

WASHINGTON STATE DEPARTMENT OF ECOLOGY
ENVIRONMENTAL INVESTIGATIONS AND LABORATORY SERVICES

M E M O R A N D U M

TO: Mike Kuntz, Hazardous Waste Cleanup Investigations Program

FROM: Laura Chern, Toxics Investigations/Ground Water Monitoring
Laura Chern

SUBJECT: Sampling at the Restover Truck Stop

DATE: December 27, 1988

Introduction

Ground water samples were collected at the Restover Truck Stop State Superfund Site on October 17-19, 1988. This memo summarizes sampling procedures, field observations and suggestions for future work at the site. Laboratory analysis have not yet been received and will be presented in a future memo.

Observations Prior to Sampling

On October 17th, prior to sample collection, each monitoring well was inspected and static water level measurements were taken in 18 wells located on site (see Table 1). An electric probe was used to measure the static water levels. MW-8A and the Crapo domestic well were substituted for wells MW-15A and MW-27A, which were dry.

Table 1. Water Level Measurements (October 17, 1988)

Well ID	Total Depth to Water (feet)	Aquifer U/L
Restover	20.65	Lower
MW-12	19.55	Lower
MW-16	18.00	Lower
WDOE-1	21.97	Upper
WDOE-2	19.84	Upper
WDOE-6A	19.13	Upper
MW-7A	19.12	Upper
MW-8A	21.47	Upper
MW-17	18.20	Upper
MW-18A	16.91	Upper
MW-21	19.84	Lower
MW-23A	19.05	Upper
MW-26A	17.33	Upper
MW-29A	16.80	Upper
MW-15A	dry	Upper
MW-20A	dry	Upper
MW-24A	dry	Upper
MW-22	dry	Upper
MW-27A	dry	Upper

Sampling Procedures

On October 18th and 19th, ground water samples were collected from 11 wells on and adjacent to the Restover site. Field parameters, pumping rates and static water level measurements are listed in Table 2 in the order wells were sampled. Wells located in the lower aquifer were sampled first, followed by wells in the upper aquifer in order from lower to higher concentration of BTX based on previous sampling results. Monitoring wells were purged using a centrifugal pump until pH, temperature, and conductivity measurements were stable. Purge water was stored in barrels on-site until it could be cleaned using an activated carbon filter (ACF). Domestic systems were purged by running the pump until field parameters were stable. Domestic well samples were collected at the tap nearest the pump. At least 3 well volumes were removed from all the wells prior to sampling. Samples from monitoring wells were collected using decontaminated bottom-emptying teflon bailers. Metals samples from monitoring wells were field filtered using 0.45 micron filters and preserved using ultra pure reagent grade nitric acid. VOA bottles were filled so that no air remained in the vials. All samples were stored at 4 degrees centigrade.

Decontamination Procedures

Bailers were decontaminated using a Liquinox wash, 3 tap water rinses, and one deionized water rinse. All teflon equipment was rinsed with nitric acid, methylene chloride, and acetone. A transfer blank was taken prior to sampling at MW-29A to determine the effectiveness of the decontamination procedure. The peristaltic pump, filter holder, pre-filters and filters used for metals samples were rinsed before sample collection with 500 ml of a 10 percent nitric acid solution followed by 500 ml of deionized water. A filter blank was taken after field cleaning the filter holder at MW-29A.

Quality Control/Quality Assurance

Five quality assurance samples including a duplicate, matrix spike duplicate, replicate, transfer blank, transport blank, and filter blank were analyzed. MW-18A and MW-18C are duplicate samples, MW-18B is a replicate taken one day later. This well was chosen because it has shown some contamination in the past at low levels. A matrix spike duplicate was taken at MW-17. Transport and transfer blanks for VOAs and metals consisted of organic free water.

Table 2. Field Sampling Results

Well ID	pH	Conductivity (umohs)	Temperature (degrees C)	TDW (ft)	Discharge (gal/min)	Aquifer Upper/Lower
Restover	5.8	95	10.9	20.67	12.8	Lower
Crapo	6.2	85	11.3	12.68	8.0	Upper
MW-16	5.9	60	11.5	18.00	1.5	Lower
MW-12	6.1	130	12.5	19.6	2.0	Lower
MW-18A	5.7	45	11.5	17.77	3.0	Upper
MW-17	5.7	55	11.1	18.25	1.0	Upper
Felker	6.1	82	11.3	17.95	11.5	Lower
MW-26A	6.1	59	13.1	17.33	1.9	Upper
MW-29A	6.4	130	11.7	16.86	3.0	Upper
MW-18B	5.9	45	13.7	17.77	1.0	Upper
MW-8A	5.9	340	13.6	21.49	-*	Upper
WDOE-6A	6.3	300	19.2	19.19	0.5	Upper

* This well was purged using a bailer.

Additional Field Observations

1. Wells MW-8A, WDOE-6A, and MW-12 had strong hydrocarbon odors. MW-12 is screened in the lower aquifer located near the Wells domestic well which draws water from the same depth.
2. A cut-bailer was used to measure product thickness in areas where floating product was suspected. No discernible thickness of product was observed in any of the wells on-site.

Suggestions for Site Improvement

1. Wells MW-18A, MW-17, MW-26A, MW-29A, MW-8A, and WDOE-6A were turbid and need further development. This can be done either by over pumping or plunging the wells prior to the next sampling round.
2. Well MW-22 and the Restover supply well need to be resurveyed; The casing for MW-22 is bent and the Restover well sampling location elevation is unknown.
3. The Crapo domestic well may be too far from the site to have contamination related to the BTX plume. It does not seem appropriate to continue sampling this well unless contaminants are detected in the October analysis results.

Future Sampling

The second round of ground water sampling at the Restover Truck Stop Site is scheduled for January 9-11, 1989. Static water level measurements will be taken in 26 wells (see map) using an electric probe.

Twelve wells will be sampled for chloride, dissolved iron, nitrate/nitrite, and VOAs. Table 3 lists the rationale for sampling each well. Purge water removed from monitoring wells will be cleaned using an ACF. In order to test the effectiveness of the ACF, a sample will be collected and analyzed for VOAs. Ground water samples will be collected in the same manner as described above.

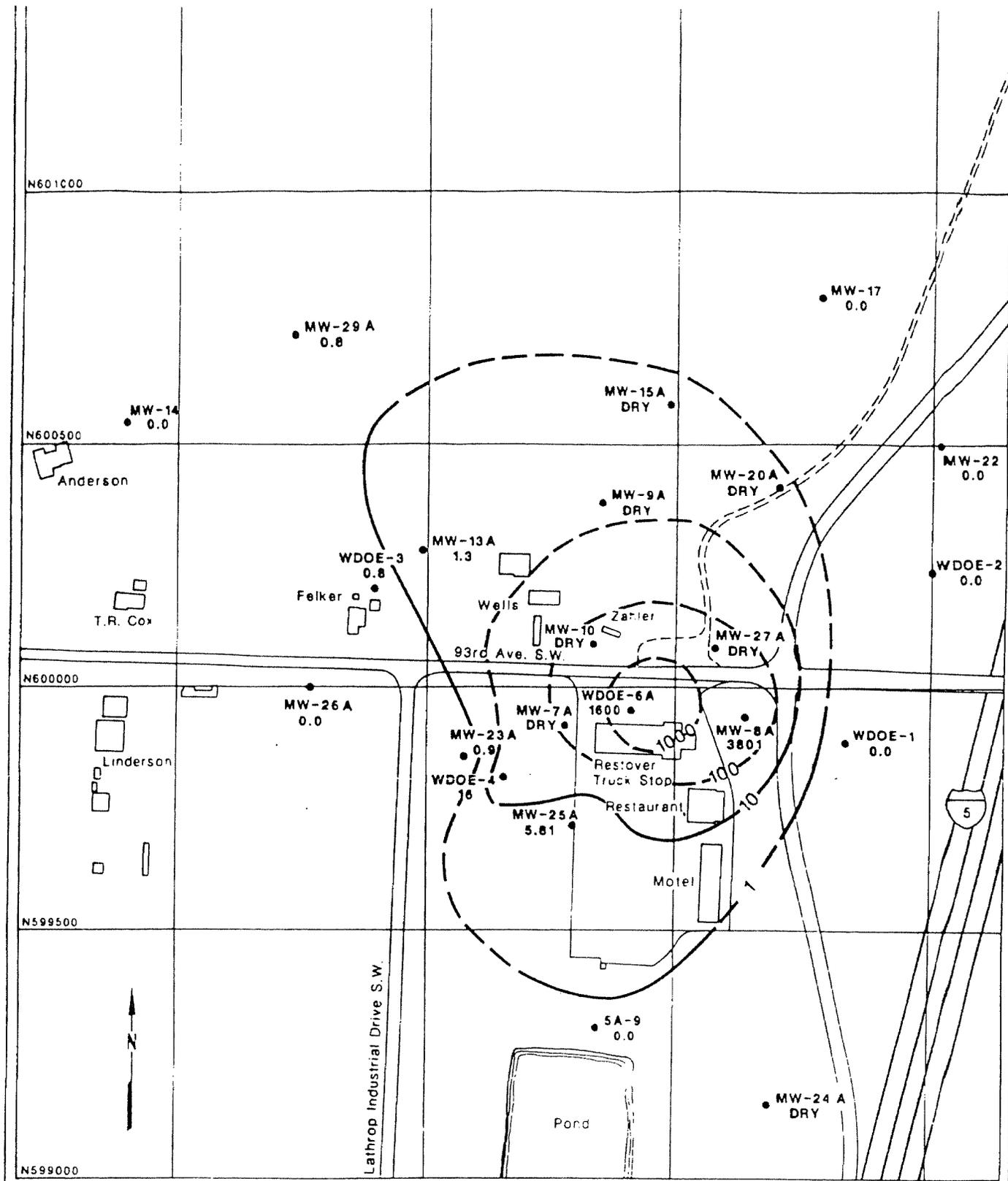
Table 3. Rationale for Monitoring Wells To Be Sampled, Round Two

<u>Rationale</u>	<u>Well Number</u>
1. Showed high concentration of BTX in the past:	WDOE-6A MW-15A or MW-10 MW-27A or MW-8A
2. Showed no or low concentrations of BTX but located in the direction of plume migration in the upper aquifer:	MW-29A MW-17 MW-26A MW-18A
3. Screened in the lower aquifer, showed low or no BTX in previous studies. Will be used to track plume migration in the lower aquifer:	Restover Spencer (Felker)* MW-12 Wells MW-16

* The Spencer domestic well was formerly the Felker domestic well

Data Management

Data will be managed using the ENVIS software package.



MW-23A
 0.9 ● Well and measured BTX concentration
 in upper aquifer
 -10- Approximate BTX concentration
 (dashed in areas of sparse data)

Contour Interval = Log₁₀
 0 100 200
 FEET

FIGURE
BTX CONCENTRATION (µg/l)
IN UPPER AQUIFER
SEPTEMBER 1987
THIRD SAMPLING ROUND
 RESTOVER TRUCKSTOP

WASHINGTON STATE DEPARTMENT OF ECOLOGY
ENVIRONMENTAL INVESTIGATIONS AND LABORATORY SERVICES

M E M O R A N D U M

TO: Mike Kuntz, HWICP
FROM: Laura Chern, EILS
SUBJECT: Laboratory Analysis Results of Restover Truck Stop Samples
DATE: February 10, 1989

This memo summarizes sample analysis results for volatile organic compounds (VOCs), nitrate + nitrite, and chloride (see Table 1) collected by Ecology during the first round of ground water monitoring at the Restover Truck Stop site October 18-19, 1988. Iron data will be forwarded as soon as it is received. Water level measurements and sampling procedures were described previously in a memo dated December 27, 1989. Chloride and nitrate + nitrite concentration contours for the upper aquifer are shown in Figures 1 and 2 respectively. The highest concentrations of each are centered around MW-8A located adjacent to Restover's septic system. Figure 3 shows the distribution of the sum of benzene, toluene, ethly benzene, and total xylene (BTEX) in the upper aquifer. High concentrations of BTEX are centered near the truck bays in monitoring wells WDOE-6A and MW-8A. MW-12, MW-16 and the Restover supply well are located in the lower aquifer. Only MW-12 shows detectable limits of BTEX.

Methylene chloride and acetone were detected in several monitoring wells. Methlylene chloride was found in method and transfer blanks. Acetone was found in transfer blanks only. Both are common laboratory contaminants and were used for bailer decontamination. Appendix A lists the matrix spike recoveries and limits for VOCs tested. Matrix spike recoveries were within acceptable limits. VOC data was reviewed by Stuart Magoon of the Manchester Laboratory and was found to be within quality assurance/quality control limits as specified for the EPA contract laboratory program.

Conclusions:

1. Chloride analysis in the area near the Restover Truck Stop's septic system and the main truck bay area are elevated but do not exceed the drinking water standard of 250 ppm.
2. Nitrate + nitrite analysis also show areas of slightly elevated concentrations near the septic system. Again, the drinking water standard of 10 ppm is not exceeded.
3. The extent of the BTEX plume in the upper aquifer is similar to that documented in September of 1987 (see Figure 4). Further investigation of the lower aquifer near MW-12 during round two of ground water monitoring will help define the extent of the BTEX plume.

Table 1: Laboratory Analysis Results for Restover Truck Stop
 Round 1 October 18-19, 1989

Wrong Date

Site Name	NO ² +NO ³ ppm	Chloride ppm	Toluene ppb	Xylene ppb	Benzene ppb	Ethly benzene ppb	BTEX ppb
Upper Aquifer							
WDOE-6A	0.245	12.0	1400	2200	1700	ND	5300
MW-8A	0.637	15.0	29	400	27	23	479
MW-17	0.769	3.2	ND	ND	ND	ND	ND
MW-18A	0.460	2.4	ND	ND	ND	ND	ND
MW-26A	0.861	2.3	ND	ND	ND	ND	ND
MW-29A	0.107	4.2	ND	ND	1.3	ND	1.3
Lower Aquifer							
MW-12	0.269	5.300	ND	0.9	6.8	ND	7.700
MW-16	1.065	2.900	ND	ND	ND	ND	ND
Restover	1.300	3.800	ND	ND	ND	ND	ND

Figure 1 Restover Truck Stop
Chloride Concentrations
October 18-19, 1988

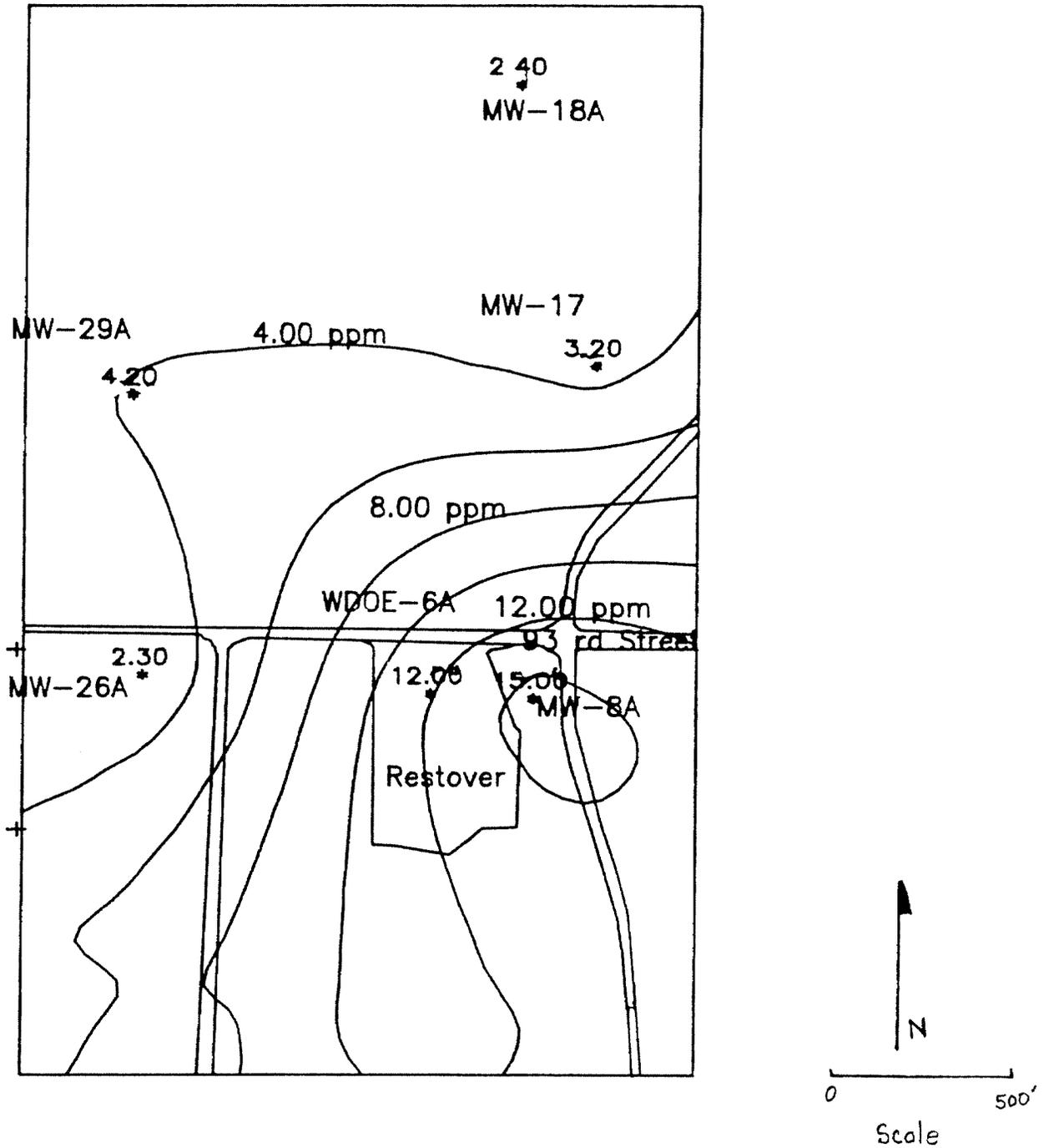


Figure 2 Restover Truck Stop
Nitrate + Nitrite Concentrations
October 18-19, 1988

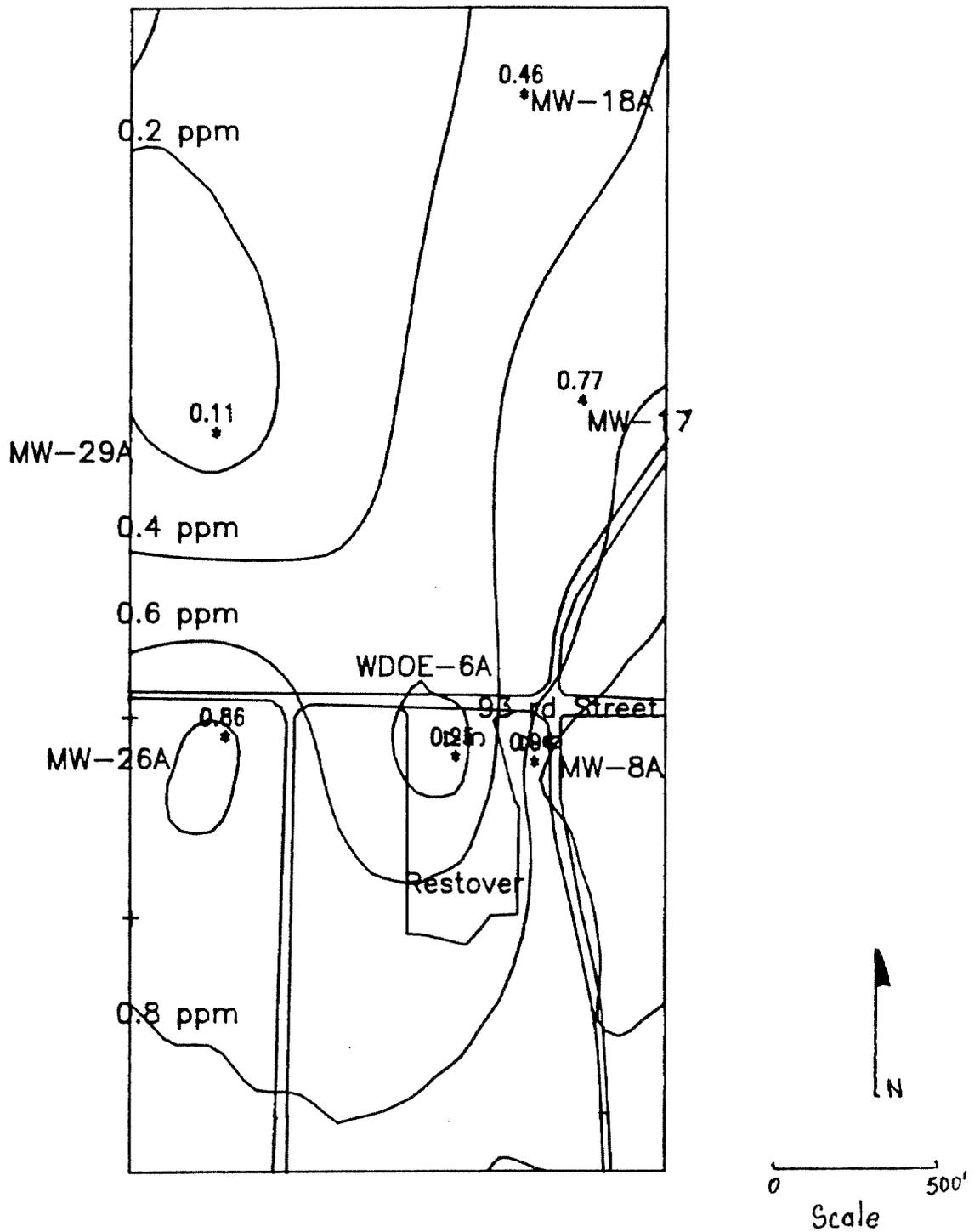


Figure 3 Restover Truck Stop
Upper Aquifer BTEX Plume
October 18-19, 1988

