiumK	ug/l																													
20 Selenium	ug/l																													
21 Silicon	ug/l																													
22 Silver	ug/l																													
23 Sodium	ug/l																													
24 Strontium	ug/l																													
25 Thallium	ug/l																													
26 Tin	ug/l																													
27 Titanium	ug/l																													
28 Tungsten W	ug/l																													
29 Vanadium V	ug/l																													
30 Zinc	ug/l																													

10JB 3030 3120 28.8B 10JB

Transaction #: 04040804 (38) Metals - ICP Scan  
 Proj Code : DOE-024Y RESTOVER TRUCKSTOP PE # : D3K01

Blank ID: PB 09.10  
 Sample Number: 91078088 91078090 91078091 91078080  
 Sample Description: MW-6A TRANSPOR FILTER SPENCER  
 Matrix: Water-Fil Water-Fil Water-Fil Water-Fil  
 Units:  
 % Slds:  
 QA Code: LBK1  
 Date Extract:  
 Date Analyzd: 910228 910228 910228 910228

	910228	910228	910228	910228
1 Aluminum Al-Diss ug/l				
2 Antimony Sb-Diss ug/l				
3 Arsenic As-Diss ug/l				
4 Barium Ba-Diss ug/l				
5 Beryllium Be-Diss ug/l				
6 Boron B -Diss ug/l				
7 Cadmium Cd-Diss ug/l				
8 Calcium Ca-Diss ug/l				
9 Chromium Cr-Diss ug/l				
10 HexChrom Cr6Diss ug/l				
11 Cobalt Co-Diss ug/l				
12 Copper Cu-Diss ug/l				
13 Iron Fe-Diss ug/l	3320	4.8JB	10JB	9.6J
14 Lead Pb-Diss ug/l				
15 Mgnsium Mg-Diss ug/l				
16 Mangnese Mn-Diss ug/l				
17 Molybdnm Mo-Diss ug/l				
18 Nickel Ni-Diss ug/l				
19 PotassiumK -Diss ug/l				
20 Selenium Se-Diss ug/l				
21 Silicon Si-Diss ug/l				
22 Silver Ag-Diss ug/l				
23 Sodium Na-Diss ug/l				
24 Strntium Sr-Diss ug/l				
25 Thallium Tl-Diss ug/l				
26 Tin Sn-Diss ug/l				
27 Titanium Ti-Diss ug/l				
28 Tungsten W -Diss ug/l				
29 Vanadium V -Diss ug/l				
30 Zinc Zn-Diss ug/l				