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1999 Annual Groundwater Monitoring Report
GPM – Monument Booster Station
Lea County, New Mexico

DECEMBER 6, 1999

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GPM - Monument Booster Station
Lea County, New Mexico

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1.0 Executive Summary

The Energy & Environmental Systems Strategic Business Unit of TRW Inc. (TRW), was retained by GPM Gas Corporation (GPM) to perform the groundwater monitoring operations at the Monument Booster Station. This 1999 annual report documents the two semi-annual sampling events performed by TRW at the GPM Monument Booster Station on February 10, 1999 and August 17, 1999. The report also contains the historical groundwater elevation and analytical data since the beginning of the project in May 1995. This monitoring and sampling program was conducted in accordance with the guidelines specified by Mr. Bill Olson of the New Mexico Oil Conservation Division (OCD) in his letters dated January 31, 1997 and March 25, 1998.

Based on the groundwater monitoring and remediation system performance data to date, the following conclusions at the Monument Booster Station are evident:

- Benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations in monitoring wells MW-1D, MW-4, and MW-6 remained well below New Mexico Water Quality Control Commission (WQCC) standards.

- Benzene levels in upgradient well MW-2 and downgradient well MW-3 have increased from less than the detection limit during the previous sampling events to levels of 0.017 mg/L and 0.043 mg/L, respectively, during the August 17, 1999 event. The increase in MW-2 may indicate impact from an upgradient, offsite source. The increase in MW-3 appears to indicate downgradient movement of the on site plume.

- Benzene concentrations in MW-7 fluctuate over time but have increased from a low of 0.094 mg/L on August 3, 1998 to 0.705 mg/L on August 17, 1999.

- As of August 17, 1999, a total of approximately 117.3 gallons of free product (condensate) has been removed from monitoring wells MW-1 and MW-5 using a combination of gravity siphoning, hand bailing, passive skimmer, adsorbent sock, and pneumatic pump recovery methods.

- The presence and trends of biological parameters (dissolved, oxygen, nitrate, sulfate, and iron) indicate that biodegradation has been taking place on site. The biodegradation capacity of electron acceptors and metabolic byproducts (33.36 mg/L) far exceeds the highest benzene concentration (1.13 mg/L) observed on site by a ratio of 30 to 1. This indicates that the biodegradation process has been active. Continued semi-annual monitoring is necessary to demonstrate the effectiveness of intrinsic bioremediation in limiting the migration of the dissolved hydrocarbon plume.

The following recommendations are suggested for the remediation system and monitoring operations at the Monument Booster Station.

- Continue free product recovery operations since the present system has been effective in recovering free product from MW-1 and MW-5. Since the Xitech system at MW-1 has been successful in reducing product thickness to a minimum it is recommended to replace it with an absorbent sock since recovery volumes have also decreased.

- Continue the groundwater monitoring program on a semi-annual basis. The next sampling event is scheduled during the first quarter of 2000.

2.0 Chronology of Events

July 1992	Benge Construction Company of Lovington, New Mexico removed three underground storage tanks (USTs) near the main compressor building for ENRON at the Hobbs Compressor Station #2). The USTs formally contained used oil and pipeline liquids (oil and/or natural gas liquid condensate). Hydrocarbon-impacted soils were removed from the used oil and pipeline liquids UST tank holds.
February 4, 1994	Geoscience Consultants Ltd (GCL) installed two monitoring wells (MW-1 and MW-2) during a subsurface investigation for ENRON. Hydrocarbon-impacted groundwater was confirmed in MW-1.
May 17, 1994	Benge Construction Company returned during a subsurface investigation conducted by Daniel B. Stevens and Associates (DBS&A) and removed an additional amount of hydrocarbon-impacted soils from the pipeline liquids and used oil UST tank holds. The amount of hydrocarbon-impacted soils removed from the used oil and pipeline liquids UST tank holds in 1992 and 1994 was not well documented, however it was estimated by DBS&A that a total of 1,064 cubic yards were excavated from the two tank holds based on the amount of backfill required to fill the excavations.
May 16-19, 1994	Six soil borings (SB-1 through SB-6) were completed as temporary drive point wells for ENRON by DBS&A to delineate the horizontal extent of hydrocarbon-impacted soils and groundwater.
October 7, 1994	The OCD requested ENRON to provide a work plan to completely define the extent of groundwater contamination at the Hobbs Compressor Station #2 site.
November 1994	GPM Gas Corporation (GPM) acquired ownership and operation of the Monument Booster Station (formerly Hobbs Compressor Station #2) from ENRON.
February 23, 1995	GPM submitted a subsurface investigation work plan to the OCD to address the groundwater conditions at Monument Booster Station.
April 5, 1995	The OCD approved the subsurface investigation work plan for Monument Booster Station.
May 8-10, 1995	GCL completed a subsurface investigation for GPM to delineate the extent of the hydrocarbon-impacted groundwater. The investigation included the installation and sampling of four monitoring wells (MW-1D, MW-3, MW-4, and MW-5) and one soil boring (SB-7).
July 28, 1995	GPM submitted the *Subsurface Investigation and Preliminary Remedial Response* report for the Monument Booster Station to the OCD.
August 24, 1995	The OCD approved GPM's recommendations for remedial action. The OCD requested a work plan for an additional monitoring well, new recovery well and product recovery system.

September 29, 1995	GPM submitted the *Remediation and Monitoring Work Plan for the Monument Booster Station* to the OCD.
October 25, 1995	The OCD approved the remediation and monitoring work plan for Monument Booster Station.
November 14-16, 1995	GCL installed two additional monitoring wells (MW-6 and MW-7) and conducted the fourth quarter 1995 sampling event at Monument Booster Station.
January 18, 1996	GCL conducted the first quarter 1996 sampling event at Monument Booster Station.
April 24, 1996	GCL conducted the annual (second quarter 1996) sampling event at Monument Booster Station. The annual report included recommendations to the OCD for remedial response.
January 22, 1997	BDM International, Inc. (formerly GCL) conducted the first quarter 1997 sampling event at Monument Booster Station.
January 31, 1997	The OCD completed the review of the annual report for the second quarter 1996 sampling event and approved the groundwater monitoring modifications for Monument Booster Station.
January 31, 1997	BDM International, Inc. (BDM) and GPM installed an automated pneumatic product recovery pump system in monitoring wells MW-1 and MW-5 to replace the hand bailing and gravity siphoning techniques used previously.
August 11, 1997	BDM conducted the annual (third quarter 1997) sampling event at Monument Booster Station.
January 23, 1998	TRW conducted the semi-annual (first quarter 1998) sampling event at Monument Booster Station.
August 3, 1998	TRW conducted the annual (third quarter 1998) sampling event at Monument Booster Station.
February 10, 1999	TRW conducted the semi-annual (first quarter 1999) sampling event at Monument Booster Station.
August 17, 1999	TRW conducted the annual (third quarter 1999) sampling event at Monument Booster Station.

3.0 Procedures

Prior to sampling, the on-site monitoring wells (MW-1 through MW-7) were gauged for depth to groundwater using a Heron Model H.01L oil/water interface probe. Each monitoring well was purged using a submersible (Whaler Superpurger) pump. Groundwater parameters, including pH, conductivity, temperature, turbidity, and dissolved oxygen (DO) were measured during purging using a Hydac Model 910 pH/conductivity meter, a Horiba Model U10 multiparameter meter, and Hanna Model 9143 DO meter. A total of 254 gallons of water was purged from monitoring wells MW-1D, MW-2, MW-3, MW-4, MW-6, and MW-7 during the February 10, 1999 and August 17, 1999 sampling events. Groundwater samples were obtained using a new, decontaminated, disposable bailer for each well after purging.

The first set of water samples were transferred into air-tight, septum-sealed, 40-ml glass VOA sample vials with zero head space for analysis of BTEX using EPA Method 8020. A duplicate sample of MW-7 was collected during both sampling events. The next set of water samples were transferred into appropriately preserved containers for analysis of nitrate (NO_3) and sulfate (SO_4), to assess the efficacy of intrinsic bioremedial activity currently taking place. During the annual sampling event on August 17, 1999, a third and fourth set of water samples were transferred into appropriately preserved containers for analysis of major ions (chloride, fluoride, and total dissolved solids) and WQCC metals (aluminum, arsenic, boron, chromium, iron, and manganese). A summary of purging and sampling methods is provided in Table 1 below. Chain-of-custody (COC) forms documenting sample identification numbers, collection times, and delivery times to the laboratories were completed for each set of samples. The water samples were placed in an ice-filled cooler immediately after collection and shipped to Trace Analysis, Inc. of Lubbock, Texas for laboratory analysis.

Table 1
Summary of Purging and Sampling Methods

Monitoring Well No.	Sample Date	Purge Method	Purge Volume (gallons)	Sampling Method	Groundwater Analytes
MW-1D	02/10/99	Pump	15	Disposable bailer	BTEX and Bio-indicators
	08/17/99	Pump	15	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-2	02/10/99	Pump	30	Disposable bailer	BTEX and Bio-indicators
	08/17/99	Pump	25	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-3	02/10/99	Pump	16*	Disposable bailer	BTEX and Bio-indicators
	08/17/99	Pump	23*	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-4	02/10/99	Pump	15*	Disposable bailer	BTEX and Bio-indicators
	08/17/99	Pump	15*	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-6	02/10/99	Pump	25	Disposable bailer	BTEX and Bio-indicators
	08/17/99	Pump	25	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-7	02/10/99	Pump	25	Disposable bailer	BTEX and Bio-indicators
	08/17/99	Pump	25	Disposable bailer	BTEX, Metals, Ions, Bio-indicators

* Indicates monitoring well was purged dry.
BTEX - benzene, toluene, ethylbenzene, xylenes
WQCC Metals - Al, As, B, Cr, Fe,and Mn
Ions - F, Cl, NO_3, SO_4, and TDS
Bio-indicatoras - DO, NO_3, SO_4
MW-1 and MW-5 not sampled due to presence of product.

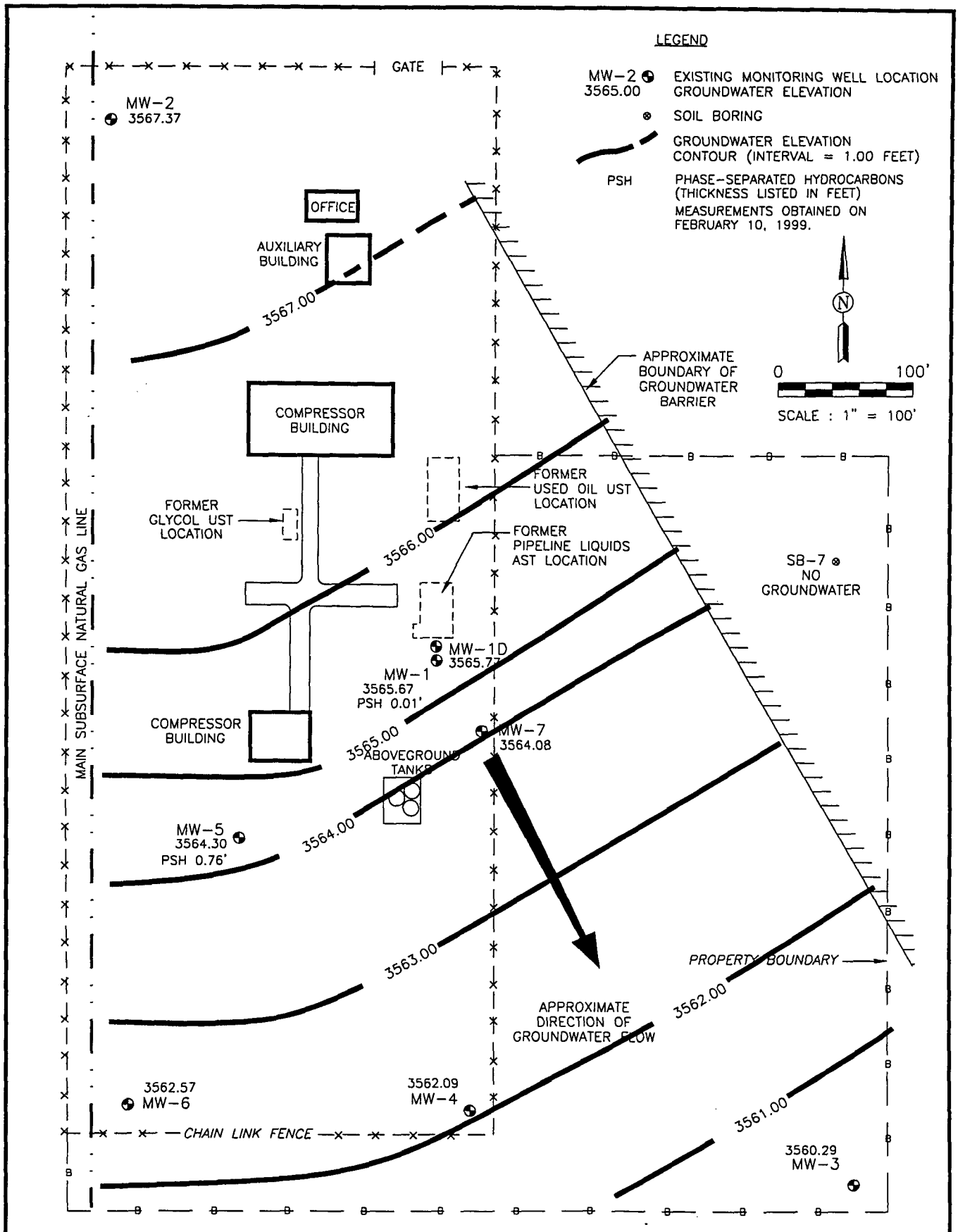
4.0 Groundwater Elevations, Hydraulic Gradient and Flow Direction

Based on the most recent gauging data collected by TRW on August 17, 1999, the groundwater conditions at the Monument Booster Station are characterized below.

- The depth to the water table across the site varies from approximately 21 to 27 feet below ground surface
- The hydraulic gradient is approximately 0.007 feet/foot
- The direction of groundwater flow is to the southeast

The direction of groundwater flow and hydraulic gradient have remained consistent for the past four and a half years. Groundwater elevation maps depicting the water table elevation and direction of groundwater flow using the gauging data obtained during the two 1999 sampling events are presented in Figure 1a (February 10, 1999) and Figure 1b (August 17, 1999).

Figure 2 depicts the changes in groundwater elevations in monitoring wells MW-1 through MW-7 with time. Historical groundwater elevations and depth to water measurements are summarized in Table 2.



TRW	CLIENT: GPM GAS CORPORATION	
	DATE: 02/10/99	REV. NO.:
	AUTHOR: GJV	DRN BY: DAG
	CK'D BY: DTL	FILE: GWEL0299

FIGURE 1a
MONUMENT
BOOSTER STATION
GROUNDWATER ELEVATION MAP

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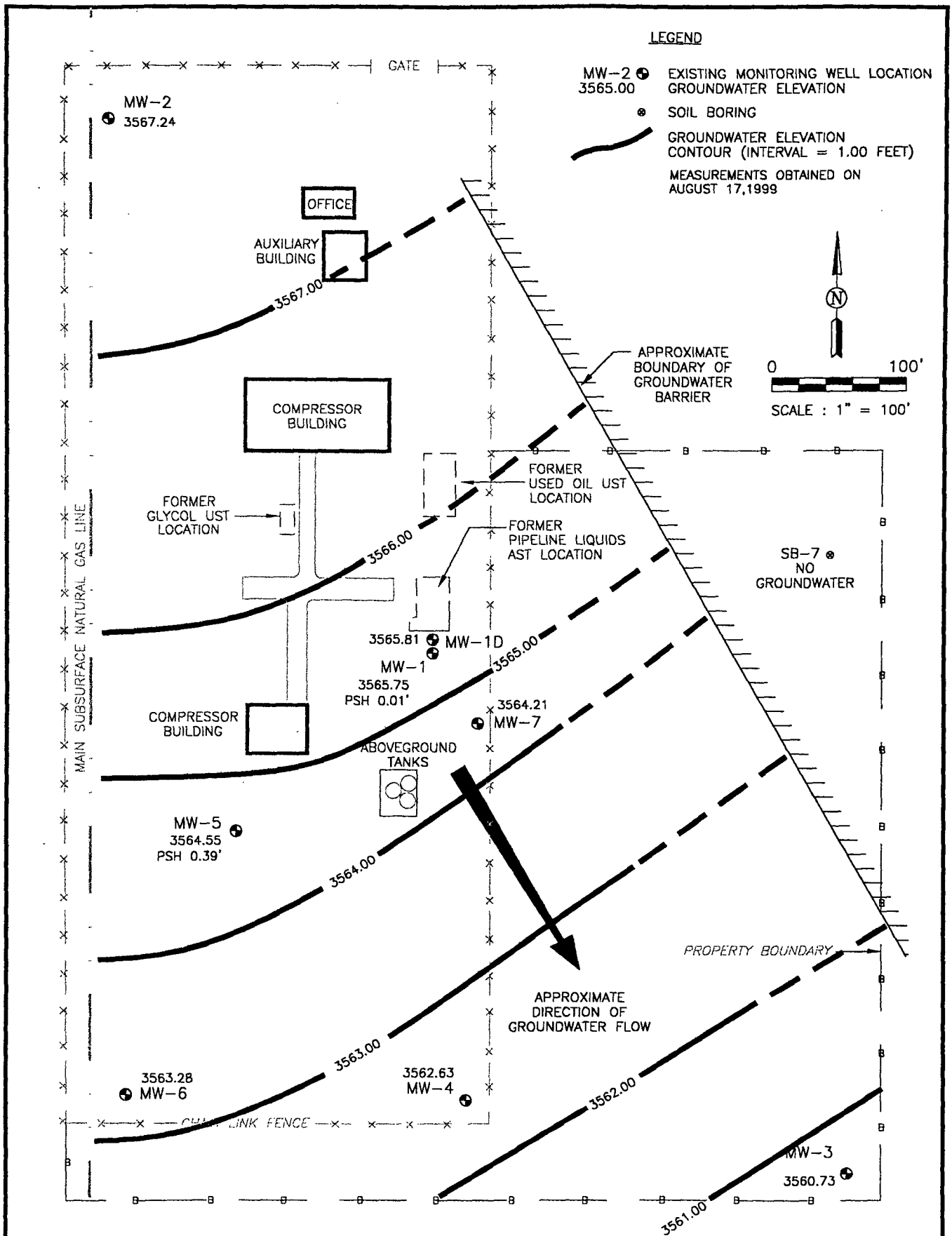

TRW	CLIENT: GPM GAS CORPORATION	FIGURE 1b MONUMENT BOOSTER STATION GROUNDWATER ELEVATION MAP
	DATE: 08/17/99 | REV. NO.:	
	AUTHOR: GJV | DRN BY: DAG	
	CK'D BY: DTL | FILE: Gwel0899	

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FIGURE 2

GROUNDWATER ELEVATION VS. TIME

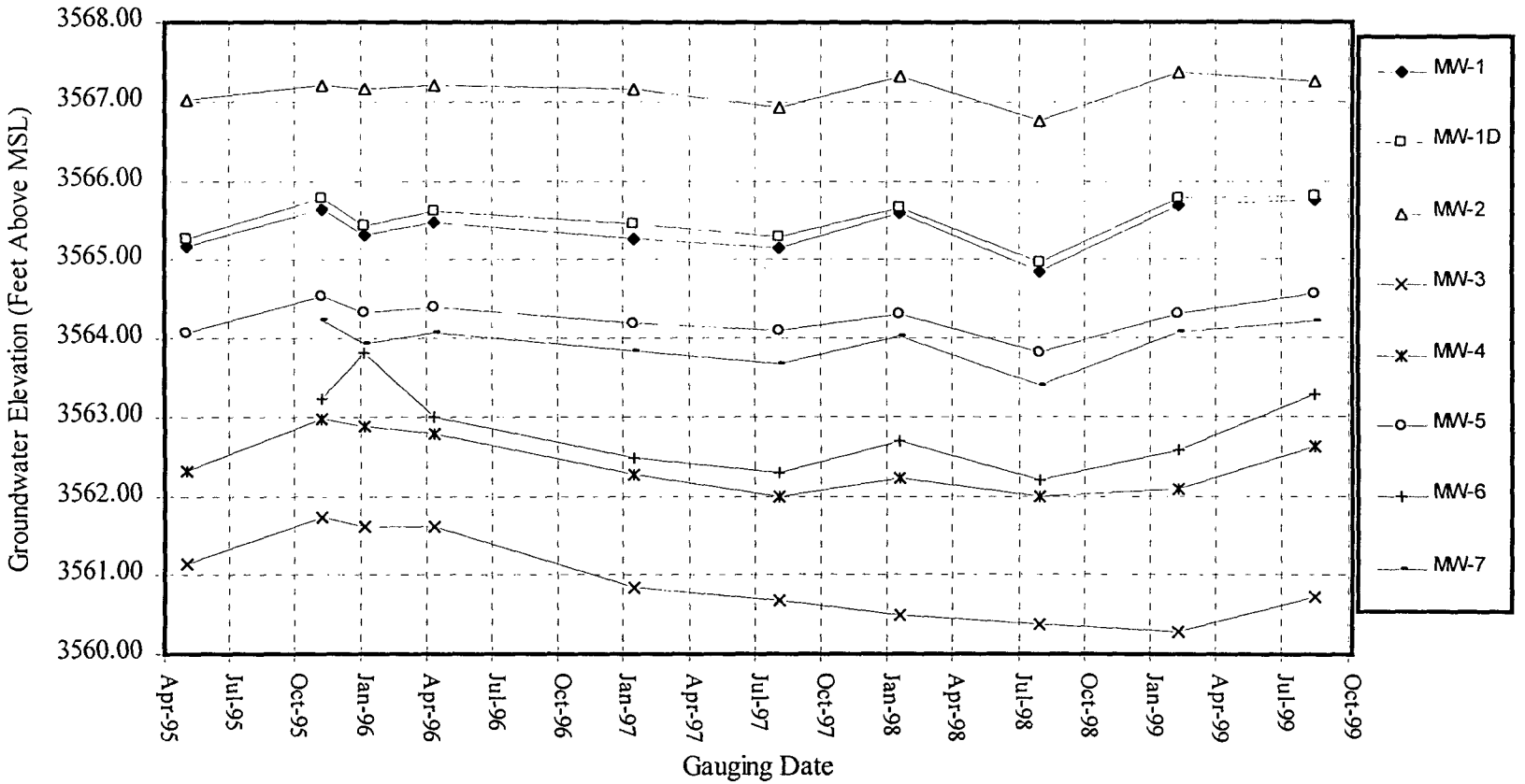


Table 2
Summary of Groundwater Elevations
Monument Booster Station

Monitoring Well Number	Gauging Date	Ground Surface Elevations (Feet)	Top of Casing Elevations (Feet)	Groundwater Depth Below Top of Casing (Feet)	Groundwater Elevation (Feet)	PSH Thickness (Feet)
MW-1	05/16/95	3588.85	3591.15	28.05	3565.17	2.52
	11/21/95	3588.85	3591.15	27.03	3565.65	1.86
	01/18/96	3588.85	3591.15	27.62	3565.32	2.18
	04/24/96	3588.85	3591.15	27.39	3565.47	2.09
	01/22/97	3588.85	3591.15	27.68	3565.27	2.20
	08/11/97	3588.85	3591.15	26.03	3565.14	0.02
	01/23/98	3588.85	3591.15	25.63	3565.59	0.08
	08/03/98	3588.85	3591.15	26.32	3564.84	0.01
	02/10/99	3588.85	3591.15	25.55	3565.67	0.09
	08/17/99	3588.85	3591.15	25.41	3565.75	0.01
MW-1D	05/16/95	3589.06	3591.31	26.04	3565.27	0.00
	11/21/95	3589.06	3591.31	25.54	3565.77	0.00
	01/18/96	3589.06	3591.31	25.89	3565.42	0.00
	04/24/96	3589.06	3591.31	25.70	3565.61	0.00
	01/22/97	3589.06	3591.31	25.85	3565.46	0.00
	08/11/97	3589.06	3591.31	26.03	3565.28	0.00
	01/23/98	3589.06	3591.31	25.66	3565.65	0.00
	08/03/98	3589.06	3591.31	26.35	3564.96	0.00
	02/10/99	3589.06	3591.31	25.54	3565.77	0.00
	08/17/99	3589.06	3591.31	25.50	3565.81	0.00
MW-2	05/16/95	3594.13	3596.30	29.28	3567.02	0.00
	11/21/95	3594.13	3596.30	29.09	3567.21	0.00
	01/18/96	3594.13	3596.30	29.15	3567.15	0.00
	04/24/96	3594.13	3596.30	29.10	3567.20	0.00
	01/22/97	3594.13	3596.30	29.15	3567.15	0.00
	08/11/97	3594.13	3596.30	29.38	3566.92	0.00
	01/23/98	3594.13	3596.30	28.98	3567.32	0.00
	08/03/98	3594.13	3596.30	29.54	3566.76	0.00
	02/10/99	3594.13	3596.30	28.93	3567.37	0.00
	08/17/99	3594.13	3596.30	29.06	3567.24	0.00
MW-3	05/16/95	3581.46	3583.86	22.72	3561.14	0.00
	11/21/95	3581.46	3583.86	22.12	3561.74	0.00
	01/18/96	3581.46	3583.86	22.25	3561.61	0.00
	04/24/96	3581.46	3583.86	22.25	3561.61	0.00
	01/22/97	3581.46	3583.86	23.02	3560.84	0.00
	08/11/97	3581.46	3583.86	23.18	3560.68	0.00
	01/23/98	3581.46	3583.86	23.37	3560.49	0.00
	08/03/98	3581.46	3583.86	23.49	3560.37	0.00
	02/10/99	3581.46	3583.86	23.57	3560.29	0.00
	08/17/99	3581.46	3583.86	23.13	3560.73	0.00

* Elevations initially surveyed by John W. West Engineering Company of Hobbs, NM.
The monitoring well casings were marked on the north side to provide consistent reference points for future gauging operations.
** Groundwater Elevation Corrected for phase-separated hydrocarbons (PSH) = Top of Casing Elevation - [Groundwater Depth - (SG x PSH Thickness)].
Groundwater direction is to the southeast with a hydraulic gradient of approximately 0.007 feet/foot.

Table 2 (Continued)
Summary of Groundwater Elevations
Monument Booster Station

Monitoring Well Number	Gauging Date	Ground Surface Elevations (Feet)	Top of Casing Elevations (Feet)	Groundwater Depth Below Top of Casing (Feet)	Groundwater Elevation (Feet)	PSH Thickness (Feet)
MW-4	05/16/95	3586.10	3588.77	26.45	3562.32	0.00
	11/21/95	3586.10	3588.77	25.79	3562.98	0.00
	01/18/96	3586.10	3588.77	25.90	3562.87	0.00
	04/24/96	3586.10	3588.77	25.98	3562.79	0.00
	01/22/97	3586.10	3588.77	26.50	3562.27	0.00
	08/11/97	3586.10	3588.77	26.77	3562.00	0.00
	01/23/98	3586.10	3588.77	26.54	3562.23	0.00
	08/03/98	3586.10	3588.77	26.77	3562.00	0.00
	02/10/99	3586.10	3588.77	26.68	3562.09	0.00
	08/17/99	3586.10	3588.77	26.14	3562.63	0.00
MW-5	05/16/95	3589.62	3592.16	28.10	3564.06	0.00
	11/21/95	3589.62	3592.16	28.24	3564.54	0.76
	01/18/96	3589.62	3592.16	28.45	3564.33	0.75
	04/24/96	3589.62	3592.16	28.41	3564.40	0.79
	01/22/97	3589.62	3592.16	28.45	3564.18	0.57
	08/11/97	3589.62	3592.16	28.13	3564.10	0.09
	01/23/98	3589.62	3592.16	27.89	3564.30	0.04
	08/03/98	3589.62	3592.16	28.79	3563.80	0.53
	02/10/99	3589.62	3592.16	28.48	3564.30	0.76
	08/17/99	3589.62	3592.16	27.93	3564.55	0.39
MW-6	11/16/95	3586.15	3587.93	24.71	3563.22	0.00
	01/18/96	3586.15	3587.93	24.11	3563.82	0.00
	04/24/96	3586.15	3587.93	24.94	3562.99	0.00
	01/22/97	3586.15	3587.93	25.44	3562.49	0.00
	08/11/97	3586.15	3587.93	25.64	3562.29	0.00
	01/23/98	3586.15	3587.93	25.25	3562.68	0.00
	08/03/98	3586.15	3587.93	25.73	3562.20	0.00
	02/10/99	3586.15	3587.93	25.36	3562.57	0.00
	08/17/99	3586.15	3587.93	24.65	3563.28	0.00
MW-7	11/21/95	3588.06	3589.40	25.16	3564.24	0.00
	01/18/96	3588.06	3589.40	25.48	3563.92	0.00
	04/24/96	3588.06	3589.40	25.33	3564.07	0.00
	01/22/97	3588.06	3589.40	25.56	3563.84	0.00
	08/11/97	3588.06	3589.40	25.73	3563.67	0.00
	01/23/98	3588.06	3589.40	25.38	3564.02	0.00
	08/03/98	3588.06	3589.40	26.01	3563.39	0.00
	02/10/99	3588.06	3589.40	25.32	3564.08	0.00
	08/17/99	3588.06	3589.40	25.19	3564.21	0.00

* Elevations initially surveyed by John W. West Engineering Company of Hobbs, NM.
The monitoring well casings were marked on the north side to provide consistent reference points for future gauging operations.

** Groundwater Elevation Corrected for phase-separated hydrocarbons (PSH) = Top of Casing Elevation - [Groundwater Depth - (SG x PSH Thickness)].

Groundwater direction is to the southeast with a hydraulic gradient of approximately 0.007 feet/foot.

5.0 Groundwater Quality Conditions

5.1 Distribution of Hydrocarbons in Groundwater

A historical listing of BTEX concentrations obtained from the on site monitoring wells is summarized in Table 3. Hydrocarbon concentration maps depicting the BTEX concentrations for the two 1999 sampling events are presented in Figure 3a (February 10, 1999) and Figure 3b (August 17, 1999). Figure 4 depicts benzene concentrations versus time in groundwater from May 1995 to August 17, 1999 for the on site monitoring wells. Based on the most recent analytical data for samples collected by TRW on August 17, 1999, the distribution of hydrocarbons at the Monument Booster Station is described below.

- BTEX concentrations in monitoring wells MW-1D, MW-4, and MW-6 remained well below WQCC standards.
- Benzene levels in upgradient well MW-2 and downgradient well MW-3 have increased from less than the detection limit during the previous sampling events to levels of 0.017 mg/L and 0.043 mg/L, respectively, during the August 17, 1999 event.
- Benzene concentrations in MW-7 fluctuate over time but have increased from a low of 0.094 mg/L on August 3, 1998 to 0.705 mg/L on August 17, 1999. The higher benzene concentrations may correlate with correspondingly high groundwater elevations within the hydrocarbon smear zone (Figure 5).

5.2 Distribution of Dissolved WQCC Metals and Ions in Groundwater

Historical groundwater sample analytical results for metals and ions are presented in Tables 4 and 5, respectively. The WQCC standards are also listed in the tables for comparison. Constituents with concentrations above the WQCC standards are highlighted in boldface type. The laboratory reports and COC documentation are included in Appendix A.

The WQCC metal results for the 1999 annual sampling event indicate no constituents exceeded the WQCC standards with the exception of manganese in MW-6, boron in MW-7, and iron in MW-7. The elevated levels of manganese in MW-1D, MW-6 and MW-7, and iron in MW-6 and MW-7 may be due to the reduced chemical environment caused by the presence of dissolved hydrocarbons. Under this condition, certain metal ions (particularly manganese and iron) have a greater affinity to go into the dissolved state as result of being produced as a byproduct from natural biodegradation processes, thus resulting in higher concentrations. In contrast, monitoring wells MW-2, MW-3, and MW-4 have no detectable concentrations of iron or manganese. Based on the results of the metal analyses during the 1999 annual sampling event, the groundwater in the site area is not adversely affected or impacted with dissolved metals.

The major ion analyses for the annual 1999 sampling event indicate no constituents exceeded the WQCC standards with the exception of fluoride in MW-1D, MW-2, MW-3, and MW-7, and total dissolved solids (TDS) in MW-2. Fluoride concentrations during the 1999 annual sampling event remain near or slightly above the WQCC standard of 1.6 mg/L as compared to the initial sampling event in May 1995. Since fluoride is not a constituent for the gas processing activities on site, its presence is likely due to natural conditions as it is a common naturally occurring compound in groundwater (USGS Water-Supply Paper 2254, 1989, pgs.120-123).

Table 3
Summary of Dissolved BTEX Concentrations
Monument Booster Station

Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-1D	05/16/95	**0.018**	0.006	0.015	0.016
	11/15/95	0.003	< 0.001	0.002	0.001
	01/18/96	0.004	< 0.001	0.003	0.009
	04/24/96	< 0.001	< 0.001	< 0.001	< 0.001
	01/22/97	0.001	< 0.001	0.001	< 0.001
	08/11/97	<0.001	< 0.001	<0.001	< 0.001
	01/23/98	<0.001	< 0.001	<0.001	< 0.001
	08/03/98	<0.001	< 0.001	<0.001	< 0.001
	02/10/99	<0.001	< 0.001	<0.001	< 0.001
	08/17/99	<0.001	< 0.001	<0.001	< 0.001
MW-2	05/16/95	< 0.001	< 0.001	< 0.001	< 0.001
	11/15/95	**0.044***	0.002*	0.006*	0.009*
	01/18/96	< 0.001	< 0.001	< 0.001	< 0.001
	04/24/96	< 0.001	< 0.001	< 0.001	< 0.001
	01/22/97	< 0.001	< 0.001	< 0.001	< 0.001
	08/11/97	< 0.001	< 0.001	< 0.001	< 0.001
	01/23/98	< 0.001	< 0.001	< 0.001	< 0.001
	08/03/98	< 0.001	< 0.001	< 0.001	< 0.001
	02/10/99	< 0.001	< 0.001	< 0.001	< 0.001
	08/17/99	**0.017**	0.013	0.002	0.003
MW-3	05/16/95	< 0.001	< 0.001	< 0.001	< 0.001
	11/15/95	< 0.001	< 0.001	< 0.001	< 0.001
	01/18/96	< 0.001	< 0.001	< 0.001	< 0.001
	04/24/96	< 0.001	< 0.001	< 0.001	< 0.001
	01/22/97	< 0.001	< 0.001	< 0.001	< 0.001
	08/11/97	< 0.001	< 0.001	< 0.001	< 0.001
	01/23/98	< 0.001	< 0.001	< 0.001	< 0.001
	08/03/98	0.007	< 0.001	< 0.001	< 0.001
	02/10/99	< 0.005	< 0.005	< 0.005	< 0.005
	08/17/99	**0.043**	< 0.005	< 0.005	< 0.005
MW-4	05/16/95	< 0.001	< 0.001	< 0.001	< 0.001
	11/15/95	**0.045***	0.002*	0.006*	0.010*
	01/18/96	0.003	< 0.001	< 0.001	< 0.001
	04/24/96	< 0.002	< 0.002	< 0.002	< 0.002
	01/22/97	0.002	< 0.001	< 0.001	< 0.001
	08/11/97	0.001	< 0.001	< 0.001	< 0.001
	01/23/98	< 0.001	< 0.001	< 0.001	< 0.001
	08/03/98	< 0.001	< 0.001	< 0.001	< 0.001
	02/10/99	< 0.001	< 0.001	< 0.001	< 0.001
	08/17/99	<0.001	< 0.001	<0.001	0.001
MW-5	05/16/95	**0.265**	0.009	0.261	0.050
MW-6	11/16/95	0.003	< 0.001	0.001	0.003
	01/17/96	0.002	< 0.001	< 0.001	< 0.001
	04/24/96	< 0.001	< 0.001	< 0.001	< 0.001
	01/22/97	0.001	< 0.001	< 0.001	< 0.001
	08/11/97	<0.001	< 0.001	< 0.001	0.001
	01/23/98	< 0.001	< 0.001	< 0.001	< 0.001
	08/03/98	< 0.001	< 0.001	< 0.001	< 0.001
	02/10/99	< 0.001	< 0.001	< 0.001	0.014
	08/17/99	0.002	< 0.001	<0.001	0.012
MW-7	11/15/95	**0.465**	< 0.001	0.205	0.163
	01/17/96	**1.130**	0.003	0.476	0.365
	04/24/96	**0.585**	< 0.002	0.251	0.013
	01/22/97	**0.896**	< 0.005	0.240	0.330
	08/11/97	**0.317**	0.020	0.155	0.049
	01/23/98	**0.876**	< 0.005	0.486	0.181
	08/03/98	**0.094**	< 0.005	0.064	0.007
	02/10/99	**0.597**	< 0.005	0.440	0.120
	08/17/99	**0.705**	< 0.005	0.060	0.556
WQCC Standards		0.010	0.75	0.75	0.62

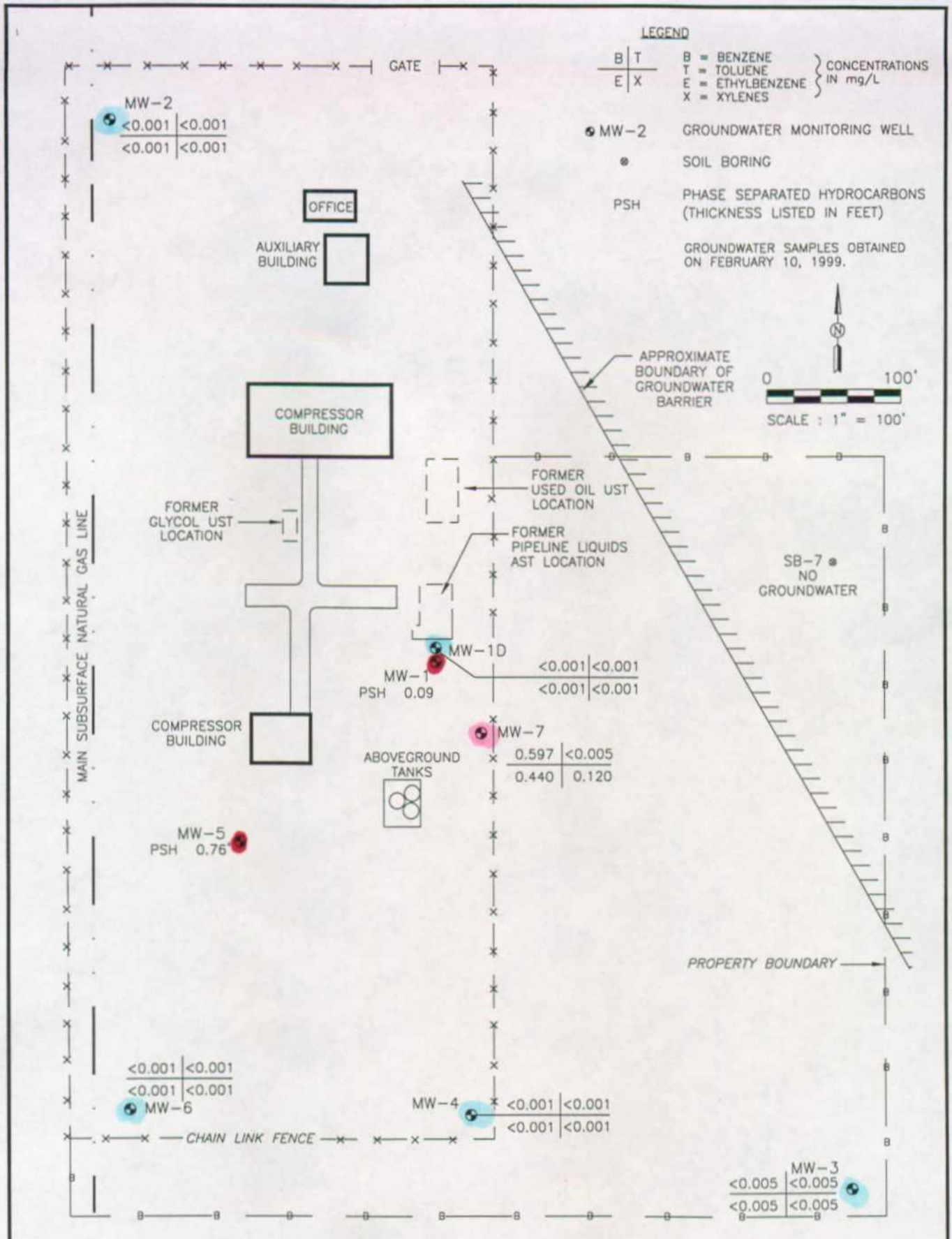
Analyses performed by Trace Analysis, Inc., Lubbock, Texas.

All samples analyzed for BTEX using EPA Method 8020 except for samples obtained on May 16, 1995 (EPA Method 8240).

Values listed in **boldface** type indicate concentrations exceed New Mexico Water Quality Control Commission (WQCC) standards.

Monitoring wells MW-1 and MW-5 (after May 16, 1995) were not sampled (due to presence of phase-separated hydrocarbons).

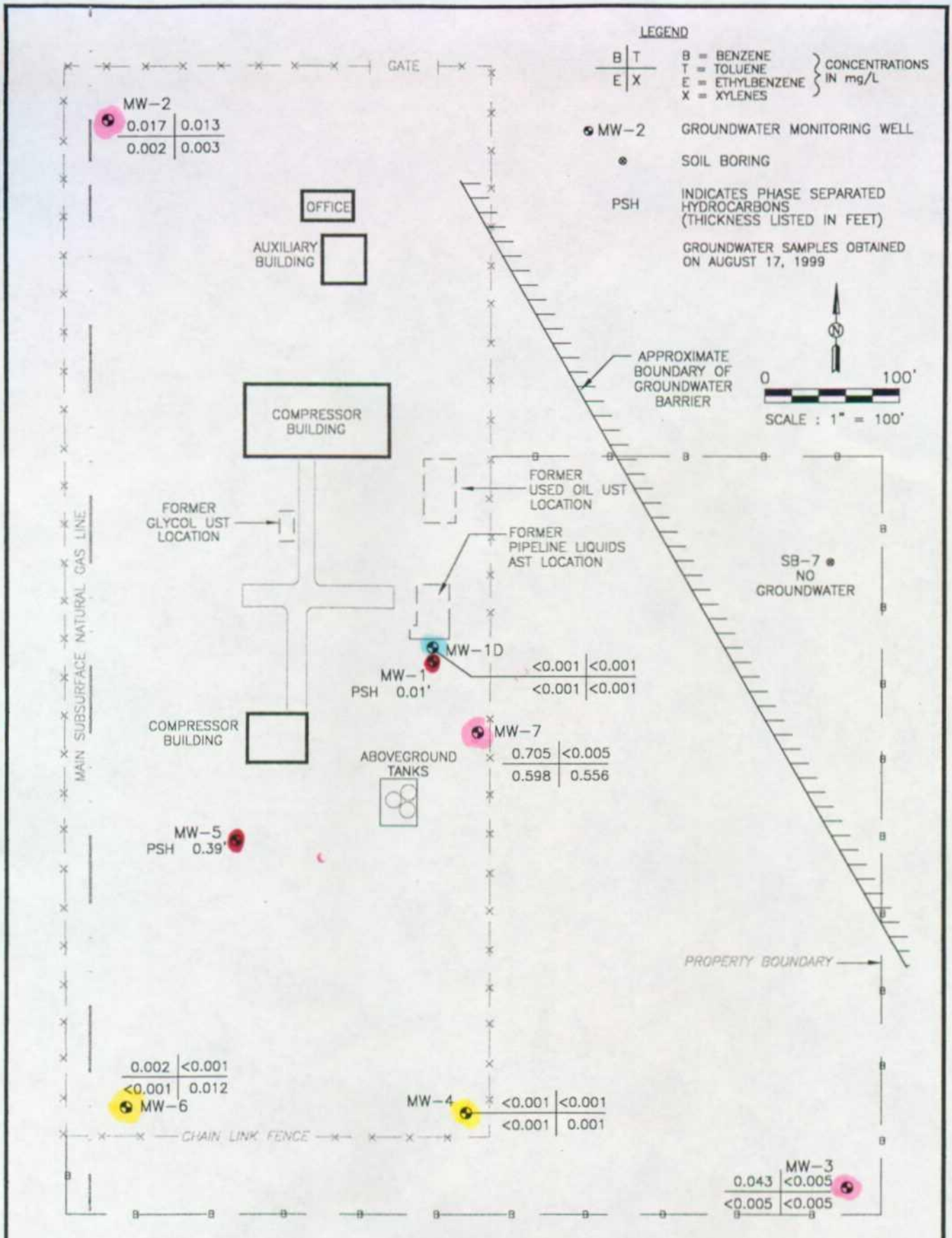
* BTEX cross-contamination occurred on samples obtained from monitoring wells MW-2 and MW-4 during the November 15, 1995 sampling event.



P2398\11\BTEX0299.DWG

TRW	CLIENT: GPM GAS CORPORATION	
	DATE: 02/10/99	REV. NO.:
	AUTHOR: GJV	DRN BY: DAG
	CK'D BY: DTL	FILE:BTEX0299

FIGURE 3a
MONUMENT
BOOSTER STATION
BTEX CONCENTRATION MAP



TRW	CLIENT: GPM GAS CORPORATION	FIGURE 3b MONUMENT BOOSTER STATION BTEX CONCENTRATION MAP
	DATE: 08/17/99 REV. NO.:	
	AUTHOR: GJV DRN BY: DAG	
	CK'D BY: MWS FILE:btex0899	

D:\DMS\TRW\GPM\btex0899.dwg

FIGURE 4

Benzene Versus Time

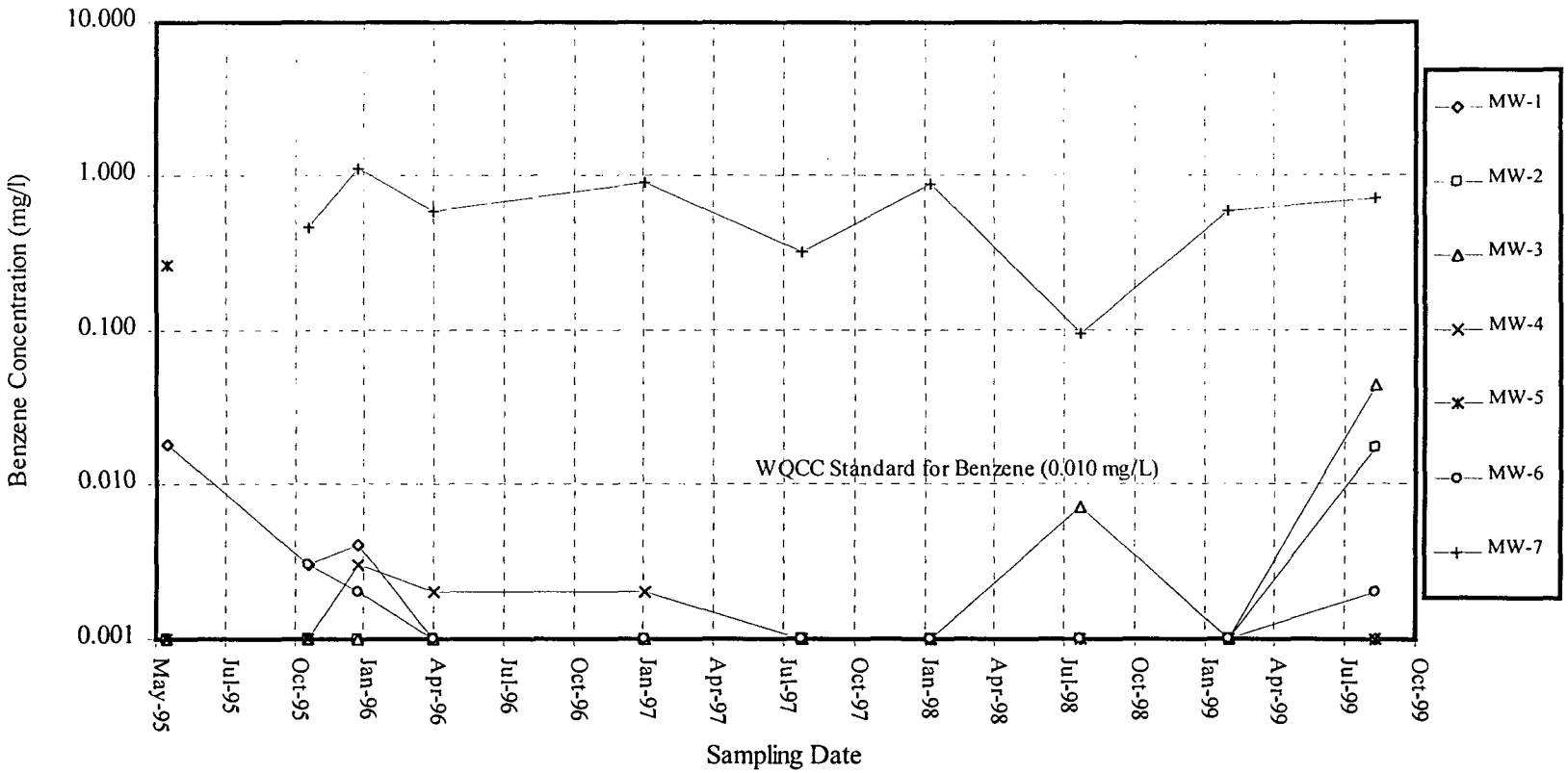


Figure 5

BTEX Concentrations and Groundwater Elevation Vs. Time (MW-7)

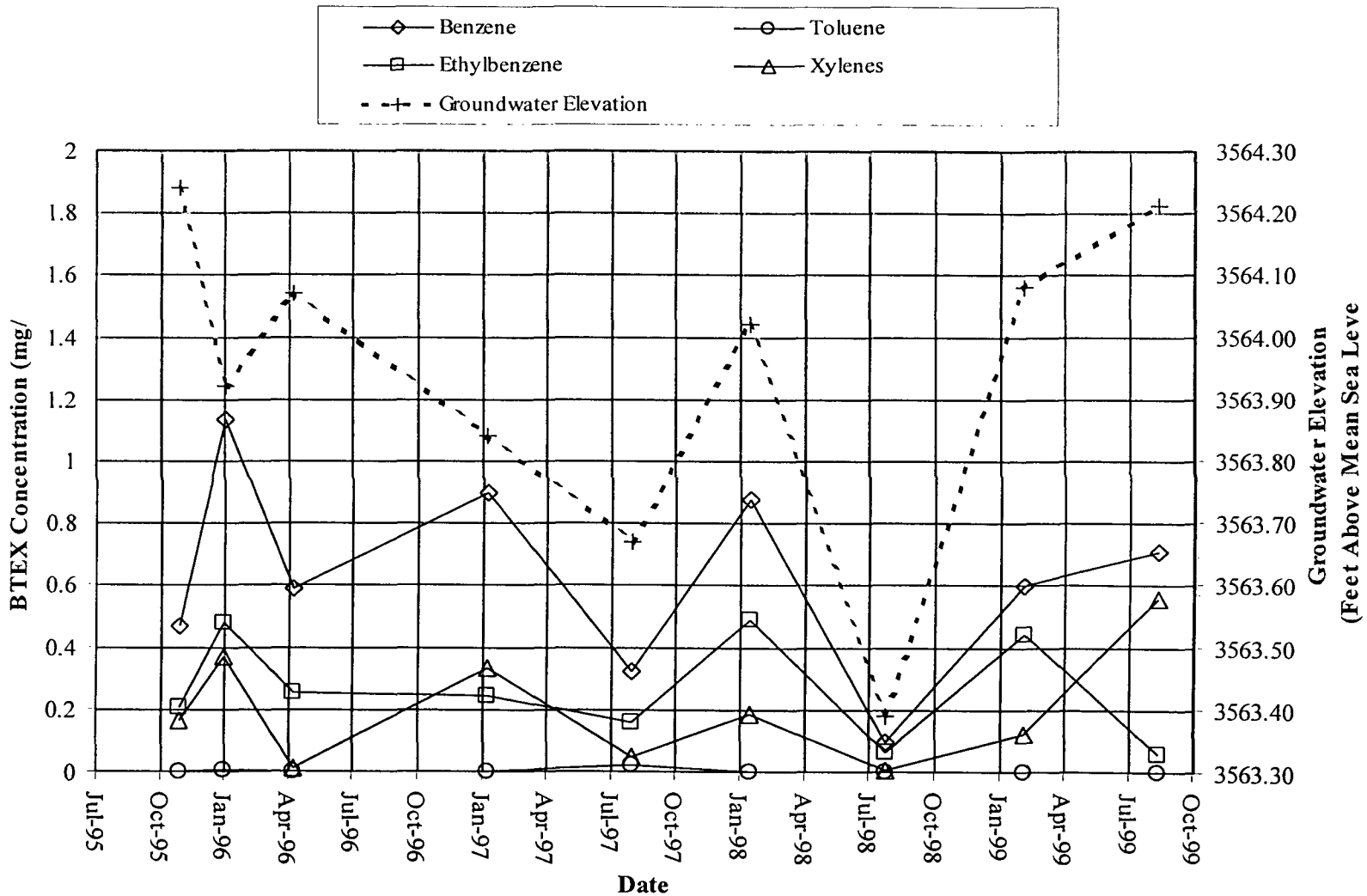


Table 4
Summary of Metal Analytical Results

Constituent	Date	MW-1 (mg/L)	MW-1D (mg/L)	MW-2 (mg/L)	MW-3 (mg/L)	MW-4 (mg/L)	MW-5 (mg/L)	MW-6 (mg/L)	MW-7 (mg/L)	WQCC Standards (mg/L)
Aluminum (Al)	05-16-96	0.55	1.34	**13.10**	0.88	**8.04**	0.24	---	---	5
	04-24-96	NS	0.2	<0.2	<0.2	<0.2	NS	0.2	0.3	
	08-11-97	NS	<0.2	0.32	<0.2	<0.2	NS	0.23	<0.2	
	08-03-98	NS	<0.1	0.17	1.7	0.10	NS	<0.1	0.14	
	08-17-99	NS	<0.1	<0.1	<0.1	<0.1	NS	<0.1	<0.1	
Arsenic (As)	05-16-96	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	---	---	0.1
	04-24-96	NS	0.012	0.011	0.019	0.008	NS	**0.238**	0.004	
	08-11-97	NS	<0.1	<0.1	<0.1	<0.1	NS	<0.1	<0.1	
	08-03-98	NS	<0.1	<0.1	<0.1	<0.1	NS	<0.1	<0.1	
	08-17-99	NS	<0.1	<0.1	<0.1	<0.1	NS	<0.1	<0.1	
Boron (B)	05-16-96	**0.85**	0.22	0.37	0.09	0.14	0.39	---	---	0.75
	04-24-96	NS	0.11	0.38	<0.03	0.06	NS	0.22	0.6	
	08-11-97	NS	<0.2	<0.2	<0.2	<0.2	NS	**0.79**	<0.2	
	08-03-98	NS	<0.75	<0.75	<0.75	<0.75	NS	<0.75	<0.75	
	08-17-99	NS	0.15	0.23	0.19	0.21	NS	0.38	**0.85**	
Chromium (Cr)	05-16-96	0.01	<0.01	0.02	0.01	0.02	0.02	---	---	0.05
	04-24-96	NS	<0.05	**0.06**	<0.05	<0.05	NS	**0.06**	<0.05	
	08-11-97	NS	<0.05	<0.05	<0.05	<0.05	NS	<0.05	<0.05	
	08-03-98	NS	<0.05	<0.05	<0.05	<0.05	NS	<0.05	<0.05	
	08-17-99	NS	<0.05	<0.05	<0.05	<0.05	NS	<0.05	<0.05	
Iron (Fe)	05-16-96	**25.58**	**4.6**	**5.82**	0.53	**4.68**	**1.75**	---	---	1
	04-24-96	NS	0.06	0.07	0.17	0.08	NS	0.15	<0.03	
	08-11-97	NS	0.28	0.24	0.14	0.08	NS	0.21	0.43	
	08-03-98	NS	<0.1	<0.1	0.55	<0.1	NS	0.26	**6.1**	
	08-17-99	NS	0.19	<0.1	<0.1	<0.1	NS	0.42	**8.1**	
Manganese (Mn)	05-16-96	**0.67**	**0.31**	0.12	0.08	0.11	**0.58**	---	---	0.2
	04-24-96	NS	**0.37**	<0.01	<0.01	<0.01	NS	**0.28**	**0.38**	
	08-11-97	NS	**0.35**	<0.01	<0.01	<0.01	NS	**0.30**	**0.37**	
	08-03-98	NS	**0.22**	<0.1	<0.1	<0.1	NS	**0.36**	**0.41**	
	08-17-99	NS	0.18	<0.1	<0.1	<0.1	NS	**0.27**	0.19	

Analyses performed by Trace Analysis, Inc. using EPA Methods 200.7, 239.2, 270.2, 272.2, and 6010B
Standards **Bold** values indicate concentrations exceed New Mexico Water Quality Control Commission (WQCC) groundwater standards as listed as specified in Regulation 3-103.
NS Indicates monitoring well was not sampled (due to presence of free product).
--- Indicates monitoring well was installed after this sampling date.
Samples were not filtered on 05-17-95, therefore results indicate total (dissolved and undissolved) metal concentrations.
Samples were filtered with a 45 mm element between 04-24-96 and 08-17-99, therefore results indicate dissolved metal concentrations..

Table 5
Summary of Major Ion Analytical Results
Monument Booster Station

Constituent	Date	MW-1 (mg/L)	MW-1D (mg/L)	MW-2 (mg/L)	MW-3 (mg/L)	MW-4 (mg/L)	MW-5 (mg/L)	MW-6 (mg/L)	MW-7 (mg/L)	WQCC Standards (mg/L)
Chloride (Cl)	05-16-95	NS	77	**812**	188	152	80	---	---	250
	04-24-96	NS	124	**314**	134	167	NS	186	143	
	08-11-97	NS	180	200	140	140	NS	160	180	
	08-03-98	NS	120	240	160	160	NS	150	160	
	08-17-99	NS	91	**1,000**	190	170	NS	160	120	
Fluoride (F)	05-16-95	NS	**1.8**	1.1	**1.8**	1.2	1.4	---	---	1.6
	04-24-96	NS	1.6	1.1	1.5	1.1	NS	0.9	**1.8**	
	08-11-97	NS	1.9	1.3	1.5	1.1	NS	0.85	**1.8**	
	08-03-98	NS	**2.4**	**1.8**	**1.6**	1.3	NS	1.3	**1.8**	
	08-17-99	NS	**2.7**	**1.7**	**2.0**	1.5	NS	1.5	**2.7**	
Nitrate (NO_3-N)	05-16-95	NS	1.37	7.42	5.62	3.69	0.56	---	---	10.0
	04-24-96	NS	<0.1	0.3	0.3	0.1	NS	<0.1	<0.1	
	08-11-97	NS	<1.0	9	9.4	<1.0	NS	<1.0	<1.0	
	01-23-98	NS	2.8	30	15	1	NS	0.28	0.39	
	08-03-98	NS	4.0	4.0	4.0	2.9	NS	<1.0	<1.0	
	08-17-99	NS	3.8	4.0	3.5	2.5	NS	<1.0	<1.0	
Sulfate (SO_4)	05-16-95	NS	174	509	115	136	67	---	---	600
	04-24-96	NS	169	443	95	115	NS	70	149	
	08-11-97	NS	110	290	75	96	NS	37	76	
	01-23-98	NS	190	230	240	180	NS	230	180	
	08-03-98	NS	100	220	80	100	NS	45	90	
	08-17-99	NS	120	150	84	120	NS	82	14	
Total Dissolved Solids (TDS)	05-16-95	NS	634	**1,478**	516	716	692	---	---	1,000
	04-24-96	NS	702	**1,318**	598	759	NS	929	828	
	08-11-97	NS	770	**1,100**	670	800	NS	810	860	
	08-03-98	NS	640	930	640	750	NS	870	800	
	08-17-99	NS	790	**2,700**	830	790	NS	920	850	

Analyses performed by Trace Analysis, Inc. using EPA Methods 160.1 and 300.
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Regulation 3-103.
--- Indicates monitoring well was installed after this sampling date.
NS Indicates monitoring well was not sampled (due to presence of free product).
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards.

6.0 Intrinsic Bioremediation Assessment

The primary source of the following description of the biodegradation process of petroleum hydrocarbons in groundwater is based on the following publication: "*Technical Protocol for Implementing Intrinsic Remediation With Long-Term Monitoring of Natural Attenuation of Fuel-Contamination Dissolved in Groundwater*" (Volumes 1 and 2, 1995, Air Force Center for Environmental Excellence, Technology Transfer Division).

During biodegradation, dissolved BTEX is ultimately transformed into carbon dioxide, methane, and water. Biodegradation of BTEX dissolved in groundwater results in a reduction of contaminant concentration (and mass) and slowing (retardation) of the contaminant relative to the average advective groundwater flow velocity. Indigenous hydrocarbon-degrading microorganisms transform available nutrients into forms useful for energy and cell reproduction by facilitating the transfer of electrons from donors to acceptors. This results in oxidation of the electron donor and reduction of the electron acceptor. Electron donors include natural organic material and petroleum hydrocarbons. Electron acceptors are elements or compounds that occur in relatively oxidized states. The more important electron acceptors in groundwater, in order of utilization, include dissolved oxygen, (DO), nitrate (NO_3), ferric iron (Fe^{3+}), sulfate (SO_4), and carbon dioxide (CO_2).

Biodegradation causes measurable changes in groundwater geochemistry. During aerobic respiration, oxygen is reduced to water, and dissolved oxygen concentrations decrease. In anaerobic systems where nitrate is the electron acceptor, the nitrate is reduced (denitrification) to NO_2^-, N_2O, NO, NH^{4+}, or N_2, and nitrate concentrations decrease. In anaerobic systems where ferric iron (Fe^{3+}) is the electron acceptor, it is reduced (iron reduction) to ferrous iron (Fe^{2+}), and Fe^{2+} concentrations increase. In anaerobic systems where sulfate is the electron acceptor, it is reduced to hydrogen sulfide (H_2S), and sulfate concentrations decrease (sulfate reduction). In anaerobic systems where CO_2 is used as an electron acceptor, methanogenic bacteria reduce it (methanogenosis) to methane (CH_4).

Using the stoichiometric derivations from the AFCEE reference cited above the mass of benzene degraded per unit mass of electron acceptor utilized and metabolic byproduct produced was used to determine the biodegradation capacity of these constituents relative to the highest observed benzene concentration on site. A conservative approach was taken in this analysis in that microbial cell mass production was not taken into account for nitrate or sulfate and only average concentrations of electron acceptors and metabolic byproducts were used. The table below summarizes this comparison.

Electron Acceptor/ Byproduct	Terminal Electron Accepting Process (in order of preferred utilization)	Trend in Analyte Concentration During Biodegradation	Mass of benzene Degraded per unit mass of Electron Acceptor Utilized	Mass of benzene Degraded per unit mass of Metabolic Byproduct Produced	Average Concentrations of Electron Acceptors/ Byproducts (mg/L)	Biodegradation Capacity of Electron Acceptors/ Byproducts (mg/L)
DO	Aerobic Respiration	Decreases	0.97	---	4.54	4.40
NO_3*	Denitrification	Decreases	0.21	---	2.60	0.55
Fe^{2+}	Ferric Iron Reduction	Increases	---	0.046	1.18	0.05
SO_4*	Sulfate Reduction	Decreases	0.22	---	129	28.36
					Total Biodegradation Capacity	33.36
					Highest Observed Benzene Concentration	1.13

* Concervative assumption (does not take into account microbial cell mass production)

Our suite of biological parameters included dissolved oxygen, sulfate, nitrate, and iron. These electron acceptor results are summarized in Table 6. Changes in dissolved oxygen, nitrate, sulfate, and iron concentrations with time are depicted in Figures 6, 7 8 and 9, respectively.

Hydrocarbon-impacted wells (MW-1D and MW-7) are compared against upgradient and downgradient wells (MW-2, MW-3, MW-4, and MW-6) to observe whether or not significant differences are observed in electron acceptor concentrations that may be related to subsurface biodegradation. The relationships in the electron acceptor data are observed:

- Generally, dissolved oxygen levels have been lower within the hydrocarbon-impacted plume area compared to the downgradient and upgradient wells indicating active aerobic biodegradation conditions.

- Nitrate concentrations fluctuate over time therefore no trend relationship is noted. However, the presence of nitrate as an electron acceptor indicate its availability for by micro-organisms in the course of hydrocarbon degradation.

- Generally, sulfate concentrations have decreased with time indicating its utilization as an electron acceptor under anaerobic conditions.

- Increased concentrations of metabolic byproducts iron and manganese in monitoring well MW-7 indicates iron and manganese reduction conditions that are the result of anaerobic biodegradation processes.

- The biodegradation capacity of electron acceptors and metabolic byproducts (33.36 mg/L) far exceeds the highest benzene concentration (1.13 mg/L) observed on site by a ratio of 30 to 1. This indicates that the biodegradation process will continue.

Table 6
Summary of Biological Parameter Results
Monument Booster Station

Monitoring Well	Sampling Date	DO (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)	Iron (Fe^{2+} and Fe^{3+}) (mg/L)	Manganese (mg/L)
MW-1D	05/16/95	1.05	1.37	174	4.6	0.3
	11/15/95	1.26	< 0.01	119	---	---
	01/18/96	4.8	0.6	168	---	---
	04/24/96	2.6	< 0.1	169	0.06	0.37
	01/22/97	7.0	< 0.1	83	---	---
	08/11/97	3.6	< 0.1	110	0.28	0.35
	01/23/98	4.6	2.8	190	---	---
	08/03/98	2.16	4.0	100	<0.1	0.22
	02/10/99	2.7	4.6	110	---	---
	08/17/99	1.03	3.8	120	0.19	0.18
MW-2	05/16/95	6.48	7.42	509	5.82	0.12
	11/15/95	6.13	---	---	---	---
	01/18/96	6.2	---	---	---	---
	04/24/96	1.5	0.3	443	0.07	<0.01
	01/22/97	9.0	2.1	310	---	---
	08/11/97	7.6	9.0	290	0.24	<0.01
	01/23/98	8.2	30.0	230	---	---
	08/03/98	7.00	4.0	220	<0.1	<0.1
	02/10/99	8.3	4.8	140	---	---
	08/17/99	5.98	4.0	150	<0.1	<0.1
MW-3	05/16/95	6.85	5.62	115	0.53	0.08
	11/15/95	1.29	---	---	---	---
	01/18/96	4.9	---	---	---	---
	04/24/96	1.0	0.3	95	0.17	<0.01
	01/22/97	8.75	2.7	76	---	---
	08/11/97	9.20	9.4	75	0.14	<0.01
	01/23/98	7.7	15.0	240	---	---
	08/03/98	3.43	4.0	80	0.55	<0.1
	02/10/99	5.8	4.9	74	---	---
	08/17/99	4.04	3.5	84	<0.1	<0.1
MW-4	05/16/95	4.85	3.69	136	4.68	0.11
	11/15/95	1.30	---	---	---	---
	01/18/96	4.0	---	---	---	---
	04/24/96	1.9	0.1	115	0.08	<0.01
	01/22/97	9.0	< 0.1	100	---	---
	08/11/97	3.5	< 0.1	96	0.08	<0.01
	01/23/98	7.0	1.0	180	---	---
	08/03/98	3.66	2.9	100	<0.1	<0.1
	02/10/99	5.0	3.7	110	---	---
	08/17/99	2.64	2.5	120	<0.1	<0.1
MW-6	11/16/95	5.40	0.06	233	---	---
	01/18/96	4.1	< 0.05	93	---	---
	04/24/96	1.7	< 0.1	70	0.15	0.28
	01/22/97	11.0	< 0.1	37	---	---
	08/11/97	3.7	< 0.1	37	0.21	0.30
	01/23/98	4.7	0.3	230	---	---
	08/03/98	1.96	< 1.0	45	0.26	0.36
	02/10/99	2.6	< 1.0	42	---	---
	08/17/99	0.80	< 1.0	82	0.42	0.27
MW-7	11/15/95	1.6	5.00	418	---	---
	01/18/96	4.8	6.54	180	---	---
	04/24/96	2.1	0.2	149	<0.03	0.38
	01/22/97	13.2	< 0.1	25	---	---
	08/11/97	3.0	< 0.1	76	0.43	0.37
	01/23/98	4.1	0.4	180	---	---
	08/03/98	1.90	< 1.0	90	6.1	0.41
	02/10/99	2.6	< 1.0	44	---	---
	08/17/99	0.90	< 1.0	14	8.1	0.19

Analyses performed by Trace Analysis, Inc., Lubbock, Texas.
Dissolved oxygen (DO) readings obtained with Hanna Model 9143 DO meter or comparable model.
Monitoring wells MW-6 and MW-7 installed on November 15, 1995.
Monitoring wells MW-1 and MW-5 were not analyzed due to presence of phase-separated hydrocarbons (PSH).

Figure 6

Dissolved Oxygen Concentrations Versus Time

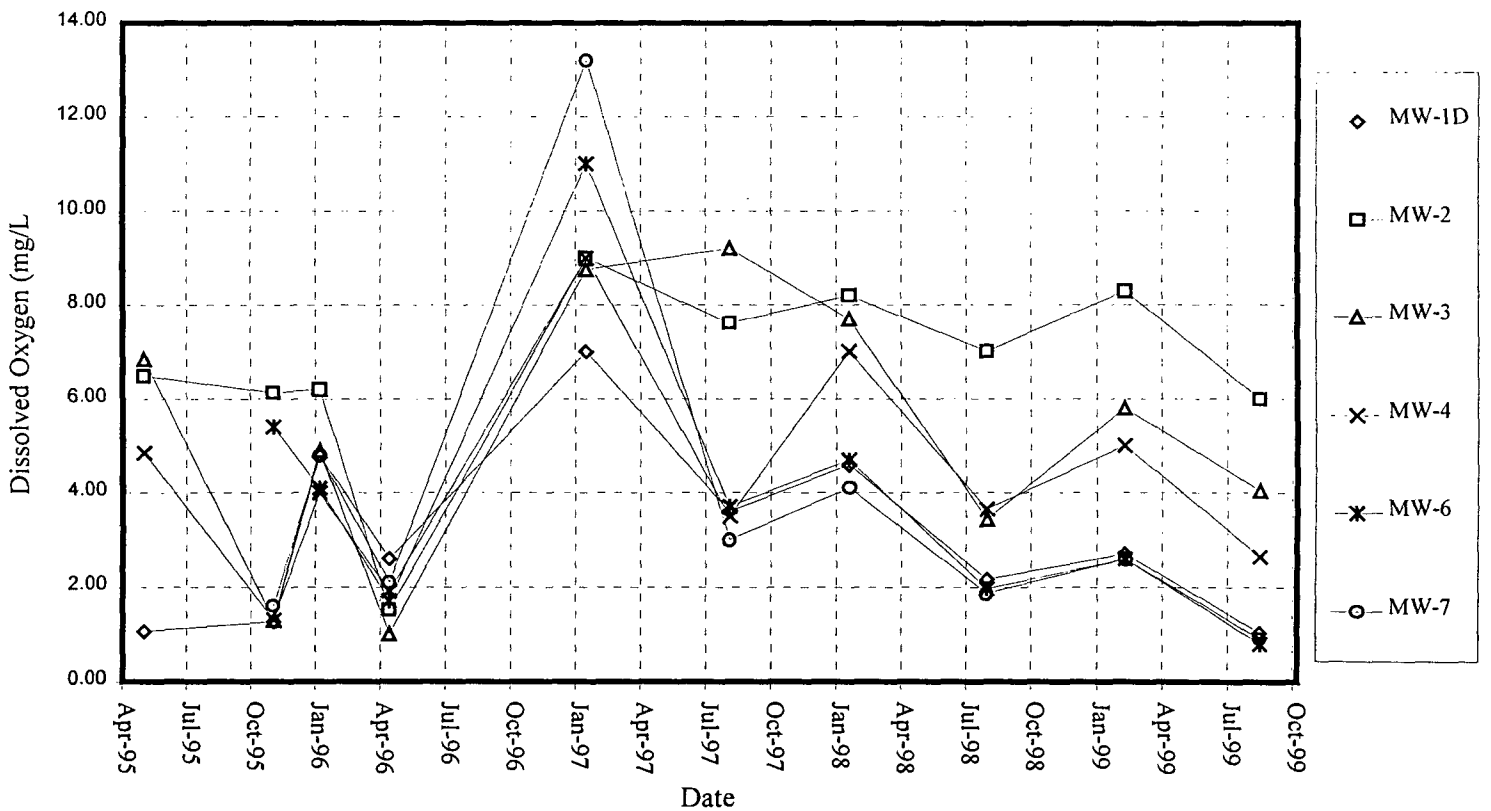


Figure 7

Nitrate Concentrations Versus Time

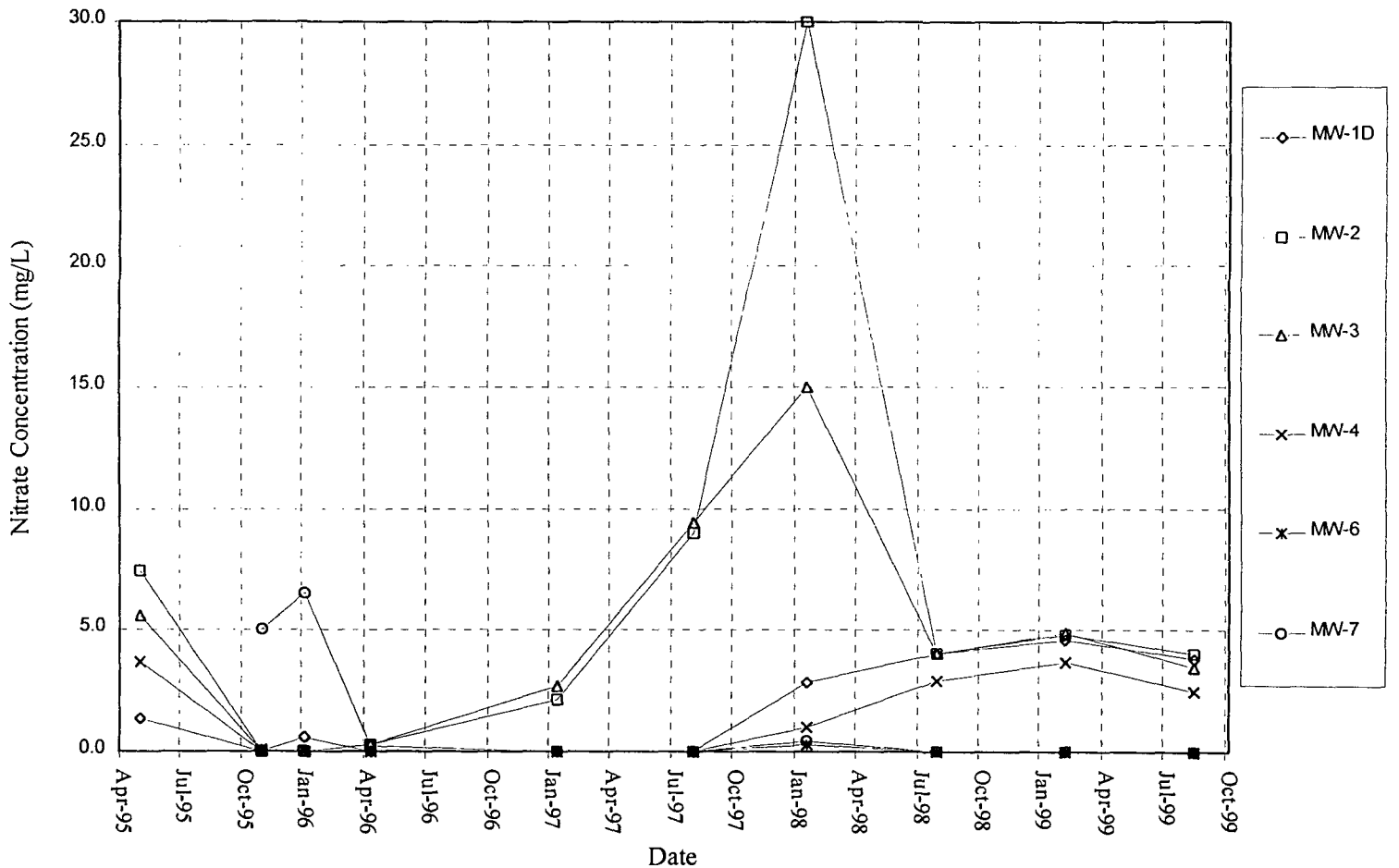


Figure 8

Sulfate Concentration Versus Time

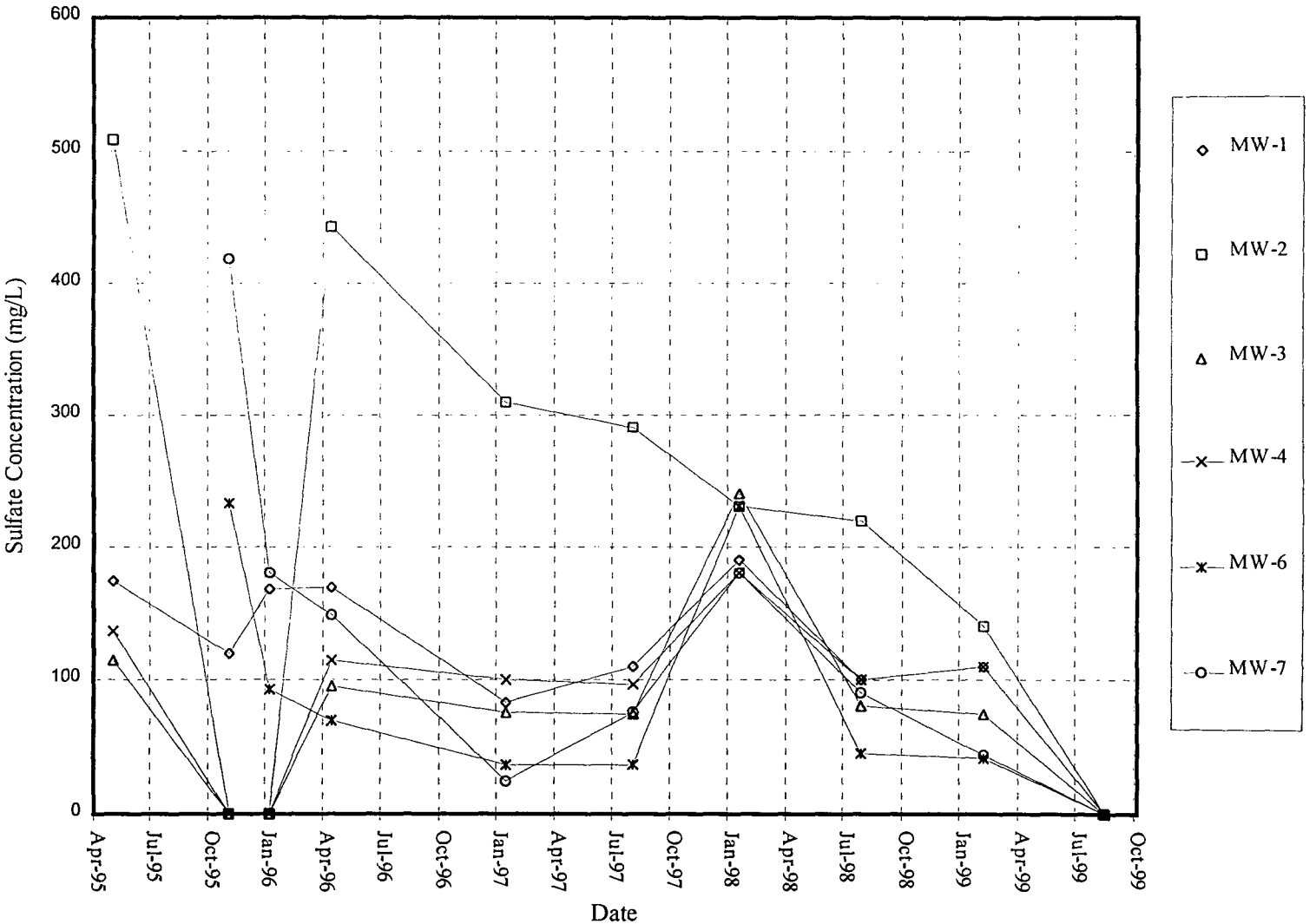
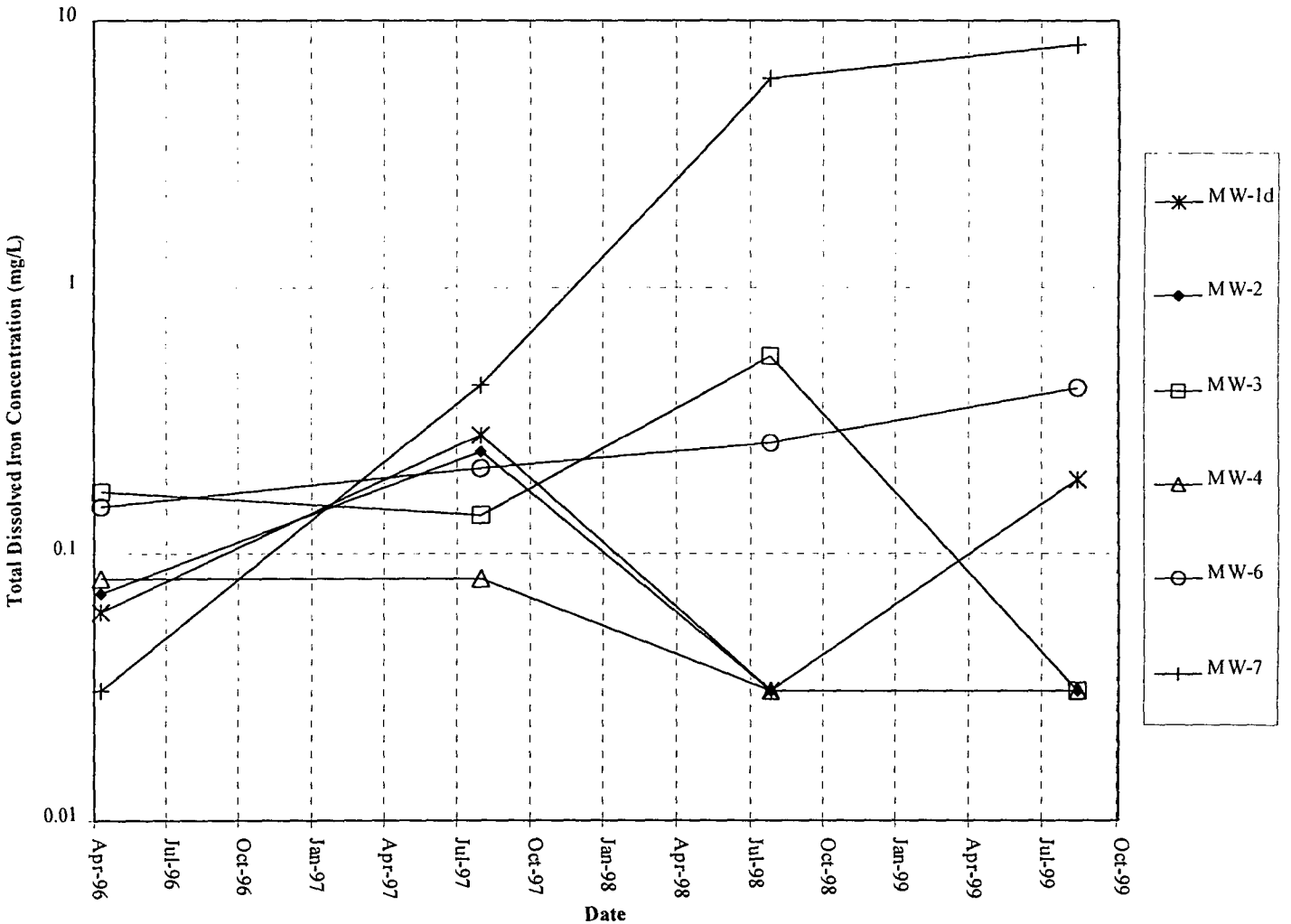


Figure 9

Total Dissolved Iron Versus Time



7.0 Remediation System Performance

The remediation system at the Monument Booster Station consists of one Xitech pneumatic product recovery system and one hydrophobic adsorbent sock. Xitech product recovery pumps were installed in monitoring wells MW-1 and MW-5 on January 31, 1997 to replace the hand bailing and gravity siphoning techniques used previously. On March 13, 1998 the Xitech pump in MW-5 was removed to be used at another facility (Lee Plant) and replaced with a passive skimmer. On April 20, 1999, the passive bailer in MW-5 was replaced with a hydrophobic adsorbent sock to improve recovery rates. As of August 17, 1999, a total of approximately 117.3 gallons of free product (condensate) have been removed from monitoring wells MW-1 and MW-5. The product recovery systems at Monument Booster Station have been successful at removing product from MW-1 and MW-5. Product recovery volumes are listed below in Table 7.

Table 7
Product Recovery Volumes

Date	Product Recovery Method	Product Recovered (Gallons)	Cumulative Product Recovered (Gallons)
MW-1			
07/24/95	Bail	10	10
07/27/95	SWAP	2	12
03/08/96	Pump	12	24
01/31/97	Pump	6	30
02/19/97	Pump	12	42
08/11/97	Pump	23	65
01/23/98	Pump	20	85
08/03/98	Pump	9	94
09/18/98	Pump	3	97
11/17/98	Pump	1	98
02/09/99	Pump	1.5	99.5
09/14/99	Pump	1	100.5
10/26/99	Pump	1	101.5
MW-5			
02/19/99	Pump	2	2
08/11/97	Pump	6	8
01/23/98	Pump	0.5	8.5
09/18/98	Skimmer	0.7	9.2
02/10/99	Skimmer	2.7	11.9
05/13/99	Skimmer	1.4	13.3
06/14/99	Sock	0.5	13.8
08/17/99	Sock	0.9	14.7
09/14/99	Sock	0.6	15.3
10/26/99	Sock	0.5	15.8
Total Volume of Product Recovered On Site:			**117.3**

Product Recovery Methods Used:
Bail: Hand bailing using PVC bailer
SWAP: Gravity siphon demonstration
Pump: Xitech ADJ1000 Smart Skimmer (Product Recovery System)
Skimmer: Passive bailer with hydrophobic filter
Sock: Hydrophobic (oil absorbent) sock

8.0 Conclusions

Conclusions relevant to groundwater conditions and the remediation performance at the Monument Booster Station are presented below.

- BTEX concentrations in monitoring wells MW-1D, MW-4, and MW-6 remained well below WQCC standards.
- Benzene levels in upgradient well MW-2 and downgradient well MW-3 have increased from less than the detection limit during the previous sampling events to levels of 0.017 mg/L and 0.043 mg/L, respectively, during the August 17, 1999 event. The increase in MW-2 may indicate impact from an upgradient, offsite source. The increase in MW-3 appears to indicate downgradient movement of a slug of contaminate; however future benzene concentrations in this area are expected to decrease.
- Benzene concentrations in MW-7 fluctuate over time but have increased from a low of 0.094 mg/L on August 3, 1998 to 0.705 mg/L on August 17, 1999.
- As of August 17, 1999, a total of approximately 117.3 gallons of free product (condensate) has been removed from monitoring wells MW-1 and MW-5 using a combination of gravity siphoning, hand bailing, passive skimmer, adsorbent sock, and pneumatic pump recovery methods.
- The presence and trends of biological parameters (dissolved, oxygen, nitrate, sulfate, and iron) indicate that biodegradation has been taking place on site. The biodegradation capacity of electron acceptors and metabolic byproducts (33.36 mg/L) far exceeds the highest benzene concentration (1.13 mg/L) observed on site by a ratio of 30 to 1. This indicates that the biodegradation process will continue. Continued semi-annual monitoring is necessary to demonstrate the effectiveness of intrinsic bioremediation in limiting the migration or elimination of the dissolved hydrocarbon plume.

9.0 Recommendations

The following recommendations are proposed for the remediation system and monitoring operations at the Monument Booster Station.

- Continue free product recovery operations since the present system has been effective in recovering free product from MW-1 and MW-5. Since the Xitech system at MW-1 has been successful in reducing product thickness to a minimum it is recommended to replace it with an absorbent sock since recovery volumes have also decreased.

- Continue the sampling and monitoring program on a semi-annual basis. The next sampling event is scheduled during the first quarter of 2000.

APPENDIX A

LABORATORY ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
4725 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

ANALYTICAL RESULTS FOR
TRW
Attention: Gil Van Deventer
415 West Wall Suite 1818
Midland, TX 79701

February 16, 1999
Receiving Date: 2/12/99
Sample Type: Water
Project No: LRMDNU-20-300
Project Location: N/A

Prep Date: 2/15/99
Analysis Date: 2/15/99
Sampling Date: 2/10/99
Sample Condition: I & C
Sample Received by: VW
Project Name: GPM-Monument Boos

TA#	FIELD CODE	N03-N (mg/L)	S04 (mg/L)
T118787	MW-3	4.9	74
T118788	MW-2	4.8	140
T118789	MW-6	<1.0	42
T118790	MW-4	3.7	110
RPD		9	0
% Extraction Accur		92	98
% Instrument Accu		96	97
Reporting Limit		0.2	0.5

METHODS: EPA 300.0.
CHEMIST: JS
N03-N SPIKE: 50 mg/L N03-N.
N03-N CV: 5.0 mg/L N03-N.
S04 SPIKE: 125 mg/L S04.
S04 CV: 12.5 mg/L S04.

Director, Dr. Blair Leftwich

2-16-99
DATE

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
4725 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

ANALYTICAL RESULTS FOR
TRW
Attention: Gil Van Deventer
415 West Wall Suite 1818
Midland, TX 79701

February 16, 1999
Receiving Date: 2/12/99
Sample Type: Water
Project No: LRMDNU-20-300
Project Location: N/A

Prep Date: 2/15/99
Analysis Date: 2/15/99
Sampling Date: 2/10/99
Sample Condition: I & C
Sample Received by: VW
Project Name: GPM-Monument Booster

TA#	FIELD CODE	N03-N (mg/L)	S04 (mg/L)
T118791	MW-1d	4.6	110
T118792	MW-7	<1.0	44
RPD		2	0
% Extraction Accura		91	96
% Instrument Accura		96	97
Reporting Limit		0.2	0.5

METHODS: EPA 300.0.
CHEMIST: JS
N03-N SPIKE: 50 mg/L N03-N.
N03-N CV: 5.0 mg/L N03-N.
S04 SPIKE: 125 mg/L S04.
S04 CV: 12.5 mg/L S04.

Director, Dr. Blair Leftwich

2-16-99
DATE

TRACE ANALYSIS, INC.
6701 Aberdeen Avenue Lubbock, Texas 79424 806•794•1296 FAX 806•794•1298

ANALYTICAL RESULTS FOR
TRW
Attention Gil Van Deventer
415 West Wall Suite 1818
Midland Tx 79701

Date: Feb 23, 1999
Date Rec: 2/12/99
Project: LRMDNU-20-300
Proj Name: GPM- Monument Booster
Proj Loc: N/A

Lab Receiving # : 9902000218
Sampling Date: 2/10/99
Sample Condition: Intact and Cool
Sample Received By: VW

TA#	Field Code	MATRIX	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	M,P,O XYLENE (mg/L)	TOTAL BTEX (mg/L)
118788	MW-2	Water	<0.001	<0.001	<0.001	<0.001	<0.001
118789	MW-6	Water	<0.001	<0.001	<0.001	0.014	0.014
118790	MW-4	Water	0.001	<0.001	<0.001	<0.001	0.001
118791	MW-1D	Water	<0.001	<0.001	<0.001	<0.001	<0.001
118792	MW-7	Water	0.597	<0.005	0.440	0.120	1.15
118793	Duplicate	Water	0.581	<0.005	0.446	0.125	1.15
118794	Rinsate	Water	<0.001	<0.001	<0.001	<0.001	<0.001
118795	Trip Blank	Water	<0.001	<0.001	<0.001	<0.001	<0.001
Method Blank			<0.001	<0.001	<0.001	<0.001	
Reporting Limit			0.001	0.001	0.001	0.001	
QC			0.106	0.104	0.105	0.304	
RPD			1	1	0	0	
% Extraction Accuracy			110	109	107	106	
% Instrument Accuracy			106	104	105	101	

TEST	PREP METHOD	PREP DATE	ANALYSIS METHOD	ANALYSIS COMPLETED	CHEMIST	QC: (mg/L)	SPIKE: (mg/L)
BTEX	EPA 5030	2/16/99	EPA 8021B	2/16/99	RC	0.100 ea	0.1 ea

RR
Director, Dr. Blair Leftwich

2-23-99
Date

TRACE ANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
4725 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

ANALYTICAL RESULTS FOR
TRW
Attention Gil Van Deventer
415 West Wall Suite 1818
Midland Tx 79701

Date: Feb 23, 1999
Date Rec: 2/12/99
Project: LRMDNU-20-300
Proj Name: GPM- Monument Booster
Proj Loc: N/A

Lab Receiving # : 9902000218
Sampling Date: 2/10/99
Sample Condition: Intact and Cool
Sample Received By: VW

TA#	Field Code	MATRIX	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	M,P,O XYLENE (mg/L)	TOTAL BTEX (mg/L)
118787	MW-3	Water	<0.005	<0.005	<0.005	<0.005	<0.005
Method Blank			<0.001	<0.001	<0.001	<0.001	
Reporting Limit			0.001	0.001	0.001	0.001	
QC			0.107	0.106	0.107	0.314	
RPD			1	2	0	1	
% Extraction Accuracy			90	89	88	87	
% Instrument Accuracy			107	106	107	105	

TEST	PREP METHOD	PREP DATE	ANALYSIS METHOD	ANALYSIS COMPLETED	CHEMIST	QC: (mg/L)	SPIKE: (mg/L)
BTEX	EPA 5030	2/18/99	EPA 8021B	2/18/99	RC	0.100 ea	0.1 ea

Director, Dr. Blair Leftwich

2-23-99
Date

118787-95

BDM International, Inc.
415 West Wall
Suite 1818
Midland, TX 79701
(915) 682-0008
FAX: (915) 682-0028

218

Chain of Custody

Date 2/11/99 Page 1 Of 1

Lab Name Trace Analysis
Address 6701 Aberdeen Ave, Ste 9
Lubbock, TX 79424
Telephone 800-378-1296

Samplers (SIGNATURES) John Ferguson

Analysis Request

Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020	Phenols, Sub Phenols 604/8040	Pesticides PCB 608/8080	Polynuclear Aromatic Hydrocarbons 610/8310	Volatile Compounds GC/MS 624/8240	Base/Neu Acid Compounds GC/MS 625/8270	Total Organic Carbon (TOC) 415/9060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons 418.1	BTEX 8021	TCLP-Vol, Semi-Vol Herbicides, Pesticides	TCLP-Metals	RCRA Metals (8)	Priority Pollutant Metals (13)	CAM Metals (18) TTLC STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total Amenable	Chemical Oxygen Demand (COD)	NO_3 + SO_4	Number of Containers
9902101010	Water	MW-3			118787								✓												✓	3
9902101120	Water	MW-2			118788								✓												✓	3
9902101210	Water	MW-6			789								✓												✓	3
9902101300	Water	MW-4			790								✓												✓	3
9902101345	Water	MW-1d			791								✓												✓	3
9902101445	Water	MW-7			792								✓												✓	3
9902101500	Water	Duplicate			793								✓													2
9902101530	Water	Rinsate			794								✓													2
506A	Water	Trip Blank			795								✓													2

Project Information
Project GPM-Monument Booster
Project Director G. Van Deventer
Charge Code No. LRMDNU-20-300
Shipping ID. No. 159-384-458-2
Via: Greyhound

Sample Receipt
Total No. of Containers
Chain of Custody Seals
Rec'd Good Condition/Cold
Conforms to Record
Lab No.

	1.	2.	3.
Relinquished By (Signature)	John Ferguson	Helen Shelton	
(Time)	1355	6:30AM	
(Printed Name)	John Ferguson	HELEN SHELTON	
(Date)	2/11/99	2/11/99	
(Company)	TRW	TRACE ANALYSIS	
Received By (Signature)	Helen Shelton		Vicki Windham (Laboratory)
(Time)	2:00PM		9:00am
(Printed Name)	HELEN SHELTON		Vicki Windham
(Date)	2/11/99		2-12-99
(Company) / (Laboratory)	TRACE ANALYSIS		Trace Analysis

Special Instructions/Comments:
Bill Direct to GPM (Mel Driver)
NEED BY 2/19/99

BUS 159384582 # Monument

Distribution: White, Canary-Laboratory • Pink BDM

2/2

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
4725 Ripley Avenue, Suite A El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

Gil Van Deventer
TRW
415 West Wall Suite 1818
Midland, TX 79701

Report Date: 9/1/99

Project Number: GPM
Project Name: LRMONU-20-300
Project Location: Monument Booster

Order ID Number: 99081909

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to TraceAnalysis, Inc. for analysis:

Sample Number	Sample Description	Matrix	Date Taken	Time Taken	Date Received
130143	MW-3	Water	8/17/99	19:30	8/19/99
130144	MW-6	Water	8/17/99	20:20	8/19/99
130145	MW-4	Water	8/17/99	21:00	8/19/99
130146	MW-2	Water	8/17/99	22:30	8/19/99
130147	MW-1D	Water	8/17/99	23:30	8/19/99
130148	Duplicate	Water	8/17/99	23:20	8/19/99
130149	MW-7	Water	8/17/99	23:50	8/19/99
130150	Rinsate	Water	8/17/99	22:40	8/19/99

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 12 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Analytical Results Report

Sample Number: 130143
Description: MW-3

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
Benzene (mg/L)		0.043	5	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001
Toluene (mg/L)		<0.005	5	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001
Ethylbenzene (mg/L)		<0.005	5	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001
M,P,O-Xylene (mg/L)		<0.005	5	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001
Total BTEX (mg/L)		0.043	5	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/L)	0.526	5	0.1	105	72 - 128	RC	PB02067	QC02573
4-BFB (mg/L)	0.46	5	0.1	92	72 - 128	RC	PB02067	QC02573

CL (mg/L)	190	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02524	0.5
Fluoride (mg/L)	2.0	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02524	0.1
Nitrate-N (mg/L)	3.5	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02524	0.2
Sulfate (mg/L)	84	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02524	0.5
Total Dissolved Solids (mg/L)	830	1	E 160.1	8/25/99	8/26/99	MD	PB02074	QC02586	10
Total Aluminum (mg/L)	<0.10	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1
Total Arsenic (mg/L)	<0.10	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1
Total Boron (mg/L)	0.19	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1
Total Chromium (mg/L)	<0.05	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.05
Total Iron (mg/L)	<0.10	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1
Total Manganese (mg/L)	<0.10	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1

Sample Number: 130144
Description: MW-6

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
Benzene (mg/L)		0.002	1	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001
Toluene (mg/L)		<0.001	1	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001
Ethylbenzene (mg/L)		<0.001	1	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001
M,P,O-Xylene (mg/L)		0.012	1	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001
Total BTEX (mg/L)		0.013	1	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/L)	0.112	1	0.1	112	72 - 128	RC	PB02067	QC02573
4-BFB (mg/L)	0.091	1	0.1	91	72 - 128	RC	PB02067	QC02573

CL (mg/L)	160	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02524	0.5
Fluoride (mg/L)	1.5	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02524	0.1
Nitrate-N (mg/L)	<1.0	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02524	0.2
Sulfate (mg/L)	82	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02524	0.5
Total Dissolved Solids (mg/L)	920	1	E 160.1	8/25/99	8/26/99	MD	PB02074	QC02586	10
Total Aluminum (mg/L)	<0.10	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1
Total Arsenic (mg/L)	<0.10	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1

Total Boron (mg/L)	0.38	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1
Total Chromium (mg/L)	<0.05	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.05
Total Iron (mg/L)	0.42	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1
Total Manganese (mg/L)	0.27	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1

Sample Number: 130145
Description: MW-4

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
Benzene (mg/L)		<0.001	1	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001
Toluene (mg/L)		<0.001	1	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001
Ethylbenzene (mg/L)		<0.001	1	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001
M,P,O-Xylene (mg/L)		0.001	1	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001
Total BTEX (mg/L)		0.001	1	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/L)	0.116	1	0.1	116	72 - 128	RC	PB02067	QC02573
4-BFB (mg/L)	0.098	1	0.1	98	72 - 128	RC	PB02067	QC02573

CL (mg/L)	170	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02524	0.5
Fluoride (mg/L)	1.5	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02524	0.1
Nitrate-N (mg/L)	2.5	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02524	0.2
Sulfate (mg/L)	120	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02524	0.5
Total Dissolved Solids (mg/L)	790	1	E 160.1	8/25/99	8/26/99	MD	PB02074	QC02586	10
Total Aluminum (mg/L)	<0.10	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1
Total Arsenic (mg/L)	<0.10	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1
Total Boron (mg/L)	0.21	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1
Total Chromium (mg/L)	<0.05	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.05
Total Iron (mg/L)	<0.10	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1
Total Manganese (mg/L)	<0.10	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1

Sample Number: 130146
Description: MW-2

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
Benzene (mg/L)		0.017	1	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001
Toluene (mg/L)		0.013	1	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001
Ethylbenzene (mg/L)		0.002	1	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001
M,P,O-Xylene (mg/L)		0.003	1	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001
Total BTEX (mg/L)		0.036	1	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/L)	0.106	1	0.1	106	72 - 128	RC	PB02067	QC02573
4-BFB (mg/L)	0.091	1	0.1	91	72 - 128	RC	PB02067	QC02573

CL (mg/L)	1000	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02525	0.5
Fluoride (mg/L)	1.7	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02525	0.1
Nitrate-N (mg/L)	4.0	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02525	0.2
Sulfate (mg/L)	150	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02525	0.5
Total Dissolved Solids (mg/L)	2700	1	E 160.1	8/25/99	8/26/99	MD	PB02074	QC02586	10

Total Aluminum (mg/L)	<0.10	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1
Total Arsenic (mg/L)	<0.10	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1
Total Boron (mg/L)	0.23	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1
Total Chromium (mg/L)	<0.05	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.05
Total Iron (mg/L)	<0.10	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1
Total Manganese (mg/L)	<0.10	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1

Sample Number: 130147
Description: MW-1D

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
Benzene (mg/L)		<0.001	1	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001
Toluene (mg/L)		<0.001	1	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001
Ethylbenzene (mg/L)		<0.001	1	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001
M,P,O-Xylene (mg/L)		<0.001	1	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001
Total BTEX (mg/L)		<0.001	1	S 8021B	8/24/99	8/24/99	RC	PB02067	QC02573	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/L)	0.109	1	0.1	109	72 - 128	RC	PB02067	QC02573
4-BFB (mg/L)	0.088	1	0.1	88	72 - 128	RC	PB02067	QC02573

CL (mg/L)		91	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02525	0.5
Fluoride (mg/L)		2.7	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02525	0.1
Nitrate-N (mg/L)		3.8	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02525	0.2
Sulfate (mg/L)		120	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02525	0.5
Total Dissolved Solids (mg/L)		790	1	E 160.1	8/25/99	8/26/99	MD	PB02074	QC02586	10
Total Aluminum (mg/L)		<0.10	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1
Total Arsenic (mg/L)		<0.10	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1
Total Boron (mg/L)		0.15	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1
Total Chromium (mg/L)		<0.05	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.05
Total Iron (mg/L)		0.19	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1
Total Manganese (mg/L)		0.18	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1

Sample Number: 130148
Description: Duplicate

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
Benzene (mg/L)		0.747	1	S 8021B	8/20/99	8/20/99	RC	PB02041	QC02536	0.001
Toluene (mg/L)		0.005	1	S 8021B	8/20/99	8/20/99	RC	PB02041	QC02536	0.001
Ethylbenzene (mg/L)		0.56	1	S 8021B	8/20/99	8/20/99	RC	PB02041	QC02536	0.001
M,P,O-Xylene (mg/L)		0.509	1	S 8021B	8/20/99	8/20/99	RC	PB02041	QC02536	0.001
Total BTEX (mg/L)		1.82	1	S 8021B	8/20/99	8/20/99	RC	PB02041	QC02536	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/L)	0.116	1	0.1	116	72 - 128	RC	PB02041	QC02536
4-BFB (mg/L)	0.096	1	0.1	96	72 - 128	RC	PB02041	QC02536

Sample Number: 130149
Description: MW-7

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
Benzene (mg/L)		0.705	5	S 8021B	8/28/99	8/28/99	RC	PB02108	QC02626	0.001
Toluene (mg/L)		<0.005	5	S 8021B	8/28/99	8/28/99	RC	PB02108	QC02626	0.001
Ethylbenzene (mg/L)		0.598	5	S 8021B	8/28/99	8/28/99	RC	PB02108	QC02626	0.001
M,P,O-Xylene (mg/L)		0.556	5	S 8021B	8/28/99	8/28/99	RC	PB02108	QC02626	0.001
Total BTEX (mg/L)		1.86	5	S 8021B	8/28/99	8/28/99	RC	PB02108	QC02626	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/L)	0.515	5	0.1	103	72 - 128	RC	PB02108	QC02626
4-BFB (mg/L)	0.581	5	0.1	116	72 - 128	RC	PB02108	QC02626

CL (mg/L)	120	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02525	0.5
Fluoride (mg/L)	2.7	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02525	0.1
Nitrate-N (mg/L)	<1.0	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02525	0.2
Sulfate (mg/L)	14	1	E 300.0	8/19/99	8/19/99	JS	PB02033	QC02525	0.5
Total Dissolved Solids (mg/L)	850	1	E 160.1	8/25/99	8/26/99	MD	PB02074	QC02586	10
Total Aluminum (mg/L)	<0.10	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1
Total Arsenic (mg/L)	<0.10	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1
Total Boron (mg/L)	0.85	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1
Total Chromium (mg/L)	<0.05	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.05
Total Iron (mg/L)	8.1	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1
Total Manganese (mg/L)	0.19	1	S 6010B	8/22/99	8/24/99	RR	PB02145	QC02666	0.1

Sample Number: 130150
Description: Rinsate

Param	Flag	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
Benzene (mg/L)		<0.001	1	S 8021B	8/20/99	8/20/99	RC	PB02041	QC02536	0.001
Toluene (mg/L)		<0.001	1	S 8021B	8/20/99	8/20/99	RC	PB02041	QC02536	0.001
Ethylbenzene (mg/L)		0.001	1	S 8021B	8/20/99	8/20/99	RC	PB02041	QC02536	0.001
M,P,O-Xylene (mg/L)		0.001	1	S 8021B	8/20/99	8/20/99	RC	PB02041	QC02536	0.001
Total BTEX (mg/L)		0.002	1	S 8021B	8/20/99	8/20/99	RC	PB02041	QC02536	0.001

Surrogate	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT (mg/L)	0.099	1	0.1	99	72 - 128	RC	PB02041	QC02536
4-BFB (mg/L)	0.073	1	0.1	73	72 - 128	RC	PB02041	QC02536

Quality Control Report
Method Blanks

Param	Flag	Blank Result	Reporting Limit	Date Analyzed	Prep Batch #	QC Batch #
Benzene (mg/L)		<0.001	0.001	8/20/99	PB02041	QC02536
Toluene (mg/L)		<0.001	0.001	8/20/99	PB02041	QC02536
Ethylbenzene (mg/L)		<0.001	0.001	8/20/99	PB02041	QC02536
M,P,O-Xylene (mg/L)		<0.001	0.001	8/20/99	PB02041	QC02536
Total BTEX (mg/L)		<0.001	0.001	8/20/99	PB02041	QC02536
Benzene (mg/L)		<0.001	0.001	8/24/99	PB02067	QC02573
Toluene (mg/L)		<0.001	0.001	8/24/99	PB02067	QC02573
Ethylbenzene (mg/L)		<0.001	0.001	8/24/99	PB02067	QC02573
M,P,O-Xylene (mg/L)		<0.001	0.001	8/24/99	PB02067	QC02573
Total BTEX (mg/L)		<0.001	0.001	8/24/99	PB02067	QC02573
Benzene (mg/L)		<0.001	0.001	8/28/99	PB02108	QC02626
Toluene (mg/L)		<0.001	0.001	8/28/99	PB02108	QC02626
Ethylbenzene (mg/L)		<0.001	0.001	8/28/99	PB02108	QC02626
M,P,O-Xylene (mg/L)		<0.001	0.001	8/28/99	PB02108	QC02626
Total BTEX (mg/L)		<0.001	0.001	8/28/99	PB02108	QC02626

Param	Flag	Blank Result	Reporting Limit	Date Analyzed	Prep Batch #	QC Batch #
CL (mg/L)		<0.5	0.5	8/19/99	PB02033	QC02524
Sulfate (mg/L)		<0.5	0.5	8/19/99	PB02033	QC02524
CL (mg/L)		<0.5	0.5	8/19/99	PB02033	QC02525
Fluoride (mg/L)		<0.1	0.1	8/19/99	PB02033	QC02525
Nitrate-N (mg/L)		<0.2	0.2	8/19/99	PB02033	QC02525
Sulfate (mg/L)		<0.5	0.5	8/19/99	PB02033	QC02525

Param	Flag	Blank Result	Reporting Limit	Date Analyzed	Prep Batch #	QC Batch #
Total Dissolved Solids (mg/L)		<10	10	8/26/99	PB02074	QC02586

Param	Flag	Blank Result	Reporting Limit	Date Analyzed	Prep Batch #	QC Batch #
Total Aluminum (mg/L)		<0.10	0.1	8/24/99	PB02145	QC02666
Total Arsenic (mg/L)		<0.10	0.1	8/24/99	PB02145	QC02666
Total Boron (mg/L)		<0.10	0.1	8/24/99	PB02145	QC02666
Total Chromium (mg/L)		<0.05	0.05	8/24/99	PB02145	QC02666
Total Iron (mg/L)		<0.10	0.1	8/24/99	PB02145	QC02666
Total Manganese (mg/L)		<0.10	0.1	8/24/99	PB02145	QC02666

Quality Control Report
Matrix Spike and Matrix Duplicate Spike

Standard	Param	Sample Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
MS	CL (mg/L)	1100	1	1250	2304.94	96		80 - 120	0 - 20	QC02524
MS	Fluoride (mg/L)		1	250	268.73	100		80 - 120	0 - 20	QC02524
MS	Nitrate-N (mg/L)		1	500	550.75	99		80 - 120	0 - 20	QC02524
MS	Sulfate (mg/L)	1100	1	1250	2491.08	111		80 - 120	0 - 20	QC02524
MSD	CL (mg/L)	1100	1	1250	2421.64	106	9	80 - 120	0 - 20	QC02524
MSD	Fluoride (mg/L)		1	250	267.53	100	0	80 - 120	0 - 20	QC02524
MSD	Nitrate-N (mg/L)		1	500	553.26	99	1	80 - 120	0 - 20	QC02524
MSD	Sulfate (mg/L)	1100	1	1250	2488.51	111	0	80 - 120	0 - 20	QC02524

Standard	Param	Sample Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
MS	CL (mg/L)	120	1	625	766.16	103		80 - 120	0 - 20	QC02525
MS	Fluoride (mg/L)	2.7	1	125	136.15	107		80 - 120	0 - 20	QC02525
MS	Nitrate-N (mg/L)	<1.0	1	250	275.97	110		80 - 120	0 - 20	QC02525
MS	Sulfate (mg/L)	14	1	625	696.38	109		80 - 120	0 - 20	QC02525
MSD	CL (mg/L)	120	1	625	755.27	102	2	80 - 120	0 - 20	QC02525
MSD	Fluoride (mg/L)	2.7	1	125	135.96	107	0	80 - 120	0 - 20	QC02525
MSD	Nitrate-N (mg/L)	<1.0	1	250	273.63	109	1	80 - 120	0 - 20	QC02525
MSD	Sulfate (mg/L)	14	1	625	673.77	106	3	80 - 120	0 - 20	QC02525

Standard	Param	Sample Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
MS	Total Aluminum (mg/L)	<0.10	1	2	1.80	90		80 - 120	0 - 20	QC02666
MS	Total Arsenic (mg/L)	<0.10	1	2	1.90	95		80 - 120	0 - 20	QC02666
MS	Total Boron (mg/L)	0.19	1	2	1.89	85		80 - 120	0 - 20	QC02666
MS	Total Chromium (mg/L)	<0.05	1	2	1.80	90		80 - 120	0 - 20	QC02666
MS	Total Iron (mg/L)	<0.10	1	2	1.81	91		80 - 120	0 - 20	QC02666
MS	Total Manganese (mg/L)	<0.10	1	2	1.76	88		80 - 120	0 - 20	QC02666
MSD	Total Aluminum (mg/L)	<0.10	1	2	1.82	91	1	80 - 120	0 - 20	QC02666
MSD	Total Arsenic (mg/L)	<0.10	1	2	1.91	96	1	80 - 120	0 - 20	QC02666
MSD	Total Boron (mg/L)	0.19	1	2	1.89	85	0	80 - 120	0 - 20	QC02666
MSD	Total Chromium (mg/L)	<0.05	1	2	1.80	90	0	80 - 120	0 - 20	QC02666
MSD	Total Iron (mg/L)	<0.10	1	2	1.81	91	0	80 - 120	0 - 20	QC02666
MSD	Total Manganese (mg/L)	<0.10	1	2	1.76	88	0	80 - 120	0 - 20	QC02666

Quality Control Report
Duplicates

Standard	Param	Flag	Duplicate Result	Sample Result	Dilution	RPD	RPD Limit	QC Batch #
Duplicate	Total Dissolved Solids (mg/L)		220	210	1	5	0 - 20	QC02586

Quality Control Report
Lab Control Spikes and Duplicate Spike

	Param	Blank Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
LCS	MTBE (mg/L)	<0.001	1	0.1	0.104	104		80 - 120	0 - 20	QC02536
LCS	Benzene (mg/L)	<0.001	1	0.1	0.101	101		80 - 120	0 - 20	QC02536
LCS	Toluene (mg/L)	<0.001	1	0.1	0.1	100		80 - 120	0 - 20	QC02536
LCS	Ethylbenzene (mg/L)	<0.001	1	0.1	0.1	100		80 - 120	0 - 20	QC02536
LCS	M,P,O-Xylene (mg/L)	<0.001	1	0.3	0.295	98		80 - 120	0 - 20	QC02536

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCS	TFT (mg/L)	1	0.1	0.1	100	72 - 128	QC02536
LCS	4-BFB (mg/L)	1	0.1	0.097	97	72 - 128	QC02536

	Param	Blank Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
LCSD	MTBE (mg/L)	<0.001	1	0.1	0.104	104	0	80 - 120	0 - 20	QC02536
LCSD	Benzene (mg/L)	<0.001	1	0.1	0.1	100	1	80 - 120	0 - 20	QC02536
LCSD	Toluene (mg/L)	<0.001	1	0.1	0.1	100	0	80 - 120	0 - 20	QC02536
LCSD	Ethylbenzene (mg/L)	<0.001	1	0.1	0.099	99	1	80 - 120	0 - 20	QC02536
LCSD	M,P,O-Xylene (mg/L)	<0.001	1	0.3	0.294	98	0	80 - 120	0 - 20	QC02536

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCSD	TFT (mg/L)	1	0.1	0.1	100	72 - 128	QC02536
LCSD	4-BFB (mg/L)	1	0.1	0.098	98	72 - 128	QC02536

	Param	Blank Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
LCS	MTBE (mg/L)	<0.001	1	0.1	0.103	103		80 - 120	0 - 20	QC02573
LCS	Benzene (mg/L)	<0.001	1	0.1	0.103	103		80 - 120	0 - 20	QC02573
LCS	Toluene (mg/L)	<0.001	1	0.1	0.102	102		80 - 120	0 - 20	QC02573
LCS	Ethylbenzene (mg/L)	<0.001	1	0.1	0.101	101		80 - 120	0 - 20	QC02573
LCS	M,P,O-Xylene (mg/L)	<0.001	1	0.3	0.295	98		80 - 120	0 - 20	QC02573

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCS	TFT (mg/L)	1	0.1	0.107	107	72 - 128	QC02573
LCS	4-BFB (mg/L)	1	0.1	0.099	99	72 - 128	QC02573

	Param	Blank Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
LCSD	MTBE (mg/L)	<0.001	1	0.1	0.113	113	9	80 - 120	0 - 20	QC02573
LCSD	Benzene (mg/L)	<0.001	1	0.1	0.11	110	7	80 - 120	0 - 20	QC02573
LCSD	Toluene (mg/L)	<0.001	1	0.1	0.109	109	7	80 - 120	0 - 20	QC02573
LCSD	Ethylbenzene (mg/L)	<0.001	1	0.1	0.108	108	7	80 - 120	0 - 20	QC02573
LCSD	M,P,O-Xylene (mg/L)	<0.001	1	0.3	0.318	106	8	80 - 120	0 - 20	QC02573

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCSD	TFT (mg/L)	1	0.1	0.112	112	72 - 128	QC02573
LCSD	4-BFB (mg/L)	1	0.1	0.104	104	72 - 128	QC02573

	Param	Blank Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
LCS	MTBE (mg/L)	<0.001	1	0.1	0.092	92		80 - 120	0 - 20	QC02626
LCS	Benzene (mg/L)	<0.001	1	0.1	0.088	88		80 - 120	0 - 20	QC02626
LCS	Toluene (mg/L)	<0.001	1	0.1	0.088	88		80 - 120	0 - 20	QC02626
LCS	Ethylbenzene (mg/L)	<0.001	1	0.1	0.088	88		80 - 120	0 - 20	QC02626
LCS	M,P,O-Xylene (mg/L)	<0.001	1	0.3	0.262	87		80 - 120	0 - 20	QC02626

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCS	TFT (mg/L)	1	0.1	0.102	102	72 - 128	QC02626
LCS	4-BFB (mg/L)	1	0.1	0.119	119	72 - 128	QC02626

LCSD	MTBE (mg/L)	<0.001	1	0.1	0.096	96	4	80 - 120	0 - 20	QC02626
LCSD	Benzene (mg/L)	<0.001	1	0.1	0.091	91	3	80 - 120	0 - 20	QC02626
LCSD	Toluene (mg/L)	<0.001	1	0.1	0.091	91	3	80 - 120	0 - 20	QC02626
LCSD	Ethylbenzene (mg/L)	<0.001	1	0.1	0.091	91	3	80 - 120	0 - 20	QC02626
LCSD	M,P,O-Xylene (mg/L)	<0.001	1	0.3	0.272	91	4	80 - 120	0 - 20	QC02626

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCSD	TFT (mg/L)	1	0.1	0.105	105	72 - 128	QC02626
LCSD	4-BFB (mg/L)	1	0.1	0.121	121	72 - 128	QC02626

	Param	Blank Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
LCS	Total Aluminum (mg/L)	<0.10	1	2	1.89	95		80 - 120	0 - 20	QC02666
LCS	Total Arsenic (mg/L)	<0.10	1	2	1.98	99		80 - 120	0 - 20	QC02666
LCS	Total Boron (mg/L)	<0.10	1	2	1.76	88		80 - 120	0 - 20	QC02666
LCS	Total Chromium (mg/L)	<0.05	1	2	1.96	98		80 - 120	0 - 20	QC02666
LCS	Total Iron (mg/L)	<0.10	1	2	1.95	98		80 - 120	0 - 20	QC02666
LCS	Total Manganese (mg/L)	<0.10	1	2	1.92	96		80 - 120	0 - 20	QC02666

LCSD	Total Aluminum (mg/L)	<0.10	1	2	1.90	95	1	80 - 120	0 - 20	QC02666
LCSD	Total Arsenic (mg/L)	<0.10	1	2	1.98	99	0	80 - 120	0 - 20	QC02666
LCSD	Total Boron (mg/L)	<0.10	1	2	1.78	89	1	80 - 120	0 - 20	QC02666
LCSD	Total Chromium (mg/L)	<0.05	1	2	1.96	98	0	80 - 120	0 - 20	QC02666
LCSD	Total Iron (mg/L)	<0.10	1	2	1.95	98	0	80 - 120	0 - 20	QC02666
LCSD	Total Manganese (mg/L)	<0.10	1	2	1.92	96	0	80 - 120	0 - 20	QC02666

Quality Control Report
Continuing Calibration Verification Standard

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	Benzene (mg/L)		0.1	0.093	93	80 - 120	8/20/99	QC02536
ICV	Toluene (mg/L)		0.1	0.093	93	80 - 120	8/20/99	QC02536
ICV	Ethylbenzene (mg/L)		0.1	0.092	92	80 - 120	8/20/99	QC02536
ICV	M,P,O-Xylene (mg/L)		0.3	0.271	90	80 - 120	8/20/99	QC02536
CCV (1	Benzene (mg/L)		0.1	0.096	96	80 - 120	8/20/99	QC02536
CCV (1	Toluene (mg/L)		0.1	0.096	96	80 - 120	8/20/99	QC02536
CCV (1	Ethylbenzene (mg/L)		0.1	0.097	97	80 - 120	8/20/99	QC02536
CCV (1	M,P,O-Xylene (mg/L)		0.3	0.284	95	80 - 120	8/20/99	QC02536

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	Benzene (mg/L)		0.1	0.107	107	80 - 120	8/24/99	QC02573
ICV	Toluene (mg/L)		0.1	0.107	107	80 - 120	8/24/99	QC02573
ICV	Ethylbenzene (mg/L)		0.1	0.106	106	80 - 120	8/24/99	QC02573
ICV	M,P,O-Xylene (mg/L)		0.3	0.309	103	80 - 120	8/24/99	QC02573
CCV (1	Benzene (mg/L)		0.1	0.11	110	80 - 120	8/24/99	QC02573
CCV (1	Toluene (mg/L)		0.1	0.108	108	80 - 120	8/24/99	QC02573
CCV (1	Ethylbenzene (mg/L)		0.1	0.106	106	80 - 120	8/24/99	QC02573
CCV (1	M,P,O-Xylene (mg/L)		0.3	0.309	103	80 - 120	8/24/99	QC02573

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	Benzene (mg/L)		0.1	0.086	86	80 - 120	8/28/99	QC02626
ICV	Toluene (mg/L)		0.1	0.086	86	80 - 120	8/28/99	QC02626
ICV	Ethylbenzene (mg/L)		0.1	0.085	85	80 - 120	8/28/99	QC02626
ICV	M,P,O-Xylene (mg/L)		0.3	0.254	85	80 - 120	8/28/99	QC02626
CCV (1	Benzene (mg/L)		0.1	0.098	98	80 - 120	8/28/99	QC02626
CCV (1	Toluene (mg/L)		0.1	0.097	97	80 - 120	8/28/99	QC02626
CCV (1	Ethylbenzene (mg/L)		0.1	0.099	99	80 - 120	8/28/99	QC02626
CCV (1	M,P,O-Xylene (mg/L)		0.3	0.294	98	80 - 120	8/28/99	QC02626

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	CL (mg/L)		12.5	12.36	99	80 - 120	8/19/99	QC02524
ICV	Fluoride (mg/L)		2.5	2.55	102	80 - 120	8/19/99	QC02524
ICV	Nitrate-N (mg/L)		5	5.20	104	80 - 120	8/19/99	QC02524
ICV	Sulfate (mg/L)		12.5	13.30	106	80 - 120	8/19/99	QC02524
CCV (1	CL (mg/L)		12.5	11.81	94	80 - 120	8/19/99	QC02524

Quality Control Report
Continuing Calibration Verification Standard

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
CCV (1	Fluoride (mg/L)		2.5	2.59	104	80 - 120	8/19/99	QC02524
CCV (1	Nitrate-N (mg/L)		5	5.20	104	80 - 120	8/19/99	QC02524
CCV (1	Sulfate (mg/L)		12.5	13.40	107	80 - 120	8/19/99	QC02524

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	CL (mg/L)		12.5	11.81	94	80 - 120	8/19/99	QC02525
ICV	Fluoride (mg/L)		2.5	2.59	104	80 - 120	8/19/99	QC02525
ICV	Nitrate-N (mg/L)		5	5.20	104	80 - 120	8/19/99	QC02525
ICV	Sulfate (mg/L)		12.5	13.40	107	80 - 120	8/19/99	QC02525
CCV (1	CL (mg/L)		12.5	12.37	99	80 - 120	8/19/99	QC02525
CCV (1	Fluoride (mg/L)		2.5	2.59	104	80 - 120	8/19/99	QC02525
CCV (1	Nitrate-N (mg/L)		5	5.17	103	80 - 120	8/19/99	QC02525
CCV (1	Sulfate (mg/L)		12.5	13.24	106	80 - 120	8/19/99	QC02525

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	Total Dissolved Solids (mg/L)		1000	921	92	80 - 120	8/26/99	QC02586
CCV (1	Total Dissolved Solids (mg/L)		1000	982	98	80 - 120	8/26/99	QC02586

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	Total Aluminum (mg/L)		1	0.94	94	80 - 120	8/24/99	QC02666
ICV	Total Arsenic (mg/L)		1	0.92	92	80 - 120	8/24/99	QC02666
ICV	Total Boron (mg/L)		1	0.96	96	80 - 120	8/24/99	QC02666
ICV	Total Chromium (mg/L)		1	0.92	92	80 - 120	8/24/99	QC02666
ICV	Total Manganese (mg/L)		1	0.90	90	80 - 120	8/24/99	QC02666
CCV (1	Total Aluminum (mg/L)		1	0.90	90	80 - 120	8/24/99	QC02666
CCV (1	Total Arsenic (mg/L)		1	0.91	91	80 - 120	8/24/99	QC02666
CCV (1	Total Boron (mg/L)		1	1.00	100	80 - 120	8/24/99	QC02666
CCV (1	Total Chromium (mg/L)		1	0.93	93	80 - 120	8/24/99	QC02666
CCV (1	Total Iron (mg/L)		1	0.92	92	80 - 120	8/24/99	QC02666
CCV (1	Total Manganese (mg/L)		1	0.90	90	80 - 120	8/24/99	QC02666

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TRW Inc.
Energy & Environmental Systems
415 West Wall St. Suite. 1818
Midland, Texas 79701
(915) 682-0008
FAX: (915) 682-0028

№ 13439

Chain of Custody

Date 8-17-99 Page 1 of 1

Lab Name: Trace Analysis Inc.
Address: 6701 Aberdeen Av, Ste 9
Lubbock, Tx. ~~7449~~ 79424
Telephone: 806/ 794-1296

Samplers (SIGNATURES)
Gil Van Deventer

Analysis Request

Sample Identification		Matrix	Date	Time	BTEX (EPA 8021B)	MTBE (EPA 8021B)	SVOC (EPA 8270)	PAH (EPA 8270)	VOC (EPA 8260)	TPH (EPA 418.1)	TPH (TX-1005)	TPH (TX-1006)	GRO (EPA 8015G)	DRO (EPA 8015D)	TDS (EPA 160.1)	Anions/Cations	Total Metals Al, As, B, Cr, Fe, Mn	TCLP Metals	Cl, F, NO_3, SO_4, TDS							Number of Containers
MW-3	130143	Water	8-17-99	1930	✓												✓		✓							4
MW-6	144	Water	8-17-99	2020	✓												✓		✓							4
MW-4	145	Water	8-17-99	2100	✓												✓		✓							4
MW-2	146	Water	8-17-99	2230	✓												✓		✓							4
MW-1d	147	Water	8-17-99	2300	✓												✓		✓							4
Duplicate	148	Water	8-17-99	2320	✓																					2
MW-7	149	Water	8-17-99	2350	✓												✓		✓							4
Rinsate	150	Water	8-17-99	2240	✓																					2
~~Trip~~																										

Project Information	Sample Receipt
Project Name: GPM	Total Containers:
Project Location: Monument Booster	COC Seals:
Project Manager: Gil Van Deventer	Rec'd Good Cond/Cold:
Cost Center No.: LRMONU-20-300	Conforms to Records:
Shipping ID No.:	Lab No.:
P O No.:	

Special Instructions/Comments: Invoice GPM direct (Mel Driver)
Metals (
Ions (Cl, F, SO_4, NO_3 & TDS)

Relinquished By: (1)	Relinquished By: (2)	Relinquished By: (3)
Gil Van Deventer 8-18-99		
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
Gil Van Deventer 3:45pm		
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
TRW Inc.		
(Company)	(Company)	(Company)
Received By: (1)	**Received By: (2)**	**Received By: (3)**
		Vicki Windham 9:00 a
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
		Vicki Windham 8-19-99
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
		Trace Analysis
(Company)	(Company)	(Company)

-1° TRIP TO 902-228-247-8 MA dn Gil

Distribution: White, Canary-Laboratory / Pink-TRW